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SCIENCE AND THE LAW*

WILLIAM J. MCGILL†

It is a great honor for me to have been invited here this evening at the outset of the fiftieth anniversary of the founding of the Guild of Catholic Lawyers of the Archdiocese of New York. The time appears also to coincide with the 500th anniversary of the birth of Saint Thomas More, the remarkably courageous Lord Chancellor of England whose resistance to the Act of Supremacy separating the English Church from Rome, and whose ultimate martyrdom at the hand of Henry VIII, have made him the patron saint of lawyers. It is easy to feel intimidated by both the historical setting and the professional competence of this distinguished audience.

My only serious legal qualification to address you is the fact that during the nearly 8 years in which I have served as President of Columbia University, I have been sued and investigated repeatedly for attempting to carry out the duties which the Trustees assigned to me. I cannot claim to be overscrupulous, but I would also never consider crossing the street against a red light. I do not smoke, although my wife does. And when she opens a pack of cigarettes, I see to it always that she tears the tax stamp. I drive our automobile very carefully, never exceeding the speed limit, and would certainly consider it unthinkable to violate the 8-foot law. Yet the events of the last 10 years in California and in New York have managed to lose for me the status I once enjoyed as an untarnished legal virgin. I have found myself on the receiving end of more than a hundred lawsuits and at least one state legislative investigation. It is perhaps indicative of the current conditions of life for university presidents that I find myself casting an eye warily around the room searching for problems beyond those of which I am already aware. I see at least a dozen familiar faces, distinguished attorneys with whom I have been recently involved, or perhaps the correct word is embroiled. Out of respect for the rules of the Marquess of Queensberry, no one has served a legal paper on me this evening—at least not yet!

Seriously, I want to speak to you this evening about the increasingly adversary character of American public life as it affects the administration of science. It is not quite true that all of us are threatening to sue the pants off each other or to investigate the daylights out of one another, but it is also not ludicrously false either. In the years since World War II, the mass media in the United States has greatly enhanced our nation's almost un-

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limited capacity for disputatiousness. Of course, this is not a new problem. Conflict is what sells newspapers, and more than 70 years ago Roscoe Pound called attention to America's unusual legal contentiousness in a remarkable paper on the causes of popular dissatisfaction with the administration of justice. Nevertheless, in view of the conflict-oriented style of our mass media, and present day judicial standards for redressing grievances, we seem to be moving toward a more distilled form of purely adversary society than even Dean Pound foresaw.

The emerging social order in America may well be one in which policy at all levels is forged from the clash of narrowly based constituency interests, each one at war for its own special advantage without regard for the others or for the larger public interest. American visitors to the People's Republic of China have commented on the striking differences between modern China and modern America in this respect. China is well organized and harmonious, displaying a universal popular dedication to the growth of its brand of rigorous Marxism, whereas the United States carries on its business in a continuing swirl of investigations, legal actions, inflated rhetoric, criticism in the newspapers, and other pressures.

I certainly do not want to be naive about this problem. The subtleties of another culture are easily misunderstood. Moreover, it is not immediately evident that harmony achieved by suppression of dissent is preferable to the hurly-burly of American public life. Dispute is a trivial price to pay for the benefits of a free society, but frankly I am worried about the effects of these psychological stresses on our people. A deepening cynicism and almost paranoid mistrust of established institutions appear to have gripped the American people in the aftermath of the Vietnam War and the Watergate scandals. Fortunately, the courts have emerged from this troubled period with enhanced respect. But the number of conflicts which the legal profession and our courts are now expected to resolve has also increased geometrically, raising serious doubts about the capacity of our legal system to deal effectively with public discord on the scale projected by the recent growth of adversary conflict in the United States.

I hope I will not be misunderstood if I say that these developments seem to me to have occurred in direct proportion to the willingness of the courts to intervene in the operation of our society's institutions. We live in an era of extraordinary judicial activism in which the courts have shown themselves quite prepared to administer schools, prison systems, state police organizations, municipal services, and many other institutional activities, if such intervention is deemed necessary to achieve compliance with their orders. It may indeed be necessary. And legislatures have shown no alarm about this remarkable expansion of judicial power. Indeed, they have encouraged it, and have themselves produced a burgeoning regulatory apparatus performing quasi-judicial functions even more interventionist than our courts. Americans are, above all, impatient. Consequently, our legal system seems to prefer social change by direct intervention in the functioning of businesses, schools, local government, and other institutions

rather than through the patient application of correctives or incentives.

We ought to think more seriously about such developments. Although legal contentiousness is an old problem in the United States, large scale judicial intervention is of fairly recent origin. There is now a substantive basis for complaint by the business sector that the interventionist bent of the courts and the government is making it increasingly difficult to form capital and thus is unwittingly, but effectively, altering the nature of our economic system. Similarly, there is a growing basis for complaint by the institutional nonprofit sector of society—schools, colleges, hospitals, churches, and social agencies—to the effect that the interventionist bent of the courts and the regulatory agencies has so embroiled these institutions in community struggle that our traditional commitments to intellectual and moral excellence have had to be suppressed in order to meet the priorities of peacemaking.

I do not rise before you this evening merely to express the frustrations that every chief administrator of a major American university feels in attempting to guide his own institution safely through this Darwinian embroglio. When we alter the power relations in society, frustrations must be expected. Institutions cannot continue to operate in their traditional easy ways when profound changes are occurring in American life. The power relations among the components of society have been altered to an astonishing extent, and there will be no ease for those who carry administrative responsibility. The point of my initial argument is that I do not accept the view of many lawyers and judges with whom I have discussed this problem; that they are more or less passive observers of society's disputes and that all this is part of the history and sociology of our time.

There is no doubt in my mind that a causal relationship exists between the willingness of the courts to review the decisions of university administrators and the development of new legislation attempting to influence the outcome of such review, and that both these factors tend to increase the number of disputes at universities that eventually find their way into court. It appears to me that the social process by which this causal sequence occurs is obvious, and courts and legislatures should not deceive themselves about the consequences of their activism. They are shapers of society, not passive arbiters.

The difficulties I am describing are, in part, the growing pains of a vigorous and creative free people. Repression of dissent and rigorous planning are as foreign to the dramatics of current American life as they seem to be natural in the Marxist states. It is plausible to argue that legislative and judicial interventionism in the United States has prevented the growth of revolutionary forces by giving voice to segments of our society previously excluded from decision-making. I happen to believe that, but I am also charged with the guidance of one of the great educational institutions of the world, and I have to tell you that the character of the community struggles in which I find myself continuously enmeshed makes me wonder how in the world we ever make sensible educational decisions. It is a

question of balance and proportion. In recent years, the balance has been struck in such a way as to involve us regularly with militant advocacy groups which object to our educational activities and move quite effectively to influence them.

It is plain that this adversary pushing and shoving may be either good or bad depending on the nature of the dangers which our centers of thought and research pose to society as well as on the extremely subtle question of what the first concerns of a university ought to be. If, in the long run, this turbulent era is seen as strengthening America by broadening the base of our democracy, increasing our respect for law, and preventing social harm, then the frustrations which we university administrators now endure will have been well worth it. On the other hand, it is not difficult to argue that we are weakening America's scientific leadership by unwittingly establishing the principle that the conflicting advocacy of the legislature or the courtroom is the best way to develop sound public policy in science and technology. I want to develop this point with you briefly this evening, and I want to counsel forbearance.

In many parts of the country, a serious town-gown struggle is developing between universities and their surrounding communities over research on recombinant DNA. The basic knowledge and biochemical technology have been developed by which scientists can combine segments of genetic material from different molecules. Thus, DNA molecules that are not known to exist in nature can be generated in the laboratory. These new research techniques also make it possible to transfer laboratory-generated genetic material to host cells where it seems to be able to replicate itself and actually to function. An immensely powerful research tool has thus been created, offering untold possibilities for understanding the nature of life processes and for the production of desirable biological substances such as scarce hormones. It also presents the possibility of inadvertently creating biological hazards. One of the methods involves the introduction of foreign genes into known viruses. A potentially lethal virus might be created, raising the spectre of the escape of an artificially generated, uncontrollable disease. Biologists acknowledge that it is not possible to give absolute assurances on this dangerous outcome, but they rate the probability as vanishingly small if the research is properly administered and carried out by qualified individuals. The overwhelming majority of biologists believe that the research must be undertaken because it is the avenue to new basic knowledge. The human race cannot protect itself by hiding from discovery. Most biologists are certain that the risks are controllable. They themselves proposed the safety standards now enforced by the National Institutes of Health to deal with biohazards. All this was accomplished before the general public had become aware of the nature of the problem. The biological research community performed a notable public service in seeking to develop public awareness and understanding of the biohazards associated with research on DNA. But the discussion has begun to cause strong apprehensions among well-educated and intelligent representatives

of the general public. Serious efforts to suppress the research are now being undertaken by opponents who fear some form of permanent damage to the human race.

One of the most attractive aspects of the era in which we live is the great public concern for the preservation of our natural environment. This concern has manifested itself in a veritable maze of statutory and regulatory constraints on industrial technology. No industrial process in the United States can dump its waste products into the air or into a body of water without reprocessing the waste to eliminate pollution. Dumping practices which were quite widespread only 2 decades ago are rapidly disappearing under rigorous public control and tough legislation. No one yet knows how much of this regulation might be reasonably described as excessive. Pollution control typically adds to the costs of industrial processes, and such costs are invariably passed along to consumers. The adversary process of the courtroom is being employed to develop the essential truths about the relationship between a clean environment, as defined by statute, and the cost of achieving it.

The struggle has spawned large numbers of public interest groups which seek out and identify the major offenders, develop the evidence against industrial polluters, and eventually bring the cases into court. The courts have responded by attempting to set well-defined guidelines and timetables in areas of environmental protection in which the technical data are not yet fully understood. The law here is quite undeveloped. Anti-pollution advocates are constantly searching for new problems so that they might alert the public to the dangers and move in court to protect the public safety.

The methods used were perfected during the civil rights movement. They involve a unique combination of legal attack and clever public relations. The mass media are used extensively in order to achieve a favorable impact on public opinion. The publicity puts great pressure on the businesses charged with environmental carelessness. Hence many of the actions move quickly to a negotiated settlement in order to prevent legislation that might be even more damaging than the negotiated outcome. The methods are uniquely matched to the achievement of desirable objectives in a democratic society, and I have nothing but admiration for them. Moreover, they are very potent. The combination of threatened lawsuits and reams of publicity hinting that a firm is responsible for injuries or deaths because of an unreasonable concern for profit has been effective in bringing industrial polluters to heel.

Much of this legal and public relations apparatus has now been turned upon the scientific community and upon research on recombinant DNA. We are seeing the familiar combination of legal pressures and fear-arousal through hysterical newspaper coverage.

There is no rule of advocacy restricting claims about the potential dangers of DNA to those which have some basis in scientific reasoning. As a consequence, dramatic overstatement, innuendo, and purple rhetoric,

the familiar tools of the adversary process of the courtroom, have combined virtually to bury the facts concerning DNA in a mass of fear and confusion. There is a real danger that fearful communities will seek to regulate scientific research at the lowest level of our political governance, where serious thought and careful analysis are often lacking. The City Council of Cambridge, Massachusetts has already interposed itself as the regulator of potentially hazardous biological research at Harvard and MIT. The Attorney General of the State of New York and the New York City Council are considering the same kind of control here. Plainly, these bodies know little about either the dangers or the subtleties of biological research. Their approach is a purely political one, responding to the fears of the voters. To those of us raised in the traditions of academic freedom, the atmosphere is reminiscent of the days of Galileo and the Inquisition.

If any one in this audience believes that I am myself falling victim to overstatement and purple rhetoric in hinting of a possible revival of the Inquisition, let me note that in 1963 Columbia University applied for a permit to operate a 250-kilowatt Triga nuclear reactor as a training device for its engineering students. The permit was opposed by community groups on the ground that the proposed installation constituted a radiation hazard to the densely populated surrounding area of Morningside Heights. I should note that 250 kilowatts is much less power than it takes to light the campus at night. The Triga reactor is a rather simple training device which has been judged to be completely safe by committees of competent scientists at Columbia and elsewhere, but these considerations did not diminish public apprehensions that we somehow would be dumping lethal radiation on our innocent neighbors.

Community opposition initially took the form of intervention in the University's application for a license to operate the research reactor. During nearly a decade of struggle before hearing and review boards of the Atomic Energy Commission, the safety issue was studied in a legal record that eventually accumulated many thousands of pages. Finally, in 1972, the AEC concluded its hearing procedures and announced its intention to issue a license. The intervenors promptly took the federal government to court, with Columbia as an interested bystander. During all this time, the device remained inoperative. In 1973, the United States Court of Appeals for the Second Circuit ruled the Columbia reactor safe and authorized the issuance of a federal license to operate it. The intervenors then brought the matter to the United States Supreme Court. In 1974 the Court refused to review the decision of the Second Circuit, and the matter was finally settled. Columbia was then free at last to obtain a license to operate its training reactor. The license was issued in 1977.

Now that should end the story—right? Wrong! Following the Supreme Court's refusal to hear the case, opponents of the Columbia reactor introduced prohibition bills in the New York State Legislature and the New York City Council. The City Council required that a permit from the Health Department be obtained. We applied. The permit was denied on

the basis of the same environmental safety arguments rejected by the court of appeals. We are now once more back in court, this time side by side with the Federal Government, arguing that the City's health permit requirement improperly contravenes the federal licensing authority. No doubt this case too will be appealed up the line to the highest courts, and perhaps some day a future generation of Columbia students may be able to benefit from the training available at forty-four such installations in this country and abroad. The essential point is that we are now in the fifteenth year of our effort to carry on research and training in nuclear engineering at Columbia, and thus far, although we have won every legal argument, the reactor remains inoperative. I ask you to consider whether this activity has been effectively suppressed at Columbia.

The intervenors put forth a list of quasi-scientific arguments calculated to impress lawyers and judges but which leave our scientists baffled. So-called "expert" academic witnesses were brought into court claiming that similar nuclear research devices have altered the frequency of birth defects in surrounding communities elsewhere in the country. Our scientists have studied the data and found them to have no basis. How is one to judge who is right? Perhaps it is safer to suppress the research in view of all the opposition, by virtue of the admittedly slim but conceivable possibility that there may be some real danger. This is what my legislative friends tell me, but unfortunately, our engineers and physicists have just as strong a claim to the protections of academic freedom as philosophers have. Hence, we cannot accept an outcome that is scientifically wrong even though it may be politically expedient.

I have gone through the development of this case history in some detail so as to argue that the most probable outcome of the adversary process in issues involving the safety of scientific research is prolonged suppression of the research. The conflicting advocacy of the courtroom unfortunately does not contribute effectively to the understanding of these extremely subtle scientific questions. The issues are always highly technical, turning on a level of knowledge and scientific judgment not easily transplanted from the laboratory. The adversary method for arriving at truth on which our legal procedures are based is, in simple language, not appropriate for arriving at sound public policy on scientific matters. Scientific questions simply cannot be settled by persuasive argument.

The only effective method for resolving safety questions in nuclear or biological research is the objective analysis of experimental results by our best scientific minds. It is not a harmonious process by any means, but it is the only way to arrive at sensible judgments about the meaning of research findings. What I am saying, in unvarnished simplicity, is that the use of the adversary legal process to control scientific research is likely to lead to serious scientific errors and to badly thought-out policy. The protracted denial of an important research tool in nuclear engineering to Columbia's students will not damage the university fatally. We shall manage, but an extension of the same principle to attempted public control of

research in biology, physics, and chemistry would be a destructive policy. This kind of control should be exercised only in the most extreme circumstances when universities show themselves to be unable to take reasonable steps on behalf of public safety. Public control is especially worrisome when it is exercised by district courts or local legislatures responding to grass root fears or public hysteria.

I want to extend my point one step further. The problems of universities, as they attempt to protect their scientific research from adversary attacks generated by well-organized community groups playing on the fears of the general public, are a rather faithful reflection of the problems of the nation as a whole addressing major public questions which turn on subtle scientific or technical judgments. America is rapidly exhausting its supplies of petroleum as our consumption of oil and natural gas continues to increase under the demands of our standard of living. By 1990, our dependence on Middle East production should be virtually complete. We can expect to be in the same position as the Japanese are in now, and indeed, to be competing with the Japanese, as well as other industrial nations, for scarce oil. Even today, more than half our consumption is derived from sources outside the United States. Yet many intelligent people still believe that the oil embargo was contrived in order to produce profits for American oil companies. It is almost shocking to discover that half the country still does not believe that we import oil.

To what extent is this astonishing level of misunderstanding and misinformation a reflection of the adversary character of our public life as we attempt to develop an effective energy policy? If a large number of elected state attorneys general see the oil companies as conspirators, what is the general public to believe? Adversary struggle, claim and counterclaim, and blizzards of publicity from public officials and public interest groups seeking divestiture legislation will not produce new oil. Our people are being encouraged to believe that it is all a plot, that nuclear energy is dangerous to life, and that solar energy development is being blocked by monied interests trying to profit from the oil crisis. As far as I can judge from what I know of the facts, nearly all of this is the purest form of nonsense. No competent scientist, oil expert, or solar energy engineer believes that this adversary rhetoric is solving any of our problems or doing the nation any good.

The idea that the adversary legal and political struggle characterizing the environmental protection movement in America during the last decade may be doing great damage to our scientific and technological capability is bound to be a very unpopular one, but I fear that it is uncomfortably close to the mark. And the basic question persists: How are we to find more responsible ways to make sound public judgments on critical national issues such as the control of energy, science, and technology?

First, I believe that we must be extremely careful to avoid legislating American science out of existence under the guise of environmental protection. Legislators must exercise forbearance in responding to the undifferen-

tiated fears of the general public. They should be willing to ask for the help and advice of the best people in the scientific community in establishing the trade-offs between environmental protection and modern technology.

Second, local authorities should be extremely reluctant to intervene in the administration of research at universities when legal actions are brought by community advocates claiming public safety violations or environmental damage. The necessary controls can and, indeed, must be established at the national level under the guidance of scientifically competent agencies such as the National Academy of Science or the National Institutes of Health. Local intervention in the form now developing in Boston and New York City will only produce chaos. It has the potential for driving scientific research out of the northeast region of the country, with all the economic danger to our area that will follow from such irrationality.

Finally, the government and the bench should turn more frequently to special commissions constituted from the best and most responsible members of the scientific community in an effort to formulate wise public policy on the protection of the environment, public health, and on all major public safety questions. I have heard of proposals that a "science court" be established for the resolution of disputes in these technically demanding areas, but I oppose the concept because it introduces courtroom advocacy into a branch of knowledge where advocacy and overstatement becloud issues instead of illuminating them. Prestigious commissions with high credibility have rendered great service toward the solution of subtle public questions in Britain. We ought to make more use of the idea in this country as an effective healing force and as an alternative to overzealous advocacy. The issues are far too complex and too much is at stake to permit us to destroy our scientific leadership in a welter of adversary struggles with narrow constituency interests. Such struggles are clearly avoidable if there is a national will to do so.

And so here we are, 500 years after the birth of Saint Thomas More, still trying to harmonize the law with justice, still striving for Utopia. The English system of law managed to survive the caprices of Henry VIII, eventually becoming the cornerstone upon which America's great legal traditions were built. For more than 2 centuries, we and our English colleagues have shown the rest of the world how societies can govern themselves through the application of principles rather than through the raw exercise of authority. Our legal structure is not perfect. It is natural to dwell on its imperfections and to consider what remains to be done, as I have done this evening. But that effort should not divert us from recognizing what Saint Thomas More sought by demanding adherence to a principle from a monarch who viewed his merest whim as the essence of law. The principles of Anglo-American law continue to illuminate our lives and to guide our destinies 5 centuries later. It is perhaps the finest contribution to humanism that man has yet devised, and we must continue to seek its perfection.