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SCIENCE AND TECHNOLOGY V. LAW, OR A PLAGUE ON BOTH YOUR HOUSES

BY WILBERT E. MOORE

THE topic of our conference is sufficiently broad to permit us lots of room to move around, perhaps to lose ourselves. My mission in these introductory comments is, to change the metaphor, to recognize that we do have a broad canvas and to seize a large brush and paint with broad strokes. This means that some of my statements are bound to be cryptic.

The title of this brief discourse may stand accused of being too cute, as I intend to explore interdependence as well as conflict. Yet the prideful and sometimes insular quest for autonomy on the part of representatives of major fields of learning lends some credibility to an adversary proceeding.

The participants in this conference represent a broad cross section of natural scientists, technologists, legal scholars, and social scientists not elsewhere classified. That means that our communications will have to be interdisciplinary if we communicate at all. Now, the glamor of interdisciplinary work, so highly touted a decade or so ago, has been dimmed by its difficulty. Yet, the problems that face our civilization are notably undisciplined. Some cooperation is therefore essential if we have any chance at all for sensible solutions. But that requires that some highly disciplined men also become interdisciplinary; one might almost say that the desirable strategy is to develop an intellectual specialty to a high level and then outgrow it.

In introducing the discussion of the interrelations of science and technology on the one hand and law on the other, I want to attend first to a couple of what I shall pretentiously call grand themes and then to a few minor and major themes, concluding with an attempt to put some of this discussion in the context of my own primary discipline of sociology.

I. THE GRAND THEMES

The first theme that I wish to explore concerning the intersection of science and law may be summarized as the view of science as innovator and law as conservator, or put even less tenably, scientists as perpetrators of problems and lawyers as perpetrators of solutions. (Clearly, I do not refer here to the scientific quest for the lawful character of nature and universe rather to the relation of that enterprise to the formalized custom, conventions, and procedures by which

societies attempt to maintain a modicum of social order.) For the view of science and technology as innovative and law as conservative there is considerable evidence and conventional wisdom, but the case is not untainted.

(1) Technologists often, and sometimes properly, stand accused of "tunnel vision," of pursuing narrow goals and solutions according to decisions made by others without regard for real social need or merit. For some inventions the proper response may be "Who needs them?" or even "Shouldn't we prevent them?"

(2) Even in "pure science" the innovations may be relatively minor. If we accept Thomas Kuhn's view of *The Structure of Scientific Revolutions*,¹ much of scientific work consists of filling-in paradigms until the paradigms will no longer serve insistent observations. Thus science may be more or less locked in by current presuppositions.

(3) The conservative influence of law may also be exaggerated. Against the undoubted importance of precedent in court decisions we should have to set the influence of legislation, administrative decision, and even judicial decision as agencies for the achievement of legal change.

The second theme to be explored is the view of science-technology and of law as autonomous forces. Part of this view is the myth of technical primacy. That technology always leads and other human concerns tardily follow is a belief widely held, and one widely admired by technologists for that makes them leaders. The view will not withstand close examination. Though essentially accidental discoveries do occur, we mainly get the technology that we deserve or are willing to pay for: moon shots and dirty rivers, two-car families and congested cities. A perhaps stronger case can be made for the leading position of science as such; but here too, we must note that there is an interaction between science and technology, not a unidirectional flow from theory to practice, and that science prospers or barely survives chiefly in terms of levels of support from all sources. For some time now scientists and technologists have proved themselves less immune to or innocent of the political process than their traditional protestations of neutrality would lead us to expect. It would be far too cynical to allege that the participation of scientists in the many discussions of science and public policy reflects chiefly an interest in research budgets, but that concern is one effective way of losing political neutrality.

The autonomy of legal systems is also subject to reservation. Despite the sense by the legal fraternity that they represent an ancient and honorable tradition, that tradition is subject to both disuse and to reflections in the law of our current state, including our current

¹ T. S. KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* (1962).

technical state. It is true that in the Roman law system (improperly called the civil law system) there is a strong presumption that the framers of the codes took care of all eventualities, but it is a presumption conspicuously falsified by crucial issues in a changeful world. In the common law system, judicial precedent (the doctrine of *stare decisis*) is sometimes given similar credence as providing legal autonomy. But decisions do change, albeit sometimes slowly, in large part because the cases change as a consequence of changing social, scientific, and technical circumstances. Indeed, if we take political and legislative processes as part of the legal system, as I believe we must, the law necessarily reflects the various pressures for amelioration and redress of grievances as well as the changing balances of interests. But this second theme was to doubt the autonomy of either science or the law; we now rest the case.

II. THE INTERSECTION OF SCIENCE-TECHNOLOGY AND THE LAW: MINOR AND MAJOR THEMES.

In what immediately follows I am going to play the part of the amateur lawyer, for as a law professor I am licensed to practice in no known jurisdiction except possibly in the south basement of the University of Denver College of Law. In doing so I should like to note briefly some *substantive* areas in law that conspicuously intersect with technical and scientific concerns. Perhaps the most obvious of these is the law of patents, a legal specialty long recognized by the legal profession which has long pretended that it generally did not specialize. The patent attorney, working with an inventor or with a technical team, must determine whether the innovation in product or process is both sufficiently novel and *useful*. As I understand patent law, some color of utility must be claimed, and that could scarcely be determined on legal grounds alone. A technical and even possibly a social input would seem indicated.

Another clear-cut intersection of law and technology is that of natural resources law. The legal interest is clear in real property law and in such rights as arise in irrigation networks. But further, the question of what constitutes natural resources also prominently involves the current state of the useful arts, that is, technology.

Still another area of intersection is represented in traffic control. The rules of the road are mainly represented in a host of administrative regulations, and not a few of those are implemented technically, ranging from safety inspections and radar traps for speeders to possible electronic controls for the spacing of vehicles on streets and highways. The current scandal of automobile liability insurance and the overburdening of the courts and the legal fraternity by automobile negligence (tort

liability) cases are inviting institutional remedies such as no-fault insurance, yet the proximate cause of this grave problem is the automobile accident, and accident prevention would seem to require a combination of legal and technical innovations.

As a final substantive area of law for present illustrative purposes, there is that somewhat abstruse — some would say nonexistent — legal specialty identified as international law, including such clearly technical fields as nuclear limitation, space law, and exploitation of the sea. To keep science and technology national is virtually impossible, despite security regulations and what I call the gauze of secrecy. This is partly because scientists and technologists identify professionally and communicate with their fellow specialists. But, more importantly, similar people working on similar problems will probably reach similar conclusions. Yet, if science and technology are predominantly international — and they do indeed form part of a global system — law is not. Law is predominantly territorial or jurisdictional, and that presents problems for the legal control of scientific and technical innovation. Since we now have a variety of ways of destroying the world for human habitation, it would seem that some legal and technical ingenuity might be devoted to saving it.

I next turn to a brief review of legal procedures for intersecting with science and technology. The predominant one, of course, is that of legislation and its creatures: the funding, research, and administrative agencies. One need only note by example the National Science Foundation, the Office of Science and Technology, the Interstate Commerce Commission, or the Federal Aviation Administration to call to mind many others that rely on technical information and advice for carrying out their missions. Some of these promote and some of them administer and control, but the difference is not sharp, since the power to promote is in effect the power to control.

Even the judicial process is of course not impervious to technical information. One well-established procedure, though not exactly common, is the *amicus curiae* brief that presumes to inform the court on matters relevant to a judicial decision. The appellate judges may take "judicial notice" of such *amicus* briefs in rendering decisions.

A currently very lively but still controversial procedure is the "class action" suit, perhaps most conspicuously associated in the public consciousness with "Nader's Raiders" (who have instituted few such suits). Recent attempts to represent purchasers of allegedly inferior or unsafe products, or citizens suffering from air pollution are examples of such suits. Even esthetic suffering may provide a cause of action, as it already does in zoning regulations. The problem of "bounding the class" one supposes is mainly a legal and sociological problem; but, testimony on the mischief complained of is mainly a technical one.

Before concluding the discussion of the intersection of law and technology, I should like to refer briefly to law itself as a kind of social technology practiced by professionals at varying degrees of proficiency as well as by a variety of paraprofessionals, some of whom are comparable to technical assistants. Whether law is also a social science has excited animated debate in more than one conference, and I doubt that it would be useful here to debate it again. However, I do have a comment to make. One view contrary to the acceptance of law as a social science points to the supposed contrast between the inquiring mind of the scientist and the adversary or the litigious mind of the lawyer. Yet when I observe the disputes among scientists, I am not totally persuaded of the validity of the contrast.

III. GRAND THEMES REVISITED

It would not do for a sociologist, who is supposed to be able to relate anything to anything, to conclude without a small conceptual exercise and a tiny view of sociological theory. Hence, I shall characterize briefly four sociological views of the social order.

Functionalism, which dominated sociological theory for a considerable time, might be succinctly summarized as the view that everything is related to everything. It was predominantly a static view of the social universe and methodologically meant that the selection of independent and dependent variables could be nearly arbitrary.

Neofunctionalism might be summarized as the view "but some things are more related than others," *e.g.*, that economy, education, or technology predict more similarities and variations in behavior than religion or even law.

Dynamism, a clear outgrowth of neofunctionalism, attended to intrinsic sources of change in systems, although it often operated on mindlessly mechanical models, such as the social evolutionary doctrine or the doctrine of technological primacy (as though machines were self-inventing without the intervention of human skill and purpose). Yet, more complex models of change do attend to unequal rates, to genuine sequences, and to interplay among elements in the dynamic process. Here again, I should reiterate that science and technology may be lagging, not leading.

Neodynamism (a regrettable term used only for symmetry) argues that we can alter the course of events by deliberate action, both in terms of goals and, to a more limited extent, in terms of means and sequences. Neither science-technology nor law is indeed autonomous and independent of human will and wisdom. Each is subject to human purpose.

In closing, I cannot refrain from quoting a quatrain from Fitz-

gerald's first translated version of a portion of the *Rubaiyat* of Omar Khayyam.²

Ah love. Could thou and I with Fate conspire
To grasp this sorry Scheme of Things entire,
Would not we shatter it to bits — and then
Re-mould it nearer to the Heart's Desire?

² RUBAIYAT OF OMAR KHAYYAM (1st ed. E. Fitzgerald transl. 1967).