SPECIAL SECTION

CARE AND CULTIVATION

Protestant Thinking on Biotechnology Seeks a Balance between Freedom and Responsibility

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James F. Drane, PhD, calls for a dialogue among the religious, research, and policy communities concerning the ethics of technological innovation in medicine ("For an Ethics of Technology," p. 30). This essay explores some themes and questions that Protestant Christianity might bring to such a dialogue.

The Theological Background: Four Strands of Protestant Thought

The influential theologians of the Protestant Reformation, such as Martin Luther (1483-1546) and John Calvin (1509-1564), made a sharp distinction between God, on one hand, and nature (including human nature), on the other. In their view, all value is derived from the divine being. Human beings, having experienced the dramatic and enduring consequences of the fall from divine grace, have been divested of ultimate value and stand in need of redemption and reconciliation.

One result of this line of thought was, to borrow Max Weber's memorable phrase, the "disenchantment of the world"—the loosening of nature's ancient hold on human attitudes and actions.[1] Nature could no longer evoke precisely those sentiments of awe and reverence that Professor Drane deems essential for the grounding of moral restraints on human manipulation of the world, including technological innovation. During the Industrial Revolution, people came to see nature as a realm open to the rationalized reductionism of science and technology. Protestant theology had sought to return God to the fore of human consciousness. Ironically, however, success in the manipulation of nature has instead tended to make people skeptical about the existence of God.

Protestant thought does share Professor Drane's belief in the necessity of a moral critique of biotechnology. Equating technology with "progress"—and both with "good"—violates what Paul Tillich referred to as "the Protestant principle": Avoid the human propensity to absolutize the relative.[2] Nonetheless, there is no such thing as a Protestant body of opinion on biotechnology. A range of Protestant perspectives can be identified on almost any moral question of consequence. Such moral pluralism is consistent with Protestantism's historical emphasis on Christian liberty and freedom of conscience. Pluralism can also be seen in Protestant approaches to biotechnology. Assessments span the spectrum, from hostility to biotechnology as an arrogant intrusion upon God's created order, on one hand, to a celebration of biotechnology as a beneficial means of partnership with God in continuing creation, on the other.

Much of this ambivalence, caution, and pluralism is the result of the tension that Protestantism sees in the biblical creation narrative. God gave humanity dual mandates: to *cultivate* and *care for* the earth. The mandate to care implies grateful acceptance for life and its possibilities; it endorses the conservation and preservation of such gifts. The mandate to cultivate, however, implies the use of human creativity to enhance the quality of human life and to realize human possibilities. Care and cultivation can be understood as regula-

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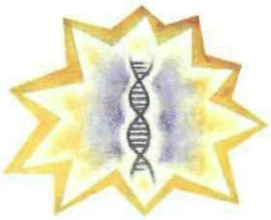


tive moral norms in the Protestant understanding of nature and its manipulation by technology. Care and cultivation provide a moral structure for both justifying *and* limiting biotechnology.

Protestantism has four basic views concerning humanity's relationship to nature.

Nonintervention

One strand of Protestant thought emphasizes a noninterventionist, passive posture. This view does not claim that nature, being intrinsically good, should be left as a kind of sacred preserve of the divine glory. It sees nature, like all creation, as fallen from its pristine Edenic state. But human beings, because of their finitude and fallibility, are through technological interventions likely to make matters worse rather than better. People are particularly limited with respect to predicting, controlling, and assessing the outcomes of actions they initiate. This is especially problematic in the realm of biotechnology because—as Professor Drane astutely observes—prudence in such cases requires the adequate assessment of innovations that are without precedent in human experience and whose consequences will accrue over long periods of time. Prudence, in short, requires seeing into the future, which is beyond human capability. When human aspirations exceed human capabilities, they run the risk of the sin of pride or hubris—of "playing God."

This strand of Protestant thought says that, in the general balance of care and cultivation, special emphasis should be laid on the side of carefulness, lest overreaching aspiration generate moral myopia. The mandate to care has priority over the mandate to cultivate. Put another way, the moral imperative is, first, to do no harm. Seeking the fruits of technological progress is morally optional. This school of thought admonishes biotechnological researchers to be cautious—even, perhaps, to discontinue some projects—to protect humanity and the world from unforeseen consequences and slippery slopes.

Anthropocentric Domination

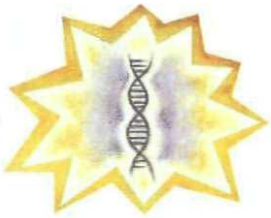
If nonintervention may be said to represent one pole of Protestant thought about biotechnology, the other pole is represented by *anthropocentric domination,* which emphasizes the mandate to cultivate, even to the neglect of caring. In addition, because it emphasizes humanity's distinctive status—creation in the image of God—this school of thought believes that human beings should be the primary beneficiaries of the cultivation of nature. Ontology, in this case, implies moral superiority: Humans are not just the culmination of creation, but also its measure and purpose. Thus this school believes that human beings have divine permission to use the resources at their disposal, including the natural resources of the earth and their own intellectual and creative potential, to improve human welfare.

The anthropocentric domination school of thought shares with the nonintervention school the view that the world and nature are fallen. But it differs from the other in two important respects. In the anthropocentric domination perspective, a fallen world invites improvement, perhaps even enhancement. This view supports efforts to cultivate biotechnology to improve the quality of human life. It transforms the world into a realm of what Professor Drane calls "conditional necessity." Nature, when seen this way, can provide no normative guidance or natural moral law with which humans should comply. Human finitude and fallibility are less restraining than in the nonintervention view. And, indeed, the historical record seems to bear out the value of a cultivation ethic. Humanity has—through the sustained investigation, understanding, and manipulation of nature—made dramatic improvements in its health and welfare, particularly over the past century in medicine. The anthropocentric domination perspective expresses confidence that biotechnological interventions will culminate in benefits rather than harm and that accompanying risks will be controlled and minimized.

> One school of Protestant thought expresses confidence that biotechnological interventions will culminate in benefits rather than harm.

Anthropocentric domination thinking has been influential not just in Protestantism. It has also provided a legitimating basis for the scientific and industrial revolutions that have now brought most of nature under human mastery. But this school of thought has also received sustained philosophical criticism. In a very influential 1967 essay, Lynn White, Jr., laid the blame for the ecological crisis precisely at the door of the anthropocentric domination school of Protestant Christianity. In White's view, the school "not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends."[3] The anthropocentric domination perspective commonly seems to be reflected in and perpetuated by contemporary innovations in biotechnology.

There is little question but that this viewpoint is compatible with the biblical injunction to humanity to cultivate the earth. But the mandate to cultivate is not unlimited. It should be directed and constrained by the mandate to care, with its emphasis on protection, preservation, and conservation. Moreover, cultivation is also limited by the injunction to be responsible and accountable before God. An anthropocentric account of



human dominion may not be as faithful to Protestant Scripture and teaching as other interpretations.[4]

Stewardship

A perspective that seeks a more balanced response to the mandates of care and cultivation has historically been designated as *stewardship* or *trusteeship*. A stewardship ethic can be found in the Protestant themes of authority, agency, and accountability. According to this school, God gave humanity both authority (or dominion) over nature and the moral freedom to make choices regarding the use of natural resources. However, such choices should reflect a concern for the common good, which, contrary to the view expressed in anthropocentric domination, is not coextensive with what is good for human beings. Moreover, this dominion is intrinsically connected to assuming accountability before God for the choices made. As stewards of life and the earth, human beings have been entrusted with the task of balancing the mandates of care and cultivation so that they may render service to others and, ultimately, to God.

The stewardship perspective tries to maintain a responsible balance of the dual mandates. This view both justifies biotechnological interventions, on the grounds of improving the world and human welfare, and limits those interventions when they overreach these goals. Responsible stewardship recognizes that both benefits and harm can occur through human technologies, and that making decisions about whether and when to use technology under the human conditions of finitude and fallibility is complex and permeated by genuine ethical uncertainties and dilemmas. Thus, although biotechnology can be justified, good reasons must be offered in its support, and constraints must be acknowledged and adhered to.

This perspective sees in responsible stewardship a profound kinship between humans, on one hand, and the earth and its creatures, on the other. Indeed, as its adherents like to point out, the words "human" and "earth" share a common etymological root: "humus." Human beings are thus "earth creatures," created by God, to be sure, but of the dust of the earth. This commonality should bring to people an awareness of interdependence, mutuality, and humility that would preclude the attitude of conquest found in the anthropocentric domination perspective.

The stewardship perspective arguably expresses the most compelling Protestant normative position, one consonant with Professor Drane's argument against a technological imperative without moral limits. A steward is by definition grateful for the munificence bestowed by the Creator and by past generations. This gratitude, in turn, imposes certain expectations in both attitude and conduct on both the steward and his or her descendants. The steward is accountable to God and to the human community, and this accountability entails moral limits on technological manipulation.

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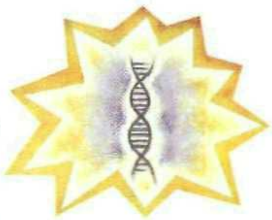
Partnership

The stewardship perspective affirms that human beings are authorized agents of God in the world, but the purposes for which the earth is to be cared for and cultivated are by and large given by divine design. Human beings are entrusted to select responsible means for the realization of these purposes. The *partnership* perspective, by contrast, emphasizes a much more active and engaged role for human beings in shaping these ultimate purposes.

The partnership view assumes that creation did not end at some point in prehistory but is instead a dynamic, ongoing process in which human beings participate as "created cocreators" with God. This view holds that human and bioecological destiny are not predetermined but shaped contextually. In his book, *The New Genesis*, the title of which symbolizes a sense of new beginnings, Ronald Cole-Turner writes, "Human work, especially our technology, may be seen as a partnership with God in the continuing work of creation. . . . [O]ur genetic engineering has the potential for being an extension of the work of God."[5]

Although this perspective has appeared in Protestant thought only relatively recently, it has received thoughtful exposition in the context of genetics and ecology not only by Cole-Turner but also by such writers as Philip Hefner and Ted Peters.[6] The partnership perspective seems likely to be increasingly influential in dialogues among representatives of the religious, scientific, and biotechnological communities. Partnership models rely more heavily on scientific views of cosmology than do their Protestant predecessors, which were largely formulated within biblically shaped worldviews.

The British theologian Arthur Peacock has articulated the analogical and substantive meaning of partnership in a way that highlights its differences from the stewardship model. "It is," he writes, "as if man has the possibility of acting as a participant in creation, as it were the leader of the orchestra in the performance which is God's continuing composition. . . . [M]an now has, at his present stage of intellectual, cultural, and social



evolution, the opportunity of consciously becoming *co-creator* and *co-worker* with God in his work on Earth, and perhaps even a little beyond Earth."[7]

Indeed, Peacocke sees human beings as existing within a cosmos whose designs and purposes are known neither by them nor by God. To him, in fact, people are *coexplorers* with God. Such a perspective is certainly compatible with, and provides theological justification for, biotechnology in its manifold applications. Biotechnology, in this view, might be described as the lead violin in the great orchestra that is creation.

Applying Biotechnology: Transgenics and Human Cloning

Protestant thinkers and communities have certainly welcomed many biotechnological innovations, particularly those that improve human health (e.g., genetically engineered human insulin). Such efforts to alleviate or cure disease are commonly seen as divine creativity and redemption expressing itself through the imaginative instrumentality of human beings. With very few exceptions, biotechnological developments are not suspect in Protestant theology. Especially when viewed from a partnership perspective, biotechnology can be theologically praiseworthy and even morally required. Nonetheless, given their historical theological commitments, Protestant thinkers do raise questions about biotechnology's purposes and the control of its application.

Indeed, some scholars have suggested that "control" itself is fundamental to the biotechnological enterprise, in the sense that it seeks to diminish human vulnerability to the capriciousness of the natural world. At the same time, some Protestant thinkers ask whether scientists conduct their research and biotechnological applications with intellectual humility—with, that is, a sufficiently deep sense of humanity's dependence on powers beyond its control. Or have these virtues perhaps been effaced by scientists' tendency to emphasize human accomplishment and mastery of nature?

The issue of human control is thus one that cuts across both substantive and procedural questions. Two biotechnological innovations, transgenics and cloning, illustrate a range of views among contemporary Protestant thinkers.

Transgenic Research

Protestantism does not generally grant plants and animals the theological and moral status it grants human beings, but it does place them in the domain of responsible human dominion. Some thinkers thus object to, or at least question, the insertion of genes from one plant or animal species into those of another species, the result being a *transgenic* organism. Transgenic biotechnology, they say, violates the order of creation by manipulating genetic information for purposes not intended in the origins of plant and animal life.

Other Protestant thinkers see the issue differently. Some note that Jesus, portrayed in Scripture as a healer in nature, provides human beings with a model to emulate as created cocreators. Cole-Turner, for example, invokes the healer image in support of the genetic alteration of plants to enhance disease-resistance traits. Human beings, he argues, can participate in the divine ordering by enhancing the usefulness of plants (and also by reducing environmental damage).[8]

Theological argument about transgenic research may become more critical when the research is done on animals rather than plants or microorganisms. Some Protestant writers have cited the creation in the 1980s of transgenic pigs (a process involving the human growth hormone gene) as an example of the moral risks implicit in such research. The goal of the research was to develop pigs that, having greater muscle mass and leaner fat content, would be more commercially desirable than current breeds. Unfortunately, the transgenic pigs turned out to be excessively hairy, arthritic, impotent, and lethargic. Theological critics argued that the research had been conducted without ethical sensitivity to its possible harm to the animals.

The stakes may become higher yet when transgenic research is applied to the human genome.

The stakes may become higher yet when transgenic research is applied to the human genome. Many Protestant theologians are particularly concerned about the integrity of the human genome, which they see as having a special status because it was created in the image of God. Hence, according to one writer, "Genetic information from any other organism which does or did not exist in the human genome should not be placed within humans."[9] However, this position may be criticized by still other Protestants. First, a prohibition on mixing genetic information from other species with that of humans would seem to suggest that human distinctiveness is constituted by genetic differences, rather than by the mysterious transcendence suggested by the concept of the "image of God." In this view, preserving human genetic integrity appears bought at a price of genetic essentialism and theological reductionism, or what one theologian criticizes as the "gene myth."[10] Second, such a position assumes that there is something inviolable about genetic information, even though human beings absorb

the genetic information of "other organisms" every day in the food they eat.

In any case, it is clear that, whether done on plants, animals, or humans, transgenic biotechnology causes widely shared concern among Protestant writers.

Human Cloning

The successful cloning of sheep and other mammals, which raises the prospect of human cloning in the near future, has revealed—perhaps more clearly than any other question in biotechnology—the pluralism of Protestant ethics. Protestant theologians were invited to testify before the National Bioethics Advisory Commission established by President Bill Clinton to recommend public policy on human cloning, and Protestant scholars have begun to contribute to the emerging ethics literature on the question.[11]

Still, cloning is not a new question within Protestantism. The Protestant theologians Joseph Fletcher and Paul Ramsey participated in influential academic and scientific forums in the 1960s and 1970s, when cloning was first proposed as a scientific solution to many of the world's ills. Fletcher and Ramsey staked out diametrically opposed positions. Fletcher saw cloning as an expansion of human freedom (self-determination) and control over human reproduction. Ramsey saw it as a moral boundary that medicine and society would cross only at the risk of compromising humanity and its ability to perpetuate itself. In contemporary Protestant faith communities, debates concerning cloning's theological meaning have revolved around several contested themes.

The Sanctity of Life In arguing against human cloning, evangelical Protestants appeal to the idea of the sanctity of human life. The process of somatic cell nuclear transfer for the purpose of making a new human being, at least as demonstrated in current animal studies, would, they say, inevitably result in loss of human embryonic life. In addition, evangelical thinkers claim that contemporary societal disregard of the sanctity of human life might lead to a redefinition of humanity, in which, for instance, cloned people might be treated as sources of spare organs and tissues for uncloned ones.

Parenthood Conservative and evangelical Protestants also object to human cloning because they see it as breaking an intrinsic connection between the unitive and procreative purposes of sexuality as embedded in the biblical creation narrative. Sexuality is understood to be a divine gift with the twin purposes of uniting partners through a physical expression of their love and bringing offspring into the world. In this context, human cloning runs contrary to the critical biological, emotional, and symbolic connections normally formed between spouses and between parent and child.

In particular, some Protestants have followed Paul Ramsey in asserting that the idea of children as "gifts" would be effaced by cloning because a child resulting from that process would be, not a gift, but a project and projection of the self.[12] These critics fear that cloning might reduce much of humanity to mere "raw material" out of which an artifice could be designed and constructed in a human designer's image, rather than in the image of God. Cloning, in this scenario, would result, not in humanity's enhancement, but in the enhancement of *some* humans' power over others.

The Image of God Conservative and evangelical Protestant scholars maintain that, as bearers of God's image, human beings possess a self-understanding that distinguishes them from the rest of creation. On one hand, cloning risks devaluing this status because it implies that genetics is the essence of personhood; on the other hand, it risks overvaluing the clone because it replicates the valued characteristics of a person.

By contrast, some mainstream Protestant theologians have argued that human cloning *can* express the creative dimensions of the *imago Dei*, insofar as those dimensions promote human dignity and welfare.[13] Moreover, these writers argue, the Christian vocation of freedom warrants the pursuit of scientific knowledge when it is coupled with the obligation of accountability delineated above. Even though sin is an inescapable reality, Christians are given permission to "sin bravely" in the pursuit of progress, these thinkers say. Thus, if research on human cloning can establish a reasonable expectation of benefits and ensure human dignity, then both research and eventually human cloning seem warranted.

Two Protestant theologians have staked out diametrically opposed positions on the question of human cloning.

Character Is Key

Protestant thought can celebrate biotechnology because it promises to reveal more about God's creation, making possible the application of that knowledge toward human betterment and the betterment of life on this planet. At the same time, Protestant thought urges caution concerning the biotechnological revolution, lest the knowledge it reveals be abused. Cultivation must be constrained by care. The powers likely to be unleashed by biotechnology must be acknowledged as limited and beyond our capacity to fully control. But Protestant thought has historically been concerned

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not simply with actions but also with what such actions reflect or express about a person's moral character. In this respect, the question Protestant theological ethics raises is: What kind of people do we need to be in order to wield such powers for good rather than ill? □

NOTES

1. M. Weber, "Science as a Vocation," in H. H. Gerth and C. W. Mills, eds., *From Max Weber: Essays in Sociology*, Oxford University Press, New York, 1958, p. 155.
2. P. Tillich, *Theology of Culture*, R. C. Kimball, ed., Oxford University Press, New York, 1959, pp. 53-68.
3. L. White, Jr., "The Historical Roots of Our Ecological Crisis," *Science*, vol. 155, 1967, pp. 1,203-1,207.
4. J. B. Cobb, Jr., "Biblical Responsibility for the Ecological Crisis," *Second Opinion*, no. 18, 1992, pp. 11-21.
5. R. Cole-Turner, *The New Genesis: Theology and the Genetic Revolution*, Westminster/John Knox Press, Louisville, KY, 1993, pp. 100, 108.
6. See P. Hefner, "The Evolution of the Created Co-Creator," in T. Peters, ed., *The Cosmos as Creation: Theology and Science in Consonance*, Abingdon Press, Nashville, TN, 1989; and T. Peters, *Playing God? Genetic Discrimination and Human Freedom*, Routledge, New York, 1997.
7. A. R. Peacocke, *Creation and the World of Science*, Clarendon Press, Oxford, England, 1979.
8. R. Cole-Turner, *The New Genesis: Theology and the Genetic Revolution*, pp. 80-84.
9. K. P. Wise in R. D. Land, L. A. Moore, eds., *Life at Risk: The Crises in Medical Ethics*, Broadman & Holman Publishers, Nashville, TN, 1995, p. 138.
10. T. Peters, *Playing God? Genetic Discrimination and Human Freedom*, pp. 5-10.
11. See R. Cole-Turner, ed., *Human Cloning: Religious Responses*, Westminster/John Knox Press, Philadelphia, 1997.
12. See G. Meilander, *BioLaw* II, 1997, pp. 114-118.
13. C. S. Campbell, in National Bioethics Advisory Commission, *Cloning Human Beings*, vol. 2, Rockville, MD, 1997, pp. D1-D64.

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sure that researchers' interests in profits, professional advancement, and reputation do not get in the way of controlled and safe experimentation. With all such precautions, however, we must use our God-given talents to help God make our world a more hospitable world for all of us. □

NOTES

In the following, M stands for Mishnah (edited c. 200 CE); T for Tosefta (edited c. 200 CE); J for Jerusalem Talmud (edited c. 400 CE); B for Babylonian Talmud (edited c. 500 CE); MT for Maimonides's Mishneh Torah (1177 CE); and SA for Joseph Karo's Shulhan Arukh (1565 CE) with the glosses of Moses Isserles.

1. David Novak, *Natural Law in Judaism*, Cambridge University Press, Cambridge, England, 1998.
2. See, for example, Deuteronomy 10:14 and Psalms 24:1. See also Genesis 14:19, 22 (where the Hebrew word for "Creator" [*koneh*] also means "Possessor," and where "heaven and earth" is a merism for those and everything in between); Exodus 20:11; Leviticus 25:23, 42, 55; and Deuteronomy 4:35, 32:6, 39.
3. *Genesis Rabbah* 11:6 and *Pesikta Rabbati* 22.4.
4. In Elliott N. Dorff, *Matters of Life and Death: A Jewish Approach to Modern Ethics*, Jewish Publication Society, Philadelphia, 1998, Chapter 2, I identify and discuss seven underlying principles, only three of which are mentioned in this article.
5. For example, bathing is a commandment, according to Hillel, *Leviticus Rabbah*, 34:3. In his code of Jewish law, Maimonides includes rules requiring proper care of the body as a positive obligation (they are not just advice for those seeking to feel good and live a long life).
6. B, *Shabbat*, 32a; B, *Bava Kamma*, 15b, 80a, 91b; MT, *Laws of Murder*, 11:4-5; SA, *Yoreh De'ah*, 116:5 gloss; and SA, *Hoshen Mishpat*, 427:8-10. Jewish law views endangering one's health as worse than violating a ritual prohibition. See B, *Hullin*, 10a; SA, *Orah Hayyim*, 173:2; and SA, *Yoreh De'ah*, 116:5 gloss.
7. B, *Sanhedrin*, 74a.
8. *Midrash Temurrah* as cited in *Otzar Midrashim*, J. D. Eisenstein, ed., Hebrew Publishing Co., New York City, 1915, pp. 580-581. See also B, *Avodah Zarah*, 40b, in which a Rabbi expresses appreciation for foods that can cure. Although Jewish tradition does not justify circumcision in medical terms, the Rabbis did maintain (as noted above) that Jewish boys are not born circumcised because God created the world so that it would require human fixing; see n. 3 above.
9. B, *Shabbat*, 10a, 119b. In the first of these passages, it is the judge who judges justly who is called God's partner; in the second, anyone who recites Genesis 2:1-3 (about God resting on the seventh day) on Friday night thereby participates in God's ongoing act of creation. The Talmud in B, *Sanhedrin*, 38a, specifically wanted the Sadducees *not* to be able to say that angels (or any beings other than humans) participate with God in creation.
10. See, for example, J. D. Bleich, *Judaism and Healing: Halakhic Perspectives*, Ktav Publishing House, Hoboken, NJ, 1981, p. 106.
11. B, *Yevamot*, 69b. Rabbi Immanuel Jakobovits notes that 40 days in talmudic terms may mean just under two months in our modern way of calculating gestation, because the Rabbis counted from the time of the first missed menstrual flow whereas we count from the time of conception, approximately two weeks earlier. See Immanuel Jakobovits, *Jewish Medical Ethics: A Comparative and Historical Study of the Jewish Religious Attitude to Medicine and Its Practice*, Bloch Publishing Co., New York City, 1959, p. 275.
12. *The Hastings Center Report*, March-April 1999, pp. 30-48.
13. See Stephen J. Gould, *The Mismeasure of Man*, W. W. Norton & Company, New York City, 1996, and George J. Annas and Michael A. Grodin, *The Nazi Doctors and the Nuremberg Code: Human Rights in Human Experimentation*, Oxford University Press, New York City, 1992.
14. For a thorough discussion of this concept, see Carl Astor, *". . . Who Makes People Different": Jewish Perspectives on the Disabled*, United Synagogue of America, New York City, 1985.
15. Leviticus 11 and Deuteronomy 14 stipulate the animals that fulfill the dietary requirements. The dietary laws also require a specific mode of slaughter, intended to minimize the animal's pain (based on Dt 12:21), a specific way to drain blood from the meat (Gn 9:4 and Dt 12:23-25), and that meat and dairy meals be separated. The prohibition on mixing seeds can be found in Leviticus 19:19 and Deuteronomy 22.9.
16. See Kassel Abelson and Mayer Rabinowitz, "Definition of a *Davar Hadash*," in *Proceedings of the Committee on Jewish Law and Standards of the Conservative Movement, 1980-1985*, Rabbinical Assembly, New York City, 1988, pp. 187-190.