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SCIENCE VS. LAW: SOME LEGAL PROBLEMS RAISED
BY "BIG SCIENCE"*

ARTHUR SELWYN MILLER**

Because the science we have now so vastly exceeds all that has gone before, we have obviously entered a new age that has been swept clear of all but the basic traditions of the old. Not only are the manifestations of modern scientific hardware so monumental that they have been usefully compared with the pyramids of Egypt and the great cathedrals of medieval Europe, but the national expenditures of manpower and money on it have suddenly made science a major segment of our national economy. The large-scale character of modern science, new and shining and all-powerful, is so apparent that the happy term "Big Science" has been coined to describe it. Big Science is so new that many of us can remember its beginnings. Big Science is so large that many of us begin to worry about the sheer mass of the monster we have created. Big Science is so different from the former state of affairs that we can look back, perhaps nostalgically, at the Little Science that was once our way of life.

*Derek J. de Solla Price, Little Science
Big Science 2-3 (1963).*

INTRODUCTION

WHEN speaking of "legal problems raised by 'big science,'" one must of necessity begin in an atmosphere clouded by ambiguity. At least four of the words in the title of this article require clarification: "legal," "problem," "big," and "science" (or, what is perhaps better, "big science"). At the outset, therefore, it seems desirable to try to provide a common understanding of these symbols, to establish a point from which we can leave together. Lawyers know better (at least, they should know better) than most the slippery nature of words. One of the first things a law student learns is to demand in any serious dialogue: Define your terms. It is the failure to do so that makes so much debate, not excluding much in law, so sterile and futile. What, then, is meant by those words?

Beginning in reverse order, by "big science" is meant, to use Dr. David Edge's definition, "those areas of basic science, and of mission-oriented technology, which cannot, because of their nature and scale, proceed without the appropriation of extensive public funds, and hence demand that detailed decisions be made by people other than the scientists directly involved."¹ With deference to Dr. Edge, that, too, leaves something to be desired. But if we

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1. Letter from Dr. David Edge, Director of the Science Studies Unit, The University of Edinburgh, July 3, 1967 (used by permission). See also A. Weinberg, *Reflections on Big Science* (1967).

take "big science" to mean that science and technology that gets direct government support, perhaps a rough idea may be derived from the term. However, "big" science or technology seems too restricted. The cumulative impact of, or legal problems raised by, "little" science may be quite as significant as—perhaps, more than—the large aspects of science. Hence, this article deals with "science" and with "law" without trying to determine what is big or little. In any event, the specific instances of big or little science are numberless; government, at least in the United States, has an inexhaustive curiosity about everything that exists on the planet or in space. That curiosity might be said to be scientific; its application is technological; and it is big simply because the cost factor is often too large for an individual or for most corporations. As Professor Harold Green has said in the November 1967 issue of the *Bulletin of Atomic Scientists*: "Our national commitment to technological advance seems irresistible, irrevocable, and irreversible."² This means that the American government is deeply committed to furthering scientific knowledge *as an end in itself*, and that, accordingly, the governmental dimension is present *in some way* in the great bulk of science and technology. What those ways are may and do differ, but the governmental presence is nonetheless there—ubiquitous, all-pervasive, significant.

The problem, in the next place, of *What is a problem?* is not easily answered. Felix Cohen, a well-known legal theorist, suggested as much in an interesting essay, *What is a Question?*, published almost forty years ago;³ and Professors Mayo and Jones, writing in a symposium devoted to law, science and technology, have more recently addressed themselves to the concept of problem.⁴ Those situations called "problems" are not always easily identifiable in the context of the law-science interface. Professor David F. Cavers, in the course of listing six "points of confrontation" between law and science, has said that the "points of contact between these two systems . . . are so many and so diverse that it is hard to find unifying themes to guide the inquiry."⁵ A suggestion I should like to make at the outset, then, is that serious attention must be accorded the methods and the criteria by which problems are identified in this burgeoning area of public concern. At the very least, this will require

2. Green, *The New Technological Era: A View from the Law*, Bull. of the Atomic Scientists, Nov., 1967, at 11. See also J. Ellul, *The Technological Society* (1964).

3. Cohen, *What is a Question?*, in *The Legal Conscience: Selected Papers of Felix S. Cohen* 3 (L. Cohen ed. 1960).

4. Mayo & Jones, *Legal-Policy Decision Process: Alternative Thinking and the Predictive Function*, 33 Geo. Wash. L. Rev. 318 (1964).

5. Cavers, *Introduction to Science and the Law Symposium*, 63 Mich. L. Rev. 1325 (1965). His "points of confrontation" include: (1) those which the law must draw on scientific knowledge to reach decisions in adjudications; (2) those which compel the re-examination of the adequacy of established legal doctrine; (3) those in which science has created new hazards that have led the state to intervene; (4) those which government employs to choose scientific objectives, ration scarce resources, and maximize the contributions of scientists; (5) those which government uses taxation to give or withhold incentives to scientific and technological development; (6) those which are creating the need for new legal relationships with other nations because of new contacts throughout the planet.

that attention be paid to goals or long-term objectives, for a situation can only be a problem if it does not give reasonable likelihood of achieving postulated ends. That, as will be emphasized, will in turn require a new type of thinking by lawyers.

Science, to state the obvious, means change, change in the social order and change in the governmental and legal order. The truistic nature of this point should not be permitted to diminish its importance; cliché though it may be, it is unlikely that most people, of whatever calling, have yet come to grips with the cataclysmic nature of change wrought by the scientific-technological revolution. What this suggests, *inter alia*, is that the problems (however identified) presented by science to law must be perceived not only as those *present*, but also as those *emergent*. By making change a social constant, science requires appropriate resolution of already known problems and the ability to anticipate future problems, plus the ability to take adequate action in advance. Change, in other words, must be managed—a simple proposition but one pregnant with difficulty—and it is here that law comes into play. If the lawyer is only a neutral technician, he will have nothing to offer; but he must be more than that. The difficulty of managing change is magnified once it is fully realized, as it must be, that the very existence of a problem means that the answers of yesteryear are at least suspect and in need of re-examination, if not outright rejection. But law is the articulation of the “answers of yesteryear.”

Our means of identifying problems, furthermore, often determines the answers that are rendered. Let me illustrate. Are the Negro riots in American cities the result of social conditions and frustrations? Or are they merely overt criminal behavior? In the United States, one can find spokesmen for both views. As for the sonic boom, is the correct question the one the U.S. government has asked—How much noise can the human tolerate? Without taking sides, my point is that the manner in which a question or problem is put often suggests the reply. A variant of this is a theme the late Justice Felix Frankfurter often repeated: one can never get correct answers without first posing the correct questions.⁶

But what is a “correct” question or problem? Here another preliminary point must be made: In my judgment, it is impossible to identify problems (or facts, for that matter) without a theory, or, if you will, without an ideology. The old saw to the contrary notwithstanding, facts do not speak for themselves—and neither do problems. As Morris Raphael Cohen has said, “without the use of concepts and general principles we can have no science, or intelligible systematic account, of the law or of any other field. And the demand for system in the law is urgent not only on theoretical but also on practical grounds. With-

6. See *Estate of Rogers v. Commissioner*, 320 U.S. 410, 413 (1943) (“In law also the right answer usually depends on putting the right question.”); *Priebe & Sons v. United States*, 332 U.S. 407, 420 (1947) (“[B]ut answers are not obtained by putting the wrong question and thereby begging the real one.”)

out general ideas, human experience is dumb as well as blind.”⁷ It is, says Professor Iredell Jenkins, “truistic that throughout most of its history, law has operated within an intellectual, moral and social order that was antecedent to and independent of it and that controlled its operations.” Law, in other words, had problems thrust on it from other sources; “the function of legal institutions and the legal profession was simply to translate and effect decisions that had been otherwise arrived at.”⁸ To date, it must be admitted that law does not have the resources requisite to the establishment and maintenance of a given social order. That it will have to develop those resources and institutions is one of the conclusions of this paper, *if*—and this is a large “if”—a humanistic social order is to come into being. Law—and when I say “law” I really mean lawyers, for I do not believe that law has an existence apart from mankind; lawyers are the elite having most to do with it—must develop the purposes and values it will promote, determine the commitments of men and control their energies, and refashion the social and physical environment. A large order, that, and one not possible without a commitment to something more than a system of “ad hoc-ism,” of waiting for problems to develop, and of treating each problem as a discrete example mainly by looking backward to see where man has been.⁹ The pragmatic approach will not do, whatever variation of the seventeen types of pragmatism may be followed. The trouble with pragmatism is that it provides no goals; a pragmatist really doesn’t know where he is going, only that he is on his way. At the very time, thus, that science and technology have created the urgent need to manage change, which includes the clarification of goals at the barest minimum, some sort of ad hoc recognition and dealing with problems is still employed. Whatever one thinks of Vietnam, it surely is a classic example of where that type of thinking leads: a problem is not a problem until it is a crisis, until, that is, it has reached the point where one can no longer “retain his options”; it is then too late to deal with it properly. The “moon shot” falls into the same category. Pragmatists are like the businessmen described by John Maynard Keynes: the practical men of action who in fact are intellectual prisoners of the ideas of defunct academicians.¹⁰

I have come this far without defining the term “problem”—and I intend to

7. M. R. Cohen, *Reason and Law* 63 (1950).

8. Jenkins, *Theory and Practice in Law*, 19 U. Fla. L. Rev. 404, 418 (1967).

9. “Ad hoc-ism” is discussed in Miller, Book Review, 15 Stan. L. Rev. 138 (1962). See also H. A. Kissinger, *The Necessity for Choice* ch. 12 (1960).

10. See J. M. Keynes, *The General Theory of Employment, Interest, and Money* 383-84 (1936): “The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. . . . I am sure that the power of vested interest is vastly exaggerated compared with the gradual encroachment of ideas. Not, indeed, immediately, but after a certain interval; for in the field of economic and political philosophy there are not many who are influenced by new ideas after they are twenty-five or thirty years of age, so that the ideas which civil servants and politicians and even agitators apply to current events are not likely to be the newest. But, soon or late, it is ideas, not vested interests, which are dangerous for good or evil.”

leave it that way, to suggest it as a question that must be pondered rather than to give a definition. In the discussion below, however, some further reference will from time to time be made to some of the problems inherent in the concept of problem.

Finally, what is "legal"? Speaking sententiously, there is no such thing as a pure legal problem—at least as the term is usually understood. There are human problems, some aspects of which lawyers, with varying skill, are equipped to deal. Put another way, all "legal" problems have "policy" features. A statement of law or of legal doctrine usually is normatively ambiguous: With regard to a given set of facts, it is at once a statement of what some official in the past has said was the law or a legal rule, a prediction about what some official (judge or administrator) will say in the future, and a statement—often unconscious—of a preference or value judgment.¹¹ To be sure, statements of law or legal rules are not made in that way; they are laid down with apparent definiteness and clarity. The law has an outward precision that only the uninitiated believe—and even some of the initiated are not immune.¹²

One reason for that is, as was just said, "legal" also means "policy." That ultimately involves a merger of law and politics. This means, among other things, that an official who has to make a decision has a much higher degree of discretion than some seem to believe, much more, for instance, than a judge was accorded in Blackstone's famous commentaries. For executive and legislative officials, discretion is obvious, but it also is present in the judiciary. More verbal acquiescence is given to this notion in the United States than in Britain, although Professor Otto Kahn-Freund has recently written that the British view is changing.¹³ Judges have a creative role, as do other officials. The point is labored for emphasis, and to suggest that one of the ways that law can grow to meet the challenges of science is through an expansive view of judicial power. One need not join Arthur Koestler's "Society for the Prevention of Cruelty to Dead Horses" to be able to assert, once again, that judges are not automata.¹⁴

Even so, even in America the concept of policy is little analyzed and little

11. See Lasswell & McDougal, *Jurisprudence in Policy-oriented Perspective*, 19 U. Fla. L. Rev. 486, 498 (1967). But see Probert & Brown, *Theories and Practices in the Legal Professional*, 19 U. Fla. L. Rev. 447 (1967).

12. See Shklar, *Legalism* 101-02 (1964) (discussing the reluctance of even some judges to face up to this fact); Breitel, *Ethical Problems in the Performance of the Judicial Function*, in Conference on Judicial Ethics 64, 67-68 (U. Chi. Conf. Series No. 19, 1965): "The popular notion that judges are mere declarers of what is in the books, all laid down clearly and simply, is not confined to the laity. It obtains too with large segments of the bar. And judges still believe it."

13. Kahn-Freund, *Reflections on Legal Education*, 29 Modern L. Rev. 121 (1966).

14. See A. Koestler, *The Ghost in the Machine* 349-53 (1967). The "society," says Koestler, is made up of those who criticize a line of argument because, "since the pillars of the citadel are already cracked and revealing themselves as hollow, one ought to ignore them and dispense with polemics. Or, to put it more bluntly, why flog a dead horse?" *Id.* at 4.

understood.¹⁵ The legal profession, it must be said, is in a comparatively primitive stage of existence, both as to knowledge and as to institutions. For example, the Chief Justice of the Supreme Court of California, Roger J. Traynor, has said that in his judgment only a few lawyers have any idea about how appellate court judges come to decisions.¹⁶ In the United States, a stream of cynical acid known as "legal realism" a few decades ago did a great deal to pierce the fog of ritual and myth that surrounds the legal profession,¹⁷ but it has not yet been translated into something more constructive. The Blackstone theory of law may be dead, but it still rules us from the grave.¹⁸ Many lawyers, perhaps more in Britain than in America, still labor under the delusion that law is some sort of Platonic idea, existing in a heaven of legal concepts, applied by supermen called judges in that handful of "hospital" cases or socially pathological disputes that get cast before them for settlement. Justice Oliver Wendell Holmes once maintained that law should be viewed as through the eyes of the "bad man," a fallacy that still prevails (even though it has been effectively refuted by Professor H. L. A. Hart¹⁹).

All of this is relevant to our inquiry, for I am not certain that a lawyer, even one of us poor drones called law professors, is in a very good position to identify the legal problems raised by big science. But, then, no one else is either; for that matter, others may be even worse qualified. The point to be seen is that the lawyer, both in the United Kingdom and the United States, is a technician, a legal mechanic, a plumber, a person who has problems thrust on him; he is not an engineer, a philosopher, or a seer, even though that type of mind is necessary to perceive the true nature of the problems. In this respect,

15. As long ago as 1881, O. W. Holmes stated in his classic, *The Common Law*, that policy had more to do with the decisional process in law than did logic. See also Holmes, *The Path of the Law*, 10 Harv. L. Rev. 457, 467 (1897) (Judges need to weigh "considerations of social advantage," i.e., policy.); Lasswell & McDougal, *Legal Education and Public Policy: Professional Training in the Public Interest*, 52 Yale L.J. 203, 241 (1943). But the literature of law is almost devoid of any helpful discussions of the concept of policy. The statements in the works cited in this footnote are couched in high level abstractions. The term is often used but never defined with any particularity. The reasons for this failure would themselves be a fascinating subject of inquiry; quite possibly, they are traceable to the Blackstone "declaratory" theory of law, which denied that the judge should take such matters into consideration. See Miller & Schefflin, *The Power of the Supreme Court in the Age of the Positive State: A Preliminary Excursus*, 1967 Duke L.J. 521, 523-36.

16. Traynor, *Badlands in an Appellate Judge's Realm of Reason*, 7 Utah L. Rev. 157 (1960).

17. An account of legal realism may be found in E. W. Patterson, *Jurisprudence: Men and Ideas of the Law* (1953). See Gilmore, *Legal Realism: Its Cause and Cure*, 70 Yale L.J. 1037 (1961); Rumble, *The Paradox of American Legal Realism*, 75 Ethics 166 (1965).

18. As recently as 1965, Professor Paul Mishkin asserted that while the Blackstone declaratory theory of law may be "in part myth," but that it could be "sacrificed only at substantial cost." Mishkin, *The High Court, the Great Writ, and the Due Process of Time and Law*, 79 Harv. L. Rev. 56, 62-70 (1965). Professor Mishkin is criticized in Miller & Schefflin, *supra* note 15. See also P. Mishkin & H. Morris, *On Law In Courts* 57 (1965), in which the authors assert that the declaratory theory is dead. Even so, even if that be accurate, most writing in law journals and legal texts seems to be predicated on an acceptance of that theory.

19. See H. L. A. Hart, *The Concept of Law* (1961). The "bad man" notion was asserted in Holmes, *supra* note 15, at 459.

it may be that the lawyer and the scientist are not so far apart intellectually. Compare, in this regard, a recent statement by Brian Abel-Smith and Robert Stevens in *Lawyers and the Courts*: They say that

power and influence in the modern state has ebbed away from both lawyers and judges²⁰ because of a reluctance to face up to the needs of the modern age,²⁰ with the admission by a committee of the National Council on Radiation Protection and Measurement that “. . . the permissible levels of radiation exposure is not basically a scientific question. . . . It is more a matter of philosophy, of morality, and of sheer wisdom.²¹

Science and technology are at once contributing to the decline of the lawyer and producing conditions that cry out for sophisticated treatment by lawyers. To quote Jenkins again: “Legal institutions and the legal profession are assuming, partly of their own pretension and partly because it is thrust upon them, the central role in defining and creating a new social order.”²² But if so, it is a role that thus far has produced little activity by lawyers.

So we begin in ambiguity. The lawyer as a technician is little concerned with “big science,” save when he is called in after the fact to put policies in the proper form or he is called on to litigate some impingement of science on the human personality (*e.g.*, sonic booms). I can still remember the look of astonishment on the face of an officer of the American Association for the Advancement of Science when, a few years ago, a colleague and I suggested that law might have something to offer to science and that a profitable interchange could and should take place. He is not alone; the National Science Foundation, for example, which has considerable to say about scientific matters in the United States, simply does not think that lawyers are relevant. To make them relevant is, I suggest, the first of the problems posed to law by science and technology. And to become relevant, lawyers will of necessity have to draw on insights and concepts developed in other disciplines.²³ That is nothing new. Holmes said it decades ago, and it has been echoed and re-echoed since then. The autonomy of law is surely one of the greatest delusions of the profession.²⁴

20. B. Abel-Smith & R. Stevens, *Lawyers and the Courts* 462 (1967).

21. This is quoted in Green, *supra* note 2.

22. Jenkins, *supra* note 8.

23. The point has been asserted for decades, running at least as far back as Holmes' assertion at the turn of the century that the man of the future was not the “black-letter” man but the master of economics and statistics. A contemporary statement is Frampton, *Scientific Éclat and Technological Change: Some Implications for Legal Education*, 63 Mich. L. Rev. 1423, 1434 (1965). It is a fascinating question as to why there has been so much resistance in the legal profession to this requirement. Possibly an observation of Arthur Koestler will shed light on the problem: “The inertia of the human mind and its resistance to innovation are most clearly demonstrated not, as one might expect, by the ignorant mass—which is easily swayed once its imagination is caught—but by professionals with a vested interest in tradition and in the monopoly of learning.” A. Koestler, *The Sleepwalkers* 427 (1959).

24. These are sedulously cultivated, be it noted, by the law schools, which maintain walls high and impregnable between them and the remainder of the universities of which they are a part. See Miller, *Science and Legal Education*, 19 Case West. Res. L. Rev. 29

The best approach to our basic question is to begin with the large questions first, to analyze the area as an exercise in constitutional law and theory. In saying this, I of course run the risk of your recollection of the fabled elephant in Hindustani, which was approached and felt by several blind men, who were then asked to describe what they had felt. One touched the tail and said it was a rope, another a leg and said it was a tree, and so on. We can only see social matters through our own spectacles, from our own subjective frame of reference. Try as we might to be objective, it cannot be done.²⁵ If, then, I speak of constitutional problems it is partly because whatever expertise I may have is as a student of that particular brand of esoterica. In what is said below, some overlap and perhaps inconsistency may be discerned; if that be so, it is because this particular elephant is difficult to corner and corral.

The perspective of the constitutional lawyer or student of the governmental process is at once more embracing and more productive of insights into the burgeoning area we may call the law-science interface than would be a private-law approach. Constitutional law essentially is made up of juristic theories of politics and economics; it forces one to look beyond the narrow confines of Blackstonianism if he is to understand. There is no need to repeat the six points of confrontation between law and science that Professor Cavers identified; rather, a series of propositions, designed to suggest areas of concern that someone at some time must deal with will be posed. These are not to be thought of as an exhaustive delineation. Some may be rejected as not "legal" or not relevant; but if so, the reply is "Why not?" Lawyers must become concerned with these matters.

Finally, a note of warning: Because of space limitations, I will be rather dogmatic about some very complex matters. This is necessary; I ask only that what I say be taken within the realization that, as Professor Ernest Nagel has said, there is no such thing as a simple and, at the same time, an adequate explanation of any phenomenon.²⁶

A SERIES OF PROPOSITIONS

Let us begin with an assumption, already stated but repeated here for emphasis: science means change and law gives no built-in guarantee that it can adequately cope with the tensions emanating from that change. President Kennedy was fond of asserting that "change is the law of life"—and so it is. This leads directly to the first proposition here advanced.

(1967). The ostensible autonomy of the law is also furthered by the activities of the collectivized bar, e.g., the American Bar Association, and trumpeted by those who believe in the omniscience of the lawyer. As to the latter, see Riesman, *Law and Sociology: Recruitment, Training and Collegueship*, 9 *Stan. L. Rev.* 643, 645-46 (1957).

25. Compare M. Polanyi, *Personal Knowledge* (1958), with G. Myrdal, *Value in Social Theory* (Streeten ed. 1958).

26. E. Nagel, *The Structure of Science: Problems in the Logic of Scientific Explanation* (1961).

I

Science undermines the juristic order. Law, if it means anything, is a conservative force; of necessity, it is conserving of the established order. At least, so it has been in the past. Speaking very broadly, it is fair to say that law resists change; or if that is thought to be unfair, it may be said that law has proceeded in the past by denying change.²⁷ This permits maintenance of the myth of a "government of laws and not of men," and in the United States of the notion that it is governed by a written Constitution. Neither accords with reality. The same conclusion may be reached about the judicial process, which, as we have already said, has traditionally been predicated on the notion that judges have no discretion, no creative role in reaching decisions.

Such a conception of law and of the judicial process appear to be derived from Newtonian mechanics and Cartesian philosophy. Some statements of the late Professor Percy W. Bridgman Nobel Prize winner in physics, are apposite:²⁸

I will not attach as much importance as do apparently a good many professional lawyers to getting all law formulated into a verbally consistent edifice. No one who has been through the experience of modern physics . . . can believe that there can be such an edifice, but it seems to me that nevertheless I can detect an almost metaphysical belief in the minds of some people in the possibility of such an edifice. If one needs specific details to fortify his conviction that there is no such edifice, plenty can be found. . . . The situation . . . for the lawyer resembles somewhat the general situation for the scientist. We have seen that in the popular view the scientist assumes that nature operates according to broad sweeping generalities. This is paraphrased by saying that the scientist must have "faith" that there are natural laws. We have not accepted this view. It seems to me that a better description of how the scientist operates is to say that he adopts the program of finding as much regularity as he can in the operation of nature, without any prior commitment as to how much he will find. So too it seems to me that here the lawyer should and can make no prior commitment about the possibility of erecting a self-contained verbal legal edifice, but all he can strive for is as self-contained and logically consistent an edifice as he can erect.

I do not presume to speak for the scientist, but for the lawyer Professor Bridgman did indicate, at least indirectly, one of the basic problems of the law-big science interface. *Possibly*—the word is stressed because it is doubted that we really know much about legal history—at one time lawyers could think in terms of a "verbally consistent edifice." But that time is now past, long since, even though its heritage still infects much of the thinking of lawyers, as Judith Shklar has recently shown and as the activities of (say) the prestigious American Law Institute evidence.²⁹

27. See K. Dising, *Reason in Society* 154 (1962); but see J.N. Shklar, *Legalism* (1964).

28. P. W. Bridgman, *The Way Things Are* 308-09 (1959).

29. J. N. Shklar, *supra* note 27. The American Law Institute purports to "restate" the

The ultimate need is to reconcile the idea of law as interdiction (as a set of normative commands) and social (and concomitant legal) change brought on by the advent of science and technology. No longer is it possible to think in terms of an *elegantia juris*, of a heaven of internally consistent legal concepts; rather, it has become necessary to think of law in terms of it being a process of decision taking place as a part of, and as a response to, the total community process.³⁰ In short, law must be viewed as *process*, rather than as *static system*; it is fluid and open-ended, always in a state of becoming. No longer is it possible only to look backward, to see where man has been, to deal with the legal problems of the day; it has become necessary to think purposively or, if you will, teleologically. The point has been recognized, however slightly, in the recent decision of the House of Lords that it was no longer invariably bound by precedent. "Their Lordships [will] depart from a previous decision when it appears right to do so."³¹ One need not be a cynic to say that this is nothing new, that their Lordships have done just that in the past—but without open avowal of change. The certainty of the law has always been more "pseudo" than real. Even so, the point is stressed that, as was recently said by Herbert Rosinski, the industrial revolution (the product of the marriage of science and technology with entrepreneurship) has transformed man's way of life "from an 'existence' into an unending 'process.'"³² The situation is magnified when nations make, as they have, continuing commitments to science and technology and expend substantial portions of the national revenues for that purpose. That factor insures the continuation of Rosinski's "unending 'process.'"

The matter may be stated another way: the changes wrought by science and technology have produced a "public-law explosion"; public law, not the private law of the post-feudal, pre-industrial age, now is dominant in the legal system. It is the change in content, in the nature of law itself, that leads me to the conclusion that science has undermined the juristic order. The burgeoning of public law means that the state is no longer the neutral umpire of the private disputes of the citizenry, natural and artificial—although it does retain that function—but an active participant in societal affairs. Possibly some recent statements by Bertrand de Jouvenel will clarify what is meant: He maintains that technology, regarded by society as its "end product," permits, even commands, an accelerating rate of social change. "Our expectation of an enthusiasm are in contradiction with fidelity to 'the ways of our fathers.' But the 'ways of our fathers' so dear to ancient moralists, have always served as a significant

law, which is at best an exercise in futility. It would be far better if that collection of brilliant legal minds would devote itself to the real problems of real people, not the sterilities of asserting black-letter propositions in various categories of law. *Malheureusement*, there is little evidence in legal circles of the ferment of thought so apparent elsewhere.

30. See McDougal, *Law as a Process of Decision: A Policy-oriented Approach to Legal Study*, 1 *Natural L.F.* 53 (1956).

31. [1966] 1 *W.L.R.* 1234, See Leach, *Revisionism in the House of Lords: The Bastion of Rigid Stare Decisis Falls*, 80 *Harv. L. Rev.* 797 (1967).

32. H. Rosinski, *Power and Human Destiny* 93 (1965).

basis for jurists." Those who look only to the past, who "operate traditionally, are a drag upon progress, since, by applying the same process, they take as much time to do the thing as was the case before, and thus impede the general social good of doing far more in a decreasing amount of time. Thus the old idea of 'due process' is hounded out of the productive realm. Judicial procedure is the sole remnant of the old idea of 'the right way,' and therefore an islet of stable procedure in a sea of shifting processes. Just how long can such an islet subsist, when it no longer corresponds to current attitudes?"³³ Furthermore, even the concept of due process has changed and is changing: it is a "living principle,"³⁴ that is not confined within a permanent catalogue of what may be deemed the limits or the essentials of fundamental rights. As Woodrow Wilson might have put it, it is "Darwinian" and subject to "the laws of life, not of mechanics."³⁵ Judicial procedure is not so stable as Professor Bridgman intimates, particularly when it relates to the rights and duties bound up in the distribution of government largesse—what has been called "the new property," much of which has some connection with science and technology.³⁶

One may welcome or deplore the new view of law. What he cannot do is ignore it. The theoretical foundation of our juristic order has been shattered; it remains to be seen in what way it will be reconstructed. Law can no longer be thought of as a seamless web, a logical set of concepts. But law eventually will deal with social change in one way or another. The fundamental difficulty at present is that law has nothing substantive to offer in dealing with change; it must draw its precepts from elsewhere. (In this connection, one may note that the precedent-smashing decision of the House of Lords said that past decisions would not be followed "when it appears right to do so"—but that their Lordships carefully refrained from stating any criteria by which "rightness" might be predicted.³⁷) Law will formalize social change, not control it. As the received wisdom and institutions of the pre-industrial age, it cannot cope with the rapid rate of change. The grand old lady, the common law, was sufficient to the need of the feudal and post-feudal age, but she is now tattered and debilitated, unable to do more than plod slowly behind the runaway train that is big science.³⁸ In its present condition, law, as Professor George T. Frampton recently said, "will not arrest a society speeding without presently known theoretical limitations toward denser population, faster transportation and communication, higher mobility, more intricate machinery, faster automatic

33. De Jouvenel, *The Political Consequences of the Rise of Science*, Bull. of Atomic Scientists, Dec., 1963, at 2-4.

34. As Frankfurter, J., said in *Wolf v. Colorado*, 338 U.S. 25, 27 (1949). See Miller, *Notes on the Concept of the "Living" Constitution*, 31 Geo. Wash. L. Rev. 881 (1963).

35. See W. Wilson, *Constitutional Government in the United States* 56-57 (1908).

36. Reich, *The New Property*, 74 Yale L.J. 733 (1964).

37. This is analogous to the continuing refusal of the Supreme Court to try to define (say) due process of law. It also enables judges to retain a maximum of discretion while being ostensibly bound by law.

38. See R. E. Lapp, *The New Priesthood: The Scientific Elite and the Use of Power* 29 (1965).

processing of data and performance of 'mental' operations, and larger size in units of organized religion, education, government, and business."³⁹ The challenge this poses to law may be insuperable.

What essentially is called for by the undermining of the juristic order by science and technology is the new way of thinking by lawyers mentioned before. The members of the legal profession must learn to think purposively, teleologically, in terms of the ends and goals of society—of how, that is, that humanistic and democratic values can be preserved in a scientific age. Law as normation, as interdiction, will have to be accompanied by law that is goal-seeking. Lawyers, thus, must be concerned not only with the procedure with which human disputes are settled, they must be aware of the substance of the rules. Law, in short, cannot be neutral; it must be "result—" or "future-oriented."⁴⁰

In saying this, it is recognized that I am being presumptuous, as a lawyer, in asserting a wider jurisdiction for the profession and for the discipline. History does not give us high marks. But in a world increasingly dominated by the technocrat, there does not seem to be anyone else, any profession other than law that can at once combine a broadly-gauged interest in social problems and a technique for resolving disputes. Some lawyers fill the bill, and some may be found in other professions, but many more must be educated.

The new way of thinking by lawyers will require one basic change: the system of legal education will have to be revamped.⁴¹ It is already late in the day for this to be done. While legal educators have made some alterations in the past few decades, they largely are too little and too late. Major surgery will be required, not sticking a piece of adhesive plaster on an already unwieldy framework. Elsewhere I have said that "our knowledge about law and legal institutions . . . is roughly comparable to that in the natural sciences of 100 to 150 years ago, before scientific knowledge was revolutionalized by Darwin and Mendel, by Planck and Einstein, and the others who precipitated the scientific revolution. Law and lawyers are in a pre-Darwinian stage, perhaps even in a pre-Newtonian and pre-Copernican stage. As yet, there is not even an accepted taxonomy."⁴² Legal educators for too long (even though they are relatively new to the university world) have proceeded on the assumption that their sole task is to train newcomers to the profession; they have been excessively "practice-oriented," too concerned with what lawyers purportedly do while making a living than with the over-all question of law. Their view, furthermore, of the legal practice seems to be that of a pre-industrial, pre-urban, pre-scientific society. A consequence is that in America, at least, the law schools

39. Frampton, *supra* note 23, at 1430-31.

40. Cf. Miller & Howell, *The Myth of Neutrality in Constitutional Adjudication*, 27 U. Chi. L. Rev. 661 (1960).

41. Compare Miller, *supra* note 24, with Levi, *Law Schools and the Universities*, 17 J. Legal Ed. 243 (1965).

42. 1967 Duke L.J. 273, 296. See Miller, *Public Law and the Obsolescence of the Lawyer*, 19 U. Fla. L. Rev. 514 (1967).

are graduating young people who are ineptly prepared for dealing with the problems of practice, private or governmental, and who neither know nor care about the larger purposes of law.⁴³ The system cannot last, simply because it is absurd. Even so, one would have to be what the late Judge Jerome Frank called a "glandular optimist" to believe that at present the legal profession has the capacity and the will to develop the responses necessary to the preservation of the essential values of a constitutional order, of a society that places a high regard on the individual human being, the values, that is, that are central to the Judaeo-Christian tradition. Perhaps it is not inappropriate to suggest that law is too important to be left to the lawyers.

Lawyers must not only respond or react to scientific change; they must affirmatively seek to guide that change into avenues that will maximize humanistic values.⁴⁴ How else will a society dominated by science and technology retain those values? With some exceptions to the contrary, there are few scientists, natural or behavioral, who are aware of the problem.⁴⁵ The manifest benefits that science and technology have brought cannot be minimized. The world has been transformed in little more than a century. But the benefits should not be allowed to override the fact that accompanying such advance is "a constantly shrinking margin for error or miscalculation"⁴⁶—plus the disruption of time-honored concepts and ways of doing things. We cannot continue to be so obsessed with scientific advance, as a matter of natural policy, that little attention is paid to the problems of protecting against the hazards, physical and psychic, of that development. Law and lawyers to date have been used as technicians to further scientific and technological growth as an end in itself. But, as Admiral Hyman Rickover, almost alone among the technocrats of today, has reminded us: technology exists to serve man; accordingly, he has cautioned against the immense "potentialities for injury to human beings and to society . . . almost as if technology were an irrepressible force to which we must meekly submit."⁴⁷ He has called upon the legal profession to undertake the civic responsibility of protecting mankind against a runaway technology. He does not suggest how this can be done; he merely throws out the challenge. In net, we lawyers must begin to try to tame the possibly "irrepressible force" of technology; we must learn to apply the human equation. The technocrat is

43. *Id.* See also Miller, *supra* note 24; Miller, *The Impact of Public Law on Legal Education*, 12 J. Legal Ed. 483 (1960).

44. See Reich, *Toward the Humanistic Study of Law*, 74 Yale L.J. 1402 (1965).

45. "[P]aradoxical as it sounds, in the course of the last century science has become so dizzy with its own successes, that it has forgotten to ask the pertinent questions—or refused to ask them under the pretext that they are meaningless, or in any case not the scientist's concern. This generalization refers, of course, not to individual scientists, but to the dominant, orthodox trend in the contemporary sciences of life, from evolutionary genetics to experimental psychology." A. Koestler, *The Ghost in the Machine* xi-xii (1967).

46. Green, *Nuclear Technology and the Fabric of Government*, 33 Geo. Wash. L. Rev. 121, 160 (1964).

47. Rickover, *Law Day Address*, reproduced in 110 Cong. Record 10, 143-45 (daily ed., May 11, 1964), *cited in* Green, *supra* note 46.

not the new messiah—and it is high time lawyers recognized it. It is *past* time that a sustained effort was made to devote as much energy to preserving humanistic values as in developing the exponential growth of science.

II

My second proposition is this: *Big science undermines the traditional political order*. Put more concretely, big science contributes substantially to the growth of pluralistic centers of power, principally the business corporation, which present critical problems of their relationship to the state and to the individual. Industrialized, technologically-oriented nations tend to form similar institutions; Galbraith recently labelled this “the principle of convergence”.⁴⁸ These institutions, consisting of large, decentralized units of production and distribution, plus their services segments (including the universities), have in a period of a very few decades completely altered the milieu in which the legal system operates and are ineluctably transforming the nature of government in the Western democracies.

Science and technology, through a marriage with entrepreneurship, permit the growth of corporate combines. They are also necessary in the modern state, as will be seen. The 20th century, as a consequence, is ever increasingly characterized by the bureaucratically managed, hierarchically controlled “private” economic organization, the corporation, which sets the tone for and which, according to Galbraith, is the basic planning unit of the American economy.⁴⁹ In speaking of corporations, the principal focus is on those called “supercorporations” by Robert Heilbroner⁵⁰—the corporate giant, big business as compared with small business. These units of decentralized economic power pose problems of the merger of politics and economics—a constitutional problem of the first order. They dominate even though, as has been shown by Victor Fuchs, the United States is the first “service” economy, one having more workers in service industries than in production and distribution.⁵¹

Perhaps there is no way to prove definitively a causal connection between science and technology and the growth of *giant* corporate enterprises, although it does seem that in timing and in geography more than a coincidence may be found.⁵² Perhaps it may have been possible to have big science and technology without giant enterprises, but that we will never know. The likelihood is to

48. J. K. Galbraith, *The New Industrial State* (1967). The idea was, of course, not an original insight of Professor Galbraith. See R. Aron, *The Industrial Society: Three Essays on Ideology and Development*, ch. III (1967).

49. J. K. Galbraith, *supra* note 48. Again, the idea is not new to Galbraith. See, e.g., A.A. Berle, *The 20th-Century Capitalist Revolution* (1954).

50. R. Heilbroner, *The Limits of American Capitalism* (1966).

51. Fuchs, *Some Implications of the Growing Importance of the Service Industries*, in *The Task of Economics 5* (Forty-fifth Annual Report of the Nat'l Bur. of Econ. Res. 1965).

52. This proposition has been contested by Harry Magdoff in a review of Galbraith, *supra* note 48; Mr. Magdoff is dubious about “Galbraith’s selection of technology as the key to a rational explanation of gigantism. . . .” Magdoff, *Rationalizing the Irrational*, *The Nation*, Sept. 18, 1967, at 246.

the contrary. What we do know is that they coincide in time with the scientific revolution (of which the industrial revolution was an early phase) and they are limited for the most part to a few nations along the North Atlantic littoral. They are something new under the economic and political and legal sun; they are *sui generis*, and have produced a host of problems.

A treatise can and should be written on the rise of the supercorporation. Here I can suggest only a few strands of thought.

First of all, I should like to proffer the idea that the individualistic base of law no longer exists. The individual *qua* individual has lost most of whatever significance he may have had. A person, for the most part, derives importance only as a member of a group. In economics, this was clear as long ago as the turn of the century; at that time, John D. Rockefeller asserted that "large scale organization has revolutionized the way of doing business and . . . individualism is gone, never to return."⁵³ Replacing the individual is a collectivity (which through the legerdemain of lawyers is considered to be a person, an individual). More currently, Jacques Ellul has maintained in *The Political Illusion* that "in an organized democracy the normal way for a citizen to express himself is through his group. Each citizen must belong to one or several groups."⁵⁴ And even more recently, Willy Ley, in terms pertinent to our discussion, said that "in a society based on technology, work must be done by many people together, and consequently every individual is destined to be part of a group, to say *we* instead of *I*."⁵⁵ The need, says Ley, is not for more Beethovens—men able to work by themselves—but for more Wernher von Brauns, men whose genius talks in "collective terms."

Consider for a moment what this means for the nature of human freedom. Freedom in a society characterized by big science and big business means the freedom to decide which group to join—and not much more. Once a group is joined, then the person subjects himself to the norms and sanctions of the organization. Of course, it is clear that all do not have even that attenuated freedom (to join a group) in the Western democracies. For example, Negroes find it difficult to find employment or to join unions.⁵⁶ Here I might point out that the Supreme Court of the United States, which in recent years has outwardly been greatly concerned with civil libertarian problems, *i.e.*, the problems of the individual vis-à-vis the state, has in fact and in effect been creating a constitutional law of group association.⁵⁷ The bulk of the ostensibly individualis-

53. This is quoted in 1 A. Nevins, John D. Rockefeller 622 (1940).

54. J. Ellul, *The Political Illusion* 178 (1967).

55. This is quoted in O. Fallaci, *If the Sun Dies* (1966). The quotation in the text is taken from an extract of that book in *The Sunday Telegraph*, Aug. 27, 1967, at 6, col. 4.

56. See, e.g., M. Sovern, *Legal Restraints on Racial Discrimination in Employment* (1966); Winters, *Improving the Economic Status of Negroes Through Laws Against Discrimination*, 34 U. Chi. L. Rev. 817 (1967).

57. S. Horn, *Groups and the Constitution* (1956); Miller, *The Constitution and the Voluntary Association: Some Notes Toward a Theory*, to be published in a future volume of NOMOS.

tic decisions of that Court are really concerned with a person enforcing his rights as a member of a group. The Negroes and the Jehovah's Witnesses furnish ready examples. Consider, furthermore, the meaning for individual freedoms of expression, set forth in the First Amendment to the Constitution, when the means of expression—the mass media—are in the hands of private entrepreneurs (or corporate managers) who are responsible or accountable to no one and when, moreover, the government (often for the best of reasons) pursues secrecy policies and “manages” the news. The “marketplace” theory of truth, enshrined into constitutional doctrine by the Supreme Court, under which “truth” is that which emanates from the clash of ideas in the “marketplace,” simply does not accord with reality.⁵⁸ When, added to the foregoing, it is seen that science and technology have made the policy problems of government vastly more complicated than in the past, it may readily be seen that freedom of expression on the part of the individual person is farcical.

Legal problems may also be seen in two other areas. First, developments in a system of industrial jurisprudence are discernible both in labor law and in such private-law categories as contract. Labor law is the resultant of state encouragement by statute of collective labor organizations and of the system of collective bargaining⁵⁹—based, I take it, on the assumption that the decisions of the leaders of corporations and unions will redound by some magic (the modern counterpart of Adam Smith's “invisible hand”) to the general welfare. The law is largely administrative in nature, but private judiciaries (arbitration tribunals) operate as well, plus, of course, the formal judiciary of the state. Second, contract law, as it developed, was the analogue, if not the product, of free-enterprise capitalism, a system based on individual enterprise or, at most, small shops. It is the legal concept appropriate to an economic system in which reliance is placed on exchange rather than tradition or custom or command for the distribution of resources. In an individualistic society, all law is ultimately based on contract, that is, derived from choices freely made by responsible individuals. But the demise of *laissez-faire* and the rise of corporate combines have created a “new feudalism” in which “contracts” are not so much the result of bargains struck but of adherence to already established terms. Government contracts provide the classic instance, but in the private sector most transactions still called contract are really “contracts of adhesion.” The rela-

58. See *Dennis v. United States*, 341 U.S. 494, 503-05 (1952). The theory is derived from the dissenting opinion of Holmes, J., in *Abrams v. United States*, 250 U.S. 616, 630-31 (1919). Some of the shortcomings of the theory are cogently set out in Barron, *Access to the Press—A New First Amendment Right*, 80 Harv. L. Rev. 1641 (1967). Professor Barron criticizes what he calls a “romantic” conception of the First Amendment, based on the “belief that the ‘marketplace of ideas’ is freely accessible,” but does not follow through on the implications of his analysis. He calls for greater access to the press and mass media, which is a laudable goal that meets only part of the problem. Cf. J. Ellul, *Propaganda* (1965); J. Ellul, *The Political Illusion* (1967).

59. In, e.g., the Wagner Act. It should be noted that one effect of such statutes is to make the unions the recipients of delegated power from the state. Cf. J. R. Commons, *The Economics of Collective Action* (1950).

tionship tends to be one of power, not of bargain, in which the group dominates to set the terms and conditions under which "agreements" are made. "Administered prices" furnish the ready example. Freedom of contract has degenerated into the "freedom" to choose which agreement one will "adhere to."⁶⁰

In net, then, big science has led to big enterprise, which has warped and added to traditional legal concepts. Furthermore, the supercorporations act as "private" governments, in at least four ways, and thus present another set of legal (constitutional) problems. Space permits merely listing these, with little discussion; they include:

1. *The supercorporation makes decisions of national or social importance.* In other words, these entities set national policy in significant areas of concern—allocation of resources, the direction and nature of investment, and so on. Alone or in concert with others, they set prices ("administered" prices, which may be thought of as a form of private taxation), carve up markets, and, among other things, subsidize the arts and education.⁶¹

2. *Quite often the supercorporations, in setting policy, act in concert with government.* Much of modern government may, in fact, be seen as an amalgam of the public bureaucracies and the private bureaucracies of the corporations. Great influence is exercised over official policy, at least to the point of being able to veto proposed policies, but also as in (say) the supersonic transport, actually establishing policy. Perhaps this system is more familiar in the United Kingdom and Europe than in the United States, but it has become increasingly obvious in America. President Eisenhower, in his farewell message, gave it a label: "the military-industrial-scientific complex." Consider also the so-called "independent regulatory commissions" established to regulate segments of industry "in the public interest." In fact, they are not independent, either from those ostensibly regulated or from the Executive, and they do precious little regulation. The commissions have evolved into protectors of those regulated rather than of the "public interest," thus illustrating the prescience of President Cleveland's Attorney General, Richard Olney, who advised a railroad president not to try to get the Interstate Commerce Commission abolished or declared unconstitutional; it was, he said, "the part of wisdom" to use the Commission for railroad purposes, thus simultaneously satisfying the public's clamor for action without harm to the industry.⁶² Speaking very generally, that is the way the system has worked.⁶³ The point stressed is the direct participation of pluralistic social groups—in this instance, the supercorporations—in the official governing process. This is accomplished through symbiotic relationships

60. It is worthy of more than passing attention that the casebooks used in law school classes in contracts are still predicated on an individualistic notion of contract. Contracts of adhesion are scarcely mentioned. Cf. W. Friedman, *Law in a Changing Society* (1959).

61. See R. Eells, *The Corporation and the Arts* (1967), for discussion of the latter. Whether this is a "Good Thing" is by no means self evident.

62. This is quoted in L. Jaffe, *Judicial Control of Administrative Action* (1965).

63. See, e.g., M. H. Bernstein, *Regulating Business by Independent Commission* (1955).

between regulated and regulator, with the industry often looked upon as something to be protected (e.g., the airlines, the radio and television networks). Those industries, it is meet to repeat, are for the most part the products of science and technology.

3. *The supercorporation is often an agency of administration for government.* Government, faced with mounting responsibilities the root causes of which are often science and technology but which is not permitted to expand the formal civil service, farms out what Harlan Cleveland once described as "staggering" amounts of the public administration, of governing power, to private organizations, including corporations.⁶⁴ "Contracting-out" is particularly evident in research and development. There is scarcely an American governmental organ, including Congress, that does not participate in the system, a system that is creating an "external bureaucracy" in ostensibly private organizations (profit and non-profit).⁶⁵

4. Finally, *the supercorporation is a private government because in its internal operations it is a political order.* The supercorporation is best seen, not as a fictitious person (as in law) or as a disembodied economic man (as in economics), but as a collectivity, a congeries of interests, a federation of disparate groups.⁶⁶ The task of those who control the enterprise is to make a profit but not necessarily to maximize profits; rather, profits are "satisfied" as the oligarchs who control the corporation (exemplifying Michels' "iron law of oligarchy") balance the conflicting interests within the firm and take into consideration "the public interest."⁶⁷

Legal problems of varying degrees of abstraction may be identified in each of these categories of private governance. Perhaps the architectonic problem is one of constitutional *legitimacy*, which political scientists will claim as their own but which is constitutional in fact (and thus legal and economic as well as political). The corporation has only the thinnest claim to legitimacy in the domestic economy and even less when it operates mainly in international commerce.⁶⁸ Some students claim corporate legitimacy because of custom and usage

64. Cleveland, in *Ethics and Bigness* (H. Lasswell & G. Cleveland eds. 1962); see also Miller, *Administration by Contract: A New Concern for the Administrative Lawyer*, 36 N.Y.U.L. Rev. 957 (1961).

65. See *Symposium—Administration by Contract: An Examination of Government Contracting-Out*, 31 Geo. Wash. L. Rev. 685 (1963).

66. Compare Chayes, *The Corporation and the Rule of Law*, in *The Corporation in Modern Society* 25 (E. Mason ed. 1960), with A. Miller, *The Supreme Court and American Capitalism* (to be published in 1968 by The Free Press).

67. See C. Walton, *Corporate Social Responsibilities* (1967).

68. See A. A. Berle, *Economic Power and the Free Society* (1957); A. A. Berle, *Power Without Property* (1959). Professor Kenneth E. Boulding has said: "The international corporation faces a peculiarly difficult problem in establishing its universal legitimacy. Within a nation, the corporation achieves a certain legitimacy simply from the fact that it is incorporated by some public body. . . . The international corporations do not have even this shred of legitimacy, simply because there is no international body that can charter them. The international corporation, that is, operates in a kind of governmental vacuum. . . ." This is quoted in Martyn, *Multinational Corporations in a Nationalistic World*, *Challenge: The Mag. of Econ. Affairs*, Nov.-Dec., 1965, at 13, 15.

and because there is no substantial intellectual opposition to these overmighty economic sovereignties. Further, they are necessary for the accomplishment of social goals seen in the various forms of the welfare state in industrial nations. If they did not exist, they would have to be invented. The basic problem is that of power, power exercised by self-appointed and self-perpetuating oligarchs. I do not suggest that these men are evil; the "robber barons" and the "dark satanic mills" are largely confined to history.⁶⁹ But I do suggest that they raise a serious question of the right to govern in any society that calls itself democratic. For govern they do, as much or more than the elected representatives of the people.

If it is difficult to justify the power wielded by the corporate obligarchs, the Lords Temporal of the modern era, it is doubly difficult to ascertain how they are *accountable*. Certainly the legal system erects few if any standards to which they must adhere. They are checked, when that is done, by the countervailing power of other groups and other corporations.⁷⁰ That sort of power is relatively rare in some industries, those in which actual or tacit agreements among the obligarchs determine what the corporations will do. IATA—the International Air Transport Association—affords as good an example as can be found.⁷¹

Accountability means that a person exercising power has to answer "in another place" and to give reasons for his decisions; it also is predicated on the notion that full publicity will be given to those decisions and the reasons underlying them. Corporate managers are not accountable in this sense; the limitations on their power are physical or economic or political, not legal. And that appears to be true whatever segment of the federation of interests that constitutes the corporation may be involved—whether it is an individual employee, a supplier, a dealer, a consumer, or the public at large.⁷²

Another problem of importance is the relationship of the supercorporation—the "techno-corporation"—to the state. It was not long ago that advocates of pluralism, *e.g.*, Figgis, could plead for the rise of social groups to counterbalance an overmighty state.⁷³ Now the question must seriously be asked as to whether these groups (here, the corporation) have not taken over the substance of sovereignty. Put another way, in the fashionable phrase, a "government-business partnership" exists, but it is by no means clear who is senior in that partnership. Although the state has become more powerful in recent decades, and has undertaken many more responsibilities, it shares power (sovereignty) with the units of neo-feudalism. Sovereignty, in practice and whatever the theory,

69. Cf. Miller, *Business Morality: Some Unanswered (and Perhaps Unanswerable) Questions*, 363 *Annals* 95 (1966).

70. Cf. J.K. Galbraith, *American Capitalism* (1952).

71. See *The Times* (London), Oct. 3, 1967, at 11, cols. 1-2, discussing the way in which members of IATA (a trade association or "cartel") "fly in formation."

72. See A. Miller, *supra* note 66, at ch. 4.

73. Cf. W. Friedmann, *supra* note 60.

is divisible—Bodin to the contrary notwithstanding. Adolf A. Berle maintained in 1954 that the corporations do a better job of governing their segment of world affairs than does political government.⁷⁴ That may well be, although Berle is silent as to criteria for determining such a conclusion; he also fails to raise the problem of benevolent despotism.

At the same time, however, that science has made the growth of huge corporate enterprise possible, government has grown in size and power. The relationships between the two characteristic organizations of the era—government and corporation—are of first importance. Government needs the corporation and uses it to accomplish societal ends. In so doing it has encouraged the growth of corporate concentrates—through direct subsidies, through a favorable legal system, through financing of science and technology too expensive even for the largest corporations—despite the antitrust laws. Those laws are a sop, a “charade,”⁷⁵ and part of the price that was paid, over and above the problems mentioned above. This brings us to the third proposition, which is really a part of the second but separately treated for emphasis.

III

Possibly only the incurable romantic will decry the development of and emphasize the problems that flow from the twin phenomena of big government and big business. The benefits that have resulted from the application of science and technology to business enterprise and the growth of social concern, exemplified in governmental welfare programs, are obvious. One of the unanswered, even unasked, questions is the relationship, if any, between public welfare programs and large enterprise. Are they twin phenomena, separate albeit interlocking? Or does one produce the other? If so, how and why? Is “welfareism” only possible because of the productive capacity of large organization, which through advanced technology makes it possible for more to be produced by fewer workers?⁷⁶ Perhaps the economist or the sociologist can answer such questions, but lawyers would find them difficult. Be that as it may, problems arise from bigness and organization. In the ensuing pages some of them, of a lesser order of abstraction than those already mentioned, will be indicated. The third proposition, then, is this: *The structure of government is being altered by big science.* Time-honored conceptions are giving way to new ways of ordering public affairs. This is particularly to be seen in the United States, ostensibly under a written constitution, but which in fact is governed under a melange of constitutional provisions, statutes, judicial decisions, executive orders, administrative rules, and the decisions emanating from private centers of power.

74. A.A. Berle, *The 20th-Century-Capitalist Revolution* (1954).

75. Galbraith, *The New Industrial State: Control of Prices and People*, *The Listener*, Dec. 1, 1966, at 793, 794.

76. It would be illusory to assert that increased attention to mass welfare can be attributed to altruism toward the “have-nots” by the “haves”; one would be hard put to find evidence buttressing an assertion that people today are more altruistic than they were (say) 100 or 1000 years ago.

Old lines of demarcation are breaking down. At least four separate strands of development may be perceived. In the first place, federalism is becoming or has become moribund as a viable principle of government. A nation with supercorporations and with economic planning (even the minimal American form of planning) can no longer be truly federal; for the firms and central planning require unified if not uniform policies throughout the nation. In the United States a *national* economy, superimposed on a decentralized political order, has made the states anachronisms in the body politic. They are unable effectively to deal with the problems of the day. Traditional federalism, thus, has had its day; it was the political theory appropriate for a small-shop, agricultural economy, with little science or technology. In its place a system of "functional" federalism developed, with the supercorporations and other groups acting as units of government rapidly achieving more significance than the states. Peter F. Drucker once said that the "factory community"—the supercorporation—was our most meaningful unit of local government.⁷⁷ So it may be. But it is a unit of government headed by persons not elected, run by oligarchs, outside of the main stream of governance; it thus raises, as has been said, critical questions of legitimacy and accountability.

Secondly, the division of powers within government is being eroded. What Montesquieu thought he saw in Britain and what was placed in the American Constitution was a principle of checks and balances, misnamed the separation of powers (for it is not that but separate institutions exercising similar powers—quite a different thing). Writing in 1885, Woodrow Wilson asserted that there was Congressional dominance in American government; but if that was true then, it no longer is.⁷⁸ The clear lesson of the 20th century is the aggrandizement of power in the Executive and the public administration. The American presidency, it has been said, permits a man to be as big as he wishes, but it no longer permits him to be as small as he might want. (I refer here not only the Great White Father from out of the West, Lyndon Baines Johnson, who has had marked success with Congress, but to anyone who occupies the White House—or who heads the Executive in any modern government.) One aspect of this, to be expanded below, is the rise of the "expert" in government. Lord Jackson of Burnley, in his presidential address in 1967 to the British Association for the Advancement of Science, is reported to have said that "Parliament needs to find a way of getting to grips more effectively with scientific and technological issues"; if it does not, he said, "its functions would be little more than endorsing, on limited information, decisions already taken at ministerial level."⁷⁹ The same may be said of Congress, which at best exercises a veto power over proposals brought to it and at worst is a mere rubber-stamp of policies already

77. P.F. Drucker, *The New Society* (1950).

78. W. Wilson, *Congressional Government* (1885).

79. This is quoted in *The Times* (London), 31 Aug., 1961.

formed. The "moon shot," the SST, and Comsat clearly exemplify the point. Vietnam provides an illustration outside of science and technology.

The third structural change in government brought on by big science is the growing obsolescence of the nation-state as a form of social order.⁸⁰ Possibly it may seem odd to state such a thesis at a time when nationalism is rampant and there are more nations (at least, ostensible nations) than at any time in history. We are well into a system of larger-than-national resolutions of public-policy questions. The Common Market, of course, is the obvious example. Many others exist, perhaps of as great or greater significance. The London agreement in August 1967 on world money, taken by the central bankers of the West, has a "real chance," according to the *Financial Times*, to be a "landmark in world history."⁸¹ The agreement formalizes methods already carried on among the nations of the North Atlantic littoral. Military (in NATO), and even some political, cooperation takes place (despite President de Gaulle). Even such a super-power as the United States is increasingly finding itself unable "to live within itself."

The net result is that slowly but surely a sociological community is being built in cooperative actions taken by officials of the nation-state of the North Atlantic and in the myriad activities of the businessman that transcend national boundaries. Perhaps this might, in Landheer's term, be called an "ideological group."⁸² The social basis of such a community is being constructed. I suggest that the development will tend to accelerate. In September 1965, *Science*, the publication of the American Association for the Advancement of Science, flatly stated that "technologically, the Atlantic Community exists."⁸³ This is not to suggest that by some grand design that community will spring into full existence; but rather to say that science and technology and economics are pushing politics and law into new forms by building what may be called the "living law of multinational constitutionalism."⁸⁴ (The charter for the North Atlantic community already exists, in the Organization for Economic Cooperation and Development.⁸⁵) We are much closer to this than is often realized. With change so rapid and ever-present, the movement in that direction could well be swift. If so, then the host of problems lawyers deal with in that "lawyers' paradise," the Common Market, will encompass a larger area. *The Times* for September 30, 1967, carried a statement by Lord Justice Diplock that there was a "painless way into Europe for law," which may be an accurate fore-

80. Compare B. Ward, *Nationalism and Ideology* (1967), with Mayo, *The New Technology and Multinational Cooperation*, 46 Minn. L. Rev. 869 (1962).

81. Brittan, *The London Agreement for World Money*, *The Financial Times*, Aug. 29, 1967.

82. Landheer, *Contemporary Sociological Theories and International Law*, 92 *Recueil des Cours* 519 (1957).

83. 149 *Science* 1080 (1965).

84. Miller, *The Organization for Economic Cooperation and Development*, 17 *Yb. of Wld. Affairs* 80 (1963) suggests this concept.

85. *Id.*

cast.⁸⁶ But at the very least, significant change can be foreseen in some areas as economic (and, inevitably, political) integration becomes a reality. Quite possibly, it is accurate to say that the substantive content of law is remarkably similar in all industrialized nations, whatever the form may be; the civil law may be close to the common law in this respect. But changes will come in law, whether painless or not, as legal systems are accommodated to each other.

American business, by going "national," was a prime force in eroding traditional federalism. It could go national only because science and technology permitted it. The businessman of today is now faced with the question of whether he should go "multi-" or "international." American business is doing so, but a contrary tendency has been noted in Europe.⁸⁷ In the long run, I have no doubt that the American idea will prevail. I do not suggest that nationalism will disappear or that those political boundaries will be erased overnight, but I do suggest a trend toward cooperation on a larger-than-national scale that will lead at some time to that end. The trend is visible in both public and private policies. Law and lawyers will have to adapt to this. With the *hubris* that seems to infect the scientific-technological community, it was recently asserted that man can now mold his future by choosing which technological developments to accelerate.⁸⁸ That may well be, although it is by no means self-evident that man has that freedom to choose; but whatever the choice may be, my suggestion is that it lead toward the desuetude of the nation-state.

Fourth, and possibly of greatest importance, the line between public and private is being progressively blurred. We are witnessing a fusion of political and economic power at the very time that the state and the corporation are incomparably stronger than ever before. I believe that this is leading us toward some sort of native corporativism, toward the "techno-corporate state."⁸⁹ Merely using such terms will no doubt cause eyebrows to rise. The corporate state has been too closely linked to various forms of totalitarianism to make one feel easy with the development. But it is there, clearly to be seen. As Professor H. L. Nieburg recently put it, "Instead of fighting 'creeping socialism,' [American] industry on an enormous scale has become the agent of a fundamentally new economic system which at once resembles traditional private enterprise and the corporate state of fascism."⁹⁰ The key word here is "resembles," for Nieburg is not saying that the corporate state has arrived; what he does say is that, within the area of the "military-industrial-scientific" complex, a new type of economy is coming into being. There the fusion of economic and political power is obvious; my point is both wider and less startling: that the interlocking part-

86. The Times (London), Sept. 30, 1967, at 4.

87. See Kindleberger, *European Integration and the International Corporation*, cited in B. Knoppers, *The Role of Science and Technology in Atlantic Economic Relations* 22 (1967).

88. Jantsch, *Forecasting the Future*, Science J., Oct., 1967, at 40, 45.

89. This is adumbrated in Miller, *The Constitution and the Voluntary Association: Some Notes Toward a Theory*, to be published in a future volume of NOMOS.

90. H.L. Nieburg, *In the Name of Science* (1966).

nership between government and business, seen throughout the corporate sector of the economy, has blurred and will continue to blur the line between public and private. A new form of politico-economic order *is* being created, but what it is can only be speculated about at this time.⁹¹

The task of effecting the structural changes in government becomes at some time lawyers' work. Tensions produced by slowly disappearing forms sooner or later become disputes that are cast before courts and other official decision-makers to settle. Even so, one should not be sanguine about the capacity of the legal profession to do anything more than put into prescribed form and procedure the decisions previously reached by others. Perhaps my point can be seen in better perspective by expanding on it.

IV

Big science, as we have seen, permits and perhaps demands organization. And organization, as we will see, involves both the supercorporations and government; two sides of the same medal, one could not exist without the other. The fourth proposition is this: *Big science has contributed substantially to the growth of the "administrative state."* As with the other propositions, I cannot prove such an assertion in the same manner as (say) facts are proved in a court of law. This is a judgment made intuitively, if you will, but it seems to have a solid base. It is more than coincidence that the rise of the bureaucracy to dominance occurred at the same time as the scientific-technological explosion. Of course, social and governmental causation, here and elsewhere, is not unilinear; it is multiple. Complexity is indeed our lot.

By the "administrative state" is meant that the locus of official governing power has been transformed to the public administration. The term includes both public and private bureaucracies, for much of the public's business is administered by outwardly private organizations. Legislatures and courts are 19th-century institutions, those appropriate for the post-feudal, pre-industrial age; they have not as yet demonstrated any marked capacity for adaptation to the needs of an industrialized and urbanized society and perhaps even less of the "post-industrial" society posited by Professor Daniel Bell).⁹² As a consequence, since political power abhors a vacuum, it has flowed to those able and willing to exercise it—and that is in the Executive (or the public administration, very broadly defined).

An added factor is the exponential growth of government itself—from the "negative, nightwatchman state" to the "positive state"—throughout the western world. The United States has lagged behind developments in other countries; the

91. It is remarkable that in the speculations about what society will be like in A.D. 2000, very little attention is paid to politics. See, e.g., *Symposium*, *Science J.*, Oct., 1967, on "forecasting the future"; out of eleven articles, only one mentioned politics—and then only in passing.

92. See Bell, *Notes on the Post-Industrial Society*, *The Public Interest* No. 6, at 24 (Winter 1967).

American version of the welfare state, even today, is far from those in some European countries. Americans still believe there is something morally reprehensible about being poor.⁹³ The traditional tasks of government remain—external security and internal order—but they have been greatly expanded by government taking on added responsibilities, epitomized in the United States by the Employment Act of 1946⁹⁴ and the “new economics.” These responsibilities, in short, call for enhancement of the economic well-being of the people. Although they are far from perfect, the programs enacted under such a concept do mark a definite constitutional change. The coming of the Positive State is the most important constitutional alteration in American history. It came without amendment, itself a commentary on the built-in flexibility of the delphic commands of the fundamental law.⁹⁵

The administrative state, then, is the Positive State. What may be said about it within the confines of this article? Space permits the suggestion of only a few ideas, including:

- 1). The complexity of the tasks with which law and policy-making must deal will continue to grow.
- 2). Scientific and technological developments will have more control over the nature and direction of public policy than political and legal doctrines that we can now state.
- 3). Much of law has been merged into the political process; it has become “politicized”; public law is dominant.
- 4). Present institutions are not adequate to deal with the power of the bureaucracies. The problem is how to keep them in check while simultaneously permitting the urgent tasks of government to be accomplished.
- 5). There is a high degree of deference to the putative expert—the “technological elite”—within the bureaucracies.
- 6). Neither legislatures nor courts have the expertise requisite to effective handling of the complex scientific-technological society.
- 7). Lawyers are losing caste, for they are not keeping abreast of new developments.
- 8). New management techniques in government—systems analysis, program budgeting, etc.—downgrade law and the lawyer in favor of the economist and the concept of efficiency.

Each of these could—perhaps, should—be the subject of a separate article. Here, they are merely listed with one being singled out for expanded treatment: the politicization of law and the legal process. History does not permit one to

93. The history of this attitude is set out in Woodard, *Reality and Social Reform: The Transition from Laissez-Faire to the Welfare State*, 72 Yale L.J. 286 (1962).

94. 60 Stat. 23 (1946). See *Symposium—The Legal Basis for Managing the Economy: The Employment Act After Twenty Years*, 35 Geo. Wash. L. Rev. 170 (1966).

95. Cf. Miller, *Notes on the Concept of the “Living” Constitution*, 33 Geo. Wash. L. Rev. 881 (1963).

state with any certainty how much the present merger of law and politics differs from the actuality of the past; what can be said is that it differs from the ideal (and the myth). The dominance of public law in a legal system developed in a private-law context presents critical problems for legal theorists. Some of these have been listed immediately above; others may occur to you.

Decisions tend to be those that are technically or physically or economically possible: law as "normation" has little part to play in the higher reaches of the public administration, however much it may control in the lower rungs of the hierarchy. Professor Robert Wood, formerly at M.I.T. and now Undersecretary of the Department of Housing and Urban Development, called attention to this development several years ago in an important paper. I quote from a discussion of Wood's point by Emmanuel G. Mesthene, Executive Director of Harvard University's Program on Science and Technology:⁹⁶

The decision-maker's options . . . [formerly] were legal options. They were confined to interpretations of the rules. Political scientist Robert Wood has made this point very clearly. The politician, he says, always winds up asking the same fundamental question, namely, "Can we do this?" "Can we achieve our objectives in this way, by this means?" In times when changes in the physical world were very slow, governments operated as if such changes were nonexistent. The ground rules were fixed, so that "Can we do this?"—Wood calls it the persistent political question—meant "Do the rules allow it?" "Can we do it within the rules?" And that is a question that lawyers answer. The politician's toolkit, consequently, looked like a lawyer's. It contained "bargaining skills, propaganda skills, and violence skills. . . . The political order obviously required leaders and advisors with the lawyer's special skills in value clarification, his verbal capacity, and his experience as an intellectual jobber and contractor who could make a strong case wherever one was required." The effect of this century's very rapid advances in science and technology is, in Wood's view, that: "It subtly shifts the emphasis of the persistent political question "Can we do this?" from the consideration of legal restraints to consideration of physical restraints. In these circumstances, it is not surprising that the ranks of senior career personnel of the federal government, executives, advisors, and specialists have been increasingly filled by the scientific skill group."

The question "Can we do this?", in other words, today more and more means, not "Can we do it within the rules?", but "Can we change the rules?" The physical conditions of political action are no longer fixed, because science and technology can make physical changes occur much faster than they ever did in the past. . . .

* * * *

As with politics, so with law, economics, culture, and society, man's ability, derived from his technical prowess, to change the physical world at will and massively removes the only heretofore inviolable

96. Mesthene, *Introduction*, in *Technology and Social Change* 5, 6 (E. Mesthene ed. 1967).

constraint on the shape and development of his social systems and institutions. This poses an unprecedented challenge to the public intelligence as society strives to achieve the wisdom necessary to contain and channel the very great physical power that science and technology have given to man. . . .

The passage is quoted at length because Professor Mesthene seems to have stated the point in rather different terms and from a different perspective. He also posed the crucial question of the day—the achievement of wisdom. In times past, it mattered less that those in positions of power could make decisions, for their total impact was both much less and relatively delayed. All that has been changed. The restraining hand of law has been swallowed up in the question of whether a given policy is physically and politically possible. Dean Don K. Price, in his recent *The Scientific Estate*, has said that the “main lines of our policy, over the long run, are likely to be determined by scientific developments that we cannot foresee, rather than by political [*i.e.*, legal or constitutional] doctrines that we can now state”⁹⁷—thereby echoing Mesthene and Wood. What this means is that wisdom must now become prospective; it can no longer be retrospective or even contemporary. “And education has to complete the road from inculcation to exploration to anticipation,”⁹⁸ particularly for lawyers. To quote Professor J. D. B. Mitchell somewhat out of context: “We have in this century tried to deal with past problems as they emerged. We have never tried to exercise the political imagination which is necessary to create the source of a system of administrative law which will be able to deal, in the future, with the state that we are creating now.”⁹⁹

The degeneration of the lawyer *qua* professional is to be seen in many parts of government. The legal specialist is called in, when the occasion demands it, to put proposed or existing policies into the proper legal form. Thus it is that State Department lawyers have no difficulty in finding a legal basis for the Vietnam engagement. Similarly, government lawyers have relied on a rather obscure case decided in 1940, *Perkins v. Lukens Steel Co.*, to justify a wide range of actions in the area of federal contracts.¹⁰⁰ One is reminded, when he ponders the merger of law into politics, of the observation of Justice Robert H. Jackson in 1952 that he did not consider himself bound as a Justice by what he had said as the President’s lawyer¹⁰¹—a revealing incident indeed, for Mr. Jackson as Attorney General had written an opinion upholding presidential seizure of private companies during a strike (in order to keep them in produc-

97. D.K. Price, *The Scientific Estate* 186 (1965).

98. Mesthene, *supra* note 96, at 7.

99. Mitchell, *Administrative Law and Parliamentary Control*, 38 Pol. Q. 360, 373-74 (1967).

100. 310 U.S. 113 (1940). This case, with *Massachusetts v. Mellon*, 262 U.S. 447 (1923), is the rock on which one founders when attempts are made to contest in the courts action under federal contracts.

101. *Youngstown Sheet & Tube Co. v. Sawyer*, 343 U.S. 579, 634 (1952) (concurring opinion).

tion). In 1952, in the *Youngstown* case, involving President Truman's seizure of the steel industry during a strike, Mr. Jackson saw the problem entirely differently. He concurred in the judgment holding the seizure unconstitutional, a change of mind interesting because it so well emphasizes how the Attorney General acts. His judgment is as much *political* as *legal*; or to put it another way, it is a poor lawyer indeed who cannot find some basis in law for what a policy-maker wishes to do.

The merger of law into politics may be seen in a number of situations in the administrative state. Take, for example, the manner in which many major contracts are awarded by the American government. It was obvious months ago that Boeing would get the contract for the supersonic transport. And so it did. The Pentagon has an interesting system whereby contract awards are announced by Congressmen in whose districts the performance will be accomplished; this, according to the *Wall Street Journal*, does not mislead the cognocenti; rather, it is a neat device to bamboozle the people back home that a given Senator or Congressman had something to do with the award. If one reads the regulations, contracts are let following "formal advertising" or "negotiations"—within, that is, a system of ostensibly canalized rules. But is that the actuality? At the very least, the contract-award system has been politicized by bringing members of Congress into the announcement. A subtle erosion of public confidence in the impartiality of awards may be perceived.¹⁰² I have mentioned the SST. Take another example: the decision by the Atomic Energy Commission to build the new linear accelerator, costing hundreds of millions of dollars, in Weston, Illinois. Why? Weston is a village, not very convenient to Chicago. Did the decision have anything to do with the fact that the Far West and the Northeast had been receiving the bulk of federal R&D contracts and had reaped the greatest monetary benefits from federal expenditures in science and technology? One need not be a cynic to point out that, prior to the decision, a perceptible wave of discontent from the Middle West became one of the variables to be fed into the decisional process; and also that Illinois is the home state of the ineffable Senator Everett McKinley Dirksen, the great and good friend of the man in the White House. Is all of this mere coincidence?

The award of governmental largess through contracts and grants has caused much trouble. How should it be done? By what criteria? By whom? Is the adversary system adequate to the need? Do lawyers have anything to contribute? The political arms of government operate with unchecked discretion in the sense of any interdictory commands of law. I have mentioned the award of contracts and grants, including those in science and technology. Let me cite another example: the regulation of those industries, usually the product of science and technology, by the purportedly independent regulatory commissions. Professor Marver Bernstein of Princeton University, as keen a student of the

102. This is discussed in Miller & Pierson, *Some Observations on the Consistency of Federal Procurement Policies*, 29 *Law & Contemp. Prob.* 277 (1964).

governmental process as there is in the United States today, has had this to say about the role of law and politics:

The fraternity of political scientists and public administration experts has increasingly accepted the finding that regulation is a political process. "Politics" is now rightly viewed not only as unavoidable, but as essential to the formulation of policies that bear some rational relation to economic and technological conditions. As one scholarly study concludes: "The mentality which disdains 'politics' and strives for a neutral and technical perfection rejects the very solvents that would reduce the obstructions."¹⁰³

If that is correct, and I am inclined to agree with Bernstein, then what becomes of law? Is the lawyer merely to tag along, dotting the "i's" and crossing the "t's," while the policy-maker plows ahead with what is politically and physically possible? That is what he is doing now; the question is whether he should take on a new role. The answer, I believe, must be "yes."

Let me approach the question from another direction: the high degree of deference accorded the expert. I put it to you that this question goes to the core of modern government—and of law, of politics, and of the interplay of science and law. "The organs of representative democracy," Jacques Ellul has recently said, "no longer have any other purpose than to endorse decisions prepared by experts and pressure groups"¹⁰⁴—which is another way of saying that law has been politicized. He could have added that the "non-representative" organ of modern democracy, the courts, have met the question by abdicating any responsibility.¹⁰⁵ Courts have neither the institutional means nor the competence to judge on complicated scientific-technological matters, which means that judicial review is nominal at best and a sham at worst.¹⁰⁶ The common-law analogies which might enable lawyers to work effectively in the area are, as Professor Cavers has maintained, a weak reed indeed.¹⁰⁷ The notion of the omnicompetence of the lawyer, cherished by the profession for centuries, is a myth.¹⁰⁸ The task, as I see it, for lawyers is three-fold: (a) the clarification and articulation of goals and of alternative ways of achieving those goals;

103. Bernstein, *The Regulatory Process: A Framework for Analysis*, 26 Law & Contemp. Prob. 329, 340-41 (1961).

104. J. Ellul, *The Political Illusion* 138 (1967).

105. The corpus of "administrative law," as set forth in text- and casebooks, is testimony to the manner in which the courts evade any systematic or comprehensive scrutiny of what takes place in the public administration.

106. See K. C. Davis, *Administrative Law Treatise* (1958), particularly the sections on scope of review, substantial evidence, and primary jurisdiction. I am not suggesting that Professor Davis calls judicial review a sham. Quite the contrary; his treatise is predicated on the idea that it is important: He defines administrative law as being mainly judicial review. But when one sees what courts do in fact, plus the full range of administrative actions that never get to courts, it is readily apparent that the judiciary is relatively unimportant.

107. Cavers, *Introduction to Science and the Law Symposium*, 63 Mich. L. Rev. 1325 (1965).

108. See Riesman, *Law and Sociology: Recruitment, Training and Collegueship*, 9 Stan. L. Rev. 643 (1957); Miller, *Science and Legal Education*, 19 Case West. Res. L. Rev. 29 (1967).

(b) the establishment of standards by which present decisions may be evaluated; and (c) the creation of new institutions to deal with new and complex problems. No mean job, that; and one would indeed have to be a "glandular optimist" to believe that the legal profession will do all, or any part, if it.¹⁰⁹

Adolf A. Berle, speaking of the rise of the supercorporation, has maintained that "corporations have consciences," that the corporate managers are checked by what he calls "inchoate law."¹¹⁰ That is a dubious proposition at best; but if we accept it, can we say the same about the experts about whom Professor Mesthene spoke? Does the "expert" have a conscience? What guides his behavior in his professional capacity? What *should* be the criteria of his decision-making? John von Neumann once said that what was technologically possible would be done. Likely he was correct. But is it desirable? Is the rise of new elites in government and the desuetude of law and lawyers something to be anticipated? The answer, I suggest, can only be "no."

We have heard much in recent months about what the world might be like in A.D. 2000. A few people in the Western World—for example, in Britain and in France—are beginning to act on the knowledge that what is decided today will determine the shape of tomorrow. I consider it regrettable indeed that lawyers do not seem to be among those present. Forecasting or planning the future has become a preoccupation of the technologists. (*Science Journal* and *Daedalus* have published symposia about the world to come it is not very far off). Their aim is to enable man to shape rather than to suffer his destiny. My question is: where does law and where do the lawyers fit into this scheme?

One can welcome, as he should, the improved means of bringing material well-being to the poverty-rows of the world, but must the price be as high as was intimated in a review of Magnus Pyke's *The Science Century*? There, Mr. Michael Maxwell Scott asserted that "people expect their governments to spend vast sums on say, atomic research, partly in the hope of material benefits yet unknown, partly as an act of faith in Science. Applied science has become far more than a stream of new techniques; it has created an indivisible stream of values. So we cannot altogether say "No" to Concord projects or assaults on the moon, without, in a sense, saying "No" to cancer research."¹¹¹ Such a conclusion seems to be a resounding *non sequitur*. The short answer to what he says is: "Why not?" Why cannot, why should not, a system of priorities

109. Cf. Miller, *Public Law and the Obsolescence of the Lawyer*, 19 U. Fla. L. Rev. 514 (1967); Miller, *supra* note 24.

110. See A.A. Berle, *The American Economic Republic* (1963); A.A. Berle, *Power Without Property* (1959); A.A. Berle, *The 20th-Century Capitalist Revolution* (1954).

111. Scott, *Science on the March*, *The Daily Telegraph*, Sept. 21, 1967, at 12, col. 8. In correspondence, Mr. Scott said further: "I can see that [the matter you quote] might be thought a non sequitur; but in fact I was trying to make the point that under the present system of values it is felt that all kinds of applied science must go forward, whether they are likely to be beneficial to people in general or not. Obviously cancer research is a good thing. The Concord and Project Apollo may have much less in their favour. But the juggernaut of technology must keep moving: even if no one knows where it is heading." Letter from Michael Maxwell Scott to Arthur S. Miller, Dec. 6, 1967 (quoted with permission).

be established under which the flow of public funds would be channeled? It is often averred, when one questions the desirability of the supersonic transport or the "crash" program to put a man on the moon, that the money would not be spent for other objectives. So, the conclusion stated is that we should go smashing ahead with these projects. This is absurd. Few thoughtful people maintain that space exploration should not take place, but many suggest that it gets too great attention and too much money. As for the SST, one wonders why it is so important to spend billions of dollars to build a machine to carry a few hundred people faster across oceans or continents, when the additional social cost is noise pollution. The public needs or is entitled to greater attention paid to aircraft safety. The relative ordering of values, of the establishment of priorities, is something that lawyers have done in the past and should be able to help with now. But the lawyer is not doing the job.

The lawyer has abdicated. He has become the handmaiden of the politician, the lackey of the person with the money. He has stood aside and failed to come to grips with the question of values. He has, in short, been used to further science and technology as ends in themselves at the very time that values are in need of clarification and there is that shrinking margin for error and miscalculation by the technocrats. Let me quote Dean Price again to indicate a facet of what I mean: "the main philosophical threat to our freedom is not that science will tempt us to invent a new materialist dialectic, or establish a '1984' style dictatorship. It is rather that if we rely on science alone we will be left with no sense of the purpose of existence, and thus no basis for determining the political goals to guide blind forces of applied technology."¹¹² It is a matter of more than passing interest to note that the symposium on "forecasting the future" in *Science Journal*¹¹³ has almost nothing to say about political structure, legal principles, and the like. That, I suggest, is what science and technology are all about: they are to serve, not dominate, man. As the future becomes a matter of choice, of conscious invention (we are living to see the truth in Whitehead's dictum that "the most important invention of the 19th century was the invention of the art of invention"), then there must be future-orientation among all those who are concerned with human values.¹¹⁴ As Mesthene says, moral enterprise has been wrenched from its traditional anchors in the social and physical stabilities of the past, stabilities that got their formal statement in law. "Those stabilities are going, but that does not mean that all possibility of stability is gone. The stabilities, the permanencies, the verities of value remain, but they must henceforth be forged out of the continuum of human experience with constant change, rather than derived from the illusion of permanence. Values now reveal them-

112. D. K. Price, *supra* note 97, at 107.

113. Oct., 1967.

114. As Raymond Aron recently said, "Modern societies are the first ever to justify themselves by their future, the first in which the motto 'Man is the future of man' appears not so much blasphemous as banal." R. Aron, *The Industrial Society: Three Essays on Ideology and Development* 15 (1967).

selves as principles, concepts, understandings, plans of action—not static imitations of social habit. Wisdom is still a matter of values, but the values must henceforth be sought, created, reshaped, made over again and again as needed. The permanencies we live by must be hewed out of the increasing impermanencies that we live in.¹¹⁵ That, I maintain, forcefully poses the problem for law and lawyers: how to act so as to reshape old values in a world of constant change, retaining that which is good, sloughing off that which is useless or irrelevant—in short, helping to create a humanistic society.

It is neither parochial pride nor guild loyalty that causes me to plead for a wider jurisdiction for law and lawyers. Rather, it is difficult to see, when one surveys the field, from what other source the fundamental need might be met. Our ethical leaders, the clergy, have been reduced to irrelevance, to conducting Sunday-morning social hours for an audience that attends but does not heed. The economists want to be mathematicians and the political scientists want to be behavioral scientists. Members of those disciplines think they can live and act “objectively”—without the intervention of values. So, for that matter, do many lawyers. That is about the most dismal delusion under which one can labor.¹¹⁶ The notion of neutrality, of objectivity, carried on in what is thought to be a scientific manner, is a dangerous snare.¹¹⁷ All human behavior involves values, avowed or inarticulated. This, then, means that there must be a conscious facing up to valuations, to the goals and purposes that are desired, and to the alternative ways of reaching them. Policy by drift is no longer adequate; “muddling through” *sounds* like a good way to describe the policy process¹¹⁸ but it is hardly adequate as a means of processing. The scientists and technologists, aided by those pseudo-scientists, the economists, are inventing the future; as Olaf Helmer has put it, “The fatalistic view that the future is unforeseeable and inevitable is being abandoned. It is being recognized that there are a multitude of possible futures and that *appropriate* intervention can make a difference in their probabilities. This raises the exploration of the future, and the search for ways to influence its direction, to activities of great *social* responsibility. This responsibility is not just an academic one, and to discharge it more than perfunctorily we must cease to be mere spectators in our own ongoing history, and participate with determination in molding the future. It will take wisdom, courage and *sensitivity to human values* to shape a better world.”¹¹⁹ This presents the problem to law—and to lawyers. It will not be easy; it is more difficult now than ever to be wise. It is simply necessary.

I have strayed far from my proposition of the merger of law and politics.

115. Mesthene, *supra* note 96, at 7.

116. See works cited in *supra* note 25.

117. This is not to say, it should be emphasized, that degrees of objectivity or neutrality do not exist. Of course they do. But it is to say that the problem of value judgments cannot be swept under the rug in a pseudo-scientific manner.

118. See C.E. Lindblom, *The Intelligence of Democracy* (1963).

119. O. Helmer, *Social Technology* (1966), *quoted in* Jantsch, *supra* note 88, at 45 (Emphasis added.).

This was deliberate. It would be the worst form of delusion (the worst stupidity, as Nietzsche said) to forget what we are trying to do. That is what I think we have done, at least in the legal profession. Lawyers as legal mechanics do little more than practice what Dean Eugene V. Rostow has called "a rather esoteric craft of limited social value."¹²⁰ At precisely the time in human history when lawyers are needed more than ever, when the profession should heed the call of Admiral Rickover to protect society against rampant technology, lawyers (and law) are dwindling in importance. They have not kept relevant to the age in which we live. Possibly my point may be better seen in the context of the next proposition.

V

The remainder of what I have to say will be summarily treated. Not that it is of less importance than the foregoing, but simply because it seems to follow from or be a corollary to what has been already said. My fifth proposition is this: *Big science creates conditions having at least the potential, and often the actuality, of adverse effects on the human personality (psyche)*. Let me mention a few examples and then attempt to indicate how they present legal problems. First, there is the question of human experimentation; to what extent should human beings be subjected to scientific experiment without their consent, the aim being the furtherance of medical knowledge for the "general good?" The doctors have been doing this, often aided by governmental grants; the lawyers have ignored it. Second, to what extent should the mass of people be subjected to noise pollution so that a few members of the "jet set" can travel a little faster between two points on an already tiny planet? Again, the lawyers have been mute; it has taken a scientist such as Dr. William Shurcliff of Harvard to air the situation.¹²¹ Next, to what extent should the state be allowed to take steps to enforce minimal health standards on people, whether they wish it or not and without the benefit of long-range tests? An example here is fluoridation of water supplies, made compulsory often by fiat and at times by vote; but the same principle could be extended to, for example, the introduction of a substance into drinking water that would make a person nauseous who smoked a cigarette or of a different chemical that would temporarily sterilize any one who drank the water. Does the constitutional principle of compulsory vaccination against smallpox cover such situations? Fourth, there is the serious question of invasions of privacy by electronic and other means—wiretapping, eavesdropping, and so on—or by what has been called "dossier technology."¹²² There is now a proposal being debated in the halls of American government to establish a "national data center" which will store in computers all information about a person "from womb to tomb"—and which, so we are assured, will not

120. E. Rostow, Report of the Dean of the Yale Law School 16 (1966).

121. Dr. Shurcliff is Director of the Citizens League Against the Sonic Boom, 19 Appleton Street, Cambridge, Mass.

122. Ozbekhan, *Automation*, Science J., Oct., 1967, at 67, 72.

be used improperly.¹²³ What is lacking here, as in the other instances, is that social norms have not been established and defined and institutions or methods have not been created to enforce those norms.¹²⁴ Where, oh where, are the lawyers?

These are a few illustrative instances of how science and technology can and do impinge on the human personality. You will note that in each of them, some more than others, it is only because government participates that the impingements can take place. This means the active intervention of government in a process that erodes the status of the individual *qua* individual. In saying this, I do not subscribe to the Robinson Crusoe fallacy; man has always been a social animal. What is new is that government is employing science and technology for purportedly good ends without taking into account what might be called the "non-serendipitous" effects. Let me be very clear about this; I do not favor dental caries or any disease that can be eradicated through science. What I do favor, and what I think we have lost sight of, is that in our fervor to pursue outwardly beneficial ends we have to take steps to insure the formulation of social norms to go along with technical advance. The cost of some such advances may well be too high, as witness the unhappy history of that very good tranquilizer, thalidomide.

Where does the lawyer fit into this? It is his task to provide leadership in clarifying all of the values involved in such matters. Take fluoridation, for it is one of the more controversial subjects. The United States government has been an active propagandist in favor of the introduction of fluoride in public water supplies. Many cities and even some states have followed along. Some doctors are on record as saying that decisions to do so should be made by the expert, that is, the medical profession, because the public at large is too uninformed to vote intelligently. The legal profession, admirably consistent in its ability not to recognize problems until they become crises, does not consider itself responsible for anything more than being the person who puts the decision of the technocrat into prescribed form. But the question is much larger than that: The legal problem is not only technical (which involves getting the policy into the proper pigeon-hole of the law), but constitutional (which involves the largest questions of the individual to the state). Why should not the profession actively seek out means to insure that, at the very least, the questions are properly debated and affirmatively propose feasible alternatives of action (including no action at all)? The non-lawyer again provides apt quotation: Speaking of dossier technology and the question of privacy, Hasan Ozbekhan recently said: "At the technical level, this confronts us with interesting problems of how to ensure privacy and security and how to design the required identification devices that will permit access [to the data bank] only to those who need to know, and at times and in circumstances when they have to know. However, technical

123. Cf. A.F. Westin, *Privacy and Freedom* (1967).

124. This is discussed by Ozbekhan, *supra* note 122.

progress has not been spectacular mainly because, in order to solve the technical problem, social norms must first be established and defined. Work leading towards such definition has hardly begun. We do not know what properties of privacy have social value and need to be preserved. We do not know how to sort out with any precision the kind of information to which access must be prohibited. We do not quite understand the complex legal, jurisdictional and, ultimately, constitutional mechanisms that are involved."¹²⁵

So this *is* lawyers' business, whether the profession is ready to admit or accept it. I am not maintaining that it is the business of all lawyers, although it is difficult to see why not, but I do say that those in academic life have a duty and a responsibility to get into such matters. We are facing a crisis of critical proportions; the assault on the human psyche has been accelerating for decades; it has now reached a crescendo. Looking around the buzzing, blooming confusion of life, one is unable to perceive any group in a better position to do this than the academic lawyers and the collectivized bar (*e.g.*, the American Bar Association, the American Law Institute). To repeat for emphasis: we have reached the point where the future must be planned for in a humanistic sense. Our future *is* being planned for us by the technocrats in the "technostructures" of modern industry and government. A counterrevolution is necessary.

VI

My last proposition is this: *Big science both exacerbates human problems and gives promise of their reasonable resolution.* It makes the human condition worse by such nonserendipitous effects as the nuclear bomb; air, water and noise pollution; through death-control measures that are largely the cause of the population explosion; and by bringing people closer together through transportation and communication. Most of these are products of big science. Collectively, they (with other like matters) make the world a less desirable place than it was—or could be. We can die as a species by being vaporized by hydrogen bombs or by asphyxiation or by being bred to death; and it is by no means accurate to say that the closer people get together, the happier they will be. Quite the contrary, science and technology, by making this one world in fact, have merely guaranteed that all wars are civil wars. Civil wars, you will recall, are to be compared with religious conflicts in being bloody and vicious. It is not accurate, furthermore, to say that affluence brings happiness. The rising crime rate among children in middle-class families is sufficient testimony to that. Let me hasten to add that I am not in favor of poverty; with Shaw, I maintain that it is a social crime. What I am saying is that we are, in this respect as well as others (*e.g.*, the interdependence of peoples), witnessing the decline of the liberal dream. That is difficult to swallow, for it was (and is) a fine dream—but a dream, nonetheless. Arthur Koestler, in *The Ghost in the Machine*,¹²⁶

125. *Id.*

126. A. Koestler, *The Ghost in the Machine*, part 3 (1967).

maintains that there is some built-in deficiency in man's native equipment that disposes him toward self-destruction, a paranoid trend running through human history. And he calls upon the scientist—big science—to produce a chemical that, when administered by psycho-pharmacists, will counteract that tendency. Now, there is a legal problem.

That is the dark side of the picture. It is gloomy enough, particularly if one adds, as he must, the contentions of Konrad Lorenz and Robert Ardrey to those of Koestler and others.¹²⁷ The other side helps to relieve, if not dispel, the gloom of the chroniclers of doom. Death-control measures do permit more people to live full and at times reasonably happy lives, if not in India then surely in Western Europe. The hydrogen bomb has not been used. Efforts are being made to cope with the various types of pollution. Something might be done about birth control. But of most importance, perhaps of the first rank in importance, is the idea that science and technology, properly harnessed and directed, can give at least the promise of bringing adequate living standards to all of the peoples of the world. To do so will, of course, take a maximum effort on the part of those who have the capacity and the resources. But it can be done, if man wills it.

Our question is: Where does the lawyer fit into this? Here I draw on a recent paper by Dr. Alvin M. Weinberg, Director of the Oak Ridge National Laboratory. The question, as I see it, is how can the lawyer and the scientist-technologist cooperate to help relieve the problems of the human condition? Weinberg notes the appalling difficulty of social problems and then asks whether technology might help:

The resolution of social problems by the traditional methods—by motivating or forcing people to behave more rationally—is a frustrating business. People don't behave rationally; it is a long, hard business to persuade individuals to forego immediate personal gain or pleasure (as seen by the individual) in favor of longer-term social gain. And indeed, the aim of social engineering is to invent the social devices—usually legal, but also moral and educational and organizational—that will change each person's motivation and redirect his activities along ways that are more acceptable to the society.

The technologist is appalled by the difficulties faced by the social engineer; to engineer even a small social change by inducing individuals to behave differently is always hard even when the change is rather neutral or even beneficial. For example, some rice eaters in India are reported to prefer starvation to eating wheat which we send to them. How much harder it is to change motivation where the individual is insecure and feels threatened if he acts differently, as illustrated by the poor white's reluctance to accept the Negro as an equal. By contrast, technological engineering is simple: the rocket, the reactor, and the desalinization plants are devices that are expensive to develop, to be sure, but their feasibility is relatively easy to assess; and their suc-

127. K. Lorenz, *On Aggression* (1966); R. Ardrey, *The Territorial Imperative* (1966).

cess relatively easy to achieve once one understands the scientific principles underlying them.¹²⁸

Weinberg then goes on to ask whether it might be possible to identify "quick technological fixes" to relieve social problems. By that he means the development of a technology that will so alter the social problem as to make its resolution more feasible. He mentions automation and mass production of goods as one such "fix" that has greatly diminished the problem of poverty and goes on to assert that the hydrogen bomb—another "fix"—may do more to prevent large-scale war than any other device or technique. (Koestler's proposed psychopharmacological drug could be considered the ultimate "fix.")

However, Dr. Weinberg ends by stating what may be considered to be the challenge to the social engineers (of whom the lawyers may be said to be in the forefront):

Yet I am afraid we technologists shall not satisfy our social engineers, who tell us that our Technological Fixes do not get to the heart of the problem; they are at best temporary expedients; they create new problems as they solve old ones; to put a technological fix into effect requires a positive social action. Eventually, social engineering, like the Supreme Court's decision on desegregation, must be invoked to solve social problems. And of course our social engineers are right. Technology will never *replace* social engineering. But technology has provided and will continue to provide to the social engineer broader options, to make intractable social problems less intractable; perhaps most of all, technology will buy time, that precious commodity that converts violent social revolution into acceptable social evolution.¹²⁹

There is a great opportunity here, for no doubt many social problems do admit of partial technological solutions. Weinberg pleads for, first, "government to deploy its laboratories, its hardware contractors, and its engineering universities around social problems," and secondly, "for understanding and cooperation between the technologist and the social engineer."¹³⁰

The conception of the lawyer as a social engineer is not new. Roscoe Pound wrote extensively about it.¹³¹ A few contemporaries have followed in his path.¹³² I do not advocate turning the entire show over to the lawyer. Or to any other skill group, for that matter. Let me suggest, however, one thing that might be done.

Recently, it has become fashionable to talk about a "post-industrial"

128. Weinberg, *Can Technology Replace Social Engineering?* U. Chi. Mag., Oct., 1966, at 6.

129. *Id.*

130. *Id.* It is worthy of more than passing mention that a movement, however small, of armaments companies toward grappling with social problems, e.g., urban renewal, "job corps," has taken place recently. See Miles, *The Politics of Consortium*, The New Republic, Sept. 9, 1967, at 4.

131. See, e.g., Pound, *The Lawyer as a Social Engineer*, 3 J. Pub. L. (1954).

132. Notably Myres McDougal and Harold Lasswell. See, e.g., Lasswell & McDougal, *Jurisprudence in Policy-oriented Perspective*, 19 U. Fla. L. Rev. 486 (1967).

society. The locus of societal power may in fact be shifting from business to the centers of knowledge, the universities, the research centers, the "think-tanks," and the like. The new man of power is he who can handle ideas and concepts and who can apply science and technology to human needs. Compare in this regard a statement by Glenn T. Seaborg, Chairman of the United States Atomic Energy Commission, with one by Professor Daniel Bell, a sociologist at Columbia University. Says Seaborg: "Most of today's schools and universities are involved to a great degree in serving the requirements of an industrial age, in fulfilling the needs of a society which has only been partly and indirectly of their making. In the future I think this role will shift to where the nature of society is determined more by the thinking of the university, and in which the industrial community will tend to serve goals created by that thinking. This is not to say that in the future the nation and the world will be under the leadership of a handful of college professors. I think even the academic community would view this prospect with horror. What I look for from the universities is the development of an education which turns out individuals of the highest intellect and broadest outlook, able to understand man and machine and live creatively with both."¹³³ Says Bell: "To speak rashly, if the dominant figures of the past hundred years have been the entrepreneur, the businessman, the 'new men' are the scientists, the mathematicians, the economists, and the engineers of the new computer technology."¹³⁴

To the extent that these views are valid, then it does not seem fanciful to think that the academic lawyers, provided they take a large and expansive view of their role, can provide the leadership necessary to take on the task of helping to manage big science to achieve humanistic ends. Together with the collectivized bar, they should establish centers for policy analysis—places where existing and proposed measures can be subjected to intense scrutiny and evaluated in the light of articulated goals. Law, as it grew in the past, was largely business-oriented. It provided a protective umbrella under which science and technology could—indeed, were encouraged to—flourish. As we move into the post-industrial era, what will happen to legal concepts—contracts and torts, property and person—that grew during the age of industrialism? Law will change as much in the future as it has in the past, for it not only is a means of social engineering; it also is a reflection of the mores of the time. In the future, administrative law will no doubt become of increasing importance, the core of the legal system. What its content will be, I do not predict; what its content should be must be planned for in the same way that the future is planned by the technocrats.

It is here that the lawyer, acting within a center for policy analysis, can be of great help to his fellow humans. But this will require a total recasting

133. Seaborg, Time, *Leisure and the Computer: The Crisis of Modern Technology*, 33 Key Rep. No. 3, at 2, 3 (1967).

134. Bell, *supra* note 92.

of legal education and a reorientation of the drives and interests of the bar associations. Law will have to be seen as a reflection of the total community process. A consistent failure on the part of lawyers, academic and practicing, so to act is only too evident. No one should be hopeful that it will be done. Furthermore, law will have to be meshed with the insights of other disciplines; lawyers will have to forego their attitude of invincible parochialism that isolates them from much of the human condition. They will have to tackle, if they are to become relevant to the modern era—to the post-industrial society—the abrasive problems, not excluding those brought by a runaway science and technology. As Dr. Weinberg has said, the technologist cannot do the job alone. If the task is to be accomplished—and no one is entitled to be optimistic on that score—then the lawyers (and others) had better come out of their cocoons. We have seen in recent years the emergence of the “church militant,” in which some members of the clergy are beginning to be cognizant of the real problems of real people. We need now the emergence of the “lawyer militant,” to help create a human-oriented society—not a society in which the machine dominates.¹³⁵

CONCLUSION

I revert again to the problem of change versus stability. The promise of law is a stable and ordered society; the thrust of science is rampant social upheaval. The two are on a collision course. In the long run, there can be no doubt that some resolution will occur. There is, I assume, some end to what science can do, although I am not rash enough to say what it is. Order and stability will return at some time, but when no one can say. We should also remember Keynes' dictum—that in the long run we are all dead; it is precious little solace to those now living to believe that at some time in the future stability and even a human-oriented society will evolve. And there is the

135. Cf. L. Mumford, *The Myth of the Machine: Technics and Human Development* 10 (1967): “It was only because I could find no clue to modern man's overwhelming commitment to his technology, even at the expense of his health, his physical safety, and his possible future development, that I was driven to re-examine the nature of man and the whole course of technological change.” Mumford does not mention law or lawyers; his book is cited to indicate what one of the better thinkers of the era believe about the crisis in the human condition. See also Loevinger, *Law and Science as Rival Systems*, 19 U. Fla. L. Rev. 530 (1967), in which Commissioner Loevinger calls for a “socially oriented jurisprudence” which would mesh “the methods, concepts and thought processes of science” with the traditional tools of the lawyer to help resolve social and legal problems. *Id.* at 550. “Unfortunately the teaching and the practice of law are still largely based upon an earlier period when statutes were few and relatively simple statements of policy, and when practical law was made in court. As a result, we have separated the study of lawmaking, which we call political science, from law interpreting and applying, which we call the practice of law. This makes about as much sense as separating the study of anatomy and physiology from the practice of medicine. . . . We cannot reasonably expect to achieve the Socratic vision of governors who are philosophers, lawyers and scientists all at the same time. But the profession of law and those it serves can hope and demand that the law schools begin to study both of the great systems of gathering data, the dialectic and the empiric, and bring both to bear in seeking solutions of the proliferating and increasingly complex problems of government in a scientific age, and in training those who will become our future governors.” *Id.* at 550-51.

future question: What kind of order? What kind of stability? Those are the unanswered and unanswerable questions.

"'Tis all in peeces, all cohaerence gone," wailed the poet at the dawn of the scientific age. So it is. We are those who are fated to live during the time that Donne's observation has come crashing into existence. Life *is* all in "peeces"; all "cohaerence" *is* gone. Somewhere T. S. Eliot has one of his characters say, "I am just a man with a set of obsolete responses." Mankind is running under the weight of a set of such responses today.

I cannot say that the matters I have discussed are "legal" problems. But I can and do say that they are human problems and that lawyers must be concerned with them.