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BIOSOCIAL SCIENCE:

KNOWLEDGE FOR ENLIGHTENED POLITICAL LEADERSHIP

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Biosocial science is a synthetic term designating the accumulated body of fact about human behaviour generated by the biological sciences during the past three decades. To find a period comparable in the fertility of discoveries and rapidity of product application, we must look back to 1880 – 1900, when chemists and physicists established clusters of industries – petroleum, communications, electric power, synthetics. Today biotechnology is \$40 billion industry whose limits, according to National Science Foundation spokesman Herman Lewis, are “only the limits of imagination”.

The boundaries of science fiction imagination circa 1930 have already been crossed. In *Brave New World*, Aldous Huxley represented test tube babies as the ultimate in monster technology. Today in vitro fertilization is merely another medical service available to Mr. and Mrs. Average, who attend church and buy their washing machine on credit. Huxley did not imagine the creation of new forms of life, now an accomplished fact with enormous potential. He also did not foresee biochemical methods of behaviour modification, which will become standard treatment for addiction and psychosis once stable forms of the effective compounds are synthesized.

The achievement of biotechnology, however spectacular, do not quite render the significance of this latest progress of science. Heretofore the natural sciences have “searched the heavens and plumbed the depths”, but they have not been able to tell us a great deal about man. Numerous speculative attempts to supply this deficiency have been made. One thinks of the fantastic man-machine imaged by Descartes; of Hobbes’ man striving for power after power; of Bentham’s slave to his two sovereign masters, pleasure and pain; of Marx’s industrial slave in revolt; of Durkheim’s urbanite intimidated by the *conscience collectif*. This fascinating but unsatisfactory prehistory is now terminated. Homo sapiens has been sectioned, strained, and clamped under the microscope by hundreds of methods.

This is the big news to social scientists struggling to nail down firm knowledge with methods they know to be defective. Indeed the track record of social science over the past eighty years is uninspiring. The tens of thousands of

highly trained researchers have expended some \$2 billion without discovering a single empirical law. In the absence of empirical laws, social scientists can neither predict events nor design effective social technologies. This last point wants some emphasis. The claim of social science to public research funding has been in part the promise of problem-solving pay-offs. Pedagogy and curriculum, industrial relations, race relations and so on, were supposed to be improvable on the basis of social science knowledge. Yet it is difficult to think of a single piece of social engineering emanating from social scientists that has solved the targeted problem. And in some areas, notably pedagogy, everything social scientists touch seems to turn to confusion.

Failure so complete prompted some social scientists to migrate toward the greener pastures of neighbouring biological sciences. The traffic has been particularly heavy in anthropology, psychology, and social psychology, all now firmly in the grip of biosocial science, even if the majority in these fields still have some catching up to do. A comment on psychology illustrates what has happened. Modern psychology began its career in the 1870's as a biological science based mainly on clinical neurology. The first desertion occurred when Sigmund Freud, who was trained as a neurologist, set up the psychoanalytic shop and substituted therapeutic talk for experimental method. The second desertion came several decades later when conditioning experimentation, originally the invention of physiologists, was torn from its somatic roots and reinterpreted as so-called behaviourism. These two fields enjoyed considerable vogue, and in the case of behaviourism, generous research funding. What has been the result? In the late thirties there was rejoicing at the discovery of the first empirical law, the Law of Effect. Further examination showed this claim to be premature, and the law eventually was buried without ceremony. Meanwhile the biological orientation was maintained by physiologists, neurologists, and endocrinologists. The result? There is now advanced knowledge of perception, learning, stress, emotions, language, and cognition. Psychological disorders are increasingly understood. The ontogeny of infant behaviour, for so long an area rich in advanced superstitions is now a scientific subject. Studies of perception and stress have generated solid principles of environmental design incorporated by space program and numerous industrial designers. Behaviour modification techniques are being used to cope with alcoholism, workaholicism, and other addiction syndromes. In sum, there's no comparison between the track records of social scientific and natural scientific research.

There's probably a lesson here. Natural science is distinguished by the experimental method. The method guarantees the objects investigated have real existence. Human behaviour, like all animal behaviour, has a real physical existence and therefore may be investigated by the experimental method. This simple reasoning has led to the splendid results of biosocial science. However, it is one of our psychological traits to invest behaviour with meaning. These meanings may be interrogated in the arm chair or any other convenient space. Social Scientists have investigated human behaviour from these prescientific sites. In doing so, they have duplicated the prescientific result: the proliferation of sects and schools of thought favouring this or that

cherished belief. This failure suggests that objective results will never eventuate from this method.

Until now political scientists and sociologists have not seen exactly how to splice their disciplines into biosocial science. The relevance of ethology has of course been noticed (Masters, 1975). But ethology's strong suit is face-to-face social interaction, while political science is primarily about government. Then too, some confusion about biosocial science has been created by the socio-biology vogue. The quick and easy way would be to dismiss socio-biology as of no relevance to political scientists. But so much has been made of it that the easy way won't do.

Sociobiology was the term coined by E.O. Wilson to signify the linkage between ethology and the population genetics. For reasons that need not concern us, the central problem of sociobiology took shape as the explanation of cooperative behaviour (altruism). Population geneticists put a handle on this problem by developing equations for inclusive fitness (kin selection). The application of this model to social insects yielded satisfactory empirical results and launched the sociobiology bandwagon. The vogue of sociobiology has also been enhanced by the success of behavioural ecology, which derives a number of behaviours from models of time-energy budgets (optimality modelling) (Krebs and Davies, 1981). What are we to make of all this?

Inclusive fitness is doubtless a powerful model for helping sort out the complexities of kinship (Sherman, 1977, Charnov, 1978). Behavioural ecology is proving its stuff in applications to the food gathering and migration habits of small hunter-gatherer bands (Emlen, 1981). Well might these studies prosper. But a caveat must be entered against the models deployed by sociobiologists. The experimental data base of population genetics is drawn mainly from small, rapid-breeding organisms that can be conveniently handled in large numbers. Often it is difficult to devise clean field tests of population genetics models, particularly for slow breeders in mixed populations, such as man. The upshot is that sociobiologists tend to press upon us untested conclusions as if they were empirical fact (Etkin, 1981). While recombinant DNA research holds great promise as a means of testing population genetics models, we should not in the meantime become absorbed in mathematical hypothesis when more relevant empirical evidence wants consideration (Caton, 1981).

The second caveat is that the subject matter of political science, government, cannot be framed within the ambience of sociobiology. Kinship and cooperation do occur within political societies, but they are not what make it political.

What then is politics from biosocial point of view? Political society is that form of association which is *not* natural (Adams, 1966; Braidwood, 1975). The "organs" of government are not biological phenomena but artefacts. The state is a place of *social technology* enabling a species whose natural sociability is evolved for small groups to extend his capacity for coordinated association to include great multitudes (Cohen, 1977; Gibson, 1972). Political science

squared to biology is the study of politics as a social technology deployed by a species outfitted with a specific repertoire of social behaviours. Understanding the relationship between the technology and the animal who applies it to himself is the core of biosocial politics.

Since the concept of social technology is coordinate with the concept of evolved social behaviours, it may be helpful to begin with the former. Social technology is an expression used to designate a specific kind of learned or “culturally acquired” behaviour. The term is to be construed in the usual sense of familiar material technologies. It is characteristic of technologies that they require an effort of conscious thought about methods of fabrication or application. These methods are teachable, especially when rules may be abstracted from successful practice. Moreover, technologies are capable of development by broadening applications, or improvement by enhancing quality or efficiency. Social technologies are techniques for defining, organising, and coordinating the activities of men. They are teachable and amenable to development and improvement.

Our species is the only one with a capacity for technology. Many species are prodigious fabricators, but the instructions are wired into their behaviour, they are one-act showmen. Homo has a general capacity to fabricate; and the men who founded the first cities in the Euphrates Valley were technicians of a very high order. In a period of about three millennia these populations (a) learned agriculture, including breeding techniques for domesticating plants and animals (Drew and Dexter, 1971; Adams, 1965); (b) mastered hydrology sufficiently to irrigate thousands of acres of semi-arid land; (c) built walled cities and introduced monumental architecture; (d) developed a calendar and writing; (e) developed trade in foodstuffs and raw materials (Higgs, 1972); (f) invented pottery, brick-making, clothes manufacture and many other crafts essential to civic existence. Their social technologies included disciplined armies, the division of labour into trades and of course government. These achievements put a great distance between Homo and the animals. They also opened a great gap between themselves and those who remained hunter-gatherers or pastoralists.

The technological break-through touched off a dynamic of growth and expansion to which our civilisation is heir. To represent its power a time-scale is helpful. Homo sapiens evolved from Homo erectus about 250,000 B.P. He was and remains but marginally different from his simian ancestors, with whom we today share more than 99% of our genes (King and Wilson, 1975; Hewet-Simett, 1975). For 240,000 years he lived little different from the apes as a subsistence hunter-gatherer. However, the forces of dramatic change were gathering. From about 30,000 B.P., Cro-Magnon became a skilled hunter capable of running the largest mammals to earth (Washburn and Lancaster, 1968) Indeed it seems likely that he wiped out dozens of mammal species either as noxious competitors or as game. He also developed numerous domestic arts based on stone tools. The transition to agriculture and domesticated animals was the prelude to take-off in political society. By

these means, (and these alone) he was able to support large, densely settled populations. Population rose from about 50 million 5,000 B.P to 500 million in 1600 to today's 5 billion, most of whom live in political societies. Food and commodity production are on an equally large scale, while the organisations that support these activities integrate many multitudes dispersed across thousands of miles distance. This astonishing process was called "progress" until the term fell into disfavour.

Politics is the art of jerry-building large, coherent organisations on man's natural sociability. Our sociability consists of repertoire of behaviours evolved for the hunter-gatherer existence. The first fact to be noticed about this sociability is that it is gauged for small groups of 20-50, similar to our simian ancestors. This size represents an optimum of a vector of two forces. Because they lacked agriculture or domestic animals, hunter-gatherers had to move about a home range in search of food. The small band is large enough to compass this activity, but not too large to generate insupportable demands against food supply (Emlen, 1979; Isaac, 1978; Coppens, 1976). The other force lies in the character of hunter-gatherer's natural capacity to associate. Again like the simians, hunter-gatherers associate on the basis of kinship. The basic ground rule of kin association is proximity, or face-to-face behaviour. Homo's behavioural repertoire is powerfully geared to the proximal ranges of sight, hearing, and touch. Let us look at some examples.

The chimpanzee has a wonderfully plastic face which he dexterously uses to signal to conspecifics. But the chimps are completely outclassed by Homo, in whom muscular articulation and the sensory-motor areas of the cortex controlling facial expression are very large (Keeton, 1980). This complex neurology and anatomy supports a range of facially-expressed signals far in the excess of the simian repertoire, although a number of them are phylogenetic derivatives from apes (Ekman, et al., 1969; Ekman, 1975).

Another example of the proximal character of human sociability is the male-female pair bond. Most simian species are polygamous; Homo by contrast is monogamous (Alexander 1974; Maynard-Smith, 1978). Polygamy is found only where some regular activity, such as warfare, reduces the sex ratio abnormally. (It is often accompanied by female infanticide as an additional means of correcting the sex ratio.) The strength of the human pair bond is related to the circumstances of human reproduction. Childbirth is traumatic in our species because the upright gait resulted in a narrowed birth canal, which made childbirth painful and risky. And additional pressure developed with the evolution of the large brain. The evolutionary compromise of this impasse was in effect premature birth. Whereas the chimpanzee neonate can cling to its mother from birth, and can move about on its own in a week, the human neonate is blind, immobile, and naked and remains heavily dependent for years. The nurture of the off-spring therefore demanded a potent pair bond between the sexes. Unlike the apes, hunter-gatherers sleep with their females and share food with them and their off-spring. Males also bond as a group to form the hunting band, which cooperates in taking prey and in defending the group against predators, animal or human.

Homo, then, is by nature a gregarious animal at home in the small group where his capacity for multiple bonding and versatility in communication are proportioned to the scale of his personal behavioural. He is not naturally cosmopolitan; he is naturally tribal chauvinist (Holloway, 1974).

This we see confirmed today in the developing nations that attempt to leap from a variety of pre-political forms to modern political society (Goody, 1971). With great difficulty are men habituated to the discipline of work routine. Vocational specialisation is not easily inculcated and the professional is scarcely intelligible. The technical vocations must be staffed by experts from abroad. Kinship dominates social life, while politics is mainly a matter of tribal alliances and enmities. Ignorant of the efficacy of work, they languish in drudgery or torpor.

Evidence of the social discipline employed in the initial phases of political society is too sketchy to say whether a comparable transition occurred there. We do know that by the time written records appear, around 5,000 B.P., sharp class distinctions, including enslavement of war captives, were enforced by a warrior caste headed by a king (Adams and Nissen, 1972). Their harsh punishments and everyday cruelties were perhaps technologies necessary to achieve that fundamental requisite of social coordination – action according to prescribed rule rather than according to the cues of face-to-face sociability. The same system prevailed also in Mezo-America and China, where techniques of intimidation and torment were refined to a pitch of perfection scarcely excelled since (Pfeiffer, 1977). It is sobering but true that everywhere Homo entered political society, the levers of cruelty and subjection were applied to stretch his natural behaviours into artificial moulds. The forces applied to this lever, existing records suggests, were the warrior caste and the priests (Caneiro, 1970; Lewis, 1981).

The natural basis of military institutions is not an ill defined quality called “aggression” but the set of behaviours evolved for the hunting band. The ethnographic evidence, some of it contemporary, that the hunting band is interchangeable with the raiding party is overwhelming (Chagnon, 1970; Sipes, 1973; Bicchieri, 1972). If warfare evolved as a predation strategy, as W.D. Hamilton suggests, it is not an obvious strategy (Hamilton, 1975). Successful predation usually involves an unequal match, such that the prey, once taken, can inflict no wounds in its struggle; but raiding parties usually take casualties; and warfare, even between hunter-gatherers, can be very lethal. If we do not know the evolutionary quirk that made men warriors, we do know how our endocrine system sustains it. Faced with danger, the endocrine system programs most animals for two options: flight in terror or combat if flight is impossible or would expose off-spring (Hinde, 1970). Man seems to be the only animal who actually goes spoiling for a fight that might be mortal. War costumes alone show the Homo approaches warfare in something of a festive spirit. The behaviours confirm the costumes. Warrior bands use dance, song, and shouts to work themselves into a state of euphoria, a group dementia pugnax, sustained by hallucinogenic hypothalamic hormones (Mendlewicz and Van Canter, 1979; Warbuton,

1975). In other words, for males, at least, war has two faces, the hallucinating ecstasy and the morning after.

The hallucination no doubt accounts for the fact that Homo's natural war tactics are so inept. The natural tactic is to gather in a host and rush upon the enemy with much hysterical joy and shouting (Chagnon, 1968; Bichieri, 1972). There are no commanders, no disciplined formations, no capacity for sustained attack or defence. Once the initial shock is spent in general melee, the combat is finished. Social technology improves fighting efficiency by imposing discipline that controls, if it does not eliminate, the euphoric hallucination. Thus, for centuries Roman armies subdued barbarian hosts far superior in numbers because they opposed disciplined formations to ecstatic but anarchic assaults. The moralists of Rome attributed her mastery to "virtue", especially courage and fidelity. This reading of events was taken from within the martial hallucinations; the barbarian hordes were scarcely wanting in courage. Rome prevailed, as all dominion in that era prevailed, thanks to her superior discipline and tactics.

The development of social technology crossed a watershed when the two great governing castes, warriors and priests, were replaced by professional politicians. We may date this event with some precision. It occurred first in Holland, in 1652, when John de Witt became Grand Pensionary and excluded the Stadholder (warlord) from office. In England it occurred when the Whig party drove James II from the throne. 1688 proved to be the definitive triumph of de Witt's politics, as mediated and augmented by John Locke.

Although this period is much studied, it is little known because history these days is held to be an "autonomous" discipline. That would be well and good if the autonomous historians would declare what laws their science confers. Mostly they do not know. What they actually compose as political history is antiquarianism draped around some arbitrary periodisation, such as Victorian England or Colonial America. There is only as much rhyme or reason in it as common sense may confer, and common sense is sometimes a weak reed. This is the problem of autonomous history: it cannot find its principles or laws in its subject matter, as scientists do, because its matter consists of the most heterogeneous and contradictory things. A dispute occurred between Galileo and the Inquisition; the matter of history does not equip the historian to understand what the dispute was actually about. Industrialisation occurred in Europe; this the historian knows, but he will never discover its causes by mere canvass of the historical record (Hexter, 1971; Caton, 1982).

The antiquarian randomness of historiography began to be remedied in the nineteenth century when efforts were made to join it to the concept of progress as a course of events amenable to scientific study. But this promising onset was abandoned, and the field was awash in the codswallop that abounds today. It is a popular belief that the onset of modernity marked the termination of feudal Europe by the rising bourgeois class of merchants, manufacturers, and other bearers of new-fangled social order called "the market society". It is said that the dominance of the bourgeois ensured the institutionalisation of certain practices characteristic of modernity, viz, the

dominance of town over country, the suppression of localism by central government, the triumph of science and industry. The good bourgeois of the seventeenth century would have been astonished, perhaps shocked by the very idea. The truth is that the bourgeois did not collaborate as a class outside the mercantile centres, and this collaboration was the continuation of practice developed in the free cities of medieval Europe, sanctioned by the Emperor and Pope (Trevor-Roper, 1972). The program ascribed to the bourgeois class was not the work of bourgeois at all; it was invented by a small number of men, and practiced in France, Holland, and England sometimes against strenuous resistance from mercantile interests (Coel, 1964; Pontalis, 1892). In the United States, which is supposed to be a “bourgeois” nation, the exponent of that program was Alexander Hamilton, whose grand design was submitted to Congress as the *Report on Manufactures*, only to be defeated with vigorous protest.

The so-called bourgeois program was a political program of a wholly new character. It was a politics of progress based upon a wholly new development – the advent of modern science, including political science. The outline of this political program is familiar. The state is held to rest on a contractual relationship specifying the reciprocal obligations of citizens and government. The purpose of government is to secure life, liberty, and property, that is, goods common to all. Citizens are obliged to obey the laws, unless they abridge these fundamental rights. It is no part of the business of government to enforce religious or other opinions believed to enhance moral virtue; and the reason is that in the absence of objective criteria of moral goodness, attempts to enforce it must lead to civil strife and persecutions destructive of those common goods for which all men must necessarily strive. The removal of morality and religion from the public agenda secured peace and liberty. It also redirected private energies toward methodic, purposive work to enhance wealth. Work, however, was redefined in the new politics as innovative labour to tap natural wealth by means of technology. The success of this endeavour fed back into the system to replace class and church as governing institutions by political parties and the civil service. Class and church had to be replaced because they were inherently irrational institutions incompatible with the institutions of a state fabricated according to scientific knowledge (Hume, 1964; Kramnick, 1968). What is irrational about class and church?

The anchor of class is the notion of natural inequality in respect to moral goodness: some men are better than others. The new political science responded that by nature, or birth, all men are equal: equally self-interested in life, liberty, and the means to both. In particular, the aristocratic principle that good birth is an entitlement to rule, whereas low birth disqualifies, is twice mistaken. There is no natural knowledge of political science; blue bloods have no more monopoly on it than they have on geometry. Secondly, the aristocratic principle is based on the illusion that virtue is an objective trait, whereas moral language is a canting vocabulary used to gain advantage in social competition (Hobbes, 1960). As for ecclesiastical institutions, they are at best a mystified civil service propping up a class-based politics. At worst they are enemies of scientific enlightenment.

This program was put into effect in Holland by John de Witt between 1652 and 1672. His brilliant success provoked a spirit of emulation in France and England. In 1662, Louis XIV installed J.-B. Colbert in office. Charles II would like to have made the Earl of Shaftesbury his Lord Chancellor, but disputes over prerogative and Protestant succession kept this program in abeyance until the Shaftesbury Whigs triumphed in 1688. The patterns of these governments are well-defined. They set up scientific societies to promote the arts and sciences (Hahn, 1971; King, 1949). They cultivated trade by introducing monetary, fiscal, and legal reforms. They set up the great financial institutions that gathered capital on an unparalleled scale (Dickson, 1967). The political chiefs were either students of political scientists or had them in brain trusts. Spinoza was an advisor to de Witt, himself a Cartesian. Colbert's brain-trusters were Cartesians and Hobbists. Charles II was a Hobbist, while the architect of Whig politics was John Locke. This array of talent used political dominance to hammer out the political doctrine of toleration and reinterpreted religious doctrine so that enlightened assent need not go beyond Deism.

These governments were exposed to stout opposition. The de Witt government was under assault from the Calvinist clergy, which spoke for pious artisans and the gentry. Colbert was vilified by the noblesse and disliked by the Jesuits. In England the Tory opposition was an alliance of churchmen and the gentry. This initial criticism of the rational commercial republic is not well known, partly because it scarcely bears reading today, and partly because it defends lost causes. However, examined in the light of new knowledge of Homo sapiens, it confirms the accuracy of the analysis of the nature of the problems of government stemming from Seventeenth Century political science. For our purposes we cannot do better than mention Jean-Jacques Rousseau's jeremiad. Rousseau propounded a series of paradoxes. The progress of science and technology, he claimed, menaces virtue, especially valour and patriotism. Political society and civilisation, far from representing a progress from primitive conditions, is a corrupt way of life that straitens and embarrasses men by shackling the sentiments to a thousand social deceits and enslaves them to opinion. Wealth relieves the penury of some, but creates miserable inequalities for others and diseases for all (Rousseau, 1964).

While these views are associated with Rousseau's name, he didn't originate them. They composed the gist of fifty years of over-wrought Tory polemic against Whig politics, reaching its height during the government of Sir Robert Walpole (Kramnick, 1968). Prior to Rousseau, France did not produce a writer of talent to express them, but diaries and poetry of the noblesse are filled with these ravings.

These writings exhibit the following common features: (1) It is a rhetoric of jeremiad, or to use the Australian expression "whinging". The whinge is that the world is in decay; that it is being "corrupted" by a variety of modern commercial and political institutions (Pocock, 1976). (2) The rhetoric is given to histrionic exaggeration. It is obsessed with moral melodrama of the

iniquitous exploiter and his victims. In the Tory version, the exploiter is the parvenu, especially Jewish stockbrokers, whose victims are the virtuous landed men. This element, though present in Rousseau's writings, is secondary to another exploiter-victim pair: the good "simple souls" whose virtue is confounded by cosmopolitan intellectuals. (3) There is a pronounced nostalgia for a lost past, identified chiefly with the virtuous republic of antiquity. The yearning for virtue, and anxiety of its loss, is specifically a yearning for manliness. The virtue paradigm is heroic virtue – patriotism and civic spirit, unswerving devotion to duty, and above all warrior prowess and the glory of warfare. (4) The virtue anxiety and the corruption whinge lead up to the dramatic representations on behalf of a return to the original purity and virtue, often in the form of small warlike republic of the past. These admonitions are accompanied by dire warnings that continuance in the corrupt condition will expose the nation to enslavement by foreign conquerors.

This whinge probably expresses the fantasies of the civilised hunter pining for his lost warrior experiences. Picture if you will Rousseau or Bolingbroke, both alienated men, invoking euphoric warrior virtue as the redeeming balm for corrupt civilisation. The emotional gradients or corruption/virtue opposition suggests that it is a manic-depressive fantasy (Winokur, Clayton, Reich, 1969). It certainly is not the common variety of warrior fantasy, which every culture ritualises, for example, in the current football mania (Morris, 1981). A manic-depressive fantasy will conjure enemies, identified in the present instance through the moral melodrama which assigns an iniquitous cause (stockbrokers, cosmopolitans) to corruption; the corruption is depicted as crying out for rectification through a redemptive violence which magically restores the lost ancient virtue. This analysis finds some confirmation in the circumstance that much of the euphoric blood-letting of the French Revolution was justified by reference to Rousseau's Roman fantasies. More interesting for the present purposes, however, is the fact that the manic-depressive fantasy was identified by the originators of political science as *the* syndrome tending to destabilise political order. Let me explain this a little.

For Hobbes and Locke, the state is the artificial construction fabricated when men leave "the state of nature", i.e., the hunter-gatherer existence. They did not suppose that on entering political society men somehow eradicated their original nature; the whole object of government is to design institutions so that men's irrepressible original nature can be made tolerably to fit political society. What is this nature? Hobbes represented it as a chaotic "war of all on all", whose only remedy is ordered thought, i.e., political science. Although chaotic, the human psyche in its natural state does exhibit patterns. One is the rapturous state called "enthusiasm" in which it is believed that one is filled with the gods, or the holy spirit, or some other divine agency. Enthusiasm was a common feature of Seventeenth Century religious life, but Hobbes' believed that it arose wherever there was belief in spirits, that is, in all cultures. Now enthusiasm is a manic state, which Hobbes paired with a depressive state called "superstition". Superstition is belief in evil demons, trolls, witches, kobolds, and other malignant agencies that perpetrate iniquities, including seduction of the righteous. Attentive readers of *Leviathan* find that Hobbes traced the history of Israel's civil calamities to the fact that

Israel's civil prudence, signified by "guilt" and "righteousness", was nothing else than the manic-depressive syndrome. Similarly, the wars and calamities of the Greco-Roman world he traced to the same syndrome, signified under the terms "virtue" and "vice". Righteousness and virtue are *hallucinating states* (that is Hobbes' express word) where the public good is manically or depressively attributed to the effects of certain attitudes, called "spirits". *Because* this civil prudence is manic-depressive, it represents harmful, iniquitous attitudes as requiring extirpation so that beneficent, righteous attitudes (spirits) may prevail. Manic-depressive civil prudence thus impresses a chaotic psychological state upon society. Since extirpation of iniquitous attitudes requires persecutions and wars, civil society is never free from turmoil.

The upshot of our analysis defines a basic principle of Hobbesian political science. The flaw of all previous political societies was the incomplete emancipation of their civil prudence from the state of nature. In that state, each individual attempts to extract from others agreement with his opinions concerning good and evil; each strives to impose a consensus of attitude. This impulse is carried over in the defective civil prudence as the demand for *moral consensus*. For Hobbes this was an impossible demand. Moral consensus cannot be achieved even among hunter-gatherers; it is out of the question for cosmopolitan political society, where diversity of activity and interest guarantees variety of attitudes and values. On the basis of evidence available today, we should modify Hobbes' position. The demand for consensus is not to be traced to individual striving for power so much as to a trait of tribal sociability. While hunter-gatherers have their quarrels, their survival placed a premium on cooperative endeavour; individualism was a luxury they could not afford. But cooperation is not primarily a rational calculation; it is built into the repertoire of face-to-face behaviours. Indeed, it is so powerfully built in that collaborative small groups in any setting, from the athletic teams to research teams, are seriously disturbed by personal differences. Small group collaboration does require a value consensus, including personal esteem for group members, although the consensus need not include all values. Hobbes recognised that such a consensus can never be attained in political society, where it would in any case be undesirable. He also realised that this fact was unrecognised in the civil prudence of all nations, and that a completely new set of possibilities would open to governments that achieved stability by eliminating this error. Above all, he identified war as the main source of civil disorders. In the light of modern evidence, let's give Hobbes' analysis a new twist. The propensity to war does not register natural competitive individualism, but derives from the hunter-warrior's cooperative sociability. Indeed, males never achieve higher grade of solidarity than when they fall upon an enemy in a shared state of *hallucinating manic ecstasy* (Warburton, 1975). Male neuro-endocrinology is so thoroughly programmed for warrior solidarity that it is no effort at all for Scout masters, athletic coaches, drill sergeants, or gang leaders to transform *randomly assorted* youths into groups whose members are jealously loyal to one another despite competition for leadership; whose pride of solidarity easily translates into contempt of mere "civilians" who itch to be turned loose on some enemy to enjoy murder and mayhem. These behaviours are present in

football games or other ritualised blood sports, and the spectators, taken up by the mood contagion, participate in the war euphoria. All this is innocent play. Confusion begins when some Jeremiah or Robespierre or Ayatolla wishes to impress the real, though hallucinating, solidarity achieved by warriors upon political society *as it's regular mode of social solidarity*. From a rational point of view, this is simply an error in political technology: The thing cannot be done. But the problem does not arise so much at the level of rational science as with the manic-depressives who become political moralists or leaders.

Practitioners of Hobbesian political science developed a number of technologies for controlling the war propensity. At the policy level, they repudiated war for booty or national honour, on the grounds that production is the mother of wealth and that honour is smoke. ("Buy peace if you can, fight if you must", was John de Witt's watchword.) That perennial source of martial spirit, the aristocracy, was phased out, together with the ecclesiastical guilt-and-redemption moralisation of politics. Public opinion was up-dated by substituting the calculus of self-interest for "ideal motives", while the free press was expected to reflect the diversity of interests and thus split opinion into so many fragments that a dangerous consensus could be formed only with difficulty. In this milieu it was possible to go very far toward reducing public business to negotiating agreements between rival interest groups.

The French Revolution administered a jolt by associating modernising reform with hunter-gatherer behaviours. A segment of the public identified civil prudence with revolutionary mania and the excitement of rioting crowds. They believed that no government measure was democratic unless promulgated by many thousands massed in the Place de la Concorde. This sentiment destabilised French politics for more than a century. The Blanquis and Proudhons pictured revolution as a cataclysmic event that would sweep away the old corruption and inaugurate a new age in which human behaviour was transformed. It was the old political millennialism of Jeremiah, of Cato, of the Calvinists, of Rousseau. Even so, after Napoleon's final defeat, European statesmen arranged an era of peace that should today awaken our interest. Peace was maintained despite the doubling of Europe's population and unprecedented change of every description. It as maintained despite a necessary shift in the balance of power toward Germany, which was accomplished by a sharp six week war. By 1900 the political economics, and military power concentrated in half a dozen nations was so overwhelming that they could have settled a world order with a good chance of enduring for centuries.

We know that it did not happen. The powers that might have imposed peace went to war for trifling reasons having to do mainly with national honour and ambition. The United States led by a Presbyterian President, broke with its long-standing enlightened policy of non-involvement and entered the war under the Boy Scout pledge to make the world safe for democracy. Clearly, enlightened political leadership had been derailed. The course of the war showed how great a mishap it was. Enlightened England led the way in broadcasting war propaganda whose bigoted cant was excelled only by its

brutality. International socialism transformed yo national socialism when trade unionists rallied to the colours. Obstinance in the chancellories was unmoved by mounting deficits and three million battle deaths. I will not dwell on the collapse of enlightened political leadership and the subsequent rise of horrific megabrutality.

The streams leading to witless government no doubt flow from many sources, but one especially deserves attention. The decline of enlightened political leadership correlates with the rise of modern social science. When we examine the attitudes of leading social scientists toward the war, our suspicion that this correlation might be meaningful increases. The political scientist who happened to be the American President broke solemn election promises and took the nation to war because he fancied himself an evangelical redeemer. In Germany, the penetrating Max Weber declared in August, 1914: "Despite its hideousness this war is great and wonderful and worth experiencing". In France the gentle Emile Durkheim sociologised his countrymen with fierce patriot devotion. L.T. Hobhouse did likewise in England, and even carried the propaganda war to the intellectual front by refuting the Hegelian metaphysic which he believed was the lynch-pin of the German war effort.

Something went wrong and it isn't difficult to discover what. All these men discarded the political science that had furnished the politics of progress its civil prudence. They replaced it with a chaotic secular religion. Durheim's sociology contained no acknowledgement of government and politics. He maintained that social behaviour is determined by the *conscience collectif*, that is, the moral conscience of the community. He took satisfaction in his discovery that this communal moral conscience was what men had for millennia worshipped as God. He felt that his discovery considerably moderated the pains of secularism. So complete was Dirkheim's innocence that he never doubted that "society" could not exist without God, i.e., moral consensus. The idea that political society requires diversity of values in order to exist could not form in his mind. Such diversity as did penetrate to his consciousness he set down to "deviance" or "anomie", the sociologian's version of sin. In our century, which has seen politics and more politics, Durkheim's sociology has operated as a machine translating policy and deliberate government action into deliverances of the social consensus, whose august moral majesty paralyses the critical faculties.

Weber's contribution to or participation in (which is hard to say) the defeat of enlightened leadership is an important index of the causes of its collapse. Indeed he may be said to have hit upon the formula for unenlightened leadership characteristic of this century. According to Weberian sociology, leaders who introduce major social changes, are individuals endowed with a rare power to attract the faith and loyalty of mass followings, in the manner of Muhammad or Calvin. This power he called "charisma", a New Testament word meaning "gift of grace", the manic experience of forgiveness, or relief of the depression of guilt. The link between religious cults and political leadership is Weber's notion about values. The achievement of the charismatic leader is his ability to lay down a table of values for a large

community, and, through his charisma, to inspire men to live by it. These values are accepted on faith, i.e., the say so of the leader. Political leaders are in the same boat with religious leaders because the values they espouse to the public must also be accepted on faith; unlike facts, value is an ineluctably subjective, ultimately irrational choice. On this basis Weber's sociology suppressed the distinction between rational and irrational politics: all politics is ultimately irrational.

Weber had drifted so far from political science that he never mentioned its solution to his value problem. It is this. The subjectivity or irrationality of values implies a clash represented by the "war of all on all". The war is incompatible with security of life and freedom from arbitrary punishments; all therefore share an interest in its termination. The means to that end is government constituted to maximise the freedom and security of all. In this political order, the value judgments entailed by this reasoning are public values established in law and institutions. The large residue of clashing values become private opinion and variety of life style *necessarily* involved in the diversity of political society. Each individual has the right to live out his irrational value choices however he pleases, unless they conflict with public law. Weber's value problem is thus not a political value at all; it is a matter of private conscience that he mistook for a question of public significance because he believed that political society required a moral consensus or orthodoxy. Precisely this tendency, typical of sectaries, promoting a manic-depressive rhetoric, was identified by political scientists as *the* error disturbing political order. To accept the rational table of values no inner illumination or act of faith is required. And politicians who put it into practice were as far as can be from charismatic leaders. They enjoyed no large following; often they were hated by the public they benefited. They did not require a large public following because government is not a matter of mass movements, public opinion polls, attitudes, and the like. It is a matter of studied, methodical work.

Consider then the difference between political science and Weberian sociology. The first has a firm grip upon values and upon the nature of politics. As civil prudence it could and did provide the basis for rational political leadership for over three centuries; it is still with us. Weberian sociology, by contrast, leaves the decision on public values to sectaries who win public opinion contests. It is therefore a political sociology for followers and devotees of great men – Napoleon, Stalin, Khomeini, it scarcely matters because this sociology cannot distinguish between them. We see then the complete collapse of leadership capacity in Weber's social science. But the matter doesn't end there. Like Durkheim, Weber went on to obliterate even the perception of political leadership. This he did in his study of the origin of "capitalism". Those familiar with studies of this subject prior to Weber will be aware that "capitalism" was regarded as one of the signal triumphs of rational politics; and its course was traced through de Witt, Colbert, Locke, Walpole, Adam Smith, the American Founders, and other men of leadership status. From Weber's study of the origins of capitalism one would not learn of the political-economic success of these men nor even of their existence. Instead, this immense political development is traced to attitudes fostered by John Calvin. Weber doesn't discuss Calvinist politics. Let it be said then that they

were Godly Commonwealth men or Millennialists whose agitations against worldliness and corruption perpetuated riot and revolution until they were finally beaten down by the rationalist politicians who initiated the politics of progress (Caton, 1983). According to Weber's study, however, capitalism was the unintended outcome of Calvinist moral attitudes toward work. There never was a rationalist politics at all.

Weber's study is compatible with or encourages the tribalism so marked in the twentieth century politics. The intelligentsia, including many social scientists, tend to estimate a government's legitimacy by the number of riots staged for or against it, not by its declared policies and its ability to carry them out. It tends to identify statesmanship with the demagoguery, and the political skill with the manipulation of crowds. Injustice it tends to identify with the discrepancy between wealth and poverty; righteousness is the fury of multitudes claiming their share of the wealth, viz., all of it. Progressive social policy is thought to be most advanced where party competition has been replaced by a para-military party leading a militant, unanimous people in cultural revolutions for equality, social justice, and backwardness. These clichés are so deeply embedded in the mental habits of the intelligentsia that they remain unshaken by documented evidence of the catastrophic economic and human effects of these regimes. Charismatic manic-depressives – most recently His Sublime Luminosity the Ayatollah – have been able to influence U.S. policy in their favour, against “corrupt” allies, merely by manipulating these clichés. Policy questions are thought to be somehow imperfect until they are turned into moral crusades, preferably with cult following. Environmental protection, for example, is largely a matter of technical problem-solving and cost-benefit trade-offs. But it has been turned into a whingeing tool for berating Wicked Industry and meat-eating. The object is to turn every question into a moral issue of grave public concern, which provides a suitable excuse for obstructionism and harassment of those charged with the public business.

The tropisms of this so-called reform politics are manifestations of hunter-gatherer behaviours. Yearnings for “community” (the tribal group) underwrite enthusiasms for regimented societies equally with “involvement” and “personalised relations”; it is the appetite for the endocrine hit that produces the warrior ecstasy. The dramatisation of politics as the Virtuous Many vs the Wicked Oppressors is the flip side of the Virtuous Tribe following the Heroic Deliverer. Finally, the sociology tribe have come forward with a tribal epistemology. We are told that even scientific knowledge has its “sociology”. Scientific knowledge derives from charismatic sectaries who make “scientific revolutions” by laying down “paradigms” that establish theory for a mass following who conduct “normal science” on that basis. Knowledge therefore derives from the scientist's peer group paradigm: he sees what his paradigm tells him to see, and nothing else. Science is merely another way of playing the tribal language game.

The attack on scientific knowledge – and make no mistake, it *is* an attack – furnishes an elegant criterion for distinguishing the tribal thinking of social scientists from the cosmopolitanism of science. The scientist will tell you that

the condition of his conscience or sex life or peer group relations have no bearing on his scientific work, where the only thing that matters is evidence. “Paradigms” are models or empirical laws. Models are created and dismembered without undue worry about what the peer group might say; the peer group – a loose international aggregate of cosmopolitans – is engaged in the same activity. As for empirical laws, they are sanctioned by nature, not by sects. The most recent attempts to sociologise science resulted in Aryan race theory and the Marxist-Leninist biology, both of which were quickly identified as frauds. If the sociological epistemology of scientific knowledge reveals nothing about science, it tells us a great deal about its advocates. It confesses that *their* “knowledge” is merely the protean component of the social grooming process. It tells us as well that although they are daily exposed to the material consequences of exact objective knowledge, they can form no concept of it. This is the atavistic mentality that today wages a campaign to discredit expertise and specialised knowledge, especially where experts contribute to framing public policy. We know where this leads because we’ve seen it happen on a large scale several times in this century, most recently in Mao’s Cultural Revolution. Technical education is abandoned as “elitist”, the engineers and doctors are sent to till the soil, and loyal tribes are placed in charge of the technical apparatus upon which civilisation depends. To the surprise of none but themselves, the result is chaos.

I am glad to say that many social scientists will not recognise in my remarks a description of what they do or how they think. Of those many, some have already retrained in biosocial science or are in the course of it. The remainder, who desire objective knowledge, and who are perhaps concerned by the failure of their disciplines to make solid contributions to the maintenance of social machine, are potential recruits to biosocial science.

In this paper I have attempted to specify some of the configurations within which political scientists may fruitfully frame biosocial research. Our analysis suggests that the main problems of political science are generated by the central problem of political society – finding and applying effective social technologies enabling a species whose social behaviours are evolved for small group interaction to associate in large, coordinated aggregates. We are still in preliminary stages and I may have blundered. About this I am not overly concerned; we are now dealing with self-correcting science. It is sufficient if the present essay conveys some impression of the wide range of phenomena that may be brought into systematic, experimentally –founded order.

Biosocial science provides the political scientist with a non-arbitrary value orientation mandated by the nature of politics. Political scientists may apply the results of their research in the same way that natural scientists apply theirs as engineers, designers, trouble-shooters, clinicians, analysts. As a research cadre, they may expect to become the custodians of the science necessary to maintaining civilised existence. Today a certain urgency attaches to that science. We expect 6.1 billions on this planet by the century’s end, even though birth control programs are showing encouraging success.

The social and economic overheads of industrial nations are enormous and will almost certainly need to be redesigned to a reduced scale, at least in the short run. The insolvency of national pension schemes together with the growing demand on them is one example. A serious disruption in one large industrial nation could trigger a chain reaction leading to general breakdown of civic order, with appalling consequences. Catastrophe scenarios are a fact of life today. But biosocial science holds the promise – to my mind the only promise - that the brains of men can do something about it. In the past, crash research programs have yielded spectacular successes; we appear now to be on the verge of reaping the benefits of crash program in cancer research. A crash program in biosocial research is feasible' it is also the utmost importance to the public weal. I am confident that we would learn how to eliminate that most dangerous of all threats, general nuclear war. Some may call that confidence visionary, others naïve. But we now have a firm grip on the psychoneuroendocrinology of hunter aggression as well as its behavioural tropisms. We therefore know how to define the problem. If the mechanisms of restraint now in force will hold but a while longer, we may hope to check that most woeful of all human behaviours, war.