The Modernization Imperative
a systems theory account of liberal democratic society

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A note on Systems Theory. Our analysis is derived from a version of Systems Theory, which is sufficiently unfamiliar to require explanation. Since no accessible account of Systems Theory currently exists we have provided one as an Appendix.

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Blurb

This book argues that contemporary society in Western democracies is generally misunderstood to be a pyramidal hierarchy dominated either by government or the economy. Neither view is correct.

We live in a fundamentally pluralistic society divided into numerous ‘modular’ social systems each performing different functions; these include politics, public administration, the armed forces, law, economics, religion, education, health and the mass media. Because each is specialized, none of these systems are dominant and there is no overall hierarchy of power. Modernizing societies are therefore structured more like a mosaic than a pyramid.
Modernization is the tendency for growth in the adaptive complexity and efficiency of the social systems. Growth in complexity is shaped by selection processes which maintain the functionality of social systems. The best examples are the market economy, science and democratic politics.
The process of modernization is both inevitable and, on the whole, desirable: this constitutes the modernization imperative. Therefore, the proper question should not be whether society should modernize, but how.

Introduction
This book argues that contemporary society in Western democracies is generally misunderstood. Commentators typically assume that we still live in a ‘pyramidal’ hierarchical state that is dominated either directly by the government, or indirectly by capitalist economics. It is assumed that social cohesion is imposed on the population by a combination of force and propaganda. Such widespread views contribute to a pessimistic attitude to the present and a fearful attitude to the future, yet neither view is correct.
The reality is that we live in a fundamentally pluralistic society divided into numerous ‘modular’ social systems each performing different functions; these include politics, public administration, the armed forces, law, economics, religion, education, health and the mass media. Because each is specialized, none of these systems are dominant and there is no overall hierarchy of power between them. Modernizing societies are therefore structured more like a mosaic than a pyramid.
The principal defining feature of modernizing societies is the tendency for permanent growth in the adaptive complexity of the social systems. Systems demonstrate ever-greater specialization of functions and progressively increasing outputs - for example the trends for more division of labour and continued growth in the economy. Functional specialization is a consequence of the potential for more complex systems to be more efficient. Social cohesion is therefore an emergent consequence of a circular ‘scissors-rock-paper’ mutual influence between social systems. In order to function, each system relies upon other systems to function. Growth in one system depends on growth in others. Inter-dependence elicits the mechanisms that maintain cohesion.
Growth in complexity is shaped by selection processes which maintain the functionality of social systems. The best known example of selection is the self-adjusting market economy, but other paradigm cases include science and democratic politics. All these selected social systems rely on generating a surplus of variants (eg. economic goods, scientific theories or political parties), which are subjected to a process of competition, by which some system variants are amplified and others suppressed. Selection processes have great power since they are capable of self-correction, learning and creative discovery of new solutions.
The process of modernization is both inevitable and, on the whole, a good thing. Modernization is very highly probable because modernizing societies are more powerful than ‘traditional’ societies, and it is preferable to the alternatives because modernizing societies are better and more hopeful places to live for most of the population, most of the time. The combination of necessity and desirability constitutes the modernization imperative.
Making the best of modernization requires a more accurate understanding of its nature and processes than exists currently. Understanding should lead to a more optimistic and confident attitude towards the future. Societies that are able to seize the modernization imperative will be those with potential to reap the most benefits while minimizing the inevitable disadvantages.
The proper question should not be whether society should modernize, but how.

Defining Modernization
Modern societies
Modernization originally referred to the contrast and transition between a ‘traditional’ agrarian society and the kind of ‘modern’ society that is based on trade and industry. For example traditional and modern would describe the difference between the medieval England and late-Victorian Britain.
A traditional society is ‘vertically’ organized by hierarchical division by class or caste - a specialization of prestige. But a modern society is ‘horizontally’ organized by function, such that the major functions are performed by modular social systems. These major social systems include the political system, the public administration (civil service), the armed forces, the legal system, the economy, religion, education, the health service and the mass media. So, while a traditional society is like a pyramid of top-down authority, a modern society is more like a mosaic held together by the cement of mutual inter-dependence.

A further contrast is that traditional societies consist of a single, unified system with a single centre of power; while a modern society is composed of a plurality of autonomous systems which interact with each other, influence each other, but do not absorb each other. Modern societies are fundamentally heterogeneous with multiple centres of power; and this is no accident but intrinsic to their nature. Indeed, the continued process of modernization tends to break down any remaining vestiges of hierarchy and centralized domination of social functions.

Modern and traditional societies differ according to their complexity of organization and their rate of growth in complexity. Modern societies are much more complex than traditional societies and are growing ever-more complex. Traditional societies are simpler and have a static structure (or one that increases its complexity so slowly or erratically that they perceive themselves as static). Complexity is favoured by selection processes, which are more powerful in modernizing societies, because specialization of function enables greater efficiency (for instance when division of labour or increased trade and communications enables greater economic efficiency) Increasing efficiency then frees resources and drives further growth. (For discussion of the meaning of 'complexity' and 'selection' see Appendix.)

Modern societies are based upon growth and the expectation of growth. Indeed the cohesion of modernizing societies requires more or less continuous growth. This is why it is impossible to stop modernization at a particular favoured point - if growth stops then the nature of society reverts towards a traditional form. Growth in modern societies includes economic growth (increasing output and productivity), but also entails 'cognitive growth' - which means an increase in knowledge and capability across a wide range of activities such as science, technology and political administration.

Traditional societies exhibit division of labour and cognitive specialization, but their complexity is constrained by the hierarchical structure into three main categories of peasants, warriors and priests (Gellner's 'plough, sword and book'). Warriors and priests constitute the ruling class who are concerned mainly with maintaining social cohesion by means of physical coercion and ideological propaganda. Peasants - whose role is agricultural production - constitute the vast majority of the population of traditional societies. Beyond the division into warriors, priests and peasants there is only a small 'middle class' of technical specialists (for example the different types of craftsmen). But in modern societies the 'middle class' is dominant: the vast majority of the population is cognitively specialized, and there are many thousands of distinctively different occupations.

A deeper understanding of modernization reveals that one vital qualitative difference between traditional and modern is the difference between a unified social system in which all activity is (in principle) subordinated to politics ('politics' being variably combined from different proportions of military force and theological legitimation); and a modern society in which politics does not dominate all activities, but in which there is instead a fundamental and continually-increasing functional specialization such as ever more division of labour into more different types of job.

The categorization of societies into traditional and modern is crude, and of limited usefulness. At present almost all societies are at least partially modernized. On the other hand, no society is 'completely' modernized and the rate of modernization is variable between societies, and between systems in a society. Pre-modern forms are obvious in all societies. There has always (so far) been scope for further increase in adaptive complexity, in a positive feedback cycle where increased productivity fuels increased complexity, which in turn fuels increased productivity.

Since modernization is dynamic, it is more useful to consider modernization as a process than as a state. A 'modern' society is based on the process of modernization: this is 'modernity'. Modernization can be seen as the general mechanism by which the social transformation from agricultural dominance to domination by trade and industry takes place, and the permanent continuation of this process. The difference between modernizing and traditional societies is profound - being the difference between simple static structure and complex dynamic process.

Modernization and complexity

Increasing adaptive complexity of societies enables the increased efficiency of information-processing, where information-processing has an abstract meaning. 'Information' includes all entities with meaning in systems (such as money, agricultural produce, industrial goods, human minds), while 'processing' includes any transforming social activities such as economic production in factories, trade, markets, formal education, the health services and the activities of the mass media. For example, increased economic productivity entails increased complexity of information-processing by increased division and specialization of labour, increased complexity of organization, and the use of complex machines and (more recently) computers.

This potential adaptive advantage for complex systems is the underlying reason why biological evolution has generated ever-more-complex organisms over the history of life on earth. The largest and most dominant organisms in the history of life on earth are late products of evolution and still alive today, and the most dominant animals in terms of biomass are humans in the temperate zones and ants in the tropics and equatorial regions - both complexly social.

Increased organizational complexity does not inevitably generate increased efficiency since complexity increases the need for communication and co-ordination. But in modernizing societies there is an selection pressure on each social system by other social systems, which means that there is an evolutionary tendency for more functionally efficient increases in complexity to survive while increases in useless or damaging complexity tend to be eliminated over time. Of course, selection is a 'trial and error' process, having the tendency to improve efficiency on average and over the long term. Selection does not generate perfectly efficient mechanisms or optimal solutions, and short-term changes may be less efficient. Nonetheless, the overall tendency is towards greater complexity and efficiency.
Modernizing societies are therefore already-complex societies that display the tendency to become more complex with time - this increasing complexity being kept under selective pressure for improved efficiency.

Social cohesion
Maintenance of stable social cohesion is the main problem for traditional rulers, and processes such as growth, or specialization of labour will be sacrificed to maintain the cohesion of a stable structure. Any significant social change is potentially a threat to structure, and new knowledge, institutions or technologies may be suppressed. Social cohesion is imposed vertically, from above, by hierarchical command. Hence, traditional socialization typically entails the inculcation of obedience to the prevailing order.
Modernizing society, by contrast, implicitly adopts the growth of adaptive complexity as its core value, and a modernizing system of education and socialization will (by comparison with traditional education/ socialization systems) tend to inculcate the desirability of growth and functional specialization as core values. Existing social structures are often sacrificed when they conflict with these modernizing processes (for example the class system impairs flexible functional specialization and tends to be dismantled by modernization). Social cohesion naturally remains vital, since all social systems have self-reproduction as their primary function (if they did not, they would not exist), but social cohesion becomes an indirect by-product of the growth in adaptive complexity.
The increasing adaptive complexity continually generates greater efficiency and a surplus of product, and this surplus is potentially available to maintain cohesion. For example, a more complex and functionally specialized organization may lead to greater economic efficiency and generate more profits, and some of these extra profits can be used to solve problems caused by new forms of organization. For example, deterioration in working conditions caused by more complex forms of organization may be compensated by paying higher wages, employing extra personnel, or eliminating jobs by new forms of technology.
A modernizing society implicitly operates on the basis of faith in the future - or more exactly a self-belief in generating a continually expanding capability as the best means of solving emergent problems. Just as a growing organization may expand without a comprehensive plan, but by expanding its capability faster than the problems it encounters; so a modernizing society does not know how it will be able to maintain growth and coherence in the unknown but more complex future, but implicitly has confidence that this can be achieved by growth in knowledge and resources. Social cohesion is therefore bound-up with deferred satisfactions. Present disaffection is ameliorated by the possibility of future improvement in modernizing societies. This is plausible when society as a whole is on an upward escalator of capability. Modernization therefore depends on the socialization of sufficient numbers of the population into a forward-looking and optimistic attitude.
A traditional society is held together mainly by force and propaganda which is imposed from above – warriors providing the force and priests the propaganda (ie. belief in the long-term stability of the social, political and economic organization; with the minimum likelihood of change. An example would be feudal medieval England, in which a tiny minority of Norman warriors (aristocrats) and the Roman Catholic priesthood ruled a mass of Anglo-Saxon peasants. Although modernizing societies continue to deploy top-down force and propaganda, the aim is not a static structural stability, nor are force and propaganda the main instruments of social cohesion.
In a modernizing society, social cohesion is a necessary consequence of the mutual inter-dependence of social systems - which means that the most important forces of cohesion are horizontal rather than top-down. Because of the specialization of social systems, each system depends upon other systems for its ability to function. For example, the economic system requires freedom to trade (political system), an educated workforce (educational system), a healthy workforce (health services) etc. All of the major functions performed by social systems are necessary to the continued survival of the society. In a modern society, (almost) everyone depends on (almost) everyone else in a vast and intricate web of reciprocal influence.
Such interdependence generates the web of forces that tend to bind society. Such forces are both formal and informal, and cohesive mechanisms differ between societies due to their different histories. For example, many early-modernizing societies depended upon nationalistic loyalty to bind their populations, but nationalism has become weaker in most of the more complex modernizing societies. Formal forces of

cohesion include the legal and regulatory framework - and this necessity is one reason why this framework tends to increase in complexity in modernizing societies. But one of the most important informal cohesive mechanisms in complex modernizing societies is the mass media.
The mass media serves to represent society to itself. The media samples information from the functional social systems and processes it into forms that are able to attract and hold attention, then these are communicated widely. The amount of information which circulates in the media, and in private life as a consequence of communications from the media, is a powerful force for cohesion (even when its contents are conflictual and sensational). The mass media not only provide horizontal links between the specialized social systems, so that a newspaper contains information relating to politics, law, education, health etc; but the media also links its own content temporally. In the mass media social memories are created, maintained and transformed. Each media 'story' is presented as growing from other stories, and leading onto yet more stories in an endless process. So that a new medical treatment for cancer may be presented in relation to knowledge about that type of cancer (perhaps linked to a celebrity sufferer), and future possible links are created - maybe in relation to potential side effects (referring to memories of thalidomide, perhaps) or to the costs of the new treatment (linking to health service politics).
In such ways, the mass media's own requirements to have something to say on a daily basis and to attract people to attend to their communications leads to a vital social function of maintaining social cohesion by the circulation of communications potentially concerning all systems. The necessary basis of the mass media's own continued existence has therefore evolved to become a functional necessity for modernizing societies - which is presumably one reason why all modernizing societies include a very large mass media system which is continually growing in complexity and size to match the society in which it operates.

Economism
There are many fundamental misconceptions about modernization, the commonest of which is that modernization entails subordinating all of society to the goal of maximizing economic growth - a doctrine sometimes termed 'economism'. By this definition, modernizers are accused of advocating that economic imperatives such as profit and productivity ought to be regarded as the ultimate social good.
By this account, while traditional societies were characterized by domination of society by the political system, modern societies are dominated by the economic system. The debate about modernization is then defined as a choice between political or economic domination. This common error is exacerbated by the fact that modernizing societies are often termed 'capitalist'. While it is true that all advanced modernizing societies have capitalist-type economic systems, this nomenclature carries the mistaken implication that capitalism is not only necessary to such societies, but definitive. However, a capitalist economy is only one feature of modernization, and (for instance) democracy, science and an independent legal system are equally definitive.
Economism is an inaccurate and incomplete description which misrepresents modern society by disregarding its fundamentally plural, modular, functional interdependence. Modularity implies that the economy is narrowly focused on economic imperatives, and that the other social systems have distinct and different imperatives. Continual economic growth (eg. especially growth in productivity) is indeed vital for modernizing societies, and economic factors influence almost all social functions. But the true nature of the relationship between social systems is two-way, or reciprocal. This arises precisely because the economic system has a narrowly economic set of functional criteria. Because it depends on the other social systems to perform non-economic functions, economics cannot dominate other systems in a one-way power relationship. Economic growth requires growth in many other social systems, efficient growth in other systems requires their autonomy, and this need for autonomy in all functional social systems leads to a balance of power between systems - not to an hierarchical domination.
A growing economic system entails increasingly effective functioning in many other social systems. For instance, economic growth requires an evolving legal framework, the political arrangements to enforce that legal framework, an expanding and changing educational system to increase and modify the skills of the population, and an effective health service to maintain the functionality of economically-active people. Efficient functioning in these other social systems implies they become ever-more specialized and complex. Each social system becomes progressively optimized for its own functional purposes.
Economics is often criticized for the narrowness of its evaluations (eg. its 'obsession' with profits and productivity and its neglect of culture and human fulfilment). But if economic evaluations were to broaden, this would tend towards de-differentiation and absorption of the horizontal modular systems of modernizing societies into the single hierarchical system of a traditional society. Many opponents of modernization who characterize modernization as economism, are advocating a form of social organization in which the economy (along with the other social functions) is subordinated to specific political and cultural goals (and such dominating political goals might be either right- or left-wing in nature). The superficially humane appeal of a broader concept of economics therefore carries anti-democratic, anti-scientific and pro-hierarchical implications.

However, it is doubtful whether anyone truly advocates economism. It is an accusation levelled against those who are seen to be placing excessive emphasis on the need to maintain and enhance economic growth, or are apparently neglecting the importance of other systems such as education, health or the arts. When its opponents characterize modernity in terms of economic domination of society (as often happens in discussions of the phenomenon labelled 'globalization'), then there is little difficulty in demonstrating the absurdity, barbarity or un-sustainability of modernizing societies. But economism is a 'straw man'.

'Scissors, Rock, Paper' interdependency

The stability of a modernizing society depends upon the interlocking of a mosaic of modular social systems - all of which are necessary, none of which is dominant. The outcome is a dynamically changing and growing network formed from relationships of mutual constraint and mutual benefit. Long-term stability comes from the fact that each system needs several other systems in order to function. Since system outputs are most efficiently provided by complex specialization, the tendency is for each system to evolve according to its own distinctive functional logic. For example, the legal system is organized around a distinction between legal and illegal, while economic logic is based around profitable/ non profitable.

A modernizing society is therefore essentially and necessarily pluralistic. Society is a system variably constituted of ever-more numerous, ever-more specialized social systems held together by a web of cohesive forces that are themselves changing and evolving. Such pluralism is no accident, nor is it a temporary phase. Indeed, modernizing societies must be characterized by mechanisms to promote and maintain functional pluralism. Each system depends on the outputs of other systems. If system specialization is lost then efficiency is threatened, and reduced efficiency leads to reduced output - which weakens other systems and tends to reverse modernization and lead to social de-differentiation back towards the traditional form of static structure (as seems to have happened in the later phases of the Soviet empire due to increasing domination of all social functions by the political system).

The more specialized social systems become, the more each system needs the outputs of other systems. Social cohesion and continued growth of adaptive complexity is in the interests of each of the social systems. This mutual dependence between systems creates a situation in which selection forces act to favour the evolution of horizontal mechanisms of cohesion. Although short-term expediency may lead to 'parasitic' exploitation of one system by another, cohesion is the only viable long term strategy. The fact that social cohesion is a matter of enlightened self-interest for all systems is the key to understanding the observation that modernizing societies have less need for coercion and propaganda than traditional societies. Although increasing specialization of function tends to increase social fragmentation, specialization also simultaneously increases mutual dependence, thereby tending to maintain social cohesion. This probably explains why modernizing societies do not (despite predictions) simply disintegrate.

The strength of this form of cohesion has increased because complex social systems have developed self-representations in the form of management, and management has developed functions of prediction and strategic planning. This implies that, in principle, social systems can avoid policies that offer short-term gains at the cost of longer-term damage.

The inter-dependent nature of social systems in a modernizing society can be expressed by analogies drawn from children's games. A traditional society is like a game of 'king of the castle' in which competitors struggle to stand on top of a hill, and the one who succeeds has a height advantage which helps him to maintain his winning position. Being on top of the hill is the overall dominant position. But in a game of 'Scissors, Rock, Paper' there is no overall dominant position. Participants thrust-out their right hand in the shape of either scissors, a rock or a flat sheet of paper: scissors cut the paper, paper wraps the rock, rock blunts the scissors. Each strategy may be more powerful than, equal to, or weaker than another strategy; and the continuation of the game is defined by its circularity. If there was an overall dominant move, then the game would end in stalemate.

Similarly, modernization is defined by a circular Scissors-Rock-Paper interdependence of social systems, with some systems dominating others in particular situations, but no system being dominant overall.

The inevitability of modernization

The 'inevitability' of modernization is based upon the idea that competition will tend strongly to select the most efficient societies, and these will also be the most adaptively complex societies. The selection pressure will therefore be for societies to become ever more adaptively complex, therefore more functionally specialized and differentiated. Strictly speaking, modernization is not so much inevitable as very highly probable, at least so long as there is competition between societies. It is not that the outcome of such encounters is pre-determined, more that the odds are stacked heavily on one side.

Because of this, the history of life on earth can be seen as one of cumulative and progressive increase in the adaptive complexity of social units, which shows itself as increases in the size and the functional

differentiation of organisms. As Robert Wright has shown, this trend has been interrupted locally in the short term, but has continued globally over the longer term. Greater size, co-operation and complexity do not inevitably generate increased greater efficiency because they also generate problems that need to be solved efficiently; problems such as coordinating large mobile animals (requiring the evolution of a brain and nervous system) or prevent excessive selfishness in social animals (eg. by means of extended familial networks in social insects). Greater complexity creates greater need for internal communications. But when these problems can be overcome, then complexity seems to be the main pathway to greater competitive advantage.

The same trend towards increasing adaptive complexity can be seen in human society. For example, simple hunter-gatherer societies were once universal among humans, but were almost completely displaced by more complex agrarian societies (ie. 'traditional' societies) whose greater economic efficiency (supported by a more complex division of labour and technology) enabled them to extract more resources per unit of environment and support a denser population. The only remaining hunter-gatherer societies inhabited agriculturally marginal or geographically remote areas. Although traditional societies were often static, or grew in complexity only very slowly over centuries, there was a slow and intermittent trend towards greater complexity throughout history - resulting in larger 'empires', incrementally improved technologies, the beginnings of formal education etc. But when 'modern' societies began to emerge, then modernization began to spread rapidly around the world by conquest, colonization, trade and emulation.

The world is now dominated by modernizing societies, and modernizing societies must continue to grow in adaptive complexity at least as fast as other competitor societies in order to survive. The rapid growth of modernizing societies has the consequence that the world is a smaller place with each passing year, while technological improvements mean that ever more of the world is suitable for modernization. There is now nowhere left for traditional societies to hide unmolested, and the conquest of modernization looks set to replace and even surpass the conquest of agriculture on a global scale.

In the sense that the replacement of hunter-gatherer societies by 'traditional' agricultural societies was 'inevitable', so the replacement of traditional societies by modernizing ones is inevitable. Even if anti-modernization parties are in power, their success in reversing modernization will not be permanent so long as other societies are modernizing. To the extent that it succeeds, anti-modernization damages the competitive strength of societies. Traditional society is at the mercy of modernizing societies, in terms of military, economic, political, technological and cognitive strength. Sooner or later, by revolution, war, bribery, persuasion or voluntary emulation; traditional societies will modernize themselves, or else be taken-over and modernized by someone else.

Politicians and modernization

Modernization is a product of selection processes (see Appendix: Selection and functionality). This means that not all political initiatives that are self-described as a ‘modernization’ can be considered as genuine modernizations. Many such ‘modernizing’ reforms actually diminish the selection processes that tend to generate complex functionality. This mismatch between rhetoric and reality arises from a terminological ambiguity by which modernization means different things in different contexts.

In this book we follow Luhmann in arguing that true modernization is the increase in functional specialization of societies, and that the functionality of a social system is defined by its having prevailed over other social system variants during a history of competition. In other words, functionality is relative; and the most functional systems are those that have displaced other system variants in a competitive situation. Selection processes are therefore intrinsic to modernization

But another use of ‘modernization’ is as a synonym for ‘rationalization’. Rationalization usually entails the reform of a social system by central government, along the lines of making it more of a ‘rational bureaucracy’ involving standardization of explicit procedures in a hierarchical command system. The confusion arises from the fact that (as Weber famously noted) the emergence of rational bureaucracies characterized many modern states, such as nineteenth century Germany. Later, this ideal of rational bureaucracy as being the most ‘efficient’ mode of organization was to dominate the social system of the USSR and its satellites.

Rational bureaucracies may indeed be an instrument of modernization in the Luhmann sense, especially when (as in nineteenth century Germany) ‘meritocratic’ formal bureaucracy replaced hereditary, arbitrary personal rule by an aristocracy. However, rational bureaucracy is not necessarily associated with modernization (as became obvious in the later decades of the Soviet Union), since politically-dominated bureaucracies that emerge without sufficient competition may tend become less functionally efficient, in terms of producing less output per unit input. Rational bureaucracy is therefore merely a means to the end of increasing functional complexity. For example, in the economy a variety of organizational forms have prevailed in economic competition – such forms include rational bureaucracies, but are certainly not restricted to this model of organization. Furthermore, many of the most successful economic systems have been highly autonomous from control by central government.

The point is that modernization in the Luhmann sense is not synonymous with the imposition of rational bureaucracies. Rationalizing political modernization may indeed be anti-modernizing – especially when central government introduces reforms that lead to long-term political domination of other social systems. This constitutes a de-differentiation of society, a reversion towards less specialized traditional social organization, and therefore tends to reduce efficiency in social systems. For example, if self-styled modernization of the educational system tended to increase direct political control of education, then this mixing of political and educational functions would constitute a reduction in the functional specialization of the education system; and would lead to lower efficiency of the system in pursuing educational objectives.

Of course, true modernization might, in principle, legitimately involve a temporary phase of increased political control which led onto a more-functionally differentiated social system. For example, central government might impose re-structuring of a social system in order to encourage growth and competition (of the right sort); after which the government would withdraw its domination to allow the social system to increase in functional complexity in a selective environment that rewarded efficiency. In other words, short-term subordination of a social system might lead to greater autonomy of that system in the longer term. Examples might include economic 'de-regulation' by which a government intervenes to impose new rules and procedures on banking services or the stock exchange, but then stands back to allow the 're-structured' system to grow and differentiate in new context of increased market competition. This is a classic example of effective modernization. But a rationalizing 'modernization' which did not introduce selection mechanisms would probably be counter-productive.

This leads on to a consideration of the extent to which the political system can 'sabotage' modernization by increasing the power of the political system (or individuals within this system) at the cost of reduced efficiency in other social systems. Clearly, it makes a difference whether politicians and political parties make the right decisions with respect to modernization. An effective modernizing government will increase the speed of modernization and/ or diminish its disadvantages. An incompetent or anti-modernizing government can slow, stop or reverse modernization, at least temporarily. But given that we live in a modernizing world, no individual or government can roll-back modernization in the long term. Modernization does not depend upon individual will.

Indeed, if modernization had depended upon the insight and motivation of politicians or parties it never would have happened in the first place. And certainly it would not have progressed so widely and with such rapidity over recent decades. It is the diversity of societies, and the competition between societies, which drives the process, and which enforces modernization in the long term. Governments that do the 'wrong thing', whether deliberately or accidentally, find their countries increasingly dominated by those countries which are making a better job of it. And this domination embraces all the social systems in which communications are international – such as economics, the armed forces, science, technology and the mass media. Since modernization is multi-system, dominance in one system tends to be associated with dominance in other systems. For example, the differential between the USA and Europe, hence the domination of the European social system by the US system, is probably growing in all the systems mentioned.

The desirability of modernization

While there are strong objective arguments for the inevitability (ie. very high probability) of continued modernization, the case for the desirability of modernization has to be made. Naturally, arguments for the desirability of a social system are seldom clear cut, since they depend on individual judgements which are a matter of perspective as well as knowledge. The process of modernization inevitably creates losers as well as winners. Furthermore long-terms gains may entail short-term costs. Nonetheless, if the contrast is drawn between traditional societies and modern societies then there would appear to be a very general consensus that life is better in modernizing societies - better for most people, most of the time.

Peasants make up the vast majority of the population in traditional societies, which are based on agriculture, and (as Gellner has shown) in traditional societies the peasants are half-starving all of the time and actually-starving for considerable periods. Subsistence agriculture leaves very little margin for bad (famine) years and much food is expropriated by the ruling class. Peasants are physically stunted and have their lives made short by malnutrition and the diseases of poor hygiene and overcrowding. It is difficult to lead a happy or fulfilled life when hungry and sick, and living among families and communities who are themselves diseased and dying. The mass of people in modernizing societies have much better basic provisions than peasants, live longer, are larger in stature, suffer less hunger and pain, suffer fewer deaths among family and friends, and have many other technological advantages. It seems reasonable to assume that the mass of people in modernizing societies are also 'happier' than peasants – as most anthropologists would confirm.

On the other hand, existence for the warriors and priests in traditional societies may be very good. While life is shorter and less healthy than in a modernizing society, the traditional ruling class have extremely high status and relatively high resources, and the social stability means that they have the ability to

transmit these advantages to their children (this is entailed by an hierarchical class structure). The distinctively privileged position of the upper classes is reflected in the fact that the ruling groups (especially local landed aristocrats and the priesthood) are generally opposed to modernization, and the drive to modernization usually comes from the 'expert' middle classes such as merchants, industrialists, professionals, craftsmen and technicians supported by central governments keen on enhancing national power and prestige.

The comparison is complicated by the fact that modernizing societies are continually changing - and some of the changes have made things worse for most people for considerable periods of time. For instance, during the nineteenth century, Britain was modernizing fast and for several decades this generated appalling conditions for the majority of workers, leading to the rise of socialism and especially Marxism. Marxism turned-out to be the most influential of anti-modernization ideologies. Marxism is *anti*-modernization since (whatever the short-term effects of forced-industrialization etc.) it entails long-term domination of social systems by the political system, which imposes a limitation on differentiation and functional specialization.

By contrast, certain phases of 'modernization' have been regarded as 'golden ages' - for instance (according to taste) Classical Athens, the Renaissance Italian city states, Elizabethan England, the 18th century Scottish Enlightenment, and pre-US-civil war New England were attractive eras - on a cusp between hierarchical, rigid and authoritarian traditional societies and more modular, chaotic and vocationally-fragmented modernization. But these were all transitional stages, and society could not have been frozen or stabilized to preserve them. Modernization has its ups and downs, its economic and other social system cycles, its better and worse times - but in the long-term a modernizing society must keep growing in complexity.

The overall superiority of life in modernizing societies compared with traditional ones can be seen by the massive migration of able-bodied peasant populations away from the land and into the cities whenever this is possible and allowed (and despite what are often appalling conditions in the cities). Between societies, there is a migration towards the most modernized societies (except where traditional societies forbid their population to leave, or modernizing societies prevent them from entering). Modernizing societies are not only more prosperous, but usually more peaceful and less coercive than traditional societies dominated by soldiers and priests.

This phenomenon of peasants voting with their feet is not purely a matter of seeking the prospect of riches, since it contrasts with the relative reluctance of hunter-gatherers to abandon their way of life. In a nutshell, hunter gatherers require coercion or persuasion to join the modern world, while peasants typically require coercion to keep them as peasants. It is probable that hunting and gathering is more humanly satisfying than modern life, but since it is not a viable way of supporting the world's population, the superiority of modern societies over traditional societies seems to be decisive.

Given that the realistic choice lies between traditional and modernizing societies, modernization seems clearly the more desirable option.

The ethos of modernization

Because modernization is inevitable and (on the whole) desirable, it would make sense that modernizing societies ought to have an explicit ethos of modernization - an ethos that modernization is morally the best available option. This does not mean that modernization is without significant disadvantages, but the disadvantages are less than those of traditional societies, and there are grounds for optimism that the problems can (mostly) be ameliorated by the modernization process itself. Modernizing societies are not only superior to traditional ones, but also more hopeful - because of their potential for self-correction and creative problem-solving.

A modernizing ethos would state (among other things) that growth is desirable, increased technical capability is desirable, increased cognitive capacity of social systems is desirable, specialization and complexity are desirable, competition and selection of systems is desirable, and democracy is desirable. For the individual this implies that more education is a good thing, social and geographic mobility are praiseworthy, and a flexible attitude towards life and work is beneficial. The modernizing ethos would be optimistic, would look forward to things improving, and would plan on that basis. In other words, the process of modernization is supported by what used to be called a 'belief in progress', a belief that things are getting better.

All this may sound naive and Pollyanna-ish, or even dangerously complacent, but it may more properly be regarded as self-consistent, realistic and adaptive both for individuals and for social systems. After all, whatever their expressed views, most people in modernizing societies implicitly operate on an optimistic basis. Most people plan their lives on the basis that the economy will grow, that scientific understanding and technological capability will increase, and that long-term investments (in children, in education, in pensions etc) are worth making. No matter how much they disagree with the government, most people acknowledge through their actions the legitimacy of democratic elections. Indeed, those that live by a pessimistic ethos are regarded as eccentric or dangerous (eg. people who do not have children because of

social despair, people who keep their money hidden in a sock, or fundamentalists who inhabit bomb shelters stocked with food, water and guns).
A modernizing society is optimistic about the unknown. The idea is that although we don't know already know how to solve the unknown problems that we will encounter in the future, we have 'faith' that (so long as we ensure that modernization continues) by the time the future arrives, we *will* know. The proviso that the necessary steps must be taken to ensure that modernization will continue, makes this an ethos of action and not one of complacency. Such optimism may be helped by a more accurate philosophical or scientific understanding of society, but also requires a mixture of such things as the historical experience of long-term progress, a commitment to inspiring stories about human triumphs over the unknown, and the personal experience of growth (eg. continuing educational achievements, increasing wealth throughout life, the perception of improving medical capabilities etc.).
Another factor is the future-orientation of public discourse - especially in the mass media. In order to maintain attention over time, the media generates a state of continual anticipation in which satisfaction is always somewhat deferred and never wholly achieved. The media future is always painted as if it *ought* to be brighter than the past, as if this is what people have a right to expect - and if the future is not in every respect turning-out to be better, then somebody must be to blame. This kind of mind-set is often criticized as being insatiably acquisitive and restless, as ungrateful, and for its voracious seeking of satisfaction in concrete future attainments rather than present inner peace. But this perpetual renewal of motivation and striving is what modernization requires of most people most of the time - especially in their functional roles in the social systems.
The necessity for optimism explains why 'official' culture is almost always grounded in optimism in modernizing societies (eg. the pronouncements by government, or by the leaders of any other modernizing social system). Long-term, overall optimism is necessary for people to tolerate the inevitable short-term and localized problems created by even the most beneficial change. By contrast, the counter-culture, and other advocates of traditional forms of social organization and status, are usually pessimistic - predicting continued decline and ultimate catastrophe unless society can be stabilized and simplified. Short-term and localized problems are presented as absolute, intolerable and unjustifiable.
If modernization is inevitable, then even if a society does not embrace an ethos of modernization it will still modernize in the end. But resisted modernization is likely to be traumatic if self-imposed following revolution; or experienced as an alien imposition if dictated by another culture following political or socio-economic conquest. Change that is embraced and self-directed in an optimistic spirit seems the least unpleasant option. We believe that a more general understanding of modernization makes more likely this preferred mode of voluntary self-modernization.

Education and modernization
The ability to function effectively in a modernizing society is not a spontaneous human attribute, and all such societies invest heavily in formal education systems which include almost all of their populations.
Formal socialization is necessary because humans have lived for most of their evolutionary history in hunter-gatherer societies. Hunter-gatherer children do not engage in economic activities and are allowed considerable freedom. By contrast, traditional societies employ coercive systems of socialization, extending into the family itself, which is an important economic unit in which the children are typically used (to the maximum of their endurance) for agricultural labour. Complex modernizing societies are intermediate between peasant and hunter-gatherers in terms of the coerciveness of socialization. Modern schooling is compulsory and formal compared with hunter gatherers, but much less coercive than long hours of agricultural labour. Formal schooling is necessary because modernizing societies require of their citizenry abstract modes of thought and the ability to participate in formal and specialized working practices. Training in abstract reasoning is therefore one primary goal of modern education; for example, the skills of counting, reading and writing are simple forms of abstract reasoning.
The need for continually increasing level of mass intellectual education is also a consequence of the need for continual growth and increasing functional specialization in social systems in order for modern societies to sustain themselves. Modernizing societies are characterized by growth - by achieved continual growth and by the expectation of future growth. And this imperative towards growth and differentiation characterizes the education system just as it does the economic, political and legal systems, because a static or contracting system will fail to provide the growing output needed by other growing systems.
Growth generates rapid change in social organization and individual functions. So, in a modernizing society, another purpose of education is to produce enough people with the generic intellectual capability to be able to train and re-train into a wide range of specialized functions - not just in the economic system, but in public administration, law, the health service, the media and all other systems. In other words, the educational 'output' should be advanced generalists capable of, and motivated for, rapid and flexible specialization in any of the thousands of different social roles. Modernization implies the need for as high as possible a level of formal education including 'literacy and numeracy' for as many of the population as possible (given the constraints of other competing claims for resources and time). This can

be summarized in the statement that modernization implies continually raising the average level of generic cognitive skills in the population. There is no mathematical contradiction between the goal of increasing the average level of cognitive skills, and the decreasing of average age-specific educational standards – both have been simultaneous trends in the UK over the past decade.
As well as the needs for abstract reasoning ability and high level literacy and numeracy skills, maximizing flexibility in the intellectual workforce implies that there is a common language of communication and a common intellectual culture, so that individuals can perform a wide rage of functions and easily be inter-changeable.

Economic drives towards educational expansion
From the economic perspective, the function of the educational system is to provide the kind of skilled manpower necessary to maintain continual economic growth. Whereas in traditional societies there was only a small literate class, the specialized complexity of modern societies has greatly increased the need for communication (because more specialization entails more co-ordination). In a modern society, therefore, ideally all the population need to be literate and numerate, and the higher the level of literacy and numeracy this mass of population can attain, the greater the complexity (hence efficiency) of communication which can be supported.
Economic growth is essentially a product of the progressive division and specialization of labour (including technological advances). But the specialization of economic function in a modern society differs from that in traditional societies. In traditional societies there was very little general education for most of the population, and a very prolonged specialized education started when young (ie. apprenticeship) which led to a lifetime of dedicated practice. The result was that the level of skill of masons, woodcarvers, jewelers etc. was extremely high, indeed so high was the required skill level that craftsmen were in effect irreversibly committed to their specific practice.
In a static (or slowly changing) society this kind of lifelong specialization was practical, but in a modern, growing and rapidly changing society life-long specialization is damagingly inflexible both to individuals and to the economy. Compared with traditional societies, modern economies tend on the one hand to de-skill the highly skilled (eg. craftsmen and trades people), but on the other hand to require much greater generic skills even from the 'unskilled' workers (eg. laborers need to become literate and numerate) The result is that a modern furniture manufacturer needs much less specific training than a traditional cabinet-maker, but a modern farm worker needs much more education than a medieval peasant.
In fact, both of these trends are aspects of the increased complexity of organization systems. Complexity of individual human cognitive processing is progressively replaced by machines or computers or complex systems of organization (such as a factory or hospital). Unskilled activities are thereby progressively eliminated and highly skilled activities are de-skilled - what is required is a workforce composed mainly of individuals with moderate and flexible skills. Furthermore, new specialized skills continually emerge in modernizing societies, such as fund-managers, tax advisors and fund-raisers
Many of the requirements of a modern economy could be described as socialization for employability. It has been suggested that the large measurable economic advantage derived from each incremental lengthening of the educational experience may be due to formal education contributing to 'incentive-enhancement preferences'. In sum, university graduates make more functional citizens and employees, who require less supervision and are more responsive to the incentives of the workplace. Graduates have - in a word - better 'attitude', and therefore attract higher salaries. This is another force driving the expansion of participation rates in higher and further education which has been a feature of many modernizing societies over recent decades.

Political drives towards educational expansion
Modern societies are no longer cohesive due to their domination by a single political system and they have evolved different processes to maintain social cohesion. As well as the interdependency of social systems and the role of the mass media, already described, a further process of social unification comes from the mass of the population having experienced a common educational process. This provides a shared culture, including a ‘language’ for communication as well as distinctive behavioral aspects such as manners, accent and lifestyle.
In traditional societies, a person’s loyalty might be to the village, caste or class - in early modern societies the nation state was the focus. But all these ideologies have lost their grip, and since the advent of universal compulsory education the shared school experience has increasingly become a basis for social cohesion. In other words, ‘national’ culture is less a matter of unreflective ‘folkish’ local traditions, and more a product of prolonged formal education.
Education is a pre-requisite for complex communications, and the participants in complex systems of communication are culturally differentiated from those unable to participate. The ability to understand and participate in cultural communications is a consequence of extended socialization, of which formal education is an ever more vital part. Even the mass media require high and rising levels of cultural

literacy - the progressively abbreviated 'sound bite' is only possible where a complex implicit understanding can be assumed.
This need for social cohesion forms one political factor driving educational expansion: the idea that a prolonged common education is the basis for national culture, and that extending this common education into university will generate an expanded, more skilled, more flexible and economically better-adapted middle class. These intellectual workers will also have the right 'employability' attitudes to become functional in the modern economy. Educational modernization will tend to expand this culture into ever more of the population, with a continually increasing proportion of the population becoming graduates.
The political ambition of university expansion therefore implies the radical agenda of generating a larger, more highly-educated middle class which will implicitly dominate future society and provide the basis for continued modernization. This middle class, educated culture is already national and is becoming increasingly international. As well as promoting cohesion on the basis of shared 'liberal' values, it already enables graduates to be geographically and socially mobile without feeling too displaced or detached, since their emotional roots are in the ever-more-inclusive educated culture, rather than in the restricted cultures of region or class.

Education in flexible abstraction
An understanding of the nature of modernization can clarify the nature of change in social systems. Educational systems in modernizing societies are no longer selective, because almost all of the population requires a high level of training in abstract thinking. School is compulsory until the mid teens, and most of the population gets considerably more education than this minimum. In the USA about half of an age cohort will become graduates - equivalent to full-time education up to 22 years - and Europe is rising to match this trend. Indeed, it seems likely that modernizing societies will move towards an ideal goal of 'universal' higher education - available at any point through life for anyone who wants it.
Formal, institutional education is essentially training in abstract, systematic thinking and communication; its function is to provide a 'literate' population able to think abstractly and communicate concisely, unambiguously and comprehensively. This kind of training is necessary because humans are spontaneously animistic and concrete thinkers in whom reasoning is tied to specific practical contexts. In very broad terms, generic education aims to instill habits of systematic thinking that enable the human animal to function in our alien and artificial world. The benefit of abstracting ability is demonstrated in the employment market, where a significantly higher salary is paid for each year of experience of higher education (regardless of subject) than for the same time spent at work gaining 'practical' experience.
Traditional formal education was limited to the need to produce numerate and literate clerks, and an elite of specialists in fields such as theology and law. Most specialists were narrowly trained by long apprenticeship from an early age. But the needs of the mass of formally educated people in modernizing societies are different. Literacy should be universal, and there are so many specialist functions, and these change so frequently in a modernizing society, that the need is for as high as possible a level of general cognitive aptitude. A person with this high level of general education can have it rapidly topped-up by a short, intense period of focused specialist training in order to perform specialized social functions.
Modern university courses are usually multi-disciplinary and modular in their structure. These entail studying many academic subjects simultaneously and in sequence. This amounts to training in the ability repeatedly to learn new systems of abstract reasoning, and in the ability to switch frequently between abstract systems. The graduates of such a system of education posses the skills and aptitudes for surviving and thriving in a modernizing society. They have the negative qualification of not having being 'captured' by expertise in a specific discipline, but more importantly the positive qualification of having become familiar with the business of repeatedly starting afresh to grasp unfamiliar abstract knowledge systems. Throughout their working life, such a graduate will be practiced in training and retraining for any of a wide range of specialized jobs in a wide range of complex organizations, and prepared for the high probability of several enforced career changes.
Formal education is therefore crucial to a modernizing society that relies on cognitive attributes which are not spontaneous but must be inculcated. And as modernization proceeds, then education will tend to expand to include more of the population for longer periods (unless new educational technologies can be devised that make the process faster).

Education and social progress
Education can be understood as having a central role in promoting 'social progress' in a modernizing society. Traditional accounts of progress towards democracy, freedom under the law, and greatly improved social and working environment for most of the population tend to use the traditional society as the basis of analysis. For example, socialists begin with a division of society into classes, and describe how co-operation among members of the working class ('labour' parties, trades unions, workplace strikes etc.) enforced a redistribution of resources away from the ruling class such that there was an incremental expansion of rights to vote, the rights to freedom of association, improved wages and conditions and so

on. Gains are seen as benefiting classes primarily, and individuals only as members of that class - class solidarity is therefore the primary virtue.
At root, this account depicts a traditional society which is a zero-sum game of distribution - of deciding how the cake is sliced. Education is interpreted as essentially a competition for high status jobs, and the success of one person can only be achieved at the expense of another's failure. More education for more people just increases the cost of the educational process. Traditional socialists have therefore been more concerned about equalizing the access to education and the distribution of educational resources between classes, than with expanding the total amount of educational provision. Or, at least, for traditional socialists educational expansion should occur *only* when it appears to satisfy the over-riding needs for equality of access and provision. In a nutshell, either everyone gets it, or no-one gets it.
But Martin Trow has described a modernizing account of human social progress as a game of more education for more people. Although the demand for education is driven by individual status-seeking, and although educational attainment leads to status hierarchies, it should essentially be regarded as a non-zero sum game which can - in principle - benefit everyone. This modernizing view of education sees formal education as an enhancement of each individual person's cognitive aptitudes. More education for more people therefore implies a higher sum of cognitive aptitude in society – which is an outcome that potentially benefits everybody. And such benefits are gained even when access and provision are unequal – indeed, a requirement to maintain equality of access and provision during expansion is seen as making expansion much slower and more difficult (mainly because continual redistribution requires a stultifying and inefficient level of central political control).
A story of social progress might therefore concentrate on ever-more individual people getting ever-more education. It is a story of the benefits of education progressively diffusing outwards and downwards from the ruling class. More education benefits the individual because it qualifies them for higher status jobs (a relative good), but also because education tends to lead to benefits such as better health and greater happiness - (which are absolute goods). As well as many individual benefits, there are also many social benefits. Advanced education benefits society because more educated people are able to perform more difficult jobs and perform them better. Indeed, education also leads to more effective functioning in social systems generally, because systems can benefit from the increased complexity of information-processing possible in an educated workforce. Furthermore, prolonged formal education is associated with many socially-valued 'liberal' attitudes which are supportive of modernizing societies, such as greater ethnic tolerance and less tendency for violent behavior. The list could be extended.
By this account, society is incrementally transformed by more education on a person-by-person basis. And one reason education is such an effective engine of transformation is that it uses the zero-sum game of seeking enhanced status through more education, to drive the non-zero-sum games of improving individual lives and benefiting society as a whole.

Politics and modernization
In modernizing societies politics is no longer the dominant social system, because there is no dominant social system. Even when it is understood that politics no longer controls everything, this is often regarded as a matter of regret since radical reformers feel that the limited power of politics limits the scope for planned change, or limits the ability of the state to resist powerful interest groups. But the matter of what politics should be doing, and how it should do it, remains unclear in most of mainstream discourse.
The role of modern politics is probably best understood in terms of its being a management system for society. In other words, politics is a social system for representing, monitoring and influencing the other social systems. Indeed, the departments of government are divided approximately according to the major social systems - economics, defence, education, the health service etc. The political system 'models' the functional social systems, hence society as a whole; and uses the model in order to try and understand, predict and modify the society and its systems. Politics is therefore a social system by which society constructs a representation of social functioning, and uses this to model social functioning.
In an idealized sense, the political system is analogous to the brain in relation to the body. The brain does not dominate the body (since it is not more important than the heart or lungs), but the brain is the only bodily system which has a regulatory overview of all the major systems of the body (including itself). The brain is the centre for integration. The brain samples information from all over the body, processes this information in order to understand it, and uses its 'model' of body activity in order to make overall decisions for the benefit of the whole organism. Not all organisms have a brain, but large and complex organisms in complex environments require this site for integration. Pretty much the same applies to societies - a political system is essential for large and complex societies operating in a large and complex world.
The role of a modernizing political system is implicitly to enable the continued growth and specialization of the functional social systems: economic growth and productivity, more education for more people, improving standards of health etc. These goals are also the goals of each of the systems, so in this sense

the government's role is merely to facilitate the process. However, individual social systems tend to pursue short-term benefit, which may entail growth at the expense of other systems. For example, the education system might grow in the short term by getting funds from higher taxation that damages longer term economic growth. Impaired economic growth then damages education in the longer term. Or the economy may grow in the short term by reducing taxes and saving money on the education system. This leads to a reduction in the level of skill in the workforce and this ends-up damaging long term growth. The role of politics is to try and ensure the continuation of growth and specialization by preventing, or detecting and solving, these kinds of problems which result from conflicts between systems.
The political system's proper role is to use the minimum necessary persuasion, coercion and propaganda to overcome the short-termist motivations of specific systems to block reforms that are in the general interest of overall growth.

Modernization and democracy
The strength of modernizing societies (and also some of their weaknesses) is a consequence of their use of selection mechanisms. And the principle of selection is the basis for the success of democratic government. Traditional societies solve problems by application of what they already know, and seek to legitimate government in a permanent way (eg. the divine right of hereditary kings or the absolute correctness of totalitarian ideology). By contrast, democratic societies use selection processes to work out the solutions to problems; for instance, they implicitly operate on the assumption that they do not know in advance the best way to govern the country. Democracy entails the tacit acknowledgment that future problems may not be amenable to current policies and procedures.
Democratic societies solve their toughest political problems not by implementing a pre-determined political program or model, but by reliance upon the democratic process to generate new and better political models. Governments interact with the population by means of periodic elections in which rival programs are put forward, and parties undergo selection by vote. A change in government may result. The democratic system therefore entails that changes in government (and political program) will be necessary in order for a modernizing society to remain viable. It also entails the belief that the voting population (on average) knows best what changes are needed (better for example than any pre-specified group of specialist experts). Democracy therefore generates a surplus of potential solutions, and employs a selection process to amplify some solutions at the expense of others.
The crucial point about modernization is that the process of selection does not know in advance how to solve functional problems - it is the process of selection itself that generates the solutions, often unforeseen solutions. In biology, the immune system does not know in advance which antibodies (of the billions it could make) are the best ones to defeat a particular bacterium. Instead, the process works by generating antibody variants which compete, and those variants which best bind to the bacteria are reproductively amplified. This is the distinctive mechanism of modernizing societies in overcoming their problems. Just as with the immune system, selection does not generate the one best solution, but selects the better solutions over the less good ones, and continued selection incrementally builds upon the successes of the past. There are inherent limitations to selection mechanisms; for example, building on the successes of the past often entails also building on the limitations of the past. It can become very difficult to change fundamental social processes because so much has been built upon them (this may explain why national legal systems vary so much and are so difficult to harmonize).
Furthermore, selection can only operate by a series of incremental improvements, so that selection may block foundational changes that are beneficial in the long term but too damaging in the short term. It may in principle be beneficial radically to re-organize an inefficient health system, but this could not be done if the resulting disruption to health services was so severe as to endanger the population. However, despite such limitations on rapid and fundamental reform, modernizing societies nevertheless operate on the pragmatic basis that selection processes can usually find a way around serious social problems, and somehow or another maintain the continued growth in social complexity. Modernizing societies are learning societies; they do not know exactly how they will be able to do the necessary things to ensure their continuation, but they operate on the basis that selection processes will be able to generate workable solutions.
Hull has argued that selection is probably the only known process for reliably producing systems that are both functional and efficient. Selection processes are inefficient in the short-term, because selection depends on the over-production of competing variants, and most variants will become extinct. But in the long term the solutions discovered by selection tend to be functionally adaptive, because the solutions which survive have demonstrated themselves superior in competition. The short-term inefficiency combined with long-term efficiency of selection mechanisms means that democratic mechanisms must sometimes be suspended in a crisis such as war. This may be necessary because societies may have to use already-existing knowledge to maximize (for instance) economic production over the short term. With an enemy at the gates, there is not possibility of channelling scarce resources into generating system variants. Societies in immediate crisis may have no time to discover the best solution to problems, and

are forced therefore to decide the one best way of doing things and organize things to accomplish this as efficiently as possible (according to current information and the predictions of currently-used models). Some version of a dictatorial and centralized command economy is usually the result. But in the longer term, central command mechanisms not only fail to generate continual improvement, but often accumulate inefficiencies since they lack comparators. Democratic processes appear to be necessary to prevent long-term stagnation.

The information-processing power of selection mechanisms such as political democracy is still insufficiently appreciated. Indeed, democracy is often regarded as less efficient than dictatorship - albeit democracy is desirable for 'moral' reasons. It is often believed that the most intellectually-sophisticated approach to politics is hierarchical and technocratic, with experts developing the 'one best plan' which accounts for all imaginable contingencies. But in a growing and functionally-specializing society, planning cannot take into account the novel consequences of future growth. For instance, economic planning in a growing economy cannot - even in principle - take into account the effects of new scientific technologies, new methods of advertising, new systems of management etc. But market mechanisms can (usually) cope with unforeseen changes, because the market is continually generating variant economic systems, and comparing these variants with each other and with existing practices in a competition in which some variants survive and grow while others are suppressed. Markets are not just self-corrective, but also innovative.

Democratic politics is not only useful for preventing the excessive abuses of power that occur in single party states, democracy is also (on average, and given time) generative of more efficient and functionally-adaptive government. Democratic processes should be regarded as powerful creative instruments for generating novel solutions to the toughest political problems.

Moral modularity

Modernization has distinctive consequences for morality. Indeed, as MacIntyre has made clear, modernization makes impossible the kind of ultimate, foundational systematic morality that is found in traditional societies.

Modernizing societies are characterized by moral pluralism, with numerous ethical codes regulating different societal functions, and with individuals often expected to deploy different moral codes according to the situation in which they are operating. The typical citizen of modernizing societies has accurately been described as 'modular man', and this moral modularity is intractable, being necessary to the functioning of modernizing society. For instance, morality at work may be governed by an explicit contract, religious morality regulated by a holy book interpreted by an official priesthood, while morality in the family is based upon implicit and un-quantified emotional factors (such as love and the sense of duty). And these moralities of work, religion and family cannot be synthesized without significantly damaging the functioning of the systems. There is no overall system of social morality by which behavior in different social systems can be harmonized – and even comparisons are likely to mislead.

As a substitute for general morality, the legal system serves the modern state as a forum for the arbitration of heterogeneous moral claims. Indeed, the legal system has the vital role of arbitrating between systems when there is dispute over which system should be regarded as relevant to a specific instance. For example, religious systems apply to many aspects of personal moral choice, but when moral choice comes into conflict with medical science and has potentially severe consequences from the perspective of medical science, the law may arbitrate that the medical science system should apply and the religious system be over-ruled. This may happen when a parent refuses to allow their child a life-saving blood transfusion for religious reasons. However, the legal system can only function by providing a very simple 'bottom line' morality which defines - in a negative fashion - what is immoral or un-acceptable behaviour. The law does not prescribe virtue.

The mass media have an even less cohesive sense of morality. Moral evaluations are indeed pervasive in the media, since moral approval or abhorrence is used to attract and retain attention, and to frame media stories. But the moral evaluations are not systematic or consistent with one another, and may flip between incommensurable extremes as when a celebrity is first praised as a saint, then exposed as a villain, then rehabilitated as repentant; or when a politician's virtue is simultaneously lauded in one newspaper and reviled in another, by the application of incommensurable moral criteria. So the media do not employ a moral system, rather a multiplicity of moral systems are subordinated to the needs of the media.

Cohesive and universal moral systems do exist in modernizing societies (especially among the priesthoods of the ancient and learned traditional religions and sects), but these moralities constitute a multiplicity of encapsulated systems. Modernizing societies lack any overall and universally-applicable and binding positive moral system defining the virtues. This lack is intrinsic to the functioning of modernizing societies, because under modernization any form of excellence is system-specific. The virtuous politician may be immoral in their personal life, and vice versa.

Modernizing societies therefore lack the kind of moral cohesion that is found in a hierarchical theocracy - such as the religious theocracy of medieval European societies, or the secular 'theocracy' of Marxist societies. Whether the lack of a universal morality is regarded as a significant disadvantage is a matter of perspective. Cultural critics, theologians, moral philosophers, and advocates of Marxism or Fascism have often regarded the lack of a universal moral system as crucially damning: revealing of the vacuity and pretence of modernization. On the other hand, the persistence and increase of moral pluralism suggests that it cannot be unacceptable for most people most of the time - or at least it implies that the disadvantages of moral modularity are outweighed by the advantages of modernization.
It appears that moral modularity is a fact of life in modernizing societies, and a problem that therefore cannot be 'solved'. The proper question is not how to restore a unified moral system, but how to negotiate the social and psychological consequences of system-specific moral evaluations. How – in other words – to cope with the tensions of intractable moral modularity. So far, it seems the social consequences have been managed by combining a tolerant moral pluralism with a legal 'bottom line'. The psychological consequences are probably ameliorated by formal education providing training in flexible abstraction – so that people are adept at switching between systems (including moral systems), and behaving in a system-appropriate manner.

Morality and democracy
One of the most important, striking, and counter-intuitive consequences of modernization is the tendency for elimination of moral evaluations from politics. Indeed, it may seem paradoxical, or even perverse, to suggest that morality has 'no place' in modern, public, democratic politics. Contemporary politics seems saturated in moral evaluations - good guys versus bad guys, saints versus sinners, the carers against the callous, and so on. Yet this apparent moral pervasiveness is not so much a part of the political system as an artifact of political reporting by the mass media.
The media use morality as one of the tools for getting and holding attention, and this is effective probably because human evolutionary history has given people a highly-developed 'social intelligence' of which moral evaluation is a major part. But the moral spin applied to politics by the media is a fundamental misrepresentation of the inner workings of the political system, and has no deeper significance to the proper business of democratic politics than the media portrayal of scandalous love affairs or comments on the looks, personality and preferences of individual politicians. These things are interesting to the public (and therefore to the mass media) but they are largely irrelevant to the internal functioning of the political system.
Internally to the political system, there is of course a specific functional ethical code. This strictly governs the conduct of political life. For example, politicians who are members of the ruling party must vote with the government under specified circumstances. Accuracy is essential with regard to the internal communications of politics (or else effective decision making would become impossible). Politicians must function in accordance with political interests, and when these are subordinated to commercial or personal interests it is regarded as corruption. And even when politicians employ 'hype and spin' in public relations, truthfulness within government (especially the truthfulness of subordinates) is enforced by sanctions. Such ethical codes have evolved to enable unambiguous communications within all functional social systems and the efficient conduct of their business, but the nature of these codes varies between systems. The ethical principles of politicians in the political system differ from those of doctors in the health system or Professors in the education system, due to the different nature of these specialized activities. And precisely because they are so functionally-orientated, these system ethical codes are hardly recognizable as moral systems by the standards of everyday personal morality, or by the various moral criteria that are employed by the mass media.
In this sense, the real business of democratic politics is essentially non-moral - and should be kept that way if democracy is valued. Democracy is only possible if moral evaluations can be eliminated (eliminated in public practice, if not in private opinion). Democratic politics has the minimal requirement of differentiating between the existence of political offices such as Prime Minister, and the individual people who hold those offices. And a brief definition of democratic politics is one which has mechanisms by which office holders may be changed. The basis for choosing which individuals (or parties) should hold office should be related to a consideration of their expected functional performance in office, and not on how virtuous a person they are.
Democratic political choice is made on the basis of factors relating to aims and competence. So that in a two party system, the right wing party has one set of priorities, and the left wing party another. Supporters of one party presumably believe that the other party is mistaken in their priorities. But - whatever people privately believe - the supporters of one party cannot publicly act on the basis that supporters of the other party are immoral. If people did act in this way then they would not be willing to allow the other party to hold government. This elimination of morality must apply even within the political system, since - whatever the demands of 'party loyalty' - the office holder and opposition must

abide by the results of democratic process. They must relinquish office when defeated in elections, a feat which would hardly be possible if the opposition were regarded as evil.
In other words, democracy depends upon ensuring that office holders can be exchanged, and the exchangeability of office holders depends on ensuring that (so far as possible) moral criteria are eliminated from the criteria used to establish office holders.

The priority of process
Democracy is therefore a system of government in which the democratic process is given priority over specific political programs. Since democracy depends upon the maintenance of a system for exchanging office holders, in effect the members of a democracy tacitly agree that maintaining this process for exchanging office holders is itself more important than the outcome of the process. Democracy is more important then whether your favoured party becomes office holder. Interestingly, this implies a decision to act as if the democratic process is more likely to be correct than one's own favoured political program. There is a practical deference to process.
By contrast, when moral evaluations are prominent in a political system this has a divisive effects on the population of the country which may make exchange of office so difficult as to be accomplished only by coercion (ie. revolution). Moral politics divides the country into 'us and them', where the opposition are not merely mistaken but morally inferior - perhaps even wicked. Since these moral divisions follow party lines they also tend to run in families and vary according to geography and occupation. This leads into a polarized situation in which some individuals, families, regions, jobs, ethnic groups are regarded as evil. The country becomes morally - as well as politically - divided.
Democracy requires a certain coolness or detachment about who holds office. In practice, this necessary detachment can only be exercised when the range of political options are such that individuals or parties who actually are considered immoral are excluded from the democratic process. For example, the existence of an explicitly fascist and racist political party is outwith the moral bounds of acceptability in current British politics, since the election of such a party would probably be regarded as not just politically mistaken, but morally unacceptable in such a way as to lead to action in defiance of the democratic process - and this defiance would threaten democratic processes.
It is a crucial point that democratic politics can only operate among choices that the participating public regard as acceptable. Tolerance is limited to that which is tolerable if elected. Of course, not all views coincide as to what is tolerable, and this will vary in different societies and at different times. In the end, the limits of tolerance are defined by that of interest groups which are powerful enough to subvert the democratic process if groups that they find intolerable are elected. When this is the case, democracy is in danger and the coercion of totalitarianism is made more likely.
One of the main functions served by electoral boundaries (especially the boundaries of nation states) is generating sufficiently homogeneous moral communities such that within them democratic processes can operate. Successful democratic nation states are groups within which the political programs offered during elections are all within the bounds of the morally-acceptable to all the significant interest groups. Democratic groupings cannot be larger than this, and when the range of tolerance diverges too far within one nation state then it may need to re-align some aspects of the democratic state – perhaps by dividing it into smaller democratic units (as has happened with some example of devolution and national partition). Conversely, when there is a convergence of tolerance between nations in relation to economic or social policy, then new democratic alliances may build up.

Single-issue politics and morality
Although the need for exchange of office holders dictates that morality needs to be excluded (so far as possible) from party politics, there is a proper place for morality in politics when there is no requirement for exchange of office holders.
The place for morality in politics is in fact precisely the arena of single issue campaigns. These are an entirely suitable area for morality. (eg. pro-war or anti-war, animal 'rights', environmental issues, the cost of specific items or artifacts etc.). By contrast with national politics, in which variation in party preferences and the electorally-imposed alternation of parties in government seem to be intractable; single-issue or 'campaign' politics does show evidence of moral 'progress'. For instance, the campaigns to abolish slavery in Britain then the United States were essentially single issue campaigns. They brought together people of diverse political views to achieve a specific goal, and ultimately succeeded in making this view universally accepted in their nations (at least nobody nowadays seems to be arguing the case for reinstitution of slavery in modernizing societies). Campaigns to abolish child labour are another example.
In a democratic society, moral arguments do least damage and most good when confined to specific campaigns with specific end-points. Of course, when moral alliances clash, the rules of democracy are threatened since those who disagree are seen not merely as mistaken but wicked. But moral issues do

require to be raised; and the cognitively- and temporally-restricted campaign focused upon a single issue tends to prevent collateral damage.
An interesting implication of this analysis is that single issue politics is not actually part of democratic politics. Indeed, single issue politics is the only kind of political activity available to people living in single party states. For example, riots are a mechanism of single issue politics - and they may be effective at obtaining the desired change (eg. a reduction in the price of bread), precisely because this can be achieved without any change of office holders.
Of course, the two kinds of politics can co-exist in a single person. A single issue campaigner may become a Member of Parliament, or *vice versa*. But when dealing with political issues that are independent of the single issue, an MP's professional decisions should be morality-free.
By this account, the current interest in single issues as a focus of moral activity in politics should not be taken as a decline in democracy, rather as a sign of maturity in a modernizing society. As democratic politics becomes more professionalized it will inevitably, and rightly, be drained of moral significance - and become more explicitly a choice between political programs: a choice between management teams. Elections quite properly will become more morally detached affairs, and moral passion be directed into single and specifically moral issues, rather than into general party politics.

Opposition to modernization
Modernization entails a continual increase in the adaptive complexity of society, such that a society is continually out-running its understanding of itself. It is unsurprising that one of the major themes of the opponents to modernization is that society has become so complex as to be uncontrollable, and on the verge of collapse. Indeed, the division of cognitive labour which has increasingly characterized modernizing societies for several centuries entails that no individual human mind has the intellectual capacity to understand human society in the way that the system understands itself. For example, the vast complexity of a modern nation is far beyond the capacity of any mind to comprehend, yet nevertheless societies manage to regulate themselves without collapsing. The fact that even extremely clever and well-informed individuals cannot understand what is going-on often leads to a sense of insecurity, alienation, and sometimes dread or panic - as it seems inevitable that the spiralling complexity must be about to end in some kind of unknowable but absolute disaster.

High status intellectuals and modernization
The most vehement and articulate critics of modernization include many of the highest status intellectuals - especially those 'general' intellectuals whose commentary extends across several social systems, the group sometimes known as 'cultural critics'. Given the evident popularity of modernization among the mass of the population, the high level of hostility among cultural critics requires analysis.
In a traditional hierarchical society, high status intellectuals (usually priests) are 'cohesion experts' whose main role is to explain society in ways that legitimate it, and to propagandize their explanations. Such experts take an overview of society and describe how and why it fits together in the way it does. These general intellectuals are 'above' the world of specific functions (which are performed by lower status craftspeople). Furthermore, in traditional societies the intellectual world is itself unified and rationally coherent - traditional systematic theology is not just a matter of religion but incorporates law, science, economics etc. From a position at or near the top of a hierarchy one is able (in principle) to take a complete and integrated overview of the whole society.
But a modernizing society is not hierarchical, and intellectuals are demoted in status and limited in scope. Society is modular and pluralistic, so that there is no vantage point from which one can take an inclusive overview. With the intellectual world divided between the specialized functional systems, even the highest status intellectuals can do no more than be a prestigious type of 'cognitive worker', subjected to the same process of specialization and narrowing of expertise that is common to other kinds of worker. The intellectuals' role is within functional systems, rather than across the whole of society: so that there are no general purpose intellectuals but instead theorists and researchers working in discrete fields such as economics, policy, law and the many branches of science.
The impossibility of a non-perspectival over-view is experienced as a loss by high status intellectuals, since it goes with the loss of their role as 'cohesion experts'. In a modernizing society, the intellectual's power is confined to specific system functions. Even when an intellectual has a position as the political ruler ('philosopher-king') or as a ruler's adviser ('grey eminence') then this is merely a role within the political system, and its intellectual scope is restricted to the functioning of that system - political intellectuals do not dominate science, medicine or the law.
All this means that in modernizing societies general intellectuals are demoted from their prestigious and powerful positions of social legitimation, to being merely 'culture critics'. Because of the social structure of modernizing societies the culture critic, whatever his claims and aspirations, offers just another system-specific perspective. Culture critics are faced with a choice of working either in social systems such as education, social science or a religious bureaucracy; or becoming a part of the mass media

'entertainment' system. No matter how famous and wealthy specific cultural critics become in a modernizing society, the desired over-arching structural intellectual role is unavailable: it does not exist.
The cultural critic also faces the problem that the rate of change in modernizing societies may render their particular expertise suddenly obsolete or low status. For example, study of 'the classics' in Western democracies has gone from being the indispensable pre-requisite of intellectual eminence (and a marker of upper class status) to being regarded as an eccentric hobby. In the sciences, the tendency is for new knowledge to displace the old - and those who know only old science lose their function in the system. This militates against the traditional intellectual virtues of lifelong immersion in a complex, but static, intellectual system; mastery of which was difficult but which carried permanent rewards in terms of status and security.
Our analysis represents an attempt to explain the hostility of most high status general intellectuals and culture critics to modernization, and their distinctive commitment to unified models of society as envisaged by religious and political ideologies such as Roman Catholicism, Marxism and some branches of nationalism. On reflection, the characteristic perspective of culture critics should not be too surprising, since it is associated with an accurate judgement of self-interest.

Environmentalism against modernization
The political opponents of modernization include what may be termed the 'environmentalists', including the various 'Green' political groupings, and the ecology movement. Others hostile to modernization are those more 'conservative' groups who believe that the role of politics is to support particular national, ethnic or religious cultures.
Of these, the radical Deep Green political perspective is the one that commands most support among the young, and so requires particular attention. (The Deep Greens go beyond environmental concern to assert the primacy of the environment. The planet is more important than people.) The Deep Greens' hostility towards modernization is essentially one that stems from the observed environmental destruction caused by growth - population growth, industrial growth, increase in world trade, the spread of housing, agricultural modernization etc. The basic argument is that perpetual growth in a finite world is impossible, and that therefore continued modernization will sooner-or-later, but inevitably, lead to planetary destruction.
This argument demonstrates the profound difference between the traditional and modernizing perspectives. The traditional perspective sees society as static and circumscribed, such that growth in one part can only be at the expense of contraction or destruction of another part. By contrast, modernization is built upon the expectation and necessity of perpetual growth generated by functional specialization: continual improvements in efficiency, increases in cognitive capability and technological improvements. The ideal is to ensure universal, perpetual growth in all systems and nations.
Deep Greens believe that growth cannot go on forever due to ultimate physical and biological constraints, and that - no matter how long delayed - endless growth will prove impossible, or there will be an ecological disaster which will wipe out human civilization, human life, or even most planetary life. This is regarded not as a possibility, but a certainty, such that Deep Greens advocate the dismantling of modernizing civilization. Even when disaster is not believed to be certain, the possibility of such an outcome may be judged sufficient to commence with de-modernization - on the basis of the so-called 'precautionary principle'.
Plausible as is the Deep Green argument, its logic is denied by modernization. What Deep Greens say *will* happen, advocates of modernization assert is probably preventable - and they make this assertion on the basis of historical experience and current knowledge. Of course, by their own understanding of the nature of knowledge, the modernizers' logic can not be conclusive; since all knowledge claims are considered to be contingent and system-specific (see Appendix). However, modernizers argue that the environmentalists' position is irrational in the sense that it entails making knowledge claims about matters which are simultaneously claimed to be unknowably complex. Deep Green predictions of eco-disaster are modelled on current science, but science (and technological capability) continues to grow and change in ways which cannot be predicted.
Modernizers can also point to the fact that modernization is essentially a growth in *complexity*, rather than a growth in size. Strictly speaking, modernization is the ever-more efficient use of resources. While perfect efficiency is unattainable there is no obvious end to the process of continually increasing efficiency. So long as growth in efficiency can continue, so can modernization.

Optimism versus pessimism
In the final analysis, the deep difference between modernization and environmentalism is the difference between optimism and pessimism about an unknown future. Pessimistic environmentalism can be analyzed as a psychologically-driven ethos (rather than a social theory); the incomprehensible and increasing complexity of modernization leading to a response of dread or depression. Likewise, optimistic

modernization can be imputed to veiled opportunism or a dangerously manic lack of insight. But even if these psychological analyses were true it does not settle the intellectual dispute.
Modernizers are optimistic about society's ability to develop new ways of dealing with unforeseen problems, as modernizing societies have successfully done in the past. The main task for modernizers is to ensure that the process of modernization continues, such that by the time problems arise, modernizing societies will have developed the necessary capability to deal with them. But environmentalists are pessimistic about this 'faith in the future' scenario, and regard it as reckless arrogance to act on this basis. The environmentalists answer is to slow down modernization to such a point that society (or individuals) can calculate and plan for the future. This slowing may entail actually stopping the growth in complexity, or reversing it to make the world a simpler place, and therefore both more comprehensible and more safely controllable.
There seems no way of settling this dispute on rational grounds. The traditionalists who continually predict disaster have been wrong so far, and the modernizers have been correct so far. The environment has not been destroyed, the planet is currently supporting human life, and previous predictions of imminent disaster were mistaken. Of course, what has happened in the past is no guarantee of what will happen in the future. But history does show that the modernizing process has a good track record for doing what it optimistically hopes it will do - which is increase its cognitive and technical capabilities fast enough that this progress in problem-solving will be faster than the incidence of potentially fatal problems generated by growth. This does not mean that modernization will be without significant problems, but that such problems will not be sufficient to stop modernization.
Environmentalism operates on the basis of a traditional ethos, calculated on the basis of known and dependable factors. By contrast modernization embodies an ethos which, although some centuries old, is still unfamiliar and does not emerge spontaneously. The ethos of modernization entails an optimistic self-belief of societies in their own ever-expanding abilities, the ability of growth to deal with whatever the future brings - including the problems caused by growth. Thus the modernizing society projects itself into the unknown like a self-constructing bridge cantilevered across a void.
Up to now, the social attitude of optimistic self-belief seems to be associated with national success, and in that sense the ethos of modernization seems to be adaptive. Whether this degree of confidence strikes the observer as heroism or hubris, as cosmically-enlightened or spiritually vacuous, depends on perspective. At any rate confident and optimistic ethos of modernization depends upon this kind of justification.

Modernization and alienation
Perhaps the most powerful critique of modernization is spiritual. This is the argument that modernization inevitably tends to make alienation worse so that while conditions improve and humans are happier, healthier and longer-lived - their lives lose meaning.
Alienation is not merely sadness or depression, but the sense that one's life is meaningless - the feeling that one does not *belong* in the world. The alienated consciousness is detached from society and nature, imprisoned in its own subjectivity. Alienation has been a theme of much philosophical thought at least since the 'romantic' movement followed the scientific and industrial revolutions. For the past several decades, counter-cultural critics have characterized the problem in terms of 'The System' versus the individual - and this seems substantially accurate except that in modernizing societies there is not one unified system but many modular systems. Nonetheless, the singular term captures the automatic, rational, controlled and impartial organization typical of modernizing society, which contrasts so sharply with the moody emotionality and potential for spontaneous unpredictability of the multiplicity of individual humans. The continual tendency for ever-greater functional specialization and ever-greater size and complexity of organizations will indeed tend to reduce humans to the level of being like 'cogs in a machine'. Modernizing society is indeed complex, abstract and systematic; performing a massive range of inter-linked and inter-dependent specialist functions. And, from the perspective of society as a whole, the role of the individual human is merely to 'serve' the needs of this system.
This situation is psychologically alienating for several reasons. Perhaps the most fundamental is the ever-increasing division between the objective reality of society (the social systems) and the emotional subjectivity of the individual. Society functions on the basis of abstract processes while the individual experiences the world as a biological animal. This human animal experiences all kinds of motivations, feelings and preferences which may have little or no relationship to the nature of the modern world and his or her role in it. This form of primary alienation is expressed in all manner of dichotomies - the private versus public, heart versus mind, art versus science, naive versus sentimental, Dionysus versus Apollo and so on. At root these dichotomies amount to the observation that emotions and instincts are out-of-step- and uncorrelated-with the structural demands of the modern world. How we feel is not a reliable guide to appropriate, socially-responsible behaviour in society as it is presently constituted. Spontaneous instinct must be overlain with learned rationality. We can predict that such divisions will tend - on the whole - to get more extreme and more widespread as modernization proceeds.

Alienation can be formulated in systems terms. Modern humans are modular, which means that they participate sequentially in many specialized social systems. For instance, in the course of a day an individual may participate in the family, the economy (work), education, the health service and a religion. Each social system involves only a fraction of the cognitive capacity of the whole human mind. Yet, at the same time, human subjectivity involves a representation of the 'whole' human mind. More exactly, since the whole mind is not accessible to awareness, human subjectivity represents a very much *wider* range of cognitive processes than are used in any of the social systems. So, when communicating in any specific social system, there is a difference between the broadness of subjective experience and the narrowness of social communication.

In principle, a human need not be aware of the difference between the social and the psychological – they might either be concentrating on subjective communications, or on social system communications. This is presumably the permanent condition of lower animals. However, human consciousness is capable of simultaneously representing both the integrated 'subjective self' and the modular, specialized 'social self' and becoming aware of the difference between the two. Furthermore, as social systems evolve in a modernizing society, the social self becomes ever-more specialized and communications more narrowly functional, and there are ever-more of these specialized social selves between which the individual must navigate. This is the condition of modern alienation, the sense that the subjective mind is greater than and separate from the public world of social systems.

So, the primary form of alienation is the spiritual division between the abstract system(s) and human psychology. But this is made worse by the physical stresses of modernization: the physical interaction between The System and the human organism. The System will tend to use humans as The System requires; without consideration for human nature. For example, factories may work best run and a 24-7 basis, which takes no account of human needs for sleep, recreation, family life etc. These human needs operate as constraints on The System, but The System will always tend towards minimizing the provision of human needs insofar as possible. What this means is that people will often be operating close to their limits, especially in the most efficient parts of the economy. For example, humans need sleep, so The System cannot operate on the basis that they do not. But people may be pressured to have the minimum duration of sleep, and to sleep at times (for instance during the day) that suit The System and not the individual. The sanctions are in terms of status - and it is noticeable that many of the most high status jobs in a modernizing society demand the most extreme subordination of human nature to the demands of The System. The principle also applies at a micro-level of most individuals being required to perform numerous specific tasks to order - in specific times, places and sequences.

A further factor contributing to alienation is that in a modernizing society jobs become ever more specialized, such that they require only a tiny proportion of total human capability (but jobs may require this narrow capability to be used repeatedly for long periods). This was approximately Marx's view of alienation and one of the factors behind Weber's description of the 'iron cage' of the modern order. The strong likelihood is that this form of alienation will continue to get worse, so long as modernization continues, since 'division of labour' is a principal mechanism for increasing efficiency.

It seems that many of the cultural critics themselves experience alienation strongly, bitterly resist further erosion of their sense of meaning in life, and seek a remedy by advocating the replacement of many functionally-specialized systems of a modernizing society with a single, unified philosophical system which re-unites or re-integrates these functions to provide people with more 'holistic' lives. The aim is to 'heal' the fragmented human condition. However, even if this anti-modernization policy were implemented (which seems extremely unlikely), and there was indeed some quantitative reduction in the sense of alienation (especially among intellectuals), the fundamental basis of primary alienation would remain.

The numerical difference between a society based on one rational intellectual system and a society consisting of many such systems is of trivial significance to alienation compared with the fundamental gulf between abstract system and the human mind.

Modernizing alienation

While increasing alienation is a significant and intractable human disadvantage of modernization, modernization also offers potential for ameliorating the problem. At any rate, the nightmare of Weber's 'iron cage' of abstract rationality has not yet become universal even after 100 years; neither has the mass of humankind in modernizing societies been utterly subordinated to the status of cogs. Brave New World has not arrived. Apparently there are countervailing forces in modernization which have tended to force The System to work around human wants – particularly among the ever-enlarging educated portion of the population. The System's need for large numbers of people with high level cognitive aptitudes in the workforce somewhat restores the power of the educated individual to demand humane conditions - as well as wages considerably above the levels of intractable immiseration envisaged by Marx. And the democratic, optimistic and non-coercive ethos of modernizing societies has led to better-than-subsistence conditions even for the uneducated and powerless.

Indeed, the advancing technological capability of modernizing societies provides powerful, albeit encapsulated, antidotes to alienation. One factor tending to ameliorate alienation is the massive provision of art via the mass media. There is nothing new about the this phenomenon, except for its scale, since the anti-alienation function of art was noticed and theorized more than 200 years ago by Frederick Schiller. Much of art serves to stimulate the imaginative faculty, and create an 'alternative reality' (albeit temporary and localized) in which the person no longer feels alienated, but participates in the imaginative world in a fashion that harmonizes meanings and emotions. For instance, music could be regarded as a language or system in which the musical structure and the emotional responses of the listener are matched-up. Stories (whether in books, on TV, in computer games or at the cinema) are all participative virtual worlds in which the linkage between emotions and intellectual understanding may be much closer than they are in 'real life'. Art, therefore, provides a sub-world where spontaneous instinct and emotion coincide with meaning.

The sheer scale of the mass media, and the selection mechanisms by which producers and consumers interact in the economic marketplace, mean that most people can 'mix and match' to find something to generate desired psychological states. This is the basis of the New Age movement which must constitute the largest and most rapidly-growing spirituality in the contemporary world. Indeed, New Age spirituality has arguably evolved to be the most distinctive and highly specialized form of religion; one that is well adapted for modernizing societies, since it focuses upon subjective psychological states such as integration, authenticity and self-expression which are ignored by other social systems. New Age is often effective at achieving its spiritual goals (eg. self-exploration and personal development), and its characteristic tolerance, eclecticism and pluralism make it able to avoid direct conflict with other social systems.

The distinctive evaluation system of New Age sets it apart from traditional religions – because its evaluations are based upon subjective feelings rather than objective knowledge claims. Validity is a matter of what 'works for me'. Contradiction from other people is re-defined as '*your* truth'. Such a subjective evaluation system makes New Age immune to challenge by science and the other social systems. Furthermore, the wide range of choice and continual innovation in New Age ensures that there is little chance of becoming habituated or fatigued by the stimuli on offer – there is always something novel to experience.

The mass media offers another potential palliation of alienation through its widespread and diverse communications. According to the selections made, the media provides stimulation of intellect and emotion, escape from the mundane and functional, and generates a continually changing but almost universal set of experiences and evaluations that serve as a common basis for communications between individuals. Indeed, strangers who need to communicate outside of their narrow functional interactions may only be able to do so using contents supplied by the mass media - news, sports and entertainments. The tendency is for media to become the same everywhere in a country, and even between countries. This sameness of the mass media has a vital role in ameliorating the feelings of strangeness and isolation which are common in modernizing societies dependent on high levels of geographical and social mobility. The individual who changes jobs frequently and moves around countries or between countries can still tap-into the same familiar international media via the internet and satellite communications.

At a more fundamental level, it may be possible to discover pharmacological or physical mechanisms that affect the mind such that feeling of alienation can be ameliorated without impairing cognitive performance. Some people are already able to ameliorate feelings of alienation by seeking solitude, communing with nature, or by inducing altered states of consciousness such as occur in dreams or induced by dancing or drumming. There are also drugs that temporarily remove the feeling of alienation (for instance alcohol or the 'rave' drug Ecstasy). But all existing technologies that diminish the sense of alienation also reduce cognitive performance. What is required is a way of technologically alleviating the feeling of alienation conveniently, quickly and as required without disabling cognitive impairment (so that people can still safely work, or look after children, for instance).

Ultimately there may be a prospect of more focused pharmacological interventions, or genetic modification of humans, to remove the mismatch between our Stone Age minds and the Silicon Age culture and bring emotional gratifications into line with the circumstances of modern life. The pluralism and democracy that characterize modernizing societies make it unlikely that these techniques will be deployed for totalitarian political purposes, as envisaged by Aldous Huxley's *Brave New World*.

If society has changed to produce alienated humans, perhaps humans can change their nature *just enough* to remove their feelings of alienation and restore the sense of belonging in the world.

The future of modernization

Since modernizing societies are more powerful and desirable than traditional ones, it is reasonable to conclude that - on the whole - things are getting better, and that this trend can (with appropriate action) continue. To embrace an ethos of modernization is to be confident and optimistic about the future, and to accept and prepare for ever-increasing social complexity and its consequences. At the social level, we

can expect that democracy will become stronger and more widespread, organizations bigger, society more changeable, competition more prevalent, social systems more numerous and specialized, and jobs narrower and more specialized. This implies an aim for personal development: more education is good, rising social status and geographic mobility should be welcomed, and an accommodating attitude towards change is to be encouraged. It is reasonable for people to look forward to social improvement, and plan on that basis.

The current paradigms of successful modernization are democracy, liberal economics, and science. These demonstrate emergent self-regulation, cumulative capability and creative problem-solving. Their strengths are due to the power of selection processes. To be a modernizer is to trust in selection processes and work for their wider application.

At present the distinctive characteristics of modernization are hardly acknowledged and generally misunderstood, with a result that its benefits are underestimated and its problems exaggerated. The modernization imperative is a consequence of the insight that modernization is both inevitable and desirable. For most of the people, most of the time, modernization will continue to happen whether we like it or not. But we should like it, since modernization is better than the alternatives.

APPENDIX - Systems Theory

We do not know of any generally comprehensible introduction to Systems Theory, so we aim to provide one here. Our main source of ideas has been the work of Niklas Luhmann (German sociologist 1927-1998) with important modifications derived from the evolutionary theorist David L Hull. Luhmann's work originally came to the attention of Peter Andras via the work of Bela Pokol.

Systems Theory is based upon the analytic division of the natural world into environment and systems. On the one hand there is an infinitely complex 'environment', and on the other hand there are systems which communicate within themselves and with each other. This division into systems and environment constitutes the major foundational, axiomatic philosophical assumption of Systems Theory.

Strictly speaking, systems are abstract - being constituted by communications of information. These processes are only contingently instantiated in physical entities. In order to apply Systems Theory to biology or sociology, it is necessary therefore to disregard the distinction between abstract information processing and physical entities. For example, the communications of the brain are equated with the nerve impulses of the brain, and lawyers and other legal personnel are (in their professional capacities) taken to be identical with the legal system. This move from abstract to concrete necessarily involves approximation, but we will not comment on it further at this point.

Where do systems come from?

Systems are a product of evolution. The planet earth presumably began as pure 'environment' with no systems, then simple, self-organizing physical and chemical systems arose by the chance contiguity of components and energy. For instance, the water cycle is a system by which water molecules associate and dissociate in processes such as evaporation and condensation. A prime attribute of systems is that they reproduce themselves, so once systems are in existence, selection can begin.

More complex systems can only be built incrementally by selection processes. Over time, simple physical and chemical systems evolved into complex biological systems such as those observable today (eg. plants and animals). Biological systems eventually led to the social systems generated by human culture, and to artificial human-created systems such as mathematics and computer programs.

Systems therefore have a history of evolution by selection processes. For example the human brain is a very complex system which performs a wide range of adaptive functions. Early in the evolution of life, single celled animals did not have a nervous system, only after the evolution of larger and more complex multi-cellular animals did a network of specialized nervous tissue evolve for the communication of information from one part of the body to another – but these animals had no brain. The first signs of brain system formation were ganglia where nerve cell bodies were collected, and in which nerve cells began to communicate with each other by a dense network of inter-connections. At a certain (imprecise) point in evolutionary history, the amount of nerve communication *within* the ganglion exceeded the amount of nerve communication *between* the ganglion and the rest of the body - and at this point the ganglion could be defined as a system, and legitimately termed a 'brain'. On the way to evolving the human brain, the relative difference in magnitude between within-brain communications, and brain-environment communications continued incrementally to grow.

It is the differential in quantity between communications within the system, and communications between the system and the external environment, that identifies a system. The bigger this differential between intra-system and inter-system communications, the more complex is the system. The cause of this differential is the system property of self-reproduction. Because systems reproduce themselves, they maintain that dense clustering of communications which itself identifies the system.

A further example of the legal system may help clarify how *social* systems can evolve. In the original hunter gatherer societies there were no professional specialist lawyers - what we would call law was combined with many other functions, especially religion. In some traditional agrarian societies there were specialist lawyers. At an early stage in cultural evolution there were lawyers but no legal system - since legal processes occurred mainly in the brains of individual lawyers. But as lawyers became more numerous and concentrated, they began increasingly to communicate on legal matters by formal procedures. The point when the legal system came into being was the point when the legal communications between lawyers exceeded the legal communications between lawyers and non-lawyers. Throughout recent centuries the quantitative differential between within-system legal communications and legal-environment communications has continued to increase. This is a measure of the growing complexity of the legal system.

A technical term for the point at which systems form is 'operational closure' - which implies that the system can usefully be treated analytically as if it were completely autonomous from its surroundings. For example, a cell (such as a brain cell) can be studied in isolation from the human organism, and the human organism can be studied in isolation from human society. Although cells are indeed influenced by organisms, and human organisms are influenced by the social environment, distinctions such as 'cell' and 'organism' are pragmatically justifiable on the basis that system boundaries are drawn through regions of

relatively low-density communications. This principle of defining systems in terms of relative density applies to Systems Theory generally.
Indeed, when a system interacts with another system, the reality is that the system interacts with itself. A human mind does not interact with another mind, rather one part of the mind interacts with another part which is representing (or modelling) another mind. The mind's knowledge of other minds takes the form of its own neural activation patterns. Similarly, a system's knowledge of its environment takes the form of a model of the environment which is itself part of the system. Systems therefore communicate with themselves. It is the selection pressure acting on a system which causes these self-communications to evolve and become functional.

System boundaries
When an observer measures communications in relation to a system, then the system boundaries would be defined as lying between 'clusters' of communication. If communications were mapped on paper, then the systems would be represented as concentrated networks of reciprocal communication. The spaces between systems would be regions of low-density communications.
All communication requires systems; therefore the first step in analysis is to partition communications into two categories of within-system communications and between-system communications. Systems are defined as those clusters having significantly denser communications within the defined boundaries than between system cluster boundaries. Because communication density is significantly greater in systems, this implies that the observed differential in the density of communications is great enough that the observed difference is statistically unlikely to have been generated by chance. This also implies that the more statistically significant the observed difference, the more likely that there really is a system.
In other words, systems are defined as those units which communicate more with themselves than they do with their environment. A political system would therefore demonstrate a greater density of communications between politicians within a defined political system, than between that defined system and its environment. And if there was no such difference in the density of communications, then there would be no political *system* (or, alternatively, it could be said that there were as many political systems as there were politicians - each political system existing in the mind of a politician). As political systems become more complex in their sub-divisions and specializations, this increases the density of internal communications between members of the political system much faster than the amount of information coming-into and going out-from the political system. And the greater the differential density between intra-system-communications and inter-system-communications, then the more complex is the system.
Systems Theory entails making decisions to define some clusters of communications as being systems. This puts the system theorist in the position of an observer of other systems. And any observer of social systems will be limited by the constraints of their observations. For example the observer of a system will only be measuring a small sample of total communications in their field of interest. For example, in a study of organizational communications only formal written language on particular topics might be sampled - not including informal written language (eg. witty office notes), apparently irrelevant communications (eg. shopping lists) or spoken language (which may be logistically too difficult to sample). Observation of written language would also be ignoring other types of communication such as gesture and facial expression. Sampling would also be limited to a particular time-frame. Such constraints regarding the spatio-temporal selectivity of sampling apply universally to the observation of systems.
Having sampled only a spatio-temporally restricted set of system communications, the observer of a system is further constrained by the limited complexity of information processing to which this set of information can be subjected. This could be the limits of information processing in the human mind if the observer is an individual; or organizational limits if the observation is being done by a social system such as a research team, or a disciplinary network of social scientists, or the structured specialization of a bureaucracy. These constraints on information processing represent further layers of simplification and bias.
The point is that observers of systems invariably operate on the basis of incomplete and provisional information. This constraint also applies to Systems Theory itself when it is engaged in performing its primary tasks of identifying social systems. Identifying and delineating a social system is dependent upon the information sampled, and the perspective and system characteristics of the observer. Any 'model' that the observer uses to understand a system is always a simplification.
But while imprecise and contingent, modelling is not arbitrary. The validity of systems modelling can be tested. In essence, models are subjected to repeated tests by comparing predictions of the model with further samples of communications from the system being modelled. Such tests are indeed the mainstream activity of science, but the principle also applies to social systems such as the management of a corporation. The management's modelling makes predictions (projections) concerning future events in a company, and this is compared with the results of monitoring to determine whether the management model is working well enough for managerial purposes.

Humans as communication units

When Systems Theory is applied to social systems, the role played by individual human beings is one that is unfamiliar and sounds counter-intuitive. Humans constitute the communication units for social systems – but neither the human organism nor the human mind are part of any specific social system.

Human beings are only relevant to social systems insofar as they produce communications within the social systems. In other words, humans are relevant only as information processors, and the information processing role of humans within a specific social system is very selective. Subjective, psychological communications that occur within the human mind (so-called consciousness) are not a part of social systems, because these are the mind's communications about the mind.

This analysis means that there are no human 'agents' in social systems. The individual mind is not regarded as a single unit by any social system; rather the mind is seen as numerous modular cognitive processes each of which communicates in a separate social system. The human mind's communications about the human mind are not, therefore, a part of social systems theory. On the other hand, these subjective communication systems are a part of human psychology; the science of which attempts to model the mind as a complex system. But these mental systems are separate from social systems.

For example, the legal system does not consider humans in terms of their subjective communications. Only very specific legal concepts are used to model human psychology, such as the legal concept of 'responsibility'. To simplify, human beings are treated by the legal system as either 'responsible' (in which one set of procedures apply) or 'not responsible' (eg young children, severely mentally handicapped or the insane) in which case another set of procedures apply (including the assignment or 'responsibility' to other parties such as a guardian or the state).

The legal concept of responsibility is quite different from that which prevails in everyday life. In a family system, even a child of 3 years may be allowed by its parent to choose their food or a toy, and is in that family-system sense is granted the status of being responsible. But from a legal perspective if that child suffers from malnutrition, or shoots someone by playing with a real gun, then the parent is legally-responsible.

Systems theory of social systems does not 'ignore' the agency of individual humans, rather agency is reframed in selective, modular, system-specific terms so that agency does not apply to actual human beings or whole minds but instead to operationally-defined agents. For example, economics famously sees human beings as some version of 'economic man', and however economic man is defined (and there are many competing and conflicting definitions) he or she is inevitably a very partial version of a real human. The same applies to all social systems – the political system seeing the population as 'voters' or members of interest groups, the health service seeing people as 'patients' (actual or potential) and so on.

In a modernizing society all social systems are specialized and tending to become more specialized. Hence all social systems represent humans in very partial and system-biased terms. There are no social systems, not even religion or art, that communicate on the basis of the 'whole' human agent.

Advantages of complexity

Complexity may be defined in terms of the minimum length of a string of information required in order comprehensively to describe a state or process. Roughly, this translates as how many 'bits' are necessary to describe a system. Most complexity (eg. a pile of sand) is neither organized nor adaptive, but such random complexity is not involved in communication. Systems Theory is concerned only with communications. Complexity of *communications* implies complexity that has evolved and is therefore by definition adaptive.

The environment is infinitely complex. Systems deal with this complexity by modelling specific aspects of the environment. But communication can only occur between systems, since information only exists in a context of systems. How, then, does a system communicate with the environment? How, for instance, does a cell communicate with the infinitely complex world outside?

The answer is that systems do not communicate with the environment. Rather, systems communicate with other systems. Since the environment is (by definition) not a system, in order to interact with the environment the system will create its own models of the environment. In effect, the system creates sub-systems within itself - each sub-system representing a different aspect of the environment. This means that although the environment is infinitely complex, a system will operate on the implicit assumption that some aspects of its environment can be treated as if they were systems; and these within-system representations of the environment are all that the system knows of the environment.

For example, a cell represents its environment by systematic models of selective aspects. Concentrations of sodium molecules surrounding the cell are dealt with by one set of processes, while concentrations of hormones are linked to different sets of processes. Most aspects of the infinitely complex environment are ignored except insofar as they alter these modelled processes. The monitored molecules are treated *as if* they are meaningful communications of another system - high concentrations of a molecule having one

type of meaning, low concentrations another kind of meaning - with the cell's responses varying accordingly.
The more complex a system, the more numerous and complex its sub-system models of the environment can be; and the greater potential the system has for adaptive responses when interacting with the environment. For instance, the visual system of a cat is more complex than that of a slug, and the cat can model more aspects of the visual environment than a slug. Hence the cat has the potential to respond adaptively to a wider range of visual information and to generate a wider range of responses. The same principle applies to social systems: the more complex the internal-processing of a legal system, the more different types of input it can cope with and the greater the spectrum of outputs it can generate. The potential adaptive advantages of complexity explain why cultural evolution has led to increasingly large and internally-specialized economic and social institutions. Larger and more complex organizations have the potential to generate more numerous and more complex models of the environment; and interact with the environment more adaptively. As with biological systems, the largest and most complex social systems in the history of life and earth are to be found today.
The value of complexity arises from its greater potential for adaptive interaction, because a complex model can contain more information than a simpler model. But complexity always carries a cost of increased internal communications. Communications consume resources and take time. The costs of internal processing increase as system complexity increases. This means that, given the inevitable disadvantages of complexity, for complexity nevertheless to occur entails that the advantages must outweigh these inevitable disadvantages. For instance, a complex organism such as the human required the evolution and maintenance of a large and elaborate brain and nervous system to maintain internal co-ordination and to model the environment - such that in a modern human, brain metabolism uses about one fifth of the total energy input. And the complexity of the human brain was incrementally elaborated by natural selection, such that each step had advantages over the step before. The reproductive advantages of a more complex brain must have outweighed the disadvantages of a large brain, or else it would not have evolved.
Most of the infinite number of ways in which complexity might increase will have higher costs than benefits. Selection processes are necessary to discover and build-upon the rare occurrences of adaptively increased complexity while suppressing the much commoner instances of maladaptive complexity.

Selection and functionality
Systems Theory assumes the existence of systems. Simple systems may come into existence by chance, but complex systems are the result of selection. The specialized functional social systems that are characteristic of modern society are the lineal descendants of systems that have incrementally increased in complexity. Systems reproduce themselves with variations, and selection processes usually amplify more complex and efficient variations. The nature of specific selection pressures operating on a system are what shapes the functionality of that system.
The functionality of a system describes an input-output relationship of a system in relation to the requirements of another system. This treats the system as if it were a machine, and ignores the specifics of internal-processing. For instance, from the perspective of the economy the function of the health service is to ensure the health of the workforce so that they can perform their economic roles. This input-output relationship might be described by something like the cost-effectiveness of the health service - the economic system therefore regards the health service as a machine for producing an ever-more healthy workforce at the minimum cost. But from the perspective of the political system the function of the health service is different, because the function of a modernizing government is related to the ensuring the continuation of growth in the adaptive complexity of society. So the function of the health service would be related to its across-the-board performance in relation to those social systems that are regarded as priorities. Such priorities would include the needs of the economy, but also might include the need for social cohesion; so that a health service might be evaluated on the efficiency of its performance in preventing social breakdown due to epidemics, or minimizing crime (for instance in relation to drugs, alcohol and mental illness), or on the ability of the health service to keep unemployment rates down by giving jobs to large numbers of people (which function may contradict short-term economic imperatives).
In a modernizing society there is no single 'true' function of the health service or any other social system - rather each social system has multiple essential functions which differ according to the perspective of the situation from which it is being evaluated, and the priorities of a specific time and location. And, as pointed out earlier, none of these functions are identical with the 'function' of a social system as seen from inside. From inside the health service, good health and the cure of illness are intrinsic values that require no further justification. Similarly with the educational system - external observers in other systems are interested in the educational system's input-output properties - such as the efficiency with which it deploys educational personnel and resources to generate suitably trained, skilled and qualified people of various types to operate the other social systems. But from within the educational system, education is an ultimate good which needs no further justification.

Complex social systems are therefore ‘functional’ as a consequence of selection processes – because unless they were adaptive to their historical environment, they would not have evolved. All social systems need to take account of the natural environment such as sun and rain, heat and cold if they are to survive; but the most obvious selection pressure for social systems comes from other social systems - especially since social systems have a tendency to increase in complexity and often size, which sooner or later brings social systems into competition, as well as increasing their interdependence.
For instance, an education system will have a different function according to the historical context of the selection pressures which have affected the reproduction of the system. Some educational systems are selected by economic factors, such as competition for fees from students. This will tend to generate educational systems efficient at competing for students. Other educational systems are state-funded, in which case the main selection pressure on the educational system may depend upon how well they extract resources from the public administration bureaucracy. Organizations that disobey or antagonize the state apparatus may decline or disappear. The main function of these two kinds of educational system would differ, and the different selection pressure would lead to different forms of information processing.
The efficiency of social systems is therefore perspectival. An economically-selected school and a politically-selected school may be equally 'efficient' in the sense that both may be equally-well adapted to their major selection pressure. However, the systems have adapted to radically different environments. In general, it is this history of environmental interaction that accounts for the nature of functionality in social systems. A Soviet-style car factory management system was economically inefficient by comparison with a Japanese one - but on the other hand, a Japanese-style management system could not have survived in the political environment of the USSR.

System ‘languages’
Systems are composed of communications the currency of which is information. A communication entails emitting, transmitting and receiving signals - what turns a signal into ‘information’ is its interpretation. This implies that information only exists within systems. Signals that are not part of systems are not communications.
Information is expressed in terms of a communications code or ‘language’. Systems are therefore characterized, and may be differentiated, by their specific languages which are ‘operationally-closed’ from the environment. Languages have distinctive signals akin to ‘vocabularies’ and processes akin to ‘grammar’. There is a language of within-cell communication based upon cycles of metabolism and the concentration levels of molecules such as calcium ions. There is another language of within-organism communication based upon the nervous system and hormones. There are also languages of human organizations and social institutions - for example the technical terminology of medicine and the formal (and informal) mechanisms by which clinical information is processed and communicated.
Since the environment is infinitely complex, all system languages are highly selective samples of environmental information, there are also temporal constraints upon processing this information, therefore a system’s understanding of the environment is always based on highly simplified models. The vast amount of un-sampled and unprocessed environmental data just counts as 'noise'. Noise may have significant consequences for a system, as when an external happening such as a hurricane or a political revolution may lead to the destruction or closure of a hospital. But when environmental events are not modelled by the system, the system does not 'know' about them, not even in a simplified summary. A blind animal may be desiccated by sunlight that it cannot perceive.
All knowledge is therefore knowledge-within-a-system. A system can only 'know' as information that which is sampled, encoded and processed. Other information may of course be 'known' to human individuals who perform functions within social systems. Office rumours may count as information in the system of the human mind, or a small system of friends who meet to gossip; but even if these humans are lawyers such information is not ‘legal information', unless the legal system encodes and processes it. Until such a time, the rumour will be ignored by the legal system. For example, a legal decision of guilty may stand as being legally rational (the defendant did indeed steal) - but the consequence of imprisonment be over-ridden by a decision to pardon a convicted criminal based on moral factors which were not admissible to the legal process (it was a mother stealing bread to feed her children). It is for this reason that legal decisions reached by strict procedures may be separated from sentencing decisions based on a separate system of morality. The strictness of legal procedures makes for a stable, predictable and potentially efficient system - but the narrowness of these procedures means that the legal decision cannot always be linked rigidly to system outcomes.

The power of cognitive specialization
The abstract cognitive capabilities of modern social systems are vastly greater than the cognitive capabilities of any individual human. And as the complexity of social systems increases, the gap between the capabilities of organizational systems and their human members is continually growing. In this sense,

all human societies are information-processing systems in which individual human minds participate, but which are not fully understandable by individual human minds. The emergent power of systems is much greater than the sum of their individual (human) parts.
For example, management systems co-ordinate numerous specialist experts (in law, economics, accountancy, statistics etc) in complex structures that divide and re-integrate information flows in subsystems such as finance, personnel, sales, buying and so on. No individual could - even in principle - master the whole spectrum of information processing involved in managing a large corporation. Indeed, the modularity of such organization means that all the information in the system is never gathered in one place; instead each hierarchical level of integration takes only a small, selected sample of information from lower levels as its input.
The fact that the complexity of managing a large organization is beyond the comprehension of an individual human mind serves to emphasize the absolute dependence of the modern world on the co-ordinated activities of a multitude of cognitive specialists, and the co-operative modularity of modernizing societies. Social understanding is dispersed among specialists working in functionally-specialized social systems. It is possible, indeed usual, for the majority of those working in a large organization to have little or no idea about the function of the organization. And even the management of such an organization may not be understandable by any individual person. The management is done by a system, not by individual people.
The same applies to science. Science works so well because it uses numerous specialists to test and generate knowledge. The cognitive division of labour suggests that concrete and specific social understanding is a property of systems rather than due to the insight of individuals. Scientific truth is an emergent property of the system, rather than an hierarchical decision imposed on scientists. Individual human reason has a vital role in generating scientific hypotheses, but the testing and comparison of hypotheses is done by the social system of science. The superiority of one theory over another over is not a decision by any specific individual or committee; rather it is an emergent property of the system of science expressed in the practice of scientists.

Rationality and selection
Rationality is a property of systems, but rationality is only half of the modernization story - the other is selection.
As Weber observed, modern social systems tend to become more rational (more 'systematic') in their organization. But each system employs a different, functionally-orientated rationality. This means that although society becomes increasingly rational, modernizing rationality is multiple and modular. The consequence is that rational analysis is useful only within systems, and cannot decide between systems.
However, systems can be compared with one another pragmatically. In other words, the proper method for evaluating systems is comparative and 'in-practice' – accepting that any such evaluation will suffer the spatio-temporal constraints of any pragmatic comparison. System comparisons are best done by selection processes; by generating variations, subjecting variants to competition, and imposing an appropriate selection pressure such that the most efficient variants expands at the expense of the others.
The overall ordering of multi-social-system, modernizing societies is therefore selection-based and emergent. Since most information processing in the modern world is not being controlled by any integrative centre, the social systems of the modern world must be regarded as mainly self-organizing and self-regulating. The relations between systems have not been planned in their specifics, but have emerged as a consequence of selection processes. This implies that useful understanding of the modern world as-a-whole is not likely to be a matter of rational analysis (however increasingly useful it is within systems). Rationality is ever-less reliable in generating accurate predictions and effective interventions in an ever-more modular and complex social world.
Consequently, selection processes are becoming increasingly important in the political system, which is a system concerned with society as-a-whole. Rational analysis and planning is highly applicable *within* social systems (and this 'routine' function is usually performed by administrative systems, which may be automated), but rationality is not very useful when analyzing the relations between multiple systems. However, although system relations cannot rationally be understood and controlled; the principles governing selection processes can be understood in principle, even when the outcomes of selection cannot be predicted. Political modernization has therefore involved progressively handing-over ever-more high-level, inter-system decisions to selection processes - especially in the economy, science and democratic politics.
In brief, rational analysis is best for intra-system decisions, but selection processes are best for inter-system comparisons. The challenge for political modernization is continue the shift away from 'rational' centralized command-and-control domination towards extending selection processes as widely as possible; ultimately to apply wherever between-system evaluations are needed.

The modernization imperative

The most successful contemporary societies - that is the most powerful societies, and the ones that most people would prefer to live-in - are characterized by growth in the functional complexity of social systems. Modern societies and social systems are ever more removed from the spontaneous, evolved modes of human thinking and behaving. Systems use humans rather than the reverse.

It seems clear that the paradigm instances of modernization succeed mainly because they have developed selection-based cognitive processes to generate system variants, and to compare and evaluate systems. Selection transcends the limitations and interests both of the individual human mind and of system-specific rationality. Democracy, economics and science therefore all privilege process over policy. We predict that this kind of reliance on system-level selection will be an expanding trend in ever-more social systems in the most successful modernizing societies.

Most people discuss modernization as if it were optional, and tend to focus mainly upon its disadvantages. While traditional forms of organization may be possible or necessary for some individuals and small groups; for society as a whole, there seems little choice and no desirable alternative to modernization. We need to grasp this nettle and eschew wishful thinking: modernization is an imperative. The question is not whether society should modernize, but how.

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