WORKING PAPER

AMONG THE ENERGY TRIBES:
THE ANTHROPOLOGY OF THE CURRENT
POLICY DEBATE

Michael Thompson

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IIASA
International Institute
for Applied Systems Analysis

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1. INTRODUCTION.

> "We are all aware of the mutable nature of perceptions and preferences. They change with new information, new propaganda, and new paradigms for viewing the human experience. This makes the study of perception *a very soft science indeed.*" *

'Hard' and 'soft', especially when they are linked with the word 'science', are very value-laden terms, and the manner in which the values associated with these terms are socially distributed serves to separate out the various academic disciplines as effectively as the genders 'masculine' and 'feminine' divide up the whole of humankind.** Since hard science is, of course, value-free any science that sets out to study the way in which value is generated and distributed must, of its very nature, be soft. By this token anthropology, with its central and justifying concern for culture, must be about as soft--as feminine--as it is possible for a discipline to be. In consequence, it would be a very foolish anthropologist who wandered into the energy debate without first equipping him (or should I say her) self with some understanding of the battle of the sexes.

**For some discussion of discipline-sexing see: Smith, Carol A. in *The Journal of Economic Literature*, Vol. XVII (September 1980) pp. 1094/5.

*Häfele, Wolf, IIASA Energy Systems Program Group. *Energy in a finite world*, Vol. II. Cambridge, Massachusetts, Ballinger. 1981. p. 26. (Emphasis added).

> I once, in conversation with an energy expert, mentioned something about Alvin Weinberg (the inventor of, among other things, the pressurised water nuclear reactor). 'Alvin Weinberg' he said 'he's gone soft hasn't he?. . . How old is he now?. . .He must be getting on for seventy at least.' For this energy expert 'soft', clearly, equalled 'soft in the head'.*

Quite amusing, in a scurrilous, gossipy, *ad hominem* sort of way, but surely an anecdote like this has no place in a scientific research report? Well, no, not in a *hard* scientific research report but yes, of course, in a *soft* scientific research report. For this *demi-monde* of energy, in which value-free scientists mark out their bounds of credibility with value-laden epithets, is the anthropologist's natural habitat.

The anthropologist, long used to working among distant and pre-literate tribes, has devoted much of his effort to the study of what is called the oral tradition; so it is hardly surprising that, when he finds himself a participant observer in the energy debate, he should try to find his bearings by reference to its oral tradition. When the women and children, the young men and the not-so-young men, gather around the fire and listen to the tales of the old men what do they hear? At the International Institute for Applied Systems Analysis tenure is unknown and the average stay is something less than seven months. This means that even the

*An eminent and senior energy expert, on hearing this anecdote, interjected: 'Alvin Weinberg; I first met him thirty years ago and he was soft then!'

memories of its most grizzled elders extend only a few years back into the past. Beyond that fuzzy four or five year point all is 'dream-time'--a realm of wondrous happenings that are remembered not because they really happened (though they may have) but because they have some crucial significance for the present.

The start of the IIASA Energy Project, nine years ago*, is lost in this dream-time and one of the tales that is sometimes recounted to the young warrior scientists concerns an heroic encounter between The Great Energy Chief and the Divine Trickster disguised, on this occasion, as an economist. [I must stress that I do not know whether anything like this *really* happened. It is a story and the only thing that *is* real about it is that it is recounted--it is, at present, part of the oral tradition of IIASA. The anthropological inference is that it is recounted because it says something important about this soft/hard divide--a topic that, because of the value-free/value-laden contradiction that it highlights, is usually taboo within the written tradition.]

> The Great Energy Chief drew on the blackboard a little diagram of The Problem. Energy demand was increasing but energy supply was beginning to fall away. An energy gap had already opened up and, if nothing was done about it, it would go on getting worse and worse. The solution lay in somehow or other increasing supply so as to close the ever-widening gap.

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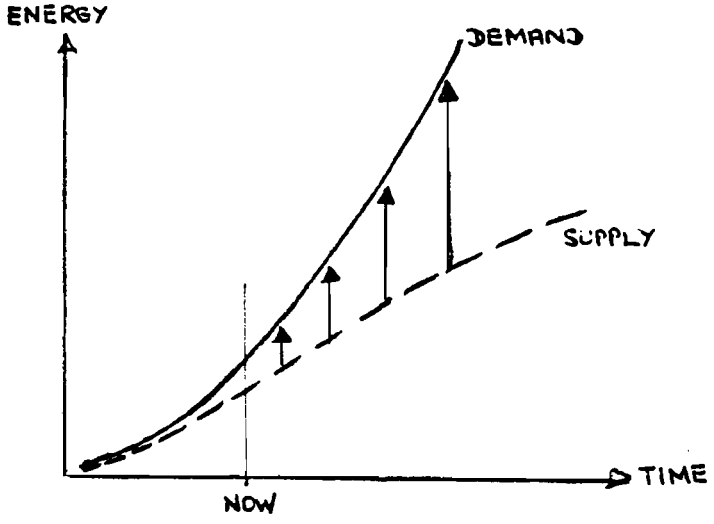
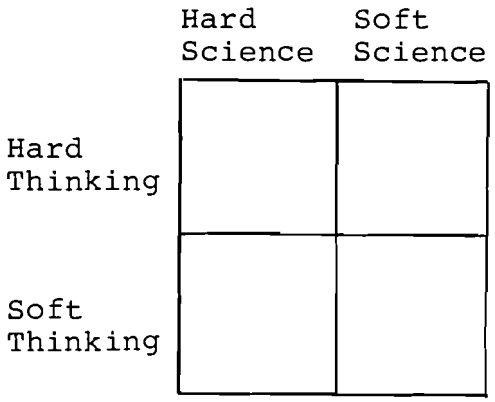
*For the purposes of this essay, the 'ethnographic present' is set at 1981.



The Divine Trickster then stood up and said that the economist would see this as only one, rather extreme, solution within a whole range of possible solutions. The two curves--supply and demand--were linked by a mechanism--the price mechanism--and their reconciliation would depend on such things as the elasticity of supply and the elasticity of demand; things that, to some greater or lesser extent, might be influenced by policy.

'Ah Yes' said the Great Energy Chief, 'but economics is a soft science and we are taking a hard science approach to The Problem.'

At this The Divine Trickster went up to the blackboard and drew a square which, so the assembled multitude thought, he would presently fill with complex details of the price mechanism. But no; he turned it into a two-by-two matrix and, muttering something about 'no names, no pack-drill', returned to his chair.



My purpose in this essay is to try to fill in the top right square of this matrix--to do some very hard thinking about a very soft science: The sociology of perception.

2. A STATEMENT OF INTENT.

I have chosen to begin with a deliberate breach of taboo--the mixing of the oral and written traditions--for two reasons. First, since it would be impossible to develop my argument without somewhere along the line bringing these distasteful matters to the surface, I might as well get it over with right at the start. Second, it is my contention that the filling in of this last square in The Divine Trickster's matrix will ultimately be to the benefit of the whole. My purpose, in other words, is to deliberately develop the anti-thesis to the hard science thesis and to develop it in such a way, and to such a point, that the two may become transcended in some new synthesis. The starting point for this anti-thesis is the questioning of the fundamental hard science assumption that 'the paradigms for viewing the human experience' are always changing. Quite the opposite; these paradigms are immutable, small

in number, and quite easily described.

There are, I will argue, just five paradigms for viewing the human experience and they are given to us, or withheld from us, according to the way in which we are caught up in the process of social life. So long as human social life exists these five possible paradigms will also exist. Far from being mutable in nature they are *eternal objects**; the mutability lies not in them but in the *actuality*--the human experience--that they render visible. The problem of description has to do with the direct inaccessibility of these paradigms. An eternal object is not something that just sits there waiting to be examined; its metaphysical status is located at one remove from phenomena. The essence of an eternal object lies not in the actuality itself--the occasion of actual happening--but in the possibility for that actuality. Eternal objects have to do not with phenomena but with the possibility of phenomena,** and these two levels--phenomena and their possibility--are brought into relationship with each other by a third feature: the eternal object's *mode of ingression* into the actuality. This, the mode of ingression *is* accessible; it reveals itself to us in the form of recurrent identifiable elements--family resemblances***--within our external world.

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*See: Whitehead, Alfred N. *Science and the modern world.* Macmillan, New York, 1926 (especially pp. 228 ff.).

**The central preoccupation of the late Wittgenstein.

***The term 'family resemblance' is used by Wittgenstein; 'recurrent identifiable element' is borrowed from René Thom. For some discussion of their relevance for sociological description see: Thompson, Michael. *Rubbish Theory: The creation and destruction of value.* London and New York, Oxford U.P. 1979.

So a convenient starting point would be to ask what recurrent identifiable elements, or family resemblances, in perception have been observed and recorded within that part of the external social world that, thanks to its recurrent identifiable elements, we have been able to denominate 'the energy debate'. It is possible to formalise this question and to seek the answers within a framework specifically designed to test the anthropological hypothesis that predicts the five paradigms and their relation to an individual's social context.

3. THE THREE ENERGY TRIBES: THE As, THE Bs AND THE Cs.

We* restricted ourselves to the written tradition--to published material relating to the energy debate--and we searched that 'universe' as best we could for descriptions of distinct and, to some greater or lesser extent, mutually contradictory perceptions within the debate. We then went on to see whether these descriptions could be correlated, first, with the five paradigms predicted by the anthropological hypothesis and, second, with one another.

In our search of the literature we have, to date, found five descriptions that satisfy these requirements, and the way in which they correlate with the hypothesis and with each other is rendered all the more remarkable by the fact

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*This test was designed and carried out jointly by Richard Caputo, Karen Closek and the author.

that, since not one of these accounts refers to any of the others and since each uses its own terminology, they would all seem to have been arrived at independently and without the convergent pressures of mutual awareness. One surprising feature--a feature that calls for some plausible explanation if the hypothesis is not to be undermined--is that all five descriptions use a tripartite typology. Since it turns out that all five authors describe the same three paradigms out of the five that are hypothetically possible, it will be necessary to provide some explanation as to why only these three should predominate in the energy debate.

For simplicity we will refer to these three predominant paradigms as Paradigm A, Paradigm B and Paradigm C on the understanding that they, in turn, relate to three 'personal strategies'--the individualist manipulative strategy, the collectivist manipulative strategy and the collectivist survival strategy, respectively--predicted by the hypothesis. With each of these personal strategies there goes a distinctive cultural bias--pragmatic materialism, ritual and sacrifice, and fundamentalism/millenarianism, respectively--and this combination of personal strategy and cultural bias results in three distinct social types--the entrepreneur, the hierarchist, and the group survivalist, respectively (sometimes referred to less formally as 'the savage beast of capitalism', 'the caste-ist', and 'the sectist', respectively).

But, for the time being, these three category labels--Paradigm A, Paradigm B and Paradigm C--will suffice and we can build up a description of them simply by showing the way

in which the various tripartite arrangements that have been observed in the energy debate line up with one another. Only when we have mustered a convincing body of evidence for the existence of the three paradigms--A, B and C--do we need to go on and, by explaining the anthropological hypothesis, show how in turn they all line up with it.

Harmon et al*. These authors are engineers with a particular interest in the harnessing of solar energy. Long immersed in energy matters (and sensitized, perhaps, by their solar zeal to the responses of their fellow engineers) they have come to discern three distinct perceptions which they label: Perception A, Perception B and Perception C. They characterize these perceptions by a quite extensive list of tripartite distinctions, many of which are picked up in the other tripartite descriptions that we have looked at. If we summarise these characterisations in terms of the different, and contradictory, ways in which energy demand and supply are perceived as being reconciled we get something like this:

Perception A. 'Onward and upward'. The present trend, given our present skills and knowledge, is sustainable (and, of course, desirable).

Perception B. 'Gradual smooth descent'. The present trend is (with some regrets) not sustainable and the solution lies in an orderly transition (carefully planned

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* REUYL, John S. HARMON, Willis W, CARLSON, Richard C, LEVINE, Mark D, and WITWER, Jeffrey G. *Solar energy in America's future*, Stanford Research Institute, March 1977 (2nd edition).

so as to minimise social and economic disruption) to a sustainable future.

Perception C. 'Sudden discontinuous descent'. The present trend is (no regrets) not sustainable and the solution--a sustainable future--can only be reached by a radical change now, a change that will inevitably be accompanied by (desirable) social and economic transformations.

Harmon et al provide a persuasive description which they buttress, to good effect, with arguments borrowed from the history of science (T. S. Kuhn) and from anthropology (Ruth Benedict) but they do not seek an explanation. Rather, their attitude is that these three perceptions are facts of life and, instead of asking 'where do they come from?' and 'how can we get rid of them?', their concern is with the much more practical and policy-relevant question 'how do we live with them?'

They argue that these perceptions are just *there* and that it would be wildly optimistic to assume that two of them will presently go away and leave a single outright winner. Furthermore, these perceptions all lie within the bounds of expert credibility, not in the sense that energy experts of one persuasion concede the expertise of those of the other two persuasions (though they sometimes may) but in the sense that the socially conferred label 'expert' is at present attached to some individuals of each persuasion. This means that we simply cannot give an answer to the question 'which

perception is the right one?'. They conclude that, when there is such persistent polarization among both experts and lay-people, the *adversary mode* (arguing about which perception is right) becomes counterproductive as a way of deciding policy. Instead, they urge an *exploratory mode* (discovering where and when each perception is appropriate) and, without too much discussion of what this might be, they point out that if we are to move to such a mode we must, somehow or other, *legitimate all these perceptions*.

Schanz.* Where Harmon et al are concerned with energy in general, Schanz zeroes in on just two energy sources--oil and gas--and we might be excused for expecting that, within the specific confines and technicalities of this particular field, there would be little scope for expert polarization. But no; the microcosm of oil and gas perfectly reproduces the three divergent perceptions of Harmon's macrocosm. Schanz, who as a Fellow at Resources for the Future has made a detailed study of oil and gas reserves estimation in the United States, discerns three distinct 'resource estimates'--'The Optimist's', 'The Moderate's' and 'The Conservative's'--tightly clumped and widely spaced within an impressively broad sweep of uncertainty. Indeed this sweep is *so* broad and has been *so* resistant, over more than half a century, to all the efforts directed at narrowing it that the history of oil and gas

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*Schanz, John J. Junior. 'Oil and gas resources--welcome to uncertainty'. *Resources* No. 58. Resources for the Future, Special issue, March 1978.

reserves estimation provides a telling indictment of the adversary mode. Since the uncertainty bounds have steadfastly refused to budge, and since the three clearly defined positions within those bounds have always been occupied and resolutely defended*, surely all the money and effort would have been better spent in trying to understand the three positions rather than in a fruitless attempt to find out which one was the right one? For, as all the protagonists concede, the only way you can *know* how much oil and gas is down there is to get it up here in which case, of course, it is no longer down there. Perhaps, when it becomes evident that only history will answer a particular question to which we would dearly like to have the answer, that is a signal that we should switch from the adversary to the exploratory mode?

Schanz presents his three 'resource estimates' in the form of a graph plotting rate of production against time. Up to now, of course, there is only one graph--the historical answer--but beyond now, any number of graphs are possible (the only constraint being that, at some point, the rates must peak and then decline to world hydrocarbon exhaustion). Out of this vast range of possible graphs just three end up with experts attached to them. Attached to the Optimist's graph we find 'the reservoir engineer', attached to the widely divergent Conservative's graph we find 'the economist', and attached to the Moderate's graph (that roughly consistent

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*Albeit by different garrisons. The section that follows draws upon an Institute for Policy and Management Research project funded by the U.S. Department of Energy. See: Wildavsky et al. *Energy in Wonderland*.

with averaging these first two) we find 'the government bureaucrat'.

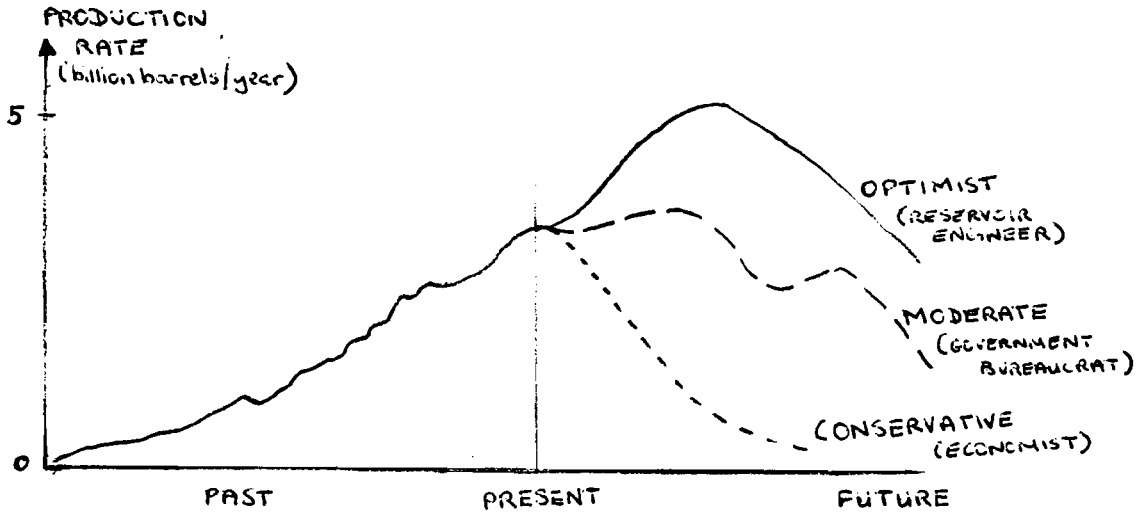

Figure 1. Alternative Futures for U.S. Oil Production (after Schanz)

Schanz suggests that the reservoir engineer, acculturated to a world of exploration and high technology, tends to perceive reserves as bumping up against what is discoverable and recoverable. The economist, on the other hand, sees all things as discoverable and recoverable *at a price* and he is led, via comparisons with other energy sources, to estimates of what is *economically* discoverable and recoverable.

The reservoir engineer, with his optimism, his ready acceptance of the high risks of exploration and his faith in technology, lines up quite nicely with Harmon's Perception A (and with 'the entrepreneur' in the anthropological hypothesis) but what of the economist? It would surely be nonsense to claim that economists are all equipped with Perception C and that they are all committed to no-growth and to imminent and radical social change. Whilst some

economists (Schumaker and Georgescu-Roegen*, for instance) might fit the bill, any theory that tried to put Milton Friedman (say) among the Cs could scarcely be said to have reduced the arbitrariness of description. No, the economist is not saying that energy demand will have to fall but that the time is coming when other energy sources will have to be substituted for oil and gas. Only those economists who argue that these other energy sources too are subject to the same sort of pessimistic constraints are aligning themselves with Harmon's Perception C.

Taxation rates (and tax exemptions) for the oil companies will, of course, have the effect of modifying the constraints that bear upon the reservoir engineer and, in much the same way, price regulation will lessen or exacerbate the constraints that the economist sees as paramount. In wielding these instruments the government bureaucrat has no interest in being more optimistic than the reservoir engineer or more pessimistic than the economist because, if he chose either of these two extreme options, he would in effect be handing over control entirely to one or other of these perceptions and the government bureaucrat's aim is not to hand over control but to maximise it. If his control decreases the nearer he gets to one or other extreme then it must increase the further he gets away from them both and, since to put himself beyond either extreme would automatically result in his total loss of control, the best he can do it to steer

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*See, Schumaker, E.F. *Small is beautiful* and Georgescu-Roegen, N. *The entropy law and the economic process*. Cambridge, Massachusetts, Harvard UP. 1974.

a course between, but equidistant from, them both.

Once government has intervened, by regulating prices and by instituting tax incentives or disincentives for exploration then strategic behaviour begins to cloud the picture as the savage beast of capitalism sees, from time to time, the advantage of concealing his entrepreneurial spots and pretending that one of the other resource estimates is the correct one. In this way, the history of energy reserves estimation (the data that the government insists on collecting as the basis for its intervention) becomes a *roman á clef* within which the strategising actors are continually changing their names and their styles of dress*. But the key--the only way of disentangling this convoluted charade--is provided by the three paradigms for, only if they pre-exist as immutable perceptual bases, is it possible for the strategising actors to hop, this way and that, between them.

This mobility, of course, is possible only because oil and gas constitute but a part of the energy whole. If Schanz's three resource estimates applied right across the energy board then an individual with a particular perception would have to stick with the appropriate resource estimate; but they do not apply right across the board and this means that, depending on what he sees happening with other energy sources, an individual can hop about from one base to another yet still remain perceptually consistent. American oil companies have,

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*How else could one account for the existence within the U.S. Department of Energy of an Office of Data Validation whose task it is to tell the DoE which of its own data it can believe?

over the years, become so agile that many American motorists, even as they waited bumper-to-bumper in the gas-lines, simply refused to believe that there was an oil crisis in 1979 and saw it instead as a situation that had been deliberately engineered by the oil companies in order to force government to allow prices to rise thereby increasing the oil companies' profits.

When experts disagree we might expect that, as good scientists, their resource estimates would be somewhat randomly spread out between the uncertainty bounds. Certainly, one would not expect them to be gathered together like three droplets of mercury on a flat surface; yet this is what seems to be happening. Uncertainty, by definition is unpredictable but *reaction to uncertainty*, though it can take a number of widely divergent forms, would appear to be so strongly patterned--so predictable--as to be almost certain. This surprising orderliness in the reaction to uncertainty calls for some explanation and one plausible explanation is that some resource estimates are specially privileged because they justify some policy or other. If you assume that policies, like plots in literature, are few and far between then tightly clumped and widely spaced resource estimates, far from causing surprise, are what you would expect to see. The interesting question then becomes: 'What leads one individual to support one policy (and to give credence to one estimate) and another individual to support another policy (and to give credence to a different estimate)?'. The traditional (Marxian) answer is 'self interest'; and both the clumps and the pattern of recruitment to them simply serve to confirm the existing

arrangement of social control over the means of production at any particular historical moment. Such an explanation is essentially an explanation in terms of goal-seeking and, whilst not necessarily disagreeing with it, we should try to shift the whole discussion onto a less trivial plane and ask how the goals that people seek are set. But, first, let me complete the case for the clumps.

In the history of oil and gas reserves estimation it is the three paradigms that provide *la clef* whilst it is the part/whole relationship between oil and gas and energy that makes *le roman*--the strategising behaviour of the characters--possible. This means that, if we want to get hold of the key, we must first put a stop to the strategising--to all the name-changing and hat-swapping as the various characters opportunely hop this way and that between the widely spaced positions. This we can do by insisting that the resource estimates for oil and gas also apply across the whole energy board. If we do this, what policies do these three estimates justify?

The Optimist's: The trend, for the time being at least, is a continuation of the recent past. Of course, there will be a downturn in the longer term, but if you have faith in the ingenuity of future generations and so are prepared to discount the future, then it is business as usual.

The Conservative's: We are now *at* the turning point. From now on the future will be

altogether different from the present and the past. If we persist on our present path then we will inevitably be using up the energy birthright of the future generations; to the extent that we delay the downturn we will simply be making it steeper and, indeed, at a not-too-far-distant point it will actually become vertical and, after that, we simply will not be able to reach a sustainable future--we will have spent it all. The message is clear: radical change now.

The Moderate's: We are not yet at the turning point but it is coming and, if we are to successfully adapt to the downturn, we will have to start making our preparations now. We simply cannot go on doing as we have been doing; there will have to be change. But it would be wrong to try to make the changes that are necessary all at once, now. Rather, the answer lies in an orderly, gradual and carefully-planned transition that will bring us safely to a sustainable future with the minimum of economic dislocation and social confusion. The optimist and the

> conservative may see this as a middle-of-the-road policy but that is because the one is obsessed with the short-term and the other is over-reacting to the long term.

Clearly, there is more to these three policies than the purely technical weighing of expert arguments as to how we should best arrange the ways in which we supply our society with energy. These policies do not just take society as a given --they have implications for it. Depending upon which policy you choose, you will end up with one or other of these alternative social arrangements. Here then, in the social implications of energy policy, is a possible clue to why some people give credibility to one perception and other people to other perceptions. All we have to do is reverse the priority of policy and social implication. If resource estimates are clumped in order to provide justifications for energy policies then, perhaps, energy policies are best understood as expressions of social preference--as rationalisations for different kinds of desired social arrangements?

If this is the case then the conventional sequence--a sequence in which you first establish the facts (how much is down there) and then on the basis of those facts, deduce a number of feasible policies from which, by a process of careful evaluation (which includes some weighing of the social implications of these policies), you finally select the best--will have to be reversed. Instead, you start with a socially-induced predilection that leads you to favour the sort of social arrangements promised by one policy and to disfavour

those promised by the alternative policies. Having chosen your policy you then look around for justifications for it and fortunately, thanks to the very wide uncertainty bounds, these are not too difficult to come by. With the help of just a few rational assumptions about how the world is, you can come up with a hard science estimate of how much is down there that will clearly demonstrate that your chosen policy is far and away the best (perhaps, even, the only) one available.

Chapman*. Where Schanz has looked at one energy source in the United States, Chapman has looked at energy across the board in Britain and has arrived at a very similar typology. Indeed, after Harmon and Schanz, there is something rather *déja vu* about Chapman's three 'energy futures'--'Business as usual', 'Technical fix' and 'Low growth'--and his typology meshes so smoothly with those from across the Atlantic as to cast serious doubt on the sort of dismissive response that sees all these social considerations as unique to California.**

Schanz has pointed out that, in resource estimation, there is nothing that can be measured and that, in consequence, the whole business is inevitably judgemental and subjective. Inevitably, those who make the resource estimates are 'projecting past experience into the future'.*** But what happens if we reverse Schanz's causal logic and say that they are

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*Chapman, Peter. *Fuels paradise*. 1975. London, Penguin.

**Though, as we shall see presently, there are *certain features* of these generally valid considerations that do appear to be unique to California.

***Schanz p. 10.

projecting the future into past experience? One thing that happens is that we substitute a final cause for an efficient cause; not in the sense that something that is going to happen in the future has caused something to happen in the past but in the sense that, within the bounds of uncertainty that are available to us, we interpret the past in terms of a future that our imagination has put 'out there' for us.

> What distinguishes the stupidest of architects from the cleverest of bees is that the architect constructs his building in his imagination before he constructs it in reality.*

As with buildings so with energy. Of course, just as many the figment of an architect's imagination never sees the light of day so not every desired energy future comes to pass. There are lost final causes as well as won final causes; but the essential point is that what we do today largely depends on how we interpret the past and our interpretation of the past will, to a considerable extent, be shaped by the futures that our desires have already created. And if, as hard scientists, we cannot (try as we may) discover how much there is down there at least, as soft scientists, we can say something about the conflicting desires that exist up here.

To do this we need to reverse Schanz's second temporal conclusion that 'the choice of the type of curve to be used

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*Karl Marx. The crucial distinction is between 'wants' and 'expectations', on the one hand, and 'desires' on the other. Wants are disconnected from time; expectations are projected from the past and present into the future; desires lie in the future and shape both the present and the past. (Ref. also to Louis Kahn).

preordains in a general way what the future will look like'*. Instead, we should conclude that the choice of future preordains in a general way the type of curve to be used. What happens when we approach Chapman's Three 'energy futures' from this imaginative and contrary direction?

If these three 'energy futures' are already 'out there' as final causes--as fixed points which, somehow or other, we have to home in on--then it should be possible, by looking at these homing-in requirements, to isolate just what it is that distinguishes the three paradigms and maintains their separation.

Paradigm A (Business as usual) This energy future lies out there on the extrapolation of the recent trend. To get to it we have to carry on as we have been doing, innovating with skill and confidence--no easy matter when all around us Jeremiahs insist that it cannot be done.

Paradigm B (Technical fix) The future *is* different from the present but it does not press too closely upon us. This gap between the future out there and present trajectory, though a blessing in many ways, creates navigational problems that are unique to this future.

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*Schanz, p. 9.

Paradigm C (Low growth) The future is altogether different from the present and, at the same time, it is so close that we can only reach it by a sudden switch--like an electron jumping from one orbit to another.

In the A faith, as long as you keep up the present innovation-fueled momentum you will arrive at the 'business as usual' future; in the C faith, once you have committed yourself to your quantum jump you are bound to find yourself in the new 'low growth' orbit (but you have to jump *now*--'he who hesitates is lost'). But to reach the technical fix future you have to walk a social and economic tightrope and, before you walk this tightrope you have to erect it. So, in the B faith, the tightrope (the plan for the transition) and the walking of the tightrope (the successful implementation of that plan) become the paramount concerns. And, of course, tightrope-walkers develop superb balance and avoid any sudden jerky movements.

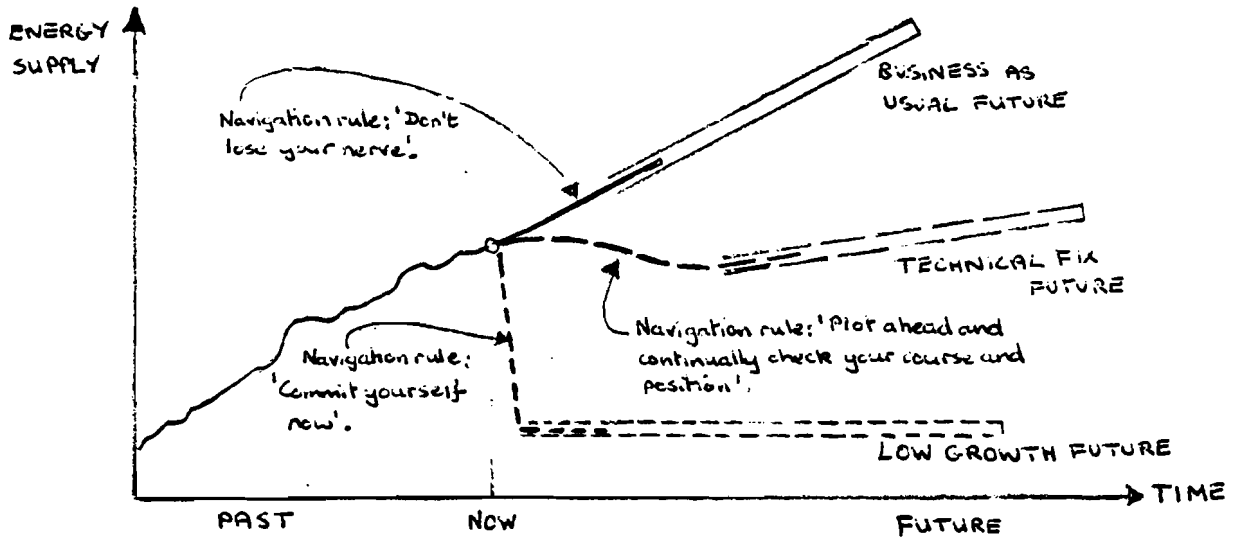

Figure 2. The Three Futures and How to Reach Them.

Two qualitative criteria -- whether the future is the continuation of the present and whether there is a time gap between the future and the present--are sufficient to separate and define these three futures.

	Is future a continuation of the present?	Is there a time gap between future and present?
Business as usual	Yes	No
Technical fix	No	Yes
No growth	No	No

Figure 3. Criteria for Separating the Three Futures*

*How near or far the 'business as usual' future is makes no difference to its navigational rule. This means that the last logical possibility--the answer: Yes, Yes--is redundant.

This (apart from the introduction of the technical refinements, the long term and the short term, to define the gap) is the set of criteria that will be used to test the anthropological hypothesis. With the energy futures themselves as the final cause, the essential differences between the three paradigms reduce to the following:

Paradigm A: Continue in present groove;

Paradigm B: Controlled disengagement from present groove;

Paradigm C: Quantum jump into different groove.

One advantage of defining the three paradigms in this parsimonious and qualitative way is that it opens our eyes to some possibilities, and to some family resemblances, that might otherwise have escaped our notice.

A wonderful future altogether different from the present yet pressing so close up against it as to be reachable only by a sudden discontinuous jump is, when stripped of its current energy trappings, a familiar social phenomenon to historians and anthropologists; it is *millenarianism*--the second coming, the world turned upside down,. . .the Garden of Eden just ahead of us instead of way behind us. To say this is not to insult the Cs or to denigrate the policies that they urge; it is simply to identify their distinctive cultural bias*--to call a spade a spade--and, for all any A or B knows, the Cs may well be right. In New Guinea, cargo cults (in which the faithful believed that the millenium

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*A key concept in this whole anthropological approach. See Douglas, Mary. 'Cultural bias'. *Occasional Papers of the Royal Anthropological Institute* No. 1978?

was about to arrive in the form an aeroplane laden with Western technology) have developed into successful national liberation movements* and, closer to home, the prediction that the meek will, one day, inherit the earth has often fuelled the engine of social change.

Nor, does the future that is out there *have* to be the small-is-beautiful world of medieval self-sufficiency; it only has to be altogether different from, and pressing close up against, the present. The inhabitant of this new future could just as easily be Nietsche's Superman. That is, the sudden discontinuous change need not be downwards; it could also be upwards--to hitherto undreamed of levels of energy supply--to electricity 'too cheap to meter'. In this way, the Clamshell Alliance (the anti-nuclear group on the Eastern Seaboard of the United States) and the Fusion Energy Foundation (a pro-nuclear organisation active in the United States and West Germany that sees fusion energy as achievable in a very short time span) are revealed as very similar social animals. Both are composed of individuals who are committed to radical change now, both believe in the possibility of sudden discontinuous change--the one on the basis of Schumaker's Buddhist economics**, the other on the basis of La Rouche's Reimannian economics***--both justify their wildly divergent futures with theories that share a common sectarian origin: the rejection of Marshall's classical doctrine 'Nature contains no leaps'.**** Both are

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*See, for instance, Worsley, Peter. *The trumpet shall sound.*

**See chapter of this title in Schumaker, E.F. *Small is beautiful.*

***See, BARDWELL, Stephen and PARPART, Uwe. "Economics becomes a science" *Fusion* (Magazine of the Fusion Energy Foundation) July 1979.

****"Natura non facit saltum" MARSHALL, Alfred. *The Principles of economics.* 1890 Title page.

short on power and formal organization and long on ideological commitment and grassroots fervour; and both (like political groups on the extremes of left and right) sustain their uncompromising purity and their internal cohesion by attacking one another.

In rather the same sort of way, the family resemblance between some of the Bs--the middle of the roaders--is not always glaringly obvious. At first sight, Harmon's Perception B and Perception C would appear to both fall into Chapman's "low growth" category and, certainly, they both seem far-removed from Chapman's "middle of the road" category who are typified by "the hardline fixers of the (British) Central Electricity Generating Board". Harmon's Bs and Cs, in fact, end up with supply and demand reconciled at virtually the same low level and it is only when we apply the crucial test of whether that level is reached by gradual or by sudden change that the two separate out in line with our paradigms B and C, respectively. But this still leaves what appears to be an enormous gulf between Harmon's B ("Mr. Green", as he has been dubbed in a recent Californian report*) and Chapman's B (The Central Electricity Generating Board mandarin). Both Mr. Green and The CEGB mandarin dissociate themselves from the "business as usual" future--Mr. Green by a wide margin, the CEGB mandarin by a much narrower one. The CEGB mandarin, in consequence, is in no danger of being confused with a C but Mr. Green's future is

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*Ref. to this report. We omitted this report from our short list because it has only a binary classification: Mr. Smith and Mr. Green. Mr. Smith fits into Paradigm A and Mr. Green into Paradigm B. We would prefer to call Mr. Green "Mr. Green Round the Edges" to distinguish him from the omitted C: Mr. Green All the Way Through".

so convergent with that of the California C that only the path by which that future is reached reveals him for what he really is--a B. So the family resemblance *is* there, but only when the middle of the road is defined as anywhere between the two edges rather than as a white line right down the centre*.

As we shall see later, this wide option range within the B Paradigm has important consequences when it comes to deciding policy within the exploratory mode but, for the present, we are faced with a problem which is to explain why the British B should look so like an A while the Californian B appears almost C-like. The answer lies in a profound difference in style of government. In the United States, and particularly in California, a truculent populace sees leadership in "bottom up" terms; in Britain, and in much of Europe, a deferential populace is prepared to go along with "top down" leadership. In Europe government "blows the whistle" on groups and individuals who are seen as getting out of democratic line; in the United States it is the people who blow the whistle on government. The result is that, in a Jacobin style of democracy, the middle of the road is likely to be over towards the As (who, via all kinds of diffuse institutionalized channels, tend to have the ear of government) whilst, in a Jeffersonian style of democracy, the middle of the road is likely to be much closer to the whistle-blowers (who make up in charisma and populism what they lack in organization and institutionalized respectability).

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*We can be pretty sure that the Cs' drive for purity and distaste for compromise will soon lead Mr. Green All The Way Through to widen his side of road, once he realizes that Mr. Green Round The Edges has got so close to him.

[This is a bold and sweeping generalization that calls for some substantiation. Beer* has ascribed the weakness of political party in the United States (compared with Britain) to the strength of what he calls the Radical Tradition--an argument that dovetails neatly with the suggestion that government in America leans towards the C Paradigm with its advocacy of radical change now. The distinction between Jacobin and Jeffersonian styles of democracy has been drawn (in somewhat value-laden terms) by Glazer** who sees the Cs as now constituting a whole New Class with interests that constitute something of a threat to the American polity. Recently, when I ventured to suggest that America's inability to decide on energy policy might be mitigated by it moving just a shade towards the Jacobin style of democracy***, I provoked a transatlantic response that by its vehemence virtually proves the existence and nature of the distinction.

> Thompson's ignorance is compounded with self-deception so that it is impossible to tell where one stops and the other begins. .... Thus Thompson criticized the democratic institutions that all Americans agree in praising .... he compounded his gaffe by misusing the whistle-blower metaphor. The American understanding is that individual citizens blow the whistle on government, not the other way round, yet the image Thompson presented for admiration was of European governments blowing the

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*Beer, S.H., *Modern British Politics*, Faber 1965,p.43.
**Glazer, Nathan (essay title?) in BRUCE-BIGGS, Barry (ed.) *The New Class?* Transaction 1979.
***Thompson, Michael, "Fission and fusion in nuclear society". RAIN (Newsletter of the Royal Anthropological Institute), No.41, December 1980.

whistles on their citizens!*]

Now, with the idea of three different kinds of future--their differences being defined not in terms of the level at which energy supply and demand are reconciled but simply in terms of the different requirements for reaching them--we can re-draw the graphs in much more general terms that classify all the various energy futures according to their family resemblances.

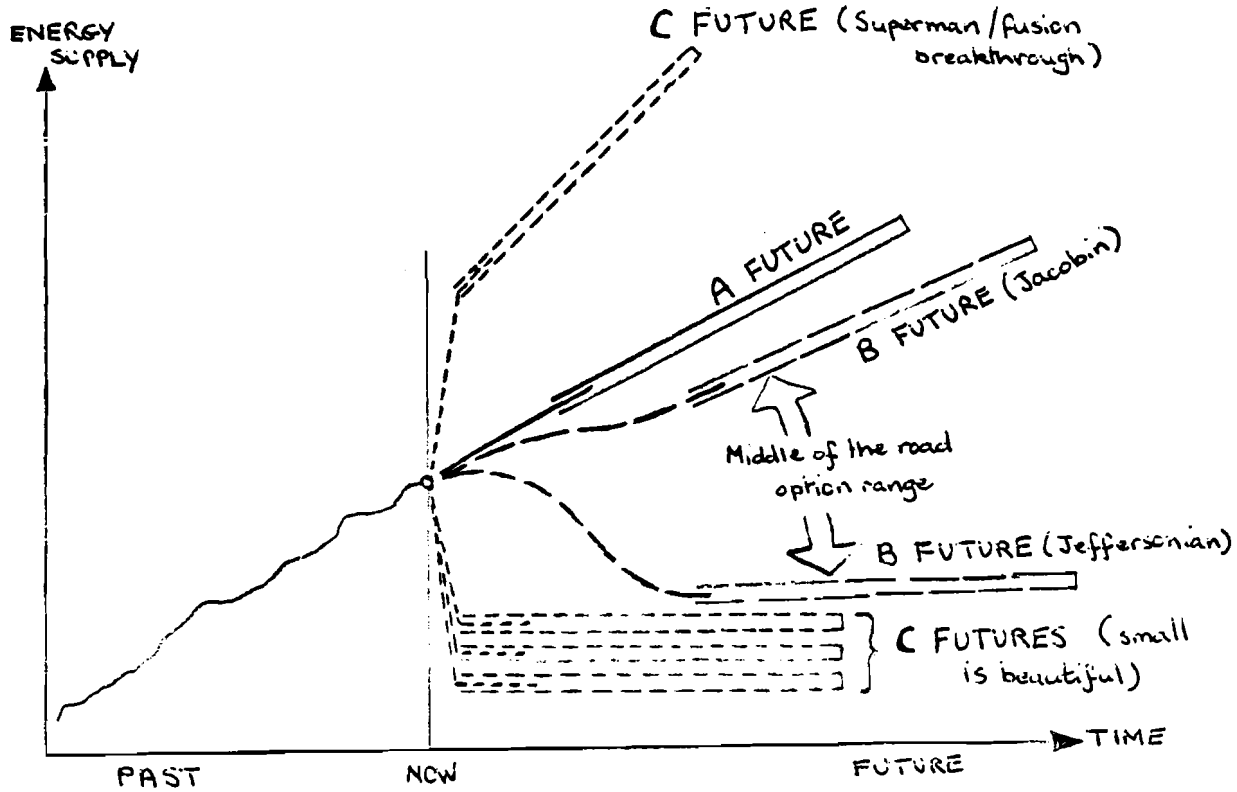

Figure 4. Energy futures and their family resemblances.

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*Leslie, Charles. Letter to the editor. RAIN No. 43. June 1981.

Humphrey and Buttel and Orr***. Since both these tripartite descriptions are drawn from a political science perspective, they can be taken together. Humphrey and Buttel's interest is in the growth/no growth debate--with the entire environmental question rather than specifically with energy--and they neatly reverse the whole framework to show that social scientists, too, are only human and that they have three paradigms just like everyone else. Humphrey and Buttel label these social science paradigms the Conservative, the Liberal and the Radical and, after listing the way in which they are distinguished by different ideas of culture, power and stratification, they go on to outline the sorts of policies that those who subscribe to these different paradigms would be likely to advocate. Even though they provide little that is specific to the energy debate, their three paradigms line up with Paradigms A, B and C without any difficulty (apart, that is, from such superficial confusions as their Conservative lining up with Paradigm A while Schantz's Conservative lines up with Paradigm C).

Orr, on the other hand, addresses himself squarely to energy policy and identifies three distinct "perspectives" which he labels Supply, Conservation and Energetics. These labels he derives from the different ways in which the problem is defined. From the Supply Perspective the problem is inadequate energy supply (the same problem as that which beset the Great Energy Chief); from the

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*Humphrey, Craig R. and Buttel Frederick H. "The sociology of the growth/no growth debate". *Policy Studies Journal*. Winter 1980, pp. 336-345.

**Orr, David W. "US energy policy and the political economy of participation". *The Journal of Politics*. Vol.41, pp.1027-56.

Conservation Perspective it is, rather, the problem of energy waste; from the Energetics Perspective it is essentially a cultural and social problem. The reason people see the problem differently, Orr goes on to argue, is that they start off with different assumptions and these, again, line up nicely with Paradigms A, B and C. In the Supply Perspective energy and economic growth are assumed to be coupled and energy growth is assumed to continue. In the Conservation Perspective it is assumed that energy and economic growth can be de-coupled* enabling the economy to go on growing while energy growth is slowed. In the Energetics Perspective energy growth and economic growth are assumed to be coupled but our present path flies in the face of the Laws of Thermodynamics and cannot continue. Cheap energy is a thing of the past.

Embedded in these assumptions about what is and is not possible are three very different ideas of how the world is, how it works, and how man fits into it and it would be nice to know what kind of individual** is led to each set of assumptions and how. Orr does this by listing the "primary actors" (together with the sorts of governance they see as desirable) and by listing the "energy goals" (together with their implications for social values) towards which these primary actors aspire. In the Supply Perspective the primary actors (Orr is only concerned with the United States) are the energy corporations and they would prefer to operate in a "Laissez-Faire" world with a minimum of government intervention. Their goal is inexhaustible cheap energy--a goal that entails no value change.

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*The very word de-couple betrays the bureaucratic paradigm: "*de-* prefix much used in civil service jargon in coining words expressing undoing or ridding" (Chamber's Twentieth Century Dictionary).

**As a social being.

In the Conservation Perspective the primary actor is "government" and the desired operating milieu one in which government plays a major role--"Leviathan". Significantly, in view of the Paradigm B distinction between the future "out there" and the getting to it, Orr lists two goals for his Leviathan--a near term goal of efficiency (conservation and de-coupling) and a long term goal of inexhaustible (but not necessarily cheap) energy supply. To reach these goals there will have to be a small value change. In the Energetics Perspective the primary actor is "the public". [I have to differ with Orr at this point. Only if his three perspectives were exhaustive--only if everyone in the society got to act in the energy policy play--would it be correct to call this primary actor "the public". Since I would maintain that there are another two perspectives that never participate, I would have to redefine Orr's "public" as "those who credibly claim to speak with the authentic voice of the people"] This primary actor, not surprisingly, wishes to participate; to blow the whistle on government; to reaffirm a Jeffersonian style of governance. This actor's goal is a decentralized solar-based society--a goal that requires a "radical value change".

Orr then goes on to deduce the different sorts of risks that loom largest in each perspective--economic disruption in the Supply Perspective; balance of payments, overseas dependence and energy wars in the Conservation Perspective; technological accidents, resource exhaustion and climate change in the Energetics Perspective. Only after he has done this--only after he has listed the three definitions of the problem, the three sets of assumptions, the primary actors and their desired styles of governance, the three goals and

their value implications, ... the three sets of salient risks--does he leave the social and political arena and enter the world of energy. Almost as an afterthought, the three "ultimate energy sources" drop out of the bottom of Orr's table--breeder/fusion in the Supply Perspective; conservation technology in the near term leading to breeder/fusion in the long term in the Conservation Perspective; decentralized solar, wind and biomass in the Energetics Perspective.

Conclusion. I have dwelt at some length on these five tripartite typologies--Harmon et al's, Schantz's, Chapman's, Humphrey and Buttel's and Orr's--because I feel that taken together, and in this sequence running from engineering to political science, they add up to a whole that is very much more than the sum of the parts. The sum of the parts constitutes a persuasive argument for the existence of the three clumps--the Paradigms A, B, and C; the whole goes a long way towards clinching Harmon et al's argument for a switch to the exploratory mode in deciding energy policy (or policy in any other area that is characterized by persistent expert disagreement and by wide uncertainty bounds that are unresponsive to sustained efforts to narrow them).

The common thread in these five accounts is the conviction that different people see the problem differently and that they see it differently because their initial assumptions are different. As we move from the engineering accounts to the political science accounts so this common thread becomes more visible and it receives its clearest and most explicit expression in Orr's table. If we see the sum of the parts as having established a strong case for the existence of the clumps, and if we see the whole as giving us an unambiguous description of which individuals and which assumptions

go with which clumps, then we can now move on to the next question--why?

4. THE ANTHROPOLOGICAL HYPOTHESIS Is economic growth possible without energy growth? The As and the Cs say "no"; the Bs say "yes". Can our present energy growth be sustained? The Cs say "no"; the As say "yes". Faced with a situation in which people attach themselves to contradictory positions, there are two questions you can ask. You can ask who is right or you can ask where the positions come from. The anthropological hypothesis is an attempt to answer the second of these two questions. The hypothesis is concerned with the social generation of alternative assumptions about the nature of the world, about the nature of man, and about the nature of the relationship between man and the world. To say that our present energy growth is, or is not, sustainable is to make assumptions about the nature of the world; to say that economic growth is, or is not, possible without energy growth is to make assumptions about the nature of man in society; and, since both energy growth and economic growth inevitably involve man in modifying the world, both sets of statements make assumptions about the nature of the relationship between man and the world.

So the hypothesis, if it has any substance, should certainly apply to the energy debate. Since the hypothesis has, up to now, been developed and applied in areas that are often rather remote from energy--the anti-smoking movement, the history of science, the environmental movement, Himalayan mountaineering, poverty and inflation, the French Revolution, play, the Salem witchcraft trials, to mention a few--I will provide only an outline of the

argument here. The reader anxious to know more about the theoretical underpinning of the hypothesis, or about the methods that have been used in its applications, is referred to the existing literature*.

The individual as a social being. The social scientist is interested in the individual not so much for what he brings with him to society--his personality, his physiology,...his genetic inheritance--but rather for what society makes of him and him of it. This is not to say that individuals are undistinguishable empty vessels until they become filled with the breath of social life but only that the focus of interest is on the social overlay rather than on whatever it was that was there to start with. This social overlay is called an individual's *social context* and it can be adequately described by just two dimensions--*group*, which has to do with the extent to which an individual is incorporated into bounded social groups, and *grid*, which has to do with the extent to which his life is circumscribed by externally imposed prescriptions. (The reader may wonder what has become of social institutions--class, family, political party, the firm, the voluntary association, and so on. The answer is that they

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*Douglas, Mary. *Natural Symbols.*
" "Environments at risk" in Benthall, Jonathan (ed) *Ecology, the shaping enquiry.* London, Longman, 1972.
" "Cultural bias". *Occasional Papers of the Royal Anthropological Institute*, No. , 19
" and Ostrander, David (eds.) *Essays in the Sociology of perception.* London, Rantledge Kegan Paul, and New York, Basic Books, 1981.
Thompson, Michael. "The aesthetics of risk: culture or context?" in Schwing, R. and Albers, W. (eds). *Societal risk assessment.* New York, Plenum, 1980.
"A three-dimensional model" and "The problem of the centre" both in Douglas and Ostrander (ed.) *Essays in the sociology of perception* (op.cit).
"Fission and fusion in nuclear society". RAIN (Newsletter of the Royal Anthropologocal Institute) No.41, Dec. 1980.
Douglas and Wildavsky: The Risks we choose (forthcoming)

are all taken into account by the dimensions of group and grid. Social context is a very rough and ready frame of measurement; it is not aimed at filling in all the fine specific detail of an individual's social environment but, rather, at sketching a broad, general, and useful picture that can be set against others from widely different social and cultural settings.)

The group dimension runs from strongly positive (the individual looks to his group for all his life support) through zero (no groups there for him to be involved with) to strongly negative (groups are there and he is not a member of any of them). The high-caste Hindu villager, for instance, and the member of a self-sufficient Western commune both have strongly positive group contexts. At the other end of the scale the self-made Victorian manufacturer, for instance, and the un-unionized weaver employed at his mill both have strongly negative group contexts. What separates the Hindu villager from the Western communard, and the mill-owner from his hired hand, is hierarchy.

The Hindu caste takes its place within a whole hierarchically-organized framework of castes--a caste system--and, since these castes are kept separate from one another by all sorts of transactional boundaries and reserved occupations, the higher your caste the more things there are that you should not do. But in the individualized context of nineteenth century industry, hierarchy is increased not decreased by the erosion of transactional boundaries. This is because the nature of the hierarchy is different. Instead of an arrangement of bounded groups kept separate by the prescriptions that each group imposes on its members, and kept ranked by the increasing stringency of these

prescriptions at each step up the system, there is an arrangement of classes of individuals that are kept separate by the prescriptions that, thanks to the absence of transactional boundaries, the members of one class are able to impose not on themselves but on the members of the classes below them in the hierarchy. The result is that, in a pure class system , prescription increases as one descends the hierarchy whilst, in a pure caste system, the reverse is the case.

So the high caste Hindu villager and the un-unionized mill worker both have strongly positive grid contexts in that their freedom is everywhere constrained by a socially imposed grid-iron of things they cannot do and moves they cannot make. And, at the other extreme, the self-made Victorian manufacturer and the self-sufficient communard both have strongly negative grid contexts in that each is free to act and transact in whatever way he pleases--the one to hire and fire in response to changes in the economic climate, the other to take his place as the equal in all respects of his fellow communards. But, just as an individual might be ungrouped simply because there are no groups around for him to be excluded from, so an individual might be free from prescription not because he is at the bottom of a caste hierarchy or at the top of a class hierarchy but simply because there are no hierarchies around in his social environment. This is the zero grid social context and, when it is combined with the zero group context, it gives a kind of absolute zero in which both group and hierarchy activities are stilled. This is where we find the hermit--the individual who has managed to keep his involvement in coercive social processes, both group dynamics and hierarchy formation, to a minimum.

These five little vignettes capture the essence of the hypothesis. If we imagine the social context square divided into four by the group and grid axes then at the centre (which depicts minimum social involvement) we find the hermit whilst at the four corners of the square (which depict the four extremes of social involvement) we find (going clockwise from the bottom left in Figure 5) the self-made manufacturer, his hired hand, the high caste Hindu villager, and the self-sufficient Western communard.

The self-made manufacturer has got to where he is by the full-blooded exercise of his rugged individualism. Always his own man, blunt and forthright, given to measuring success in material terms, and much impressed by the free operation of the market as a mechanism for increasing wealth and welfare, he follows a forceful personal strategy that is both defiantly individualistic and unashamedly manipulative. He is a pragmatic materialist; the world, he agrees, is a nasty place and many a nasty thing gets done there, and....if he doesn't do it somebody else will!

The mill-owner's hired hand finds himself on the receiving end of all this, not in the sense that his life is a misery of exploitation (though, at times, it may be) but in the sense that he finds himself the unresisting object of his employer's manipulation. Good times and bad times come to him almost regardless of his skill, character and diligence. Un-unionized, he is in a direct one-to-one relationship to his employer but the crucial difference is that he has only one such relationship whilst his employer has many. Mrs. Gaskell exactly caught his predicament when she described his life as being "like a lottery"*. His

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*Gaskell, Elizabeth. *North and South* and *Mary Barton*, 186 ?

environment does things to him, sometimes good sometimes bad, but he is unable to do anything to it. The unpredictability of his environment, and the lack of any feedback from it in response to his actions, mean that he cannot build much by way of a mental model of it. Sometimes it delivers, sometimes it does not, and he copes with it as best he can with the help of an appropriately inconsistent eclecticism--a view of the world cobbled together from such bits and pieces of predictive framework as he can lay his hands on. Coping and surviving is what this social context is all about and, in the absence of any association--any bounded group that could negotiate with the mill-owner one-to-one on behalf of all the hired hands--his strategy is inevitably one of individualist survival.

The high caste Hindu enjoys his considerable rights to land, to water, to priestly duties, and to the deference of his fellow villagers of lower caste by virtue of his membership of his bounded group. Unlike the mill-worker, the prescriptions that impose such a heavy grid-iron on the high caste Hindu are not the consequence of his being manipulated by others; they are the means by which he collectively manipulates others. These prescriptions are not imposed on his group by a higher group in order to keep him down; they are self-imposed to keep his group up--to ensure that the boundaries are not blurred and the rank differentials are not eroded as a result of lax observances that would allow transactions to spill out of their proper channels. The result is an environment in which all has been regulated and purified and, with a place for everything, the problem becomes one of keeping everything in its place. Scrupulous observation of the rules that protect each level of the hierarchy from contamination by the levels below it

is the way to resolve this problem and, in consequence, we find a complex and highly discriminated environment maintained in this desired state by ritualism and sacrifice. The high caste Hindu follows a manipulative strategy in which he effaces himself by the observance of all the impersonal rules--dietary, occupational, matrimonial and transactional--appropriate to his collectivity.

The member of a self-sufficient Western commune rejects the assumptions of inequality that inevitably accompany a caste system. He is a member of a group that is, above all, egalitarian and which gains its definition not by its carefully negotiated and asymmetrical relationship with other groups within the wider society but by the rejection of that wider society. His "secular sect" cuts itself off from the nasty, predatory and inegalitarian outside world by a wall of virtue that protects those on the inside and provides them with their unifying theme and their sole principle of organization. The result is that, though they may do some terrible things to themselves, they can do little to the rest of society. Their's is a survival strategy but, unlike that of the mill-workers, it is a collectivist survival strategy. Purity defined in terms of just a single boundary, the rejection of compromise and negotiation across that boundary, and a collective egalitarian fervour that can only be expressed and maintained by piling ever more stones onto the top of the wall of virtue characterize the environment of the member of a secular sect. The sharp discontinuity between inside and outside means that the outside can only come into line by a sudden radical shift, whilst the organizational problems that would result from this sudden disappearance of the wall of virtue leave the details of this millenium strangely undefined. The two states of this environment--the

present sustained by the wall of virtue and the imminent future in which that wall will be swept away--are maintained and rendered meaningful by a blend of fundamentalism and millenarianism.

The hermit deliberately avoids all coercive social involvement, and the fact that he is able to do this suggests that he has some considerable measure of control over his environment and that he chooses to exercise this control in such a way as to avoid the sorts of manipulation that are imposed on the mill-worker and on the member of the self-sufficient commune whilst, at the same time, resisting the sorts of temptations that might lead him to exercise manipulation in the manner of the mill-owner or the high caste Hindu. Of course, if he follows an occupation (such as taxi-driving, or marginal farming, or the caretaking of a small office building) which is most effectively conducted in an individual rather than a group mode, and which affords few opportunities for economies of scale, these requirements will not be too difficult to satisfy. His strategy is not aimed at survival, nor is it aimed at manipulation; it is aimed at autonomy--at a benign and unbeholden self-sufficiency. (By this definition, raucous journalists like Thoreau are not hermits at all but, rather, one-man sects noisily throwing up their walls of virtue and waiting for the recruits to pour in). Autonomy--the middle path between manipulating and being manipulated--is sustained by the cultivation of a benign and immediate environment in which the boundaries between man and man, and between man and nature, are lowered and in which long time perspectives are deliberately dismantled for fear of the socially coercive frameworks that accompany them. Provided you keep your needs fairly low nature will provide and, so far as the future is concerned, sufficient unto the day is the evil thereof.

These five vignettes--these five kinds of social beings--can be summarized in terms of how their individual strategies, their cosmologies (or cultural biases), and the sorts of justification they use in accounting for their actions relate to social context. Then, if the hypothesis has any intuitive appeal at all, Paradigm A should line up with the self-made manufacturer (*the entrepreneur*), Paradigm B with the high caste Hindu (*the hierarchist*) and Paradigm C with the Western communard (*the group survivalist*).

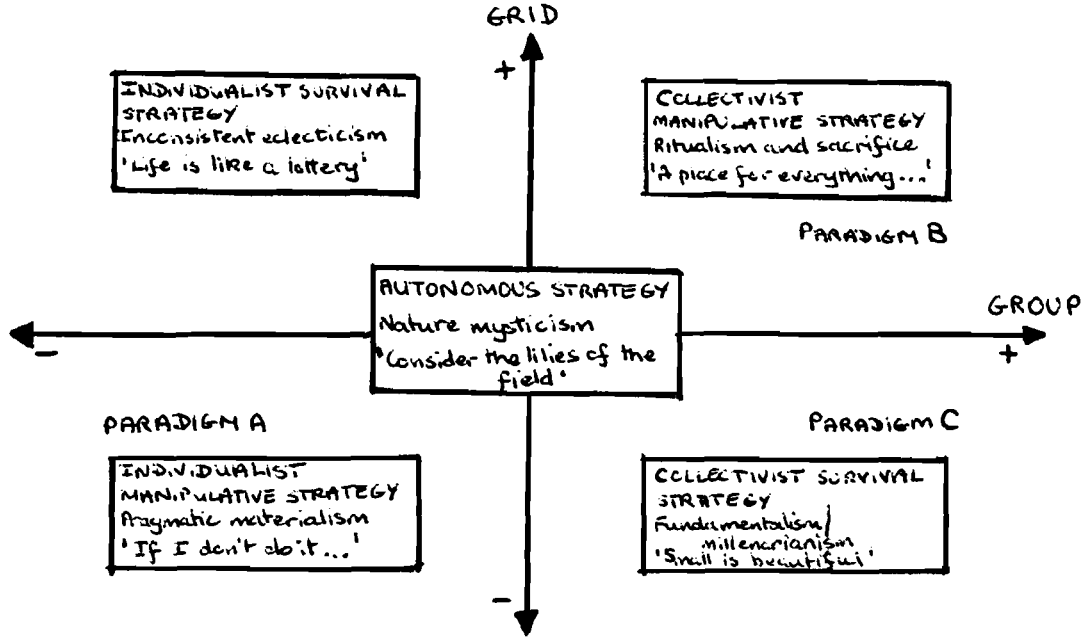

Figure 5. Individual strategies, cosmologies and justifications in relation to social context.

Justification for the hypothesis. This social context synthesis has been achieved by bringing together a number of things that tend to be kept apart. Caste, for instance, is usually restricted to the anthropology of the Indian sub-continent whilst sects and nature mystics usually stay safely inside the confines of the sociology of religion. Such intellectual tidyness is, perhaps, itself symptomatic of a caste-like academic tendency--of a purifying enterprise that seeks to leave the world in a rather more

orderly state than that in which it found it. By contrast the approach taken here insists that, even in the most competitive and individualistic social systems, we will find some bounded social groups (in the civil service, the armed forces and the trades unions, for instance) that display rather caste-like characteristics and that, even in a secular field like energy, we will discover some charismatic individuals whose eyes are as aglint with the true faith as any ayatollah's.

But it could well be objected that, in its own way, this synthesis is every bit as tidy-minded as those separate formulations that it implicitly criticises. First, in depicting these five social contexts as distinct non-overlapping clumps and, second, in depicting them as exhaustive, is it not pretending that social life is much more patterned than it really is? Of course, if you just ignore this question and crash on with the analysis and it works (in the sense that it leads to helpful policy suggestions) that, so far as the pragmatic materialist is concerned, is justification enough. But there is a theoretical justification as well.

According to the hypothesis, as an individual's social context varies so the extent to which he manipulates others (or is himself manipulated by others) also varies. Indeed, it is the pursuit of a manipulative (or survival or autonomous) strategy that, combined with a distinctive cosmology and a particular type of justification, actually stabilizes the individual in his social context. So, implicit in the social context diagram is a third axis--manipulation. At the two extremes of one diagonal (known as "the positive diagonal" and linking the entrepreneur and the hierarchist) manipulation is positive; at the two extremes

of the other diagonal (known as "the negative diagonal" and linking the life-is-like-a-lottery man and the group survivalist) manipulation is negative; and at the point where they cross (the social context of the hermit) manipulation is neither positive nor negative--it is zero.

So we can add this third dimension, manipulation, to the social context picture and we can plot in these five values--two positive, two negative, and one zero--on it. What is more, since these points represent stabilizable equilibria, we know that the graph will have to flatten out at these five points. If you then join these five "flat bits" together, in the simplest possible way, you will obtain a "landscape" in which two hilltops are linked by a ridge which, in turn, is flanked by two basins. To stabilize yourself on a hilltop you need to follow a strategy of heading for the higher ground, to stabilize yourself in a basin you need to head for the lower ground; and to stabilize yourself at a saddle point you need always to pull back from steepening slopes. Translated into social terms these three strategies become the manipulative, the survival and the autonomous, respectively.

At the same time, the clear separation of the five clumps is made graphically clear. Each flat bit defines a region of stability and eventually, depending on the strategy he is following, an individual is bound to end up clumped with socially similar individuals (his *moral community*) at the appropriate equilibrium and the surrounding slopes--the regions that lie between the five equilibria--will only be transiently populated by individuals who for one reason or another are on the move from one stabilizable equilibrium to another. So, the making explicit

of the manipulation dimension reveals the separation of the clumps to be valid but still leaves their exhaustiveness something of an open question. All we can say is that is that these five clumps arranged in this way is the *simplest* configuration we can have and, since these dimensions can only be measured on ordinal scales, they are the only clumps that we can separate.* But, if there

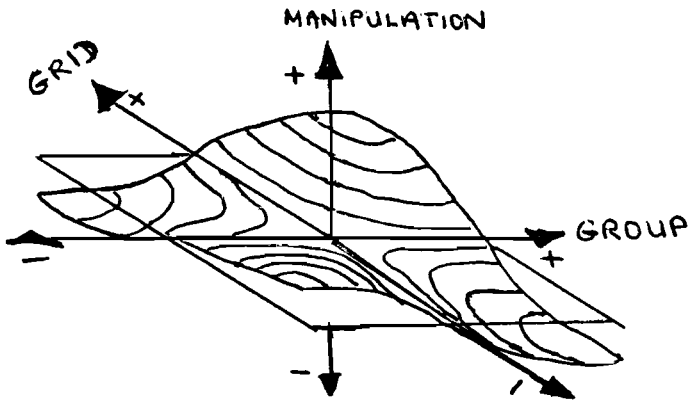

Figure 6. The separation of the clumps

have to be at least five stabilizable equilibria, why are there only three energy tribes?

Social context and the perception of time. Expertise and perception of the long term go hand-in-hand. This means that any individual whose perception does not extend to the long term will not be able to gain recognition as an expert. If expertise in energy

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*This argument for the equilibria and their stabilization is very simplified. For a more detailed explanation see: Thompson, Michael, "The problem of the centre" (op.cit) and Zeeman, E.C., "Decision making and evolution" in Renfrew, C., Rowlands, M.J. and Selgraves-Challon, B.A. (eds.) *Theory and explanation in Archaeology: The Southampton Conference*, Academic Press, New York, 1982.

matters is an essential qualification for participation in the energy debate then any social contexts that, for one reason or another, impose myopia upon their occupants simply will not be represented in that debate.

There are two myopia-inducing contexts--that of the hermit, whose autonomous strategy involves the systematic dismantling of long term investment structures (such as those built up by genealogies, delayed inheritance, rules of primogeniture and bans on divorce) because of the social pressures (the rights and obligations, the claims and counter-claims) that inevitably accompany them,and that of the life-is-like-a-lottery man, whose inability to put together any investment structure that can withstand the erratic responses of his environment renders him incapable of seeing from one week's end to the next. For the hermit the myopia is voluntary; for the life-is-like-a-lottery man it is involuntary; but, either way, the absence of long term perception means that both inevitably occupy expertless contexts.

The myopia of the life-is-like-a-lottery man is obvious enough but an example may help to clarify that of the hermit. When the Dalai Lama visited Berkeley in 1979 he was, inevitably, asked to comment on the terrible tragic choices that the world faces as a result of the pollution of its atmosphere and of the rapid depletion of its non-renewable resources. What position did he take on the energy (and the wider environmental) problem? This was clearly the subject uppermost in the minds of many of those who had come to listen to him, but it was not uppermost in his mind. "If it is soluble" he said, "no problem; if it's insoluble, no problem". This, in fact, is the hermit policy and, when related to the rather gentle kind of exploitation of nature that goes on in the autonomous context, it

has much to recommend it. But it *shrugs off* the problem that the experts, in their different ways, are so eager to solve and that, surely, is no way to get into the energy debate? Quite so; it is the way to keep out of it!

Turning to the three contexts in which the long term *is* perceived, we meet three different kinds of experts and the problem is to explain why each kind of expert is appropriate to his particular context. Both the entrepreneur (Paradigm A) and the group survivalist (Pardigm C) are able to perceive both the short and the long term but they evaluate them very differently. For the entrepreneur the short term dominates the long term; he is in the business of manipulation but he is realistic enough to know that his manipulation, being the product of his own efforts (rather than of the authority of an institutionalized office that he, for a time, fills), does not extend too far into the future. Being an expansive optimist, he allays his fears that his short term successes may not continue by insisting that the long term will turn out to be a prolongation of the short term and, through the exercise of his not inconsiderable political influence, he does what he can to ensure that this desired state of affairs actually comes to pass. He is predisposed to give credence to the "business as usual" scenario.

The group survivalist's evaluations of the short and long terms are the reverse of the entrepreneur's. Collectivised within his wall of virtue and with little control over the short term, he sees himself as one of the meek who, in the long term, will inherit the earth. In this way the optimistically perceived long term comes to dominate the gloomy short term. If there is to be a long term at all, then the short term is going to have to be drastically

altered now. He is, in consequence, predisposed to grant credence to the "no growth" (the "radical change now") scenario.

Where both the entrepreneur's and the group survivalist's evaluations of the short and long terms are unbalanced, with the short term dominant for the entrepreneur and the long term dominant for the group survivalist, the evaluations of the hierarchist (Paradigm B) are quite nicely balanced. This is the context occupied by the planner and the bureaucrat. Insulated from the pressing daily concerns of the entrepreneur by the institutionalized framework that guarantees the continued existence of the office that he fills, he is able to give adequate attention to the long term. What is more, he sees events in that long term as being controllable--not by him personally, you understand, but by the complex collectivity of which he is a self-effacing part. Being part of an elaborate hierarchy, he is predisposed to be sensitive to fine distinctions and in consequence is unlikely to see the long term as a mere extension of the short term or vice versa (and, of course, if he were to concede that there was no distinction he would be handing over control to the entrepreneur and putting himself out of a job in the process). Each is seen in a balanced and discriminating way and, since collective control over events is seen as extending far beyond the short term, the long term is viewed with cautious optimism. The results is a willingness to grant credence to the so-called "middle of the road" scenario. (I say "so-called", not because I wish to denigrate it in relation to the other two scenarios, but in order to stress that it derives from a qualitatively distinct and separate evaluation of the long and short terms and is not simply some quantitative compromise between the "business as usual" and the "radical

change now" scenarios. Nor do I make any value judgments between "balanced" and "unbalanced").

We can summarize these time perception criteria--long versus short sightedness, choice versus compusion, short term dominance versus long term dominance, and balanced versus unbalanced evaluation--with the help of the basic social context diagram.

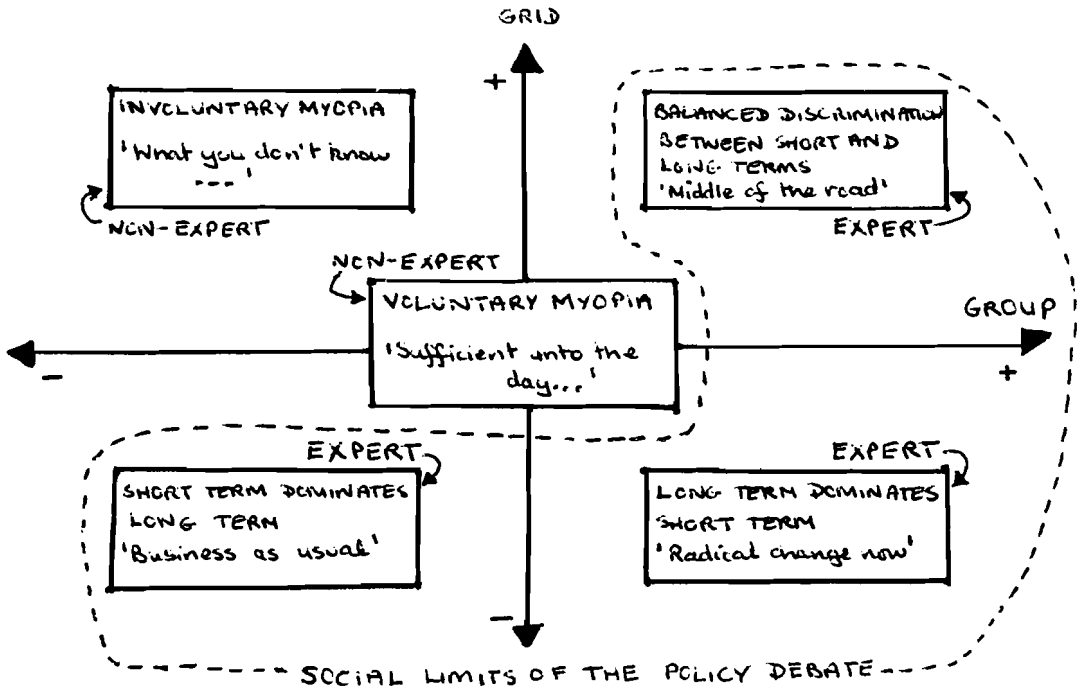

Figure 7. Socially induced time perceptions and resultant credible scenarios and conferment of expertise.

The two invisible paradigms. One interesting feature of this diagram is that it reveals a marked bias within the energy debate over and above the biases associated with each of the three positions in it. These three positions, even if the influence each exerts accurately reflects the proportions of individuals in that social context in the wider society, inevitably ignore those individuals who are in the other two contexts. Just because these individuals do not participate in the energy debate it does not follow that they have not got any preferred scenarios. In other words, in addition to perceptions A, B, and C, there is perception D and there is perception E and a necessary condition for a switch

to the exploratory mode is that these two "invisible paradigms" will have to be legitimated as well. But before we can legitimate them we will have to discover what, in energy terms, they are. (A handy mnemonic device for remembering which perception goes with which social context is: "A is for Aggressive individualist, B is for Bureaucrat, C is for Coercive utopian, D is for Down-trodden proletarian , and E is for 'Ermit".)

The hermit's scenario follows automatically from the Dalai Lama's response to his Berkeley questioners and, in order to stress the way in which perception E deliberately turns away from the long term, we can label it the "sufficient unto the day" scenario. The life-is-like-a-lottery man shares the socially induced myopia of the hermit but not its voluntariness. Percep - tion D does not have to turn away from long term considerations; the life-is-like-a-lottery man could not consider the long term even if he wanted to, but this does not cause him any great distress. He has enough on his short term plate as it is without bothering himself about things out there that he cannot see and that he could not do anything about even if he could see them. Life must go on, survival is paramount, and the first essential is to clear a little bit of space for oneself in the here and now. To help maintain this priority he assures himself in a rather braggardly, but nevertheless realistic, way that what he doesn't know can't harm him. And this is the credible energy future in the D per-ception--the "what you don't know" scenario.

From inside the energy debate, the "sufficient unto the day" and "the what you don't know" scenarios are seen, at best, as not being scenarios at all and, at worst, as ignorant, facetious or even downright criminally irresponsible. Yet perhaps this is

because all the expert perceptions are problem-elevating perceptions whilst the non-experts' are problem-depressing perceptions . After all, if the non-experts were right (what a terrible unthinkable thought) the energy problem would just go away! But, be that as it may, the simple fact remains that these problem-depressing scenarios are the scenarios appropriate to these two expert-less contexts and the occupants of these contexts do conduct their daily lives, and make their daily decisions about energy consumption, in accordance with them.

A nursery fact that sometimes gets overlooked in the heat of the energy debate is that aggregate energy consumption is the sum of all the individual energy consumptions; and the whole significance of the social context argument is that you cannot assume that all individuals are the same, nor can you assume that they all fit under some smooth single humped distribution. An individual's energy consumption decisions, like all his other decisions, are likely to be strongly patterned by the strategy that he is following and, if the strategies are clumped, the chances are that the sub-aggregates (consumption disaggregated by social context) will also be clumped. Even if the "what you don't know" scenario and the "sufficient unto the day" scenario were to turn out to have little or nothing to contribute to energy policy, they would still have relevance for our understanding of one of the key variables that energy policy should consider--the social patterning of energy consumption.

Conclusion. This then,in outline, is the anthopological hypothesis that explains where the three positions in the energy debate-- the Paradigms A, B, and C--come from and how it is that individuals are variously led by their social context to these three positions

(and to the other two that, though there, never participate in the debate). It is worth pointing out that this is an explanation that goes way beyond the notion of self-interest to provide a plausible account of how it is that individuals who act in their own interest come to know where that interest lies. In other words, it is a social theory of goal-setting.

Equipped with this theory, we can now begin to develop the anti-thesis to the hard science thesis. Where the hard science thesis keeps demanding a single certain answer from uncertainty, the soft science anti-thesis looks for a number of contradictory answers that, taken together, will fill out a certain picture not of the uncertainty itself but of the socially induced responses to that uncertainty. Where the hard science thesis has us ask (over and over and over again) "how much oil and gas is there down there?" the soft science anti-thesis has us ask "how much oil and gas would you (and you, and you) like there to be down there?"

5. THE ANTI-THESIS

Low energy demand and high energy demand, decentralized supply and centralized supply, de-growth and growth, de-coupling and the impossibility of de-coupling,....*soft paths and hard paths* represent fundamental ways in which individuals seek to rationalize preferred social relations. The reason the usual arguments over energy are so frustrating is not that some of us are rational and others are not but that "we" do not understand that "they" operate under cultural concepts rationalizing different ways of life. There is no sense in railing against others because they find incredible scenarios that we find credible when it is our very convictions about the nature of the world that is the setting for those

scenarios that they reject.

When, despite all the resources that have been committed to it, a debate still retains such a wide spectrum of credibility, and when different experts still take up such widely-spaced positions along that spectrum, then the customary qualifications for participation in the debate--expertise in energy matters--becomes largely irrelevant. Indeed, it may even become something of an encumbrance preventing those who possess it from realizing that their distressingly polarized debate now calls for the attentions of a different kind of expert. When the experts on energy are in persistent disagreement the time has come to call in the expert on disagreement among experts.

It is important to stress the word persistent . In the early stages of a debate experts may find themselves in disagreement because of "misperceptions" or "misinformation"--because they have variously given too much weight to this factor or failed to take enough account of that one. Persistent disagreement is that disagreement that remains *after* all these "sub-optimizations" have been thrashed out in the debate and, if there is one thing that the expert justly prides himself upon, it is his skill in this sort of transactional activity. Persistent disagreement, therefore, cannot be ascribed to "transactional friction"*--to a regrettable stickiness that prevents the different experts from moving all the way towards the single equilibrium point that is their common objective. No, it is not that one or other (or both)

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*When it *is* ascribed then we are back at one rationality railing at another for its irrationality with the words "misperception" and "sub-optimizing" being hurled about as insults.

is sub-optimizing; it is that they are both optimizing extremely well but at *different* equilibria.

The anthropologist (for that is the identity of the expert on disagreements among experts) has an easy familiarity with such multiple equilibria. His specialist skill lies in getting under the skin of an exotic culture and thereby gaining an understanding of its internal logic. Each socio-cultural system, being persistent, *has* an internal logic and *can* be understood; in other words, it is *rational*. But, though all socio-cultural systems are logical, they are not all the same and this means that there is *more than one rationality*. Anthropology, alone among the social sciences, recognizes this plurality of rationalities and seeks to understand it. In asking "how many different rationalities are possible?", "where do they come from?..."what are the conditions that lead to one rather than the other?", it sets out systematically to de-provincialize rationality.

Absolutely central to all that follows is the conviction that, when we have persistent disagreement among experts, we have a plurality of rationalities and that, when we have a plurality of rationalities, we have a problem that is of its essence an anthropological problem.

Plural rationality and the disharmony of the spheres. When the anthropologist speaks of *cosmology* he means "those shared beliefs and convictions about how the universe is that sustain and justify moral judgments".* The cosmologist would probably reply that this is not at all what he means by cosmology but the anthropologist

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*Ref. to Mary Douglas?

would argue that, in saying this, the cosmologist is mistaken.

Cosmologists agree that there is only one universe (this is often held out as the unique property that distinguishes cosmology from all the other sciences) and only disagree about its nature. For instance, a cosmologist (assuming the big bang) will depict three alternative natures by means of a little diagram.

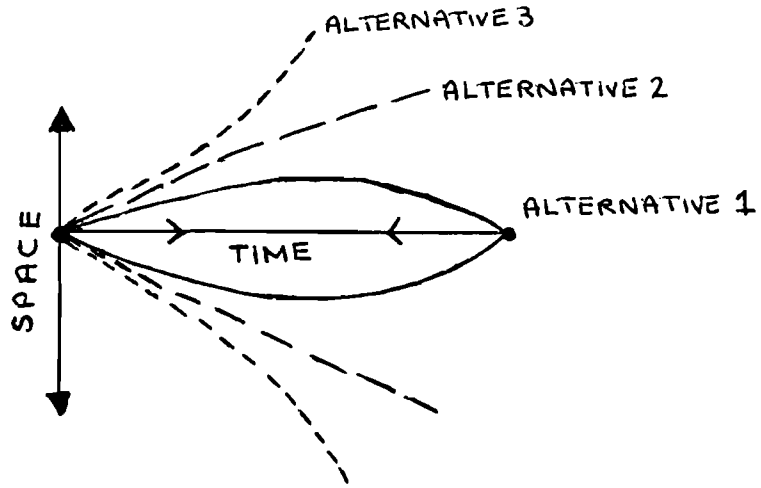

Figure 8. Three alternative natures for the universe.

He will go on to explain that, given the present state of knowledge, it is not possible to say to which of these three possibilities our one universe conforms. He will then choose one of these possibilities and proceed to tease out its fascinating properties--the directionality of time, the curvature of space, the limits within which the laws of thermodynamics hold and the different laws that hold outside those limits...and so on. The cosmologist is excited by the properties of the universe he has chosen; the anthropologist is excited by the cosmologist's choice of universe.

The anthropologist wants to know why, out of these three possible universes (and the one or more other universes that go with the other possible starting point: continuous creation), the cosmologist chose the one he did. Cosmologists, as it happens, quite often choose Alternative 1 and, if they are pressed as to why they find it more attractive than the others, they will probably explain that, unlike Alternatives 2 and 3 it does not entail the infinite. In a more relaxed atmosphere they may confide that the real attraction of Einstein's universe is that, if you keep going long enough, you will arrive back home again; it is a *cosy* universe. By contrast, a cosmologist who chooses one of the other universes, far from finding the infinite discomforting, may draw intellectual succour from its contemplation.... and so on.

Thomas Carlyle, in rebuking the young lady who confessed to accepting the universe with the retort "By God, you'd better", had got it all wrong. What he should have said was "Of course, my dear, but which one?". But the cosmologist, on overhearing this, would cry "Don't talk nonsense, Carlyle, there only *is* one!" Now, at last, the anthropologist has got the cosmologist cornered: "If there only is one universe, tell me, what is it like?" "Like this" says one cosmologist; "No, like this" says another; "No, no, like this" cries a third....and so on. If reality is something concrete--something "out there"--then, of course, there is only one universe but if reality is socially constructed--if it is something that we project *onto* whatever it is that is out there--then there can be lots of them.

But, though there is more than one socially constructed universe, there turn out not to be *that* many of them; four or five,

six or seven...seven or eight perhaps--it depends a little on how keen you are to separate or to lump together--but, either way, socially constructed universes cluster around the magic number: seven plus or minus two (give or take the odd one).

The anthropologist pounces on two curious properties of these socially constructed realities. The first is that socially constructed realities, though multiple, do not multiply to infinity. The second is that the cosmologist's choice is not at all an arbitrary or random thing; it is the predictable consequence of a definite predilection*--a predilection so definite that he himself (with a little prodding) can give expression to it. And that basis--that rationale--for his cosmological preference, far from being something logical and cold, turns out to be full of passionate commitment to a particular set of preferred social relations and as warm as a fireside cat.

- o Einstein with his cosy universe in which all roads lead to hearth and home and no dice-playing God to capriciously turn the sign-posts around.
- o The cosmo-hermit who, sternly setting these transient domestic pleasures aside, develops his taste for the desert landscape and, by the contemplation of its empty infinitude, dissolves away all boundaries between himself and the universe until at last he becomes one with the very object of his study.
- o Hoyle keeping his options open by a deliberate entrepreneurial homelessness, and, instead of committing himself to just

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*"An attitude of mind that predisposes one to choosing, or judging or taking a stand without full consideration or knowledge". Webster's New Collegiate Dictionary.

one universe, treating them all as little more than intellectual resting places--overnight steps along an impressively individualistic and pragmatic journey.

My purpose here is not to perform a complete disaggregation of cosmologists into the five social contexts of the anthropological hypothesis but simply to give some indication of how that might be done. Unlike the energy expert, the cosmologist does not, at present, find himself at the centre of a polarized and policy-relevant debate. This means that, though the requisite wide range of uncertainty is there, the pressures that would result in the very clear separation of the positions--the hard science justifications for the desired policies--are not. Even so, the cosmo-hermit clearly has a strong affinity with, for instance, Sufi mysticism--the nature mysticism of the Islamic faith. In Sufi mysticism the dance of the Whirling Dervishes does not just symbolize the unity of man and the universe; its purpose is to actually bring the dancer to this state of oneness. Einstein's universe has credibility for the As because of its predictive power and the wealth of opportunities that it opens up. But it also has appeal for the Bs through the degree of navigational control that it promises and through its orderliness its lack of sudden change and its discounting of chance. But perhaps Hoyle, with a personal style of daring yet shrewd intellectual risk-taking and a prickly intolerance of the group constraints that Academia has from time to time tried to lay upon him, is the real A cosmologist. The fact that he has gone on record * as strongly pro-growth, pro-nuclear and anti-green is, perhaps, not entirely coincidental.

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* HOYLE, F. *Energy or extinction: The case for nuclear energy*. London, Heinemann Educational, 1977.

If cosmologists can do this sort of thing to the universe just think what our experts on energy can do to that poor little sphere that we all have to cling to!

Social worlds apart. The contradictory beliefs and convictions about what is "out there" that serve to separate the cosmologists' universes centre around an appropriately cosmic taste--the palatability of the infinite--and, in a similar but more mundane way, the same sort of taste difference helps us to sort out the different worlds of the energy experts: a conviction that resources are finite and that all the frontiers in Spaceship Earth are long since closed *versus* a profound faith in man's endless ingenuity and the unshakeable belief that one door has only to shut for another one to open. Embedded in the first is an *accountable* view of the nature; embedded in the second is a *cornucopian* view of nature.*

The way in which these contradictory tastes and distastes build up into a small number of taste patterns--patterns that can then be used as bases for the moral justification of certain kinds of actions and for the moral condemnation of other kinds of actions--can be described in a number of ways, but perhaps the one that is best suited to the task of disentangling the different worlds of the energy experts is that in terms of personal management strategies for needs and resources.

6. THE PLASTICITY OF NEEDS AND RESOURCES

The gregarious and well-fleshed businessman who trots out that cobweb-laden quip about being unable to reconcile his net income with his gross habits is, in a rather backhanded way,

*For some empirical support for the existence of these contradictory views of nature and for their social generation see: COTGROVE, Stephen, 'Cornucopia or catastrophe', *New Society*, March 22, 1979

boasting about his worldly success and we can be pretty sure that, if he manages to push his income a few notches higher, he will not take that opportunity to close the gap. No, he will just develop some even grosser habits thereby maintaining his insatiability and his expansive optimism--he will be propelled ever onward and ever upward until that unfair day when death (Nature's way of saying 'slow down')* finally puts a stop to it all.

From this we might deduce that needs are infinite and that their ordering--the sequence in which they come to be satisfied--is brought about by the finiteness of resources. But, if we were to adopt this view of the nature of needs and resources, what would we make of Mr. Po Chü-i?

> What I shall need are very few things.
> A single rug to warm me through the winter;
> One meal to last me the whole day.
> It does not matter that my house is rather small;
> One cannot sleep in more than one room!
> It does not matter that I have not many horses;
> One cannot ride on two horses at once!**

Mr. Po Chü-i's needs cannot be infinite for they fit comfortably inside the confines of his quite modest resources. If we want to be able to handle both the exuberant businessman and the sufficient Mr. Po Chü-i we will have to modify our idea of the

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*The satirical dart appropriate to the sort of eager risk-acceptance that goes on in this entrepreneurial social context, the equivalent definition for the risk-averse individual is: 'Life is a sexually-transmitted terminal disease'.

**Po Chü-i. 'A mad poem addressed to my nephews and nieces.' AD 835. Translated by Arthur Waley c. 1918. Re-published in Allott, Kenneth (ed.) *Contemporary Verse*, London, Penguin. 1950.

nature of needs and resources. Both resources and needs will have to be finite with the latter fitting inside the former. Mr. Po Chü-i, clearly, has rather overdone things whilst in the other direction the businessman is a bit out of control and heading for trouble.

But then comes a knock on Mr. Po Chü-i's door. It is a small group of public officials come to tell him that he has not got enough bed-clothes, he is not eating enough, his mobility is inadequate and his small house is in contravention of Parker-Morris standards. He is to be moved into an old people's home where he will be properly clothed, fed and housed. He has been living below The Poverty Line As he makes this involuntary transition to the old people's home so his needs are expanded until they reach their correct level. If we want to be able to handle these public officials, as well as the businessman and Mr. Po Chü-i, we will have to revise our ideas about the nature of needs and resources yet again. The needs of individuals are, as it were, given and resources (which are inherently rather unruly) have to be extended a bit here and trimmed a little there so as to fill out this rigid frame. On this view both the businessman and Mr. Po Chü-i are, in their different ways, somewhat pathological cases that will have to be brought into line if nature is not to be outraged.

But there is something unsatisfying about accepting this account of the nature of needs and resources. We have already met the likes of our businessman, our Mr. Po Chü-i and our public officials--they are the As, the Es and the Bs,* respectively--and to accept that two of them (the As and the Es) are pathological in some way is tantamount to removing their legitimacy

* Again, I should stress that these distinctions derive from the various strategies that individuals *as social* beings are led to adopt. They are neither innate or immutable.

--to imposing the narrow provincialism of just one perception of needs and resources (that of the Bs) on all the others. If we want to preserve the legitimacy of the various perceptions that, in their different ways, contradict the B perception we need the idea that needs and resources have a certain social malleability. People do not just *have* needs nor do they just *have* control over resources; they are, to some variable extent, able to *manage* their needs and to *manage* their control over resources.

The businessman and Mr. Po Chü-i now regain their dignity; far from being pathological cases, we can credit each of them with the savvy to forcefully manage their needs and their resources in accordance with the different personal strategies that they are following. An intuitively attractive consequence of adopting this sort of approach is that, if people in general have some scope to manage their needs and their resources, then perhaps poverty can be defined simply (and without any recourse to poverty lines and to such slippery concepts as relative deprivation) as that sorry social state in which these two degrees of freedom are frozen up. Four logical, and equally legitimate, possibilities follow.

1. You can manage neither your needs nor your resources.
2. You can manage your needs but not your resources.
3. You can manage your resources but not your needs.
4. You can manage both your needs and your resources.

*Personal Management Strategies**. What may not be immediately obvious is that, for the fortunate individual who has both

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*Again, only a brief outline of the argument is provided here. For a fuller account, and for some discussion of its application and testing see: IIASA Working Paper: WP-80-174, Michael Thompson. 'The social landscape of poverty'.

degrees of freedom, there is a third one. If he has the scope to manage both his resources and his needs then, depending on how he chooses to mix these two managements, he has the chance of managing the size of the overlap between his resources and his needs. For many individuals this is the crucial variable.

> 'Annual income twenty pounds, annual expenditure nineteen nineteen six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery.'
>
> Mr. Micawber*

Whether an individual who has the scope to manage his needs and his resources also acquires the scope to manage the overlap between them is given by the following little matrix.

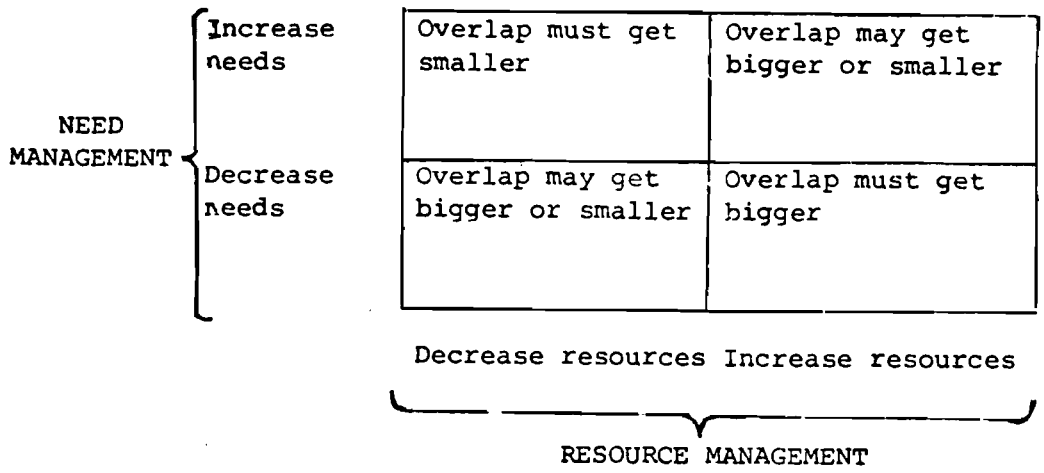

Figure 9. The third degree of freedom

So there are, in all, three degrees of freedom--scope to manage needs, scope to manage resources and scope of manage the overlap

*Dickens, Charles, David Copperfield.

between them. At the origin--the point at which all these scopes are completely frozen up--there is no management space at all but, as the scopes gradually unfreeze, so a three-dimensional management space opens up and, as this space opens up, so the fourth possibility splits to give two clearly separate extremes--possibility 4a and possibility 4b.

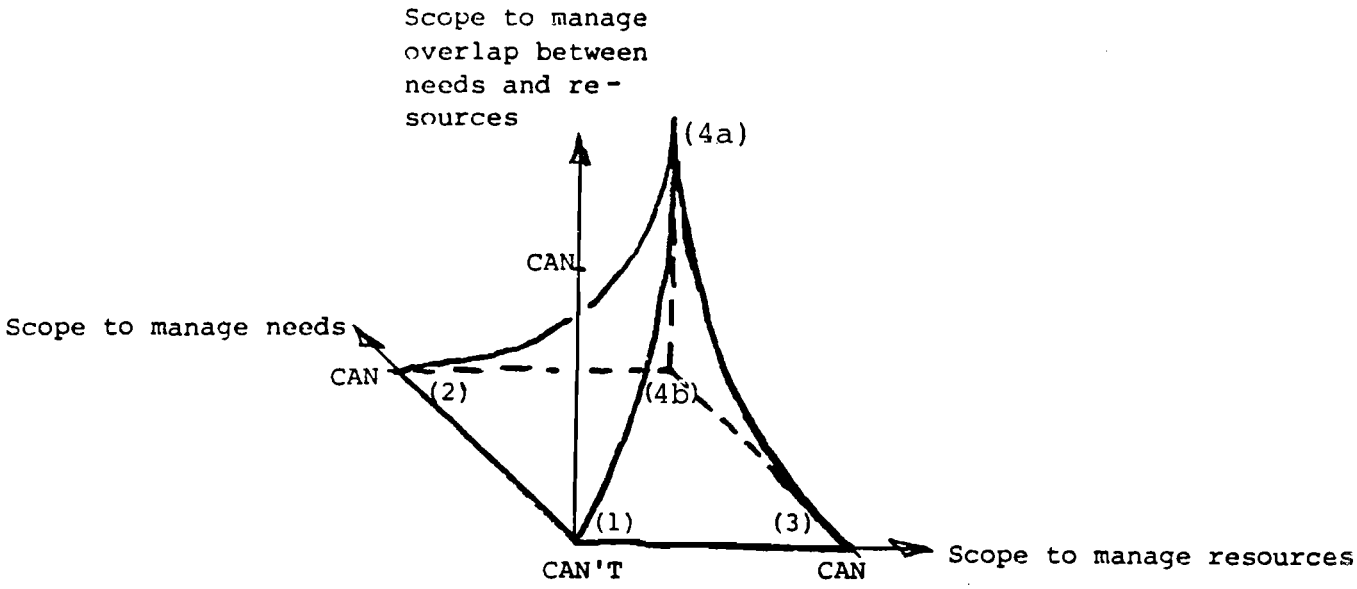

Figure 10. The management space and its five extremes.

Of course, if the only calibrations are 'can't' and 'can', one cannot say that the space will be *exactly* this shape; only that it will not be spherical and that, whatever shape it really is, it will have five corners to it. This means that there are five distinct directions in which you *may* be able to move, five distinct avenues that you *may* be able to explore,. . .five clearly separate goals towards which you *may* be able to move with the help of five distinct personal strategies for managing needs and resources. What, then, is it that converts 'may' into 'can'? How does permission to move in one direction come to be given to you and how is it that permission to move in other

directions is withheld from you? What causes the thawing and the freezing of the three degrees of freedom?

The answer is that these climatic changes are brought about by the complex dynamics that generate the process of social life and that one avenue is opened up to you, and others are closed to you, according to the way in which you are caught up in that process. But, in general, you are not some dead fish to be swept along in the surrounding current; you are actively engaged in the business of creating, sustaining and changing the process of which you are part. So, within this flux, there are two dynamical problems--the local equilibrium, in which the individual and his social context approach stability, and the global equilibrium, in which the entirety is stabilized by some particular dispositions within the freedom space of all the individuals who comprise that entirety. For the moment I will consider only the local equilibrium.

Possibility 1. Since this individual has no scope to manage his needs or his resources, he really cannot be said to have a management strategy. His concern, rather, is just to cope as best he can with an environment over which he has no control. Mr. Po Chü-i, once he is tranferred to the old people's home, finds himself in this sort of situation. Both his needs and his resources have been assessed by the kind-hearted public officials--they are no longer in his control--and he can count himself lucky that the resources he is given are exactly equal to the needs he is given. Sometimes for people in his sort of

predicament they can be wildly out of alignment ('I wonder what the poor are doing?' Answer: 'without'); at other times the misalignment may be more welcome (a win in the numbers game or a sub-optimised welfare payments scheme). So the rational response if you find yourself at Possibility 1 is: keep your fingers crossed and hope that Lady Luck smiles on you--survive by coping.

If this is the rational response what is the nature that it is the rational response to like? It is essentially cornucopian, in that there clearly are plenty of resources out there, but it is a lottery - controlled cornucopia--the horn of plenty only disgorges in your direction when it is your lucky day. Equilibrium calls for a matching of response and environment and this is achieved by adopting the appropriate attitude--fatalism.

Possibility 2. Since resources here are fixed and you can do nothing about them, your only available strategy is to decrease your needs so as to ensure a comfortable (or at any rate, a non-negative) overlap. But it is no use doing this on your own. If resources are fixed and finite then one man's gain is inevitably another man's loss and so this need-reducing strategy, to be effective, will have to be followed by everyone. In a strongly collectivised social context individuals can all

see the advantages of such behavior and in the background, of course, there is always the threat of strong group sanctions to encourage those individuals who may be dragging their altruistic feet.

For this to be the rational response nature cannot be cornucopian--it must be strictly accountable. At Possibility 1 the *a priori*--the unquestioned gut-conviction about how the world is--can be summarised in the phrase: 'If your number comes up. . .'; at Possibility 2 there can be no such thing as a windfall--nature is a zero sum game.

Possibility 3. If you cannot do anything about your needs then the only available strategy is to increase your resources so as to make sure that the overlap does not go negative. On the other hand, there is little point in going to an inordinate amount of trouble to increase the size of the overlap if your needs are fixed. Mr. Po Chü-i in his old people's home cannot fit this strategy because, though his needs are fixed, he is not in any position to manage his resources but what about those who put him there--the public officials? They are from different departments and different grades within a complex hierarchical organisation and complex hierarchical organisations maintain themselves by imposing equally complex and ranked patterns

of needs upon the individuals who compose them.* Individually the members of such groups within a hierarchy have little manipulative ability but collectively (by working to rule, for instance) they are able to increase their share of the cake so long as, in doing so, they do not overtake the group above them. If this collective strategy is being pursued at all the different levels of the hierarchy then the result is *differential maintenance*.

If this is the rational response then the nature that it is the rational response to cannot be completely accountable nor can it be completely cornucopian. Nature *is* bountiful but within accountable limits, and these limits are given by the imperative to maintain nature's isomorphism with society--differentials have to be maintained and we cannot have levels merging or, worse still, changing places. The *a priori* here is that the leopard cannot change its spots. There are all kinds of things that leopards *can* do but spot-changing is not one of them. If leopards could change their spots we simply wouldn't know where we were and so, to those individuals to whom knowing where they are (and where everyone else is relative to them) is very important, spotless

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*Ref. to IIASA Working Paper on Hierarchies by Brian Arthur?

leopards are unthinkable.

Possibility 4a. Here both needs and resources are manageable and the individual has chosen to manage them in such a way that he also has the scope to manage the overlap between them. This means that, unlike our exuberant businessman, his needs will nestle comfortably inside his resources. If he manages his resources up then his needs can follow at a safe distance; if he is managing his resources down (perhaps because he cannot manage them up, perhaps because he does not want to) he will have to bring his needs down a little bit ahead of them. Po Chü-i, before he is taken into the old people's home, is in this situation. Though he could increase his resources he chooses not to; that way lies coercive social involvement and he has had enough of that.

People when they are old are often burdened with ties;
But *I* have finished with marriage and giving in marriage.
No changes happen to jar the quiet of my mind;
No business comes to impair the vigour of my limbs.
Hence it is that now for ten years
Body and soul have rested in hermit peace.*

This is the rational response to a nature that is essentially benign, provided one makes oneself a part of it. For those whose needs are slight (and whose time horizons are short) nature will always provide. When Po Chü-i starts to take

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*Po-Chü-i. (op.cit.).

some thought for the morrow, and to worry about what is to become of him in his failing years, he relies on the Winter Chrysanthemum to dismantle his alarming time structure.

At this sad season why do you bloom alone?
Though well I know it was not for my sake.
Taught by you, for a while I will smooth my frown.*

Possibility 4b. The exuberant businessman would consider himself to be in a bad way if he caught himself talking to the chrysanthemums; chrysanthemums are for buying and selling. You don't waste your time talking to flowers; you talk to people--important people. The businessman wades straight into all that social involvement that Po Chü-i has been at such pains to avoid. He clearly has the scope to manage both his needs and his resources and he chooses to reject the overlap-managing option and to manage his needs and his resources upwards to the very limit of his entrepreneurial skills and his physical abilities.

Unlike Po Chü-i, plenty of events jar the quiet of his mind--he is right in the middle of the turbulent stream of competitive individualism where success comes to he who boldly and skill-fully accepts the risks--the opportunities--that present themselves there. Nature is cornucopian, but it is not a freely available cornucopia nor

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*Po Chü-i, 'The Chrysanthemums in an Eastern Garden'. AD. 812. (op.cit).

> is it controlled by a lottery--it is controlled by skill. It is a jungle out there; it is the survival of the fittest; it is nature red in tooth and claw.

So this brief outline, with its few carefully chosen examples, suggests that these five logically possible personal strategies for the management of needs and resources are actually taken up in real life. At the same time, the idea that the management scopes are frozen up or thawed out according to variations in an individual's social context provides us with a plausible way of mapping those five need and resource management strategies onto the social context diagram.

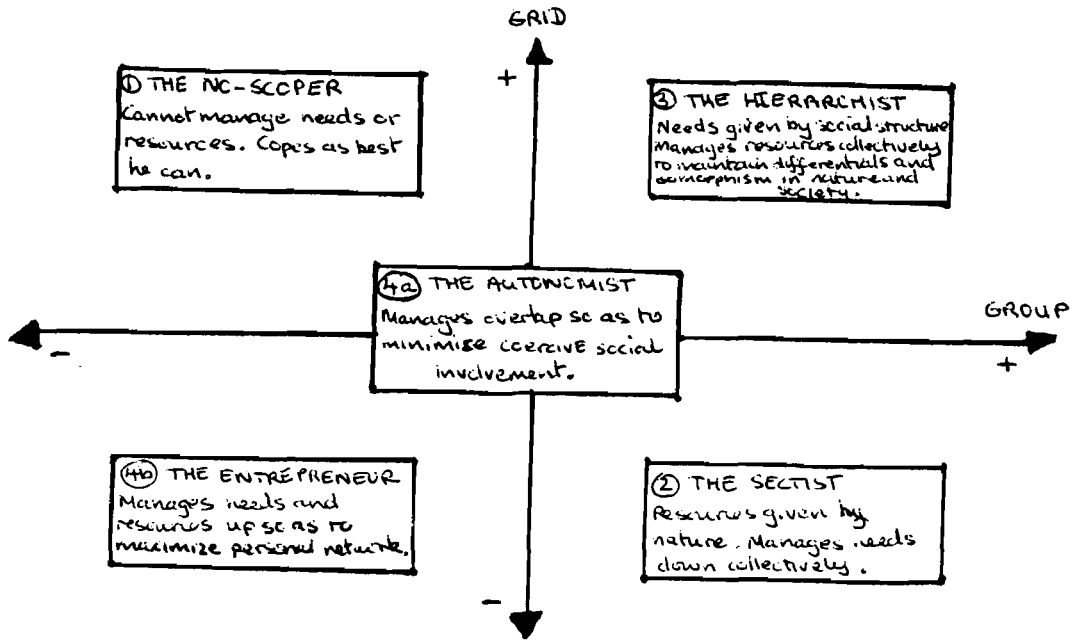

Figure 11. Need and resource management strategies mapped onto social context.

Global equilibrium. Whether there are individuals so positioned by their mode of involvement in social life as to be able,

severally, to take up all of these five possibilities will depend on the sort of *social regime* with which we are dealing. So too will the proportions in which individuals are distributed between those positions. But social regime is not something separate from, and prior to, individual paradigm. Rather, the two--power and perception--advance hand-in-hand to give a continuous flux within which regimes emerge not as some distinct political realm but simply as recurrent regularities associated with those configurations of individuals and paradigms that happen to be statilizable. But I do not wish to suggest that global equilibrium--the stability of regimes--depends directly upon individuals and their socially-induced perceptions. Regimes are stabilized by *institutions* and it is the stability of the institutions that, in turn, depends on the support of individuals. When an institution enjoys that support it displays a massive solidity; when it does not, it crumbles. Institutions wax and wane according to the credibility they enjoy and individuals are led to extend, or to withdraw, credibility according to the degree of consonance, or dissonance, between their social institutions and their socially-induced perceptions.

A particular global equilibrium will be maintained by some compensating pattern of relationships between the very different local equilibria that it contains--a system of checks and balances, as it were, in which the manipulated in one social context help stabilize the manipulators in other social contexts and *vice versa*. You cannot stabilize a system in which there are only manipulators nor can you stabilize one in which there are only manipulated individuals*but, unfortunately, it is the

*Though it is possible to stabilize one in which there are neither manipulators nor manipulated. The conditions that are required for the existence of such a system are rather curious and unlikely to be satisfied in modern industrial societies. See, Thompson, Michael. 'The problem of the centre' (op.cit).

easiest thing in the world to produce a policy for the totality by aggregating the personal strategies for needs and resources of just one of these local equilibria. For instance, if everyone were to drive the sorts of cars that people who display 'Atomkraft Nein Danke' ('Nuclear Power--No Thanks') stickers on their cars drive then the fossil fuel that would be saved would probably put several nuclear power stations into mothballs. But the fact that many people do not want to do this, and in consequence see this sort of policy as the embodiment of 'coercive utopianism', suggests that policies derived from local equilibria do not work too well at the global level. The As are aghast at the disruption of business that would result from the removal of enormous chunks of the motor industry (Rolls Royce and Mercedes, for instance) and the Bs are equally dismayed but for a different reason: what would the *herren* ride in once all the *volks* were in their wagens?

The cultural approach, by mapping these local equilibria, reveals these sorts of policies for what they really are--local stabilizing mechanisms masquerading as global stabilizing mechanisms. At the same time, by providing a framework within which the various local equilibria that are present in any regime can be analysed, it opens the way to a consideration of what the global policies--the effective means of stabilizing the various regimes (or of transforming one regime into another that is seen as more desirable)--might be.

7. TRIBAL ENERGY POLICIES

Each strategy conjures up its own idea of nature as well as its own particular direction--its own idea of what best to

do with that nature. This can have profound consequences for policy since an individual is unlikely to put his weight behind a policy that is not going the way he wants to go, and he is even less likely to put his weight behind it if it is aimed at bringing about a state of affairs that, in his nature, is impossible. So the stage is all set not just for disagreement but for disbelief--not just for differences of emphasis but for mutual incredibility. So let us look at the three characters who strut and fret their hour upon the energy policy stage--the A, the B and the C.* Given their different ideas about what is desirable, and given their different convictions about what is possible, what policies will they each support?

The A policy. The A individual manages his needs and his resources upwards to the limit and this means that energy demand will always tend to outstrip energy supply. It is a demand-led system that will be heading for real trouble if supply becomes inelastic. But, fortunately for the A, nature is is cornucopian and resources can be increased by human ingenuity. For the A there is no such thing as a natural resource; there is only raw material, and it is his skill, knowledge and enterprise that converts a raw material into a resource. The answer, then, is to ensure that skill, knowledge and enterprise are brought to bear upon all our raw energy materials so that the supply curve can be pushed up to meet the demand curve.

*Yet again, let me stress that these are social beings whose characteristics are derived not from their individual psychology but from the distinctive socially-acquired strategies that they are following.

The C policy. The C individual cannot do anything to his resources --they are fixed and finite--and so his strategy is to collectively manage his needs down so as to bring them onto a sustainable path--one that will enable Nature to balance her books. The A policy of demand-led growth is just incredible because it continues a trend that, even now, does not allow Nature's books to balance. To get to this sustainable state is the only hope for the future and to get there supply will have to be brought down *now* to a level way below where it is at present and demand will have to follow it. If you want there to be a future--if you care about the world your children will inhabit--then there is only one policy: supply-led de-growth, now, before its too late.*

The B policy. The B individuals' needs are given and this means that the sort of sudden reduction of supply advocated by the Cs is socially unacceptable. On the other hand, the sort of increase of supply advocated by the As would cause all kinds of difficulties when it came to maintaining all the differentials that sustain that complex hierarchical social system. Fortunately, it is probably impossible--For the Bs, nature is bountiful but not *that* bountiful. The imperative to maintain

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*This is the 'small is beautiful' C policy. The superman C policy lies at the opposite extreme.

differentials does not entail any particular level of needs but only that the needs appropriate to the various groups within the hierarchy are clearly differentiated. So, as long as it is done in a gradual, planned and carefully controlled way, the whole framework of needs can be detached from the levels where it happens to be at present. This means that demand could, in the longer term, be brought down to levels almost as low as those in the C policy. But this would have to be done gradually and incrementally in an orderly and carefully planned way. In the other direction, there is little point in trying to satisfy the levels of demand envisaged in the A policy; it may well be impossible to do this and, even if it were possible, it would be terribly wasteful. The proper way to proceed is by de-coupling energy growth from economic growth. Just how much de-coupling (and how fast) is going to be a matter of nice judgement and this--the ability to de-couple and the judgement that goes with it--furnishes a powerful instrument for order and control.

If supply falls off faster than de-coupling is taking place then there will be some retardation of economic growth as well, and this means that de-coupling can be used to control the growth rate. If supply is allowed to fall off very rapidly (or if the Cs are right and it cannot be kept up) then there will be a high rate of retardation of

growth. This would create some social and economic strains but they could be handled by foresight and planning. The essential thing is that, if there is to be a transition to a low level of supply, it will have to be a smooth and orderly transition and, in the short term, we may need to make the most efficient use possible of every available energy source in order to avoid any sudden jolts. Since his nature *is* bountiful the B finds the C argument for the inevitability of a sudden drop in supply incredible (nature is not *so* unforgiving) and, at the other extreme, his conviction that nature's bounty is contained within certain limits leads him to reject the possibility of sustained energy growth. So, at the extremes, the B policy runs counter to both the A and the C policies. This leaves a wide 'middle of the road' and, at the same time, a high level of control to the B--he can choose whether to drive on the left (as in Jacobin Britain, in which case he looks rather A-like) or he can drive on the right (as in Jeffersonian California, in which case he looks rather C-ish) or he could drive down the middle, or he could start off on the left and move across to the right, or *vice versa*. In other words, within certain limits there is considerable scope and the B policy is neither supply-led nor demand-led; both supply and demand are subordinated to something else--the maintenance of a complex and highly discriminated social order.

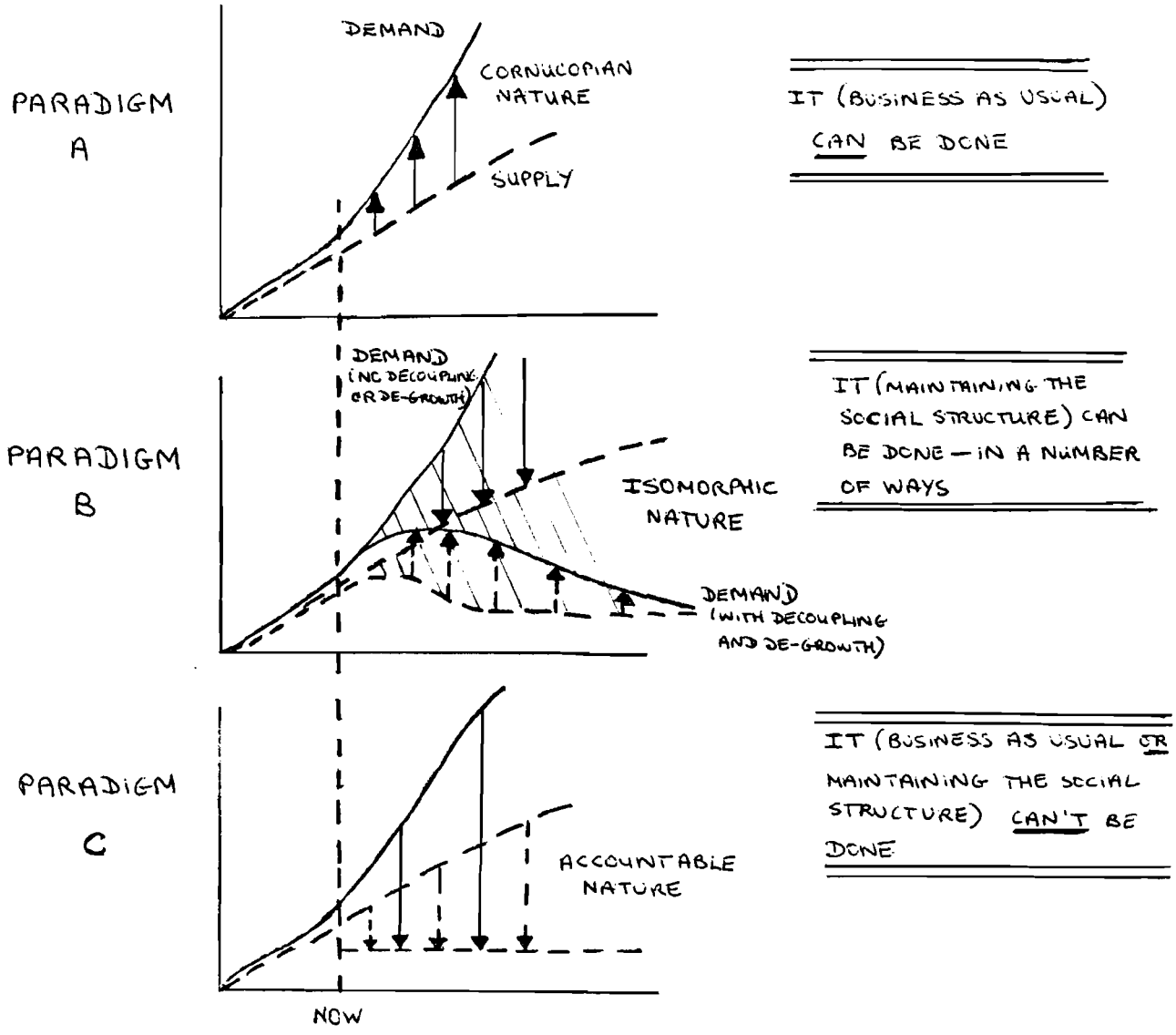

Figure 12. Tribal policies and the ideas of nature that ensure that each tribe gets the answer it needs to justify the policy it wants.

8. CONCLUSION

Each of these policies is what you get if you aggregate each individual strategy for managing needs and resources *on the assumption that everyone in the society is following the same strategy*. That is why they are essentially *tribal* policies. But, in complex industrial societies, you never find just one kind of individual strategy; all three--the A strategy, the B strategy, and the C strategy--are present, and so too are the two strategies that do not participate in the energy debate--the D strategy and the E strategy. With this serious contradiction extablished, the question now becomes: how can we de-tribalize energy policy?

A first response would be that Harmon *et.al.* were on the right track when, in advocating a shift from the adversary mode to the exploratory mode, they insisted that some way will have to be found to legitimate all the perceptions. What this means is that, somehow or other, those who are responsible for deciding energy policy must discover how to bend over backwards to compensate for their cultural biases rather than giving them full rein which, on top of being their natural tendency, is what the adversary mode presently encourages them to do.

If this is what the exploratory mode has to do, how do we set about constructing it? First of all, we will need a typology of cultural biases--a list of all the socially-inducible perceptions and the social contexts that go with them. Then we will need some understanding of the ways in which these biases are related to one another--of how the dynamic tension within certain mixes of biases, all of which are pulling in different directions, can result in the stability of the whole. In other words, we will

need an understanding of both the local and the global equilibria of the system. And then we would like to know about the transitions--about the dynamics that, outside of these regions of global stability, are responsible for the flipovers (sometimes smooth, sometimes discontinuous) from one global regime to another. In other words, we need some understanding not just of the dynamical system's stabilizable states but of its possible evolution as well.

All this necessary understanding is something that, at present, we do not have. Getting it, one might say, is the objective of the research program. But we do have a lot of clues, a lot of pointers, a lot of bits and pieces of understanding--a tentative typology of cultural biases and social contexts, for instance, and a partial list of stabilizable regimes--and, on the basis of these, let me conclude by risking five very general guidelines for moving towards the exploratory mode for deciding policy--not just energy policy but policy in any area that is characterised by persistent and serious disagreement between experts.

(a) *How to select the exploratory mode.*

I cannot stress too strongly that the exploratory mode should be seen as additional to, not in replacement of, the adversary mode. You cannot say that one is always right and the other is always wrong; rather, it is a question of appropriateness. The adversary mode is well understood and it has often served us very well; but it does not always serve us well, and it is in those distressing instances where the adversary mode, contrary to all expectations, turns out to be so counter-productive that the exploratory mode is appropriate. So, if we are to have not one

but two tools in our policy-deciding toolbag, we will need some criteria for deciding, in any particular situation, which is the best tool for the job. If you are trying to cut a piece of wood a saw is appropriate; if you are trying to cut a sheet of glass a glass-cutter is the tool for you; but what if you cannot tell whether what you want to cut is made of wood or of glass?

Translated into the language of systems analysis this dilemma becomes one of knowing whether your description (your model of the system) is adequate. If it is adequate then, every time, you will pick up your saw to cut the piece of wood and your glass-cutter to cut the glass but, if it is inadequate, you will spend a lot of your time trying to cut glass with a wood-saw and wood with a glass-cutter. Worse still, if you only have one model for what, unbeknown to you, are different systems then you will have no option but to go through life treating everything as a lump of wood.

So, if you don't know for sure what it is that you are handling, the answer is to pick up your saw, not with the intention of treating your material as a piece of wood regardless of how it reacts, but in a tentative and experimental way with the intention of watching to see *how* it reacts. In other words, if you know what to listen for--the sound of saw-teeth biting into wood or the screech of them bouncing over glass--it will tell you what it is. The same with the adversary and exploratory modes. Start with the adversary mode but watch to see whether its teeth bite--whether the bounds of uncertainty are narrowed and, with them, the distances between the positions it is possible for the different experts to take up. If serious disagreement persists, that is the signal to switch to the exploratory mode.

An added complication--one that does not happen with wood and glass--is that the one system may change into the other. The bounds of uncertainty in any particular policy area may get narrower or they may get wider, and this means that a mode that was appropriate to begin with may become inappropriate as time goes by and *vice versa*. This means that the monitoring--the attention to feedback--is not a once-and-for-all exercise but something that should be going on all the time. But it should not go on to such an extent as to seriously interfere with getting on with the job. A nice balance has to be struck between circling around and weighing up what the job is and getting on with it--a balance that is neatly summed up in the old military adage: *"Time spent on reconnaissance is never wasted but don't waste time on reconnaissance"*.

(b) *The right question to avoid*

In those debates where there is persistent disagreement among experts the uncertainty bounds are sufficiently wide, and are sufficiently resistant to attempts to narrow them, for all the tribal policies to fall within them. Though all the participants believe they have the right answer there is, given the current state of knowledge, no way of knowing which answer (if any) is the right one. Worse than that, there is no way of saying what right would mean in such a situation.

If energy policies are justifications for preferred patterns of social relations then the fact that a particular policy that opponents claim is physically impossible turns out to be perfectly feasible does not make it the right policy. Right *for some*, yes (those who, thanks to the adoption of the policy, find that social

relations are increasingly of their preferred patterns) but wrong for others (those who would prefer different patterns). Conversely, if such a policy were to fail, the wide uncertainty would mean that it would be impossible to say for sure whether it had failed because it was physically impossible or whether it had failed because of a lack of political will. Its opponents will favour the first reason, it protagonists the second. So, if the successful implementation of a particular policy requires the elimination of all those social contexts that would generate opposition to that policy, then, once it has been implemented, it is *bound* to be right. But right only in the sense that, like the oysters in "The Walrus and The Carpenter", those who would demur from that judgement have all disappeared. In other words, any one of these tribal policies will only be right when it has eliminated or suppressed all the tribes that are convinced it is the wrong policy. So the second de-tribalizing guideline is: *If you are asking who is right you are wrong*!

(c) *How to move from eclectic to appropriate solutions.*

The adversary mode is admirably suited to the task of finding the right solution and it is this property that makes it the appropriate mode in those situations where there is a right solution to be found. The history of Public Health, for instance, is replete with success stories for this mode. When Dr. John Snow had, by diligent research, satisfied himself that a cholera outbreak in London was linked with the water in a particular well he simply removed the pump-handle. This rather high-handed piece of public policy implementation gained general acceptance because it put an end to, or coincided with the end of, the cholera outbreak.

Further research reduced the liklihood of the coincidence explanation to virtually zero and Public Health, by spectacularly narrowing the uncertainty bounds, had won its first battle almost before its adversaries could get their act together. A hundred or so years later the Smoking and Health debate is a more evenly matched affair--one in which there is nothing quite so simple as a pump-handle for the good doctors to remove and in which, even if there was, they would come up against some powerful adversaries equally keen to keep it in its place. But, even so, their carefully designed studies, the stringent criticisms to which those studies are subjected by the tobacco companies, and the subsequent carefully planned studies aimed at refuting those criticisms all contribute to an adversarial process in which the uncertainty bounds are slowly but surely becoming narrower and narrower.

But, as the history of energy reserves estimation clearly shows, the adversary mode does not always result in an ever-tightening noose of certainty that inexorably pulls the divergent experts nearer and nearer to agreement--to the right, or at any rate the least wrong, answer. When this ever-tightening noose is present then the adversary mode operates in such a way as to produce a final policy that, in general, is not the same as any one of the rival policies that were being advocated at the beginning. Though each of these initial policies has contributed its two penn'orth, and though the process simply would not have been possible were it not for these policies, none of them was the right one. But, when the adversary mode is used in a situation in which the noose steadfastly refuses to tighten, there is no possible way in which each rival policy can make its contribution. Here, by demanding the

right answer, the adversary mode ensures that just one policy is finally adopted, unchanged and without any modification, and that all the other policies are rejected without the chance of their making any contribution.

By contrast, the exploratory mode blocks this tyrannical outcome by insisting that each rival position has *something* to contribute--that variety and contradiction, far from being monstrous abominations, are our most valuable resources. Or, rather, they are our most valuable raw materials; only when the requisite knowledge and skill have been brought to bear upon them will they become resources. An eclectic policy, arbitrarily cobbled together from a bit of this, a little of that... a whiff of the other, will just be a mess; skill and knowledge are needed in order to furnish the selection criteria that will tell us what to keep and what to discard from each of the rival policies. It is cultural theory that provides us with these selection criteria. By offering us the idea of appropriateness it allows us to sidestep the two current, and polar, styles for handling variety and contradiction --ruthless intolerance and anything-goes eclecticism. It allows us to avoid demanding an answer to the question "Who is right?" without, at the same time, requiring us to discard all discrimination.

But how can the idea of appropriateness be applied to an issue such as nuclear power where the stark but simple choice is between having it or not having it? Surely, in a situation like that, in which there is just a single issue and just two sides, the one saying we must have it the other that we must not have it, there is no way in which each can contribute to a final policy that is different from both the initial rival policies? The answer is

that there are very few policy areas that are inherently single issue and energy is not one of them. Single issues, more often than not, are made not by nature but by culture; they are the product of a social process in which the adversary mode, acting upon a socially-induced pattern of predilections, drives the initial rival policies ever further into the divergent cul-de-sacs of cultural bias.** The exploratory mode answer, therefore, is to reverse this process by systematically resisting the temptation to create single issues. In the language of International Negotiation: *"Fractionate the issues".**

(d) *How those who do not participate can contribute.*

Since we already *have* nuclear power, the single issue choice between having it or not having it is somewhat unreal. The choice, rather, is between having more of it or less of it and, faced with that sort of choice, we are naturally led to ask how *much* more or how *much* less do we want? 'So much less, and so quickly, that very soon we will have none' is one valid answer along this spectrum; 'Much more, and the sooner the better' is another; 'Enough to keep the nuclear industry alive' is yet another. Then there are different *kinds* of nuclear power. Should we go flat out for fusion, should we stick with the most efficient types of reactors... should we play safer and move more towards those that do not produce weapons-grade material? And then nuclear power stations can come in different *sizes*. Do we go for optimum size in terms of economic efficiency or do we opt for smaller units that may do something to lessen alienation? Even this little fraction of

*See FISHER, Roger 1975? *International Negotiation for beginners.*

**For an illustration of this see the protocols for the series of debates on Austrian television about nuclear power. These debates had to be abandoned before the end of the planned series because of the increasing violence of both participants and audience.

the nuclear issue does not reduce to a straight yes-or-no answer; *how* big is best... *how* small is beautiful? And then nuclear power is only one fraction of the total energy mix and energy itself is only one fraction of the energy/conservation mix.

At present the energy/conservation mix is scarcely understood at all.* Whilst to understand the policy capabilities of the energy mix you have to first fractionate the issues, to understand the policy capabilities of the energy/conservation mix you have

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*Indeed, the very idea of an energy/conservation mix may sound as nonsensical as talking about the day/night mix. Normally, when we speak of mixes, we are talking about positive things--about the variable quantities of ingredients that go to make up the mixture. What makes a nonsense of the day/night mix is that night, far from being a positive ingredient, is simply the absence of day. The point I wish to make is that, contrary to current assumptions, conservation *is* a positive ingredient. Just as ignorance is not simply the absence of knowledge, and just as impotence is not simply the absence of power, so conservation is not simply the absence of energy use.

The reason is that the different socially-induced strategies, by the way in which those who operate them create about themselves the environments that they then perceive, result in fundamentally different frames of accountability. In a conservation-conscious community moral approbation is bestowed on those who have demonstrably conserved. In energy-conscious communities conservation is just one line in the account book; energy consumption forgone now may be carried down for future use. But in the conservation-conscious community it is not carried down; it--conservation--is consumed. Only within the tribal perspective that denies the legitimacy of all the other perspectives does the energy/conservation mix come to resemble the day/night mix. [For a description of the various accountancy styles and their social bases see: GEE, K.P. *Financial control*. Inaugural lecture, 19 Nov. 1980. Published by the University of Salford, England].

first to fractionate the people. Cultural theory, with its five personal strategies for managing needs and resources, enables us to do this. The B strategy and the C strategy are both *conservation-conscious* strategies--the B's are *micawberists* striving to manage their command over resources so as to exactly match their fixed needs, the C's are *minimalists* striving to manage their needs so that they fit within resource limits that are set for them by a stern and frugal Nature. Whether the strategies they espouse actually result in energy-conserving behaviour is something we do not at present know. Nor do we know whether the gas-guzzlers--those who follow the A strategy of managing both needs and resources upwards--invariably consume inordinate amounts of energy. Since their strategy makes them highly responsive to small variations in opportunity costs, it is quite likely that some them in some circumstances are *unconscious-conservers*. This is data that we could quite easily obtain. First, we would need to confirm that it is possible to disaggregate a population in terms of these strategies,* and then we would need to conduct total energy audits for samples of members of each category.

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*A pilot study (by the Institute for Policy and Management Research for the Rockefeller Foundation--see IIASA Working Paper 80-174 'The social landscape of poverty') on the effects of inflation upon the poor in Britain, Israel and the United States has indicated that it is possible to do this and a research proposal (on behalf of Aaron Wildavsky, Ellen Tennenbaum and the author) aimed at a thorough disaggregation by personal strategy is currently (Aug 1981) with the American Enterprise Foundation.

Tentative data* suggests that current tribal conservation policies are disappointingly ineffective. The conscious-conservers in the British Department of Energy and in the professional regulating bodies for the architectural and engineering professions are anxious to encourage practising architects and engineers to produce energy conserving buildings. Seeing it as essentially an exercise in technology transfer, they have begun by satisfying themselves that the requisite knowledge and techniques do exist and have then gone on to sponsor courses in those techniques for practising architects and engineers. To their dismay, they have had very few takers for these courses. The reason is, not that the practitioners are acting irrationally, but that they are following a rationality different from that of those who are anxious to provide them with the energy conserving information. The information package does not slot comfortably into the designing style that they operate--to take it on board they would have to disrupt a well tried and tested mode of operation that has long served them well--and they do not see it as bringing with it advantages that would outweigh this disruption.

Three possibilities exist--redesign the package, alter the opportunity costs, decrease the information costs. The first could be achieved by recasting the information in a form similar to that of information packages that *do* currently slot into the designing style--either the stick-like statutory codes such as

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*POWELL, James A. and NICHOLS, Terry. 'The utilisation of technical information in design of buildings'. Centre for the Utilisation of the Built Environment (CUBE), School of Archictecture, Portsmouth Polytechnic, England. Preprint 1981.

the Building Regulations (B style incentives) or the clear and simple carrots such as are provided in the brochures of manufacturers (A style incentives). The second could be achieved by the professional bodies modifying the present fee structures so that they reflect not just the capital costs of the building but its running costs as well (a trade-off between A style and B style incentives). The third could be achieved by substituting computer managed learning (CML) systems that the professional could operate on his own micro-computer, in his own office, in his own time (A style learning) for the present week-long, fixed date, pre-booked residential courses (B style learning).

This little example demonstrates how the cultural theory, by first explaining the unexpected failure and by then suggesting a nicely judged mix of prescriptions for removing that failure, can make real and practical contributions to energy policy. Though less explicit, the C policy also contributes to this solution in a number of ways. First, the Bs' conservation-consciousness has undoubtedly been considerably raised by the shrill criticism of the Cs . Second, many of the technical solutions that are wrapped up in the information package have their origin in the 'cranky obsessions' of the Cs. They have, admittedly, been 'stolen' by the Bs (once they have seen their potential for decoupling) and by the As (once they have seen the entrepreneurial opportunities of energy saving techniques in a world of rising energy prices).* (see next page)

*In most instances it is one strategy stealing from another strategy rather than one individual from another individual--a phenomenon that confirms the social rather than the individual nature of the strategies. The individual who, losing some of his sectist fervour, drifts away from his egalitarian group and, by developing a more caste-like account of himself, gains entry to a distinctly hierarchical government research establishment will have moved both himself and his energy-conserving techniques across from the C strategy to the B strategy. His fellow communard whose drift is towards individualism rather than towards hierarchy, and who goes into self-employed business as a windmill-maker or as a passive solar consultant, will similarly have transferred himself and his techniques to the A strategy.

The extent of this 'innovation by stealing', the social context routes by which it is effected, and the factors that tend to inhibit or promote it are little understood at present. It may be that in the United States the main migration is towards the B strategy--into government agencies--whilst in Jacobin Britain the dizzy hierarchical heights of government channel it more towards the A strategy--towards small-scale entrepreneurship. On the latter journey the autonomous strategy often, perhaps always, provides a convenient staging post. [For data on the 'need for autonomy' among individuals who successfully embrace the A strategy see: WADE, Peter F. "Some factors affecting problem solving effectiveness in business: a study of management consultants". Ph.D. Thesis, Faculty of Management, McGill University, Canada. March 1981].

So far, so good, but what about the Ds and the Es? What about those individuals who, attracted to the ideal of 'architecture without architects', house themselves without any professional 'help'; and what of those who have no option but to accept whatever building they are given (if they are lucky enough to be given one, that is)? Together these two strategies, though they do not participate in the energy debate, may account for anything up to 25% or even 50% of the population. Are they conservers or guzzlers? Are their patterns of energy consumption influenceable by public policy and, if so, in what way do these possible influences differ from those that influence the followers of the A, B and C strategies?

Once again, since no-one has looked, we do not know. The tentative indications are that the E strategy encourages unconscious conservation and that the D strategy encourages energy consumption. When it comes to policy influence the positions are reversed. The E strategists, having removed themselves from coercive social involvment, are largely immune to policy; the D strategists, on the other hand, will consume as much (or as little) as they are given and how much they are given is almost entirely determined by policy--poverty policy. Since policy can either encourage or discourage individuals from adopting the E strategy--from becoming energy conservers--and since policy can directly control the amount of energy that those who are following the D strategy will consume, these two strategies have profound implications for the resilient management of the energy/conservation mix. Exactly what these implications are, only further research will tell, but we would be less than wise if we ignored them. Though the debate is restricted to the As, the Bs and the Cs, we should not forget that *there are the Ds and Es as well.*

(e) *The golden rule of thumb.*

Students of organisations are familiar with two kinds of rationality--*market rationality*, which corresponds to the A perception and *bureaucratic retionality* which corresponds to the B perception The energy debate provides a text-book example of these two kinds of rationality in action but it also highlights a third kind of rationality-- the *sectist rationality* which corresponds to the C perception and which would seem increasingly (in the United States and Western Europe, at least) to be responsible for shaping the debate. Far from the energy debate being a straight contest between the A and the B rationalities, the As and the Bs find themselves welded into a coalition in order to resist the arguments of their common enemy--the Cs. It is almost as if the A and B rationalities, on the one hand, and the C rationality on the other, were oppositely charged particles. Cultural theory shows us that they are.

The A and B strategies are heavyweight strategies--they are manipulative and power-wielding; the C strategy is lightweight--it is designed for survival under conditions of impotence. The A and the B strategies countenance negotiation and compromise (in this they are the same; what distinguishes them are the different criteria they apply in determining what is negotiable and when); the C strategy, since it is based on the rejection of the outside world, has to turn its face away from negotiation and compromise. The A and the B strategies work well with multiple issues (they differ only in the principles by which they do the dividing up); the C strategy works all the time to create single issues. The As and the Bs govern; the Cs criticise. That is the democratic division of labour.

Going inside a culture and distinguishing the different cultural biases that it contains is the sociological equivalent of going inside the atom. Cultural theory does for social science something akin to what Bohr did for the Dalton atom. Instead of a solid billiard ball--fundamental and indivisible--it gives us a little solar system in which the stability of the whole depends on the diversity of its clearly separated parts. In the socio-cultural equivalent of the Bohr atom we find a heavy nucleus (the locus of power) composed of two equally weighty strategies--a positively-charged business-as-usual proton and an uncharged middle-of-the-road neutron. Orbiting around this nucleus, like a wasp around a plum, is a single lightweight strategy--the negatively-charged radical-change-now electron (the locus of impotence). For stability--for the continued existence of the atom--there has to be both a nucleus and an electron, there has to be a polarity of equal charges between them (to prevent them from flying apart) and there has to be a wide imbalance of weight between them (so that one will spin around the other--it is a *dynamic* equilibrium). In the language of political science the nucleus becomes *the centre* and the electron becomes *the border**. It is as well to change to this terminology at this point because it is here that the Bohr atom analogy begins to break down. It is social institutions that maintain the essential distinctions that keep the border spinning around the centre and social institutions, unlike the elementary particles of matter, are things that are man-made and man-unmade..

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*See DOUGLAS, Mary and WILDAVSKY, Aaron. *The risks we choose.* (forthcoming)

In a social system the imbalance of power between centre and border cannot be taken for granted; it is something that has to worked at. So too is the clear division of labour--governing at the centre, criticising at the border. If the centre becomes complacent and, by ignoring or suppressing the border, makes itself deaf to criticism then the stability of that particular regime of the system is threatened.. So too is it threatened if the weight shifts the other way--if the border becomes too heavy as a consequence of the centre responding too eagerly to criticism. In other words, beyond a certain range tribalism and democracy are inimical.* As the inappropriate adversary mode goes on and on encouraging the polarization of the energy tribes, and as the system is propelled ever nearer to the limits of its range, so the liklihood of instability--either of the centre snuffing out the the border or of the border overwhelming the centre--is increased. At this level of generalization, the problems of energy become one with the dilemma of democracy. So the last and the most general guideline is: *The centre must not be eroded; the border must not be suppressed.***

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*Rather than just one regime there is, perhaps, a little family of regimes that might be labelled 'democratic'. All would be characterised by a Bohr atom configuration of centre and border but would be distinguished by different A:B weight proportions in the nuclear coalition and by corresponding differences in the weights of the C electron(s). Perhaps, in a Jacobin regime, the power exercised by a strongly hierarchical bureaucracy tip the coalition more towards the B strategy and thereby inhibits the development of a weighty border. In a Jeffersonian regime, it may be that a rather heavier border inhibits the development of very much hierarchy within the bureaucracy (and the wider society) thereby tipping the nuclear balance towards the A strategy.

**Assuming, of course, that you are in favour of democracy.

9. EPILOGUE

The two harlots who took their dispute to King Solomon confronted him with something of a rarity--a genuine single issue. One was the mother of the child, the other was not, and since both claimed to be the mother the problem was to discover which one was right. When Solomon proposed to fractionate the issue by cutting the child in two and giving each woman half, the real mother soon revealed herself by her marked lack of indifference. Solomon was then able to restore the still unfractionated issue to the rightful owner--a decision that, thanks to this dramatic reduction of uncertainty, met with near-unanimous approval.

The unwisdom of our current policymaking is that it strives to handle energy in the same, essentially adversarial, way. But Solomon, we may be sure, would have been quick to point out that the problem with energy is almost the exact opposite of that which the two harlots laid before him. In energy there is no right answer, there is no single issue, and the solution is to fractionate, not to obtain the answer to the question 'Who is right?' but in order to avoid having to ask it. Wisdom lies in understanding that there is more than one mode and in knowing, in any particular instance, which one is appropriate.

	ADVERSARY MODE (the two harlots)	EXPLORATORY MODE (energy)
CERTAINTY	There is a right answer.	There isn't a right answer.
NATURE OF THE PROBLEM	Natural single issue.	Cultural single issue.
SOLUTION	Fractionate to obtain the answer to the question: "Who is right?"	Fractionate to avoid asking the question: "Who is right?"

Figure 13. The appropriateness of the two modes.