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The Patentability of Living Organisms Under 35 U.S.C. § 101: *In Re Bergy*

In re Bergy, 563 F.2d 1031 (C.C.P.A. 1977), *vacated and remanded sub nom. Parker v. Bergy*, 98 S. Ct. 3119 (1978).

I. INTRODUCTION

In a landmark decision the United States Court of Customs and Patent Appeals in *In re Bergy*¹ held that a microorganism² may be patented by its inventor, thus addressing the unsettled question of whether living things are statutory subject matter under 35 U.S.C. § 101.³ Section 101 provides the following definition of categories of patentable subject matter:

Inventions patentable.

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.⁴

In the age of outstanding developments in discoveries of microorganisms and their usefulness in chemical, pharmaceutical and related industries,⁵ the holding in *Bergy* bridges the gap between

1. 563 F.2d 1031 (C.C.P.A. 1977), *vacated and remanded sub nom. Parker v. Bergy*, 98 S. Ct. 3119 (1978).

2. Microorganism is the general term for a living organism of microscopic or ultramicroscopic size.

3. (1976).

4. 35 U.S.C. § 101 (1976).

5. See Wegner, *Patenting Nature's Secrets—Microorganisms*, 7 INT'L REV. INDUS. PROP. & COPYRIGHT L. (1976). The author presents a timely example of the imperative need for the development of microorganisms. In the future, the world will be faced with shortages not only in fuel and mineral supplies, but also in essential chemical starting materials such as steroids used in the manufacture of the "Pill." A recent discovery employing the chemical characteristics of a microorganism has revealed a new source of the steroid used in the "Pill," thereby averting the threatened shortage.

these discoveries and the previous lack of legal mechanisms available to protect and encourage microbiological research. While the court specifically limited the scope of its holding to microorganisms,⁶ an important and interesting question is whether the decision will be extended to other living things, *i.e.*, whether a patent will be obtainable for recombinant DNA discoveries⁷ or a new, improved strain of chicken.⁸

The United States Constitution extends Congress the authority to enact legislation necessary to protect inventions:⁹ "The Congress shall have power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors^[10] and Inventors the exclusive Right to their respective Writings and Discoveries."¹¹ Since 1790 Congress has continuously fulfilled this mandate and provided federal statutory protection to inventors.¹²

A patent is a contract between the inventor and the United States that is designed to be an incentive for the private production of inventions which will benefit the public. The court in *Rubber Tire Wheel Co. v. Milwaukee Rubber Works Co.*,¹³ succinctly stated the policy and operations of the patent statute:

Inventive minds may fail to produce many useful things that they would produce if stimulated by the promise of a substantial reward; what is produced is the property of the inventor; he and his heirs and assigns may hold it as a secret till the end of time; the public would be largely benefited by obtaining conveyances of these new properties; so the people through their representatives say to the inventor: Deed us your property, possession to be yielded at the end of 17 years, and in the meantime we will protect you absolutely in the right to exclude everyone from making, using

6. 563 F.2d at 1035.

7. See Brief for the Commissioner of Patents and Trademarks at 20, *In re Bergy*, 563 F.2d 1031 (C.C.P.A. 1977), *vacated and remanded sub nom. Parker v. Bergy*, 98 S. Ct 3119 (1978). See also Otten, *Patenting Life*, Wall St. J., Jan. 26, 1978, at 16, col. 3. The commentator reported on *In re Chakrabarty*, 153 F.2d 40 (C.C.P.A. 1978), which was argued before the Court of Customs and Patent Appeals on December 5, 1977, and was decided on March 2, 1978. In that case, General Electric Co. sought a patent on a bacteria that "contains extrachromosomal genetic material that produces oil-degrading enzymes—a discovery of obvious use in combating oil spills." Otten, *supra*, at 18. To declare such an invention patentable, the commentator stated, arguably "moves a significant step closer towards recombinant DNA technology." *Id.*

8. See *In re Merat*, 519 F.2d 1390 (C.C.P.A. 1975). See also notes 66-68 & accompanying text *infra*.

9. U.S. CONST. art. I, § 8, cl. 8.

10. This clause empowers the Congress to enact copyright laws for the protection of authors. These provisions are codified in 17 U.S.C. §§ 101-810 (1976).

11. U.S. CONST. art. I, § 8, cl. 8. See *McClurg v. Kingsland*, 42 U.S. 202 (1843).

12. See 1 A. DELLER, *DELLER'S WALKER ON PATENTS* §§ 12-13 (2d ed. 1964). The last major legislative changes occurred in 1952. The patent laws are presently codified in 35 U.S.C. §§ 1-293 (1976).

13. 154 F. 358 (7th Cir. 1907).

or vending the thing patented, without your permission.¹⁴

While the effort, expense and genius of the inventor may be substantial, so is the seventeen years of governmental protection. This patent protection is in essence a monopoly on the invention and cannot be granted without careful examination of the patentee's claim. Accordingly, Congress enacted 35 U.S.C. § 102¹⁵ and 35 U.S.C. § 103¹⁶ to ensure that "[t]he invention . . . serve[s] the ends of science—push[es] back the frontiers of chemistry, physics, and the like; and make[s] a distinctive contribution to scientific knowledge."¹⁷ Section 102 provides that an invention must be novel. If an invention has been known or used by others in this country, or has been patented or described in a printed publication in this country or a foreign country before the patentee's claim to the invention, the patent will be disallowed by the Commissioner of Patents. Additionally, section 103 requires that the invention be non-obvious: "[I]f the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains,"¹⁸ a patent will not be obtainable. To be patentable, section 101 also requires an invention to be "useful."¹⁹ The requirement of utility is generally considered the least exacting of the patent conditions. Justice Story in *Lowell v. Lewis*²⁰ stated, "[a]ll that the law requires is, that the invention should not be frivolous or injurious to the well-being, good policy, or morals of society. The word 'useful,' therefore, is incorporated into the act in contradistinction to mischievous or immoral."²¹

This note deals specifically with section 101²² which defines the categories of patentable inventions. Before the conditions of sections 102 and 103 become relevant, the subject matter of the invention must be deemed patentable under section 101.²³ This question of patentability was presented to the court in *In re*

14. *Id.* at 361.

15. (1976). See generally 1 A. DELLER, *supra* note 12, §§ 54-82.

16. (1976). See generally 1 A. DELLER, *supra* note 12, § 106.

17. *Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp.*, 340 U.S. 147, 154 (1950) (Douglas, J., dissenting).

18. 35 U.S.C. § 103 (1976).

19. *Id.* § 101.

20. 15 F. Cas. 1018 (C.C. Mass. 1817) (No. 8,568). See generally 1 A. DELLER, *supra* note 12, §§ 83-101.

21. 15 F. Cas. at 1019.

22. 35 U.S.C. § 101 (1976). See also note 4 & accompanying text *supra*.

23. While this appears the logical approach to a patent application, the Solicitor of the Patent Office contended that such was not the case in the patent application of Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127 (1948). See notes 103-07 & accompanying text *infra*.

Bergy.²⁴

II. HISTORY OF THE PATENT APPLICATION

On June 10, 1974, the Upjohn Company filed an application for a patent on a "Process."²⁵ Claims one through four²⁶ in the application described the process as a microbiological process which produced the antibiotic lincomycin with increased recovery efficiency. Claim five added by amendment on January 14, 1975,²⁷ described the microorganism which became the subject of this action: "A bio-

24. 563 F.2d 1031 (C.C.P.A. 1977), *vacated and remanded sub nom. Parker v. Bergy*, 98 S. Ct. 3119 (1978). See Case Comment, *The Patentability of Living Organisms Under 35 U.S.C. § 101*, In re *Bergy*, 91 HARV. L. REV. 1357 (1978); Note, In re *Bergy: Patentability of Micro-Organisms: Legal Control of Life*, 47 U.M.K.C. L. REV. 130 (1978).

25. See Record at 32, In re *Bergy*, 563 F.2d 1031 (C.C.P.A. 1977). The inventors of the process, Malcolm E. Bergy, John H. Coats and Vedpal S. Malik, appointed the legal counsel at the Upjohn Company to prosecute the application for the patent. *Id.* at 26. The Upjohn counsel continued to represent the inventors through the appeal process.

The title "Process" was changed by an amendment dated Jan. 23, 1975, to "Process For Preparing Lincomycin." A process claim was defined by the Court in *Cochrane v. Deener*, 94 U.S. 780 (1876), as "a mode of treatment of certain materials to produce a given result. It is an act, or series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing." *Id.* at 787-88.

An abstract of the disclosure for the *Bergy* process stated:

Microbiological process for preparing antibiotic lincomycin at temperatures ranging from 18° C. to 45° C. using the newly discovered microorganism *Streptomyces vellosus*. The subject process advantageously results in the preparation of lincomycin without the concomitant production of lincomycin B (4'-depropyl-4'-ethylincomycin). The absence of lincomycin B production results in increased lincomycin recovery efficiency.

Record, *supra* at 6.

26. Claims one through four read:

-1-

A novel process for preparing the antibiotic lincomycin which comprises cultivating *Streptomyces vellosus*, having the identifying characteristics of NRRL 8037, and lincomycin-producing mutants thereof, in an aqueous nutrient medium under aerobic conditions until substantial antibiotic activity is imparted to said medium by the production of lincomycin.

-2-

A process, according to claim 1, wherein the cultivation is conducted at a temperature range of about 18° C. to about 45° C.

-3-

A process, according to claim 1, wherein said aqueous nutrient medium contains a source of assimilable carbohydrate and assimilable nitrogen.

-4-

A process, according to claim 1, wherein said lincomycin is isolated from the fermentation broth.

Record, *supra* note 25, at 25.

27. *Id.* at 28.

logically pure culture of the microorganism *Streptomyces vellosus*, having the identifying characteristics of NRRL 8037, said culture being capable of producing the antibiotic lincomycin in the recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances."²⁸

Claim five of the *Bergy* application was disallowed by the Patent and Trademark Office Examiner on February 6, 1975, because it sought to patent nonstatutory subject matter.²⁹ The Examiner rejected the claim to patent the microorganism on the basis of the product of nature rule.³⁰ This rule is a judicially created standard which has been invoked by the courts and the Patent Office to refuse a patent because the "invention" was known to occur in nature prior to the patentee's claim to it³¹ or because the invention had not been sufficiently altered by the inventor to constitute either a manufacture or a novelty.³² As authority for rejection on that basis, the Examiner cited the supportive dicta of *In re Mancy*:³³

Here appellants not only have no allowed claim to the novel strain of *Streptomyces* used in their process but would, we presume (without deciding), be unable to obtain such a claim because the strain, while new in the sense that it is not shown by any art of record, is, as we understand it, a "product of nature."³⁴

-
28. *Id.* at 76. The detailed description of the microorganism invention submitted by Upjohn read:

The Microorganism

The novel actinomycete used according to this invention for the production of lincomycin is *Streptomyces vellosus*. One of its strain characteristics is the production of lincomycin without the concomitant production lincomycin B. Another of its strain characteristics is the production of comparable titers of lincomycin at a temperature of 28° C. and 45° C. A subculture of this living organism can be obtained upon request from the permanent collection of the Northern Regional Research Laboratories, Agricultural Research Services, U.S. Department of Agriculture, Peoria, Illinois, U.S.A. Its accession number in this repository is NRRL 8037.

Id. at 8.

29. Claim 5 is rejected under 35 U.S.C. 101 as non-statutory subject matter. Claim 5 claims a product of nature (*Streptomyces vellosus* NRRL 8037). See *In re Mancy et al.* 182 U.S.P.Q. 303 at page 306, second sentence before [4].

Claims 1-4 are allowable in view of the declaration filed January 27, 1975.

Id. at 34.

30. *Id.*

31. See *American Wood-Paper Co. v. The Fibre Disintegrating Co.*, 90 U.S. (23 Wall.) 566 (1874).

32. See *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1 (1931).

33. 499 F.2d 1289 (C.C.P.A. 1974). See notes 81-82 & accompanying text *infra*.

34. 499 F.2d at 1294 (emphasis added).

On February 18, 1975, in response to the rejection, Upjohn filed a Request for Reconsideration pursuant to Rule 197.³⁵ The request was supplemented by the supporting affidavits of three scientists which attested to the facts that

the manufacture of the "biologically pure culture" of Claim 5 is obtainable *only* by the discovery and skills of a microbiologist; that the "biologically pure culture" of Claim 5 is *not* found in nature; that the taxonomic description on pages 4-16 of the specification is *only* for a "biologically pure culture" of the microorganism; that the fermentation conditions and procedures disclosed in the subject application are for a "biologically pure culture"; and, that the expected fermentation results are completely *different* for the "biologically pure culture" of Claim 5 as compared to an *impure* culture.

In view of the above, it is respectfully submitted that Claim 5 is *not* directed to a "product of nature," but, rather, a "manufacture" or a "product of a microbiologist" which is clearly patentable.³⁶

On April 22, 1975, the Examiner again rejected claim five stating that it "defines a microorganism, which is a product of nature and not a process, machine, manufacture or composition of matter, or any new and useful improvement thereof as required by 35 U.S.C. 101."³⁷ Supporting this final rejection based on the product of nature rule, the Examiner cited in addition to *In re Mancy*,³⁸ *Guaranty Trust Co. v. Union Solvents Corp.*³⁹ and *Funk Brothers Seed Co. v. Kalo Inoculant Co.*⁴⁰ In *Guaranty Trust Co.*,⁴¹ an action was brought for infringement of a process involving bacteriological fermentation in the production of acetone and butyl alcohol. The defendant denied infringement and claimed the patent was invalid because, *inter alia*, the process was unpatentable subject matter. The court stated:

Lastly, the defendant contends that the invention of the Weizmann patent is unpatentable since it is for the life process of a living organism. *Were the patent for bacteria per se, a different situation would be presented.* As before stated, the patent is not for bacteria per se. It is for a fermentation process employing bacteria discovered by Weizmann under conditions set forth in the specifications and claims.⁴²

The dicta that a different situation would be presented if the Weizmann patent claim had been for the bacteria *per se* was considered "especially pertinent" by the Examiner in his determination that the microorganism was unpatentable.

35. 37 C.F.R. § 1.197 (1977).

36. Record, *supra* note 25, at 37 (emphasis in original).

37. *Id.* at 55.

38. 499 F.2d 1289 (C.C.P.A. 1974).

39. 54 F.2d 400 (D. Del. 1931), *aff'd*, 61 F.2d 1041 (3d Cir. 1932).

40. 333 U.S. 127 (1948).

41. 54 F.2d 400 (D. Del. 1931), *aff'd*, 61 F.2d 1041 (3d Cir. 1932).

42. 54 F.2d at 410 (emphasis added).

Funk Brothers Seed Co.,⁴³ cited as additional authority by the Examiner, was an infringement action in which the validity of the patent for a compatible mixture of Rhizobia, bacteria used in an inoculant highly useful in the farming industry, was challenged. Citing the Court's invalidation of the patent in *Funk Brothers Seed Co.*, the Examiner stated:

[T]he Supreme Court observed that the inventor "ascertained that . . . strains can, by certain methods of selection and testing, be isolated and used in mixed cultures." The Supreme Court held that they could not hold invention "without allowing a patent to issue on one of the ancient secrets of nature now disclosed."⁴⁴

In *Bergy*, the Examiner's final rejection also challenged Upjohn's contention that there was precedent for a patent claim to materials made pure by human intervention.⁴⁵ Because the microorganism was considered a "biologically pure culture," this precedent was important to the argument for patentability. As authority for this argument, Upjohn had cited *Merck & Co. v. Chase Chemical Co.*⁴⁶ and *Merck & Co. v. Olin Mathieson Chemical Corp.*⁴⁷ Both courts had held vitamin B₁₂ patentable despite challenges that the vitamin was simply a purified product of nature. Additional authority was provided by *Kuehmsted v. Farbenfabriken of Elberfeld Co.*,⁴⁸ in which the court held aspirin purified in the manufacturing process was patentable although the impure aspirin compound is found in nature. The recent decision of the Court of Customs and Patent Appeals in *In re Bergstrom*⁴⁹ further sustained Upjohn's contention. In *Bergstrom* the court had held that pure chemical compounds which had been isolated from extracts of an animal fluid were patentable. However, the Examiner in *Bergy* distinguished these holdings⁵⁰ as pertaining only to "pure chemical compounds as contrasted with the instant microorganism."⁵¹ It was the Examiner's view that the methods of isolating these microorganisms were "standard and commonplace" and did not alter their natural products sufficiently to consider them inventions.⁵²

43. 333 U.S. 127 (1948).

44. Record, *supra* note 25, at 55-56 (quoting *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948)).

45. Record, *supra* note 25, at 56.

46. 273 F. Supp. 68 (D.N.J. 1967).

47. 253 F.2d 156 (4th Cir. 1958).

48. 179 F. 701 (7th Cir. 1910), *cert. denied*, 220 U.S. 622 (1911).

49. 427 F.2d 1394 (C.C.P.A. 1970).

50. Cited by the applicants in *Bergy* as additional precedent for the patentability of claims limited to pure materials were *Ex parte Hillyer & Nicewander*, 102 U.S.P.Q. 126 (1953), *In re Williams*, 171 F.2d 319 (C.C.P.A. 1948), *Ex parte Parke & Lawson*, 64 U.S.P.Q. 335 (1944), and *Park-Davis & Co. v. H.K. Mulford & Co.*, 189 F. 95 (C.C.S.D.N.Y. 1911).

51. Record, *supra* note 25, at 56.

52. In a reply brief directed to the Commissioner of Patents and Trademarks,

Following the Examiner's final rejection of claim five, the Upjohn Company petitioned the Board of Appeals of the Patent Office for a review of its claim to the microorganism.⁵³ While the Examiner's rejections had concluded that the microorganism was not patentable because it claimed a product of nature, the Board, without explanation, reframed the question presented to it on appeal.⁵⁴ The issue addressed and decided by the Board was "whether or not a microorganism, being a *living thing*, is or is not within the realm of statutory patentable subject matter."⁵⁵ The Board upheld the Examiner's rejection, but its approach was a decided departure from the Examiner's product of nature approach. Holding that section 101 should be strictly construed, the Board stated that a living organism did not fall within the four categories of patentable subject matter:⁵⁶

An analogous result has been reached by the courts with respect to non-

Upjohn addressed the new issues raised in the Examiner's final rejection and distinguished *Guaranty Trust Co.* and *Funk Bros. Seed Co.* as inapposite to the direct issue of the patentability of the microorganism. Record, *supra* note 25, at 51. (The reply brief was filed pursuant to 37 C.F.R. § 1.193(b) (1977)). In *Bergy*, the Examiner had cited the language of the court in *Guaranty Trust Co.* that a different issue of patentability would have arisen had the claim been solely for bacteria rather than the patentable Weizmann process. Upjohn dismissed that language as dictum and, therefore, of no precedential value for the Examiner's rejection. Record, *supra* note 25, at 57. See also note 35 & accompanying text *supra*.

Further, Upjohn contended that *Funk Bros. Seed Co.* was inapposite to the patent application because it was "not claiming a material which is found in nature and doing what the material is known to do in nature [*sic*]." Record, *supra* note 25, at 57. The bacteria in *Funk Bros. Seed Co.* and its natural nitrogen-fixing function had been previously known in the art. Species of the bacteria had been used in the manufacture of less useful forms of inoculants. The microorganism in *Bergy*, however, was not previously known to the art. Nor did the impure form of the microorganism found in nature naturally produce the antibiotic lincomycin. That was a result brought about by human intervention.

In the final statement of the reply brief, Upjohn addressed the Examiner's contention that *Guaranty Trust Co.*, *Funk Bros. Seed Co.*, and *Mancy* all involved "isolated or biologically pure microorganisms" and, therefore, were precedent for the unpatentability of the microorganism. Record, *supra* note 25, at 56. In its view, the validity of the examiner's statement was unsound "since (1) none of the decisions cited, nor any known decision, has held that a 'biologically pure culture' is unpatentable, and (2) there is no evidence that a 'biologically pure culture' was in issue in any of the cited decisions." *Id.* at 58.

53. Record, *supra* note 25, at 59.

54. The Court of Customs and Patent Appeals explained the Board's abandonment of the product of nature basis of the rejection: "The circumstances persuade us that the board went in search of another reason to support the rejection because it realized the Examiner's position was untenable." 563 F.2d at 1035.

55. Record, *supra* note 25, at 62 (emphasis added).

56. *Id.*

patentability of mental processes, printed matter or methods of doing business none of which are also expressly excluded by the indicated section of the statute, but neither can they be said or have been held to be included thereby.⁵⁷

The Board reasoned further that while section 101 did not expressly exclude living things as acceptable subject matter, Congress had found it essential to supplement the statute with the Plant Patent Act of 1930.⁵⁸ This legislation extended to agriculturalists, presumably for the first time, the same patent protection which had been traditionally provided to inventors. The Board determined that if section 101 could have been construed to include living things prior to 1930, there would have been no need for the Plant Patent Act;⁵⁹ claims for living plant inventions would have proceeded in the normal course of patent applications. The Board further relied upon the legislative history of the Plant Patent Act of 1930 and the Plant Variety Protection Act of 1970⁶⁰ to conclude "that Congress [did not] intend 35 U.S.C. § 101 to encompass any living organism, whether they be plants or microorganisms."⁶¹

Following the Board's adverse decision, Upjohn appealed to the Court of Customs and Patent Appeals.⁶² The court responded to the confusion over the grounds for rejection caused by the different theories presented by the Examiner and the Board and delineated its own view on both the product of nature and the "living" theories. It dismissed the product of nature issue by stating that "[t]he biologically pure culture of Claim 5 clearly does not exist in, is not found in, and is not a product of, 'nature.' It is man-made and can be produced only under carefully controlled laboratory conditions."⁶³ The court then proceeded to decide the issue as framed by the Solicitor of the Patent and Trademark Office: "Whether the uncontroverted fact that the biologically pure culture, *as claimed*, is *alive* removes it from the categories of inventions enumerated in § 101."⁶⁴ Reversing both the Examiner and the Board, the court held that it did not.⁶⁵

The court was prompt to state that it was not deciding the question left unanswered in *In re Merat*,⁶⁶ but only the question involved in the patent application in *Bergy*: whether microorganisms found to be new, useful and unobvious are patentable under sec-

57. *Id.*

58. 35 U.S.C. §§ 161-164 (1976).

59. Record, *supra* note 25, at 62.

60. 7 U.S.C. §§ 2321-2583 (1976).

61. Record, *supra* note 25, at 63.

62. The appeal was made pursuant to 35 U.S.C. § 141 (1976).

63. 563 F.2d at 1035.

64. *Id.*

65. *Id.*

66. 519 F.2d 1390 (C.C.P.A. 1975).

tion 101. *In re Merat*⁶⁷ involved a patent application entitled "Method of Improving Strains of Chickens." The Examiner had rejected all of the claims as being nonstatutory subject matter "on the theory that a method of breeding animals [was] not a 'process' within the meaning of § 101 and that a 'thing occurring in nature' [presumably the chicken of claim 2] under controlled propagation [was] not a manufacture."⁶⁸ The Court of Customs and Patent Appeals dismissed the need to discuss the patentability of the strain of chickens, and upheld the Board's rejection of the *Merat* claim based on section 112,⁶⁹ which requires that the claim language when read by a person of ordinary skill in the art to which the invention pertains describe the invention with sufficient precision to enable the person to duplicate and use the invention. The language of the claim in *Merat* was ambiguous as to the subject matter to be used in the breeding process and the contemplated results of the breeding.

In the analysis of precedential authority to determine the patentability of living things, the court in *Bergy* initially distinguished the "peripheral court comments" relied upon by the solicitor as precedent for the proposition that microorganisms were not included within section 101.⁷⁰ *In re Mancy*,⁷¹ the first case to be distinguished by the court, involved a patent claim on a microbiological process used for the production of a known antibiotic. Reversing the Board's determination that the process claim was obvious, the court in *Mancy* set forth the dicta relied upon by the solicitor in *Bergy*, that while the strain was new, it was still a "product of nature."⁷² Stating that the dicta in *Mancy* was ill-considered in light of the court's new knowledge on the isolation and development of microorganisms, the court in *Bergy* held the language in *Mancy* to be pertinent only to the issue of novelty as applied to "something pre-existing and merely plucked from the earth and claimed as such, a far cry from the biologically pure culture [of *Bergy*] produced by great labor"⁷³

67. *Id.*

68. *Id.* at 1393.

69. 35 U.S.C. § 112 (1976).

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Id., Para. 1.

70. 563 F.2d at 1035.

71. 499 F.2d 1289 (C.C.P.A. 1974).

72. *Id.* at 1294. For complete quote, see text accompanying note 34 *supra*.

73. 563 F.2d at 1036.

The court in *Bergy* also dismissed the Examiner's reliance⁷⁴ on the statement in *Guaranty Trust Co. v. Union Solvents Corp.*⁷⁵ that "[w]ere the patent for the bacteria per se, a different situation would be presented."⁷⁶ It distinguished the statement as "a trite observation of minimal magnitude as precedent, dealing with a non-issue on which no opinion was expressed."⁷⁷ Instead, the court found *Guaranty Trust Co.* pertinent to the argument favoring the patentability of living organisms because that decision had rejected the argument that the subject claim should be considered unpatentable because it employed the life process of a living organism. The court stated that *Guaranty Trust Co.* is, indeed, exemplary of the line of cases holding "that processes, one of the categories of patentable subject matter specified in section 101, are uniformly and consistently considered to be statutory subject matter notwithstanding the employment therein of living organisms and their life processes."⁷⁸

The court noted that there is nothing within section 101 that expressly excludes living organisms. It rejected the assertion that merely because a biologically pure manufacture or composition of matter is living, it is removed from the categories of patentable subject matter, when processes which employ the life functions of microorganisms have consistently been held to be patentable.⁷⁹ The court reasoned that because section 101 makes no distinction between manufactures and compositions of matter on the one hand and processes on the other, the argument that manufactures and compositions of matter which are alive are, therefore, not patentable must fail even under the strict construction proposed by

74. See note 42 & accompanying text *supra*.

75. 54 F.2d 400 (D. Del. 1931), *aff'd*, 61 F.2d 1041 (3d Cir. 1932).

76. 563 F.2d at 1036 (quoting *Guaranty Trust Co. v. Union Solvents*, 54 F.2d at 410). For complete quote, see text accompanying note 42 *supra*.

77. 563 F.2d at 1036.

78. *Id.* at 1037. In response to the majority's contention that since processes using the microorganism are patentable subject matter, the microorganism itself should be, the dissent cited recent computer program cases in which an analogous issue confronted the courts. *Id.* at 1041. These cases held that algorithms contained in programs or processes used to operate a computer are patentable whereas patent claims directed to the algorithm itself are not. See *Gottschalk v. Benson*, 409 U.S. 63 (1972); *In re Waldbaum*, 559 F.2d 611 (C.C.P.A. 1977) (*Waldbaum II*).

The dissent concluded that "the fact that claims directed to a process of using microorganisms constitute patentable subject matter does not logically compel the conclusion that claims to biologically pure cultures of microorganisms are patentable." 563 F.2d at 1041. Finally, the dissent stated that to have the court extend the patent laws to living things based upon a theory of public interest is to abrogate its duty to adjudicate within the scope of the intent of the patent statute as enacted by Congress.

79. *Id.* at 1037.

the Board.⁸⁰

Consistent with the limited scope of its holding, the court in *Bergy* further stated that the functions of the microorganism were "more akin to inanimate chemical compositions such as reactants, reagents and catalysts than they are to horses and honeybees or raspberries and roses."⁸¹ On the premise that microorganisms are "important tools" in the chemical industry the court held that there was

no sound reason to refuse patent protection to the microorganisms themselves—a kind of tool used by chemists and chemical manufacturers in much the same way as they use chemical elements, compounds, and compositions which are not considered to be alive, notwithstanding their capacities to react and to promote reaction to produce new compounds and compositions by chemical processes in much the same way as do microorganisms we think it is in the public interest to include microorganisms within the terms "manufacture" and "composition of matter" in § 101. In short, we think the fact that microorganisms, distinguished from chemical compounds, are alive is a distinction without legal significance . . .⁸²

In its final statement, the majority summarily dismissed the relevancy of the Plant Patent Act of 1930,⁸³ and the legislative history of that provision as presented in *In re Arzberger*,⁸⁴ as authority for the nonpatentability of living things. In *Arzberger*, the Court of Customs and Patent Appeals concluded that the Plant Patent Act was enacted for the express benefit of agriculture. The court held that bacteria, although scientifically defined as plants, did not fall within the agricultural purposes intended by Congress and were, therefore, not patentable under the Plant Patent Act.⁸⁵ In the view of the *Bergy* Court, the legislative analysis in *Arzberger* was irrelevant to the issue of what constituted patentable subject matter under section 101.⁸⁶

80. *Id.*

81. *Id.* at 1038. The dissent challenged the majority's amorphous attempt to distinguish between microorganisms and more complex animals. Contrary to the majority's conclusion that the microorganism and chemical compounds function in similar ways, the dissent stated that microorganisms are "fundamentally different from inanimate chemical compositions [in that] both the microorganisms claimed herein and honeybees are alive, reproduce, and act upon other materials to form technologically useful products (lincomycin and honey, respectively)." *Id.* at 1039. The dissent concluded that the majority's limitation of its holding to microorganisms is readily assailable unless it can substantiate the argument that microorganisms are more like chemical compounds than the honeybee or other higher forms of life.

82. *Id.* at 1038.

83. 35 U.S.C. §§ 161-164 (1976).

84. 112 F.2d 834 (C.C.P.A. 1940).

85. *Id.* at 838.

86. Whereas the majority summarily dismissed the relevance of the Plant Patent Act of 1930, 35 U.S.C. §§ 161-164 (1976), and Plant Variety Protection Act of 1970, 7 U.S.C. §§ 2321-2583 (1976), the dissent agreed with the Board's rejection

On June 26, 1978, in *Parker v. Bergy*,⁸⁷ the United States Supreme Court, having granted certiorari, dispensed with oral arguments and vacated the Court of Customs and Patent Appeals' landmark decision in *Bergy*. The Court's summary action in *Bergy* was achieved without any discussion of the many controversial policy questions that *In re Bergy* had presented.⁸⁸ The only indication of the ground for the vacation was the order for remand for further consideration in light of the very recent Supreme Court decision in *Parker v. Flook*.⁸⁹

In *Flook*, the respondent had applied for a patent on a method for updating alarm limits during catalytic conversion processes. The single novel feature of the invention was a mathematical formula for which the inventor had identified a limited category of useful, though conventional, post-solution applications. In a prior case, *Gottschalk v. Benson*,⁹⁰ the Supreme Court had held that a novel and useful mathematical formula could not be patented because it would be, in essence, a patent on an idea, a result in clear contravention of the patent laws.⁹¹ The specific question before the Court in *Flook*, however, was whether that mathematical formula could be distinguished from the *Benson* formula and held patentable under section 101⁹² because the inventor intended only to use the formula in a limited fashion.⁹³ In other words, the inventor did not seek to totally preempt the use of the mathematical formula.⁹⁴

In *Flook* the Court disallowed the patent on the formula.⁹⁵ The technical reasons it advanced for the disallowance of the claim are not important to this discussion. Rather, the general view of the patent laws evinced by the Supreme Court in *Flook* provides the background for its vacation of *Bergy*.

In justifying the disallowance of the patent in *Flook*, the Court recognized that much of its reasoning was based on precedent de-

of claim five. Relying upon the legislative history of these two statutes, the dissent concluded that no living organisms—plants or animals—were intended to be patentable subject matter under section 101. If section 101 were construed so broadly as to include live subject matter, the special legislation extended for the protection of new, useful, and unobvious plants would have been superfluous. 563 F.2d at 1040.

87. 98 S. Ct. 3119 (1978).

88. See note 174 & accompanying text *infra*.

89. 98 S. Ct. 2522 (1978).

90. 409 U.S. 63 (1972).

91. See note 126 & accompanying text *infra*.

92. See note 4 & accompanying text *supra*.

93. 98 S. Ct. at 2523.

94. *Id.* at 2524.

95. *Id.* at 2528.

cided well before the advent of modern computers.⁹⁶ The Court made express efforts to clarify that its rejection of the claim was not to be interpreted "as reflecting a judgment that patent protection of certain novel and useful computer programs [would] not promote the progress of science and the useful arts, or that such protection is undesirable as a matter of policy."⁹⁷ Rather, it concluded that these controversial questions of policy are to be answered by Congress, which possesses the more competent means of assessing the appropriate categories of patentable things:

It is our duty to construe the patent statutes as they now read, in light of our prior precedents, and we must proceed cautiously when we are asked to extend patent rights into areas wholly unforeseen by Congress. As Mr. Justice White explained in writing for the Court in *Deepsouth Packing Co. v. Laitram Corp.* . . . :

"[W]e should not expand patent rights by overruling or modifying our prior cases construing the patent statutes, unless the argument for expansion of privilege is based on more than mere inference from ambiguous statutory language. We would require a clear and certain signal from Congress before approving the position of a litigant who, as respondent here, argues that the beachhead of privilege is wider, and the area of public use narrower, than the courts had previously thought. No such signal legitimizes respondent's position in this litigation."⁹⁸

III. ANALYSIS OF *IN RE BERGY*

This note will examine the validity and effect of the decision of the Court of Customs and Patent Appeals in *Bergy* in the context of the following three inquiries: (1) whether after a review of precedential authority, "living things" can be reasonably defined to fall within the categories of patentable subject matter in section 101; (2) whether the statutory provisions providing patent protection for plants preclude the interpretation that living things fall within section 101; and (3) whether *In re Bergy* will have an impact on American patent law.

A. Patent Case Law

There has been no direct discussion in case law of living organisms and their patentability under section 101.⁹⁹ The two authorities relied on by the Board for their supporting dictum, *In re Mancy*¹⁰⁰ and *Guaranty Trust Co. of New York v. Union Solvents Corp.*,¹⁰¹ were dismissed by the court in *Bergy* as "peripheral

96. *Id.*

97. *Id.* at 2529.

98. *Id.* (quoting *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 531 (1972)).

99. Brief, *supra* note 7, at 10.

100. 499 F.2d 1289 (C.C.P.A. 1974).

101. 54 F.2d 400 (D. Del. 1931), *aff'd*, 61 F.2d 1041 (3d Cir. 1932).

court comments."¹⁰²

Surprisingly, however, *Funk Brothers Seed Co. v. Kalo Inoculant Co.*,¹⁰³ was not discussed by the court in *Bergy* as supporting authority for the patentability of the microorganism. *Funk Brothers Seed Co.* involved a patent claim for a mixture of noninhibitive strains of nitrogen-fixing bacteria used in an inoculant useful to the agricultural industry.¹⁰⁴ The Court of Appeals for the Seventh Circuit held the invention valid and, therefore, patentable because the patentee had done "much more than discover a law of nature."¹⁰⁵ On appeal, the Supreme Court reversed, but not on the ground that the bacteria mixture was nonstatutory matter. The Court held that the discovery that certain strains of bacteria could be mixed without deleterious effects to the properties of either was not an invention because it was only an uncovering of the qualities of inhibition and thus a finding of the "handiwork of nature."¹⁰⁶ The majority in *Funk Brothers Seed Co.*, speaking through Justice Douglas, intimated that living organisms are indeed patentable subject matter, for the opinion did not expressly state that the bacteria *per se* are not patentable. Rather, Justice Douglas stated repeatedly the reasons the *specific* bacteria in the claim, and not bacteria *per se*, fall short of constituting an invention:

But however ingenious the discovery of that natural principle [the compatible mixture] may have been, the application of it is hardly more than an advance in the packaging of the inoculants. Each of the species of root-nodule bacteria contained in the package infects the same group of leguminous plants which it always infected. No species acquires a different use. The combination of species produces no new bacteria, no change in the six species of bacteria, and no enlargement of the range of their utility. Each species has the same effect it always had. The bacteria perform in their natural way. Their use in combination does not improve in any way their natural functioning. They serve the ends nature originally provided and act quite independently of any effort of the patentee.¹⁰⁷

The reasonable implication of this language is that if the action of

102. See notes 71-77 & accompanying text *supra*.

103. 333 U.S. 127 (1948).

104. The usefulness of the patentee's invention is illustrated by the fact that prior to the claim in *Funk Bros. Seed Co.*, a farmer who produced clover, alfalfa and soybeans would need to purchase three different types of bacteria-containing inoculants. The bacteria of the genus *Rhizobium*, which infected the roots of the leguminous plants thereby enabling these plants to fix nitrogen from the air, were believed to be mutually inhibitive. The patentee's claim involved a mixture of *Rhizobium* bacteria which had proved not to be mutually inhibitive, thereby allowing the farmer to purchase one inoculant for all varieties of leguminous plants.

105. *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 161 F.2d 981, 986 (7th Cir. 1947).

106. 333 U.S. at 131.

107. *Id.* at 131. See Record, *supra* note 25, at 38-43. The supporting affidavits of the three scientists clearly remove the *Streptomyces vellosus* of the *Bergy* claim from the objections of lack of invention as expressed in *Funk Bros. Seed Co.*

the bacteria had not been found in nature or the bacteria had not acted independently of the patentee, the bacteria would be patentable. It follows that if living organisms were absolutely not patentable, there would have been no need for the Court's distinction of the properties of the invention claimed in *Funk Brothers Seed Co.*

Funk Brothers Seed Co. was relied upon by Upjohn for the proposition that if bacteria *per se* were considered unpatentable, the Court would have expressly refused the patent for that reason. The solicitor attempted to counter¹⁰⁸ Upjohn's reliance on *Funk Brothers Seed Co.* on the basis of *Dann v. Johnston*.¹⁰⁹ In *Johnston*, the Supreme Court held the inventor's "machine system for the automatic recordkeeping of bank checks and deposits"¹¹⁰ unpatentable because of obviousness. In doing so, the Court summarily dismissed the need to decide whether the computer program was patentable subject matter under section 101.¹¹¹ In a prior statement on the patentability of computer programs, the Supreme Court in *Gottschalk v. Benson*,¹¹² in an expressly limited holding, had held a specific digital computer program to be unpatentable because it was nonstatutory matter.¹¹³

It does not necessarily follow that the Court's failure to discuss the patentability of computer programs under section 101 in *Johnston* supports the proposition that the failure of the Court in *Funk Brothers Seed Co.* to decide the patentability of bacteria *per se* was without consequence. The state of the law regarding the patentability of computer programs and bacteria was clearly distinguishable. The Supreme Court had already addressed, albeit ambiguously through *Benson*, the patentability of computer programs. It had expressly stated that all programs would not be considered unpatentable merely because of label.¹¹⁴ It left open the possibility that claims may be presented which would not fall within the scope of *Benson* and would merit the award of a patent. It is obvious, therefore, that the Court's need to address the issue of patentable subject matter in *Johnston* was not comparable to the need in *Funk Brothers Seed Co.*, where there had been no prior statements regarding the patentability of living things under section 101. In contrast to *Johnston*, the Court in *Funk Brothers Seed*

108. See Brief, *supra* note 7, at 12. The solicitor stated the "argument [to be] untenable" that the Court in *Funk Bros. Seed Co.* would have held the bacteria to be unpatentable rather than proceeding to invalidate the patent for lack of invention if it had considered bacteria *per se* unpatentable.

109. 425 U.S. 219 (1976).

110. *Id.* at 225.

111. *Id.* at 220.

112. 409 U.S. 63 (1972).

113. *Id.* at 71-72.

114. *Id.* at 71.

Co. was presented with a clear opportunity to address the issue of the patentability of a certain category of things. Because it did not decide that specific issue, there is a clear indication that the "living" element of the bacteria was irrelevant to patentability. The same cannot be said of *Johnston*. The fact that the Court there dismissed the need to discuss the issue of section 101 in relation to the computer program claim cannot purport to carry the same implications as the Court's inaction in *Funk Brothers Seed Co.*, because in *Benson* the Court had already addressed and decided the relation of section 101 to computer program claims.¹¹⁵

In summary, the refusal to patent the bacteria mixture in *Funk Brothers Seed Co.* was premised on a lack of invention, that the claim "had been plucked from the earth" and not that the bacteria were alive. Nowhere in the opinion is there any reference indicating that the characteristic of life alone would prohibit patentability. Furthermore, because the "living" concept is so interrelated with the product of nature principle, it appears reasonable that Justice Douglas would have used that concept to buttress the refusal to patent the bacteria if it had been thought relevant to his argument. Because he did not, it is reasonable to assume that "living" was not relevant to the patentability issue.¹¹⁶

Central to the court's argument for the patentability of microorganisms *per se* in *Bergy*, is the fact that processes using the life processes of living organisms have already been held to be patentable subject matter.¹¹⁷ While patent case law does distinguish be-

115. Thus, the use of *Johnston* to support the contention that the failure of the Court in *Funk Bros. Seed Co.* to decide the issue of patentability of living things was of no consequence appears to have no merit. Moreover, the claim in *Johnston* may have been patentable under section 101. The Court may have simply chosen to avoid a discussion of that issue when the claim could be disposed of conclusively on the basis of section 103. Indeed, prior to appeal to the Supreme Court, the Court of Customs and Patent Appeals in *In re Johnston*, 502 F.2d 765, 771 (C.C.P.A. 1974), had distinguished the claim in *Johnston* from the claim in *Benson* to its satisfaction and held the program patentable.

Further support for the patentability of living things is demonstrated in Justice Frankfurter's concurring opinion in *Funk Bros. Seed Co.*: "Insofar as the court below concluded that the packaging of a particular mixture of compatible strains is an invention and as such patentable, I agree, provided not only that a new and useful property results from their combination, but also that the particular strains are identifiable and adequately identified." 333 U.S. at 133.

116. The dissenting opinion in *Funk Bros. Seed Co.* further demonstrates that the patent claim of a bacteria mixture was considered statutory subject matter and therefore patentable. 333 U.S. at 136 (Burton, J., dissenting).

117. 563 F.2d at 1037. See *City of Milwaukee v. Activated Sludge, Inc.*, 69 F.2d 577 (7th Cir. 1934); *Cameron Septic Tank Co. v. Village of Saratoga Springs*, 159 F. 453 (2d Cir. 1908); *Dick v. Lederle Antitoxin Laboratories*, 43 F.2d 628 (S.D.N.Y. 1930); *Ex parte Prescott & Morikawa*, 19 U.S.P.Q. 178 (1932).

tween the patentability of the tools of the process and the process itself,¹¹⁸ it is clear that the microbiological processes that have been held to be patentable would not exist without the crucial element of the living organism. As in *Bergy*, the process in which the microorganism produces lincomycin would not occur without the living properties of the *Streptomyces vellosus*. In essence, the process is totally dependent upon the living material. Thus, in the words of the Court of Customs and Patent Appeals in *Bergy*:

It seems illogical to us to insist that the existence of life in a manufacture or composition of matter in the form of a biologically pure culture of a microorganism removes it from the category of subject matter which can be patented while the functioning of a living organism and the utilization of its life functions in processes does not affect their status under § 101.¹¹⁹

Moreover, if manufacturers and compositions of matter are excluded because they are alive, it follows *a fortiori* that processes should also be excluded. Section 101 does not, nor does any other provision of the patent statute, differentiate between the conditions of patentability for each of the four categories of subject matter.¹²⁰ Therefore, the argument that the living property is to be examined differently as to the patentability of processes than as to the patentability of manufactures or compositions of matter fails on a theory of statutory interpretation.

In a challenge to the court's argument on this issue, the dissent in *Bergy* states that the fact that a "process of *using* microorganisms constitute[s] patentable subject matter does not logically compel the conclusion that claims to biologically pure cultures of microorganisms are patentable."¹²¹ In support of this contention the dissent cited *In re Waldbaum*¹²² and *Gottschalk v. Benson*,¹²³ two computer program cases which held that claims on a method covering all practical uses of a mathematical formula and the involved algorithm do not constitute patentable subject matter. In other words, claims on processes that use an algorithm to *operate* a system are considered patentable subject matter while claims on the algorithm *per se* are not.¹²⁴ The distinguishing factor in this logic as applied to the claim in *Bergy* is that the algorithm *per se* is being rejected for a characteristic not inherent in the process in

118. See *Cochrane v. Deener*, 94 U.S. 780 (1876). *Cochrane* stands for the settled principle that "[process] is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result." *Id.* at 788.

119. 563 F.2d at 1037.

120. See 35 U.S.C. §§ 101-103 (1976).

121. 563 F.2d at 1041 (Miller, J., dissenting).

122. 559 F.2d 611 (C.C.P.A. 1977) (*Waldbaum II*).

123. 409 U.S. 63 (1972).

124. Compare *In re Christensen*, 478 F.2d 1392 (C.C.P.A. 1973), with *In re Deutsch*, 553 F.2d 689 (C.C.P.A. 1977).

which it is employed. The rejected algorithm claim in *Gottschalk v. Benson*¹²⁵ was in essence a mathematical formula—an idea—and, therefore, unpatentable in its own right. To have allowed the process claim in *Benson* would have precluded the use of that idea by anyone else, a result in clear contravention of the patent laws.¹²⁶

Claims to methods using algorithms to translate information into the mathematical languages used in computers have been allowed when the use of the algorithm was purely incidental to the process and the method did not preempt all uses of the algorithm.¹²⁷ However, the use of the microorganism, as in *Bergy*, is not purely incidental to the process. The very existence of the process depends upon the specific microorganism. Nor is the objectionable living characteristic of the microorganism separable from the process in which it is used as is the idea element of the algorithm used in the method of operation or machinery. Therefore, the use of the computer program cases as authority for viewing the patentability of the use of the tool differently from the patentability of the tool itself is not logically amenable to the unique properties of microbiological processes and microorganisms.

Further examination of the line of cases decided under the product of nature doctrine provides additional insight into the analysis of whether the court in *Bergy* properly held living things to be patentable under section 101. While the amorphous¹²⁸ product of nature rule had been the basis for prior patent rejections,¹²⁹ it gained additional prominence in patent law when the Supreme Court relied on the rule to invalidate a patent for an invention which was admitted by the Court to be useful, ingenious, and commercially successful. In *Funk Brothers Seed Co. v. Kalo Inoculant Co.*,¹³⁰ the Court held that the discovered characteristics of certain mixed cultures of bacteria were no more than the work of nature and therefore not an invention. According to one writer this judicially created category for rejection has been an unfortunate deterrent to patent applications on inventions arising out of natural

125. 409 U.S. 63 (1972).

126. See generally 1 A. DELLER, *supra* note 12, § 25.

127. *In re Deutsch*, 553 F.2d 689 (C.C.P.A. 1977).

128. See notes 31-33 & accompanying text *supra*.

129. *Compare* *American Wood-Paper Co. v. The Fibre Disintegrating Co.*, 90 U.S. (23 Wall.) 566 (1874), *and In re Mertz*, 97 F.2d 599 (C.C.P.A. 1938), *with Kuehmsted v. Farbenfabriken of Elberfeld Co.*, 179 F. 701 (7th Cir. 1910), *and Parke-Davis & Co. v. H.K. Mulford Co.*, 189 F. 95 (C.C.S.D.N.Y. 1911), *aff'd*, 196 F. 496 (2d Cir. 1912).

130. 333 U.S. 127 (1948).

products, and more specifically, to claims on microorganisms.¹³¹ This language has also been a factor in the resistance exhibited by the courts to product of nature claims.¹³² The dicta of *In re Mancy*,¹³³ distinguished by the court in *Bergy*, exemplifies such prejudice. Following *Funk Brothers Seed Co.* and the passage of the 1952 amendments to the patent statute, courts generally began to look beyond the automatic preclusion of the natural products label and assess the patentability of such claims under the conditions of sections 102¹³⁴ and 103.¹³⁵ In *Merck & Co. v. Olin Mathieson Chemical Corp.*,¹³⁶ the court was presented with the issue of whether vitamin B₁₂, the result of processes of extraction, concentration, and purification of natural materials was patentable subject matter. The court held that it was, stating: "There is nothing in the language of the Act which precludes the issuance of a patent upon a 'product of nature' when it is a 'new and useful composition of matter' and there is compliance with the specified conditions for patentability."¹³⁷

Similarly, in *In re Bergstrom*,¹³⁸ the applicant sought a patent on two distinct chemical compounds which had been isolated from known crude, semipurified extracts of an animal secretion. The court held the invention to be patentable. Rejecting the Examiner's holding that the compounds were naturally occurring and therefore not "new," the court concluded that the compounds did not exist in nature because "pure" materials are by definition new with respect to their "impure" natural state.¹³⁹ It is clear from the decision in *In re Bergstrom* that the product of nature rule is no longer read as conclusive to the nonpatentability of inventions which arise out of discoveries of naturally occurring materials. Rather, the invention must be examined as would any other seeking a patent under sections 102 and 103. Such a test assures that the patentability of an invention will be determined by standards sufficiently rigorous to prevent infringement of inventions that should appropriately be claimed by Mother Nature.

The significance of the product of nature doctrine to the claim in *Bergy* is that the doctrine was promulgated in *Funk Brothers Seed Co.* in which the patent claim at issue was for a culture of

131. Wegner, *Patent Protection for Novel Microorganisms Useful for the Preparation of Known Products*, 5 INT'L REV. INDUS. PROP. & COPYRIGHT L. 285 (1974).

132. *Id.* at 288 n.8.

133. 499 F.2d 1289 (C.C.P.A. 1974).

134. 35 U.S.C. § 102 (1976). See text accompanying notes 15-21 *supra*.

135. 35 U.S.C. § 103 (1976). See text accompanying notes 15-21 *supra*.

136. 253 F.2d 156 (4th Cir. 1958).

137. *Id.* at 161.

138. 427 F.2d 1394 (C.C.P.A. 1970).

139. *Id.* at 1402.

bacteria, a living composition of matter. Indeed, the product of nature theory served as the only basis for the rejection of that claim.¹⁴⁰ It is reasonable, therefore, that just as the product of nature rule has been abrogated to allow the patentability of products which through the inventive genius of humans, have been made pure and completely distinct from the original natural product, so also should it allow the patentability of a pure culture of *Streptomyces vellosus* which does not exist in nature and is considered human-made by all parties. As stated by one commentator:

A final strawman is that a microorganism is a "living" being, and as such neither a "composition of matter" nor "manufacture." No criterion is raised in 35 USC § 101 that something must be dead to be patentable. The microorganism should not be excluded as a statutory composition of matter any more than the vitamin B₁₂ of the *Merck* cases, merely based upon the additional distinction that the microorganism is "alive" and the vitamin B₁₂ is dead.¹⁴¹

B. Plant Patent Legislation

Central to the dissent's argument in *Bergy* against the patentability of the microorganism is the congressional enactment of the Plant Patent Act of 1930¹⁴² which extended patent protection to the inventors of asexually reproduced plants which meet the requisite conditions of patentability as provided in the patent statute. Noting that the language of section 101 did not specifically proscribe plants from the class of acceptable subject matter, the dissent contended that the Plant Patent Act would have been superfluous if section 101 had been construed to include living things in 1930.

A substantial volume of legislative history¹⁴³ substantiates the fact that the intent of the plant patent legislation was to benefit agriculture and horticulture by extending incentives to those industries for the development of needed plant inventions. As stated by Senator Townsend, a co-sponsor of the plant patent bill, "[t]he purpose of this bill is to authorize the grant of patents on new varieties of plants and thus give to agriculturists the same privileges that have been enjoyed by industrial inventors and discoverers during the last century."¹⁴⁴ Additionally, case law indicates that with the passage of the Plant Patent Act of 1930, new, useful, and unobvious plants were accorded patent protection for the first time and, therefore, could not have been considered patentable under

140. 333 U.S. at 131.

141. Wegner, *supra* note 133, at 290.

142. 35 U.S.C. §§ 161-164 (1976).

143. See, e.g., S. REP. NO. 315, 71st Cong., 2d Sess. (1930); H.R. REP. NO. 1129, 71st Cong., 2d Sess. (1930); *A Bill to Provide for Plant Patents: Hearings on H.R. 11372 Before the House Comm. on Patents*, 71st Cong., 2d Sess. (1930).

144. 72 CONG. REC. 8750-51 (1930) (remarks of Senator Townsend).

section 101. In *In re Grice*,¹⁴⁵ the inventor sought plant patents on two "Rosa Floribunda Plants." The Board of Appeals had rejected the application under 35 U.S.C. § 102(b)¹⁴⁶ because the inventions had appeared in English publications one year prior to the filing of the patent applications. On appeal to the Court of Customs and Patent Appeals the issue was whether the applicant could be refused a plant patent because of the invention's failure to meet the conditions of patentability in the patent statute in addition to those of the Plant Patent Act of 1930. Finding that the history and policy of the Plant Patent Act required that the plant patent applications be considered under the conditions of the patent statute, the court in *Grice* stated: "35 U.S.C. § 161 engrafts the Plant Patent Act onto the basic patent law,"¹⁴⁷ thereby "remov[ing] the existing discrimination between plant developers and industrial inventors."¹⁴⁸

In addition, a review of other authorities indicates that at the time of passage of the Plant Patent Act of 1930, plants were not considered by Congress to be encompassed within section 101. In a 1953 article on the topic of patent protection for biological specimens and products, one commentator wrote of an attempt made in 1928 to enact legislation which would provide protection for the inventors of all plants and animals.¹⁴⁹ The wide scope of the requested legislation was significantly reduced when finally passed in 1930 and covered only asexually reproduced plants.

Although microorganisms are living, they are clearly distinguishable in functional properties from plants.¹⁵⁰ Therefore, it

145. 301 F.2d 929 (C.C.P.A. 1962).

146. (1976). This section reads:

Conditions for patentability; novelty and loss of right to patent.
A person shall be entitled to a patent unless—

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States

147. 301 F.2d at 933.

148. *Id.* at 932 (quoting from the Committee on Patents). The Committee on Patents stated further: "No one has advanced a just and logical reason why reward for service to the public should be extended to the inventor of a mechanical toy and denied to the genius whose patience, foresight, and effort have given a valuable new variety of fruit or other plant to mankind." *Id.*

149. Dienner, *Patents for Biological Specimens and Products*, 35 J. PAT. OFF. SOC'Y 286, 290 (1953). See also Rossman, *Plant Patents*, 13 J. PAT. OFF. SOC'Y 7 (1931); Thorne, *Relation of Patent Law to Natural Products*, 6 J. PAT. OFF. SOC'Y 23 (1923).

150. See von Pechmann, *National and International Problems Concerning the Protection of Microbiological Inventions*, 3 INT'L REV. INDUS. PROP. & COPYRIGHT L. 295 (1972). The author distinguishes the functional properties of plants and microorganisms:

does not necessarily follow as reasoned by the court in *Bergy* that since plants did not constitute patentable subject matter within section 101 prior to 1930, microorganisms should also be considered nonstatutory subject matter. Plants and microorganisms have been considered by both the courts and Congress as entirely distinguishable from one another. In *In re Arzberger*,¹⁵¹ the inventor applied for a plant patent on a species of bacteria isolated and cultured by him. Expressing no indication as to the patentability of the bacteria under other provisions of the patent statute, the court held that the Plant Patent Act read "in the common language of the people" did not encompass bacteria even though it was established that bacteria were scientifically defined as plants.¹⁵² Rather, the plants covered by the statute were those grown by nurserymen and agriculturalists pursuant to the purpose of the legislation, for the benefit of agriculture. In addition, as Chief Judge Markey stated in his concurring opinion in *In re Chakrabarty*,¹⁵³ "[t]he legislative history of the Plant Protection Statute of 1930 or of the Plant Variety Protection Act . . . does not establish that Congress thought it was overcoming an objection to plants as unpatentable solely because they were 'alive.'"¹⁵⁴

Furthermore, it is reasonable to assert that while the Congress in 1930 believed that the intent of the patent statute was not to include plants or other living organisms, the initial lawmakers may very well have intended the statute to provide protection for such inventions. If the spirit of the constitutional provision and the statute is to encourage inventions that are for the benefit of society, it may be argued that the significant benefits of microorganisms secured to the public do just that,¹⁵⁵ and these enabling provisions

[A] new microorganism, in contradistinction to a plant, is as a rule only an auxiliary material for the solution of a technical problem. The microorganism or, more specifically, its fermentation system serves as a reagent or a catalyst in connection with the biochemical production of new or known substances. Unlike with a plant variety, it will not be possible to see in the vegetative propagation of a microorganism the protectable step which leads directly to the practical development of the salient properties of the product resulting from the culture.

Id. at 300.

151. 112 F.2d 834 (C.C.P.A. 1940).

152. *Id.* at 838.

153. 571 F.2d 40 (C.C.P.A. 1978) In *Chakrabarty*, the Court of Customs and Patent Appeals, subsequent to *Bergy*, held patentable a new strain of bacteria highly useful in combating oil spills. See also notes 180-84 & accompanying text *infra*.

154. *Id.* at 44 (Markey, C.J., concurring).

155. See Edelbute, *Microbiological Applications and Patents*, in THE ENCYCLOPEDIA OF PATENT PRACTICE AND INVENTION MANAGEMENT 567 (R. Calvert ed. 1964).

should be read in light of the changing needs of today's industry and the constant discoveries of modern technology. Whether the patent statute should be construed as presently written, or specifically amended to cover biological products, has been said to depend solely upon a question of policy. "[D]oes the country desire to give encouragement to the development of new biological products and specimens, both plant and animal?"¹⁵⁶ The Solicitor for the Patent Office contended that the question addressed and decided by the court in *Bergy* was "a policy matter which cannot . . . be deemed the proper subject for interstitial judicial legislation. Appellants' remedy is with Congress."¹⁵⁷

When presented with the question of whether living things constituted patentable subject matter, the court in *Bergy* deemed it to be within its judicial discretion to extend the patent laws to these inventions and not a policy matter which necessitated the express action of Congress. This judicial interpretation appears well-reasoned and valid in light of the intent of the constitutional clause and the patent statute, the important industrial function of microorganisms, the fact that the microorganism is considered the manufacture of a microbiologist, the fact that life processes employing the crucial life functions have long been held to be patentable, and the fact that there is no express language in legislative or judicial authority that precludes the patentability of living things.

C. The Desirability of Patenting Living Matter

The use of microorganisms in pharmaceutical and related research is a large and essential business. Concern regarding the policies and the mechanics of patenting these tools has been expressed both in industry and in the international scientific community.¹⁵⁸ Considering the industrial importance of the microorganism, it is arguable on a public policy basis that just as the inventors of chemical compounds have long enjoyed the protection of the patent laws to ensure the development and dedication to the public of new chemical compounds, the inventors of these useful microorganisms should also receive patent protection.

Because of a characteristic unique to microorganisms and which is not present in chemical compounds, one commentator presents a series of arguments illustrating that the need to patent microorganisms is greater than the need to patent chemical compounds.¹⁵⁹ He contends that chemical compounds would be devel-

156. Dienner, *supra* note 149, at 290.

157. Brief, *supra* note 7, at 20.

158. See Tak, *Protection of Applied Microbiology*, 5 INT'L REV. INDUS. PROP. & COPYRIGHT L. 382, 385 (1974).

159. See Wegner, *supra* note 5, at 237.

oped and placed on the market "whether or not patent protection has been granted, if the compound is of sufficient importance."¹⁶⁰ Once on the market, the compositions of chemical compounds would be readily discernible through analysis of the compound by one skilled in the art. The important distinction between chemical compounds and microbiological processes is that the starting materials in the former are not mysteries to one skilled in the art. Although without the protection of a patent the incentive to invent useful chemical compounds would be reduced, it would not be completely diminished, and American industry would benefit from those chemical compounds which continue to be marketed.

A very different situation exists with regard to detecting the starting materials in microbiological processes producing patentable end products. The virtual impossibility that one skilled in the art will duplicate the microorganism requires that these tools be patented in preference to other inventions. Prior to *Bergy*, in claims involving these processes, only the patented end product would be marketed and not the production process itself. The process and its tools were protected by trade secret, thereby effectively keeping these inventions from the public. As stated by the commentator:

[A]bsent larceny or blind luck of a competitor, [it would be impossible] to reproduce the microorganism necessary to conduct a trade secret microbiological process for the production of the new end product. The inventor would be able to reap the fruits of his invention through the sale of the *product* produced by his secret process, while maintaining the secrecy of the microorganism used in the process. In this way, the inventor would be able to exploit his invention and the public would not have the benefit of the use of the microorganism after the expiration of a limited period as would be the case where an invention is protected by a patent. Perhaps equally important is the fact that industry would be deprived of the disclosure of the microorganism for experimental purposes of further research.¹⁶¹

Therefore, while the inventor of the microorganism used in processes producing patentable end products may choose to protect the invention by trade secret with the additional assurance that it would be most unlikely that the microorganism would become public knowledge, public interest is better served by an interpretation permitting microorganisms *per se* to be patentable because the patent would add incentive to make public a very concealable tool. While the claim in *In re Bergy* did not involve a process with a patentable end product, it is not unreasonable to assume that inventors of such processes would take advantage of

160. *Id.*

161. *Id.*

the patent process to secure protection for the total invention—the process, the microorganism, and the end product.

Additionally, in the interest of the continued development of the microbiological industries, an even more apparent need for patent protection for microorganisms is demonstrated by the large number of processes using microorganisms in the production of previously known and, therefore, unpatentable end products.¹⁶² The inventor of this type of process has had the option of either marketing the unpatentable end product and retaining the process for the production by means of trade secret, or of patenting the process itself provided it met the conditions of sections 102¹⁶³ and 103.¹⁶⁴ By selecting the former course, the inventor could effectively keep the information regarding the process from the public. An extension of patent protection to microorganisms would encourage the inventor of this type of process to patent that tool and perhaps the process which uses the tool to arrive at a specific result.

If the inventor were to choose to patent the process, he or she would have dedicated to the public the use of those tools of the process that were themselves unpatentable. If microorganisms are unpatentable, they are free to be used by the public. Under section 112,¹⁶⁵ if a microorganism is one of the process tools, the inventor as a part of the enabling disclosure places on deposit in a public depository a sample of the microorganism which will in turn be made readily available to the public once the patent for the process is issued.¹⁶⁶ Therefore, the virtually impossible task of duplicating the microorganism is avoided by anyone wishing to use it for other than the patented process. The court in *In re Mancy*¹⁶⁷ reasoned that the benefit of public access to these valuable but unprotected tools was additional justification for permitting the patent claim:

Indeed, the public interest appears to be well served by encouraging the patenting of such inventions [processes where a new strain of microorganism producing a known antibiotic is not considered obvious simply because the antibiotic has been produced by a different strain of the same microorganism]. While the patent will grant appellants a limited right to exclude others from producing daunorubicin by the use of *Streptomyces bifurcus*, the public receives not only the knowledge of appellants' discovery but also access to *Streptomyces bifurcus* through its deposit with the Department of Agriculture.¹⁶⁸

162. *Id.* at 238.

163. 35 U.S.C. § 102 (1976). See text accompanying notes 15-21 *supra*.

164. 35 U.S.C. § 103 (1976). See text accompanying notes 15-21 *supra*.

165. 35 U.S.C. § 112 (1976).

166. See *In re Argoudelis*, 434 F.2d 1390 (C.C.P.A. 1970).

167. 499 F.2d 1289 (C.C.P.A. 1974).

168. *Id.* at 1294.

Although the inventor had patent protection extended to the process producing a specific product, the inventor could not control the use of the unpatentable tool in its application to other uses. Therefore, if the microorganism was believed to be useful in other processes, a natural result would be for the inventor to maintain the process and microorganism under trade secret rather than patent it, thereby keeping the valuable information from the public.

Allowing microorganisms to be patented will ensure an increased dedication of microbiological processes and their tools to industry under the incentives of the patent system. As stated by one commentator, the "[p]rotection of the new strain itself would doubtless bring certain advantages to the inventor. Just as with a chemical product claim, every use of the strain would be protected, even for processes not discovered by the inventor."¹⁶⁹ Because it is in the interest of the public to encourage development of new and improved methods of producing known products, it is reasonable to encourage such a result by extending to the inventor the exclusive right to the new, useful, and obvious microorganism in all uses for a limited period of time. This extension of the patent laws is not unreasonable in light of the public's benefit from (1) the increased knowledge and benefits secured from the improved methods of the process, and (2) the increased knowledge and availability of the tool.

In response to arguments for extending to the inventor of the microorganism the exclusive right to its use, one commentator has stated that the realities of microbiological technology do not require such protection:

[T]he necessity for protection of the microorganism in and of itself does not appear to be so urgent. In any event, no case is known to me in which a new strain has at a later point become suitable for the preparation of other chemical compounds. As a rule, with the protection of the new process of preparation for the antibiotics or with protection of the antibiotic itself (chemical product protection), the inventor will already obtain an adequate reward for his actual, new technical contribution.¹⁷⁰

In addition, since the microorganism is usually the means to a specific end, the fact that the protection of the organism would necessarily control the use of the end product should be seriously considered by those desiring an extension of the patent laws.¹⁷¹

The commentator's contention that patent protection of the process or the end product would adequately reward the inventor of the microorganism does not address the fact that the microorganisms in *Bergy* and similar inventions meet all the conditions for patentability. There is an implication in his argument that the in-

169. von Pechmann, *supra* note 150, at 299.

170. *Id.* at 301.

171. *Id.*

vention must demonstrate usefulness in more than one manner to justify the award of the patent. Such a requirement is not evident in the patent provisions. The fact that a microorganism cannot yet produce more than one chemical, and that a patent at present on that specific microorganism's process would appear adequate for the inventor, is not reasonable justification for the denial of a patent award to an invention which in all other respects deserves one. Furthermore, the commentator's rationalization that the inventor would be adequately protected by a patent on the antibiotic itself was not valid in the case of the applicants in *Bergy*, nor in situations in which scientists have significantly improved on the methods of obtaining important, but already known, end products. The end product in the *Bergy* case had been previously patented by other parties.¹⁷² Finally, the protection accorded the inventor by merely patenting the process does not provide sufficient incentive and recognition. The alternative of patenting the microorganism *per se* would provide the greatest encouragement for further research.

The commentator also contended that protection of the microorganism would control the use of the end product.¹⁷³ However, that is not true of the claim in *Bergy* and comparable claims to microorganisms employed in processes producing known and unpatentable end products. A patent award to the *Streptomyces vellosus* in *Bergy* would not preclude another inventor from isolating and culturing a microorganism to produce it in a more efficient manner. Indeed, that is precisely what the scientists in *Bergy* succeeded in doing. While a patent on the microorganism would not control the use of the end product, it would entitle the inventor to exclusive control over the use of the specific organism. That right bestows no greater privileges than those accorded the inventors of patentable chemical compounds.

Even to those who believe patenting microorganisms is a reasonable extension of the patent laws, there is the troublesome question of whether section 101 will be or should be further extended to encompass more complex forms of living organisms. To answer this question, it is necessary to review *In re Bergy* and determine whether there is a discernible scope to the holding, and whether there is a standard by which attorneys, examiners, and courts may judge the patentability of more complex forms of life. The importance of determining whether a clear standard exists is evidenced by the open expression of concern—the "far-fetched fears" described by the court in *Bergy*—over the patenting of higher forms of life. As one patent attorney stated in reference to

172. Record, *supra* note 25, at 21.

173. von Pechman, *supra* note 150, at 299-302.

Bergy: "As soon as you discuss patenting living organisms, people have visions of 1984."¹⁷⁴ An analysis of the court's language reveals that it did not provide any express limits to patentability. Indeed, if a court was to find it necessary to draw a line distinguishing microorganisms from higher forms of life, the summary reasoning expressed on that issue in *Bergy* would provide little guidance. Instead, a study of inferences is necessary to determine the scope of patent protection accorded living things.

Subsequent to finding the living quality to be legally irrelevant to patentability, the court in *Bergy* held the microorganism to be a qualified invention for the following reasons: (1) it was a new human-made product; (2) it was "an industrial product used in an industrial process—a useful or technological art if ever there was one;"¹⁷⁵ (3) it was an obvious industrial tool; and (4) it was in the public interest to encourage the development of this invention.¹⁷⁶ Thus, the approach taken by the court was comparable to that it would take in examining the application of any invention—whether the invention meets the conditions of sections 102¹⁷⁷ and 103.¹⁷⁸

The sole language of the court intimating that the complexity of the organism might be relevant to the application was the following: "The nature and commercial uses of biologically pure cultures of microorganisms like the one defined in claim 5 are much more akin to inanimate chemical compositions such as reactants, reagents, and catalysts than they are to horses and honeybees or raspberries and roses."¹⁷⁹ The court then commented on the similarity between the microorganism and the chemical compound, both of which are valuable tools of the chemist and chemical manufacturers. This comparison indicates that a function analogous to that of a reactant, reagent or catalyst may be a criterion in evaluating future patent applications for living organisms. However, the problem with distinguishing the patentability of the microorganism on the basis of such a criterion is readily apparent when the living function of the microorganism, *i.e.*, the fermentation process of producing an antibiotic, is compared with the comparable living functions of the far more complex honeybee or a hypothetical strain of cow that may produce an improved quantity or quality of milk. Arguably, if that criterion is used and these forms of life are

174. Otten, *supra* note 7, at 18.

175. 563 F.2d at 1038.

176. *Id.*

177. 35 U.S.C. § 102 (1976). See text accompanying notes 15-21 *supra*.

178. 35 U.S.C. § 103 (1976). See text accompanying notes 15-21 *supra*.

179. 563 F.2d at 1038.

thereby found to meet the conditions of sections 102 and 103, they too would be patentable subject matter under *Bergy*.

On March 2, 1978, five months after *In re Bergy*, the Court of Customs and Patent Appeals decided *In re Chakrabarty*,¹⁸⁰ which arguably broadened the *Bergy* holding. In *Chakrabarty*, a strain of bacteria highly useful in combating ocean oil spills had been rejected by both the Examiner and the Board.¹⁸¹ Finding *In re Bergy* the controlling precedent on the "living" issue, the court in *Chakrabarty* held that the bacteria were patentable. Although the court dismissed the significance of the "genetic engineering" and found no relevant difference between the claims in *Chakrabarty* and *Bergy*, there is an express distinction. The microorganism in *Chakrabarty* is one step beyond the "biologically pure culture" present in *In re Bergy* and much closer to the DNA technology and mutation of living organisms that some feel fall within the "far-fetched fears" that the court refused to address in *Bergy*. Some individuals contend that permitting living things to be patented "could easily be applied in far out and scary directions; to patent products of recombinant DNA technology, cloning, cell fusion and other genetic engineering, perhaps organic modification of animals or even humans."¹⁸² The unknown limits of discovery coupled with the questionable benefits to society of these inventions creates understandable apprehensions. Less objectionable would be a new improved strain of animal such as the chicken in *In re Merat*¹⁸³ which provides a product to the American public that is both desired and beneficial.

The unsettling problem is that the present law as construed in the aftermath of *Bergy* and *Chakrabarty* indicates that those living inventions that are most significantly altered by humans, *i.e.*, the "far-fetched" inventions, could be considered patentable while those with less alteration, such as the chicken, would not. This theory was substantiated by Chief Judge Markey in his concurring opinion in *Chakrabarty*: "There are but two sources for manufactures and compositions of matter. They are God (or "nature" if one prefers) and man. As presented to us, the invention is admit-

180. 571 F.2d 40 (C.C.P.A. 1978).

181. The applicant had sought a patent on a new strain of microorganism altered by "genetic engineering," a process which involved the incorporation in a *single* cell [prior inventions had involved bacteria mixtures whose cumulative degradative actions failed to consume the oil from the spills at fast enough rate] by transmission therein of a plurality of compatible "plasmids," of a capacity for simultaneously degrading several different components of crude oil with the result that degradation occurs more rapidly.

Id. at 41.

182. Otten, *supra* note 7, at 18.

183. 519 F.2d 1390 (C.C.P.A. 1975).

tedly a "manufacture" by man. It therefore falls squarely within the language of the statute."¹⁸⁴ Thus, the threshold question to patentability is whether the living invention has been sufficiently altered by humans to be considered human-made. For example, the manufacturing procedure of isolating and culturing an unknown strain of single cell life and developing the production of a chemical substance which does not normally occur in nature from that life, is a significant alteration and is distinguishable from the cross breeding of several strains of known chickens resulting in a chicken that produces more white meat, a phenomenon occurring naturally. Arguably, the latter is not enough of an alteration of a natural product to be a manufacture of humans and would remain in the product of nature category. On the other hand, "genetic engineering," which is the "creation of new living organisms by combining genetic material from different life forms,"¹⁸⁵ would appear to be sufficient, and indeed was so held to be in *Chakrabarty*. Although the narrow holding in *Bergy* provides the legal mechanism to protect and encourage the development of microbiological technology and appears well-reasoned and necessary in light of the needs of industry, the lack of expressed limits of patentability coupled with the little known or understood advanced technologies of altering life gives rise to concern. Whether this research should receive the benefit of the patent laws involves questions of policy, ethics, and science that are well outside the expertise or appropriate function of the courts.

A solution to the question of the potential scope of patentability is for Congress to articulate the limits of patentable inventions. This legislation could easily recognize the valuable chemical properties of living inventions comparable to those in *Bergy* and *Chakrabarty*, and at the same time expressly disallow the patentability of more complex animal forms. Wherever the line is drawn, a decision on the patentability of an invention that is considered a higher form of life than the chemically useful microorganism in *Bergy* involves issues that can only appropriately be handled by Congress.

184. 571 F.2d at 45.

185. Brief, *supra* note 7, at 20. See Berger, *Government Regulation of the Pursuit of Knowledge: The Recombinant DNA Controversy*, 3 VT. L. REV. 83 (1978), in which the author presents a discussion of "whether to restrict [DNA research] which has only been shown to be potentially hazardous, which involves a quest for new scientific knowledge, and gives man the capability to design new life forms and ultimately, perhaps, to design future generations of himself." *Id.* at 109. The average citizen who has an enormous stake in the potential ramifications of continued DNA research must make that decision.

IV. CONCLUSION

In view of the purpose of the patent statute and the state of patent law, *Bergy* was an appropriate response to the needs of modern microbiological technology. It is a necessary extension of the patent laws to protect and encourage research on the microorganism, a living chemical tool highly used and valued in American industry. In an article published one year prior to *Bergy*, one writer forecasted:

With the importance of this [microorganisms chemistry] rapidly developing field of science having an increasingly significant impact on the industrialized world, specific protection under the patent laws is called for, either through the German case law solution of *Backerhefe*¹⁸⁶ or through legislative modernization of the law, to take a realistic view of the science of microorganisms chemistry as being a part of the world of commerce and not merely a colorful curiosity of nature under a child's microscope.¹⁸⁷

Although in *Bergy*, the Court of Customs and Patent Appeals provided a timely answer, it may be concluded from the holding in *Parker v. Flook*¹⁸⁸ and the vacation of *Bergy*¹⁸⁹ that the Supreme Court of the United States does not consider itself the appropriate vehicle for the expansion of the patent laws into new areas of technology. This appears to be so even when the expansion may be achieved by reasonable judicial interpretation of the patent statute and its policy and purposes as was evidenced by the decision of the Court of Customs and Patent Appeals in *Bergy*.

Under the Supreme Court's view, it now appears that if the invention or area of technology involved in a patent application was "wholly unforeseen" by Congress at the time of the enactment of the patent statute, protection cannot and should not be given to the invention. Instead, Congress must expressly address the intended patentability of the new area of technology. The message to American industry is clear: If protection is desired in order to bolster the incentives and increase the monies for development in the newest of technologies, the advocates of such protection will need to initiate the necessary legislation and convince Congress

186. *Backerhefe* [Baker's Yeast], 6 INT'L REV. INDUS. PROP. & COPYRIGHT L. 207 (1975), was decided by the German Federal Supreme Court on March 11, 1975. The court held a microorganism patentable as an invention so long as the inventor could show a reproducible method of producing the microorganism.

187. Wegner, *supra* note 5, at 246.

188. 98 S. Ct. 2522 (1978).

189. 98 S. Ct. 3119 (1978).

that such legislation will proximately result in the promotion of the inventive skills and products of American industry.

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