

FDA's Implementation of the Delaney Clause: Repudiation of Congressional Choice or Reasoned Adaptation to Scientific Progress?

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I. Introduction

The Delaney Clause, the most famous federal health statute, bars Food and Drug Administration (FDA) approval of any carcinogenic food additive.¹ In an era when scholars and politicians are again voicing concern about the propensity of legislatures to delegate broad power to administrators,² the Delaney Clause is an exceptional illustration of Congress's capacity to enact specific laws.³ The Clause seems to express the unequivocal judgment that consumers should not be exposed to food ingredients shown to cause cancer, regardless of the benefits the ingredients might provide or the magnitude of the risk that they might present. Like many extreme policies, the Delaney Clause has proved increasingly difficult to administer.

The Clause was not part of the original food additives bill that FDA's parent, the Department of Health, Education, and Welfare (HEW), had introduced in the House of Representatives in 1958. That bill merely required that a food additive be shown "safe" before it could be approved.⁴ At first HEW opposed a specific ban against carcinogens, but it withdrew objection when Congressman Delaney's proposed amendment was revised to confirm FDA's scientific discretion in interpreting the results of animal

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From 1975 to 1977 I was Chief Counsel to the Food and Drug Administration and in that role I was involved in some of the decisions discussed in this article.

1. 21 U.S.C. § 348(c)(3)(A) (1982); *see also* 21 U.S.C. §§ 360b(d)(1)(H), 376(b)(5)(B) (1982).

2. *E.g.*, Aranson, Gellhorn & Robinson, *A Theory of Legislative Delegation*, 68 CORNELL L. REV. 1 (1982). *But see* Mashaw, *Prodelegation: Why Administrators Should Make Political Decisions*, 1 J.L. ECON. & ORG. 81 (1985).

3. *See* J. MASHAW & R. MERRILL, *ADMINISTRATIVE LAW: THE AMERICAN PUBLIC LAW SYSTEM* 92-103 (2d ed. 1985).

4. *See infra* text accompanying note 278.

tests.⁵ Departmental spokesmen thereafter claimed that the law meant the same with or without the Delaney Clause.⁶ The language finally enacted appears as a proviso in section 409(c) of the Federal Food, Drug, and Cosmetic (FD&C) Act. Its instructions appear nonproblematic: FDA should not approve additives that have been shown to cause cancer in humans or have been shown, through animal experiments, to be potential human carcinogens.⁷

Implementation of this policy might have engendered little controversy if the universe of "food additives" had remained well-defined, if few compounds had displayed the capacity to "induce cancer" in laboratory animals, and if no food constituents shown to cause cancer had gained popularity among consumers or producers. However, experience has frustrated both the Clause's opponents and its defenders. Improvements in analytic chemistry have enlarged the universe of compounds that FDA regulates as food (and color) additives.⁸ More extensive testing of chemicals and more sensitive protocols have enhanced toxicologists' ability to identify substances capable of producing tumors, including several substances adopted for food use years ago.⁹ Some of these substances gained market acceptance long before their carcinogenicity was discovered.¹⁰ Any one of these developments might have caused FDA officials to question the Delaney Clause's literal instructions; together they have provided irresistible incentives to reinterpret or ignore them.

In addition to these science-driven pressures on regulators, the public health community's concerns about the relationship between diet and cancer have shifted focus. A consensus has emerged that dietary patterns influence cancer incidence.¹¹ Investigators have also revealed that the human

5. See *infra* text accompanying notes 285-301.

6. See *infra* text accompanying note 311.

7. Regulators, and scientists too, consider the results of properly conducted experiments in animals, primarily rodents, to be highly relevant evidence of a substance's capacity to cause cancer in humans. See COMMITTEE ON THE INST'L MEANS OF ASSESSMENT OF RISKS TO PUB. HEALTH, COMM'N ON LIFE SCIENCES, NAT'L RESEARCH COUNCIL, NAT'L ACADEMY OF SCIENCES, RISK ASSESSMENT IN THE FEDERAL GOVERNMENT: MANAGING THE PROCESS 20-33 (1983) [hereinafter RISK ASSESSMENT]. All but one of the substances now recognized as human carcinogens cause cancer in laboratory animals, though to be sure hundreds of animal carcinogens have not yet been confirmed as human carcinogens. *Id.*

The proponents of Delaney relied on a second premise as well, namely that "safe" levels of exposure could not be determined for some carcinogens. See *infra* text accompanying notes 282 & 335.

8. See *infra* text accompanying notes 64-77.

9. See *infra* text accompanying notes 78-94.

10. Saccharin, for example, had been in independent use since the early 1900s, but was not found to be carcinogenic in animals until the early 1970s. Over the years it had demonstrated its value as a non-nutritive sweetener, particularly beneficial for diabetics. See Merrill & Taylor, *Saccharin: A Case Study of Government Regulation of Environmental Carcinogens*, 5 VA. J. NAT. RESOURCES L. 1 (1985). Cyclamates, and possibly nitrites, also fall in this group. See Roberts, *Nitrite: A Case Study in Food Policy*, 34 FOOD DRUG COSM. L.J. 153 (1979).

11. See COMMITTEE ON DIET, NUTRITION AND CANCER, COMM'N ON LIFE SCIENCES, NAT'L

food supply is full of substances (most occurring naturally) that have been, or may be, shown to cause cancer in laboratory animals.¹² At the same time they have downplayed the possible contribution to cancer incidence of man-made chemicals, including pesticide residues and other inadvertent food additives.¹³

This article chronicles FDA's decade-long efforts to reconcile Congress's language with circumstances Congress may not have foreseen and for which it surely did not provide. The story is an intriguing study in statutory implementation, and it vividly illustrates the impact of science on the formulation of regulatory policy. Its most recent chapter invites debate over the scope of administrative authority to ignore Congressional instructions in an effort to implement wise policy.¹⁴

II. The Statutory Text and FDA's Evolving Understanding

A. *The Statute*

The Delaney Clause is actually three parallel provisions applicable to three classes of food constituents: (1) food additives, the subject of language adopted in 1958,¹⁵ (2) color additives, the subject of an almost identical prohibition adopted in 1960,¹⁶ and (3) animal drug residues, the product of fine-tuning amendments to the FD&C Act in 1968.¹⁷ This article will focus on the 1958 version and its 1960 sequel.

RESEARCH COUNCIL, NAT'L ACADEMY OF SCIENCES, DIET, NUTRITION AND CANCER: DIRECTIONS FOR RESEARCH ch. 1, at 14 (1982) [hereinafter COMMITTEE ON DIET, NUTRITION AND CANCER]; Merrill, *Reducing Diet Induced Cancer Through Federal Regulation: Opportunities and Obstacles*, 38 VAND. L. REV. 513 (1985). This consensus embraces a strong suspicion of diets that are high in animal fats and a more cautious hope that some fruits and vegetables may protect against disease. COMMITTEE ON DIET, NUTRITION AND CANCER, *supra*, ch. 1, at 1-15, ch. 15, at 1-9.

12. McCann & Ames, *Detection of Carcinogens as Mutagens in the Salmonella/Microsome Test: Assay of 300 Chemicals: Discussion*, 73 PROC. NAT'L ACAD. SCI. 950 (1976); Ames, *Dietary Carcinogens and Anticarcinogens: Oxygen Radicals and Degenerative Diseases*, 221 SCIENCE 1256 (1983).

13. See OFFICE OF TECHNOLOGY ASSESSMENT, TECHNOLOGIES FOR DETERMINING CANCER RISKS FROM THE ENVIRONMENT 65-109 (1981); Doll & Peto, *The Causes of Cancer: Quantitative Estimates of Avoidable Risks of Cancer in the United States Today*, 66 J. NAT'L CANCER INST. 1191 (1981).

14. The story took a sharp, but possibly only temporary, turn on October 23, 1987, when the U.S. Court of Appeals for the District of Columbia Circuit overturned FDA's approval of two color additives that had been found carcinogenic in animal feeding experiments. *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987). The Agency ruling that precipitated this decision provides the last chapter of my chronicle. The court's opinion and its import for FDA's future implementation of the Delaney Clause are discussed below. See *infra* text accompanying notes 46 & 389.

15. 21 U.S.C. § 348 (1982).

16. 21 U.S.C. § 376 (1982).

17. 21 U.S.C. § 360b (1982).

Section 409(c), as amended, reads in part as follows:

(3) No such regulation shall issue if a fair evaluation of the data before the Secretary—

(A) fails to establish that the proposed use of the food additive, under the conditions of use to be specified in the regulation, will be safe: *Provided, That no additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are appropriate for the evaluation of the safety of food additives, to induce cancer in man and animal*

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In recent years the key question has been whether the Delaney Clause added anything to the general safety standard and specifically whether, in the case of carcinogens, it converted a general directive to exercise prudent scientific judgment into a rigid expression of legislative policy. As we begin exploring this issue it is worth examining the statute more closely.

One of the Delaney Clause's noteworthy features is its location. Because it appears as a proviso to the general standard for evaluating food additives, the Clause literally applies only to substances that are "food additives."¹⁹ It does not automatically proscribe FDA approval of animal carcinogens that are not "food additives," even if they might be present in or added to food.²⁰ Congress's later adoption of similar language for color additives and animal drug residues reinforces this point. It is not clear that members of Congress appreciated the full significance of this limitation, but there is no doubt that the proponents of the food additives legislation were aware that they were not requiring premarketing proof of safety for all food constituents. Accordingly, we can say that from the beginning FDA had authority to decide whether specific substances fell within the class to which the premarketing proof of safety requirement—and thus the Delaney Clause—applied.

The Delaney Clause, moreover, seems redundant. It accompanies lan-

18. The statute continues:

[E]xcept that this proviso shall not apply with respect to the use of a substance as an ingredient of feed for animals which are raised for food production, if the Secretary finds (i) that, under the conditions of use and feeding specified in proposed labeling and reasonably certain to be followed in practice, such additive will not adversely affect the animals for which such feed is intended, and (ii) that no residue of the additive will be found (by methods of examination prescribed or approved by the Secretary by regulations, which regulations shall not be subject to subsections (f) and (g) of this section) in any edible portion of such animal after slaughter or in any food yielded by or derived from the living animal.

21 U.S.C. § 348(c)(3)(A) (1982) (emphasis supplied).

19. Merrill, *Regulating Carcinogens in Food: A Legislator's Guide to the Food Safety Provisions of the Federal Food, Drug and Cosmetic Act*, 77 MICH. L. REV. 171, 203-17 (1978).

20. *Id.* at 203-04, 217-22.

guage that forbids approval of any additive that has not been shown to be “safe,” a standard that FDA spokespersons in both 1958 and 1960 said could not be met by a substance that caused cancer in experimental animals.²¹ Nonetheless, the Agency acceded to the addition of this supposedly redundant language in 1958 and actively sought its inclusion in 1960.²² If the Clause was intended merely to confirm agency policy, this is perplexing behavior indeed. If Congress meant simply to endorse FDA’s current judgment but leave it flexibility should the scientific consensus change, language to that effect in a committee report would have sufficed.²³

Even within the scope of its literal application, the Delaney Clause is not self-executing. The Clause specifies that FDA may not “deem” a food additive “safe” if two circumstances converge: (1) the additive “induces cancer” when (2) it is fed to animals²⁴ or is administered to them by other means “appropriate” for assessing the safety of food additives. Deciding whether these conditions exist requires expert judgment, presumably by FDA. The interpretation of animal test results is not a simple exercise.²⁵ The conclusion that a substance has “induced cancer” in animals embodies a series of findings based on evidence that is frequently equivocal.²⁶ Whether a test by a route other than ingestion qualifies as “appropriate” also demands scientific judgment. The Delaney Clause does not purport to dictate how these judgments are to be reached. The statute’s silence is consistent with the assumption that FDA was to adhere to the evolving standards of the disciplines that collaborate in chemical safety assessment.²⁷

21. See *infra* note 329; *infra* text accompanying note 301.

22. See *infra* text accompanying notes 300–01, 318 & 335.

23. Syntax and location do not, of course, determine definitively legislative intent. Inclusion of the Delaney Clause in the statute itself may have been seen as a convenient and harmless way to appease Representative Delaney. Nevertheless, Agency officials’ claims that the 1958 clause would change nothing should not be taken at face value either, for it was clearly in FDA’s interest to appear to agree with Delaney’s position on the merits while asserting the freedom to revise its policy if the merits warranted. By 1960, HEW and FDA had apparently lost interest in preserving flexibility, for Secretary Flemming assured the House Commerce Committee that the Agency had no scientific basis for seeking authority to approve any carcinogenic color. He promised that FDA would return to Congress, presumably for new legislation, should science later provide such a basis. See *infra* text accompanying notes 326–31.

24. The statute speaks in terms of inducing cancer “in man or in animals,” but the former restriction has not yet engendered controversy. The debate thus far has focused exclusively on the statute’s application to animal carcinogens.

25. The toxicologist must identify damaged tissues in hundreds of animals; determine which lesions are to be classed as tumors; diagnose those that are malignant and those that are benign; and compare the frequencies of tumors in dosed and control groups. See, e.g., RISK ASSESSMENT, *supra* note 7, at 20–33. For a discussion of the various factors that can influence the choice of risk assessment techniques, see Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. ON REG. 89 (1988).

26. *Id.* at 29–32.

27. When FDA listed Orange No. 17 and Red No. 19 for external use in 1986, it cited a discussion initiated on the Senate floor by Senator Jacob Javits during debate on the Color Additives

Yet there remains a kernel of the Delaney Clause that appears to foreclose choice-making by FDA. The text seems to preclude the Agency's deeming safe a substance that is acknowledged to be a food additive and that meets the Clause's other criteria. The natural reading is that once FDA has concluded that a substance is a food additive and has induced cancer in animals, it may not sanction its use, even if the Agency might otherwise conclude that consumers who ingest the additive would not face any significant risk. For many years, this was FDA's view of the law as well.²⁸

B. *FDA's Escape from Delaney*

Part III of this Article examines the milestones in FDA's reinterpretation of the Delaney Clause and describes the developments that have spurred it. But to place these decisions in context we should first preview FDA's current, and, at least recently, rejected, view of the law.

The first test of FDA's policy involves the 1960 Color Additives Amendment and its version of the Delaney Clause.²⁹ Orange No. 17 and Red No. 19 have been used for many years to color drugs and cosmetics. Both were among the several dozen colors in use at the time of the passage of the 1960 amendments and thus eligible for "provisional listing,"

Amendments of 1960. Senator Javits obtained confirmation that the Delaney Clause would be implemented using the rule of reason. *See* Listing of D&C Orange No. 17 for Use in Externally Applied Drugs and Cosmetics, 51 Fed. Reg. 28,331, 28,342 (1986) [hereinafter D&C Orange No. 17]; *see also* Listing of D&C Red No. 19 for Use in Externally Applied Drugs and Cosmetics, 51 Fed. Reg. 28,346, 28,359 (1986) [hereinafter D&C Red No. 19].

28. *See* Saccharin and Its Salts, Proposed Rulemaking and Hearing, 42 Fed. Reg. 19,996 (1977). In its opinion overturning FDA's decision to approve permanent listing of Orange No. 17 and Red No. 19, the D.C. Circuit noted:

The FDA candidly acknowledged that its safety findings represented a departure from past agency practice: "In the past, because the data and information show that D&C Orange No. 17 is a carcinogen when ingested by laboratory animals, FDA in all likelihood would have terminated the provisional listing and denied CTFA's petition for the externally applied uses . . . without any further discussion."

Public Citizen v. Young, 831 F.2d 1108, 1111 (D.C. Cir. 1987) (quoting D&C Orange No. 17, *supra* note 27, at 28,341).

29. FDA has defended its new interpretation of the Delaney Clause in terms that would apply to both the 1958 and 1960 versions. *See* Brief for Respondents, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548). It relied on essentially the same arguments in announcing that it would not ban methylene chloride, a conceded animal carcinogen, for use in decaffeinating coffee—a food additive use. *Cosmetics; Proposed Ban on the Use of Methylene Chloride as an Ingredient of Aerosol Cosmetic Products*, 50 Fed. Reg. 51,551 (1985).

The court's opinion in *Public Citizen v. Young*, however, recognizes that there may be differences in the framework for regulating food additives and, possibly, in the legislative history of the 1958 Delaney Clause, that might justify different interpretations of the twin provisions. *See* 831 F.2d at 1119-20. A challenge to FDA's methylene chloride ruling has been dismissed as premature. *Public Citizen v. Bowen*, 833 F.2d 364 (D.C. Cir. 1987).

that is, approval pending confirmation of safety in accordance with the new law's requirements.³⁰

As has often occurred when Congress has mandated the testing of older chemicals,³¹ modern studies of provisionally listed color additives have revealed that some—Orange No. 17 and Red No. 19 among them—produce tumors in animals. The two colors thus would appear to fall under the 1960 Delaney Clause, whose applicability is undisputed. Yet FDA not only refused to ban them;³² on August 7, 1986, it sanctioned their continued use, concluding that each is “safe” for human use and that the Delaney Clause does not bar their approval.³³

Unlike ingested food and color additives, FDA reasoned, Orange No. 17 and Red No. 19 are used in products that are applied topically and in low concentrations. Accordingly, anticipated human exposure, even assuming lifetime use, is low.³⁴ Coupling its estimate of exposure with analysis of the dose-response relationship observed in animal experiments, FDA arrived at estimates of the human cancer risks posed by the two colors.³⁵ Applying a widely accepted extrapolation model,³⁶ the Agency estimated that the maximum risks to humans exposed to drugs and cosmetics containing the colors were, respectively, one in nineteen billion and one in nine million.³⁷ On this basis FDA concluded that the colors met the law's general requirement that they be shown to be “safe.” Their estimated risks could be zero, and in any case were well below the level that in other contexts it had considered safe.³⁸

FDA relied on the same risk estimates to escape the Delaney Clause,

30. See Color Additives: Provisional Regulations; Postponement of Closing Dates, 42 Fed. Reg. 6991 (1977).

31. See, e.g., COMMITTEE ON SCIENTIFIC AND REGULATORY ISSUES UNDERLYING PESTICIDE USE PATTERNS AND AGRICULTURAL INNOVATION, NAT'L RESEARCH COUNCIL, NAT'L ACADEMY OF SCIENCES, REGULATING PESTICIDES IN FOOD: THE DELANEY PARADOX 36-37 (1987) [hereinafter REGULATING PESTICIDES].

32. Letter from Frank Young, FDA, to Dr. Sidney Wolfe, Public Citizen (June 21, 1985) (response to Public Citizen petition to remove colors from provisional list) [hereinafter Young Reponse to Public Citizen].

33. See D&C Orange No. 17, *supra* note 27; D&C Red No. 19, *supra* note 27.

34. While uncertainty always surrounds such exposure estimates, even FDA's critics have not offered plausible evidence that its estimates in this case are wrong. Brief for Petitioners at 17-18, Public Citizen v. Young, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

35. See generally RISK ASSESSMENT, *supra* note 7.

36. The petitioning Cosmetic, Toiletry and Fragrance Association presented safety data for both colors based on a multistage model which used “the extrapolation curve that best fits the experimental data.” D&C Orange No. 17, *supra* note 27, at 23,338; D&C Red No. 19, *supra* note 27, at 28,354. An FDA scientific review panel assumed that “[t]he linearized multistage model reflects the true relationship between dose and response.” It noted that the model might either accurately reflect or overstate the risk at low doses. D&C Orange No. 17, *supra* note 27, at 28,340; D&C Red No. 19, *supra* note 27, at 28,355.

37. D&C Orange No. 17, *supra* note 27, at 28,344; D&C Red No. 19, *supra* note 27, at 28,360.

38. D&C Orange No. 17, *supra* note 27, at 28,344; D&C Red No. 19, *supra* note 27, at 28,360-61.

but its reasoning took a different tack. Rather than attempt to square its conclusion with the statute's language, the Agency invoked its "inherent" authority to "overlook circumstances that in context may fairly be described as *de minimis*."³⁹ It found support for this authority in *Alabama Power Co. v. Costle*,⁴⁰ where the D.C. Circuit declared that "[u]nless Congress has been extraordinarily rigid, there is likely a basis for an implication of *de minimis* authority to provide exemption when the burdens of regulation yield a gain of trivial or no value."⁴¹ Rejecting the suggestion that the Delaney Clause is extraordinarily rigid,⁴² FDA pointed to passages in the legislative history of the 1960 Amendments that in its view confirmed its authority to interpret the law in light of scientific advances.⁴³

With its approval of Orange No. 17 and Red No. 19, FDA arrived at an interpretation of the Delaney Clause that would allow it to approve weak carcinogens to which humans are exposed only in small quantities.⁴⁴ If one accepts the premise that quantitative risk assessment can reliably estimate human cancer risks, the result arguably represents sound policy. But this result is reached by reading the Delaney Clause out of the statute. According to FDA, no carcinogenic additive that presents more than an insignificant risk can be considered "safe." However, an additive that presents only an insignificant risk not only may be considered "safe," it also escapes the Delaney Clause. A provision that for thirty years has been considered the epitome of risk-averse legislation thus turns out to have no independent force at all.⁴⁵

As noted above, shortly before this article went to press the D.C. Circuit overturned FDA's decision to list Orange No. 17 and Red No. 19

39. *Alabama Power Co. v. Costle*, 636 F.2d 323, 360 (D.C. Cir. 1979); see also D&C Orange No. 17, *supra* note 27, at 28,344; D&C Red No. 19, *supra* note 27, at 28,359.

40. 636 F.2d 323 (D.C. Cir. 1979).

41. *Id.* at 360-61.

42. Young Response to Public Citizen, *supra* note 32, at 32.

43. See D&C Orange No. 17, *supra* note 27, at 28,342; D&C Red No. 19, *supra* note 27, at 28,359.

44. FDA has consistently spurned any suggestion that it possesses greater discretion in applying the Delaney Clause to additives already in use at the time of its enactment than to additives for which approval is sought for the first time. Nor has it attempted to defend its decisions on Orange No. 17 and Red No. 19 (or its action on methylene chloride) as a variety of "inaction," even though they are implemented through the Agency's failure to act to terminate their approval. See *Heckler v. Chaney*, 470 U.S. 821 (1985). FDA is correct in assuming that it must defend its *de minimis* theory on the merits rather than seek ways to avoid judicial review. Its decision on the two colors very clearly represents formal agency action, for, while in fact FDA failed to take steps to curtail their continued use, in form it affirmatively approved their marketing by moving them from the provisional list to the status of permanently listed. Moreover, the Agency has never suggested its theory would protect only additives already in use; rather, it has implied that it could be the basis for the approval of new uses and new substances.

45. See Cooper, *Stretching Delaney Till It Breaks*, REGULATION, Nov.-Dec. 1985, at 11.

permanently in the face of the Commissioner's finding that each color induces cancer in experimental animals. The court concluded that neither the legislative history of the 1960 Clause nor the judicial precedents FDA had invoked supported so bald a departure from the statute's plain meaning. The court further found that Congress could reasonably have meant to prohibit the introduction and use of all carcinogenic color additives, even though some, including the two at issue, might pose human health risks "it seems altogether fair to characterize . . . as trivial."⁴⁶

III. FDA's Decisions Under the Delaney Clause

A. *Coverage of the Clause*

FDA's policy evolved gradually in a series of decisions on specific issues and problems (exemplified by specific food constituents) to which the statute provided no obvious answer or, sometimes, provided an answer that appeared unsound. Through this incremental process, the Agency had arrived at a coherent view of the food and color additive laws: it would decline to ban any carcinogenic additive that poses no greater human cancer risk than one in one million.⁴⁷ This "interpretation" of the Delaney Clause, however, represented a reversal of the position FDA embraced immediately after enactment, a position that acknowledged the Clause's automatic ban of additives found to induce cancer in animals.

While the Agency held to this view for many years, it never went out of its way to invoke the Delaney Clause nor did it attempt to ban all carcinogens from human food. On only four occasions did FDA rely on the Clause as the basis for refusing to allow a substance in food. Even during the 1960s, when the Clause was clearly understood to forbid approval of carcinogenic food or color additives, FDA had few occasions to enforce the provision.

There are several explanations for this inactivity. So far as the public record reveals, FDA rarely received petitions to approve additives that had been shown to cause cancer in laboratory animals. The ingredients that it acknowledged as problems were already used prior to 1958. Most of these had not previously been thoroughly tested,⁴⁸ and few of those that underwent toxicological testing in the subsequent decade appeared to cause cancer. Indeed, it seems likely that supporters of the Delaney Clause believed that few additives would be affected. In short, relatively few food ingredients were initially shown or suspected to be animal carcinogens.

46. *Public Citizen v. Young*, 831 F.2d 1108, 1111 (D.C. Cir. 1987).

47. See *REGULATING PESTICIDES*, *supra* note 31, at 39 (regarding contaminants/constituents).

48. See *Merrill & Taylor*, *supra* note 10; *Roberts*, *supra* note 10.

Furthermore, the statute itself is constructed in ways that constrict the literal coverage of the Delaney Clause and afford FDA opportunities to avoid its application. For example, while the layperson might assume that the term "food additive" embraces any chemical that a person "adds" to food, the statutory definition itself contains several exceptions. The exception for "color additives," is of no moment, because, as already noted, the 1960 Color Additive Amendments contain their own Delaney Clause.⁴⁹ But other exceptions, which significantly narrow the scope of Congress's apparent refusal to sanction the knowing addition of animal carcinogens to human food, are worthy of brief summary.

One of the most significant explicit exceptions to the definition of "food additive" is that for any "pesticide chemical in or on a raw agricultural commodity."⁵⁰ It has allowed approval for use on human food crops of numerous chemicals now convincingly demonstrated to cause cancer in laboratory animals.⁵¹ Another exception covers drugs administered to livestock whose residues may remain in meat, milk, or eggs consumed by humans.⁵² In 1962 Congress modified the Delaney Clause for this category of added food constituent.⁵³ A third exception excludes "any substance used in accordance with a sanction or approval granted" by FDA or the Department of Agriculture prior to 1958.⁵⁴ These express but operationally ambiguous exceptions to the "food additive" definition have presented FDA with many opportunities to rule on the coverage of the Delaney Clause, and to take into account the practical consequences of extending its ban on carcinogens.⁵⁵

The language of the Delaney Clause itself has allowed FDA some room to maneuver. The statute specifies "that no [food] additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are appropriate for the evaluation of the safety of food additives, to induce cancer in man or

49. See 21 U.S.C. § 376(b)(5) (1982), which reads in part:

(B) A color additive (i) shall be deemed unsafe, and shall not be listed, for any use which will or may result in ingestion of all or part of such additive, if the additive is found by the Secretary to induce cancer when ingested by man or animal, or if it is found by the Secretary, after tests which are appropriate for the evaluation of the safety of additives for use in food, to induce cancer in man or animal, and (ii) shall be deemed unsafe, and shall not be listed, for any use which will not result in ingestion of any part of such additive, if, after tests which are appropriate for the evaluation of the safety of additives for such use, or after other relevant exposure of man or animal to such additive, it is found by the Secretary to induce cancer in man or animal. . . .

50. 21 U.S.C. § 321(s) (1982).

51. REGULATING PESTICIDES, *supra* note 31, at 36.

52. 21 U.S.C. § 321(s) (1982).

53. See 21 U.S.C. § 376(b)(5)(B) (1982).

54. 21 U.S.C. § 321(s) (1982); see Merrill, *supra* note 19, at 214-17.

55. See Cooper, *supra* note 45.

animal. . . .”⁵⁶ These contingent phrases inescapably, and perhaps by design, have given FDA flexibility in applying the statutory ban. For example, while the statute does not specify by whom it must be “found” that an additive “induces cancer,” undisputed tradition has left this a finding for the Commissioner of Food and Drugs.⁵⁷ FDA commissioners have decided whether tests were “appropriate” for the evaluation of an additive’s safety. The Agency has assumed the authority to demand that safety tests meet prevailing scientific standards in design and execution.⁵⁸ And substantial discretion accompanies the Agency’s responsibility for interpreting the results of animal tests. In determining whether an additive “induce[s] cancer,” the Agency must select criteria for deciphering animal tissues and choose a standard of statistical significance to arrive at a qualitative judgment. FDA effectively has authority to decide what evidence will support or dictate a positive finding. Will it be satisfied with a positive result in one sex of one species? In both sexes of a single species? Only in two species? Are benign tumors to count? Only if they accompany malignant tumors?⁵⁹ Likewise, the statute’s silence gives FDA authority to question

56. 21 U.S.C. § 348(c)(3)(A) (1982).

57. See Merrill, *supra* note 19. In the current regulatory context, where the Office of Management and Budget (OMB) has assumed a significant role in overseeing rulemaking by executive agencies, questions could arise about the scope and independence of the Commissioner’s scientific role. Indeed, in the very decision that has given rise to the first challenge to FDA’s *de minimis* theory, OMB appears to have played a significant, and perhaps decisive, role. One Congressional committee has found that FDA staff members and the Commissioner of Food and Drugs at first expressed unwillingness to rely on this theory to approve Orange No. 17 and Red No. 19. *HHS’ Failure to Enforce the Food, Drug, and Cosmetic Act: The Case of Cancer-Causing Color Additives*, H.R. REP. NO. 151, 99th Cong., 1st Sess. (1985). The Department of Justice also exercised a heavy hand over the explanations offered by FDA for the ultimate decision, reportedly insisting that the FDA Commissioner withdraw his earlier acknowledgements that the two colors “induce cancer” and revise his reasoning for their approval. See *FDA Continues to Permit the Illegal Marketing of Carcinogenic Additives*, H.R. REP. NO. 361, 100th Cong., 1st Sess. (1987).

The D.C. Circuit had no occasion to evaluate the propriety of either intrusion on the Commissioner’s decisional authority. The role of OMB was not challenged by the petitioners, and the court essentially treated FDA’s last-minute effort to withdraw its findings that the two colors “induce cancer” as spurious. It decided the case on the grounds first asserted by the Agency. See *Public Citizen v. Young*, 831 F.2d 1108, 1120–22 (D.C. Cir. 1987).

58. See 21 C.F.R. § 170.20(s) (1986); see also Walden, *FDA with a Capital L*, 31 *FOOD DRUG COSM. L.J.* 649, 652–53 (1976); Brisson, *A Look at the Bioresearch Monitoring Program: The Agency Perspective*, 38 *FOOD DRUG COSM. L.J.* 184 (1983).

59. Risk assessment, the evaluation of potential human health effects from an environmental hazard, involves four steps. Step one, hazard identification, defines the nature of the hazard using data from epidemiologic studies, long-term animal studies, short-term studies and analysis of the agent’s molecular structure. Step two is dose response assessment, determining the relationship between the dose of an agent and the effect it causes in humans. As there is frequently little data on humans, there is heavy reliance on animal data. Since animal studies are generally conducted using high doses, low dose effects must be extrapolated from the high dose information by the use of various models. There must also be mathematical adjustments performed to account for the differences among species in extrapolating from animal studies to humans. The third step, exposure assessment, requires determination of who will be exposed to the agent, and in what concentrations or amounts. The fourth step, risk characterization, is the estimation of the hazard’s extent in public health terms. See *RISK ASSESSMENT*, *supra* note 7, at 29–30.

the reliability of test results. It may dismiss the results of studies that it believes to be incomplete or dishonest.⁶⁰ Judgments of this sort are obviously an integral part of administering the statute. While FDA has not adopted formal rules for resolving all such issues,⁶¹ one can guess how it has behaved. It is likely that FDA has been more willing to interpret tests of new additives as suggesting disqualifying carcinogenicity than to find that familiar ingredients "induce cancer."⁶² Some observers believe that FDA has been slow to characterize any additive as a carcinogen.⁶³ This reluctance may predate more recent decisions in which FDA has resorted to legal rather than scientific arguments to avoid the Delaney Clause. It is to these decisions that we now turn.

B. *Erosion of the Assumptions Underlying the Delaney Clause*

The coverage of the Delaney Clause, and thus the problems encountered in administering it, are largely a function of two circumstances: (1) the number of substances that fall within the definition of "food additive," and (2) the number of substances within this universe that are found to "induce cancer." Through the 1970s, scientific advances in two arenas enlarged dramatically the universe of substances to which the Delaney Clause might apply. At the same time, a consensus began to emerge

60. The FD&C Act does not expressly empower the Agency to punish, or indeed to ignore, experimental data that have been falsified or are the result of fraudulent or inept research, but its inherent authority to insist on the integrity of experimental reports seems uncontested. And FDA has based formal decisions largely on its conclusions that the data submitted by a petitioner could not be considered reliable evidence of the findings they purported to sustain.

For example, in 1975 FDA stayed a regulation for the use of the non-nutritive sweetener aspartame. Although the notice gave details, the basis for the action was clear:

Preliminary results of an audit of the records of certain animal studies conducted by or for the petitioner, including studies on aspartame, indicate the need for a comprehensive review of certain of the research data held by or for the petitioner. The Public Board of Inquiry is therefore being postponed until questions raised by the audit have been resolved.

Aspartame; Stay of Effectiveness of Food Additive Regulation, 40 Fed. Reg. 56,907 (1975). From other sources, it was apparent that there were dubious laboratory practices as well as possible misrepresentations in the long term animal toxicity studies supporting the food additive petition. See *Preclinical and Clinical Testing by the Pharmaceutical Industry, 1976 - Part II: Joint Hearings before the Subcomm. on Health of the Senate Comm. on Labor and Public Welfare and the Subcomm. on Administrative Practice and Procedure of the Senate Comm. on the Judiciary*, 94th Cong., 2d Sess. 50, 72-78 (1976) (statement by Alexander M. Schmidt, M.D., FDA Commissioner).

The following year, FDA proposed withdrawal of approval for the new drug Naprosyn on the basis of inconsistencies and omissions in the data submitted from its supporting animal studies. Naprosyn Tablets: Opportunity for Hearing on Proposal To Withdraw Approval of New Drug Application, 41 Fed. Reg. 45,605 (1976). In the case of a new drug application, the authority to revoke approval upon discovery of misrepresentation is explicit. 21 U.S.C. § 355(e)(4) (1982).

61. See BUREAU OF FOODS, U.S. FOOD & DRUG ADMIN., TOXICOLOGICAL PRINCIPLES FOR THE SAFETY ASSESSMENT OF DIRECT FOOD ADDITIVES AND COLOR ADDITIVES USED IN FOOD 23-25, 48-50 (1982).

62. REGULATING PESTICIDES, *supra* note 31, at 41.

63. See *id.* at 38-39, 41.

among public health experts that while a substantial portion of human cancer was linked with diet, little could be attributed to synthetic chemicals in food.

FDA officials were not oblivious to these developments. Agency spokespersons remarked on the dramatic advances in analytical chemistry which were revealing "additives" in food whose occurrence had not previously been expected. They also recognized that more comprehensive and sensitive testing of chemicals was expanding the list of proven animal carcinogens. And they became less hesitant about pointing out that the food supply contains hundreds of trace chemicals, most present "naturally," that have been associated with tumor formation in experimental animals. Furthermore, Agency officials were reminded of the growing concern about the links between dietary patterns and human cancer when food producers began promoting products as high in fibre or rich in Vitamin C while invoking the findings of the National Cancer Institute. These developments eroded both of the assumptions of the framers of the Delaney Clause: few chemical "additives" caused cancer, but those few presented a serious threat to public health.

1. *Progress in Analytical Chemistry: Enlarging the Universe of "Additives"*

Regulation of chemicals used in food production and processing, such as pesticides and packaging materials, has for decades depended on the capacity of FDA inspectors to measure residues and thereby enforce health-based limits on their occurrence. The protection afforded by such limits in turn depended on the sensitivity of the analytical methods chosen to enforce them. Improvements in analytical chemistry have had the disconcerting propensity to reveal residues where there should be none, thus requiring the Agency to set more stringent limits or explain why the residues it could now detect were safe.

According to a 1979 HEW report, the smallest amounts measurable by analytical techniques had decreased by up to seven orders of magnitude since 1930, bringing picogram amounts of many chemicals within the reach of detection.⁶⁴ The best documented, and perhaps most dramatic, improvements in analytical chemistry have occurred in the methods for detecting pesticide residues. Until 1955, assay methods for specific pesticide residues were primitive; most were colorimetric (involving color com-

64. STAFF OF SENATE COMM. ON AGRIC., NUTRITION AND FORESTRY, 90TH CONG., 1ST SESS., FOOD SAFETY: WHERE ARE WE? (Comm. Print 1979) (statement by U.S. Dep't of Health, Educ., and Welfare).

parisons using standard reference solutions) or nonspecific.⁶⁵ "Any residue in a food sample containing less than 0.05 ppm was usually reported, in all good faith, as zero or nondetectable."⁶⁶ The development of thin layer and gas chromatography improved analytical sensitivities by more than one thousand times.⁶⁷ These powerful technologies were in their infancy in 1958.

In a 1966 study of pesticide residues in food, 0.05 ppm was the sensitivity limit for all but one group of pesticides.⁶⁸ Twenty-four of the chemicals reported by FDA researchers in 1986 had concentration ranges below 0.05 ppm. Confining comparison to just these chemicals, as many as twenty-four found in 1986 would probably have escaped detection in 1966. In a survey done between 1980 and 1982, FDA researchers found residues of sixty different chemicals in an analysis of 120 food items. The number detected ranged from a low of eight in dairy products to a high of twenty-six in garden fruits.⁶⁹ Many of these residues were detected at very low levels. For thirty-nine chemicals, or almost two-thirds of the sample, residues were detected at levels under 0.05 ppm, or fifty ppb, the 1955 limit of detection. Had this study been performed with the analytical techniques available in 1955, thirty-nine chemicals out of sixty probably would have escaped detection.

A recent example demonstrates how advances in chromatographic analysis can create a regulatory problem. P-toluidine, a contaminant in some color additives, is an animal carcinogen.⁷⁰ Chemists had not detected P-toluidine in Green No. 6 using gravity elution chromatography,⁷¹ which had a limit sensitivity thought to be at least 250 ppm.⁷² In 1979, however, a scientist using high pressure liquid chromatography (HPLC) reported that there might be P-toluidine contamination in Green No. 6. The subsequent use of HPLC with ultraviolet absorption or fluorescence detectors to analyze the separated chemicals proved capable of detecting P-toluidine residues down to ten ppm. This technique confirmed in 1982 that P-toluidine was present at an average concentration of 393 ppm.⁷³ The in-

65. Van Middleem, *Assay Procedures for Pesticide Residues*, in PESTICIDES IN THE ENVIRONMENT pt. II, at 315 (R. White-Stevens ed. 1971).

66. *Id.*

67. *Id.*

68. Duggan, Barry & Johnson, *Pesticide Residues in Total-Diet Samples*, 151 SCIENCE 101, 102 (1966).

69. Gartrell, Craun, Podrebarac & Gunderson, *Pesticides, Selected Elements and Other Chemicals in Adult Total Diet Samples October 1980-March 1982*, 69 J. A. OFFICIALS ANALYTICAL CHEMISTRY 146, 146 (1986); *id.* at 157 (Table 3).

70. D&C Green No. 6; Listing as a Color Additive in Externally Applied Drugs and Cosmetics, 47 Fed. Reg. 14,138, 14,139 (1982).

71. *Id.* at 14,139-40.

72. D&C Green No. 5; Final Rule, 47 Fed. Reg. 24,278, 24,279 (1982).

73. D&C Green No. 6; Listing as a Color Additive in Externally Applied Drugs and Cosmetics,

formation about Green No. 6 raised suspicions concerning Green No. 5, which was derived from Green No. 6.⁷⁴ Chemists using HPLC with fluorescence detected the presence of P-toluidine in Green No. 5 at levels of .57 to 2.54 ppm.⁷⁵

Just as improvements in instrumentation have allowed FDA scientists to detect more substances in food at lower concentrations, other agencies have discovered increasing numbers of previously undetected chemicals in the environment. The Environmental Protection Agency began monitoring organic chemicals in the nation's drinking water in 1973, when it reported finding 253 different chemicals. By 1979, it had identified more than 700 "foreign" chemicals in drinking water.⁷⁶

FDA scientist Albert Kolbye summarized the trend:

[A]nalytical chemists can now detect a whole new galaxy of low levels of substances in food. Previously the limits of qualitative identification and quantitative measurement were in the parts per thousand range: today parts per trillion are not uncommon and in some instances routine. This represents a millionfold increase in our ability to detect "chemicals" in food.⁷⁷

The universe of detectable chemicals "added" to human food had thus grown vastly larger than the universe of additives legislators had confronted in 1958.

2. *Progress in Toxicology: Enlarging the Universe of Carcinogens*

Proponents of the Delaney Clause did not expect that significant numbers of food ingredients would prove to be carcinogenic. In a 1957 article advocating that carcinogenic additives be forbidden, National Cancer In-

47 Fed. Reg. 14,138, 14,340 (1982).

74. D&C Green No. 5; Final Rule, 47 Fed. Reg. 24,278, 24,279 (1982).

75. FDA confronted another dilemma during the 1970s as older mouse uterine assays and then even chromatographic methods for detecting DES residues in animal tissue were discredited by more sensitive assays. A 1979 food industry paper stated that the sensitivities of assays for DES residues had increased from 100 ppb in 1958 to one ppb, or even levels measured in parts per trillion. Expert Panel on Nutrition and Safety, Inst. of Food Technologists, *The Risk/Benefit Concept as Applied to Food*, in STAFF OF SENATE COMM. ON AGRIC., NUTRITION, AND FORESTRY, 90TH CONG., 1ST SESS., FOOD SAFETY: WHERE ARE WE? 630 (Comm. Print 1979).

76. Menzer & Nelson, *Water and Soil Pollutants*, in CASARETT AND DOULL'S TOXICOLOGY: THE BASIC SCIENCE OF POISONS 825, 838 (C. Classen, M. Amdur & J. Doull 2d ed. 1980).

77. Kolbye, *Decision-Making Issues Relevant to Cancer-Inducing Substances*, in REGULATORY ASPECTS OF CARCINOGENESIS AND FOOD ADDITIVES: THE DELANEY CLAUSE 93, 94 (F. Coulston ed. 1979). In 1986 FDA noted: "There is no indication that in 1958 Congress foresaw the likelihood that within less than thirty years after the Delaney Clause was enacted, science would have progressed so far as to be able to document the widespread presence of trace amounts of proven carcinogens in food." Listing of D&C Red No. 8 and D&C Red No. 9 for Use in Ingested Drug and Cosmetic Lip Products and Externally Applied Drugs and Cosmetics, 51 Fed. Reg. 43,877, 43,894 (1986).

stitute (NCI) scientist W.C. Hueper identified only four direct food additives, eight food colors, and three classes of chemical contaminants as potential targets.⁷⁸ Hueper stated:

It is unlikely. . . that many of the presently used additives and contaminants of foodstuffs, especially most of those of purely inorganic nature, unless they are radioactive or belong to the group of carcinogenic metals . . . introduce any carcinogenic hazard into the general food supply. . . .⁷⁹

The 1960s marked not only the advent of systematic testing of chemicals for carcinogenicity, but also the rapid increase in the number of intentional food additives in use. By 1966, the total number of direct additives approached 2,430.⁸⁰ The numbers of new additives approved each year fluctuated widely,⁸¹ however, and by the 1970s the increase had slowed to a trickle. During this period relatively few older direct additives were subjected to testing. In 1975, of the 540 chemicals under test in the NCI Carcinogenesis Program, only nine were food additives.⁸² But ninety-four were pesticides and agricultural chemicals, some of which might find their way into food. In 1976, the NCI program included fourteen food additives and eighty-five pesticides and related chemicals.⁸³ The National Research Council (NRC) Committee on Diet, Nutrition and Cancer, in a table entitled, "Some Food Additives and Contaminants Suspected or Proven to be Carcinogenic in Laboratory Animals," listed twenty-two intentional additives, of which twenty had been identified between 1974 and 1980. Suspect unintentional additives included eight single agents and seven chemical groups (organochlorine pesticides, polycyclic aromatic hydrocarbons, cycads, nitrosamines, tannins, pyrrolizidine alkaloids, and polychlorinated biphenyls (PCBs)).⁸⁴

While the proportion of food additives suspected to be carcinogenic in animals has not increased significantly, this finding is deceptive because relatively few additives have been thoroughly evaluated. A National Academy of Sciences (NAS) committee in 1984 reviewed a list of 8,627 chemi-

78. Hueper, *Potential Role of Non-Nutritive Food Additives and Contaminants as Environmental Carcinogens*, 62 A.M.A. ARCHIVES PATHOLOGY 218, 222-24 (1957).

79. *Id.* at 218.

80. Sanders, *Food Additives*, CHEMICAL & ENGINEERING NEWS, Oct. 10, 1966, at 107.

81. THE PRESIDENT'S SCIENCE ADVISORY COMM., NAT'L SCIENCE FOUND., CHEMICALS AND HEALTH REPORT OF THE PRESIDENT'S SCIENCE ADVISORY COMMITTEE 66 (1973).

82. DIVISION OF CANCER CAUSE AND PREVENTION, NAT'L CANCER INST., REPORT OF THE CARCINOGENESIS PROGRAM, FISCAL YEAR 1975, at 130.

83. DIVISION OF CANCER CAUSE AND PREVENTION, NAT'L CANCER INST., THE CARCINOGENESIS PROGRAM: FISCAL YEAR 1976, at 155.

84. See COMMITTEE ON DIET, NUTRITION, AND CANCER, *supra* note 11.

cals “regulated or classified by FDA . . . as direct food additives, indirect food additives, GRAS substances, colors, and flavors.” It found there was “no toxicity information available” for forty-six percent of the chemicals. Data sufficient for a complete risk evaluation were available only for five percent.⁸⁵

Moreover, the 8,000-plus food-use substances represented less than one-sixth of the rapidly expanding universe of chemicals to which humans are exposed. Within this larger universe, the number of chemicals identified as animal carcinogens appears to have grown more sharply: “When the Delaney amendment was adopted approximately twenty-five years ago, chemical carcinogens were considered rare in man’s environment. . . . The number of chemicals which have been shown to be carcinogenic in animals over the past decade has grown enormously and represents a wide spectrum of unrelated chemical structures.”⁸⁶ The Task Force on Environmental Cancer placed the estimate of carcinogens at “about 1,000 chemicals.”⁸⁷ The National Toxicology Program’s (NTP’s) First Annual Report on Carcinogens noted that of 34,000 chemicals listed as toxic by the National Institute for Occupational Safety and Health, 2,330 had “one or more unevaluated studies dealing with tumorigenicity.”⁸⁸

While the percentage of chemicals that display carcinogenicity is probably not large, increased testing has produced a steady increase in the total number of reported animal carcinogens. According to the 1975 report of NCI’s Carcinogenesis Program, eighty-six of the 540 chemicals under study in that year had been reported to have “carcinogenic activity.”⁸⁹ NTP, which absorbed the NCI bioassay program, had completed full evaluations of 252 chemicals by 1980.⁹⁰ NTP’s Second Annual Report included twenty-five human carcinogens and sixty-three additional substances drawn from a pool for which there were positive NCI bioassay findings.⁹¹ NTP’s Third Annual Report, issued in 1982, classified ninety-

85. STEERING COMM. ON IDENTIFICATION OF TOXIC AND POTENTIALLY TOXIC CHEMICALS FOR CONSIDERATION BY THE NAT’L TOXICOLOGY PROGRAM, NAT’L RESEARCH COUNCIL, NAT’L ACADEMY OF SCIENCES, TOXICITY TESTING: STRATEGIES TO DETERMINE NEEDS AND PRIORITIES 12 (1984).

86. Heuper, *supra* note 78, at 218.

87. TASK FORCE ON ENVIRONMENTAL CANCER AND LUNG DISEASE, FIRST ANNUAL REPORT TO CONGRESS: ENVIRONMENTAL POLLUTION AND CANCER AND HEART AND LUNG DISEASE 4 (1978).

88. PUBLIC HEALTH SERV., U.S. DEP’T OF HEALTH AND HUMAN SERVS., FIRST ANNUAL REPORT ON CARCINOGENS 3 n.4 (1980).

89. DIVISION OF CANCER CAUSE AND PREVENTION, NAT’L CANCER INST., REPORT OF THE CARCINOGENESIS PROGRAM: FISCAL YEAR 1975, at 59–60.

90. NATIONAL TOXICOLOGY PROGRAM, U.S. DEP’T OF HEALTH AND HUMAN SERVS., 1 NTP TECHNICAL BULLETIN No. 3, at 2 (1980).

91. PUBLIC HEALTH SERV., U.S. DEP’T OF HEALTH AND HUMAN SERVS., SECOND ANNUAL

five chemicals as “reasonably anticipated to be carcinogens,” based on limited human evidence or sufficient animal bioassay evidence.⁹² The following year’s report expanded the “official list” by thirty-one chemicals, for a total of 148, including 119 substances in the “reasonably anticipated to be carcinogens” group.⁹³

As Bruce Ames has pointed out:

Out of about 200 chemicals tested by NCI in eight years, 60 percent were judged carcinogenic, 33 percent noncarcinogenic, and 7 percent inadequately tested. The high percentage of carcinogens found is somewhat disturbing, as the conventional wisdom is that carcinogens are very rare. This discrepancy could be accounted for by the fact that more suspicious chemicals are being tested. It could also be that carcinogens are more common than we think. We have no idea of what the true percentage of carcinogens is among chemicals in general (including natural ones) when tested at the maximum tolerated dose in rodents. Even if it is 10 percent, our current regulatory policies, which assume carcinogens are rare, are in trouble.⁹⁴

3. *Shifting Focus from Man-Made to Natural Dietary Constituents*

Both the structure and the language of the FD&C Act betray a bias in favor of home-prepared products of American agriculture and a suspicion of “artificial” ingredients. The Food Additives Amendment embodies this prejudice, excluding from its coverage substances “generally recognized as safe” based on their prior use in food while requiring premarket proof of safety for most chemical additives. Scientific debate during the 1950s reinforced this dichotomy, focusing suspicion on a relatively small number of foreign chemicals and, if only by silence, exonerating basic constituents of the food supply.

By the 1970s, the dialogue between researchers and public health officials had changed dramatically. Sir Richard Doll and Richard Peto estimated that nearly one-third of all cancers are diet-related, but attributed no more than one percent to chemical additives in food (including pesticides). Bruce Ames continued to report the results of research identifying carcinogens naturally present in food, arguing that regulation of carcino-

REPORT ON CARCINOGENS (1981).

92. PUBLIC HEALTH SERV., U.S. DEP’T OF HEALTH AND HUMAN SERVS., THIRD ANNUAL REPORT ON CARCINOGENS (1982).

93. PUBLIC HEALTH SERV., U.S. DEP’T OF HEALTH AND HUMAN SERVS., FOURTH ANNUAL REPORT ON CARCINOGENS (1985).

94. Letter from Bruce Ames in *Letters: Cancer and Diet*, 224 SCIENCE 658, 668 (1984).

genic risks has been mistakenly preoccupied with man-made chemicals.⁹⁵ In the face of this consensus, it is not surprising that FDA officials should have become uncomfortable with legal interpretations that dictated automatic banning of trace chemicals and ingredients shown to be carcinogenic in animal bioassays. Hueper's 1957 article identifying direct carcinogenic food additives, colorants, and chemical contaminants mentioned only a few potential "natural" carcinogens. By 1961, however, his list of potential carcinogens included seventeen direct food additives and nineteen food dyes, as well as a number of indirect additives, pesticides, and other environmental pollutants. He included tannic acid, which occurs naturally in some food substances, and "thermic and oxidation products of oils and fats," while noting that the evidence for heated fats was "equivocal and contradictory."⁹⁶ Hueper observed that smoking meat and fish, and processes such as roasting and baking which char food, may all produce "3-4-Benzopyrene," a known carcinogen.⁹⁷ Despite the increasing interest in naturally occurring carcinogenic substances, however, synthetic chemicals dominated Heuper's roster of dietary carcinogens.

Widespread study of the natural occurrence of carcinogens in food did not begin until the 1970s.⁹⁸ By 1982, when the NRC Committee on Diet, Nutrition, and Cancer surveyed the literature, numerous mutagenic and carcinogenic substances in the American diet had been identified. Aflatoxins, a mold product widely present on corn and peanuts, and other mycotoxins have demonstrated carcinogenicity in animals.⁹⁹ A wide variety of plant constituents have demonstrated mutagenic and carcinogenic activity. A number of naturally occurring estrogenic compounds have been identified in palm kernels, clover, and legumes such as soybeans. Another animal carcinogen, ethyl carbamate, or urethan, occurs naturally at low concentrations in fermented foods and beverages.¹⁰⁰ In this country, most of the nitrate and perhaps twenty percent of the nitrite ingested comes from vegetables. The risk from these chemicals derives from their role in the formation of N-nitroso compounds (e.g., nitrosamines), which are potent carcinogens.

The development of in vitro tests for mutagenicity by Ames and others in the 1970s led to the identification of entire new classes of potentially carcinogenic food constituents.¹⁰¹ In 1977, Nagao (with Sugimura) discov-

95. Ames, Magaw, & Gold, *Ranking Possible Carcinogenic Hazards*, 236 SCIENCE 271 (1987).

96. Hueper, *Carcinogens in the Human Environment* (pt. 2), 71 A.M.A. ARCHIVES PATHOLOGY 355, 358-362 (1961).

97. *Id.* at 369.

98. See COMMITTEE ON DIET, NUTRITION AND CANCER, *supra* note 11.

99. *Id.* ch. 12, at 6 (Table 12-1).

100. *Id.* ch. 12, at 18.

101. Sugimura, Sato, Ohgaki, Takayama, Nagao & Wakabayashi, *Overview: Mutagens and Car-*

ered that charred surfaces of broiled fish and meat had mutagenic activity equivalent to 500 times the amount of benzopyrene reported in a charcoal broiled steak.¹⁰² That same year, scientists discovered that pyrolysis (breakdown by heat) of nearly all the amino acids tested produced mutagenic activity. Studies in 1980 and 1981 showed the presence of mutagens derived from the pyrolysis of proteins in broiled beef, cuttlefish, chicken, sardines, and grilled onions.¹⁰³ Five studies showed that the mutagens derived from heating food proteins or amino acids produced cancer in laboratory animals.¹⁰⁴ Research was not only directed at heat-formed mutagens but also at mutagens which are present naturally in plants, such as flavonoids. Thought to contribute to the mutagenic activity of a number of foods, flavonoids are found naturally in coffee, grape juice, raisins, onions, red wine, whiskeys, brandies, and black, green, and roasted tea.¹⁰⁵

In a 1983 *Science* article, Bruce Ames examined the risks from natural dietary carcinogens.¹⁰⁶ He began with the assertion, "Despite numerous suggestions to the contrary, there is no convincing evidence of any generalized increase in U.S. (or U.K.) cancer rates other than what could plausibly be ascribed to the delayed effects of previous increases in tobacco usage."¹⁰⁷ He claimed that the chief causes of cancer were more likely to be found not in comparatively recent industrial activity but in longstanding lifestyle patterns, including, prominently, diet. Ames emphasized that our dietary exposure to some naturally occurring teratogens, mutagens, and carcinogens was very large, but our knowledge of their effects was still meager. He contrasted the huge body of toxicologic information regarding synthetic agents to which our exposure is very low.¹⁰⁸ Naming alcohol, mold products, and nitrite, nitrate, and nitrosamines, Ames concluded, "There are large numbers of mutagens and carcinogens in every meal, all perfectly natural and traditional."¹⁰⁹

cinogens in Cooked Food, 206 PROGRESS IN CLINICAL AND BIOLOGICAL RES. 85, 85 (1986) [hereinafter Sugimura].

102. *Id.* at 85; see also COMMITTEE ON DIET, NUTRITION AND CANCER, *supra* note 11, ch. 13, at 3.

103. COMMITTEE ON DIET, NUTRITION AND CANCER, *supra* note 11, ch. 13, at 4-6.

104. *Id.* ch. 13, at 8.

105. *Id.* ch. 13, at 10-12.

106. Ames, *Dietary Carcinogens and Anticarcinogens*, 221 SCIENCE 1256 (1983).

107. *Id.* at 1256.

108. *Id.* at 1257-68.

109. *Id.* at 1261. Ames's article elicited vehement response. Samuel Epstein and several co-signatories challenged Ames's statement about cancer trends, his minimization of the risks of synthetic chemicals, and his overstatement of dietary risks. See *Letters: Cancer and Diet*, 224 SCIENCE 658 (1984). Ames rejoined that large numbers of mutagens had been identified in cooked food and in plants and molds, and that some had been shown to be carcinogenic in bioassays. *Id.* at 668, 670. He later stated, "we are ingesting enormously more in both number and amount of natural pesticides and other natural toxic molecules (and traditional mixtures such as cooked food) than we are of man-made substances." *Id.* at 758.

In the years since the NRC report and Ames's original article, scientists have continued to investigate naturally occurring mutagens and carcinogens in food. All of the mutagens discovered in broiled meat and tested in bioassays as of 1986 proved carcinogenic.¹¹⁰ An additional class of mutagens, the nitropyrenes, were identified in grilled chicken and found to be carcinogenic in animals. Researchers discovered that soy sauce and Chinese cabbage became mutagenic after treatment with nitrite.¹¹¹ Investigators calculated that human dietary exposure to these compounds was greater than exposure from previously recognized sources such as inhalation of diesel exhaust.¹¹² While some scientists recognized as early as the 1950s that carcinogens might be naturally present in foods or occur naturally during food preparation, investigation of these phenomena did not begin in earnest until the 1970s. Scientists have begun to define the dimensions of this "natural" dietary risk only within the past five years. The number of known or potential naturally occurring carcinogens is still increasing. The risk they pose may approach and perhaps far surpass that from man-made chemicals.

C. *Administrative Escapes from the Delaney Clause*

When administrators conclude that a legislative mandate no longer makes sense they can be expected to respond in one of two ways: They may circumscribe the cases to which the mandate applies, or they may attempt to reinterpret the mandate. FDA Commissioners have done both.

1. *"Added" Food Constituents v. "Food Additives"*

One of the most significant "exceptions" to the Delaney Clause that FDA has crafted derives from the Agency's interpretation of two other provisions of the FD&C Act.¹¹³ Since its enactment in 1938 the Act has applied a more tolerant standard to foods that naturally contain hazardous materials than to foods containing "added" toxicants. The 1938 statute singled out for rigorous control—primarily through seizure of "adulterated" products—foods that might be injurious to consumers because they contained any "added poisonous or deleterious" substance, without defining what "added" meant. Foods containing "non-added" poisons whose consumption in excessive amounts or without proper precautions might be

110. Sugimura, *supra* note 101, at 85, 88-89.

111. Nagao, Wakabayashi, Fujita, Tahira, Ochiai & Sugimura, *Mutagenic Compounds in Soy Sauce, Chinese Cabbage, Coffee and Herbal Teas*, 206 PROGRESS IN CLINICAL & BIOLOGICAL RES. 55, 56-57 (1986).

112. Sugimura, *supra* note 101, at 94-96.

113. See Merrill & Schewel, *FDA Regulation of Environmental Contaminants of Food*, 66 VA. L. REV. 1357 (1980).

hazardous could only be seized if FDA proved them "ordinarily injurious" to consumers.¹¹⁴

This dichotomy recognized that many agricultural commodities require care in preparation or ingestion; it focused, therefore, on "added" hazards that growers or manufacturers could control. Later amendments to the food safety provisions of the FD&C Act have dealt with various categories of "added" constituents, such as pesticide residues, food and color additives, and animal drug residues. Each amendment has converted a prosecutory system of control into a licensing regime.¹¹⁵ However, these licensing requirements did not cover all potentially hazardous substances whose presence in food could be ascribed to human activity. Notably, Congress created no premarket approval system for industrial contaminants of food.¹¹⁶

The Act did not specify whether such materials should be regulated under the rigorous "added" constituents standard or under the looser "ordinarily injurious" standard.¹¹⁷ FDA preferred the former because it could set tolerance levels for such materials and because, even if it chose not to, proving adulteration would be easier. Use of the power to set tolerances would enable the Agency to pressure growers and producers to take greater precautions to limit contamination.¹¹⁸

In 1974 FDA promulgated regulations in which it asserted that food contaminants as a class were "added" constituents.¹¹⁹ Ironically, this approach provided FDA with potentially too powerful a weapon, for the Act's expansive food additive definition, coupled with the Delaney Clause, threatened to make any food contaminated by a carcinogenic industrial chemical "adulterated."¹²⁰ By the 1970s, for example, industrial users of PCBs would have been hard pressed to argue that they could not "reason-

114. Merrill, *supra* note 19, at 186-89.

115. Merrill & Taylor, *supra* note 10, at 14.

116. That is, substances introduced by human activity into the environment which find their way into food through "natural" processes, such as water pollution.

117. Merrill & Schewel, *supra* note 113, at 1365-82.

118. *Id.* at 1370-73.

119. Department of Health, Educ., & Welfare, Food & Drug Admin.: Poisonous or Deleterious Substances in Food, 39 Fed. Reg. 42743 (1974).

120. See 21 U.S.C. § 321(s) (1982), which reads in part:

(s) The term "food additive" means any substance the intended use of which results or may reasonably be expected to result, directly or indirectly, in its becoming a component or otherwise affecting the characteristics of any food (including any substance intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting, or holding food; and including any source of radiation intended for any such use), if such substance is not generally recognized, among experts qualified by scientific training and experience to evaluate its safety, as having been adequately shown through scientific procedures (or, in the case of a substance used in food prior to January 1, 1958, through either scientific procedures or experience based on common use in food) to be safe under the conditions of its intended use. . . .

ably expect” some PCBs to get into waterways and hence into food.¹²¹ And since PCBs are carcinogenic, all contaminated fish would be “adulterated,” and all shipments of PCBs for uses that might pollute streams would be subject to regulatory action as “unsafe” food additives.¹²² FDA escaped this ineluctable if bizarre result by concluding that such contaminants could not be food additives because they performed no functional purpose in food.¹²³ Congress, the Agency reasoned, could not have meant to bring within the “food additive” category substances which could not possibly meet the standard for approval.¹²⁴

Another substance that FDA wished to regulate as “added,” but not as a “food additive,” was aflatoxins, potent animal carcinogens that probably cause human liver cancer. FDA had no difficulty concluding that aflatoxins in raw peanuts were not “food additives” because they could not be characterized as having any intended use.¹²⁵ But it was more difficult to explain why aflatoxin-contaminated peanuts, when combined with other ingredients in peanut butter, were not “food additives” which, because they contained a carcinogen, were barred by the Delaney Clause.¹²⁶ It is not surprising, then, that FDA has never announced, much less attempted to explain, its position that tainted peanuts are not unsafe “food additives.”¹²⁷

2. “Carcinogens” That Do Not “Induce Cancer”

At the same time it was devising its legal theory for regulating environmental contaminants of food, FDA was also facing a petition for an additive to animal feed that presented awkward questions under the Delaney Clause. The petition sought approval, under the Food Additives Amendment, for the marketing of a selenium-enriched feed premix for livestock. It is important to note that the Act’s definition of “food” includes food

121. Cf. *Natick Paperboard Corp. v. Weinberger*, 525 F.2d 1103 (1st Cir. 1975).

122. *Merrill & Schewel*, *supra* note 113, at 1415-23.

123. See Department of Health, Educ., & Welfare: *Poisonous or Deleterious Substances in Food and Food Packing Material*, 39 Fed. Reg. 42,746, 42,747-48 (1974); *Merrill & Schewel*, *supra* note 113, at 1360-70.

124. Department of Health, Educ., & Welfare: *Poisonous or Deleterious Substances in Food and Food Packing Material*, 39 Fed. Reg. 42,746, 42,747-48 (1974).

125. *Aflatoxins in Shelled Peanuts and Peanut Products Used in Human Foods: Proposed Tolerance*, 39 Fed. Reg. 42,751, 42,751 (1974). Indeed, one could have said that they were not “added” by human agency but simply developed through natural processes. This characterization, however, would have defeated FDA’s goal of setting aflatoxin tolerances and thereby applying pressure on producers to control their occurrence.

126. *Merrill, Regulations of Toxic Chemicals* (Book Review), 58 TEX. L. REV. 463, 477-78 (1980).

127. See *Community Nutrition Inst. v. Young*, 106 S.Ct. 2360 (1986).

consumed by animals,¹²⁸ and that for many years FDA has reviewed petitions for approval of feed additives for livestock.¹²⁹

In a 1973 proposal,¹³⁰ FDA ruled that the Delaney Clause did not bar the approval of selenium as an additive to livestock feed because “[t]he anticancer clauses do not apply in the case of an agent that (1) occurs naturally in practically all foods, (2) is used in a manner such that its natural level in food is not increased, (3) has a definite hepatotoxic effect/no-effect level, and (4) has a possible carcinogenic effect which is associated only with the hepatotoxic effect.”¹³¹ The Agency cited evidence of selenium’s widespread, albeit varying, natural occurrence in foods such as corn, as well as evidence that selenium is “essential for normal growth and metabolism in [many species of] animals.”¹³²

FDA recognized, however, that selenium’s link to cancer in laboratory animals raised concerns about its safety for humans who consumed food derived from livestock to whose feed it was added. The Agency solved this dilemma by positing that the animals would excrete any selenium that they did not require for basic nutrition. Thus, the addition of selenium to livestock feed would not be expected to increase the levels to which humans were exposed naturally.¹³³ Turning to selenium’s liver toxicity and apparent carcinogenicity, the Agency found that the experimental evidence clearly demonstrated a “no-effect” level for selenium’s hepatotoxicity; below dietary levels of 0.5 ppm no animals displayed liver damage.¹³⁴ The levels of selenium supplementation proposed were well below this “no-effect” level. Furthermore, FDA reported, NCI scientists agreed with its conclusion that liver tumors did not occur in test animals that did not receive doses of selenium high enough to produce cirrhosis.¹³⁵ The carcinogenic effect was thus “secondary” to selenium’s conventional toxicity—a toxicity that occurred only at levels much higher than those for which the petition sought approval.¹³⁶

128. 21 U.S.C. § 321(f) (1982).

129. The Delaney Clause applies to feed additives, but with a significant caveat enacted in 1962. This caveat is central to the next episode in our chronicle, but FDA did not rely on it in approving the petition for selenium—a substance associated with tumor induction in three different animal studies. See R. MERRILL & P. HUTT, *FOOD AND DRUG LAW: CASES AND MATERIALS* 477-78, 484 (1980).

130. Selenium in Animal Feed, Proposed Additive Regulation, 38 Fed. Reg. 10,458 (1973).

131. *Id.* at 10,460.

132. *Id.* at 10,458.

133. *Id.* at 10,459.

134. *Id.* at 10,460.

135. *Id.* at 10,459. This discussion could presage the creation of another significant “exception” to the Clause if scientists confirm their speculations that some non-genotoxic carcinogens will display “no-effect” levels.

136. FDA took the opportunity to enlarge on its narrow ruling that selenium could be approved, the Delaney Clause notwithstanding, by offering an analogy to beverage alcohol. It noted that heavy

FDA's proposal concluded with a discussion of Congress's rationale for enacting the Delaney Clause.¹³⁷ The Clause was predicated on the principle that not even a single molecule of a carcinogen should be allowed in human food because scientists did not fully understand the mechanisms of carcinogenesis. FDA conceded that in the case of "primary" carcinogens this ignorance persisted. But, it continued, if a substance is found to promote cancer only through its dose-dependent primary toxic effects, the substance poses no risk of cancer so long as its "no-effect" level is not exceeded.¹³⁸

The selenium decision marked the first time that FDA had knowingly approved the intentional addition of an animal carcinogen to food in the face of the Delaney Clause. At the time, however, the ruling did not excite much interest.¹³⁹

3. Elusive Residues of Carcinogenic Animal Drugs and Feed Additives

The next episode in FDA's efforts to make sense of the Delaney Clause also took place in the early 1970s. The Agency's reasoning is notable both for its sophistication and for its portent: FDA's methodology underpins all of its subsequent efforts to limit the Delaney Clause.

To understand what has come to be called FDA's "sensitivity of method" doctrine, we must advert briefly to the original language of the 1958 Delaney Clause. That language appeared flatly to prohibit FDA approval of any carcinogenic additive to human food or to animal feed. The definition of "food additive," however, excluded substances whose use in food had been previously sanctioned by FDA or the Department of Agriculture.¹⁴⁰ Prior to the 1958 enactment of the Food Additives Amendment, FDA had approved the marketing of a number of agents designed

consumption of beverage alcohol by humans is associated with cirrhosis of the liver, which in turn is associated with an increased incidence of liver cancer. The Agency asserted that beverage alcohol (undeniably a "food additive") and other food constituents with similar effects "are not by reason of their capacity to induce liver damage when abused by being consumed at high levels, properly classified as carcinogenic because of their potential association with a higher rate of liver cancer." *Id.* at 10,460.

137. *Id.*

138. *Id.*

139. No formal objections to the proposal were ever filed, no lawsuit was brought, and no Congressional hearings ensued. Nor was the decision or its rationale criticized within the communities that have challenged FDA's de minimis interpretation of the Delaney Clause. The fact that the initial "consumers" of selenium would be livestock and not humans might have muffled opposition; or perhaps critics recognized that denial of the petition would leave FDA in the anomalous position of refusing to allow the addition of selenium to feeds grown in selenium-deficient regions while permitting it in areas where crops naturally contained amounts sufficient to support robust livestock growth. Even FDA's gratuitous analogy to beverage alcohol failed to provoke comment.

140. 21 U.S.C. § 321(s)(4) (1982).

to promote livestock growth, including diethylstilbestrol (DES).¹⁴¹ Even then it was recognized that DES caused cancer in animals, and by 1960 suspicions were growing that it might cause cancer in humans as well.¹⁴²

FDA's pre-1958 approvals for DES were predicated on the assumption that no measurable amount of the material remained in human food derived from the treated livestock. But the 1958 Delaney Clause contained no language that confined its prohibition to carcinogens added to human food. And even then some FDA scientists doubted that the Agency could assure that none of the DES administered by implantation would not make its way into, thereby "becoming a component of," human food. Accordingly, after the Food Additives Amendment's passage, FDA abruptly stopped approving new petitions for the marketing of DES as a livestock growth promotant. This action did not curtail DES use; it simply confined purchasers to suppliers who had obtained approval prior to 1958 and whose products were therefore not subject to the new Delaney Clause.¹⁴³

In 1962 Congress amended the original 1958 language by adding the so-called "DES proviso."¹⁴⁴ The amendment was designed to allow all makers of DES and similar products to compete on an equal footing, subject to whatever restrictions FDA found necessary to assure the safety of human food. The proviso stipulates that the Delaney Clause does not bar approval of a carcinogenic animal drug or feed additive if FDA concludes that, when the substance is used as directed, "no residue of the additive will be found" in human food derived from treated animals, by the Agency's specified method of chemical analysis.¹⁴⁵ The language triggered a decade-long effort within FDA to devise criteria for analytical methods for carcinogenic veterinary drugs and feed additives.¹⁴⁶

141. DES typically was administered either by implantation in the animal or as an addition to its feed. Address by Richard Kingham, Course on Food and Drug Law for FDA Scientists at Univ. of Va. Sch. of Law (Aug. 18, 1978); see also R. MERRILL & P. HUTT, *supra* note 129, at 484.

142. The drug has occasioned much litigation, including one ground-breaking decision. See *Sindell v. Abbott Laboratories*, 26 Cal. 3d 588, 607 P.2d 924, 163 Cal. Rptr. 132 (1980). One of the best accounts of the early steps in the discovery of DES's carcinogenicity for humans is M. SHAP, *A NATION OF GUINEA PIGS* 163-90 (1979).

143. See R. Kingham, *Statutory and Administrative Theories by which FDA Avoids Applying the Delaney Clause*, November 10, 1977 (unpublished manuscript on file with author); see also R. MERRILL AND P. HUTT, *supra* note 129.

144. Drug Amendments of 1962 § 104(f), 21 U.S.C. §§ 348(c), 376(b) (1982).

145. 21 U.S.C. §§ 348(c)(3)(A), 376(b)(5)(B) (1982).

146. See Cooper, *supra* note 45, at 12. At first the Agency embraced whatever seemed to be the most powerful method available for a substance, subject to the important qualification that it be rapid and inexpensive enough for use by governmental laboratories. But methods for different compounds varied widely in their capacity to find trace residues. Furthermore, chemists were continually developing more powerful methods, which made a policy that demanded the "best available" method a recipe for constant revision of the terms of approval—and use—of veterinary drugs and feed additives. Accordingly, by 1970, FDA generally demanded that the proponent of any carcinogenic drug or feed additive supply a practicable method of analysis capable of measuring residues at the two parts per billion (ppb) level. *Id.*

By 1973, amidst mounting controversy,¹⁴⁷ FDA officials concluded that its early approaches to prescribing methods for “finding” residues in human food could not be justified. Continual improvements in chemical analysis made a “best available” requirement inherently unstable. A uniform standard for all animal drugs failed to take account of differences in carcinogenic potency. The “overlooked” residue of one drug might pose virtually no human risk of cancer, while the same quantity of another drug might raise serious health concerns.

The emergence of quantitative risk assessment for carcinogens persuaded FDA officials that it was possible to distinguish significant differences in risk. They also realized that an assay’s failure to detect a toxicant in a medium does not mean that none is present, only that none is detectable at the limit of measurement of the method used.¹⁴⁸ Each new method of analysis seemed to find residues that had previously escaped detection,¹⁴⁹ suggesting that administration of any drug to livestock was almost

147. See *Regulation of Diethylstilbestrol (D.E.S.) (Its Use as a Drug for Humans and in Animal Feeds) (Parts 1-3): Hearings Before a Subcomm. of the Comm. on Gov't Operations, 92d Cong., 1st Sess. (1971), 2d Sess. (1972); Hess & Clark, Div. of Rhodia, Inc. v. FDA, 495 F.2d 975 (D.C. Cir. 1974).*

148. Chemical Compounds in Food Producing Animals, 42 Fed. Reg. 10,412, 10,413 (1977).

149. A brief account of this history appears in Hess & Clark, Div. of Rhodia, Inc. v. FDA, 495 F.2d 975 (D.C. Cir. 1974), which was a successful challenge to FDA’s first effort to withdraw approval for the use of DES in cattle and swine.

Prior to 1971, the animal drug DES, used as a growth-promoting feed additive, could not be detected in beef liver if discontinued forty-eight hours before slaughter. However, new assay methods in 1971 found DES residues in liver, and FDA extended the withdrawal period to seven days. See *Diethylstilbestrol: Extension of Withdrawal Period*, 36 Fed. Reg. 23,292 (1971). By mid-1972, more DES residues were being detected with the new methods despite the withdrawal period. FDA announced it was considering withdrawal of all DES use in feed. See *Elanco Products Co. et al., Diethylstilbestrol; Notice of Opportunity for Hearing on Proposal to Withdraw Approval of New Animal Drug Applications*, 37 Fed. Reg. 12,251 (1972). The Agency then discovered that DES, even used according to regulations, left residues which persisted for at least seven days after the drug was stopped. Furthermore, it was doubtful that any existing assay was sensitive enough to detect the residues present. See *Diethylstilbestrol: Order Denying Hearing and Withdrawing Approval of New Animal Drug Applications for Liquid and Dry Premixes, and Deferring Ruling on Implants*, 37 Fed. Reg. 15,747 (1972). FDA therefore ultimately revoked the regulations governing DES in animal feed. See *Diethylstilbestrol: Revocation of All Provisions for Use in Animal Feed*, 37 Fed. Reg. 26,307 (1972).

DES was also given to animals in the form of implants which slowly released the drug. New studies with radiolabeled DES showed that low levels of the drug were detectable even 120 days after implantation, and cast similar doubts on the sensitivity of current assays. FDA consequently withdrew approval for all New Animal Drug Applications (NADAs) for DES implants. See *Diethylstilbestrol; Order Denying a Hearing and Withdrawing Approval of New Animal Drug Applications for Diethylstilbestrol Implants*, 38 Fed. Reg. 10,485 (1973). It revoked the controlling regulations, including those which specified assay methods. See *Diethylstilbestrol Implants; Revocation for Use Alone or in Combination With Testosterone*, 38 Fed. Reg. 10,926 (1973). Some manufacturers challenged FDA’s revocation of NADAs and the controlling regulations in court. The Agency denied additional hearing requests which followed a motion to stay the revocation. See *Diethylstilbestrol: Order Denying Hearing to Vineland Laboratories, Inc., and Hess & Clark*, 38 Fed. Reg. 29,510 (1973). The court then vacated FDA’s orders and remanded the case to the Agency for further action. *Hess & Clark, Div. of Rhodia, Inc. v. FDA, 495 F.2d 975 (D.C. Cir. 1974)*. The court directed FDA to address the factual issues concerning relevance of its radioactive tracer studies to commercial use of DES and its safety,

certain to leave some residues even though they might be, for a time, below the limits of detection. FDA officials decided in 1973 to cut through this conundrum and fashion a policy whose general requirements would apply to all carcinogenic animal drugs and feed additives, but whose specific demands would be calibrated to the risks posed by individual compounds.¹⁵⁰ To do this, the Agency had to grapple with the meaning of the 1962 amendment. FDA rejected the suggestion that Congress had meant to preclude approval of any carcinogenic drug whose residues might find their way into human food. Adoption of this interpretation, it concluded, would nullify the 1962 amendment, which was clearly intended to facilitate marketing of growth-promoting agents for use in livestock production so long as consumers were protected.¹⁵¹ The Agency explained its abandonment of its earlier policies of demanding the “best available” method and later insisting on a detection capability of two ppm for all drugs—which ignored differences in potency.¹⁵²

FDA then articulated what has become its general approach to regulating carcinogenic residues of animal drugs and feed additives, even though the underlying regulations have never been adopted.¹⁵³ In a sentence, the Agency said that it would interpret the “no residue will be found” language as allowing approval of any carcinogenic compound whose sponsor provides an analytical method capable of detecting residues that could pose a “significant” human cancer risk. The Agency initially proposed that any lifetime risk of greater than one in one hundred million should be considered significant.¹⁵⁴ The required analytic sensitivity was to be

id. at 994, and FDA subsequently reinstated the approvals for DES. *See* Diethylstilbestrol For Use in Cattle and Sheep: Notice to Holders of New Animal Drug Applications, 39 Fed. Reg. 11,323 (1974). It also immediately proposed revocation of the currently approved assay methods. *See* Diethylstilbestrol (DES) in Edible Tissues of Cattle and Sheep: Proposal to Revoke Test Methods for Determination of Residue Levels, 39 Fed. Reg. 11,299 (1974). Eventually, in 1979, FDA revoked NADAs for DES given in feed or by implant, citing the insufficiency of all current analytical methods and invoking the Delaney Clause. *See* Chemical Compounds in Food-Producing Animals: Criteria and Procedures for Evaluating Assays for Carcinogenic Residues, 44 Fed. Reg. 17,070 (1979).

150. Compounds Used in Food Producing Animals, 38 Fed. Reg. 19,226 (1973).

151. Food Producing Animals: Criteria and Procedures for Evaluating Assays for Carcinogenic Residues, 42 Fed. Reg. 10,412, 10,413 (1977).

152. FDA discussed the advantages and disadvantages of prescribing a fixed limit of detection methodology for all carcinogenic drugs, a “practical zero.” This approach “would provide a well-defined criterion for the lowest limit of measurement that any petitioner’s assay would have to satisfy,” but it would not “take into account differences in carcinogenic potency among carcinogens,” and it would be increasingly vulnerable to improvements in analytic capability that would undermine the premise that no residues were allowed. *Id.* at 10,419.

153. Sponsored Compounds in Food-Producing Animals; Criteria and Procedures for Evaluating the Safety of Carcinogenic Residues, 50 Fed. Reg. 45,530, 45,530 (1985).

154. Compounds Used in Food-Producing Animals: Procedures for Determining Acceptability of Assay Methods Used for Assuring the Absence of Residues in Edible Products of Such Animals, 38 Fed. Reg. 19,226, 19,227 (1973). FDA in its 1977 promulgation asserted that the one in 100 million risk level could be downgraded to one in one million with no significant compromise of public health. Food Producing Animals: Criteria and Procedures for Evaluating Assays for Carcinogenic Residues,

determined by extrapolation from animal test results demonstrating carcinogenicity to estimate the residue level whose human consumption could entail any larger risk. Accordingly, if a drug's sponsor could provide FDA a method capable of detecting such residues, the drug could, consistently with the Delaney Clause, be approved.

While FDA's reasoning was elaborately complex, the effect of its policy is summarized simply. FDA was (and is) prepared to ignore residues of carcinogenic drugs and feed additives in human food that the approved method could not detect. The Agency conceded that this policy would allow the intentional addition of animal carcinogens to the human food supply—albeit only in quantities posing very small cancer risks. This policy was explained in terms of the special proviso that Congress had enacted in 1962. FDA did not purport in 1973 to articulate a general approach to the regulation of trace carcinogens in human food.

The “sensitivity of method” (SOM) policy has not been tested in court. FDA's 1977 regulation, based on the 1973 proposal, was overturned on review, but on the ground that the Agency had failed to allow opportunity for comment on changes it had incorporated.¹⁵⁵ FDA has twice since published revised proposals designed to simplify the regulations, adjust the criterion of “significant” risk, and moderate its demands for data from drug sponsors.¹⁵⁶ While never formally upheld, however, FDA's SOM doctrine has gained support as a scientifically sensible and legally plausible rendering of the ambiguous instructions that Congress provided in 1962.¹⁵⁷ As we shall see, FDA's adoption of quantitative risk assessment to reconcile the Delaney Clause with the DES proviso has presaged its approach to other classes of carcinogenic compounds.

4. *The Attempt to Ban Saccharin*

No chronicle of FDA's implementation of the Delaney Clause would be complete without examining its abortive 1977 effort to ban saccharin—the last occasion it sought to enforce the Clause. A detailed account of this

42 Fed. Reg. 10,412, 10,421 (1977).

155. *Animal Health Inst. v. FDA*, [1977-1978 Transfer Binder] Food Drug Cosm. L. Rep. (CCH) ¶ 38,154 (D.D.C. 1978).

156. See *Chemical Compounds in Food Producing Animals: Criteria and Procedures for Evaluating Assays for Carcinogenic Residues*, 44 Fed. Reg. 17,070 (1979); *Sponsored Compounds in Food-Producing Animals; Criteria and Procedures for Evaluating the Safety of Carcinogenic Residues*, 50 Fed. Reg. 45,530 (1985).

157. EPA has applied the doctrine to approve pesticide residues on processed crop byproducts that are used for animal feed. See *REGULATING PESTICIDES*, *supra* note 31, at 220-24; *Thiodicarb: Proposed Tolerances*, 50 Fed. Reg. 27,452 (1985).

episode is available elsewhere,¹⁵⁸ a brief summary will reveal its key lessons.

In April, 1977, FDA proposed to withdraw approval for the use of saccharin in all foods, including artificially sweetened soft drinks, and in ingested cosmetics and drugs as well.¹⁵⁹ The Agency said it would entertain new drug applications for table-top sweetening products made of saccharin, provided they were accompanied by clinical evidence that the products were effective in weight control. This announcement was based on the results of a series of animal experiments, culminating in a Canadian government study which demonstrated that saccharin induced malignant tumors in second-generation male rats. As the legal basis for its proposal, FDA invoked both the Delaney Clause and the Food Additives Amendment's "general safety clause."

FDA's proposal triggered protests from consumers, legislators, clinicians who treated juvenile diabetics, and manufacturers of saccharin-sweetened foods. Congress acted quickly to prevent implementation of the ban,¹⁶⁰ directing FDA to commission studies by NAS and amending the FD&C Act to foreclose for two years any FDA action based on the existing animal test to ban or restrict use of saccharin.¹⁶¹ The Saccharin Ban Moratorium provisions have been reenacted four times.¹⁶²

Though they foresaw opposition from several quarters, FDA officials were surprised by its intensity and had not seriously explored interpretations of the statute that might have allowed them to avoid a ban of saccharin. To be sure, none of the escape routes the Agency had previously charted (or later devised) appeared plausible. Saccharin was unequivocally a "food additive" in the Agency's view because only five years earlier it had promulgated what it termed an "interim food additive regulation" to confirm the legality of saccharin use while further tests were underway.¹⁶³ The Canadian study appeared to confirm that it was pure

158. See Merrill & Taylor, *supra* note 10.

159. Saccharin and Its Salts: Proposed Rule Making, 42 Fed. Reg. 19,996 (1977).

160. Saccharin Study and Labeling Act, Pub. L. No. 95-203, 91 Stat. 1451 (1977).

161. The first study was to assess: (1) the "current technical capabilities" to predict human risk from food additives which were animal carcinogens; (2) the risks and benefits of foods which contain toxins or carcinogens, the means of risk/benefit evaluation and the statutory authority for balancing those factors; (3) instances where restrictions are inappropriate, considering the risk/benefit balance; and (4) the relationship between Federal policies for regulating food and those for regulating deleterious substances with non-food uses. The second study was to determine "the chemical identity of any impurities" in saccharin, potential human risk from any impurities, and the health benefits associated with nonnutritive sweeteners, particularly saccharin. *Id.* at 1451; see also NATIONAL ACADEMY OF SCIENCES, SACCHARIN: TECHNICAL ASSESSMENT OF RISKS AND BENEFITS, PART 1 (1978); NATIONAL ACADEMY OF SCIENCES, FOOD SAFETY POLICY: SCIENTIFIC AND SOCIETAL CONSIDERATIONS (1979).

162. See Merrill & Taylor, *supra* note 10, at 58.

163. Saccharin and Its Salts: Removal From Generally Recognized as Safe List; Provisional Reg-

saccharin, not some contaminant, that caused tumors in male rats.¹⁶⁴ The SOM theory did not fit, for saccharin was ingested directly by humans. Furthermore, the estimated cancer risk attributable to saccharin consumption (roughly one in ten thousand¹⁶⁵) was measurably higher than the figure FDA had only recently embraced as the threshold of “significance.”¹⁶⁶ Even if agency officials had anticipated the possibility, the *de minimis* doctrine could not have saved saccharin.

In short, by 1977 FDA officials believed that they had exhausted every available excuse for not enforcing the Delaney Clause, including the claim that more time was needed to complete and analyze studies of saccharin’s effects, a claim which had sustained the ingredient for nearly a decade. FDA’s proposed ban of saccharin can therefore be viewed as the reluctant action of an agency that had already come to question the wisdom of the Delaney Clause and in other contexts had exploited legal devices to avoid it.¹⁶⁷

This interpretation of the history is consistent with, though it does not corroborate, the view voiced by groups who claimed that FDA invoked the Delaney Clause in order to bring it into ridicule and enhance the prospects for Congressional repeal.¹⁶⁸ After all, they argued, FDA could have relied solely on the general safety clause to support its proposed ban; its emphasis on Delaney seemed gratuitous. In any event, the Agency’s proposed ban provoked a Congressional rebuke—despite its protestations that it was merely carrying out Congress’s instructions. But Congress left the Clause intact, crafting language that preserved it for all other food (and color) additives found to induce cancer, and later ignoring proposals to modernize the food safety provisions of the FD&C Act.¹⁶⁹

The repudiation of its saccharin proposal taught FDA officials that some food ingredients enjoy a distinct status. Congress’s rejection of the very premises that inspired enactment of the Delaney Clause sent a clear message: some ingredients are too important to ban.¹⁷⁰ A second, more important lesson was that legislative revision of the law was improbable. Congress was prepared to create exceptions to the FD&C Act’s general

ulation Prescribing Conditions of Safe Use, 36 Fed. Reg. 12,109 (1971).

164. See Merrill & Taylor, *supra* note 10, at 35-46.

165. Saccharin and Its Salts: Removal From Generally Recognized as Safe List; Provisional Regulation Prescribing Conditions of Safe Use, 36 Fed. Reg. 12,109 (1971).

166. See *supra* text accompanying note 156.

167. See Merrill & Taylor, *supra* note 10, at 78-84.

168. See Schultz, *The Bitter Aftertaste of Saccharin*, 40 FOOD DRUG COSM. L.J. 66 (1985).

169. See, e.g., H.R. 1819, H.R. 3482, H.R. 3378, S. 587, 96th Cong., 1st Sess. (1979); see also Hutt, *Food Legislation in Perspective*, 34 FOOD DRUG COSM. L.J. 590 (1979).

170. See Memorandum for the Attorney General Re: Proposed Phasing Out of Nitrites in Foods (Mar. 1979), reprinted in R. MERRILL & P. HUTT, *supra* note 129, at 782; see also Roberts, *supra* note 10.

requirements—including ingredient-specific exceptions to the Delaney Clause—but it seemed unwilling to entertain seriously any categorical revisions of this icon. Almost none of the food safety bills subsequently introduced risked frontal repeal of the anticancer language that Congress almost casually, perhaps even reluctantly, had included in 1958.¹⁷¹ The saccharin episode, therefore, probably strengthened the conviction among some FDA officials—and others outside the Agency—that if the problems presented by literal application of the Delaney Clause were to be solved, administrators would have to solve them.¹⁷²

5. *Migrating Food Packaging Materials*

Well before 1974 FDA had approved a variety of food-contact uses of the plastic acrylonitrile.¹⁷³ In that year the Agency was presented with a petition to use the material in fabricated beverage containers, a product with a potentially vast commercial market. The Agency granted the petition, setting separate limits on the amount of residual acrylonitrile monomer that could remain in the container itself and on the amount that could permissibly migrate into food.¹⁷⁴ FDA scientists were aware at the time of concerns that acrylonitrile might be an occupational carcinogen and of industry plans to test it in animals. The limits on residual monomer and on migration were considered adequate to protect consumer health.

FDA's decision provoked formal objections, accompanied by a demand for an evidentiary hearing, from the Natural Resources Defense Council

171. Thus, in outlining the need for and desirable features of new food safety legislation, Senator Orrin Hatch, Chairman of the Senate Labor and Human Resources Committee and chief sponsor of several bills to restructure the law, omitted even to mention the Delaney Clause. Hatch, *Areas for Change in the Food and Drug Laws*, 38 FOOD DRUG COSM. L.J. 97 (1983). See generally Weeda, *Food Safety Regulation—Time for Change and Compromise*, 40 FOOD DRUG COSM. L.J. 375 (1985).

172. See Hutt, *FDA Can Handle Food Safety Issues Most Effectively*, Legal Times of Wash., Apr. 27, 1981, at 28. But see Pape & Taylor, *Congress, Not FDA, Should Rewrite Delaney Clause*, Legal Times of Wash., May 25, 1981, at 34. See also Henteleff, "Modernizing" the Delaney Clause, 38 FOOD DRUG COSM. L.J. 147 (1983). Saccharin also demonstrates that some carcinogenic additives provide benefits that may outweigh even significant cancer risks. The Delaney Clause is often cited as the reason FDA could not take those benefits into account. But this is one defect of the statute for which Delaney is not responsible, and which judicial (or legislative) approval of FDA's de minimis theory would not correct. FDA has consistently held that the general safety clause does not allow consideration of an additive's benefits. This position has never been seriously challenged, and the legislative history supporting the Agency's view appears convincing. See generally Cooper, *supra* note 45.

173. By 1974, FDA had granted approval under food additive regulations for the use of acrylonitrile copolymers in cellophane, adhesives, paper and paperboard packaging components, plastics, various coating applications, such as for nylon or polyolefin films, and a number of other applications. *Acrylonitrile Copolymers Intended for Use in Contact with Food: Notice of Proposed Rule Making*, 39 Fed. Reg. 38,907, 38,907 (1974).

174. *Food Additives Resulting From Contact With Containers or Equipment and Food Additives Otherwise Affecting Food; Acrylonitrile/Styrene Copolymer*, 40 Fed. Reg. 6489 (1975).

(NRDC).¹⁷⁵ NRDC asserted that acrylonitrile had not been shown to be safe for food contact use and that, in any case, it should not be approved for nondegradable beverage containers because of adverse environmental consequences. The Agency delayed responding to these objections. It was reluctant to acknowledge that adverse environmental effects might play any role in its regulation of food additives under a statute that required only proof of safety for ingestion.¹⁷⁶ Furthermore, FDA scientists had received preliminary reports from the now-ongoing toxicological study which suggested that acrylonitrile caused cancer.

Eventually FDA acted. It was aware that the Coca-Cola Company was poised to begin distribution of soft drinks in acrylonitrile containers supplied by the petitioner, Monsanto. To forestall this, acting Commissioner Gardner announced that FDA was staying its prior approval on several grounds.¹⁷⁷ First, recent toxicological findings suggested that acrylonitrile might be teratogenic and revealed suspicious masses in test animals. Second, new analyses of the Monsanto containers indicated that acrylonitrile migration might exceed the announced limits.¹⁷⁸ Third, the consumer exposure would increase sharply with the marketing of acrylonitrile beverage containers. Fourth, NRDC's objections had raised a number of substantial questions which merited a hearing.¹⁷⁹ The effect of this order was to suspend the approval of Monsanto's food additive petition and send the company immediately into court.

Monsanto won an initial victory in the D.C. Circuit, which ordered

175. *Monsanto Co. v. Gardner*, [1976-1977 Transfer Binder] Food Drug Cosm. L. Rep. (CCH) ¶ 38,097 n.3 (D.C. Cir. 1977); see Food Additives: Acrylonitrile Copolymer Beverage Containers; Stay of Regulations, 42 Fed. Reg. 13,546, 13,548 (1977).

176. FDA had begun to assemble data on the environmental impact of plastic beverage bottles in 1973. *Manufacturers and Distributors of Plastic Bottles for Carbonated Beverages and Beer Use: Requirement of Environmental Impact Analysis Reports*, 38 Fed. Reg. 24,391 (1973). However, in 1975 it announced that unless an adverse environmental effect was prohibited by the FD&C Act or another law it administered, it was "legally precluded from taking or restraining from taking any action upon that adverse impact," and it published a regulation to that effect. *Environmental Impact Considerations: Legal Effect of NEPA on Agency Action*, 40 Fed. Reg. 16,662, 16,662 (1975). The Environmental Defense Fund prevailed in a court challenge of the Agency's stance. *Environmental Defense Fund, Inc. v. Mathews*, 410 F. Supp. 336 (D.D.C. 1976). FDA then revoked its contested regulations. *Environmental Impact Considerations: Revocation of Impact Determination Regulation*, 41 Fed. Reg. 21,768 (1976). The Agency did complete an environmental impact statement for plastic bottles in 1976. *Plastic Bottles for Carbonated Beverages and Beer; Availability of Final Environmental Impact Statement*, 41 Fed. Reg. 43,944 (1976). In 1977, FDA announced that it was taking no action on that environmental impact determination. It was evident from the discussion that FDA's evaluation for safety was a separate exercise from determination of environmental impact, and the Agency did not consider environmental impact in determining whether an additive was "safe." See *Plastic Bottles for Carbonated Beverages and Beer: Environmental Impact Determination*, 42 Fed. Reg. 9227 (1977).

177. *Food Additives: Acrylonitrile Copolymer Beverage Containers; Stay of Regulations*, 42 Fed. Reg. 13,546 (1977).

178. *Id.* at 13,547.

179. *Id.* at 13,548.

FDA to conduct an expedited hearing on the safety of the company's plastic bottle.¹⁸⁰ The hearing resulted in a ruling by Commissioner Donald Kennedy that the Monsanto beverage container was a "food additive" which had not been demonstrated to be safe.¹⁸¹ Under extreme testing conditions, Kennedy found, Agency scientists had been able to detect migration into food from Monsanto's original bottle. Kennedy conceded that no migration could be detected from Monsanto's second-generation bottle, which it had designed to reduce the level of residual acrylonitrile monomer. Nevertheless, Kennedy ruled that this bottle, too, was a "food additive" because it could be predicted, based on the tests of the first bottle, that some monomer would migrate even if it escaped detection.¹⁸²

On review in the D.C. Circuit, Judge Leventhal's majority opinion rejected Commissioner Kennedy's ruling, but it provided FDA some practical guidance in the interpretation of its statute:

The Court is . . . concerned, that the Commissioner may have reached his determination in the belief that he was constrained to apply the strictly literal terms of the statute irrespective of the public health and safety considerations. . . . [T]here is latitude inherent in the statutory scheme to avoid literal application of the statutory definition of "food additive" in those *de minimis* situations that, in the informed judgment of the Commissioner, clearly present no public health or safety concerns.¹⁸³

The *Monsanto* opinion became one of the two chief intellectual sources of FDA's subsequent approval of Red No. 19 and Orange No. 17. The other was the Agency's acceptance of quantitative risk assessment as a tool for estimating the health risks of low-level carcinogens. However, FDA ultimately did not find it necessary to rely on Judge Leventhal's *de minimis* language to resolve the problem posed by acrylonitrile and other carcinogenic food packaging materials, which confronted the Delaney Clause as soon as it became apparent that trace amounts were likely to migrate into packaged food. After prolonged internal debate, FDA eventually approved Monsanto's plastic bottle on the theory that it was not the "additive," but a "constituent," which induced cancer,¹⁸⁴ a theory that it

180. *Monsanto Co. v. Gardner*, [1976-1977 Transfer Binder] Food Drug Cosm. L. Rep. (CCH) ¶ 38,097 (D.C. Cir. 1977).

181. Indirect Additives: Polymers; Acrylonitrile Copolymers Used To Fabricate Beverage Containers, 42 Fed. Reg. 48,528, 48,543 (1977).

182. *Id.* at 48,532.

183. *Monsanto Co. v. Kennedy*, 613 F.2d 947, 954 (D.C. Cir. 1979).

184. Indirect Food Additives: Polymers; Acrylonitrile/Styrene Copolymers, 49 Fed. Reg. 36,635, 36,638 (1984).

had previously and more fully articulated in regulating several color additives.¹⁸⁵

Predictably, participants in the current dispute over FDA's application of the de minimis theory differ in their views of this precedent. Leventhal invited the Commissioner to focus on the substance rather than on the vocabulary of Congressional policy.¹⁸⁶ But two features of the case weaken its force in the present context. First, it is not clear that the court understood that FDA was dealing with a carcinogen. While the Agency record contained evidence of the preliminary toxicological findings, FDA had consciously refrained from reaching a definitive judgment—in part because it did not want to establish a precedent of acting on the basis of reports from incomplete or unreviewed scientific studies.¹⁸⁷

Second, FDA was not (and thus neither was the court) dealing with the language of the Delaney Clause, which the Agency had not relied on in any of its decisions. While Leventhal did not qualify his endorsement of FDA's authority to "avoid literal application" of the statute, the food additive definition differs from the Delaney Clause. The former's phrasing—"likely to become a component of food"—is facially indeterminate. In devising a scheme of premarket approval for some but not all chemicals used in food production and marketing, Congress had to draw some sort of boundary. There is little evidence that the drafters focused on the possibility of migration at the molecular level. More importantly, there is no suggestion that the authors of the 1958 law intended to cir-

185. As Richard Cooper has pointed out, Judge Leventhal's de minimis exception is remarkably similar to FDA's own solution to the conundrum posed by the DES proviso. But Cooper notes that Leventhal went a step further, and invited the Agency to disregard residues of a substance that it was confident would be found in food if it thought that the substance posed "no public health concern." See Cooper, *supra* note 45, at 13-14.

186. In its brief in the Red No. 19/Orange No. 17 dispute, the government interpreted *Monsanto* as authorizing the exclusion of a probable carcinogen from definition as a food additive if the risk is de minimis, thus escaping the Delaney Clause. The government argued that, under *Monsanto*, FDA may also approve the use of a carcinogenic color additive if the risk is likewise de minimis. Brief for Respondents at 31-32, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548). The intervenor Cosmetic, Toiletry and Fragrance Association similarly argued that *Monsanto* had the practical effect of exempting a carcinogen which posed a de minimis risk from regulation under the Delaney Clause. Brief for Intervenor-Respondent: The Cosmetic, Toiletry and Fragrance Association at 24, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

187. The language of FDA's stay of regulations suggests that it was reluctant to act until all the data had been submitted:

The issues raised in the objections are substantial. The Commissioner anticipates, therefore, that when the chronic feeding study is complete or possibly sooner it will be appropriate to convene an evidentiary hearing under section 409 of the Federal Food, Drug and Cosmetic Act (21 U.S.C. 348) to resolve those factual issues. . . . The Commissioner concludes that it is in the public interest to act prudently, albeit not definitively, at this time on the acrylonitrile copolymer beverage containers.

Acrylonitrile Copolymer Beverage Containers; Stay of Regulations, 42 Fed. Reg. 13,546, 13,548 (1977).

cumscribe FDA's authority to define the precise boundary based on judgment and experience.

By contrast, the Delaney Clause is framed to restrict FDA's discretion. The purpose of the Clause, at least for its proponents, was to preclude decisions that the looser general safety clause would have allowed.¹⁸⁸ The current debate over FDA's approval of Red No. 19 and Orange No. 17 is really about the capacity of Congress, through conscious choice of statutory language, to curtail administrative discretion. *Monsanto* does not speak directly to this question.¹⁸⁹

6. *The "Special" Case of Lead Acetate*

A color additive that came under scrutiny as a result of FDA's efforts to resolve the status of all provisionally listed colors caused the Agency's next confrontation with the Delaney Clause. Lead acetate has been used as a color additive in cosmetics for many years, chiefly in hair coloring products marketed to disguise greying hair. This form of lead is also an unequivocal carcinogen when ingested by mice and rats.¹⁹⁰ Because hair dyes containing lead acetate are applied dermally, FDA faced the question of whether lead acetate was absorbed through the scalp. This question was difficult to resolve because humans are exposed to lead from many other sources and lead can always be found in their tissues at low, though fluctuating, levels. The key problem for FDA was to distinguish lead absorbed from hair dyes from this "natural" background.¹⁹¹

This issue proved to have legal as well as scientific importance. The Delaney Clause in the Color Additive Amendments is really two clauses. The first tracks the language of the 1958 Clause; the second applies to noningested additives, and provides that a color additive

shall be deemed unsafe, and shall not be listed, for any use that will not result in ingestion of any part of such additive, if, after tests which are appropriate for the evaluation of the safety of additives for such use or after other relevant exposure of man or animal to such

188. See *infra* text accompanying notes 288 & 304-07.

189. Judge Williams's opinion for the D.C. Circuit in *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987), distinguished *Monsanto* in two sentences:

The opinion makes no suggestion that anyone supposed acrylonitrile to be carcinogenic, or that the Delaney Clause governing food additives . . . was in any way implicated. Thus the case cannot support a view that the food additive Delaney Clause (or, obviously, the color additive one) admits of a *de minimis* exception.

Id. at 1118.

190. General Specifications and General Restrictions for Provisional Color Additives for Use in Foods, Drugs, and Cosmetics; Provisional Listing of Lead Acetate: Postponement of Closing Date, 43 Fed. Reg. 8790, 8791 (1978).

191. *Id.* at 8792-93.

additive, it is found by the Secretary to induce cancer in man or animal.¹⁹²

Thus, even if FDA were able to confirm that lead acetate in hair dyes was absorbed through the scalp, for the Delaney Clause to apply the Agency would have to find that the rodent feeding studies demonstrating carcinogenicity were “appropriate” for evaluating the safety of such a non-ingested additive. FDA contrasted this requirement with the ingested use portion of the Delaney Clause under which, it declared, a “finding of carcinogenicity alone *renders the additive ‘unsafe’ as a matter of law.*”¹⁹³

Though it confirmed through radiotracer studies that tiny amounts of lead acetate were absorbed through the scalp of hair dye users, FDA ultimately concluded that the rodent carcinogenicity studies were not appropriate for evaluating the colors’ safety for this use. The Agency’s reasoning followed an unusual path. Indeed, the Agency conceded that “this conclusion is based upon the unusual combination of scientific facts peculiar to lead acetate in hair dyes, a combination which will rarely, if ever, be presented again in this context.”¹⁹⁴

FDA based its conclusion on two findings, neither of which it attempted to link textually with any conventional meaning of the term “appropriate.” First, it pointed out that while users of lead acetate hair dyes might absorb trace amounts of the color, even frequent use would result in average daily absorption of no more than 3/10 millionths of a gram, increasing the user’s body lead burden by less than one percent. “Such an increase,” the Agency said, “does not augment the existing risk of acute or chronic lead toxicity, including cancer, in any clearly discernible, much less significant, manner.”¹⁹⁵

Second, FDA cited quantitative assessments performed by its own staff and by the sponsor of lead acetate, which predicted, respectively, a lifetime cancer risk from this level of absorption of ten in ten million and ten in 18.5 million. “These very conservative risk assessments support a conclusion that any risk likely to result from use of lead acetate hair dye cannot be considered significant in terms of public health protection.”¹⁹⁶ Thus convinced that any cancer risk posed by the use of lead acetate in hair dyes was “minute,” FDA found that lead acetate was “safe for use in hair dyes.” The conclusion that the carcinogenicity studies were not “appropri-

192. 21 U.S.C. § 376(b)(5)(B) (1982).

193. Lead Acetate: Listing As a Color Additive in Cosmetics That Color the Hair on the Scalp, 45 Fed. Reg. 72,112, 72,115 (1980) (emphasis supplied).

194. *Id.* at 72,115.

195. *Id.*

196. *Id.* at 72,116.

ate” for evaluating the safety of this use of lead acetate appeared to flow, more as a matter of ipse dixit than analysis, from this finding of safety.¹⁹⁷ The Agency implied that ingestion studies would not be considered “appropriate” for evaluating the cancer-causing potential of noningested color additives unless they yielded risk estimates that would cause it to find an additive unsafe.

Formal objections to FDA’s approval of lead acetate, in addition to contesting the Agency’s view of the law, focused chiefly on its apparent willingness—claimed to be implicit in its risk estimates—to allow some consumers to get cancer.¹⁹⁸ The objecting parties did not, however, press their views to a hearing or seek judicial review of FDA’s decision.¹⁹⁹

7. “Constituents” of Additives

Many of FDA’s most difficult decisions have arisen in the context of its efforts to review the safety or effectiveness of products already on the market. Each of the major amendments to the FD&C Act authorizing premarket approval for a class of products or adding new approval requirements has imposed on FDA the obligation to review older products and bring them into compliance with the new standards.²⁰⁰ This exercise, in addition to claiming substantial agency resources and imposing heavy testing burdens on the private sector, has invariably revealed that some older products do not meet the standards demanded of new ones.²⁰¹

197. *Id.* For additional discussion of FDA’s regulatory approach to lead acetate in hair dyes, see Taylor, *History of Cosmetic Color Additive Regulation: Creative Maneuvering by FDA Bodes Well for the Future*, 37 FOOD DRUG COSM. L.J. 152, 161-62 (1982); Cooper, *supra* note 45, at 14-15.

198. Removal of Stay of Regulation for the Listing of Lead Acetate as a Color Additive in Cosmetics That Color the Hair on the Scalp; Confirmation of Effective Date, 46 Fed. Reg. 15,500, 15,501 (1981).

199. *See id.* In 1986, FDA rejected the contention of the Cosmetic, Toiletry and Fragrance Association that feeding studies were inappropriate for a Delaney Clause evaluation of the externally applied color additive Red No. 19:

FDA’s decision concerning lead acetate was based upon the unusual combination of scientific facts, peculiar to the use of lead acetate in hair dyes, which the agency recognized “will rarely, if ever, be presented again in this context” (45 F[ed.] R[eg.] 72112, 72115; October 31, 1980). Similar facts do not exist in the case of D&C Red No. 19. For example, a key factor that influenced FDA’s judgment that the Delaney Clause just did not apply to lead acetate was the fact that a background level of lead is always present in the blood of humans, a background level much greater than the possible increase in lead burden that would result from the use of lead acetate in hair dyes. There is, of course, no background level of D&C Red No. 19 in humans. The agency believes that the tests on D&C Red No. 19 are appropriate for an evaluation of the substance under the Delaney Clause.

D&C Red No. 19, *supra* note 27, at 28,359. The Agency rejected the same argument for the externally applied color additive Orange No. 17. *See* D&C Orange No. 17, *supra* note 27, at 28,342.

200. Drug Amendments of 1962, Pub. L. No. 87-781, 76 Stat. 780 (codified as amended at 21 U.S.C. § 376(b)(5)(B) (1982)); Color Additive Amendments of 1960, Pub. L. No. 86-618, 74 Stat. 397 (codified as amended at 21 U.S.C. § 376(b)(5)(B) (1982)); *see also* REGULATING PESTICIDES, *supra* note 31, at 36-37.

201. *See* McIlwain v. Hayes, 690 F.2d 1041 (D.C. Cir. 1982); Cutler v. Hayes, 549 F. Supp.

This scenario is illustrated by FDA's efforts to confirm the safety of color additives that were in commercial use before 1960. The Color Additive Amendments allowed the Agency initially to "provisionally list" those colors whose safety was not already suspect and contemplated that it would then review and permanently "list" those that met contemporary safety criteria. FDA delayed undertaking any systematic review for nearly fifteen years. By the mid-1970s, when it took up the effort in earnest, intervening advances in safety assessment necessitated that many of the still "provisionally listed" colors undergo new testing.²⁰²

The results of the tests FDA demanded in 1977 proved disconcerting. Some listed colors, like Orange No. 17 and Red No. 19, were shown to be animal carcinogens.²⁰³ Several others were discovered to contain trace contaminants, which in other tests also displayed carcinogenicity. The latter discovery posed for FDA the question whether the 1960 Delaney Clause precluded permanent listing of the parent colors when contemporary tests showed them to be safe and failed to demonstrate that they induced cancer.

That an additive, not itself a carcinogen, might contain a substance that induces cancer when tested separately was not unprecedented. FDA's policy for such cases prior to 1977 was clear if not well-publicized: the Delaney Clause precluded approval even if the parent compound did not induce cancer.²⁰⁴ The discovery that carcinogenic contaminants occurred in several currently approved colors, whose numbers had been shrinking, caused the Agency to rethink this policy. Quantitative risk assessment again provided the tool for reconciling the Agency's reluctance to invoke the Delaney Clause with its duty to protect consumers.

In what has become known as its "constituents policy,"²⁰⁵ FDA interpreted the Clause to apply only to the "additive" for which approval was sought, that is, to the compound whose coloring properties provided the *raison d'être* for using it. The unavoidable, nonfunctional carcinogenic contaminant was a mere "constituent" of the additive. So long as the

1341 (D.D.C. 1982); *Cutler v. Kennedy*, 475 F. Supp. 838 (D.D.C. 1979).

202. Color Additives: Provisional Regulations; Postponement of Closing Dates, 42 Fed. Reg. 6991 (1977).

203. See *supra* text accompanying notes 31-38.

204. In the regulatory history section of its Federal Register notice on carcinogenic constituents of food and color additives, FDA stated that, "with a few exceptions" its past practice had been to disallow any additive containing even small amounts of carcinogens even if the additive itself was not carcinogenic. Policy for Regulating Carcinogenic Chemicals in Food and Color Additives, 47 Fed. Reg. 14,464, 14,465 (1982).

205. *Id.*; see also Bachrach, *D & C Green No. 5: Judicial Review of the Constituents Policy*, 39 FOOD DRUG COSM. L.J. 299, 301-05 (1984); Henteleff, *supra* note 172, at 149-52.

“additive” did not induce cancer when tested, the Delaney Clause did not come into play.²⁰⁶

This left the issue whether the “additive”—the color with its “constituents”—was safe for human ingestion. FDA could not claim the contaminant posed absolutely no risk, for it had been demonstrated to cause cancer in animals. Nor did it question the premise that carcinogenesis is presumptively a no-threshold process. But it declined to follow this logic to the conclusion that the parent additive had not been shown to be safe. FDA interpreted the statute’s “general safety” standard as requiring a finding that the additive, at likely ingestion levels, would present no “significant” risk to consumers.²⁰⁷ Quantitative risk assessment was to be used to determine whether the risk associated with the carcinogenic constituent would be “significant.”²⁰⁸

FDA used this technique in approving the listing of Green No. 6, a color additive that contains as a contaminant n-toluene, an acknowledged animal carcinogen.²⁰⁹ Because the additive is used in small quantities at low levels in relatively few foods and ingested drugs, estimated human exposure is quite low. Likely exposure to the carcinogenic constituent is, predictably, even lower, so low that the estimated human cancer risk is on the order of one in fifteen million to one in 150 million. According to FDA, this risk did not prevent a finding that Green No. 6 was safe within the meaning of the statute.²¹⁰

FDA’s interpretation of the statute was challenged in court by Glenn Scott.²¹¹ The nominal subject of the action was FDA’s listing of Green No. 5, which contained the same carcinogenic constituent as Green No. 6, but in even smaller quantities.²¹² Scott’s central claim was that the Delaney Clause barred FDA from approving an additive that contains any carcinogenic material.²¹³ He insisted that the statute did not allow FDA to distinguish between the parent compound and its “constituents.”²¹⁴

The Sixth Circuit rejected this contention.²¹⁵ Though the perfunctory opinion explored none of the difficulties with FDA’s position, the case was

206. Henteleff, *supra* note 172, at 150-52.

207. *Id.*

208. *Id.*

209. D&C Green No. 6; Listing as a Color Additive in Externally Applied Drugs and Cosmetics, 47 Fed. Reg. 14,138 (1982).

210. *Id.* at 14,144-45.

211. *Scott v. FDA*, 728 F.2d 322 (6th Cir. 1984). Scott is an inventive and tenacious litigant who has challenged other FDA actions.

212. *Id.* at 323; D&C Green No. 5, Final Rule, 47 Fed. Reg. 24,278 (1982).

213. *Scott*, 728 F.2d at 324.

214. *Id.*

215. *Id.*

a victory for FDA in its efforts to narrow the reach of the Delaney Clause. It provided support for FDA's reading of the general safety standard as allowing approval of color and presumably food additives that carry very small, albeit real, cancer risks. The ruling implicitly sanctioned the Agency's reliance on quantitative risk assessment to estimate the risks posed by low-dose carcinogens.²¹⁶

IV. Surrender of the Citadel

In the decisions chronicled in Part III, FDA chipped away at the edges of the Delaney Clause. None of the issues it faced had been anticipated or resolved by Congress in 1958 or in 1960. Arguably, FDA did no more than exercise its delegated authority to make sense of the statute it is responsible for administering, and it always purported to ground its decision in the statutory text. By contrast, FDA's *de minimis* theory, on which it rests approval of Red No. 19 and Orange No. 17, conflates the Delaney Clause and the general safety clause, seemingly leaving no case in which the anticancer language would bar approval of an additive the Agency is prepared to characterize as "safe." Moreover, as initially articulated by FDA, the *de minimis* doctrine does not rest on an interpretation of Congress's language. Rather, it represents an assertion of administrative power to ignore the statute's literal terms when their application seems unwise.

A. FDA's Explanation for *De Minimis*

FDA's approval of Orange No. 17 and Red No. 19²¹⁷ was anticipated in two earlier rulings in which the Agency advanced its *de minimis* theory. The Agency first embraced the *de minimis* doctrine in rejecting a demand that it immediately ban six provisionally listed colors as animal carcinogens. FDA Commissioner Young announced in June 1985 that the Agency would permit the colors' continued use pending assessment of their risks.²¹⁸ Young conceded that this postponement could not be justi-

216. The court of appeals summarized FDA's assessment of the cancer risk associated with human exposure to the trace levels of p-toluidine present in Green No. 5, and observed that the petitioner "does not contest the validity of the tests employed by FDA in determining that [the color] was safe. . . ." *Id.* at 325. The court went on to say:

The FDA's conclusion that the risk levels ascertained after testing D&C Green No. 5 . . . were so low as to preclude a reasonable harm from exposure to the additive within the meaning of the General Safety Clause, is also in accordance with the law. . . . This finding is consistent with the holding in *Monsanto v. Kennedy*. . . .

Id.

217. See *supra* text accompanying notes 29-45.

218. Provisional Listing of Certain Color Additives; Proposed to Extend Closing Dates, 50 Fed. Reg. 26,377 (1985) (to be codified at 21 C.F.R. § 81).

fied if FDA were barred from ultimately "listing" the colors;²¹⁹ he asserted, however, that the Delaney Clause does not preclude approval of a carcinogenic additive if the human cancer risk is "de minimis."

Commissioner Young assumed, if he did not expressly concede, that the colors in question had been shown to induce cancer in animal experiments. Though he acknowledged that the Agency then lacked the data needed "to form the proper basis of a risk calculation,"²²⁰ Young argued that "[i]f the risk associated with a color is *essentially negligible*, there is no gain to the public, and the statutory purpose is not implemented, if the words of the statute are interpreted not to leave the Agency any discretion to apply it reasonably."²²¹ According to Young, the 1960 legislative history demonstrated that Congress meant to allow FDA to approve individual carcinogenic colors if scientists could determine that expected exposure levels posed no significant human health risks.²²²

Commissioner Young's explanation of the Delaney Clause was the first official suggestion that a de minimis risk policy might protect directly added food ingredients that themselves induce cancer in animals. In its earlier decisions on carcinogenic animal drugs, contaminants of color additives, and migrating food packaging materials, FDA dealt with substances whose presence in food served no functional purpose. Moreover, in explaining the Agency's theory, Young did not purport to interpret the language of the statute.

The implications of Young's ruling became clearer when FDA later announced preliminary decisions on another acknowledged carcinogen, methylene chloride. The Agency proposed to ban methylene chloride as an ingredient of cosmetics on the ground that expected exposure levels rendered those products unsafe.²²³ At the same time, it declined to revoke the existing food additive approval for the use of methylene chloride to decaffeinate coffee, a use which leaves measurable residues in both the beans and the coffee brewed from them. FDA asserted that the human cancer risk posed by methylene chloride residues in coffee was so low it did not warrant regulatory concern. Citing both *Alabama Power* and *Monsanto*, the Agency relied on its "inherent" administrative authority to ignore the statute's literal command when confronted with trivial risks.²²⁴ For the

219. Young Response to Public Citizen, *supra* note 32, at 28.

220. *Id.* at 19.

221. *Id.* Commissioner Young cited *Monsanto Co. v. Kennedy*, 613 F.2d 947, 955 (D.C. Cir. 1979), which applied the de minimis principle to the threshold definition of a food additive.

222. Young Response To Public Citizen, *supra* note 32, at 33-34.

223. It relied on section 601(a) of the FD&C Act, a provision that does not include an express ban on carcinogens.

224. Cosmetics; Proposed Ban on the Use of Methylene Chloride as an Ingredient of Aerosol Cosmetic Products, 50 Fed. Reg. 51,551, 51,555-56 (1985).

first time, FDA linked the de minimis standard to a specific risk level: a lifetime cancer risk no greater than one in one million, it asserted, should be considered below the threshold of regulatory concern.²²⁵ Agency scientists had estimated that the upper bound cancer risk for consumers of large amounts of decaffeinated brewed coffee was one in one million, while the risk to consumers of large amounts of decaffeinated instant coffee was one in 2.5 million.²²⁶ Deciding that the actual risk was probably lower, FDA concluded: “[T]here would be no safety gain to the public if it interpreted the Delaney Clause to require a ban on this use of methylene chloride.”²²⁷

B. *The Justice Department’s Reformulation*

FDA applied the de minimis doctrine for the first time in late 1986, when it published final orders permanently listing Orange No. 17 and Red No. 19.²²⁸ The Agency had asked the National Center for Toxicological Research (NCTR), part of FDA, to review the risk estimates submitted by the colors’ proponents.²²⁹ A panel of NCTR scientists agreed that the two colors should be considered animal carcinogens, but it confirmed industry claims that each posed very small risks.²³⁰ FDA Commissioner Young relied heavily on the panel’s findings in explaining that the colors could be permanently listed, Delaney Clause notwithstanding.²³¹

FDA’s ruling precipitated formal objections.²³² The objectors did not contest the Agency’s assessment of the risks posed by Red No. 19 and Orange No. 17; instead they challenged FDA’s legal conclusion that the statute allowed the approval of additives found to cause malignant tumors in laboratory animals.²³³ They thus declined the evidentiary hearing to which the statute would have entitled them, setting the stage for an immediate judicial challenge to FDA’s de minimis theory.

225. *Id.* FDA thus embraced the same risk standard it had relied on in interpreting the DES proviso and in assessing the safety of food and color additives containing carcinogenic constituents.

226. *Id.* at 51,553–55.

227. *Id.* at 51,555. The ruling on methylene chloride was promptly challenged. The case was dismissed on ripeness grounds in *Public Citizen v. Bowen*, 833 F.2d 364 (D.C. Cir. 1987).

228. D&C Orange No. 17, *supra* note 27, at 28,346.

229. Provisional Listing of Certain Color Additives; Proposal to Extend Closing Dates, 50 Fed. Reg. 26,377–79 (1985).

230. D&C Orange No. 17, *supra* note 27, at 28,331, 28,338–341, 28,346, 28,354–57.

231. *Id.* at 28,341–42; D&C Red No. 19, *supra* note 27, at 28,357–58.

232. Brief for Petitioners, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548). Ordinarily, *Public Citizen* would stay FDA’s listing of the colors pending an evidentiary hearing. See 21 U.S.C. §§ 371(e)(2), 376(b)(5)(C), 376(d) (1982).

233. The objectors did not squarely concede the reliability of FDA’s risk assessment methodology or its estimates, but they made clear that it was the Agency’s legal position to which they objected. See Brief for Petitioners at 2–17, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

In March 1987, just a few days before the government's brief in the case was to be filed, FDA published two notices offering revised explanations for its original rulings declining to apply the Delaney Clause.²³⁴ To understand the government's shift of position one must recall FDA's original explanation for its approval of Orange No. 17 and Red No. 19. The Agency acknowledged that the colors had been shown to induce cancer in properly designed and conducted animal experiments.²³⁵ But it also found²³⁶ that the cancer risk associated with human exposure to each color was extremely small—one in nineteen billion in one case, one in nine million in the other. These estimates, it said, were tantamount to findings that the colors posed no human risk of cancer at all.²³⁷

Based on this conclusion FDA invoked what it characterized as the well-established doctrine that an agency may decline to follow literal statutory language if to do so would yield no public gain.²³⁸ FDA relied chiefly on *Alabama Power Co. v. Costle*,²³⁹ where the D.C. Circuit had declared, that “[u]nless Congress has been extraordinarily rigid, there is a likely basis for an implication of *de minimis* authority. . . .”²⁴⁰ Turning to the language and history of the Color Additive Amendments, the Agency concluded that Congress had not been “extraordinarily rigid” but, indeed, had left room for the consideration of evidence that specific additives might present essentially no risk to humans even though they induced cancer in animals.²⁴¹

234. Correction of Listing of D&C Orange No. 17 for Use in Externally Applied Drugs and Cosmetics, 52 Fed. Reg. 5081 (1987); Correction of Listing of D&C Red No. 19 for Use in Externally Applied Drugs and Cosmetics, 52 Fed. Reg. 5083 (1987).

235. See D&C Orange No. 17, *supra* note 27, at 28,344; D&C Red No. 19, *supra* note 27, at 28,357.

As noted below, see *infra* text accompanying notes 242–65, under pressure from the Department of Justice FDA attempted later to explain that it had not in fact found the colors to be carcinogenic in the sense addressed by the Delaney Clause. The Agency's original rulings, however, appeared unequivocal. After rejecting industry arguments that the Delaney Clause did not apply because feeding studies were not appropriate tests for evaluating the safety of additives for external use, FDA affirmed that each color “induces cancer when tested in laboratory animals.” See D&C Orange No. 17, *supra* note 27, at 28,334–36, 28,341; D&C Red No. 19, *supra* note 27, at 28,349–52, 28,357.

There was little discussion of this finding, but the Agency would not have taken the unusual step of referring the industry risk estimates to NCTR if its own scientists had not been convinced that each color had induced cancer. Nor would proponents of the colors have devoted so much effort to demonstrating that the risks were small if they had discovered a plausible basis for contesting these findings.

236. D&C Orange No. 17, *supra* note 27, at 28,344; D&C Red No. 19, *supra* note 27, at 28,360.

237. D&C Orange No. 17, *supra* note 27, at 28,343–44; D&C Red No. 19, *supra* note 27, at 28,360.

238. D&C Orange No. 17, *supra* note 27, at 28,342–44; D&C Red No. 19, *supra* note 27, at 28,359–61.

239. 636 F.2d 323 (D.C. Cir. 1979).

240. *Id.* at 360. FDA also relied on *Monsanto v. Kennedy*, 613 F.2d 947 (D.C. Cir. 1979), which dealt specifically with the Food Additives Amendment.

241. D&C Orange No. 17, *supra* note 27, at 28,343; D&C Red No. 19, *supra* note 27, at 28,359.

Though surely controversial, FDA's reasoning was straightforward. The Agency found that Red No. 19 and Orange No. 17 were as safe for human consumption as color additives could be shown to be, despite their propensity to cause cancer in rodents at high feeding levels customary in bioassays. The Department of Justice, however, declined to defend FDA's bold logic. Departmental lawyers reportedly forced Commissioner Young to advance an alternative, wholly unprecedented, rationale for the Agency's decisions to approve the two colors.²⁴²

FDA's revised explanation retracted its earlier findings that Orange No. 17 and Red No. 19 induce cancer.²⁴³ According to this explanation, because the colors do not "induce cancer," the Delaney Clause does not bar their approval.²⁴⁴ And because the colors' estimated risks are negligible, they may be approved under the general safety clause.²⁴⁵

This reasoning's most startling feature is the assertion that Red No. 19 and Orange No. 17 do not "induce cancer." The government's brief acknowledges that FDA found that "the color additives do indeed. . . cause some test animals to develop cancer at certain levels of ingestion."²⁴⁶ But this finding was not tantamount to a conclusion that the colors "induce cancer in man or animal within the meaning of the Delaney Clause."²⁴⁷ The test animals received exceedingly high doses.²⁴⁸ If the likelihood of cancer at lower doses, comparable to those humans would encounter, is de minimis, FDA may conclude that the additive does not "induce cancer" and is therefore not subject to the Delaney Clause.²⁴⁹ According to the government's brief, FDA never intended to find that Red No. 19 and Orange No. 17 "induced cancer" in the legal sense. The likelihood that they would cause cancer in animals at doses "comparable" to those experienced by humans was "so remote that it cannot even be said to be a genuine risk at all."²⁵⁰

This novel argument perplexed close observers of the dispute, including supporters of FDA's de minimis theory.²⁵¹ The Agency reportedly acquiesced in this reasoning at the Department of Justice's insistence.²⁵² Divin-

242. Food Chemical News, Feb. 23, 1987, at 35.

243. Correction of Listing of D&C Orange No. 17 for Use in Externally Applied Drugs and Cosmetics, 52 Fed. Reg. 5081, 5082-83 (1987).

244. *Id.* at 5083-84.

245. *Id.*

246. Brief for Respondent at 8, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

247. *Id.* at 10.

248. *Id.* at 18.

249. *Id.* at 15.

250. 52 Fed. Reg. 5083, 5084 (to be codified at 21 C.F.R. §§ 74, 81, 82).

251. See Food Chemical News, Feb. 23, 1987, at 35.

252. For a detailed, if not entirely balanced, account of the Department of Justice's efforts to persuade Commissioner Young to reexplain his decision, see *FDA Continues to Permit the Illegal*

ing the motives of the Department's lawyers involves guesswork, but two mutually reinforcing hypotheses seem plausible.

One byproduct of FDA's new theory is that literal application of the Delaney Clause would not bar approval of the colors. It can shift from an argument that relies mainly on judge-made law to one that exploits the propensity of reviewing courts—most notably the Supreme Court—to defer to agency interpretations of their own statutes.²⁵³ The government is thus asking courts to defer to FDA's interpretation of what "induce cancer" means. From its perspective, the controlling precedent is no longer *Alabama Power Co. v. Costle*,²⁵⁴ but *Chevron U.S.A. Inc. v. Natural Resources Defense Council*.²⁵⁵

A second possible explanation for the Department of Justice's discomfort with FDA's original explanation lies in an obscure opinion issued by the Department's own Office of Legal Counsel (OLC) in 1979. The ruling involved nitrite, a familiar and controversial food additive. FDA and the Department of Agriculture sought Attorney General Griffin Bell's opinion on their authority to delay banning nitrite's use should a recent laboratory experiment demonstrate that the substance induced cancer. The agencies believed that its health benefits²⁵⁶ probably outweighed any human cancer risk,²⁵⁷ and they sought a ruling which gave them discretion to "phase out" the use of nitrite.

The Attorney General's response was disappointing. Although OLC as-

Marketing of Carcinogenic Additives, H.R. REP. NO. 361, 25th Report by the Comm. on Gov't Operations, 100th Cong., 1st Sess. 17-22 (1987).

253. See Diver, *Statutory Interpretation in the Administrative State*, 133 U. PA. L. REV. 549 (1985); Starr, *Judicial Review in the Post-Chevron Era*, 3 YALE J. ON REG. 283 (1986).

254. 636 F.2d 323 (D.C. Cir. 1979).

255. 467 U.S. 837 (1984). The Department of Justice may have hoped as well to exploit the long line of cases confirming the courts' general deference to the factfinding of regulatory agencies operating on the "frontiers of science." *E.g.*, *Industrial Union Dep't v. Hodgson*, 499 F.2d 467 (D.C. Cir. 1974). If the government were able to persuade the court that FDA's interpretation of the statutory "induce cancer" language should be deferred to, presumably the Agency's subsequent rulings on individual additives would, as a practical matter, be reversal proof. The authority to decide what carcinogens should be restricted or banned would thus shift to the executive branch.

256. Most notably, nitrite can prevent the formation of botulinum toxin.

257. In its 1972 response to early reports suggesting cancer risks from nitrite or nitrate, FDA pointed out that there had been no episodes of botulism in foods treated with those chemicals. Outbreaks did occur, however, before nitrate was used commercially as a food preservative. The Agency continued:

There is need, therefore, to consider with extreme care any changes in regulations governing the use of these substances. From a public health standpoint, the choice to be made is between the risk of the possibility of a chronic illness (cancer) and a very real and more immediate hazard (botulism).

Food Additives: Use of Sodium Nitrite, Sodium Nitrate, Potassium Nitrite, and Potassium Nitrate, 21 C.F.R. § 121 (1972). Three years later, after an expert panel recommended lower permissible levels of nitrite, FDA again cautioned that "in the desire to reduce levels to eliminate the possibility of nitrosamine formation, the very real public health hazard of botulism cannot be ignored." Nitrates, Nitrites and Salt: Notice of Professional Rulemaking, 40 Fed. Reg. 52,614 (1975) (codified at 9 C.F.R. §§ 318, 381).

sumed that some uses of nitrite would not be subject to the Delaney Clause,²⁵⁸ it characterized the agencies' discretion narrowly: "The responsibility and the authority to decide whether nitrites are in fact carcinogenic rest exclusively with your two Departments."²⁵⁹ Once such a finding is made, however, "the statutes contemplate that Congress will make the ultimate determination whether its continued use will be permitted."²⁶⁰ Both Attorney General Bell and the accompanying OLC memorandum stressed that Congress, in the general safety standard and the Delaney Clause, had already formulated the nation's policy for regulating carcinogenic food ingredients.²⁶¹

OLC's discussion of the Delaney Clause is redolent of FDA's early statements:

Congress chose to treat potentially carcinogenic substances with extreme caution by enacting the Delaney Clause, which prohibits the Secretary from establishing tolerances for any substance found to induce cancer when ingested by man or animal. *Such a substance is therefore unsafe in whatever amount it may be added.*²⁶²

The memorandum criticized FDA's contemplated phaseout of nitrite as flatly inconsistent with "the statutory requirement of a finding to a reasonable certainty that no harm will result from the addition of a food additive."²⁶³ It expressly rejected FDA's chief legal justification for

258. After the Justice Department's ruling, FDA explained how the definition of a food additive at 21 U.S.C. § 321(s)(4) (1982) functioned as a grandfather clause for the use of nitrite as a meat preservative:

The legal basis for allowing the preservative use of nitrites in meat (at levels up to 220 ppm) lies in pre-1958 USDA regulations approving that use. This USDA "prior sanction" . . . excludes nitrites in meat from the definition of "food additive" (see section 201(s)(4) of the [Federal Food and Cosmetic Act] (21 U.S.C. 321(s)(4))) and thus means that nitrites may be used lawfully in meat for preservation purposes without an FDA food additive regulation approving that use.

Nitrites in Bacon; Proposed Exception From the Color Additive Definition and Request for Information on Other Meat Products That May Qualify for the Exception to the Color Additive Definition, 44 Fed. Reg. 75,659, 75,660 (1979) (codified at 21 C.F.R. pt. 70). Although a pre-1958 regulation exempted nitrite use in meat from regulation under the Delaney Clause, no similar regulation could then be found to exempt the use of nitrite in poultry. *See* Nitrates and Nitrites in Poultry Products; Proposed Declaration That No Prior Sanction Exists, 44 Fed. Reg. 75,662 (1979) (codified at 21 C.F.R. § 170 (1987)).

259. Letter from Attorney Gen. Griffin Bell to Secretaries of HEW and Agric. (Mar. 30, 1979), *reprinted in* Secretary of Health Educ. and Welfare, and Secretary of Agric.—Authority Under the Federal Food, Drug and Cosmetic Act, Meat Inspection Act and Poultry Products Inspection Act, To Authorize Continued Use of Nitrites as Food Additives, 43 Op. Att'y Gen. No. 19, at 1, 2 (1979).

260. *Id.* at 3.

261. Harmon, Memorandum for the Attorney General Re: Proposed Phasing Out of Nitrites in Foods (Mar. 30, 1979), *reprinted in* 43 Op. Att'y Gen. No. 19, at 3, 17–20, 31. John Harmon was Assistant Attorney Gen., Office of Legal Counsel.

262. *Id.* at 17 (emphasis supplied).

263. *Id.* at 19.

delayed enforcement²⁶⁴—section 306's authorization to refuse to initiate action against "minor violations."²⁶⁵

My speculation that Attorney General Bell's 1979 exegesis on the Delaney Clause influenced the Department of Justice's recent refusal to defend FDA's original *de minimis* theory is admittedly just that. Neither Commissioner Young's revised explanation of his approval of Red No. 19 and Orange No. 17 nor the government's brief adverts to the nitrite episode. However, the nitrite opinion is easy to locate and recent enough to be recalled by Department lawyers.

FDA's revised explanation is the only one that would sustain its position without repudiating Bell's ruling. The Agency's current position purports to avoid the apparent clash between its approval of the two colors and the unusually explicit policy expressed in the Delaney Clause. By its terms, that policy applies to additives found to "induce cancer." Because, according to Commissioner Young, no such finding has been made for

264. Events in 1980 made FDA's proposed phasing out of nitrates and nitrites unnecessary. Public Citizen in 1979 had challenged the prior-sanctioned status of nitrites as preservatives and suggested they might even be color additives under the exclusive jurisdiction of FDA. *Public Citizen v. Foreman*, 471 F. Supp. 586 (D.D.C. 1979); see R. MERRILL & P. HUTT, *supra* note 129, at 77 n.3. The court ruled that the Department of Agriculture and FDA had properly found a pre-1958 sanction for the use of nitrite as a preservative. 471 F. Supp. at 593.

The District Court had not ruled on the status of nitrite as a color additive, but referred that question to FDA for study. 471 F. Supp. at 594. FDA proposed an exception from the color additive definition for nitrite in bacon. *Nitrites in Bacon; Proposed Exception From the Color Additive Definition and Request for Information on Other Meat Products That May Qualify for the Exception to the Color Additive Definition*, 44 Fed. Reg. 75,659, 75,660 (1979) (codified at 21 C.F.R. § 70 (1987)). In 1980, it deferred action on that question for other meat products. *Nitrites in Bacon; Proposed Exception From the Color Additive Definition and Request for Information on Other Meat Products That May Qualify for the Exception to the Color Additive Definition; Separation of the "Color Imparting" Issue from the "Exception" Issue for Red Meats Other Than Bacon*, 45 Fed. Reg. 32,324 (1980); see R. MERRILL & P. HUTT, *supra* note 129, at 77 n.3.

Also in 1980, the Department of Agriculture obtained evidence of a sanction for the use of nitrate and nitrites which predated the Sept. 6 enactment of the Food Additives Amendment of 1958, Pub. L. No. 85-929, 72 Stat. 1784 (1958). See *Nitrates and Nitrites in Meat and Poultry Products; Declaration and Codification of Prior Sanctions*, 48 Fed. Reg. 1702 (1983). Thus, as used in both meat and poultry, nitrites and nitrates were not food additives within the meaning of section 201(s) of the Federal Food Drug and Cosmetic Act, 21 U.S.C. § 321(s) (1982), and therefore not subject to the Delaney Clause. These findings, plus the postponement of the color question, eliminated most of the nitrite-related pressures on FDA. FDA codified the prior sanctioned status of nitrate and nitrite early in 1983. 21 C.F.R. §§ 181.33, 181.34 (1987).

265. Section 306 as codified reads: "Nothing in this chapter shall be construed as requiring the Secretary to report for prosecution, or for the institution of libel or injunction proceedings, minor violations of this chapter whenever he believes that the public interest will be adequately served by a suitable written notice or warning." 21 U.S.C. § 336 (1982). The Justice Department did not find this applicable.

The proposed phasing out of nitrites through the withholding of enforcement is of a different order. . . . The effect of the policy—indeed its purpose—would be to authorize the continued use of nitrites in certain products under circumstances that would concededly constitute non-minor violations of the specific terms of the Food and Drug Act.

Harmon, *supra* note 261, at 27-28.

Red No. 19 and Orange No. 17, Congress's policy is not violated. Indeed, it is not applicable.

V. The Legislative History of the Delaney Clause

A. *Background*

In 1958 Representative James J. Delaney of New York persuaded his colleagues to include an anticancer provision in the Food Additives Amendment, and two years later they incorporated similar language in the Color Additive Amendments.²⁶⁶ Since one question surrounding FDA's current efforts to escape these clauses is the effect members of Congress expected them to have, a survey of the 1958 and 1960 legislative histories is appropriate.

Participants in the debate over FDA's policy frequently assume that the two anticancer clauses have the same meaning.²⁶⁷ This assumption has some logic. Continuity in the membership of the relevant House and Senate committees suggests that views would remain consistent. And during the 1960 debates members spoke as though the issue were whether to reenact the policy they had previously adopted for food additives. None suggested that carcinogenic colors should be treated differently from carcinogenic food additives.

FDA, on the other hand, at first opposed the inclusion of the 1958 Delaney Clause, while two years later its representatives invited Congress to adopt anticancer language for color additives. HEW Secretary Flemming testified in 1960 that the Agency would seek amendments to the law if scientific advances ever provided the tools for determining that some level of a carcinogen could be safe.²⁶⁸ Thus, it is not implausible that the 1960 Delaney Clause might represent a sharper barrier to approval of

266. See Pub. L. No. 86-618, 74 Stat. 397-407 (codified at 21 U.S.C. §§ 301, 321, 331, 333, 342, 343, 346, 348, 351, 352, 354, 361, 362, 364, 371, 376, 441 (1982)).

267. See Brief for Intervenor-Respondent at 27-33 & n.34, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548); see also Harmon, *supra* note 261, at 17 (acknowledging that "the immediate legislative history of the Food Additives Amendment itself is somewhat sparse"). The memorandum then turns to the testimony offered "less than two years after passage of the Food Additive Amendment" by Secretary Flemming in support of the color additive Delaney Clause. *Id.* at 17-19. See *infra* text accompanying notes 326-33 for a full discussion of Secretary Flemming's testimony. The Department of Justice memorandum essentially equates the 1958 and 1960 Delaney Clauses:

In view of the fact that the anticancer clause in the Color Additive Amendment was patterned after that in the Food Additives Amendment, and was enacted on the basis of the Secretary's statement of its intended scope and rationale, based on his familiarity with and contemporaneous interpretation of the parallel clause in the Food Additives Amendment, the foregoing [legislative history] represents a reliable indication of the purpose and effect of the clause in the Food Additives Amendment as well.

Id. at 19.

268. See *infra* text accompanying notes 330-31.

animal carcinogens. Such a distinction, of course, might hold little immediate appeal for FDA, which faced the first challenge to its de minimis theory in the context of its approval of two carcinogenic color additives.²⁶⁹

As this discussion implies, the legislative history does not yield unequivocal answers to questions about how Congress expected the Delaney Clause to be interpreted. The history does not clearly reveal how much or what kind of discretion FDA was to have. No doubt inclusion of the anticancer clauses had appeal as an assurance that FDA would protect consumers from the hazard of cancer. But not many members appear to have thought through how the language might operate. Without Congressman Delaney's insistence, an anticancer clause would certainly not have been included in 1958, and possibly not in 1960. We do not know, however, whether Delaney got his way because key supporters of the food additives bill believed they were buying his support with valueless currency, that is, because the Clause would not in fact curtail FDA's flexibility, or whether they were prepared to surrender some future discretion because Delaney's resistance could derail the whole bill.²⁷⁰

With these observations in mind, we turn to the key passages of the 1958 and 1960 legislative history.

B. *Enactment of the Food Additives Amendment*

1. *House Hearings*

Beginning in July 1957 the Subcommittee on Health and Science of the House Committee on Interstate and Foreign Commerce held hearings on nine different proposals to regulate chemical food additives.²⁷¹ Congressman Delaney's own bill, H.R. 7798²⁷² was the first to contain an anticancer clause.²⁷³ Section 409(d) of the bill stipulated that the Secretary of HEW "shall not approve for use in food any chemical additive found to

269. See *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987). With the initial success of that challenge, and the unlikelihood of Supreme Court review, the possibility that the 1958 Delaney Clause can be interpreted as less restrictive of administrative discretion assumes more importance for FDA. The challenge to its failure to restrict the use of methylene chloride at first appeared to provide an opportunity to test this theory, but the case was dismissed on ripeness grounds. See *supra* note 227. The reader can judge for herself whether the legislative history would support such sharply different readings of the two clauses.

270. See Blank, *The Delaney Clause: Technical Naivete and Scientific Advocacy in The Formulation of Public Health Policies*, 62 CALIF. L. REV. 1084, 1114-16 (1974).

271. *Food Additives: Hearings on Bills to Amend the Federal Food, Drug, and Cosmetic Act with Respect to Chemical Additives in Food Before a Subcomm. of the House Interstate and Foreign Commerce Comm.*, 85th Cong., 2d Sess. (1958) [hereinafter *Food Additives Hearings*].

272. 103 CONG. REC. 7918 (1957).

273. H.R. 7938, introduced by Rep. Sullivan, was identical to H.R. 7798. *Food Additives Hearings*, *supra* note 271, at 166 (statement of Rep. Sullivan).

induce cancer in man, or, after tests, found to induce cancer in animals.”²⁷⁴

In response to a request for the Department’s views, HEW Secretary Marion Folsom commented on this proposed language.²⁷⁵ Folsom’s main concern appears to have been that Delaney’s original clause²⁷⁶ would have barred FDA from considering whether the route by which animals were exposed was relevant to assessment of human risk. The language ultimately adopted met this concern by specifying that any test, other than by “ingestion,” be appropriate for the evaluation of the safety of food additives.²⁷⁷

Folsom’s other point—couched as an explanation of the Department’s bill—reflects a view of FDA authority that the enacted statute arguably rejected. He stressed: “We believe that H.R. 6747 will prohibit the addition of any chemical additive to the food supply until there is adequate assurance acceptable to competent scientists that it will not produce cancer or any other disorder in man under the conditions of use proposed.” FDA claims that a quantitative risk estimate based on conservative estimates of human exposure showing that an additive poses a risk no greater than 1×10^{-6} is tantamount to assurance that the additive in fact “will not produce cancer . . . in man under the conditions of use proposed.”²⁷⁸ Accordingly, HEW’s bill, H.R. 6747, might would have allowed FDA to draw on the

274. H.R. 7798, 85th Cong., 1st Sess., *reprinted in Food Additives Hearings, supra* note 271, at 10.

275. Folsom said, in part:

We, of course, agree that no chemical should be permitted to be used in food if, as so used, it may cause cancer. We assume that this, and no more, is the aim of the sponsor. No specific reference to carcinogens is necessary for that purpose, however, since the general requirements of this bill give assurance that no chemical additive can be cleared if there is a reasonable doubt about its safety in that respect.

On the other hand, the above-quoted provisions are so broadly phrased that they could be read to bar an additive from the food supply even if it can induce cancer only when used on test animals in a way having no bearing on the question of carcinogenicity for its intended use. This, we think, would not be in the public interest. Scientists, I am advised, can produce cancer in test animals by injecting sugar in a certain manner, and they can produce cancers by injections into test animals of cottonseed oil, olive oil, or tannic acid (a component of many foods). We think that it would unnecessary and undesirable to rule out of the food supply sugar, vegetable oils, or common table beverages simply because, by an extraordinary method of application never encountered at the dining table, it is possible to induce cancer by injecting the substances into the muscles of test animals.

Food Additives Hearings, supra note 271, at 38–39.

276. Delaney’s original bill, H.R. 7798, required that “[t]he Secretary shall not approve for use in food any chemical additive found to induce cancer in man, or, after tests, found to induce cancer in animals.” H.R. 7798, 85th Cong., 1st Sess., *reprinted in Food Additives Hearings, supra* note 271, at 12.

277. See *infra* text accompanying note 301.

278. Brief for Respondent at 14, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

sort of scientific advances that underpin its de minimis policy. But Congress enacted a different bill.

During the first week of House hearings, several scientists testified in support of H.R. 7798 and Delaney's anticancer clause. Because these witnesses were among those who inspired Delaney to press for an anticancer clause,²⁷⁹ their testimony may provide insight into his understanding of the provision. The first witness, Dr. William E. Smith of the Sloan-Kettering Institute, addressed the administering agency's role in evaluating the appropriateness of animal tests for carcinogenicity:

Since the Secretary must evaluate the evidence in order to make a finding as to the cancer-inciting properties, the carcinogenicity of any chemical, I submit that *the wording of the sentence, excluding carcinogens*, in H.R. 7798, *enables the Secretary to exercise judgment* in evaluating claims for carcinogenicity of chemicals.²⁸⁰

Smith went on to endorse the principle of refusing approval of additives shown to cause cancer in animals.²⁸¹

The second witness was Dr. Francis E. Ray of the University of Florida. Dr. Ray doubted that all carcinogens should be assumed to have no threshold, but he opposed giving FDA authority to determine which ones might be "safe."

There may be a safe dose of some cancer-producing chemicals, but we do know there is no safe dose of certain other cancer-producing chemicals. . . . [W]e should be on the safe side. Because we know there is no safe minimum dose for certain cancer-producing chemicals, *I think we ought to adopt that rule, at least tentatively, that there is no safe minimum dose*, though I readily admit that there may be a safe minimum dose for some cancer-producing chemicals.²⁸²

Ray was prepared to concede that some carcinogens might display "safe minimum doses," but he favored a "tentative rule" that there is no safe

279. See 104 CONG. REC. 17,420 (1958).

280. *Food Additives Hearings*, supra note 271, at 170 (emphasis supplied).

281. He stated:

[S]afe doses cannot be established with confidence for carcinogens because of their unusual pharmacological action. . . .

All of the present bills to amend the food law will permit use in food of safe quantities of chemicals found harmful in higher concentration.

H.R. 7798, however, precludes extension of this safe quantity principle to carcinogens. *It is the only bill that does so.*

Id. at 171 (emphasis supplied).

282. *Id.* at 202 (emphasis supplied).

minimum dose. Congress adopted precisely such a rule in the Delaney Clause, but the rule's import remains elusive. Did it establish a binding presumption subject to revision, if science ever provided the basis for determining "safe minimum doses" for carcinogens, only by Congress itself? Or was the language chosen intended merely to endorse, but not codify, FDA's own "tentative principle" that no carcinogen should be approved for addition to human food?

Later, the subcommittee heard testimony from a group of research scientists assembled by NAS. Dr. Maurice H. SeEVER of the University of Michigan claimed that "safe doses" for carcinogenic additives could be established:

One of the cardinal principles of toxicology is that every substance has a "no effect" dose and every substance also has a toxic dose. . . .

[T]here is a tolerance level for every compound including the so-called carcinogenic agents.

The hazard . . . of a chemical compound for man can never be defined in absolute terms and it is never possible to state that any chemical substance is absolutely safe. The best we can ever expect to do is to arrive at a situation in which we can make an intelligent guess on the basis of a large amount of experimental data.

One of the other fundamental principles is that the person who is making the toxicological examination or the person who is responsible for evaluating these data—and in this instance, this would apply not only to the original investigator but also to the people in the Food and Drug Administration who ultimately are charged with the responsibility for making these decisions—should not be tied by any standardized procedure. Their hands should not be tied as to the type of tests that they shall ask for in determining toxicity or predicting safety.²⁸³

Seever clearly endorsed the need for flexibility in the interpretation of animal test results. Indeed, Seever might have gone further than FDA was prepared to go, for he argued that the Agency should have authority to use scientific judgment in evaluating the results of tests for carcinogenicity and, apparently, in establishing levels at which even carcinogenic additives might be safely used. HEW's own bill was not inconsistent with this approach, but both Secretary Folsom and FDA officials stated that they did not believe that current conventional safety assessment methodology could be applied to carcinogens. We thus have little guidance as to the

283. *Id.* at 338 (emphasis supplied); *see also id.* at 344–46 (testimony of Dr. Spencer).

Agency's view about the discretion it would have had before the Delaney Clause was added.

On the final day of hearings, representatives from FDA and HEW testified in support of the Department's bill, which contained no anticancer clause.²⁸⁴ FDA Commissioner George P. Larrick repeated familiar themes:

We endorse the [American Cancer] society's goal of seeing that cancer-producing foods are not on the American market. This was one of the Department's cardinal aims in drafting H.R. 6747. This bill bars the use of an additive unless it is established that it is without hazard to health. *Thus, the bill would prohibit the addition of any chemical additive to the food supply until adequate evidence, acceptable to competent scientists, shows that it will not produce cancer in man under the conditions of use proposed.*

But we see no more reason to single out cancer production for specific mention in the legislation than to single out . . . a host of other disorders.²⁸⁵

Larrick's testimony makes the case for the authority FDA wished to exercise, and believed the administration bill allowed, and he set forth the Agency's objections to Delaney's proposed ban on carcinogens. Larrick was less emphatic than Secretary Folsom in assuring that FDA would not approve carcinogenic additives under the general safety clause, "*until adequate evidence . . . shows it will not produce cancer in man. . .*"²⁸⁶ Larrick thus seems to have assumed that the Department's bill would allow FDA to rely on such yet-to-be-developed evidence—in essence, the argument that FDA is now making. But Larrick was supporting a bill

284. H.R. 6747, 85th Cong., 1st Sess., reprinted in *Food Additives Hearings*, supra note 271, at 4.

285. *Food Additives Hearings*, supra note 271, at 453-54 (emphasis supplied). The American Cancer Society's agenda for reaching this goal was defined in a letter from James Adams, Chairman, Legislative Comm. of the Am. Cancer Soc'y, to Hon. John Williams, Chairman, Health and Science Subcomm. of the House Comm. on Interstate and Foreign Commerce. This letter, dated July 22, 1957, reads in pertinent part:

We strongly urge that your committee recommend legislation [which] embrace[s] the following principles:

1. That the proponent of any proposed chemical additive be required to conduct tests which will demonstrate that the additive is safe for human consumption in the manner in which it will be used, and that these tests include one to determine whether the additive may be carcinogenic to experimental animals. The adequacy of these tests should be determined by the Food and Drug Administration.

2. That permission to use the additive be withheld until its safety has been demonstrated to the satisfaction of the Food and Drug Administration by the proponent.

3. That no substance shall be approved found to induce cancer in man, or after tests provided in No. 1 above, found to induce cancer in animals.

Id. at 383.

286. *Id.* at 454 (emphasis supplied).

that was not enacted and opposing language that, with revisions, Congress did adopt.

One of the last witnesses at the House hearings was Congressman Delaney himself. He criticized a recent FDA ruling that approved a one ppm tolerance for residues of a carcinogenic pesticide,²⁸⁷ declaring that “[t]he precedent established by the Aramite decision has opened the door, even if only a little, to the use of carcinogens in our foods. That door should be slammed shut and locked. That is the purpose of my anticarcinogen provision.”²⁸⁸

In assessing the impact of the Delaney Clause, this statement is ambiguous. The Clause enacted was rewritten by HEW ostensibly only to assure that FDA would not be forced automatically to ban additives that caused cancer only by an inappropriate route of exposure. But we cannot be sure that the revised clause was intended to translate Delaney’s criticism of the Aramite decision into law.²⁸⁹ In any event, Congressman Delaney was unable to persuade the House Commerce Committee to incorporate his language into the bill it reported later that year.

2. House Report

Following the House hearings, Subcommittee Chairman John B. Williams introduced a clean bill, H.R. 13254, which bore many similarities to

287. FDA initially established a zero tolerance for Aramite residues on certain agricultural commodities, but granted a one ppm tolerance on September 30, 1955 after an advisory committee of experts appointed under section 408(g) of the FD&C Act, 21 U.S.C. 346(g) (1982), concluded that this residue level “would offer no hazard to the public.” *Tolerances and Exemptions from Tolerances for Pesticide Chemicals in or on Raw Agricultural Commodities*, 20 Fed. Reg. 7301 (1955). FDA cited section 408(d)(2) of the FD&C Act, 21 U.S.C. 346a(d)(2) (1982), as authority for this decision. As a result of additional feeding studies recommended by the same advisory committee, FDA on December 24, 1958 revoked the one ppm residue tolerance, returning to a zero level tolerance. *Tolerances and Exemptions from Tolerances for Pesticide Chemicals in or on Raw Agricultural Commodities*, 23 Fed. Reg. 10,180 (1958).

288. *Food Additives Hearings*, *supra* note 271, at 498. Later on the House floor, Delaney returned to the Aramite decision in explaining the purpose of his provision: “Mr. Speaker, the significance of FDA’s former ruling on Aramite was that for the first time a precedent was set that might give legal sanction to the introduction of so-called “safe” quantities of cancer-inciting additives into food.” He reiterated that it was the “firm purpose” of his clause to “slam shut and lock” the door that this ruling had opened. 104 CONG. REC. 7783 (1958).

289. That decision was to approve a finite tolerance for a carcinogenic pesticide. Defenders of FDA distinguish its *de minimis* policy from the formal approval of tolerances for carcinogens, that is, the affirmative sanctioning of their presence in food. Brief for Respondent at 24 n.11, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548). In this context, the distinction is elusive. As applied, FDA’s *de minimis* policy sanctions the continued marketing of additives for specific purposes, and sometimes subject to quantitative limitations, that determine the amount consumers are likely to ingest. The Agency purports to evaluate the additive’s potency and to estimate human exposure. The legal standard it applies in evaluating the residual risk is whether the material, under the conditions of likely human exposure, will be “safe.” And, in at least one context where the *de minimis* policy may some day be applied—the approval of pesticide residues in processed food—the conclusion that the risk to humans is *de minimis* would result in the approval of a formal tolerance.

Delaney's bill but omitted the anticancer language.²⁹⁰ This bill was favorably reported by the Commerce Committee on July 28, 1958, with this cryptic statement: "Since the scientific investigation and the other relevant data to be taken into consideration by the Secretary include information with respect to possible cancer causing characteristics of a proposed additive, the public will be protected from possible harm on this count."²⁹¹

It is difficult to credit the claim that the authors of the reported bill believed that it would have the same effect with or without the Delaney Clause. They had heard Delaney's arguments in favor of a specific prohibition against carcinogens as well as HEW's arguments against. The assurance that "the public will be protected" appears to endorse Commissioner Larrick's assertion that FDA would not approve a carcinogenic additive unless, after evaluating all of the evidence, it were confident the additive would be safe.²⁹²

The report explained the so-called general safety standard that FDA was to apply in assessing food additives:

Safety requires proof of a *reasonable certainty* that no harm will result from the proposed use of an additive. *It does not—and cannot—require proof beyond any possible doubt that no harm will result under any conceivable circumstance. . . .*

In determining the "safety" of an additive, scientists must take into consideration the cumulative effect of such additive in the diet of man or animals over their respective life spans together with any chemically or pharmacologically related substances in such diet. Thus, the safety of a given additive involves informed judgments based on educated estimates by scientists and experts of the *anticipated ingestion of an additive by man and animals under likely patterns of use.*²⁹³

HEW endorsed the reported version of H.R. 13254.²⁹⁴ After the Committee filed its report but before the bill came up for debate, however, Delaney's colleagues were persuaded to include his anticancer language.²⁹⁵ The reasons for this revision can only be inferred from statements later made on the House floor.

It has been claimed that makers and users of food additives would have

290. H.R. 13254, 85th Cong., 2d Sess., 104 CONG. REC. 12,872 (1958).

291. H.R. REP. NO. 2284, 85th Cong., 2d Sess. 5 (1958).

292. *See id.* at 4-5.

293. *Id.* (emphasis supplied).

294. *Id.* at 7.

295. 104 CONG. REC. 17,420 (1958). The language accepted by the Committee was narrower than the version Delaney used in his own bill. The accepted version confined the prohibition to substances found to cause cancer when "ingested" or when administered by other "appropriate" tests. *Id.* at 17,412.

prevented passage of the 1958 law had they believed that the addition of the Delaney Clause would alter the decisions FDA would reach under the general safety clause.²⁹⁶ There is no direct evidence for this claim in the legislative history.²⁹⁷ Of course, formal documents often fail to reveal the political forces that determine the content of specific statutory provisions. But the incorporation of his clause in the statute itself suggests that Delaney (and his allies) wielded considerable influence, at least on this narrow point. Of course, food industry representatives may have been content to rely on *ex cathedra* claims that the statute's operation had not been changed rather than press their point and risk the statute's defeat. But even this hypothesis suggests that Delaney's influence was not negligible and that, at least for many members, the inclusion of his clause was not cosmetic.

3. *House Floor Debate*

On August 13, 1958, when Commerce Committee Chairman Oren Harris brought H.R. 13254 up for a vote,²⁹⁸ he explained that “[w]hile the committee felt that the bill as reported by the committee includes the matter covered by the Delaney amendment in the general language contained in the bill, there was no objection to the addition of the amendment suggested by Mr. Delaney.”²⁹⁹

Harris stated that the bill, even with the anticancer clause, had HEW's endorsement.³⁰⁰ He inserted into the record a letter from HEW Assistant Secretary Elliot L. Richardson, which read in part as follows:

296. Brief for Intervenor-Respondent at 14, 30, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

297. According to the brief submitted on behalf of the users of Orange No. 17 and Red No. 19, “[i]ndustry groups agreed to drop their opposition to the Delaney Clause on the express assurances of FDA Commissioner Larrick that ‘the rule of reason would be applied to all materials, cancer producing or otherwise.’” *Id.* (citing Brady, *Responsibility, Freedom, and the Law*, 17 *FOOD DRUG COSM.* L.J. 323, 326 (1962), which recounts a meeting between Larrick and industry representatives and states that “the Commissioner was also on record with the Senate to this effect”). Wholly apart from questions about the reliability of this source, the passage casts no light on what application of “the rule of reason” meant. In light of the persistent concern within HEW to retain authority to exercise scientific judgment in determining whether a substance had induced cancer, it seems likely that this was the focus of the reported exchanges between Larrick and the industry representatives—and not whether FDA retained authority to decide that the risk posed by an animal carcinogen was so slight as to be negligible. *See* Brief for Intervenor-Respondent at 30, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

298. 104 *CONG. REC.* 17,412 (1958).

299. *Id.* at 17,414. This reveals little about Harris's understanding of the effect of the Delaney amendment. The committee's failure to object may have been based on FDA's assurances that no animal carcinogen could be approved under the general safety standard, or on the belief that the amendment would not curtail the Agency's ability to find that individual carcinogens posed essentially no risk.

300. *Id.*

This Department is in complete accord with the intent of these suggestions—that no substance should be sanctioned for uses in food that might produce cancer in man. H.R. 13254, as approved by your committee, will accomplish this intent. . . . *Any indication that the additive may thus be carcinogenic would, under the terms of the bill, restrain the Secretary from approving the proposed use of the additive unless and until further testing shows to the point of reasonable certainty that the additive would not produce cancer and thus would be safe under the proposed conditions use. . . .*

At the same time, if it would serve to allay any lingering apprehension on the part of those who desire an explicit statutory mandate on this point, the Department would interpose no objection to appropriate mention of cancer in food additives legislation. If the specific disease were referred to in the law, it would however, be important for everyone to have a clear understanding that this would in no way restrict the Department's freedom in guarding against other harmful effects from food additives.

It would be important, also, to use language that would provide the intended safeguards without creating unintended and unnecessary complications. For example, the language suggested by some to bar carcinogenic additives would, if read literally, forbid the approval for use in food of any substance that causes any type of cancer in any test animal by any route of administration. This could lead to undesirable results which obviously were not intended by those who suggested the language. . . .

The enactment of a law which would seem to bar such common materials from the diet on the basis of the evidence described above, would place the agency that administered it in an untenable position. The agency would either have to try to enforce the law literally so as to keep these items out of the diet—evidently an impossible task—*or it would have to read between the lines of the law an intent which would make the law workable*, without a clear guide from Congress as to what was meant.

This difficulty could readily be avoided, if there is still a desire to make specific mention of cancer in the bill, by providing that “no additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are appropriate to the evaluation of the safety of food additives, to induce cancer in animals.”³⁰¹

Richardson's letter makes several familiar points. His description of the operation of the unamended bill implies that FDA would have authority—after “further testing”—to approve an animal carcinogen. This implication, however, is not pursued. One hypothesis is that Rich-

301. *Id.* at 17,415 (emphasis supplied).

ardson (that is, FDA) believed that the redrafted Delaney Clause would not foreclose such decisions. Another is that the Department was not so interested in retaining flexibility that it was willing to resist Delaney's efforts to incorporate anticancer language. A third hypothesis is that, while appreciating the potential incompatibility between Richardson's interpretation of the general safety standard and the language of the Delaney Clause, HEW was content to leave the issue unresolved.

Richardson's letter confirms that FDA officials were concerned that Delaney's language would force them to ban any additive shown to cause cancer in any animal experiment, regardless of its appropriateness for assessing the safety of ingested substances. They offered, and the House committee (as well, apparently, as Delaney) accepted, the redrafted version of the anticancer language that Congress ultimately enacted.³⁰²

Following Chairman Harris's explanation of the committee's inclusion of an anticancer clause, Congressman Williams, the original sponsor of H.R. 13254, rose to explain the bill's general safety standard:

[T]he bill uses a concept of safety which involves the question of whether the use of a substance in food would be hazardous to the health of man or animal. To establish the safety of an additive the bill requires proof of the practical certainty that no harm will result from the proposed use of the substance. The bill does not—and cannot—require proof beyond any possible doubt that no harm could result under any conceivable circumstance.

Since the scientific investigation and the other relevant data to be taken into consideration by the Secretary include information with respect to possible cancer-causing characteristics of a proposed additive, the public will be protected from possible harm on this count. A committee amendment to the bill expressly indicates that any substance found to cause cancer cannot be approved.³⁰³

As the statement of one of the bill's chief proponents, this passage claims our attention.³⁰⁴ Williams first explains that the best scientists can do is arrive at "practical certainty" that an additive will not cause harm; they cannot prove that a substance will be harmless. This observation is

302. *Id.* at 17,415. Richardson's treatment of this point contains an intriguing allusion. He suggests that, without modification, Delaney's language would force FDA to ban all sorts of conventional food constituents or "read between the lines of the law an intent which would make the law workable, without a clear guide from Congress." But "this difficulty" could be averted, Richardson argued, by revising the language as FDA had suggested. In light of Congress's adoption of the very language that Richardson proposed, is it legitimate for FDA "to read between the lines of the law an intent which would make the law workable"?

303. *Id.* at 17,418.

304. See G. FOLSOM, LEGISLATIVE HISTORY: RESEARCH FOR THE INTERPRETATION OF LAWS 34-35 (1972).

not incompatible, either textually or theoretically, with Williams's later statement that the Delaney amendment "indicates that any substance found to cause cancer cannot be approved." The first passage deals with the intended operation of the general safety clause, that is, it describes FDA's inquiry in the general case. The concluding passage describes the law's expected operation in a specific, presumably narrower, set of cases, in which an additive has been shown to "induce cancer" in animals. On this analysis it would appear that Williams believed the Delaney Clause might sometimes override a conclusion FDA might reach under the general safety standard alone.

This possibility apparently occurred to other members of the House, for some of them objected to Delaney's amendment. Congressman Miller argued that the bill "is impossible to enforce, that is, to determine what foods, if any, would produce any carcinogenic tendencies in human beings." Congressman Harris reassured his colleagues: "I am sure if there is any difficulty with this amendment, . . . *we will be requested by the Food and Drug Administration to make further clarification.*"³⁰⁵

This response suggests that a chief proponent of the Food Additives Amendment, with the Delaney Clause in its current form, believed that amendatory legislation would be required to free FDA from any practical difficulties in administration. Perhaps Chairman Harris believed that FDA could seek "clarification" through more informal means, such as correspondence with the appropriate committee chairmen. It seems unlikely, however, that so experienced a legislator would have thought that informal exchanges with members of Congress could readily cure dysfunctional rigidities embedded in the language of the statute.³⁰⁶

Despite continuing controversy over its content, H.R. 13254—with HEW's version of the Clause intact—passed the House by a large margin.³⁰⁷ The bill then went to the Senate, where it appears to have received only cursory study.³⁰⁸

305. 104 CONG. REC. 17,421 (1958) (emphasis supplied). Miller is the same congressman who sponsored the 1954 Pesticide Residue Amendments, which contained no anticancer language.

306. Representative Joseph P. O'Hara, another member of the Commerce Committee, also criticized the Delaney amendment:

I think it is the type of amendment that it is unfortunate to have go into a bill of this type, because it emphasizes, for purposes which I do not quite understand, certain disease. I think there are a lot of other diseases about which some language could have been used relating to various types of diseases, but I do not think it would have been necessarily helpful.

Id. at 17,422. This familiar objection sheds no light on the members' general understanding of the Delaney Clause, and very little on O'Hara's own views on the critical issue of interpretation.

307. Two-thirds of the House members present voted for the bill. *Id.* at 17,424.

308. *Id.* at 17,565.

4. *Senate Report*

The report of the Committee on Labor and Public Welfare on H.R. 13254³⁰⁹ contains this discussion of the Delaney Clause:

[I]t is the intent and purpose of this bill, even without that amendment, to assure our people that nothing shall be added to the foods they eat which can reasonably be expected to produce any type of illness in humans or animals. . . . [T]he bill is aimed at preventing the addition to the food our people eat of any substances the ingestion of which reasonable people would expect to produce not just cancer but any disease or disability.³¹⁰

The report reaffirms the government's position that the general safety clause would bar approval of any additive that FDA concluded might cause illness in humans or in animals. The report also stressed that the mention of cancer is not to be interpreted as diminishing concern for other diseases. Then these two sentences: "[W]e believe the bill reads and means the same with or without the inclusion of the [Delaney] clause. . . . This is also the view of the Food and Drug Administration."³¹¹

Proponents of FDA's *de minimis* policy cite this passage as confirming that the Delaney Clause did not make the general safety clause more stringent.³¹² They argue that since the general safety clause was understood as allowing FDA to take into account new knowledge, and specifically knowledge about the low-dose effects of carcinogens, addition of the Delaney Clause did not curtail this authority.³¹³

While this conclusion cannot be rejected out of hand, it strains credulity. The statement in the Senate report has a self-serving flavor. If FDA officials wished to retain flexibility to take new knowledge about carcinogens into account, it made sense to claim that the bill, even as amended, would allow them to do so.³¹⁴ This interpretation implies that Agency spokesmen feared they had surrendered flexibility by agreeing to the

309. S. REP. NO. 2422, 85th Cong., 2d Sess., *reprinted in* 1958 U.S. CODE CONG. & ADMIN. NEWS 5300.

310. *Id.* at 11, 1958 U.S. CODE CONG. & ADMIN. NEWS at 5309-10.

311. *Id.* at 11, 1958 U.S. CODE CONG. & ADMIN. NEWS at 5310.

312. Brief for Intervenor-Respondent at 30, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548).

313. The D.C. Circuit's ruling in *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987), flatly rejects this argument, interpreting the 1960 Delaney Clause as curtailing discretion FDA might otherwise have had. To be sure, the court dealt exclusively with the 1960 clause and explicitly refused to rule on the meaning of its precursor. The dismissal of the challenge to FDA's failure to ban methylene chloride, *see supra* notes 29 & 227, will delay a definitive ruling on the import of the 1958 clause's language.

314. Had the foregoing passage appeared in the House Report or during debate on the House floor following adoption of Delaney's amendment, it would carry more force—for it was in the House

Delaney Clause, i.e., that the bill with the Clause did mean something different, but attempted to keep the best face on the deal they had struck.

A second possibility is that FDA officials realized that they had relinquished authority to find any animal carcinogen safe by conceding that there did not yet exist any scientific basis for doing so. Under this interpretation, the general safety clause itself precluded approval of carcinogenic additives. As thus interpreted, none would disagree that the Delaney Clause added nothing substantive to the law.

A third possibility is that neither the authors of the Senate report nor Agency spokesmen focused clearly on the potential conflict between the general safety standard and the Delaney Clause. The first directs FDA to implement a two-part goal: Do not approve food additives of whose safety you are uncertain, but do approve those you are confident will be safe. Beyond recognizing that perfect assurance of safety is not possible and listing factors to be considered, the statute's authors do not specify how this is to be done.³¹⁵ The addition of the Delaney Clause appears simply to reaffirm the central message.

The difficulty with this reconstruction is that the Clause is not written as a reaffirmation of this goal; it instructs FDA how, not merely what, to decide. It specifies the policy consequences of a certain scientific finding, the finding that a substance induces cancer in animal feeding or other appropriate studies. For such substances FDA is not told merely to exercise care before finding that they are safe; it is forbidden to make that finding at all. These assertedly redundant instructions collide when FDA later becomes convinced that it can fulfill Congress's operational goal by approving certain animal carcinogens whose use levels or potency allow the conclusion that no consumers will be harmed.

that the differences between FDA and Delaney were fought out.

315. The statute reads in part:

In determining, for the purposes of this section [409], whether a proposed use of a food additive is safe, the Secretary shall consider among other relevant factors—

(A) the probable consumption of the additive and of any substance formed in or on food because of the use of the additive;

(B) the cumulative effect of such additive in the diet of man or animals, taking into account any chemically or pharmacologically related substance or substances in such diet; and

(C) safety factors which in the opinion of experts qualified by scientific training and experience to evaluate the safety of food additives are generally recognized as appropriate for the use of animal experimentation data.

21 U.S.C. § 348(c)(5) (1982).

5. *Senate Passage*

H.R. 13254, in the form passed by the House, was approved by the Senate without further amendment on August 23, 1958. The perfunctory floor debate did not advert to the Delaney Clause.³¹⁶

C. *Enactment of the Color Additive Amendments*

The 1960 Color Additive Amendments originated with a bill drafted by HEW,³¹⁷ which from the beginning contained explicit anticancer language.³¹⁸ The Amendments embraced the “safety in use” principle, authorizing FDA to approve even toxic colors for use at levels the Agency was confident would be safe. The incorporation of an anticancer clause was thus an obvious and self-conscious exception to the general approach of safety assessment embodied in the law.³¹⁹

316. 104 CONG. REC. 19,358 (1958).

317. 106 CONG. REC. 14,349 (1960).

318. See *Color Additives: Hearings Before the Comm. on Interstate and Foreign Commerce on H.R. 7624 and S. 2197*, 86th Cong., 2d Sess. 19 (1960) [hereinafter *Color Additives Hearings*].

The legislative history actually reflects some ambiguity on this point. It appears that HEW first sent its draft bill to the Senate. The Senate Report does not reproduce the draft submitted by the Department, and Secretary Flemming’s letter of transmittal does not refer to the Delaney Clause. S. 2197, the introduced bill, made no reference to cancer. By contrast, the draft transmitted later in the summer of 1959 to House Speaker Sam Rayburn contained an anticancer clause, as did H.R. 7624, the bill introduced by Representative Oren Harris, Chairman of the House Commerce Committee. Yet Secretary Flemming’s letter to Speaker Rayburn is virtually identical to the one he submitted earlier to the Senate; it too is silent on Delaney.

In his first appearance before the House committee Secretary Flemming described S. 2197 as “identical with H.R. 7624 and our proposal . . . except that the Senate bill omitted the anticancer provision. [I]f the anticancer clause of the House bill were inserted in S. 2197, we would support it in that form.” *Id.* at 39. Later, in response to questioning by Representative Dingell, Secretary Flemming represented that the drafts HEW submitted to the two houses were identical but conceded that “somewhere prior to its introduction [the Senate bill] lost the so-called cancer clause, or the Delaney Amendment.” *Id.* at 83.

It is probably not important whether HEW first embraced the desirability of incorporating the Delaney Clause in the 1960 legislation before or only after the Senate passed S. 2197. By the time the House came to consider the bills, it is clear that Secretary Flemming was the provision’s most vigorous proponent. The House hearings suggest that Flemming’s view may have been firmed, if not inspired, by FDA’s recent frustrations in dealing with residues of DES in poultry and contamination of major portions of the nation’s cranberry crop with residues of another carcinogen, the pesticide aminotriazol. See *id.* at 61-82.

319. This central purpose of the 1960 legislation accounts for statements in the legislative history like the following passage from the House Report:

There is no justification from the point of view of the public interest, in driving either color manufacturers or food, drug, or cosmetic producers, dependent upon the use of color, out of business where the particular use of the color involved is one which can safely be admitted under proper conditions of use (including tolerance limitations and certification requirements) established by the [Secretary].

H.R. REP. NO. 1761, 86th Cong., 2d Sess. 9, reprinted in 1960 U.S. CODE CONG. & ADMIN. NEWS 2887, 2891.

1. *Senate Passage*

The HEW draft was sent sequentially to the Senate and the House. The Senate Committee on Labor and Public Welfare deleted certain passages, including (without explanation) the proposed anticancer language, and designated the bill S. 2197.³²⁰ Dispensing with hearings,³²¹ the committee reported the bill favorably on August 21, 1959.³²² Three days later, the full Senate passed S. 2197 without amendment or debate.³²³

2. *Referral to House*

In a letter transmitting the Department's draft to the House, HEW Secretary Arthur Flemming provided only the briefest explanation of the anticancer language:

In determining whether the use of a color additive is safe, the Secretary is required to consider a broad range of factors. In particular, however, a color additive may not be listed if it has relevant carcinogenic potential. (This paragraph is modeled on [the original Delaney Clause], relating to food additives.)³²⁴

The bill introduced some ten days later by Congressman Harris did contain HEW's proposed anticancer clause.³²⁵

3. *House Hearings*

Secretary Flemming was the first witness in the House hearings. Flemming made clear his support for the Delaney Clause by stating that if it were inserted in S. 2197, HEW would support the Senate-passed bill. He summarized the Department's proposal:

The Government would be authorized to take into consideration, in determining whether a proposed use is safe, the amount of color which would be used and the manner of use; and it would be empowered to set safe limits on the amount and conditions of use as necessary to protect the public health. . . .

We have recommended . . . that the law contain a provision that would prohibit the use of a color in any quantity if it is found by appropriate tests to cause cancer in either man or animal.³²⁶

320. S. REP. NO. 795, 86th Cong., 1st Sess. 9, 11 (1959).

321. *Id.* at 2.

322. *Id.*

323. 105 CONG. REC. 16,776 (1959).

324. *Color Additives Hearings*, *supra* note 318, at 29.

325. *Id.* at 5.

326. *Id.* at 40. Flemming noted that "we have no authority to set tolerances under the present law

Flemming went on to explain why HEW supported a flat ban on carcinogenic color additives.³²⁷ He rejected the claim that the proposed anticancer clause would bar the exercise of scientific judgment,³²⁸ but he made clear that the role of scientific judgment would be confined.³²⁹

In a subsequent colloquy with Chairman Harris, Flemming reiterated HEW's distinction between the exercise of scientific judgment in identifying carcinogenic activity and the discretion to set tolerances for additives found to be carcinogenic:

When the time comes that our research reaches the place where that threshold can be identified, where a tolerance can be established that we know will not induce cancer in man, *then we will come back and*

even though we find that the use of a color in specified amounts would not be harmful. If it is harmful to use the color in large amounts, it cannot be used at all." *Id.* This interpretation of the existing law was the product of *Flemming v. Florida Citrus Exch.*, 358 U.S. 153 (1958), which held that FDA was powerless to approve any color that had been shown to be toxic in animals. The ruling disabled FDA from continuing the approval of virtually all color additives. The objective of toxicological studies, to facilitate judgments about safety in use, is to reveal the ways in which and levels at which substances produce toxic effects. Even in 1960, any reasonably sophisticated battery of toxicity tests of a substance would reveal it to be harmful to animals at some level. A chief purpose of the Color Additive Amendments was to restore a safety in use standard for the approval of color additives. S. REP. NO. 795, 86th Cong., 1st Sess. 1-2 (1959). The reader will note, however, that Flemming went on to distinguish the treatment that was to be accorded under the new law to colors that had been shown to cause cancer. His statement suggests that, for this subset of color additives, toxicity at any level would continue to preclude approval.

327.

Our advocacy of the anticancer proviso in the proposed color additives amendment is based on the simple fact that no one knows how to set a safe tolerance for substances in human foods when those substances are known to cause cancer when added to the diet of animals. . . .

Unless and until there is a sound scientific basis for the establishment of tolerances for carcinogens, I believe the Government has a duty to make clear—in law as well as in administrative policy—that it will do everything possible to put persons in a position where they will not unnecessarily be adding residues of carcinogens to their diet.

Color Additives Hearings, supra note 318, at 61 (emphasis supplied).

328.

It has been suggested that once a chemical is shown to induce a tumor in a single rat, this forecloses further research and forever forbids the use of the chemical in food. This is not true. The conclusion that an additive "is found to induce cancer when ingested by man or animal" is a scientific one. The conclusion is reached by competent scientists using widely accepted scientific testing methods and critical judgment. An isolated and inexplicable tumor would not be a basis for concluding that the test substance produces cancer.

Id. at 62.

329.

This, I believe, is as far as our discretion should go in the light of present scientific knowledge. We have no basis for asking Congress to give us discretion to establish a safe tolerance for a substance which definitely has been shown to produce cancer when added to the diet of test animals. We simply have no basis on which such discretion could be exercised because no one can tell us with any assurance at all how to establish a safe dose of any cancer-producing substance.

Unless and until cancer research makes a breakthrough at this point, the principle in the anticancer clause is sound.

Id.

*ask the Congress to give us authority to identify the threshold or to establish the tolerance.*³³⁰

In response to a question Flemming agreed that, under the HEW bill, if a color additive “produces one trace of cancer in animals,” it would be banned.³³¹

This is one of the most important passages in the legislative history of the anticancer clauses. Here the head of the department proposing new legislation does not merely explain the Agency’s understanding of the proposed law; he promises that, if scientific advances should undermine that understanding, the department will seek—presumably by statutory amendment—authority to incorporate these advances in its decisionmaking. Flemming’s testimony amounts to a concession that the language Congress was to enact would not allow FDA to take into account advances in understanding that in principle might allow identification of safe levels of exposure for carcinogenic additives.

During testimony of a representative of the Pharmaceutical Manufacturers Association (PMA), Representative Dingell defended the House bill’s incorporation of anticancer language like that in the food additive law.³³² In contrast, Chairman Harris advocated giving FDA more discre-

330. *Id.* at 95 (emphasis supplied). Secretary Flemming was later quoted in the House Report acknowledging that Congress had not yet authorized FDA to determine safe levels of use for animal carcinogens:

Whenever a sound scientific basis is developed for the establishment of tolerances for carcinogens, we will request the Congress to give us that authority. We believe, however, that the issue is so important that the elected representatives of the people should have the opportunity of examining the evidence and determining whether or not the authority should be granted.

H.R. REP. NO. 1761, 86th Cong., 2d Sess. 12, *reprinted in* 1960 U.S. CODE CONG. & ADMIN. NEWS 2887, 2894.

331. *Color Additives Hearings, supra* note 318, at 103.

332. Representative Dingell argued with Representative Williams:

Mr. WILLIAMS. All I meant to say, Mr. Dingell, was that with respect to carcinogens in colors, that [in the H.R. 7624] we are restoring the per se doctrine. . . .

Mr. DINGELL. Actually, in point of fact, the Delaney amendment already applies, at least as applied by the Food and Drug Administration, already applies the per se doctrine and has since the last food additive bill, has applied the per se doctrine to carcinogens, permitting the establishment of tolerances in other instances. . . .

Mr. WILLIAMS. Well, I do not interpret the Delaney clause as the Department does. I think the legislative history shows it was not intended to be interpreted that way.

Mr. DINGELL. I was one of the members of the committee, and I interpret it just exactly as the Department interprets it.

Mr. WILLIAMS. Well, I certainly do not know how you interpret it, but I know that the Senate committee indicated rather clearly that they did not think it changed the amendment as it had been reported by this committee.

Mr. DINGELL. In fact, it was my recollection, as you pointed out in your testimony, that zero tolerance would be applied to substances which were carcinogens whether, as or if the Delaney amendment were included or not.

Id. at 319-20. In a supplemental statement to the House committee, PMA’s representative again objected to FDA’s rigid interpretation of the 1958 Delaney Clause: “A literal interpretation of this section must lead to the prohibition of . . . a [carcinogenic] substance even though present in trace

tion in applying the Delaney Clause, but he acknowledged the difficulty of deleting the Clause altogether:

People are so conscious of this deadly disease when it gets hold of them, that it seems to me arbitrarily to throw out the Delaney amendment would create so much fear in the mind of the American people in their reaction against industry that it might be pretty bad.

. . . I have a feeling that it ought not to be so construed, and if it is so construed, that it should be modified, to permit the regular delegated administrative officers to deal with it practically, and in the best interests of the health of the American people.

[B]ut I still say that since it has already been included, to then try to eliminate it completely, I think, would bring on a lot more difficulty than it would be to try to adjust it in a way that makes it workable. . . .³³³

On April 5 and 6, 1960, the House Commerce Committee heard from a panel of cancer experts assembled by the National Academy of Sciences. An exchange with Dr. Walter E. O'Donnell of the Sloan-Kettering Cancer Institute illuminated the sort of discretion that Representative Dingell, at least, believed FDA retained under the 1958 Delaney Clause:

Dr. O'DONNELL. [I]t would seem to me [the Secretary] is empowered to decide when tests are appropriate for the testing of a substance and when they are not appropriate, and if he is confronted with evidence which would appear to the average person, let's say, to demonstrate that a substance is carcinogenic, it is his prerogative to declare this an inappropriate test.

Mr. DINGELL. . . . In effect, what the Secretary does is exercise an intelligent judgment as to whether or not the tests are appropriate to determine whether this substance actually happens to fall within the bane [sic] of the so-called Delaney clause and actually determine whether or not they induce cancer, whether these substances induce cancer in humans or in test animals; isn't that correct?

Dr. O'DONNELL. Yes, this is his role.³³⁴

Secretary Flemming testified again on the final day of hearings and reiterated HEW's support for the Delaney Clause:

The Department's position is that the proposed color additives legislation should include an anticancer clause that makes illegal the use

amounts. . . . This is, of course, the interpretation made by the Secretary." *Id.* at 589 & n.1.

333. *Id.* at 327, 329.

334. *Id.* at 422.

of any color that will induce cancer when tested by appropriate methods.

We believe this position to be the only sound public policy in view of the fact that our experts tell us present scientific techniques do not permit them to state unequivocally how much or how little of a substance that induces cancer when administered to animals will induce cancer when administer [sic] to man. . . .

[T]he opposition to inclusion of an anticancer clause arises largely out of a misunderstanding of how this provision works. It allows the Department and its scientific people full discretion and judgment in deciding whether a substance has been shown to produce cancer when added to the diet of test animals. But once this decision is made, the limits of judgment have been reached and there is no reliable basis on which discretion could be exercised in determining a safe threshold does [sic] for the established carcinogen.³³⁵

4. *Report of the President's Science Advisory Committee*

While the color additive bill was under consideration by the House Commerce Committee, the White House released a study of the use of chemicals and drugs as food additives.³³⁶ The expert panel's report expressed concern over the potential impact of the 1958 Delaney Clause:

Section 409(c) . . . prohibits the approval of a food additive regardless of the amount that is found to be required to increase the incidence of cancer in test animals. A literal interpretation of the section must lead to the prohibition of such a substance even though present in trace amounts.³³⁷

The panel declared that such a ban would be foolish if it barred useful chemicals that induced cancer in animals only at very high level doses.³³⁸ The panel predicted that scientists would soon be capable of estimating the risks posed by low doses of carcinogens, and urged that FDA have authority to follow a "rule of reason" in administering the Delaney Clause.³³⁹ The panel refrained, however, from expressing an opinion

335. *Id.* at 500-01.

336. PRESIDENT'S SCIENCE ADVISORY COMM., REPORT OF THE PANEL ON FOOD ADDITIVES (1960), reprinted in *Color Additives Hearings*, *supra* note 318, at 394.

337. *Id.* at 396.

338. *Id.* at 397.

339. The panel wrote in part:

It is to be emphasized that the present difficulty in establishing whether there are permissible levels for certain possibly carcinogenic food additives is accentuated by the limited relevant scientific information available. From the experience obtained in animal experiments and study of humans who have been exposed to carcinogens in the course of their work such as cited

about the correct legal interpretation of the statute.³⁴⁰

This report surfaced during consideration of the 1960 Delaney Clause and was embraced by three Senators a week after the Senate had passed the Color Additive Amendments with the Clause intact.³⁴¹

The panel's report forecast the likelihood that scientists "eventually" would be able to assess "the probability of cancer induction from a particular carcinogen in minute doses." FDA now claims that modern techniques of quantitative extrapolation from animal experiments permit it to do just this.³⁴² But the panel implicitly acknowledged that the statute might not allow FDA to exploit such knowledge when it recommended that the law be amended "if [it] does not permit the Secretary . . . to exercise discretion consistent with the recommendations of this report."³⁴³

5. House Committee Report

The Commerce Committee favorably reported H.R. 7624, repeating and endorsing Secretary Flemming's defense of the Delaney Clause. The House Report discussed several proposed amendments to the anticancer provision and explained why none had been adopted:

One industry witness objected to any anticancer clause. Another witness argued that it is possible to establish safe tolerance levels for substances that produce cancer when fed to test animals. Some would have the ban on cancer producers apply only to colors that induce

above, the panel believes that the probability of cancer induction from a particular carcinogen in minute doses may be eventually assessed by weighing scientific evidence as it becomes available.

The special emphasis placed by the Congress on the protection of the public from the danger resulting from the addition of possible carcinogens to food calls for prudent administration of section 409(c). . . . Since an area of administrative discretion based on the rule of reason is unavoidable if the clause is to be workable, it is essential that this discretion be based on the most informed and expert scientific advice available. Until the causes of carcinogenesis are better understood, each situation must be judged in the light of all applicable evidence.

Id. at 398 (footnote omitted) (emphasis supplied).

340. "If existing legislation does not permit the Secretary . . . to exercise discretion consistent with the recommendations of this report, it is recommended that appropriate modifications in the law be sought." *Id.* at 398.

341. *See infra* text accompanying notes 355-56. It should be noted that the report was not authored by persons responsible for administering the Delaney Clause or by either House of Congress. Moreover, the report appears to urge a more flexible interpretation—at least of the 1958 clause—than FDA had yet embraced.

342. *See* D&C Orange No. 17, *supra* note 27, at 28,341; D&C Red No. 19, *supra* note 27, at 28,357.

343. Close analysis of the report does not reveal whether this recommendation is addressed to FDA's discretion to decide whether a substance has been shown to induce cancer in animals tests—the sort of discretion that Secretary Flemming defended—or the discretion to utilize later-developed methods for assessing "the probability of cancer induction from a particular carcinogen in minute doses. . . ." But the text makes clear that the report's authors were taking no position on the legal question of what discretion either Delaney Clause in fact allowed the Agency.

cancer when ingested in an amount and under conditions reasonably related to their intended use. And another witness proposed that the cancer clause be taken out of its present position in the bill and added with material language changes to section 705(b) (5) (A) so that it would become simply one of the factors for the Secretary to consider in evaluating the safety of a color additive.

It is evident that such proposed changes are intended to give the Secretary the right to establish tolerances for presumed safe levels of colors that produce cancer when tested under appropriate laboratory conditions. Thus, any of the proposals, if adopted, would weaken the present anticancer clause in the reported bill. For this reason all of the proposed changes were rejected by the committee. . . .

Some of the panel members have suggested that despite these difficulties, in extraordinary cases, the Secretary of Health, Education, and Welfare should have the authority to decide that a minute amount of a cancer-producing chemical may be added to man's food after a group of scientists consider all the facts and conclude that the quantity to be tolerated is probably without hazard.³⁴⁴

The committee decided that the anticancer provision should be retained without change.³⁴⁵

6. *House Floor Debate*

There was discussion, but no further illumination, of the Delaney Clause on the House floor.³⁴⁶ After brief debate the full House approved H.R. 7624.³⁴⁷ Chairman Harris immediately called for consideration of the Senate-passed bill, S. 2197, but moved that it be amended to include

344. H.R. REP. NO. 1761, 86th Cong., 2d Sess. 12, *reprinted in* 1960 U.S. CODE CONG. & ADMIN. NEWS 2887, 2895. Among the rejected amendments was one that would have allowed FDA "to decide that a minute amount of a cancer-causing chemical may be added to man's food after a group of scientists . . . conclude that the quantity to be tolerated is probably without hazard." *Id.*, 1960 U.S. CODE CONG. & ADMIN. NEWS at 2895.

345. *See id.*, 1960 U.S. CODE CONG. & ADMIN. NEWS at 2896. FDA's defenders acknowledge that the Agency lacks authority to establish "tolerances" for any carcinogenic additive, but they insist that this is not what the agency is doing when it invokes the de minimis doctrine. Brief for Respondent at 24 n.11, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548); Brief for Intervenor-Respondent at 34, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548). That is surely different in form from the promulgation of a regulation that affirmatively sanctions specific levels of additive on the premise that they will be "safe" for human consumption. FDA's continued approvals of Red No. 19 and Orange No. 17 do not in form authorize specified levels of exposure. Rather, FDA's argument is that levels likely to be consumed by individuals carry so low a risk of cancer that the additives may be considered "safe." But the intellectual exercise involved in reaching this conclusion about hypothesized (as opposed to sanctioned) levels is similar, involving as it does the extrapolation from results of high dose exposure in animals to estimated levels of human exposure.

346. 106 CONG. REC. 14,349 (1960).

347. *Id.* at 14,373.

the Delaney Clause. The amendment was agreed to and S. 2197 then passed the House.³⁴⁸ A few days later Senator Lister Hill, Chairman of the Committee on Labor and Public Health and co-sponsor of S. 2197, secured the upper chamber's concurrence in the House-passed version.³⁴⁹

7. *Senate Reconsideration*

One week after both houses had approved S. 2197, Senator Javits moved that the Senate reconsider the vote by which it had concurred in the House bill.³⁵⁰ Javits asked to have the "Conclusions and Recommendations" portion of the report of the President's special panel inserted into the record, asserting that it demonstrated that the Delaney Clause was to "be used and applied within the 'rule of reason.'" Javits then engaged in an exchange with Senators Dirksen and Hill designed to create legislative support for a flexible interpretation of the Delaney Clause:

Mr. DIRKSEN. . . . They tell that both the Department of Health, Education and Welfare and private industries can live with this legislation, and that the rule of reason will prevail. I think that is the manner in which most of those who have come to discuss it, particularly the advisers of some of the commercial interests, have approached it.

Mr. JAVITS. [T]he assurance the Senator from Illinois has just given us . . . is a caveat to our own agency [FDA?] to apply the rule of reason. I yield to no one in my anxiety to have the law applied to the full, in terms of public health and safety. But at the same time we do not want the application of the law to "go overboard." We wish it to be fair. . . .

Mr. HILL. Mr. President, after consultations with Secretary Fleming . . . I wish to state that I agree. . . .

Mr. JAVITS. Mr. President, will the Senator from Alabama then join in the assurance given by [Mr. Dirksen], namely that, fully consistent with health and safety—and all of us are absolutely committed to guarding and safeguarding them in every possible way, he, too feels that the legislative record here should show clearly that the recommendation as to the application of the rule of reason by the enforcing agency is expected to be applied?

Mr. HILL. I would say so.³⁵¹

348. *Id.* at 14,378.

349. *Id.* at 15,136.

350. *Id.* at 15,380.

351. *Id.* at 15,381.

At the conclusion of this exchange, Senator Javits's motion to reconsider was tabled.³⁵²

It is difficult to know what to make of this episode. By the conventions of statutory interpretation, the colloquy among Senators Javits, Dirksen, and Hill is not entitled to much weight.³⁵³ It occurred long after the responsible committees had completed their work and a full week after the two houses had agreed on the final legislation. The Congressional Record does not reveal how many Senators were on the floor at the time Senator Javits moved for reconsideration; no others are recorded as participating in the discussion.³⁵⁴ One has the impression that Senator Javits and his colleagues were concerned that the 1960 Delaney Clause would restrict FDA's authority more than they believed desirable, and, accordingly, they seized upon a motion to reconsider as a device to "make history" of their own.

The Senators' statements are unilluminating. Senator Javits secures "assurance" from his two colleagues that "the rule of reason" should guide FDA's interpretation of the Delaney Clause. But we are left in the dark about how FDA is to apply this principle. In the light of discussions at both the hearings and on the House floor, it would be entirely reasonable to infer that Javits and his colleagues wished to reaffirm FDA's authority to exercise scientific judgment in interpreting the results of animal experiments. No passage indicates that they were focusing on the Agency's authority to incorporate later-developed techniques for quantifying the risks of low-dose carcinogens.

D. *The Delaney Clause's Legislative History: An Evaluation*

The legislative history of the Delaney Clause contains many gaps and apparent inconsistencies. They are particularly obvious in this chronicle of the broken path to enactment in both 1958 and 1960. In 1958, the origi-

352. *Id.* at 15,382.

353. G. FOLSOM, *supra* note 304, at 36. Defenders of FDA's current interpretation claim that this passage, and particularly the statements of Senator Hill, who chaired the Senate Committee, is entitled to substantial weight as evidence of Congressional understanding of the 1960 anticancer clause. See Brief for Intervenor-Respondent at 32, *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987) (No. 86-1548). The cases cited for this proposition, however, all involve statements made by the managers or proponents of legislation prior to passage. The quoted statements of Senator Hill were made a week after the Color Additive Amendments were passed and outside the hearing of its chief proponents. Moreover, they were made in the chamber that had initially, albeit without comment, declined to include the anticancer language. The reader will note that the Senators are careful not to claim that Secretary Flemming, the chief architect of the 1960 clause, agreed with their position.

Indeed, the staging of this unusual exchange after formal enactment of the 1960 statute suggests that the participants were worried that the case for flexibility in the application of the Delaney Clause had been lost—or, more accurately, had been surrendered by FDA's chief spokesman, Secretary Flemming himself.

354. 106 CONG. REC. 15,381 (1960).

nal Delaney Clause appears in the House bill just before floor passage, and is agreed to by the Senate without careful review. The 1960 version of the Clause receives more attention, and a vigorous defense from HEW, during the House deliberations, but again gains Senate approval without discussion.

Notwithstanding the fragmentary character of this legislative record, several conclusions can be ventured. First, by 1960 FDA (or at least its parent, HEW) had not only embraced the principle of the Delaney Clause but had adopted what industry spokesmen considered an overly rigid interpretation of the 1958 language. Second, while one can identify differences in the language used to explain and defend the two versions of the Delaney Clause, there appears to have been general agreement that they meant the same thing—at least with respect to additives that consumers ingest. Third, Agency (as well as industry) spokesmen appear to have secured agreement that the Clause as enacted preserved an important role for scientific judgment in determining whether an additive caused cancer—what will be termed diagnostic judgment. FDA sought to protect, it seems, those areas of judgment involving the interpretation of experimental observations and the assessment of routes of administration.

Fourth, the history strongly supports the conclusion that FDA was not to have authority to set “tolerances” for carcinogenic additives, that is, to determine that specific use or residue levels would be safe for human consumption. The history says nothing about the Agency’s authority to decide that the estimated incidence of cancer in test animals at “realistic” exposure levels is so low that a carcinogenic additive cannot be said to “induce cancer” within the meaning of the statute. But this is so novel a theory that the history’s silence tells us nothing. While the history supports FDA’s central role in determining whether an additive “induces cancer,” this is repeatedly characterized as a scientific, rather than a legal, determination.

The most telling passages of the legislative history are those from the 1960 House Report and the preceding hearings in which Secretary Flemming—the official formally responsible for administering both laws—discusses the relationship between administration and legislation. Before the committee that, in both years, was the main arena for debate, he not only disclaimed the ability of Agency scientists to determine levels of carcinogenic additives that humans may safely consume; he promised to seek formal Congressional approval before allowing FDA to rely on any subsequent insights into the risks posed by low-dose carcinogens. No member of Congress or spokesman for FDA ever questioned or challenged Flemming’s assurances.

VI. Conclusion

FDA's protracted divorce of the Delaney Clause revives debate over the allocation of policy-making power between Congress and the executive. The Agency's immediate policy, while explained as the product of statutory interpretation, is obviously the work of administrators. As such, the policy does not differ substantially from those adopted by other regulatory agencies.³⁵⁵ Nor is FDA's theory that the Delaney Clause does not forbid approval of all carcinogenic additives noteworthy simply because it departs from the Agency's historical interpretation. Administrators often change their policies, and their legal authority to do so is well established.³⁵⁶ Rather, FDA's current approach is provocative precisely because the statute appears, and has long been considered, more explicit than other health laws. It has been assumed that FDA had less discretion to ignore (or approve) low-level carcinogens than sister agencies because Congress had, with uncommon clarity, declared that carcinogenic additives should not be allowed in human food.³⁵⁷

In this conclusion, after endorsing the substance of FDA's policy, I examine the practical consequences of these efforts. I then question the legality of FDA's de minimis theory and briefly discuss the rebuff that the Agency suffered in the first court challenge to its interpretation. I conclude with some comments on the roles of legislation and administration in the formulation of regulatory policy.

A. *The Anomalies of the Delaney Clause*

I accept the premise that the policy articulated in the Delaney Clause is unsound. If interpreted to require banning of all food and color additives that are animal carcinogens, without regard to potency or extent of human exposure, the Clause will dictate many disruptive decisions that yield little

355. For example, EPA's proposed acceptable risk level for hazardous waste constituents classified as probable carcinogens on the basis of human epidemiology or animal bioassays was a lifetime risk of 10^{-6} (one case in one million lifetimes). EPA, Hazardous Waste Management System: Land Disposal Restrictions, 51 Fed. Reg. 1602, 1628 (1986). The Agency also relied on risk assessment in setting maximum contaminant levels for drinking water: "For drinking water contaminants, the target reference risk range is 10^{-4} to 10^{-6} and most regulatory actions in a variety of EPA programs have generally fallen in this range. . . ." EPA, National Primary Drinking Water Regulations; Synthetic Organic Chemicals; Monitoring for Unregulated Contaminants, 52 Fed. Reg. 25,690, 25,698 (1987); see also D&C Orange No. 17, *supra* note 27, at 28,344-45 (FDA's own discussion of other agencies' approaches, including EPA and OSHA).

356. "An initial agency interpretation is not instantly carved in stone. On the contrary, the agency, to engage in informed rulemaking, must consider varying interpretations and the wisdom of its policy on a continuing basis." *Chevron U.S.A. Inc. v. Natural Resources Defense Council*, 467 U.S. 837, 863-64 (1984).

357. See *supra* text accompanying notes 1-7; OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 13, at 182, 196, 204.

or no public health gain. Carcinogens differ in potency,³⁵⁸ sometimes dramatically, and human exposure to materials used in food production varies widely.³⁵⁹ Since the human risk associated with exposure to a carcinogen is a function of potency and exposure, a policy that allows no discrimination among carcinogenic additives will ban some that pose only trivial risks.³⁶⁰

FDA is convinced, correctly in my view, that the number of compounds this policy imperils is larger than Delaney's proponents ever anticipated. More "additives" are being detected in food and a sizeable share are laboratory carcinogens.³⁶¹ Even if one concludes from this evidence that we should be more, rather than less, concerned about carcinogens added to food—a conclusion I do not accept³⁶²—one should favor a policy that allows regulators to differentiate between large and small risks.

The Delaney Clause's limited reach creates other anomalies. The Clause does not apply to constituents that are not "added" to human food—an elusive, but not empty, category.³⁶³ It does not apply to ingredients sanctioned by FDA or the Department of Agriculture prior to 1958.³⁶⁴ It does not forbid residues of carcinogenic pesticides on raw foods or in processed food at levels that do not exceed raw food tolerances.³⁶⁵ These "exceptions" to the Delaney Clause are apparent on the face of the statute. The number grows when one adds the exceptions resulting from FDA's careful parsing of the DES proviso and of the definition of "additive."³⁶⁶

Thus, even if one embraced the heroic view that we should allow no carcinogens to be added by human agency to food, the Delaney Clause is a pale imitation of such a policy. Its boundaries and exceptions invite ingenious, sometimes sophisticated, arguments to protect important food ingredients suspected of inducing tumors in rodents. Combined with the general propensity of regulators to demand more evidence before restricting old chemicals than before refusing approval of new ones, the large gaps in Delaney's wall favor old additives and disfavor new ones. Peter Huber

358. Ames, Magaw & Gold, *supra* note 95, at 272; OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 13, at 191.

359. RISK ASSESSMENT, *supra* note 7, at 27.

360. See Ames, Magaw & Gold, *supra* note 95, at 271.

361. See *supra* text accompanying notes 65-94.

362. Basic food constituents, such as fat, are considered more worrisome. See Cohen, *Diet and Cancer*, SCI. AM., Nov. 1987, at 42; COMMITTEE ON DIET, NUTRITION AND CANCER, *supra* note 11.

363. See R. MERRILL & P. HUTT, *supra* note 129, at 59-62. Some of these inherent constituents are animal carcinogens. See *supra* text accompanying notes 94-112.

364. See *supra* text accompanying note 54; Merrill, *supra* note 19, at 214-17.

365. See *supra* text accompanying notes 50-51; REGULATING PESTICIDES, *supra* note 31, at 25-27.

366. See *supra* text accompanying notes 117-57 & 203-16.

has discussed this subject elsewhere, revealing the law's inequity and documenting its perversity, for newer technologies are often safer than older ones.³⁶⁷

The Delaney Clause imposes another cost, a cost which will be paid so long as their boundaries remain elusive. Whenever a food constituent that enjoys consumer or commercial acceptance falls under suspicion, FDA comes under pressure to delay a decision. The temptation to seek additional tests or invite review by esteemed experts becomes very strong.³⁶⁸ Agency decisionmakers recognize that their room to maneuver will shrink as soon as they acknowledge that an additive "induces cancer" or that traces of a known carcinogen have been found in food. Public and Congressional reactions to FDA's abortive effort to ban saccharin have likely reinforced inclinations to equivocate and delay.

In short, the case for repeal of the Delaney Clause seems to me convincing. And to the extent that FDA's inventive interpretations have sculpted a wiser policy, analysts ought to congratulate the Agency. But there remain important questions about the content of the policy that FDA has devised, and serious doubts about its legality.

B. *Policy Implications of De Minimis*

1. *Accuracy of FDA's Risk Estimates*

FDA officials profess confidence in their ability to differentiate between carcinogens that pose significant health risks for humans and those that at most pose trivial risks.³⁶⁹ The basic methodology that the Agency uses enjoys broad, though not unquestioning, support within the scientific community, and it parallels the approaches of other agencies responsible for regulating carcinogens.³⁷⁰ Quantitative risk assessment assumes that the human risk posed by exposure to a substance capable of causing cancer is a product of the substance's potency and the extent of exposure.³⁷¹ At some level of generality, this assumption appears to command universal acceptance. Accordingly, if FDA's methods for measuring potency and exposure and estimating risks were equally well accepted, it would be hard to reject its policy on public health grounds. Because these methods re-

367. See Huber, *The Old-New Division in Risk Regulation*, 69 VA. L. REV. 1025, 1107 (1983); Huber, *Exorcists vs. Gatekeepers in Risk Regulation*, REGULATION, Nov./Dec. 1983, at 23.

368. See Hutt, *Public Policy Issues in Regulating Carcinogens in Food*, 33 FOOD DRUG COSM. L.J. 541, 550 (1978). FDA referred cyclamate twice, and saccharin three times to the NAS for review of their safety. See Merrill & Taylor, *supra* note 10, at 28-43.

369. See, e.g., Policy for Regulating Carcinogenic Chemicals in Food and Color Additives, 47 Fed. Reg. 14,464, 14,466 (1982) (FDA "Constituents Policy" authored by Commissioner Hayes).

370. See *supra* text accompanying note 361.

371. REGULATING PESTICIDES, *supra* note 31, at 33.

main unverified, we cannot be confident that FDA's risk estimates will always prove true. But science has not yet produced better methods, and the alternative to quantitative risk assessment is ignorance—with or without Delaney.

Two circumstances persuade me that FDA's estimates of cancer risks are not likely to jeopardize public health. First, like EPA and OSHA, FDA incorporates into its calculations assumptions about likely human exposure that are almost certainly exaggerated.³⁷² The second key step in estimating the risk of a chemical shown carcinogenic in animal studies is to extrapolate from the measured incidence of cancer at known exposure levels to the potential incidence at projected human exposure levels. Here again FDA's standard risk assessment procedures are calibrated to avoid underestimating human risk.³⁷³

We should not ignore the uncertainty inherent in FDA's claim that the human cancer risk of Red No. 19, for example, is no greater than one in nine million. But the Agency's basic approach makes sense. There ap-

372. In estimating dietary exposure to residues of carcinogenic pesticides, EPA assumes that all acres of a crop have been treated with the agent and that all food sold contains residues at the permitted tolerance level. FDA's exposure estimates for conventional food ingredients are based on more concrete use and consumption data, but they nonetheless tilt towards overestimating exposure. *Id.* at 32. FDA has similarly relied on "worst case" exposure estimates for color additives in cosmetics when it was not confident that "reasonable estimates" could be made. D&C Orange No. 17, *supra* note 27, at 28,337-41; see RISK ASSESSMENT, *supra* note 7, at 101; Office of Science and Technology Policy, Chemical Carcinogens; Review of the Science and Its Associated Principles, 49 Fed. Reg. 21,594, 21,648-49 (1984); Policy for Regulating Carcinogenic Chemicals in Food and Color Additives, 47 Fed. Reg. 14,464, 14,468-69 (1982).

373. The extrapolation involves two important assumptions. One is that humans are likely, as a qualitative matter, to respond to the chemical as rodents do. RISK ASSESSMENT, *supra* note 7, at 22-23; OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 13, at 169-70. The second assumption is that the relationship between dose and response in humans is likely to mimic the dose-response observed in animals. RISK ASSESSMENT, *supra* note 7, at 24-26; OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 13, at 169-70. Scientists have no way to validate this assumption for compounds that have been evaluated only in animals, the class into which virtually all putative candidates for regulation under the Delaney Clauses will fall.

Even acceptance of this second assumption does not avoid uncertainty, for the analyst usually has no direct evidence in animals of the relationship between dose and response at levels of exposure comparable to those that humans encounter. The accepted practice of administering agents at the so-called "maximum tolerated dose" typically produces tumors only at dose levels far higher than any humans will encounter. To bridge this gap the analyst uses one of several mathematical models to simulate a dose-response relationship at levels below those actually administered. These hypothetical lower doses are then converted into human equivalents to derive estimates of human risk. For a more detailed account of risk assessment see RISK ASSESSMENT, *supra* note 7, at 17-49.

This discussion illustrates only the most obvious uncertainties involved in the analysis that is the heart of FDA's current policy. The resulting estimates would be subject to dispute even if only one extrapolation model were available. But several models exist, and they may predict quite different risks at low human dose equivalents. *Id.* at 24-25; OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 13, at 160-63. FDA has sought to meet objections by incorporating several "conservative" features in its risk assessment protocol. For example, it generally employs one of the most conservative extrapolation models and often offers estimates from more than one model before concluding that the risk posed by an additive is de minimis. Policy for Regulating Carcinogenic Chemicals in Food and Color Additives, 47 Fed. Reg. 14,464, 14,468-69 (1982).

pears to be no good alternative if one believes it desirable to try to differentiate among the health risks posed by carcinogens found in human food. Furthermore, while evidence bearing on the assumption that humans exposed to comparable doses are likely to display approximately the same (or no greater) rate of cancer predicted for animals is not voluminous, what evidence there is, is reassuring. A recent survey supports earlier findings, based on a smaller sample, that quantitative estimates based on animal studies are not likely to underestimate human risks.³⁷⁴

No agency or legislator can escape the reality that regulating human exposure to chronic health hazards is an uncertain exercise. Data about health effects is costly and always in short supply. Information about human exposure is often meager. Limitations inherent in epidemiological studies prevent discovery of the effects of many environmental agents. Indeed, these limitations will as a practical matter prevent validation of any FDA finding that a specific carcinogen poses risks too small to worry about, for the background incidence of cancer obscures the contribution of all but the most significant causes. We must find comfort in the knowledge that the primitive tools FDA has relied on to fashion a more risk- and cost-sensitive regulatory policy are the best available.

2. *Impact on Additive Approvals*

Before assessing the operational impact of FDA's new policy, we must first establish what that policy is. This exercise was difficult before the D.C. Circuit's recent rejection of FDA's *de minimis* interpretation because the Agency had never embraced general criteria for classifying risks as trivial; the court's ruling has added another major uncertainty to the calculus. But an even greater source of uncertainty is our ignorance of the results of toxicological studies yet to be done on additives yet to be developed. To assess FDA's detour around the Delaney Clause requires more than a map of the new route and an estimate of structural stability—we need some estimate of the traffic.

If the Supreme Court were to reverse the D.C. Circuit, the immediate consequence of FDA's decisions would be the continued approval of Red No. 19 and Orange No. 17. At first blush these appear to be gains as trivial as the risks that are said to accompany the colors. But the persistence of their users suggests either that the two colors are commercially important or that other important colors are likely to be sheltered by a favorable ruling. Both may be true. FDA's "constituents" policy protected

374. See K. Crump, Correlation of Carcinogenic Potency Between Animals and Humans, Presentation of the Risk Science Institute of the International Life Sciences Institute (May 5, 1987); OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 13, at 170-71.

more than Green No. 5.³⁷⁵ And its SOM proposal purported to set general standards for the continued use or fresh approval of carcinogenic animal drugs, although the Agency (correctly) anticipated that DES would fail the test.³⁷⁶

One can identify several approved additives that have survived as a result of FDA's efforts to escape or make sense of the Delaney Clause.³⁷⁷ But it is more difficult to identify any new additives—direct ingredients, colors, animal drugs, or packaging materials—that have gained approval. Pesticides comprise the category in which such gains might be observed first; while many display carcinogenic properties, some uses carry low risks because exposure is low.³⁷⁸

Some ingredients would not be saved by any theory yet advanced. FDA's original *de minimis* theory asserted that carcinogenic additives whose risks were trivially small could be ignored. While the Agency never purported to set a specific risk cutoff,³⁷⁹ its adoption of one in one million lifetime risk in its SOM proposal and its frequent allusions to this precedent suggested that this risk level had become an operational definition of "safe."³⁸⁰ The implication has been that additives posing higher risks would encounter difficulty. On this assumption, saccharin would not gain approval. FDA's original estimate (prepared hurriedly in 1977 to support its conclusion that the sweetener would have been banned even if the Delaney Clause had not applied) placed the bladder cancer risk at four in ten thousand.³⁸¹ Few carcinogenic direct additives are likely to fall within

375. Both Agency officials and industry representatives were aware that other colors had been, or would be, found to contain carcinogenic contaminants whose presence, under FDA's old interpretation of Delaney, would require them to be banned. See D&C Green No. 5, Final Rule, 47 Fed. Reg. 24,278, 24,279 (1982).

376. There is doubt, however, whether the SOM theory has facilitated approval of any animal drug that might have failed under a more wooden interpretation of the law. The costs of performing the several studies needed to determine the required level of assay sensitivity for a carcinogenic drug are potentially very high, and may deter manufacturers from seeking to secure, perhaps even to defend, FDA approval of products whose economic returns are not expected to be, or are not, fully compensatory. See Becker, *Sensitivity of Method—Legal Implications*, 35 FOOD DRUG COSM. L.J. 355, 358 (1980). Even FDA officials have acknowledged that the conditions for satisfying the Agency's revised interpretation of the DES proviso could prove expensive. See Norcross, *Sensitivity of Method—A Wave of the Future*, 35 FOOD DRUG COSM. L.J. 342, 346 (1980).

377. See *supra* text accompanying notes 121–24 (PCBs), 125–27 (aflatoxin), 130–39 (selenium), 173–85 (acrylonitrile), 190–99 (lead acetate), 205–16 (Green No. 6), 223–27 (methylene chloride).

378. REGULATING PESTICIDES, *supra* note 31, at 54, 76–77.

379. See *Cosmetics; Proposed Ban on the Use of Methylene Chloride as an Ingredient of Aerosol Cosmetic Products*, 50 Fed. Reg. 51,551, 51,557 (1985); D&C Orange No. 17, *supra* note 27, at 28,344–45.

380. See *Cosmetics; Proposed Ban on the Use of Methylene Chloride as an Ingredient of Aerosol Cosmetic Products*, 50 Fed. Reg. 51,551, 51,557 (1985); D&C Orange No. 17, *supra* note 27, at 28,344–45.

381. Saccharin and its Salts, 42 Fed. Reg. 19,996, 20,000–01 (1977).

FDA's operational definition because they generally are consumed in quantities too large to yield risks of one in one million or less.

Thus, before the Justice Department intervened, the principal beneficiaries of FDA's *de minimis* theory appeared to be existing direct additives used in small quantities, such as colors, and various existing indirect additives, such as packaging materials and pesticides. This is hardly surprising, for the theory was a product of the Agency's desire to avoid disruptive actions against incumbent chemicals whose carcinogenicity was discovered long after their original introduction.

We should not overlook another of FDA's theories for avoiding the Delaney Clause—the so-called “secondary carcinogen” theory, which sustained its approval of selenium as an animal feed supplement.³⁸² This decision can be viewed as the earliest official embrace of the now widely accepted belief that carcinogens operate by different mechanisms. This topic is too arcane to explore in detail here.³⁸³ Suffice it to say that as scientists have learned more about how cancers develop they have recognized distinctions among different kinds of agents associated experimentally with tumor induction.³⁸⁴

The significance of these scientific advances for regulation lies in the acceptance of the proposition that some carcinogens do not produce tumors in the absence of exposure to other toxic agents and the speculation that the tumorigenic effect of others may be dose-dependent. Former FDA Commissioner Donald Kennedy once acknowledged that he expected scientists eventually to be able to demonstrate that some carcinogens display thresholds, i.e., do not cause cancer below specified doses.³⁸⁵ FDA's selenium decision in effect interpreted the statutory language “induce cancer” as applying only to carcinogens that conform to the no-threshold generalization on which the Delaney Clause rests. Evidence for a threshold for specific additives may be difficult to generate, but it is likely that such a showing can be made for some. And, in such cases, the escape from Delaney has already been charted.³⁸⁶

382. See *supra* text accompanying notes 130–39.

383. See OFFICE OF TECHNOLOGY ASSESSMENT, IDENTIFYING AND REGULATING CARCINOGENS 62–65 (1987).

384. See Office of Science and Technology Policy, Chemical Carcinogens; Review of the Science and its Associated Literature, 49 Fed. Reg. 21,594, 21,600–15 (1984).

385. *Oversight of Food Safety, 1983: Hearings Before the Senate Comm. on Labor and Human Resources*, 98th Cong., 1st Sess. 25 (1983).

386. FDA is currently considering permanent listing of a color additive, Red No. 3, which appears to be carcinogenic in rodent bioassays, but only, according to its proponents, by a “secondary” mechanism of action. According to the Agency, this hypothesis suggests the possibility of regulating the color “under the general safety requirement, rather than the anticancer clauses,” of the FD&C Act. FD&C Red No. 3; Availability of Final Report of FD&C Red No. 3 Peer Review Panel, 52 Fed. Reg. 29,728 (1987); see also Provisionally and Permanently Listed User of FD&C No. 3 and of its Lakes; Request for Data for Specific Uses, 52 Fed. Reg. 44,485 (1987).

This route will not be closed even if the courts decisively reject FDA's *de minimis* theory. The Agency's explanation for approving selenium did not require it to renounce prior statements about the meaning of Delaney. Furthermore, the 1958 and 1960 legislative histories contain numerous statements that FDA retained discretion to decide whether a particular additive "induces cancer." These passages did not touch on the possibility that FDA might be presented with evidence that an additive caused tumors but only when administered with other agents or at doses high enough to cause obvious organ damage. But statements that FDA was to employ the best science in its assessment of animal experiments are easily found.³⁸⁷ Moreover, the issue of what "induces cancer" means is of the sort that the Agency is empowered to resolve.³⁸⁸

This detour around the Delaney Clause may prove more significant than FDA's *de minimis* theory, which by its terms applies only to additives that have been found to "induce cancer" and in practice protects only those used in small quantities. The selenium decision, by contrast, is arguably a precedent for approving any additive, new or old, for which convincing showing of dose-limited carcinogenicity can be made. And nothing in the D.C. Circuit's recent rejection of FDA's *de minimis* theory speaks to the vitality of this precedent.

C. *Is FDA's Position Lawful?*

This article is not primarily concerned with the legality of FDA's reinterpretation of the Delaney Clause, but an understanding of the difficulty of the Agency's argument will contribute to an appreciation of the practical considerations that have motivated it. Accepting the premise that the policy embodied in the Delaney Clause, as historically understood, is dysfunctional, the question is whether the statute allows FDA to depart from that understanding.

The D.C. Circuit recently provided an unequivocal response.³⁸⁹ Writing for a unanimous panel, Judge Stephen Williams had no difficulty concluding that Congress, at least in the 1960 version of the Delaney Clause, had ruled out precisely the sort of discretion that FDA purported to exercise in approving Orange No. 17 and Red No. 19. While he accepted as "altogether correct" FDA's characterization of the colors' risks as "trivial," Judge Williams found that Congress could plausibly have concluded

387. See *supra* text accompanying notes 327, 329, 340 & 335.

388. "When a challenge to an agency construction of a statutory provision, fairly conceptualized, really centers on the wisdom of the agency's policy, rather than whether it is a reasonable choice within a gap left open by Congress, the challenge must fail." *Chevron U.S.A. Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 866 (1984).

389. *Public Citizen v. Young*, 831 F.2d 1108 (D.C. Cir. 1987).

that it was prudent to forbid the use of any color additive shown to cause cancer in laboratory animals. Though I find the court's opinion convincing, it may not be the last word on the issue, and thus one can justify some further, albeit abbreviated, examination of the legal issue.

Any attempt to divine the meaning of statutory language must concede the problematic character of the undertaking.³⁹⁰ One cannot say with certainty that the members of Congress who voted for the Delaney Clause intended that it should bar approval of all carcinogenic food and color additives, regardless of potency, regardless of exposure, regardless, in short, of their safety for human consumption. This is, however, what the statutory language seems to me to say, and the conventions of statutory interpretation hold that this "plain meaning" of the statute should govern—absent convincing evidence that it conflicts with the understanding of the drafters.³⁹¹ At the very least, FDA bears a heavy burden to demonstrate that another reading is legitimate as well as desirable. I am not satisfied that it has done so.

In assessing FDA's position we should distinguish between the arguments made by the Agency prior to the filing of the government's brief in the color additives case and those later advanced by the Justice Department. FDA originally argued that the Commissioner has authority to depart from the literal language of the Delaney Clause when its application would yield trivial public health gains, i.e., when the risk posed by a carcinogenic additive is *de minimis*.³⁹² This authority, FDA claimed, was "inherent" in every regulatory scheme, absent evidence that Congress had been "extraordinarily rigid" in its instructions.³⁹³ The Agency's treatment

390. Legislating is a collaborative process, in which some participants are more informed, or interested, or influential than others, and it is reckless to ascribe the views of articulate participants to all who vote for (or against) specific provisions. Drafters often select vague language because they are not capable of visualizing all of the situations to which a provision might apply, or because vagueness allows legislators holding divergent views to reach agreement, while consciously (or unconsciously) leaving the resolution of future disputes to the administrative process or judicial review. Even when legislators adopt precise language, they may entertain different views about what it means. And it is by no means uncommon for legislators who fail to secure adoption of the language they desired to litter the legislative record with assertions that the language actually enacted means more or less than its terms suggest. See generally G. FOLSOM, *supra* note 304.

391. "When Congress has thus spoken 'in the plainest of words' . . . we will ordinarily decline to fracture the clear language of a statute." *Andrus v. Sierra Club*, 442 U.S. 347, 356 (1978) (citation omitted); see also *TVA v. Hill*, 437 U.S. 153, 194 (1978) ("Our individual appraisal of the wisdom or unwisdom of a particular course consciously selected by the Congress is to be put aside in the process of interpreting a statute. Once the meaning of an enactment is discerned and its constitutionality determined, the judicial process comes to an end.").

392. See *supra* text accompanying notes 29-43, 228-33; D&C Orange No. 17, *supra* note 27, at 28,342-44; D&C Red No. 19, *supra* note 27, at 28,359-60.

393. See *supra* text accompanying notes 39-43; D&C Orange No. 17, *supra* note 27, at 28,342; D&C Red No. 19, *supra* note 27, at 28,359.

of the legislative history was designed to negate the inference that the 1960 Delaney Clause represented an example of “extraordinary rigidity.”

Thus FDA implicitly conceded that the “plain meaning” of the statute would dictate a contrary result. Furthermore, FDA acknowledged, as the Court of Appeals noted, that it historically had embraced this “plain meaning” view of the Delaney Clause.³⁹⁴ An agency may, of course, change its policies and even its interpretation of statutory requirements, but FDA did not invoke this principle because it was not purporting to interpret the Delaney Clause. Rather, it sought to justify a noninterpretivist application of the statute.

FDA’s argument faced difficulty on its own terms. If ever a statutory provision can be “extraordinarily rigid,” the Delaney Clause would appear to be such a provision. This apparent rigidity is not simply a product of language, but also of the Clause’s location. The Delaney Clause does not merely repeat Congress’s basic directive not to approve additives not shown to be safe; it appears to restrict the sort of scientific judgment that the Commissioner is authorized to reach under the general safety clause. It purports to dictate the policy consequences of a biological phenomenon.³⁹⁵ And this language was twice added to the law after the introduction of language requiring merely proof of safety. If the resulting provisions do not curtail administrative discretion, the exception recognized in *Alabama Power* would seem a null set.

FDA sought support for its theory in the legislative history. Several passages endorse FDA’s flexibility in administering the Delaney Clause, but one should distinguish between those (like HEW Assistant Secretary Elliot Richardson’s statement in 1958³⁹⁶) that claim the statutory language allows flexibility and those (like the report of the White House special panel in 1960³⁹⁷) that express the hope that the language can be flexibly interpreted or if necessary amended. For me, the two key passages are from 1960, and they suggest a contrary answer. In one, HEW Secretary Flemming assures the House Committee that the executive will seek new legislation if scientists ever devise methods for reliably determining that humans may safely be exposed to some doses of some carcinogens.³⁹⁸ This reads like an acknowledgement that the Congress is the appropriate body to decide whether quantitative risk assessment may be relied on to

394. See D&C Orange No. 17, *supra* note 27, at 28,342–43; D&C Red No. 19, *supra* note 27, at 28,359–60; Merrill, *FDA’s “Erasure” of the Delaney Clause: A Study in Statutory Interpretation* (The Glenn A. Kilpatrick Memorial Lecture), 50 A. FOOD & DRUG OFFICIALS Q. BULL. 199, 201–06 (1986).

395. See Merrill, *supra* note 19, at 202; Blank, *supra* note 270, at 1084–86.

396. See *supra* text accompanying note 301.

397. See *supra* text accompanying notes 336–40.

398. See *supra* text accompanying notes 329–31.

allow human exposure to carcinogenic color additives. The other key passage appears in the House Committee Report, whose authors explained that they declined to accept amendments that would empower FDA to allow traces of carcinogenic color additives if it found they would present no risk to humans.³⁹⁹

It is not necessary, however, to accept the proposition that the legislative history demonstrates that the Delaney Clause was meant to be as rigid as FDA had long contended. It is sufficient to point out that the legislative history is at very best ambivalent. The claim that the history as a whole demonstrates that the Delaney Clause was little more than a caution flag, a temporary reminder to FDA to “take care” with all carcinogens until science provided ways to differentiate those that pose only slight risks, is unconvincing.⁴⁰⁰

It may have been such difficulties that led the Justice Department to insist that FDA revise its reasoning. The government’s litigating theory—that the two colors do not “induce cancer within the meaning of the Delaney Clause” and thus are not barred by it⁴⁰¹—avoids concessions implicit in the Agency’s original position, but it confronts even greater difficulties.

The government’s latest argument gives no ground to advocates of “plain meaning.” The Commissioner’s assertion that neither color “induces cancer,” accompanied though it was by a disingenuous explanation that the Agency had never meant to say that they do,⁴⁰² renders the Delaney Clause literally inapplicable. Thus, the government has attempted to

399. See *supra* text accompanying notes 344–45.

400. Judge Williams found other passages in the 1960 legislative history that supported the conclusion that Congress had indeed meant to be “extraordinarily rigid” in the Delaney Clause. He expressly limited his ruling to that provision, holding out the possibility that the history of the 1958 version, which was not before the court, might support a different, more flexible reading. See *Public Citizen v. Young*, 831 F.2d 1108, 1119–20 (D.C. Cir. 1987). And, to be sure, the passages most damaging to FDA’s case are to be found in the history of the Color Additive Amendments. But FDA has not been entirely punctilious in its examination of the legislative history, and the Justice Department in its 1978 opinion on FDA’s contemplated “phase out” of sodium nitrite treated the 1960 history as reliable evidence of the reasoning that inspired the 1958 clause. Several passages of the later history say or imply that the 1960 version was intended to replicate—for colors—the same policy that Congress had adopted for food additives two years earlier.

FDA passed up, at least temporarily, the opportunity to make the case that the 1958 Delaney Clause allows it more discretion when it moved successfully to dismiss as premature the challenge to its continued approval of methylene chloride to decaffeinate coffee. *Public Citizen v. Bowen*, 833 F.2d 364 (D.C. Cir. 1987).

401. See *supra* text accompanying notes 234–51.

402. Commissioner Young’s language in the 1986 final rule listing Red. No. 19 suggests that the color fell squarely under the Delaney Clause: “Because D&C Red. No. 19 has been shown to be a carcinogen when ingested by laboratory animals, as discussed above, the Delaney Clause . . . is applicable. A strictly literal application of the Delaney Clause would prohibit FDA from finding that D&C Red No. 19 is safe, and therefore prohibit FDA from permanently listing the color. . . .” D&C Red No. 19, *supra* note 27, at 28,357. The same pronouncement was made for D&C Orange No. 17. D&C Orange No. 17, *supra* note 27, at 28,341.

shift the legal debate from the dubious existence of FDA's authority to ignore the Delaney Clause to the scope of its conceded authority to decide whether individual additives do "induce cancer," and, more important, to its implicit authority under *Chevron* to decide what "induce cancer" means. For the Justice Department this no doubt seems more congenial terrain.

But the government's claim for deference here strains credulity. The full details of the negotiations between FDA and the Justice Department are not public, but it appears clear that it was the lawyers who concocted the novel notion that an additive which causes malignant tumors in animals only at doses so high that the likelihood of tumors at comparable human doses is de minimis does not "induce cancer within the meaning of the Delaney Clause."⁴⁰³

The government's current legal position is difficult to reconcile with FDA's historical view, shared by other agencies, that high-dose animal tests are a reliable means for identifying human cancer hazards. In only two other cases has FDA discounted positive findings from such studies, and in only one of these cases did the Agency imply that such findings might not satisfy the "induce cancer" language of the Delaney Clause.⁴⁰⁴ The Commissioner's last-minute assertion that Red No. 19 and Orange No. 17 do not "induce cancer" is not merely a departure from the Agency's past statements about these colors; it repudiates a central pre-

403. To be sure, this notion has now been embraced by the Commissioner of Food and Drugs. The Justice Department prudently insisted that the Commissioner publish new decision documents embracing their theory, no doubt so they can escape precedents rejecting the "post hoc rationalizations of counsel."

The rule which the Agency sought to avoid is stated, for example, in *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Automobile Ins. Co.*, 463 U.S. 29, 50 (1983): "[C]ourts may not accept appellate counsel's *post hoc* rationalizations for agency action. . . . It is well established that an agency's action must be upheld, if at all, on the basis articulated by the agency itself."

For additional comment on FDA's revised interpretation of the Delaney Clause, see *Food Chemical News*, Feb. 23, 1987, at 35.

404. In evaluating selenium, FDA (and NCI) scientists found that tumors occurred only at dose levels high enough to cause frank liver damage, which appeared to be an essential precursor of cancer. The decision was qualified by findings that selenium was also ubiquitous in some regions, was an essential nutrient, and was naturally present in food derived from many animals. *Selenium in Animal Feed*, Proposed Additive Regulation, 38 Fed. Reg. 10,458 (1973).

In the case of lead acetate, FDA relied on the "appropriate test" language in the non-ingestion phrase of the 1960 Delaney Clause to discount the applicability of animal feeding studies in assessing the carcinogenicity of an additive to which humans would be exposed, if at all, only by dermal absorption. The Agency did not suggest that the lead acetate had not "induced cancer." See *Lead Acetate: Listing As a Color Additive in Cosmetics That Color the Hair on the Scalp*, 45 Fed. Reg. 72,112, 72,115 (1980). FDA specifically rejected arguments that the feeding studies of Red. No. 19 and Orange No. 17 were not "appropriate" for assessing the cancer risks posed by the external uses of these colors. D&C Orange No. 17, *supra* note 27, at 28,342; D&C Red No. 19, *supra* note 27, at 28,358-59.

mise of carcinogenicity tests, which routinely employ high doses to reveal whether an agent has the capacity of causing tumors.⁴⁰⁵

The Justice Department has had the Commissioner claim that the phrase "induce cancer" is a term of art, to be given meaning by FDA in light of the objectives of the Color Additive Amendments. Though this argument has superficial plausibility, on close analysis it is unconvincing. Without question, FDA has always recognized the "induce cancer" inquiry as requiring the exercise of judgement. A report that a compound has proved carcinogenic in one experiment does not automatically trigger the conclusion that it "induces cancer." This label is for the Agency to apply, and its application customarily has been the product of careful, often protracted review of the evidence.⁴⁰⁶ But FDA has not previously suggested (save perhaps in the case of selenium) that whether an additive "induces cancer" in animals depends on the magnitude of the cancer risk that it presents—for animals or for humans. Indeed, until recently the Agency's position was that Congress had made this inquiry irrelevant, at least for direct additives.⁴⁰⁷ It viewed the "induce cancer" inquiry as a matter of investigating a compound's biological activity in animals, an inquiry distinct from, albeit obviously linked to, assessment of its risks for humans. The Commissioner's revised ruling has entirely obscured this distinction.⁴⁰⁸

The D.C. Circuit's treatment of the government's argument is bemusing. While Judge Williams recounts in skeptical language the Commissioner's attempts to retract earlier statements that Red No. 19 and Orange No. 17 induced cancer, he proceeds to decide the case on the basis, and in the face, of the arguments originally advanced by FDA. The Department of Justice's novel theory is given virtually no attention.⁴⁰⁹

405. See RISK ASSESSMENT, *supra* note 7, at 23–24; OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 13, at 123–26.

406. FDA scientists have embraced a rather elaborate set of formal criteria for evaluating animal studies—criteria for pathological diagnosis, differentiation between benign and malignant tumors, for statistical significance, etc. See generally BUREAU OF FOODS, FDA, TOXICOLOGICAL PRINCIPLES FOR THE SAFETY ASSESSMENT OF DIRECT FOOD ADDITIVES AND COLOR ADDITIVES USED IN FOOD (1982).

407. See Saccharin and Its Salts: Proposed Rulemaking, 42 Fed. Reg. 19,996 (1977). Saccharin also demonstrates that some carcinogenic additives provide benefits that may outweigh even significant cancer risks. The Delaney Clause is often cited as the reason FDA could not take those benefits into account. But this is one defect of the statute for which Delaney is not responsible, and which judicial (or legislative) approval of FDA's *de minimis* theory would not correct. FDA has consistently held that the general safety clause does not allow consideration of an additive's benefits. This position has never been seriously challenged, and the legislative history supporting the Agency's view appears unconvincing. See Cooper, *The Role of Regulatory Agencies in Risk-Benefit Decision-Making*, 33 FOOD DRUG COSM. L.J. 755, 757–58 (1978).

408. For the importance of maintaining the distinction, see RISK ASSESSMENT, *supra* note 7, at 19–40.

409. See *Public Citizen v. Young*, 831 F.2d 1108, 1120–22 (D.C. Cir. 1987).

FDA's *de minimis* theory and the Justice Department's reformulation share one common feature; both deprive the Delaney Clause of any independent force. Or perhaps, more cautiously, one should say that neither identifies a set of circumstances in which the Clause would affect decisions FDA would reach under the general safety standard alone.⁴¹⁰ This result is not inconsistent with FDA's latterday view of the Delaney Clause as essentially a reaffirmation of the general safety clause, couched in terms that reflected scientists' prevailing, but temporary, inability to determine "safe" exposure levels for carcinogens. The Agency's willingness to read the Delaney Clause out of the statute contrasts sharply with the reasoning in its SOM proposal. There it claimed that to interpret the DES proviso as forbidding approval of any carcinogenic drug which might leave residues, no matter how minuscule, in food derived from treated animals, would render the provision a nullity. It invoked the familiar rubric that statutes should be interpreted to give effect to all of their provisions.⁴¹¹

D. *The Roles of Congress and Executive*

I have suggested that the debate over FDA's reinterpretation of the Delaney Clause is at one level a debate over the appropriate arena for making food safety decisions. For someone who views the Clause as at once an explicit and imprudent expression of legislative will, this debate is especially disconcerting. Congress not only adopted a clear but unwise rule for regulating carcinogenic additives; it has since displayed no capacity to come to grips with the serious practical problems that the current law creates.

I believe that the law should allow FDA to use quantitative risk assessment in evaluating and regulating all carcinogens found in food. I say "allow" because it would be a mistake for Congress to dictate that quantitative risk assessment or any other specific methodology be used. To prescribe a specific analytical approach for the resolution of food safety issues would be to repeat the error of Delaney. Before it was amended to satisfy Congressman Delaney, the proposed food additives bill provided a right answer: it specified that only "safe" additives were to be approved, thus mandating a risk-averse strategy and clearly (albeit implicitly) ruling out consideration of benefits. This answer was "right" because the democratically responsible branch would have established the contours for administrative decisionmaking in language that would have allowed FDA to ex-

410. See Merrill, *supra* note 394.

411. See Chemical Compounds in Food-Producing Animals: Criteria and Procedures for Evaluating Assays for Carcinogenic Residues, 44 Fed. Reg. 17,070, 17,077 (1979); see also *supra* text accompanying notes 140-57.

plot advances in toxicology, chemical analysis, and risk assessment as they gained acceptance and proved practical in regulatory decisionmaking. FDA's decision to ban saccharin in 1977 suggests that this framework might not always have worked. But one hard case does not prove that a "safety only-no benefits" formula would not be the appropriate formula for Congress to embrace for the general run of cases.

By the same token, it would not have been a mistake for Congress, either in 1958 or later, to allow FDA to consider the benefits of individual additives. Whether such factors should generally have a role in decisionmaking is the sort of question Congress ought to resolve, and FDA could have lived with either choice. The Delaney Clause is troublesome because it prescribes a formula for decisionmaking that has proved more than redundant of the general safety clause—and has threatened (if rarely produced) disruptive decisions that would not contribute significantly to consumer safety.

The more troubling message of the saccharin episode was that Congress seems unprepared to correct the deficiencies in the current statute. Distrust of the executive branch produced proposals couched in language almost as rigid and as likely to prove dysfunctional as the original Delaney Clause. The challenge of devising different formulae and procedures for regulating several categories of food constituents taxed the patience of members of Congress and their staffs. Quick action to protect saccharin eliminated immediate pressure to act, and FDA's subsequent ingenuity in applying the Delaney Clause has averted further crises.⁴¹²

The price of Congressional inaction is probably small: the evisceration of a controversial but ultimately unimportant provision, coupled with very slight increases in the cancer risks of food consumers. But there is another cost as well. It is not any loss of administrative authority. FDA is as well armed, statutorily, to regulate food safety as it would have been had Congress declined to adopt Congressman Delaney's famous clause. Even if its decisions approving Red No. 19 and Orange No. 17 are finally overturned, it will find ways to avoid banning carcinogenic food constituents that pose very small risks. But its success in the face of such statutory precision should convince drafters of the futility of efforts to cabin administrative power through positive law. Perhaps this is a small cost too.

412. For a brief account of legislative attempts to broaden the discretion that FDA could exercise regarding food safety in the years following the Saccharin Ban, see Hutt, *supra* note 169, at 598-600.