

Role of the Courts in Technology Assessment

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Recommended Citation

Barry M. Portnoy, *Role of the Courts in Technology Assessment*, 55 Cornell L. Rev. 861 (1970)

Available at: <http://scholarship.law.cornell.edu/clr/vol55/iss5/11>

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THE ROLE OF THE COURTS IN TECHNOLOGY ASSESSMENT

Technology is the application of science to the uses of man.¹ The impetus for technology is derived from its beneficial consequences. The automobile and the supersonic transport, for example, provide comfortable, fast, and inexpensive transportation. A river dam may control floods and produce power. The "pill" and artificial insemination (AID) free mankind from the vicissitudes of chance in family planning. In addition to these benefits, however, each technology may raise problems or create undesirable secondary consequences. The automobile and the SST cause noise and atmospheric pollution. The dam may destroy a fishing industry or inundate an historic location.² The "pill" may cause cancer or changes in sexual behavior,³ and AID raises the question of whose genes shall be propagated.⁴

Technology assessment is the process of balancing the desirable consequences against the undesirable, including, to the extent possible, effects that are uncertain. Modified and alternative approaches to achieving the benefits are evaluated in light of predictions as to the future direction of the technology and possible controls on that direction.⁵ Finally, a decision is made whether to encourage the technology in question.⁶

Technology assessment is currently receiving considerable attention in the American scientific community. Two national studies of the process have recently been completed.⁷ Numerous bills relating to technology assessment have been introduced in Congress.⁸ One leading

¹ Wald, *The Evolution of Life and the Law*, 19 CASE W. RES. L. REV. 17 (1967).

² For a discussion of these and similar problems, see B. COMMONER, *SCIENCE AND SURVIVAL* (1966).

³ N.Y. Times, Jan. 16, 1970, at 1, col. 8; *id.*, Jan. 23, 1970, at 31, col. 1.

⁴ See Bravenec, *Law and the Modification of Heredity Through DNA Chemistry*, 8 J. FAMILY L. 13 (1968).

⁵ For a lawyer-oriented introduction to the new science of forecasting, see Cetron & Weiser, *Technological Change, Technological Forecasting and Planning R & D—A View from the R & D Manager's Desk*, 36 GEO. WASH. L. REV. 1079 (1968).

⁶ For a similar definition of technology and technology assessment, see Daddario, *Technology Assessment—A Legislative View*, 36 GEO. WASH. L. REV. 1044, 1055-57 (1968).

⁷ COMMITTEE ON PUBLIC ENGINEERING POLICY, NATIONAL ACADEMY OF ENGINEERING, 91ST CONG., 2D SESS., *A STUDY OF TECHNOLOGY ASSESSMENT* (House Comm. on Science & Astronautics Print 1969); NATIONAL ACADEMY OF SCIENCES, 91ST CONG., 2D SESS., *TECHNOLOGY: PROCESSES OF ASSESSMENT AND CHOICE* (House Comm. on Science & Astronautics Print 1969).

⁸ *E.g.*, H.R. 17046, 91st Cong., 2d Sess. (1970). For a catalogue of recent proposals put before Congress, see Muskie, *The Role of Congress in Promoting and Controlling Technological Advance*, 36 GEO. WASH. L. REV. 1138, 1142-47 (1968).

scientist has proposed that a national scientific "court" be established to make technology assessments.⁹ Symposia have begun to appear in the law reviews.¹⁰ Through all of this, however, there has been almost no discussion of the role the courts play in the process.¹¹

I

COURT INVOLVEMENT IN TECHNOLOGY ASSESSMENT

Courts most frequently become involved in technology assessment when an individual or small group of individuals suffers the adverse consequences of a technology to a greater degree than the community as a whole. Although courts rarely mention that they are in fact making a technology assessment, probably all common law theories of tort liability have successfully been levied on some form of technology by an injured individual. People who contract hepatitis as a result of a blood transfusion,¹² lose the use of wells because a neighboring refinery pollutes an underground stream,¹³ or are injured by a defectively designed power tool¹⁴ or automobile¹⁵ regularly all turn to the courts for relief or compensation. Similarly, contract actions for breach of warranty,¹⁶ property actions for nuisance¹⁷ and trespass,¹⁸ refusal to submit to eminent domain takings,¹⁹ and even constitutional

⁹ Kantrowitz, *Proposal for an Institution for Scientific Judgment*, 156 SCIENCE 763 (1967).

¹⁰ E.g., *Symposium—Science Challenges the Law*, 19 CASE W. RES. L. REV. 1 (1967); *Symposium—Technology Assessment and the Law*, 36 GEO. WASH. L. REV. 1033 (1968); *Symposium—Reflections on the New Biology*, 15 U.C.L.A.L. REV. 267 (1968).

¹¹ But see Katz, *The Function of Tort Liability in Technology Assessment*, 38 U. CIN. L. REV. 587 (1969).

¹² Jackson v. Muhlenberg Hosp., 53 N.J. 138, 249 A.2d 65 (1969).

¹³ Dillon v. Acme Oil Co., 49 Hun 565, 2 N.Y.S. 289 (Sup. Ct. 1888).

¹⁴ Greenman v. Yuba Power Prods., Inc., 59 Cal. 2d 57, 377 P.2d 897, 27 Cal. Rptr. 697 (1963).

¹⁵ Larsen v. General Motors Corp., 391 F.2d 495 (8th Cir. 1968).

¹⁶ E.g., Hamon v. Digliani, 148 Conn. 710, 711, 174 A.2d 294 (1961) (product allegedly advertised as "the all-purpose detergent—for all household cleaning and laundering"); Worley v. Procter & Gamble Mfg. Co., 241 Mo. App. 1114, 1117, 253 S.W.2d 532, 534 (1952) (product "kind to hands").

¹⁷ E.g., Ryan v. City of Emmetsburg, 323 Iowa 600, 4 N.W.2d 435 (1942) (sewage treatment and disposal plant constituted a nuisance and resulted in temporary or continuing damage until abatement).

¹⁸ E.g., Martin v. Reynolds Metals Co., 221 Ore. 86, 342 P.2d 790 (1960) (discharge of industrial waste products that settled on neighboring pasture held a trespass).

¹⁹ E.g., Texas E. Transp. Corp. v. Wildlife Preserves, Inc., 48 N.J. 261, 225 A.2d 130 (1966).

challenges to statutory authority²⁰ have been employed by specially damaged individuals to force courts into the area of technology assessment.

Three recent Supreme Court decisions on standing suggest that individuals and small groups will be able to bring an increasing number of technology questions before the courts. *Abbott Laboratories v. Gardner*²¹ created a presumption that Congress intended judicial review of all administrative decisions.²² *Flast v. Cohen*²³ expanded the permissible range of taxpayer actions against the government. And in *Association of Data Processing Service Organizations, Inc. v. Camp*,²⁴ the Court outlined the "interest" sufficient to give a plaintiff standing to sue:

[The question of standing] concerns, apart from the "case" or "controversy" test, the question whether the interest sought to be protected by the complainant is arguably within the zone of interests to be protected or regulated by the statute or constitutional guarantee in question. . . . That interest, at times, may reflect "aesthetic, conservational, and recreational" as well as economic values. . . . We mention these non-economic values to emphasize that standing may stem from them as well as from . . . economic injury²⁵

The perimeter of this new concept of standing to review governmental action has not yet been fully sketched,²⁶ but a number of actions in-

²⁰ *E.g.*, *Berman v. Parker*, 348 U.S. 26 (1954) (suit to enjoin urban renewal agency because statute authorizing condemnation unconstitutional). *See also* Pollack, *Legal Boundaries of Air Pollution Control—State and Local Legislative Purpose and Techniques*, 33 LAW & CONTEMP. PROB. 331 (1968).

²¹ 387 U.S. 136 (1967).

²² "[J]udicial review of a final agency action by an aggrieved person will not be cut off unless there is persuasive reason to believe that such was the purpose of Congress." *Id.* at 140. Because the federal government is so intimately involved in modern science and technology, this holding opens a vast area to judicial review. Approximately two-thirds of all money spent on scientific research and development in the United States is spent by the government. Furthermore, many of the technological applications of science, such as power plants, roads, or sewage treatment facilities, may receive government financing and are at least regulated by government agencies. Green, *Technology Assessment and the Law: Introduction and Perspective*, 36 GEO. WASH. L. REV. 1033, 1038-41 (1968). In fact, it has been estimated that the government directly or indirectly finances 50% of the technological research and development in the United States. TECHNOLOGY: PROCESSES OF ASSESSMENT AND CHOICE, *supra* note 7, at 22; Katz, *supra* note 11, at 593.

²³ 392 U.S. 83 (1968).

²⁴ 397 U.S. 150 (1970).

²⁵ *Id.* at 153-54.

²⁶ For example, it is unclear whether this concept of standing will be limited to suits for judicial review of administrative decisions and constitutional challenges of existing statutes and regulations or will extend to actions for damages.

volving technology assessment have already been initiated by combining the holding in *Abbott Laboratories* with the reasoning of either *Flast*²⁷ or *Data Processing*,²⁸ including one in which a national conservation organization with "no personal economic interest to assert" successfully challenged the location of a federally approved highway.²⁹

When an individual lacks standing to complain of a harm, a governmental institution, as a representative of the community, may be able to involve the courts in technology assessment. The enforcement procedures of certain criminal statutes require courts to make technical assessments.³⁰ When the courts are called upon to arbitrate policy conflicts between different governmental layers in our federal system, as, for example, when a court must determine the status of federally reserved rights in navigable streams³¹ or ascertain whether a municipality may dedicate parts of the public domain to private use without state approval,³² the decision may in fact include a technology

²⁷ *E.g.*, *Crowther v. Seaborg*, — F. Supp. — (D. Colo.), *aff'd*, 415 F.2d 437 (10th Cir. 1969) (taxpayer action to enjoin AEC's Project Rulison). Actions on the state level, where taxpayer suits were more liberally allowed in the past, point out a range of possibilities for technology assessment. *E.g.*, *Parks v. Simpson*, 242 Miss. 894, 137 So. 2d 136 (1962) (taxpayer action to enjoin state-contracted dredging of tidewater bottoms).

²⁸ *See* Citizens Comm. for the Columbia River v. Resor, No. 69-498 (D. Ore., filed Sept. 4, 1969); *Sierra Club v. Hickel*, No. 51,464 (N.D. Cal., filed June 5, 1969); *Environmental Defense Fund v. Hoerner Waldorf Corp.*, Civil No. 1694 (D. Mont., filed Nov. 13, 1968). These actions are cited in Sax, *The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 473 nn.1, 2 & 7.

Some courts had already accepted this rationale prior to *Data Processing*. *E.g.*, *Nashville I-40 Steering Comm. v. Ellington*, 387 F.2d 179 (6th Cir.), *cert. denied*, 390 U.S. 921 (1967); *Scenic Hudson Preservation Conf. v. FPC*, 354 F.2d 608 (2d Cir. 1965), *cert. denied*, 384 U.S. 941 (1966); *Road Review League, Town of Bedford v. Boyd*, 270 F. Supp. 650 (S.D.N.Y. 1967).

²⁹ The rule, therefore, is that if the statutes involved in the controversy are concerned with the protection of natural, historic, and scenic resources, then a congressional intent exists to give standing to groups interested in these factors and who allege that these factors are not being properly considered by the agency.

Citizens Comm. for the Hudson Valley v. Volpe, 302 F. Supp. 1083, 1092 (S.D.N.Y. 1969) (footnote omitted).

³⁰ *E.g.*, Air Quality Act of 1967, 42 U.S.C. §§ 1857d(g), (h) (Supp. IV, 1969) provide for a de novo consideration of the issues by the court if an action for abatement is brought. *United States v. Bishop Processing Co.*, 287 F. Supp. 624, 634 (D. Md. 1968). Criminal statutes may also make the courts mere administrators of a policy set by a technology assessment made elsewhere. *People v. Madearos*, 230 Cal. App. 2d 642, 41 Cal. Rptr. 269 (1964) (conviction for violation of statutory limitations on auto emissions).

³¹ *E.g.*, *United States v. Rio Grande Irr. Co.*, 174 U.S. 690 (1898); *State of Washington Dep't of Game v. FPC*, 207 F.2d 391 (9th Cir. 1953), *cert. denied*, 347 U.S. 936 (1954).

³² *E.g.*, *People ex rel. San Francisco Bay Conservation & Dev. Comm'n v. Town of Emeryville*, 69 Cal. 2d 533, 446 P.2d 790, 72 Cal. Rptr. 790 (1968).

assessment. Similarly, a governmental unit can bring a question of technology assessment before the courts in an action to abate a public nuisance³³ or in other circumstances when the governmental unit claims to represent the public generally.³⁴

II

COURT DISPOSITION OF TECHNOLOGY ASSESSMENT CASES

Courts confronted with technology assessment questions often attempt to assist Adam Smith's "invisible hand" and leave the assessment to the market place. By holding the purveyor liable for the damages caused by his technology, the courts internalize the financial burden of secondary consequences. The market price of the technology is raised,³⁵ and, in theory, the market system then makes the actual technological assessment.³⁶

A second response that courts make to questions of technology assessment is to force other agencies of government to make the assess-

³³ *E.g.*, *New Jersey v. City of New York*, 283 U.S. 473 (1931) (defendant enjoined from dumping garbage into ocean because it polluted waters and beaches of plaintiff); *Georgia v. Tennessee Copper Co.*, 206 U.S. 230 (1907) (defendant enjoined from discharging sulphurous fumes that polluted parts of plaintiff state). Perhaps because the government that must bring the action usually has available to it the alternatives of regulation or criminal prosecution, public nuisance is not extensively used as a means of technology assessment. Furthermore, the doctrine of public nuisance has a historical association with the abatement of brothels, gambling dens, and similar places; the case law is not readily transferable to technological problems. *See Sax, supra* note 28, at 485 n.45.

³⁴ *E.g.*, *Udall v. FPC*, 387 U.S. 428 (1967) (intervention by the Secretary of the Interior in action to review license grant of FPC); *Harris County, Tex. v. United States*, 292 F.2d 370 (5th Cir. 1961) (action to review license and order of AEC brought by county government).

³⁵ "[T]he risk of injury can be insured by the manufacturer and distributed among the public as a cost of doing business . . ." *Escola v. Coca Cola Bottling Co.*, 24 Cal. 2d 453, 462, 150 P.2d 436, 441 (1944) (concurring opinion). Actions for inverse condemnation are good examples of how courts make technology pay its way. *E.g.*, *Thornburg v. Port of Portland*, 233 Ore. 178, 376 P.2d 100 (1962). Some have argued that private nuisance cases that award monetary damages instead of an injunction have in effect extended the constitutional guarantee of compensation to private takings. *See Roberts, The Right to a Decent Environment; E = MC²: Environment Equals Man Times Courts Redoubling Their Efforts*, 55 CORNELL L. REV. 674, 679-82 (1970).

³⁶ For comprehensive explanations of the economic theory behind this type of court technology assessment, see *Baxter, The SST: From Harlem to Watts in Two Hours*, 21 STAN. L. REV. 1 (1968); *Coase, The Problem of Social Cost*, 3 J. LAW & ECON. 1, 2-6 (1960). Costing-in may either stimulate or retard technology. In a particular case the new cost may spur efforts to improve the art so as to avoid liability. But in another case the cost may be a sufficient obstacle to block development of the technology.

ment. This power, used when a court feels that other governmental agencies have not adequately considered their actions, has both procedural and substantive aspects.

The procedural aspect is best illustrated by the judicially-developed "public trust" doctrine,³⁷ which holds that public lands are held by the government in trust for future generations and is currently being used to preserve some aspects of the physical environment.³⁸ In *Gould v. Greylock Reservation Commission*,³⁹ the Massachusetts Supreme Judicial Court declared that special and specific legislation is required to alienate public lands. The state legislature had created a public authority to construct and operate an aerial tramway. The authority had contracted with private financial interests to finance and operate a full scale ski resort development. The court voided the contracts, holding that public land "is not to be diverted to another inconsistent public use without plain and explicit legislation to that end"⁴⁰ In *Robbins v. Department of Public*

³⁷ See generally Sax, *supra* note 28.

³⁸ Court enforcement of the Freedom of Information Act (5 U.S.C. § 552 (Supp. IV, 1969)) is another procedural control on the administrative processes of technology assessment because it better enables the public to participate. See J. FREEDMAN, MATERIALS ON ADMINISTRATIVE LAW: THE FREEDOM OF INFORMATION ACT AND CITIZEN PARTICIPATION IN THE ADMINISTRATIVE PROCESS (1969). Similarly, the courts have on occasion gone to some lengths to find statutory or constitutional requirements that the assessment process be democratized. In *District of Columbia Fed'n of Civic Ass'ns, Inc. v. Aires*, 391 F.2d 478 (D.C. Cir. 1968), the court found that the District of Columbia Highway Department had to comply with the public hearing requirements of an 1893 master highway plan, even though Congress had specifically appropriated funds for the roadway in question. In *Citizens Comm. for the Hudson Valley v. Volpe*, 302 F. Supp. 1083 (S.D.N.Y. 1969), the court determined that a dam called a dike was in law a dike, and therefore, under sections of the Rivers and Harbors Appropriation Act of 1899 (43 U.S.C. § 401 (1964)) and the Department of Transportation Act (49 U.S.C. § 1651(b)(2) (Supp. IV, 1969)), New York could not build a road along the Hudson without first obtaining the specific approval of Congress and the Secretary of Transportation. Similarly, a federal court in Washington, D.C. recently enjoined the Alaska Pipeline Project as a violation of sections of the 1920 Mineral Leasing Act, which requires the consent of Congress (30 U.S.C. § 185 (1964)) and the National Environmental Policy Act (42 U.S.C.A. § 4332 (Supp. March 1970)). *N.Y. Times*, April 14, 1970, at 1, col. 7. See also *Powelton Civic Home Owners Ass'n v. HUD*, 284 F. Supp. 809 (E.D. Pa. 1968) (Housing Act (42 U.S.C. §§ 1441-86 (1964)) requires Secretary to afford residents an opportunity to submit evidence before determining eligibility of project for federal funds); *Meunch v. Public Serv. Comm'n*, 261 Wis. 492, 53 N.W.2d 514 (1952) (statute that allowed state power commission to ignore recreational considerations in its licensing procedure if board in county where dam was to be built approved site selection was unconstitutional because it gave local boards power over a state-wide issue).

³⁹ 350 Mass. 410, 215 N.E.2d 114 (1966).

⁴⁰ *Id.* at 419, 215 N.E.2d at 121, quoting *Higginson v. Treasurer & School House Comm'rs*, 212 Mass. 583, 591-92, 99 N.E. 523, 527 (1912). Specifically, the court objected to the use of almost half of the 9,000-acre reservation, to the building of four ski lifts not mentioned in the statute, and to the apparent subordination of the authority's

Works,⁴¹ the same court forbade an interdepartmental transfer of land, even though the legislature had generally approved such transfers when made with the approval of the governor and the executive council:

We think it is essential to the expression of plain and explicit authority to divert parklands, Great Ponds, reservations and kindred areas to a new and inconsistent public use that the Legislature identify the land and that there appear in the legislation not only a statement of the new use but a statement or recital showing in some way legislative awareness of the existing public use. In short, the legislation should express not merely the public will for the new use but its willingness to surrender or forgo the existing use.⁴²

The substantive aspect of the courts' power to force others to make technology assessments can be seen in *Udall v. FPC*.⁴³ In that case the Secretary of the Interior sought to reopen an FPC licensing proceeding to argue that the government, rather than private interests, ought to build a proposed power dam. The Supreme Court first quoted Justice Holmes's observation that "[a] river is more than an amenity, it is a treasure"⁴⁴ and then raised the question of whether the dam should be built at all.⁴⁵ The Court analyzed the possible effects of the dam on anadromous fish, even to the point of distinguish-

regulatory interests to the developer's commercial interests. 350 Mass. at 420-24, 215 N.E.2d at 122-24.

⁴¹ — Mass. —, 244 N.E.2d 577 (1969).

⁴² *Id.* at —, 244 N.E.2d at 580. See also *Sacco v. Department of Pub. Works*, 352 Mass. 670, 277 N.E.2d 478 (1967) (Public Works Department needed specific legislative authorization to convert a pond owned by its waterways division into a highway); *Abbot v. Osborn*, No. 1465 (Super Ct., Dukes County, Mass., March 28, 1969) (residents of Martha's Vineyard entitled to preliminary injunction forbidding Dukes County Commissioners from clearing state forest land for an airport extension). Other jurisdictions have similarly required specific legislation to effectuate a divestiture of public-trust property. *E.g.*, *People v. California Fish Co.*, 166 Cal. 576, 138 P. 79 (1913) (absent specific legislation, grant of tidelands property is made subject to public right of navigation). *Contra*, *Marks v. Whitney*, 276 Cal. App. 2d 72, 80 Cal. Rptr. 606 (1969), *petitions for rehearing granted*, Civil No. 26,883 (Ct. App., Oct. 7, 1969); *Parks v. Simpson*, 242 Miss. 894, 137 So. 2d 136 (1962) (legislative grant of authority to Marine Conservation Commission narrowly construed so as to void oyster bed dredging contract). It should be pointed out, however, that public-trust property has been narrowly defined. *E.g.*, *State ex rel. Buford v. Tampa*, 88 Fla. 196, 102 So. 336 (1924) (grant by city to private developer did not violate public trust because it involved mud flats "having no value or purpose for commerce or navigation").

⁴³ 387 U.S. 428 (1967).

⁴⁴ *Id.* at 493, quoting *New Jersey v. New York*, 283 U.S. 336, 342 (1931) (footnote omitted).

⁴⁵ The Secretary had argued before the FPC that the dam was unnecessary (387 U.S. at 442), but had abandoned this position by the time of the appeal (*id.* at 454 (dissenting opinion)).

ing between the effects on salmon and the effects on steelhead.⁴⁶ It also considered the effects on other wildlife in the area⁴⁷ and reviewed various technical forecasts of the needs for and sources of electrical power in the future.⁴⁸ Concluding that all of these factors "were largely untouched by the Commission,"⁴⁹ the Court held that the statute governing the FPC required that the licensing procedure be reopened to consider the issues raised by the Court as well as the question of who should build the dam.⁵⁰

A third response courts give to questions of technology assessment is to make the assessment themselves. In *Anderson v. American Smelting & Refining Co.*,⁵¹ for example, a group of farmers sought to enjoin the operation of two nearby lead and copper smelting plants because the sulphurous gases they emitted poisoned pastures and vegetable gardens. The court carefully reviewed the scientific evidence and concluded by requiring the companies to devise a means of eliminating the nuisance or go out of business.⁵²

⁴⁶ *Id.* at 440-43.

⁴⁷ *Id.* at 443-44.

⁴⁸ *Id.* at 444-48.

⁴⁹ *Id.* at 450.

⁵⁰ Other cases similarly illustrate judicial willingness to examine the substantive considerations behind agency decisions. *E.g.*, *Scenic Hudson Preservation Conf. v. FPC*, 254 F.2d 308 (2d Cir. 1965), *cert. denied*, 384 U.S. 941 (1966) (FPC had not adequately considered alternatives with a view toward conserving the aesthetic and historical qualities of proposed dam site). Courts also occasionally limit the scope of agency considerations. *E.g.*, *New Hampshire v. AEC*, 406 F.2d 170 (1st Cir. 1969) (AEC not required to consider thermal pollution in proceeding to license nuclear power plant); *Zabel v. Tabb*, 296 F. Supp. 764 (M.D. Fla. 1969) (ordering Corps of Engineers to issue dredging permit because it lacked statutory power to deny permit for ecological and conservational reasons).

⁵¹ 265 F. 928 (D. Utah 1919).

⁵² I do not believe the limit of improvement has been reached, or that it is impossible for the smelting and farming interests to exist in the same neighborhood to the advantage of both and without discomfort or injury to the farming community. On the other hand, in this period of the world, when the right of every human being to live in comfort has become a universally accepted principle in American life, I am loath to believe that the law, or the courts in applying it, will condemn any community of citizens to suffer perpetual discomfort or injury resulting from an unavoidable industrial nuisance. . . .

My conclusion is that, if the defendants will suggest a method of operation that will overcome the conditions complained of in this case and eliminate cause of further complaint, a decree will be entered accordingly, or if they will suggest a method of operation or further improvement that gives fair promise of accomplishing the desired result Failing in either of the alternatives above suggested, a decree will be entered in accordance with the prayer of plaintiffs' complaint.

Id. at 943-44. In *Remkin v. Harvey Aluminum, Inc.*, 226 F. Supp. 169 (D. Ore. 1963), the court analyzed the structure and operation of defendant's plant together with the scientific evidence on exhaust and fume control presented by both sides and concluded as follows:

Direct technology assessment by the courts most often consists of reviewing an assessment made elsewhere.⁵³ Direct actions for review of administrative decisions are the most common, but courts may review the assessments of others in other types of proceedings as well. *Miller v. Schoene*⁵⁴ was a constitutional challenge to a Virginia statute authorizing the state entomologist to order certain privately-owned cedar trees destroyed to prevent the communication of cedar rust to neighboring apple orchards. The Supreme Court reviewed the evidence on available technology in the field of plant disease and concluded that "[t]he only practicable method of controlling the disease and protecting apple trees from its ravages is the destruction of all red cedar trees, subject to the infection, located within two miles of apple orchards."⁵⁵ Because the economic contribution of apple trees to the state was significant, and that of cedar trees was relatively minor, the Court concluded that the statute was a constitutional exercise of the police power.⁵⁶ *Texas Eastern Transportation Corp. v. Wildlife Preserves, Inc.*⁵⁷ was an action to enforce an eminent domain taking by a federally authorized pipeline company against a private nonprofit corporation maintaining "the finest inland, natural fresh water wetland in the entire Northeastern United States."⁵⁸ Defendant argued that taking the proposed route would cause extensive ecological damage to vegetation and wildlife and that an alternate route with less drastic consequences was available. A unanimous New Jersey Supreme Court held that courts would not enforce an eminent domain taking

The great weight of evidence points to the conclusion that the installation of the cell hoods and the employment of electrostatic precipitators would greatly reduce, if not entirely eliminate, the escape of the excessive material now damaging the orchards of the plaintiffs.

While the cost of the installations of these additional controls will be a substantial sum, the fact remains that effective controls must be exercised over the escape of these noxious fumes. Such expenditures would not be so great as to substantially deprive defendant of the use of its property. While we are not dealing with the public as such, we must recognize that air pollution is one of the great problems now facing the American public. If necessary, the cost of installing adequate controls must be passed on to the ultimate consumer

Id. at 172. See also Katz, *supra* note 11, at 614.

⁵³ See *Plaintiffs' Brief in the Project Rulison Case*, 55 CORNELL L. REV. 761 (1970).

⁵⁴ 276 U.S. 272 (1928).

⁵⁵ *Id.* at 278-79.

⁵⁶ See E. PATTERSON, *LAW IN A SCIENTIFIC AGE* 12-14 (1963).

⁵⁷ 48 N.J. 261, 225 A.2d 130 (1966).

⁵⁸ *Id.* at 270, 225 A.2d at 135. The description is that of an "expert" quoted by the court.

if the route selection was "arbitrary" in light of the potential damage and the available alternatives.⁵⁹

III

OBSTACLES TO THE COURTS' EFFECTIVE PARTICIPATION IN TECHNOLOGY ASSESSMENT

The passive nature of the courts and the practical and procedural barriers to the maintenance of an action are the most pervasive obstacles to the use of the judiciary as an effective instrument of technology assessment. Courts are unable to initiate actions; they must await complaints by plaintiffs. The politics of existing governmental institutions indicate that they will take technology to court infrequently.⁶⁰ Individual plaintiffs must be willing and able to bear the trouble and expense of litigation, and the financial burden of technology litigation may be formidable. Even when an individual comes forward, his standing to bring an action involving a question of technology assessment, other than for review of a governmental decision, is limited.⁶¹

Because of the passive nature of the courts, technology assessment questions that are litigated usually do not reach them until the questioned technology is already in general use or until substantial sums have been invested in it. Private citizens seem unaware of or unaroused by the secondary consequences of technology until injury takes place or construction actually begins. In addition, a court may dismiss an action because damage is not imminent.⁶²

⁵⁹ *Id.* at 275-76, 225 A.2d at 137-39. The case was remanded to develop the facts and determine the arbitrariness of the route selection. The case was finally decided in favor of the pipeline company and the taking approved on appeal. *Texas E. Transp. Corp. v. Wildlife Preserves, Inc.*, 49 N.J. 403, 230 A.2d 505 (1967). See generally Tarlock, *Recent Natural Resource Case*, 8 NATURAL RESOURCES J. 1 (1968).

⁶⁰ In *Parks v. Simpson*, 242 Miss. 894, 137 So. 2d 136 (1962), for example, a taxpayer action to enjoin oyster bed dredging was begun only after plaintiff had first "solicited both the Attorney General of the State and the District Attorney of the Second Judicial District of Mississippi to bring the suit or permit the same to be brought in their names, but . . . said officers declined to do either." *Id.* at 898, 137 So. 2d at 136. See also D'Amateo, *Environmental Degradation and Legal Action*, 26 BULL. OF THE ATOMIC SCIENTISTS 24 (March 1970).

⁶¹ For example, an individual or group of individuals must prove special damages in order to bring an action for public nuisance. *Kirwin v. Mexican Petroleum Co.*, 267 F. 460, 461 (D.R.I. 1920). See Prosser, *Private Action for Public Nuisance*, 52 VA. L. REV. 997 (1966).

⁶² In *New Hampshire v. AEC*, 406 F.2d 170 (1st Cir. 1969), for example, the First Circuit refused to consider whether possible thermal pollution of the Connecticut River constituted a taking for which compensation ought to be paid because the permit in question authorized only construction, not operation, of a nuclear power plant.

The *fait accompli* aspect of much assessment litigation cannot help but influence the result. In *Nashville I-40 Steering Committee v. Ellington*,⁶³ for example, the court refused to enjoin highway construction, although there were obvious violations of statutory public hearing requirements,⁶⁴ partially because \$10,000,000 of property had been acquired along the route by the time the action was brought. Similarly, *Hatch v. Ford Motor Co.*⁶⁵ denied recovery for negligent design against an auto manufacturer rather than let a jury "be the arbiters of the design of automobiles . . . not when the automobile was manufactured but after the occurrence of an accident."⁶⁶

The judicial method of reasoning seems to have similarly negative implications for the effective use of the courts in technology assessment. Precedent frequently burdens the courts with historic logic that may be irrelevant when applied to modern technology.⁶⁷ For example, although a characteristic secondary effect of much modern technology is the harm resulting from extended exposure to small amounts of contaminants from a variety of sources, the case law of tort compensation is largely based on sudden injuries from a single source.⁶⁸ Similarly, the historical idea that a trespass can be committed only by a corporeal thing has saved many a polluter who emits noise or invisible gas the societal costs of his operations.⁶⁹

⁶³ 387 F.2d 179 (6th Cir. 1967).

⁶⁴ The public notice of the hearing had announced the wrong date. *Id.* at 182-83. See also *Road Review League, Town of Bedford v. Boyd*, 270 F. Supp. 650, 664 (S.D.N.Y. 1967):

To enjoin defendants at this stage from carrying out the commitment of the federal government to provide 90 per cent of the necessary funds for this project would create a chaotic situation. Plaintiffs argue that the damage to the State could be mitigated, that the rights of way which the State has acquired could be sold or returned to their former owners These arguments do not seem to me to be realistic.

Contra, *Boch v. Sarrich*, 74 Wash. 2d 575, 445 P.2d 648 (1968) (a residential development over a lake enjoined as an interference with riparian rights even though the developer had already invested between \$100,000 and \$250,000 in construction).

⁶⁵ 163 Cal. App. 2d 393, 329 P.2d 605 (1958).

⁶⁶ *Id.* at 397-98, 329 P.2d at 608.

⁶⁷ Cf. Miller, *Science and Legal Education*, 19 CASE W. RES. L. REV. 29, 32 (1967).

⁶⁸ For a discussion of the problems involved in bringing an action based on such harm and an attempted solution, see Rheingold, *Civil Cause of Action for Lung Damage Due to Pollution of Urban Atmosphere*, 33 BROOKLYN L. REV. 17 (1966).

⁶⁹ E.g., *Batten v. United States*, 306 F.2d 580 (10th Cir. 1962) (no recovery for airport noise unless plane flies directly over plaintiffs' property); *Arvidson v. Reynolds Metals Co.*, 125 F. Supp. 481 (W.D. Wash. 1954) (fluorine gas and minute particles deposited on and over plaintiff's land not a trespass). *Contra*, *Thornburg v. Port of Portland*, 233 Ore. 178, 376 P.2d 100 (1962) (noise); *Martin v. Reynolds Metals Co.*, 221 Ore. 86, 342 P.2d 790 (1959) (gas and particles).

The courts' treatment of AID (artificial insemination) is a further illustration of the problems created by adhering to old legal concepts. In *Strnad v. Strnad*, 190 Misc.

The tendency of judicial thinking to focus on the unique circumstances of each action further limits the effect of the courts' contribution to the process of technology assessment. Contributory fault, assumption of the risk, or coming to the nuisance by the plaintiff may be a perfect defense in a particular case.⁷⁰ The defendant's ability to foresee harm, his posting a warning, or his general intent may either extricate him or result in punitive damages.⁷¹ Even the legalistic relationship between the parties may be determinative.⁷² Such considerations are essentially irrelevant to the process of costing-in secondary consequences. Similarly, focusing on the individual circumstances of the parties before the court invariably weights a direct assessment in favor of the expensive large scale technology over the damage done an individual or small group of plaintiffs.⁷³ Furthermore, the particularistic nature of the case law system is at best a form of "incremental planning" with minimum integration into general rules that can guide the future actions of individuals, industries, and government agencies.⁷⁴

786, 78 N.Y.S.2d 390 (Sup. Ct. 1948), a child conceived through AID was ruled not illegitimate and a divorced husband granted visitation rights. In *Doornbos v. Doornbos*, 23 U.S.L.W. 2308 (Super. Ct., Cook County, Ill., Dec. 13, 1954), *appeal dismissed on procedural grounds*, 12 Ill. App. 2d 473, 139 N.E.2d 844 (1956), it was held that when the semen is obtained from a third party, the artificial insemination constitutes adultery, and the child so conceived is illegitimate, whether or not the husband consented. *Gursky v. Gursky*, 39 Misc. 2d 1083, 242 N.Y.S.2d 406 (Sup. Ct. 1963), held that a child so conceived is illegitimate, but the husband is liable for support if he consented to the AID. *Anonymous v. Anonymous*, 41 Misc. 2d 886, 246 N.Y.S.2d 835 (Sup. Ct. 1964), similarly held the husband liable for support but without reaching the question of legitimacy. In *People v. Sorensen*, 68 Cal. 2d 280, 437 P.2d 495, 66 Cal. Rptr. 7 (1968), the court commended the issue of legitimacy to the legislature while finding a consenting husband to be a "lawful father" within the meaning of the criminal support statute.

⁷⁰ For the status of such defenses in nuisance, see Seavy, *Nuisance: Contributory Negligence and Other Mysteries*, 65 HARV. L. REV. 894 (1952). Some of these defenses are available even in strict liability actions. See Prosser, *The Fall of the Citadel (Strict Liability to the Consumer)*, 50 MINN. L. REV. 791, 838-40 (1966).

⁷¹ Although more common in other tort actions, punitive damages may be awarded in nuisance actions. *McElwain v. Georgia-Pac. Corp.*, 245 Ore. 247, 421 P.2d 957 (1966) (fumes from paper mill "intentionally" damaged neighboring property).

⁷² For example, several courts have held that a manufacturer's strict liability does not extend to an injured bystander. See Prosser, *supra* note 70, at 817-20.

⁷³ *Koseris v. J.R. Simplot Co.*, 82 Idaho 263, 352 P.2d 235 (1960) (damage caused to a two-acre plot with a cinder block storage building on it by dust, smoke, and odors from a fertilizer plant with over 1,000 employees and an annual payroll of \$1,242,000; no injunction issued). Only a few courts have indicated a willingness to look beyond the immediate interests of the parties before them. *E.g.*, *Renken v. Harvey Aluminum, Inc.*, 226 F. Supp. 169, 172 (D. Ore. 1963).

⁷⁴ For a discussion of the distinction between "incremental planning" and comprehensive, or "synoptic planning," see A. ETZIONI, *THE ACTIVE SOCIETY* (1968).

As long ago as 1901, Learned Hand discussed the anomaly of asking a lay judge and jury to resolve a dispute between experts on a subject about which they know nothing other than what the experts have told them.⁷⁵ Courts have occasionally cited their technical incompetence as a reason for avoiding questions of technology assessment⁷⁶ and have always been particularly keen to accept the results of assessments made elsewhere.⁷⁷ Today, as the range of discretion open to industry and administrators is being narrowed by the courts,⁷⁸ their technical incompetence shows through in the form of a hesitancy to make direct assessments or to order technical advances. In *Boomer v. Atlantic Cement Co.*,⁷⁹ for example, the court refused to order a polluting cement plant to devise pollution control facilities because "there would be no assurance that any significant technical improvement would occur."⁸⁰ Instead, the court awarded damages to the

⁷⁵ Hand, *Historical and Practical Considerations Regarding Expert Testimony*, 15 HARV. L. REV. 40 (1901).

⁷⁶ E.g., *Dillingham v. Chevrolet Motor Co.*, 17 F. Supp. 615, 618 (D. Okla. 1936):

It is a well-known fact that different automobile manufacturers rely upon the judgment of their own engineers, and it would be an easy matter for an engineer for a different make of car than the Chevrolet to criticize the entire mechanical construction of the Chevrolet car. . . . But such a difference in judgment of the engineers would not be sufficient to justify the conclusion that the manufacturer, who followed the advice of his engineer, would be guilty of negligence.

. . . There is no allegation that any portion of the brakes was defective or that material was used in the construction of the brakes which would make their use dangerous. This can only amount to a conclusion of the pleader that he knows more about the construction of an automobile than the manufacturer.

⁷⁷ E.g., *Washington Dep't of Game v. FPC*, 207 F.2d 391, 398 (1953) ("If the dam will destroy the fish industry of the river, we are powerless to prevent it.") See also *Scott Lumber Co. v. United States*, 390 F.2d 388, 391-92 (9th Cir. 1968) (taking of private property to be affirmed if not "arbitrary, capricious or made in bad faith"); *Harris County, Tex. v. United States*, 292 F.2d 370, 371 (5th Cir. 1961) ("unless the record is completely bare of evidence supporting it, . . . the finding of the Commission granting the license must be sustained against the attack upon it"); *Mahoney v. United States*, 220 F. Supp. 823 (E.D. Tenn. 1963) (refusal to find causal connection between damage and radiation exposure where exposed within limits set by AEC); *Bulloch v. United States*, 145 F. Supp. 824 (D. Utah 1956) (sheep-owner's damage claim for injuries to herd from radioactive fallout in the Nevada test area dismissed because of failure to show causation).

⁷⁸ The recent litigation surrounding the Project Rulison underground nuclear blast is a good example. The district court judge did not enjoin the blast, but despite AEC assurances he did retain jurisdiction to make sure that the radioactive gases could be locked underground until release was safe. *Crowther v. Seaborg*, — F. Supp. — (D. Colo.), *aff'd*, 415 F.2d 437 (10th Cir. 1969). Since that time the court has allowed the gas to be released but still retained jurisdiction to ensure that adequate safety standards are observed. Civil No. C-1712 (D. Colo., March 16, 1970).

⁷⁹ — N.Y.2d —, — N.E.2d —, — N.Y.S.2d — (1970).

⁸⁰ *Id.* at —, — N.E.2d at —, — N.Y.S.2d at —. Contrast the court's view with the following statement:

Invention can be predicted with a fair degree of accuracy and it can be sched-

neighboring property owners and specifically avoided considering the general social interest in controlling air pollution.⁸¹

Technical incompetence of the courts is undoubtedly partially responsible for the difficulties of proof encountered by those who attempt to challenge technology in the courts.⁸² In all such actions the purveyor or advocate of the technology has at least the technical competence necessary for its employment. The challenger, on the other hand, may be an individual without such particular competence who merely suffers the secondary consequences. Nevertheless, the general rule is that the challenger must bear the burden of proof.⁸³

CONCLUSION

The passive nature of the courts and the difficulties encountered in their use make it clear that they cannot serve as society's primary instrument for technology assessment. Direct assessment by the courts may be used to resolve special problems of local concern, but even then the results seem to depend more on chance precedent and the individual circumstances of the parties than on a balance between the societal interests involved. Similarly, the liability method of internalizing the secondary costs of technology seems at best sufficient only to protect individuals from private damage, not to protect society from technological catastrophe.⁸⁴ When dealing with the wide-ranging

uled. In the automotive industry, our technology has advanced to the stage that our engineers can invent practically on demand. Almost any device we can dream up, the engineers can make.

Address by Donald Frey, Vice President, Ford Motor Company, National Industrial Research Conf., Purdue University, Jan. 2, 1966, cited in Nader & Page, *Automobile Design and the Judicial Process*, 55 CALIF. L. REV. 645, 652 (1967).

⁸¹ — N.Y.2d at —, — N.E.2d at —, — N.Y.S.2d at —.

⁸² See *Drummond & Lyford v. General Motors Corp.*, CCH PRODS. LIAB. REP. ¶ 5611 (Super. Ct., Los Angeles County, Cal. 1966). See also Korn, *Law, Fact, and Science in the Courts*, 66 COLUM. L. REV. 1080 (1966); Nader & Page, *supra* note 80, at 666 & n.126.

⁸³ *E.g.*, *South Hill Neighborhood Ass'n, Inc. v. Romney*, — F.2d — (6th Cir. 1969) (to have standing, plaintiff must suggest alternative plan for historic building); *Scientific Supply Co. v. Zelinger*, 139 Colo. 568, 341 P.2d 897 (1959) (mere showing that plaintiff became ill after exposure to insecticide does not meet burden of establishing that the product unreasonably dangerous to humans). Other cases appear to spread the burden more equitably. *E.g.*, *Renken v. Harvey Aluminum, Inc.*, 226 F. Supp. 169, 174 (D. Ore. 1963) (once plaintiff establishes that he has been damaged, burden shifts to defendant polluter to show injury unavoidable).

⁸⁴ After analyzing the problems of internalizing the secondary costs of technology, some scholars have advocated abandonment of the fault system of individual litigation and the substitution of a workmen's compensation-type administrative procedure. *E.g.*, Baxter, *supra* note 36, at 53-57.

effects of some modern technologies, courts like our other institutions, are still uncertain what the secondary consequences are,⁸⁵ who should pay for them,⁸⁶ or to whom payments should be made.⁸⁷ Indeed, the whole idea of internalizing costs as a form of technology assessment depends upon a theory of market operations that has been increasingly questioned in recent years.⁸⁸

⁸⁵ The costs of air pollution, for example, with its pervasive effect on aesthetics, plant and animal life, human health, and even the earth's temperature, are probably incalculable and indivisible. See Wolozin, *The Economics of Air Pollution: Central Problems*, 33 LAW & CONTEMP. PROB. 227, 228-33 (1968).

⁸⁶ In the traditional case of internalizing costs the question is whether the particular injured individual or all the consumers of the technology should bear the cost. When courts attempt to internalize the pervasive effects of modern technology, however, the question becomes whether the consumers of the technology or society as a whole will bear the burden. Making electric power consumers pay the costs of flooding the Storm King Mountain area (Scenic Hudson Preservation Conf. v. FPC, 354 F.2d 608 (2d Cir. 1965), *cert. denied*, 384 U.S. 941 (1966)) may in fact be a form of regressive taxation. See Luce, *Utility Responsibility for Protection of the Environment*, 10 ARIZ. L. REV. 68, 69 (1968).

⁸⁷ An analogy might be made to the cases that have required that disposition of public park lands be made for a fair price and the money kept in trust for the purchase of another park. *Hiland v. Ives*, 154 Conn. 683, 228 A.2d 502 (1967); *Jacobson v. Parks & Recreation Comm'n*, 345 Mass. 641, 189 N.E.2d 199 (1963). See also Sax, *supra* note 28, at 482 n.35, 547. To date no court has established a trust fund to remedy the undesirable consequences of other technology.

⁸⁸ Courts have previously taken note of the ability of modern technology to generate and control its own market. *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 384, 161 A.2d 69, 84 (1960) ("Judicial notice may be taken of the fact that automobile manufacturers, including Chrysler Corporation, undertake large scale advertising programs over television, radio, in newspapers, magazines and all media of communication in order to persuade the public to buy their products"). Some judges have complained that imposing costs on technology is an insufficient control. In *Boomer v. Atlantic Cement Co.*, — N.Y.2d —, — N.E.2d —, — N.Y.S.2d — (1970), Judge Jason, dissenting, stated:

In permitting the injunction to become inoperative upon the payment of permanent damages, the majority is, in effect, licensing a continuing wrong. It is the same as saying to the cement company, you may continue to do harm to your neighbors so long as you pay a fee for it. Furthermore, once such permanent damages are assessed and paid, the incentive to alleviate the wrong would be eliminated, thereby continuing air pollution of an area without abatement.

Id. at —, — N.E.2d at —, — N.Y.S.2d at —.

Even the direct imposition of secondary costs on technology may not be sufficient incentive to businessmen. Discussing the efficacy of an effluent tax, one businessman made the following observation:

True, if you were to base pollution control on a system of incentives, you might be disappointed. The marginal dollar gained for pollution control is hardly as exciting as the marginal dollar gained in expanding sales, creating new products or improving technology. This type of income promises growth and future profits. I think that many, if not most businesses have a shortage of key personnel and they would rather use this resource to develop the main-spring of their profits than to maximize their pollution subsidies.

Letter from Robert E. Kohn to Harold Wolozin, July 4, 1967, *quoted in* Wolozin,

When the courts act as part of a governmental administrative structure for technology assessment, on the other hand, they seem to have considerable influence on the process. The courts are still passive in the sense that they cannot act until someone decides to bring an action, but the recently expanded concept of standing virtually assures that most controversial governmental decisions will have their day in court. Similarly, the distorting effects of historical precedent and the particular circumstances of the parties are largely irrelevant in such actions. The technical incompetence of the courts shows through in the obvious judicial bias in favor of upholding an assessment once made, but the power of the courts to determine who should participate and what factors should be weighed can have definite effects.⁸⁹ Although the burden of proof is still heavy in these actions, occasionally some of it is shifted to the administrators to show that they have considered all the relevant issues.⁹⁰

An attempt has been made to categorize judicial activity within a framework of technology assessment. No longer should a negligence action be seen as merely a means of compensating the injured and punishing the blameworthy; its effects on technology must also be considered. There are essentially three roles courts may play in the assessment process, some of which they perform better than others. There is no reason to assume, however, that present obstacles to effective judicial performance will be with us forever. With the recent

supra note 85, at 236. Since the imposition of secondary costs by a court is even less predictable than an effluent tax, the effects on technology may be correspondingly less significant. See Nader & Page, *supra* note 80, at 673-74.

⁸⁹ The events subsequent to *Parks v. Simpson*, 242 Miss. 894, 137 So. 2d 136 (1962) show how court enforcement of procedural due process can affect the ultimate technology assessment. The court had enjoined tidewater dredging on the ground that the contracts were beyond the statutory power of the State Marine Conservation Commission. Subsequently the legislature expressly granted this power to the Commission under limited circumstances. Such projects must now be approved by three-fifths of the entire Commission membership and must have the support of the Commission's marine biologist member. Furthermore, there must be a finding that "dredging will not be deleterious to the aquatic life and harmful to the fishing industry," which must be "spread full upon the minutes." MISS. CODE ANN. § 6048-03 (Supp. 1969). See also Sax, *supra* note 28, at 554-56.

Delay, which is almost an essential by-product of court involvement in administrative technology assessment, may itself have constructive consequences. The Storm King Project (*Scenic Hudson Preservation Conf. v. FPC*, 354 F.2d 608 (2d Cir. 1965), *cert. denied*, 384 U.S. 941 (1966)) is scheduled for reargument before the FPC in late April, 1970. The author has been informed by attorneys involved that technical developments in the area of gas turbine power production during the past five years have materially changed the arguments on the feasibility of alternate power sources.

⁹⁰ *E.g.*, *Scenic Hudson Preservation Conf. v. FPC*, 354 F.2d 608, 620 (2d Cir. 1965), *cert. denied*, 384 U.S. 941 (1966).

expansion of the concept of standing in actions to review governmental decisions, courts have demonstrated a conscious willingness to become involved in technology assessment. They may have no choice; we live in a technological world and, unless we are prepared to design new institutions and re-orient existing ones for control of technology, we may soon find its consequences beyond our control.

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* The author wishes to acknowledge the assistance of Mr. Philip L. Bereano, Commissioned Officer in the U.S. Public Health Service, in the preparation of this Note.