

Survey of Recent Halakhic Periodical Literature

GENETIC ENGINEERING

I. PERMISSIBILITY OF GENETIC MANIPULATION

Genetic engineering has made it possible to manipulate the DNA of microorganisms, animals and plants in order to satisfy human needs. Science has developed bacteria that ingest petroleum in order to alleviate the environmentally devastating effects of oil spills, bacteria to produce insulin, sheep whose milk contains a drug used in treatment of cystic fibrosis and a host of genetically modified foods. One third of the harvest of corn, soybeans and canola in the United States is genetically modified to make the crops resistant to insects. At least in the laboratory, it is possible to remove from a salmon DNA that keeps the fish from freezing and to introduce it into strawberries in order to produce a freeze-proof strawberry. It is also possible to introduce animal genes into plants. A small company in Syracuse has contracted with a scientist at the University of Connecticut to develop a genetically engineered cat that will not cause allergies, an effort that may prove to be highly profitable, since it would allow countless numbers of people who cannot now do so to keep cats as pets. Scientists at the University of Florida have patented a method of implanting a silkworm gene into grapevines to make the vines resistant to Pierce's disease, a blight currently menacing vineyards in California. The silkworm gene kills the bacterium responsible for the blight.

There is, of course, reason to be concerned with regard to possible deleterious effects of genetically modified foods upon humans. There is evidence that corn that has been genetically modified to produce a toxin that kills a caterpillar called the European corn borer may also kill monarch butterflies. Genetically modified crops may produce unfamiliar proteins that might prove to be allergenic, toxic or carcinogenic. These concerns are appropriately addressed both by the scientific community and by government regulatory agencies.

The theological and religious question is whether man has the right to intervene in the natural order by mixing and mingling the genetic material of diverse species. There is no reflection in Jewish tradition of a doctrine that establishes a global prohibition forbidding man to tamper with known or presumed *teloi* of creation. There are, however, indeed individual thinkers who have explained the rationale underlying particular *mizvot* in a manner echoing such a concept. Biblical commandments prohibiting interbreeding of species and the mingling of diverse agricultural species certainly lend themselves to such an interpretation. Although Rashi, in his commentary to Leviticus 19:19, regards those restrictions as *hukkim*, i.e., arational statutes not subject to human inquiry, Ramban, in his commentary on the same verse, takes sharp issue with Rashi and opines that interbreeding and prohibited mingling of species are forbidden as constituting illicit tampering with creation. Ramban states that every creature and every plant is endowed by God with cosmically arranged distinctive features and qualities and is designed to reproduce itself as long as the universe endures. Interbreeding and cross-fertilization produce a reconfiguration of those distinctive qualities and also compromise reproductive potential. By engaging in such activities man usurps the divine prerogative in producing a new species or entity with its own novel set of attributes and, presumably, a species less than optimally suited to fulfill the divinely ordained *telos* associated with the original species.

Ibn Ezra has been understood as presenting the matter in a somewhat different light in declaring that the Torah prohibits crossbreeding of species because the act thwarts propagation of the species and hence represents an injustice to the animals who are prevented from fulfilling the divine purpose of propagating their respective species.¹ Ibn Ezra has similarly been understood as explaining the prohibitions against the mixture of agricultural species as well as the combination of linen and wool in the cloth of a garment as violative of the natural order decreed by the Creator.² R. Samson Raphael Hirsch had no difficulty in explaining the prohibition regarding *sha'atnez* (the mixing of linen and wool) in similar terms. Indeed, R. Hirsch understood all *hukkim* as being reflective of the principle that man should not interfere with the order and harmony—and hence the *telos*—of creation.³ According to R. Hirsch, such laws are distinguished from *mishpatim*, or so-called rational commandments, only because our duties toward our fellow men are more intelligible to us by virtue of our recognition of our own needs

and aspirations. That particular purposes are similarly assigned to animals and even to inanimate objects is not immediately grasped by the human intellect and hence *hukkim* are depicted as arational. It is noteworthy that, although R. Hirsch regards these commandments as designed to prevent interference with divinely ordained *teloi*, unlike natural law theologians, he regards the *teloi* themselves as not being readily apparent to human reason. That understanding of the nature of *hukkim* is certainly confirmed by the fact that no natural law philosopher has ever asserted that the manufacture of linsey-woolsey or even agricultural hybridization is intuitively perceived as interfering with the divine plan for creation.

Were it to be assumed that tampering with the ostensive or presumed nature of animal species is always forbidden, most forms of genetic engineering would be illicit. No bacterium is designed by nature to clean up oil spills by metabolizing petroleum or to excrete human insulin for use by diabetics. In the absence of evidence in rabbinic sources to the contrary, it must be assumed that, even accepting Ramban's explanation of the prohibition against interbreeding or R. Hirsch's broader analysis of the rationale underlying *hukkim* in general, biblical strictures must be understood as limited to those matters explicitly prohibited.⁴

There is, to be sure, a perceptible tension between the concepts enunciated by Ramban and R. Samson Raphael Hirsch and the many midrashic sources indicating that man is an active partner in the process of creation and, as such, is charged with bringing creative processes to completion. Indeed, the biblical charge to Adam exhorting him to "fill the earth and conquer it" (Genesis 1:28) seems to give Adam *carte blanche* to engage in any form of conduct that is not specifically proscribed. The problem is readily resolved if it is understood that, in general, the functions and *teloi* of the products of creation are not immutable; that the Creator did not intend to bar man from applying his ingenuity in finding new uses and purposes for the objects of creation;⁵ and that there is no injustice to animal species or inanimate objects in doing so. Immutability of function and *telos* is the exception, not the rule. Thus, for example, it has never been suggested that manufacture and use of synthetic fibers in the making of clothes is in any way a contravention of either the letter or the spirit of the law.⁶ The exceptions were announced by the Creator as formal prohibitions. It is precisely because human reason cannot intuit, or even comprehend, when

and under what circumstances contravention of the natural order is inappropriate that these commandments are in the nature of *hukkim*.

More generally, man's creative power, at least to the extent that it does not involve creation of novel species, is extolled in rabbinic sources. The divine appellation "*Shaddai*" is understood in rabbinic exegesis as an acronym "*she-amarti le-olami 'dai*" — "Who said to My universe, 'Enough!'" Thus the verse, "I, the Lord *Shaddai*" (Genesis 17:1) is rendered by *Midrash Rabbah* 46:2, "I am the Lord who said to the universe 'Enough!'" R. Jonathan Eibeschutz, *Tiferet Yonatan, ad locum*, followed by R. Joseph Ber Soloveichik, *Bet ha-Levi, ad locum*, explains that, in His creation of various artifacts, God arrested their development before completion. Man plants a seed, the seed germinates, a stalk grows and kernels of wheat develop. The Creator could well have made it possible for the kernels to crumble into flour, for the flour to absorb rain or moisture from the atmosphere, for the wind to churn the water-drenched flour so that dough be formed and for the heat of the sun to bake the mixture in order to yield a product that might literally be termed a "breadfruit." Instead, the Creator arrested the process long before its completion and ordained that grinding the wheat, mixing the flour with water, kneading the dough and baking the bread be performed by man. Similarly, the flax plant could have been endowed with properties causing strands of flax to separate and intertwine themselves in a cloth which might grow in the shape of a cloak. Instead, the process is arrested and brought to completion by man. Indeed, the Gemara, *Shabbat* 30b, declares that in the eschatological era the Land of Israel will yield "cakes" and "linen garments." *Bet ha-Levi* explains that the import of that statement is simply that, in the end of days, God will allow the processes of creation to reach their destined end by modifying the natural order in a manner that will permit the creative process to become complete and thus spare man any travail. In the interim, however, He has declared, "Enough!," i.e., He has precipitously interrupted the process of creation and co-opted man, who must complete the process, as a collaborator in fashioning the universe.

It is abundantly clear that human intervention in the natural order is normatively interdicted only to the extent that there are explicit prohibitions limiting such intervention. Moreover, there is no evidence either from Scripture or from rabbinic writings that forms of intervention or manipulation not expressly banned are antithetical to the spirit of the law. Quite to the contrary, Jewish tradition, although it certainly

recognizes divine proprietorship of the universe, nevertheless, gratefully acknowledges that while "The heavens are the heavens of God" yet "the earth has He given to the sons of man" (Psalms 115:6). In bestowing that gift upon mankind, the Creator has granted man dominion over the world in which he lives and over the living species that are co-inhabitants of that world. Man has been given license to apply his intellect, ingenuity and physical prowess in developing the world in which he has been placed subject only to limitations imposed by the laws of the Torah, including the general admonition not to do harm to others, as well as by the constraints imposed by good sense and considerations of prudence.

The tension between the role of man as the agent of completing the work of creation and biblical prohibitions against certain forms of interference in the natural order is elucidated by R. Judah Loew, popularly known as Maharal of Prague, in his *Be'er ha-Golah*, chap. 2:3, *s.v. Masekhet Pesachim*. The Gemara, *Pesachim* 54a, states that the creation of a number of entities was planned by God before the first Sabbath but they were not actually created until the conclusion of the Sabbath. Upon the conclusion of the Sabbath "the Holy One, blessed by He, bestowed understanding upon Adam and he took two stones, rubbed them one upon the other and fire emerged; [Adam] brought two animals, mated one with the other and from them emerged a mule." Clearly, this statement reflects the notion that the potential for both fire and interspecies is the product of divine creation and that the potential became actualized through the intermediacy of human intelligence, which is itself a divine gift.

Maharal notes that, although interbreeding of diverse animal species was clearly interdicted by the Torah, the Sages certainly regarded the breeding of mules by Adam as a fulfillment of the divine plan. Maharal boldly declares that the fact that God has prohibited a certain act does not necessarily mean that God has renounced the effect of that act. Thus crossbreeding of animal species was prohibited to Israel at Sinai but was not forbidden to Adam because the breeding of mules was incorporated in the divine blueprint for creation. Thus a distinction must be drawn between act and effect. And, if disdain for the effect is not the rationale underlying the prohibition of the act, there exists no basis for expanding the prohibition to encompass any act that is not formally within its ambit.

Man's role is "completion" (*hashlamah*) of the process of Creation. Insofar as "completion" of creation is concerned, it is the divine plan

that such development take place. Maharal asserts that it is the divine will that even interspecies such as the mule come into being, although not in circumstances that involve violation of Torah law. Thus cross-breeding was permitted to Adam because emergence of interspecies is integral to "completion" of the universe. According to Maharal, cross-breeding by a person who is not commanded otherwise (or in situations in which the prohibition does not apply) does not constitute a violation of the divine will or of the divinely ordained *telos* because "the way of Torah is one thing and the way of completion is another matter entirely."

Genetic manipulation involving even the introduction of a gene of one species into the genotype of an alien species does not constitute a violation of the prohibition against crossbreeding. *Hazon Ish*, *Kila'im* 2:6, notes that violation of the commandment occurs only in directly causing copulation between two living animals. *Hazon Ish* declares that artificial insemination designed to produce an interspecies is not forbidden just as an *inter vivos* organ transferred from one species to another is not forbidden. It is thus quite obvious that genetic manipulation, since it does not entail a sexual act involving partners who are members of different species, cannot be regarded as forbidden.

A similar principle applies to genetic manipulation of agricultural species. R. Shlomoh Zalman Auerbach, *Minhat Shlomoh*, II, no. 97, sec. 27, declares that pollination of one species with pollen of another species does not result in a fruit that would be halakhically classified as a hybrid. Thus, although Rabbi Auerbach affirms that the fruit of an *etrog* tree produced as the result of grafting of a lemon branch may not be used on *Sukkot* for purposes of fulfilling the *mizvah* of the four species, he nevertheless regards pollination as an entirely different matter. Accordingly, rules Rabbi Auerbach, if an *etrog* is pollinated with the pollen of a lemon tree the resultant fruit is an *etrog* and may be used for fulfilling the *mizvah*. Rabbi Auerbach declares that the prohibition against hybridization of species applies only to the planting or grafting of vegetative material that might independently yield fruit or a seed capable of germinating independently. Pollen can never grow into fruit; hence, for purposes of Halakhah, introduction of foreign pollen⁷ does not affect species identity. Again, it is quite obvious that such pollination conducted artificially by humans is not prohibited. Similarly, it follows that introduction of a gene of a foreign species is not forbidden as a form of hybridization since an isolated gene can never develop into a tree or into a plant.

II. KASHRUT IMPLICATIONS

The major halakhic issue with regard to non-human genetic engineering is the identity of the resultant genetically engineered entity. It seems entirely obvious that a tomato modified to prevent freezing by insertion of a salmon gene is a plant and not an animal. Accordingly, the blessing to be recited before eating the genetically modified tomato remains identical to the blessing pronounced over unmodified tomatoes. But what is the status of a cow whose genotype has been modified by splicing in genes derived from a pig? Does the *kashrut* status of an animal depend upon the status of the gestational mother or upon its own genetic make-up? If the latter, is species identity determined by the source of the majority of the animal's genes or, if its genes are derived from animals of two or more species, is the genetically engineered animal regarded as a hybrid to be treated as a member of each of those species? Another ramification of that issue lies in the area of interbreeding: If genes of a sheep are introduced into a cow does the genetically modified animal remain a cow that may legitimately be bred with a bull or does it acquire at least the partial identity of a sheep that may not be crossbred with a bull? For that matter, may two such cows genetically engineered in an identical manner, but one a male and the other female, be bred with one another?

These issues began to receive scholarly attention due to rumors that circulated in B'nei Brak several years ago concerning genetically engineered poultry. The reports were quite vague in nature and told only of genes of non-kosher birds being introduced into poultry which, according to one rabbinic writer,⁸ "led to offspring with odd changes in the shape of their necks and the manner in which they stand on their feet." Another writer⁹ describes those chickens as sporting feathers on their legs and further asserts that, when perched on a pole, rope or wire, those chickens separate their toes by placing two digits on either side of the object on which they are perched. The latter phenomenon is recorded in *Shulhan Arukh, Yoreh De'ah* 82:2, as one of the defining criteria of a non-kosher species. One observer claims that he has observed one such chicken seizing its food with its feet,¹⁰ a phenomenon that, in the opinion formulated by Rashi, *Niddah* 50b,¹¹ is denoted by the term "*doves*" employed by the Mishnah as descriptive of the primary criterion of a non-kosher bird. The fear expressed by these rabbinic scholars is that similar genetic manipulation may have occurred with regard to other commercially available poultry but that those genetic changes may have

yielded no recognizable anomalies. There are also reports¹² of commercially slaughtered chickens of unknown provenance that lack feathers on their necks and whose skin in the area of their necks turns red when the chickens are frightened. A series of responsa dealing with this issue were collected by R. Hizkiyahu Yosef Cohen for inclusion in his as yet unpublished *Teshuvot Arnei Hen*.¹³ Among those items are responsa authored by R. Yisra'el Ya'akov Fisher and R. Moshe Sternbuch, both of the Bet Din of Jerusalem's *Edah ha-Haredit*, R. Nathan Gestetner, author of the multi-volume work, *Le-Horot Natan*, R. Samuel ha-Levi Wosznar, author of *Teshuvot Shevet ha-Levi*, as well as Rabbi Cohen's own comments. Rabbi Fisher's responsum has been published in his own responsa collection, *Teshuvot Even Yisra'el*, VIII, no. 55.

In a communication to a colleague, a copy of which is in the possession of this writer, Dr. Lawrence Shore, a member of the Department of Human Research of the Kimron Veterinary Institute in Bet Dagan, advises that transgenic poultry were never offered for sale but that such reports gained currency as a result of extremely interesting research that he had conducted. Dr. Shore reports that he successfully crossed a chicken with a jellyfish by inserting a gene from a jellyfish into a chicken. The gene thus transferred is responsible for the green pigmentation of jellyfish. The result was a green chicken. Dr. Shore further reports that the transfer procedure he employed is patented, that all research specimens were destroyed and that such chickens are not commercially available.¹⁴ Accordingly, the rumors represent little more than a halakhic tempest in a scientific teapot. The aforesaid does not at all imply that halakhic discussions of the issues involved are irrelevant. We live in a world in which yesterday's science fiction is today's laboratory experiment and tomorrow's commonplace reality.

A discussion of the halakhic ramifications of the issues involved must begin with one well-established point. As noted by R. Moshe Sternbuch in his responsum, the halakhic issue is quite similar to one posed by grafting a branch of a newly-grown sapling onto a mature tree. The fruit of the mature tree, i.e., a tree more than three years old, is no longer subject to the prohibition of *orlah*; the fruit of the young sapling is subject to that prohibition. Nevertheless, for purposes of *orlah*, the branch of the younger tree acquires the identity of the older tree and, accordingly, its fruit is permitted. In effect, the identity of the sapling becomes submerged in the identity of the tree onto which it has been grafted. Presumably, the same provision would apply to an individual gene that is "grafted" or spliced into the germ cell of another species.

However, in his responsum, Rabbi Nathan Gestetner, ignores this consideration with regard to rules governing *orlah* and hence fails to discuss its applicability or non-applicability to products of genetic manipulation. Instead, Rabbi Gestetner simply assumes that the transferred gene does not lose its halakhic identity as a particle of a forbidden entity. Nevertheless, he finds grounds to permit at least the progeny of the genetically altered bird on the basis of a principle of Halakhah applicable to the product of multiple causes. That principle is formulated, *inter alia*, in association with the prohibition against deriving benefit from any deified object. This prohibition notwithstanding, *Shulhan Arukh*, *Yoreh De'ah* 142:11, rules that, during the summer, even in climes in which vegetables need shade in order to grow, it is permitted to plant vegetables under a tree that has been made the object of pagan adoration. The halakhic principle reflected in that ruling is “*zeh va-zeh gorev muttar*,” i.e., the product of two causes, one permissible and one forbidden, is permissible. Germination and growth of the vegetables in question are attributable to two causes, *viz.*, 1) nutrients provided by the soil which are entirely permissible and 2) the shade provided by the prohibited tree.

Similarly, the Gemara, *Hullin* 58a, declares that eggs laid by a bird suffering from a congenital anomaly or which has sustained a trauma such that it has the status of a *treifah* may nevertheless be eaten. As Rashi explains, that is so because, according to the talmudic principle, eggs are the joint product of both the father bird and the mother bird.¹⁵ Although, in the case of a *treifah*, the meat of the mother may not be consumed, nevertheless, since the father is not a *treifah*, the resultant egg is permissible on the basis of the principle of *zeh va-zeh gorev*, i.e., it is the product of two separate causes. Accordingly, argues Rabbi Gestetner, a genetic complement containing genes from both a permitted species and a non-permitted species should have the status of *zeh va-zeh gorev* and hence all progeny should be permissible. Even more significantly, if only one of the progenitors of the chicken was the product of genetic engineering, but the other was not, the offspring are certainly the product of two separate “causes” and hence permissible.

However, as Rabbi Gestetner observes, that conclusion is not compatible with the position of Ramban, *Avodah Zarah* 49a, cited by *Bet Yosef*, *Yoreh De'ah* 142, who asserts that the principle of *zeh va-zeh gorev* is applicable only in situations in which two elements, one permitted and one forbidden, combine to generate a single cause, e.g., foliage which acts as fertilizer that combines with permissible nutrients

found in the soil, but is not applicable to situations involving two distinct causes such as shade and soil. The Gemara, *Niddah* 31a, declares that each parent is the source of different parts of the body: the father produces the “white” portion that forms bones, sinews etc, while the mother contributes the “red” portion that becomes skin, flesh etc. If so, in the case of poultry, since each parent is a separate cause producing a unique effect, the causes are distinct and separate. Hence, according to Ramban, the principle of *zeh va-zeh gorev* would not apply.

Rabbi Gestetner takes note of the fact that, in apparent contradiction to Ramban’s thesis, the Gemara, in two separate instances, *Temurah* 30b and 31a, applies the principle of *zeh va-zeh gorev* to an animal born of a prohibited mother and a permitted father. It is quite possible that Ramban assumes that the talmudic statement indicating that the father contributes the “white” while the mother contributes the “red” establishes a principle with regard to humans but not with regard to animals. In any event, *Shulhan Arukh, Yoreh De’ah* 142:11, rejects Ramban’s position in ruling that *zeh va-zeh gorev* is permissible even in the case of two independent causes.¹⁶

Nevertheless, the principle of *zeh va-zeh gorev* may not be applicable to genetic manipulation that yields recognizable physical characteristics of the forbidden cause because of an entirely different reason. Rabbenu Nissim, *Avodah Zarah* 48b, asserts that *zeh va-zeh gorev* is not an independent halakhic principle; rather, he argues, it is an application of the general concept of nullification (*bittul*), i.e., just as a forbidden substance loses its identity when it becomes submerged in a quantity sixty times as great, so also does a causal agent fail to preserve its identity in the effect it has produced in instances in which another identifiable cause is also present. Yet, as recorded in *Shulhan Arukh, Yoreh De’ah* 98:4, a forbidden substance that has become mixed with a quantity of a permitted substance sixty times as great but which nevertheless remains recognizable is not nullified. The applicable principle is that a recognizable substance never loses its identity. Genes that are responsible for particular physical characteristics do not lose their identity by reason of nullification, argues Rabbi Gestetner, because they remain recognizable in the physical characteristics for which they are responsible. Thus, since *zeh va-zeh gorev*, according to Rabbenu Nissim, is naught but a form of nullification, the principle cannot be invoked in situations in which the effect of a gene derived from a non-kosher source is perceivable.¹⁷

R. Yisra’el Ya’akov Fisher points out that, if *zeh va-zeh gorev* is indeed predicated upon the principle of nullification, any foodstuff pro-

duced by dual causes, one kosher and one non-kosher, is permissible only *post factum*. It would, therefore follow that it is forbidden purposely to employ that principle in engaging in transgenic procedures in order to breed animals or poultry for consumption by Jews just as purposeful adulteration of a forbidden food is forbidden.

There is yet one other factor to be considered that is relevant only to the *kashrut* of genetically engineered fowl but not to mammalian species. The *kashrut* of any particular animal species is determined on the basis of whether or not the species is endowed with split hoofs and whether or not the animal chews its cud.¹⁸ Once the *kashrut* status of an animal species is determined, individual animals born to members of the species are kosher or non-kosher depending upon the status of the parent animals. Accordingly, insofar as offspring are concerned, the presence or absence of the physical criteria of kosher species is irrelevant in determining their *kashrut*. Thus, hypothetically, a piglet born to a cow as the result of genetic mutation would be kosher; conversely, a calf born to a mare would not be kosher. The applicable principle as formulated by the Mishnah, *Bekhorot* 5b, is: "A pure animal that gives birth to [what appears to be an animal of] an impure species, [the offspring] is permitted for eating; an impure [animal] that gives birth to [what appears to be an animal of] a pure species, [the offspring] is prohibited for eating, for that which emerges from the impure is impure and that which emerges from the pure is pure."

The situation with regard to avian mutations is more complex. Scripture does not distinguish between kosher and non-kosher birds on the basis of anatomical or physiological criteria. Instead, Leviticus 11:13-19 and Deuteronomy 14:12-18 enumerate twenty-four species of non-kosher birds; all others are declared to be kosher.¹⁹ Nevertheless, the Mishnah, *Hullin* 59a, does present a number of physical criteria that serve empirically to assist in distinguishing between kosher and non-kosher birds. The principle that that which emerges from the impure is impure and that which emerges from the pure is pure is to be understood simply as meaning that any creature that "emerges from," or is born of, another creature has the halakhic status of the creature from which it is born. An animal that gestates in the womb of the mother certainly emerges from the mother and hence has the selfsame halakhic status as the mother. However, unlike mammals, birds do not gestate their young; instead, they lay eggs. Eggs do indeed "emerge" from the female and hence have the same *kashrut* status as the mother. Eggs and milk are kosher or non-kosher depending upon the status of

the animal that gives the milk or lays the eggs.²⁰ Thus, without question, eggs laid by a non-kosher bird are not kosher. And since hatchlings emerge from the eggs, it might readily be assumed that the baby bird is also endowed with the same species identity and halakhic status as the egg from which it emerged. That is indeed the view of *Tosafot*, *Hullin* 62b, and of Rambam, *Hilkhot Ma'akhalot Assurot* 3:11, as understood by *Maggid Mishneh*, *ad locum*.²¹ Thus, in line with the earlier discussed consideration of the fact that the gene contributed by the non-kosher animal is recognizable in physical anomalies it produces, it should be concluded that such a genetically engineered chicken should be regarded as non-kosher since the bird, at least in part, is the *yozei*, i.e., the derivative, of a non-kosher entity that has not been nullified.

However, Rashi and *Tosafot*, *Niddah* 50b, adopt an opposing view.²² Noting that a hatchling does not gestate within its mother but emerges from an egg, *Tosafot* point to the fact that the Gemara, *Temurah* 31a, declares that, in the course of gestation, the egg putrefies and becomes “dust” unfit for consumption by man or beast. In the process the egg loses its status as either a kosher or non-kosher food. Since the egg is destroyed or rendered into “dust” in the course of gestation, the emerging bird, declare *Tosafot*, is not the *yozei* of any entity or, to put the matter somewhat differently, the bird is halakhically deemed to be *sui generis*.²³ As such, each bird that emerges from an egg is tantamount to the primordial bird that served as the progenitor of a species whose halakhic status is determined entirely on the basis of the physical criteria that distinguish one species from another.²⁴ According to that opinion²⁵—and that opinion alone²⁶—genetically engineered poultry would always be kosher provided that they exhibit the physical criteria of an identifiable species of kosher fowl.²⁷ Citing this statement of *Tosafot*, but without citing the conflicting statement of *Tosafot*, *Hullin* 62b, or of other authorities who concur in the latter view, Rabbi Sternbuch dismisses the halakhic problem out of hand and rules that transgenic poultry are kosher provided that they do not manifest the criteria of non-kosher birds.

Rabbi Sternbuch asserts that, even if some individual transgenic chickens are in the category of animals that are “*dores*,” the species is nevertheless kosher. Presumably, that is also the case if some individual chickens separate their digits when placed upon a pole, rope or wire which is an indication that the bird is “*dores*.” He asserts that those criteria serve only to establish the status of a heretofore unidentified species but are irrelevant in determining the status of individual mem-

bers of a species whose status has already been established. In response, Rabbi Cohen points to the statement of *Shakh*, *Yoreh De'ah* 82:6, declaring that, if a single bird is found to manifest criteria of a non-kosher species, any previously existing tradition establishing the *kashrut* of the species is thereby abrogated.

However, it seems to this writer that *Shakh's* ruling is not applicable to the case at hand. Evidence that a member of a species is *dores*, for example, is presumptive evidence that the entire species is not kosher. That characteristic, however, is not the factor that renders the bird non-kosher; it is only evidence establishing that the species is one of the twenty-four biblically enumerated non-kosher species. When the presence of that characteristic can be cogently explained in some other manner, e.g., by virtue of genetic manipulation that lacks halakhic significance, it ceases to be evidence that the species to which the bird belongs is non-kosher.

Rabbi Sternbuch does, however, express reservations with regard to use of such poultry for an entirely different reason. Rabbi Sternbuch cites Rema, *Yoreh De'ah* 60:1, who forbids consumption of the meat of an animal that has been fattened primarily by being fed forbidden foods and tentatively suggests that if an animal has been subjected to growth stimulating genes of non-kosher origin it may have the status of an animal fattened by forbidden foods. However, Rabbi Sternbuch candidly concedes that the latter case can be distinguished from the subject of Rema's ruling.

The comparison of genetically modified animals to animals fattened on forbidden foods is tenuous to say the least. The Gemara, *Menahot* 69a, discusses the status of objects such as wheat, barley or utensils consumed by animals and subsequently excreted. One example is the suitability of kernels of wheat that have been eaten by an animal for subsequent use in a meal-offering. The Gemara concludes that if the swallowed wheat remains whole it retains its status as wheat. However, once the kernel of wheat begins to be digested it loses its status as wheat and becomes an integral part of the animal that has consumed it.

Tosafot, *Temurah* 31a, understand the Gemara's conclusion as pertaining only to the issue of ritual impurity. Living animals are not susceptible to impurity. Accordingly, once an animal has begun to digest an object and it becomes part of the animal itself, it can no longer be subject to impurity. Nevertheless, at least at that point, the object has not lost its own identity and hence, if it is a non-kosher foodstuff, it may not be eaten. However, *Tosafot*, *Menahot* 69a,²⁸ Rash and Rosh,

Oholot 11:7, as well as an earlier authority cited by Rosh, *Bekhorot* 1:8, maintain that in the course of the process of digestion any food product loses its previous identity with regard to all matters of Halakhah.

Rema, *Yoreh De'ah* 60:1, follows the view of *Tosafot*, *Temurah* 31a, in ruling that the meat of an animal raised exclusively on forbidden food may not be eaten because it is a *yozei* of a forbidden entity. If the animal has been fed both kosher and non-kosher food it does not acquire non-kosher status by virtue of the earlier discussed principle of *zeh va-zeh gorev*. As discussed earlier, an animal whose progenitor had received genes from a non-kosher animal is, at worst, the product of *zeh va-zeh gorev* and hence is permitted for food, at least when there is no manifestation of the physical characteristics of the non-kosher donor of the transformed gene.

Moreover, *Shakh*, *Yoreh De'ah* 60:5, as well as numerous other authorities disagree with Rema's ruling and permit consumption of the meat of an animal that has been fed forbidden food exclusively. *Shakh* maintains that the early-day authorities who serve as the sources for Rema's ruling maintained only that forbidden foods do not lose their identity or status simply because the digestive process has commenced and therefore remain prohibited. However, argues *Shakh*, once digestion is complete and those forbidden foods are assimilated by the host animal's body, the meat of an animal raised in such a manner is permissible because the forbidden food is completely destroyed in the process of digestion before its nutrients are absorbed by the animal's body. Hence, an animal raised in such manner is not to be regarded as the *yozei* or derivative of a forbidden food. Therefore, according to *Shakh*, since even an animal fattened on exclusively forbidden foods is permissible, there can be no analogy to transgenic animals or poultry.²⁹

Rabbi Sternbuch raises yet another concern. He reports that he has been informed that rodent genes may be implanted in poultry to stimulate growth but that such genetic manipulation would give rise to no other recognizable physical characteristics. Rabbi Sternbuch takes note of the statement of the Sages, *Yoma* 39a, declaring that forbidden foods are *metamtem*, or "stop up," the heart, i.e., forbidden foods dull the heart and cause the development of undesirable character traits and of the comment of Rema, *Yoreh De'ah* 81:7, who discourages use of the services of a gentile wet-nurse for the same reason as well as of a statement of Rambam³⁰ who asserts that partaking of forbidden foods causes intellectual deficiencies in those who consume them and may cause those

persons to espouse heretical views. Indeed, the Palestinian Talmud, *Haggigah* 2:1, cites one opinion to the effect that the heresy of Elisha ben Abuyah was a consequence of his mother's conduct during her pregnancy. Elisha ben Abuyah's mother had been wont to inhale the odors of idolatrous sacrifices. Rabbi Sternbuch expresses the fear that transgenic manipulation involving the genes of a non-kosher species may yield food that engenders similarly deleterious consequences.³¹

The permissibility of transgenic poultry is but the first halakhic question involving genetic manipulation to be addressed by rabbinic scholars. It may certainly be anticipated that there will be further discussions of this problem as well as of similar matters. This emerging area of halakhic inquiry represents yet another challenge to the intellectual prowess of halakhic decisors who must apply age-old principles to issues that could not have been fathomed, much less formulated, in earlier ages.

NOTES

1. See R. Abraham ibn Ezra, *Commentary on the Bible*, Leviticus 19:19 and R. Judah Leib Krinsky, *Karnei Or*, loc. cit. See also R. Abraham Chill, *The Mitzvot: The Commandments and their Rationale* (Jerusalem, 1974), p. 236.
2. See the supercommentary to Ibn Ezra of R. Shlomoh Zalman Netter, Leviticus 19:19, published in the Horeb edition of the Pentateuch (Jerusalem, London, New York, 5711). A similar interpretation was earlier advanced by *Ohel Yosef* and *Mekor Hayyim* in their respective works on Ibn Ezra published in *Margaliyot Torah* (Stanislaw, 5687). *Mekor Hayyim* also understands Ibn Ezra's comments regarding interbreeding of animal species in a like manner. However, these scholars' understanding of the passage in question is less than compelling. Cf., R. Abraham Chill, *The Mitzvot*, p. 236.
3. See R. Samson Raphael Hirsch, *The Nineteen Letters of Ben Uziel*, Eleventh Letter; *idem*, *Horeb*, sec. 327.
4. Rambam, *Guide of the Perplexed*, Book III, chap. 37, regards the *hukkim* as prohibitions designed to deter idolatrous conduct. The actions in question, he asserts, were cultic practices associated with pagan worship and sacrifice. According to Rambam's understanding of these commandments, there is no hint of a negative attitude with regard to intervention by man in the natural order.
5. Cf., R. Joseph B. Soloveitchik, "Confrontation," *Tradition*, vol. VI, no. 2 (Spring-Summer, 1964), p. 20.

6. It is indeed the case that one finds occasional comments in rabbinic writings representing those prohibitions in phraseology that is general and unqualified. See, for example, the sources cited *supra*, note 2. Nevertheless, it seems to this writer that those comments must be understood in the manner herein indicated.
7. An apparently contradictory statement by R. Shlomoh Zalman Auerbach appears in a different volume, *Minhat Shlomoh, Tinyana* (Jerusalem, 5760), no. 100, sec. 7. In that work Rabbi Auerbach writes that hybridization of trees is forbidden “even if the hybridization is [performed] only by means of injection of sap that, if planted in the ground, would not at all sprout.” In context, Rabbi Auerbach’s statement in *Minhat Shlomoh, Tinyana* seems to be offered in order to establish a negative view regarding genetic manipulation of agricultural species. Nevertheless, in the same discussion, Rabbi Auerbach emphasizes that, with regard to animals, genetic manipulation since it does not involve a sexual act does not constitute a violation of the prohibition against crossbreeding.
8. R. Nathan Gestetner, in an unpublished work, *Teshuvot Avnei Hen*, ed. by R. Hizkiyahu Yosef Cohen.
9. R. Yisra’el Ya’akov Fisher, *Teshuvot Avnei Hen*. R. Moshe Sternbuch, in a responsum included in the same unpublished work similarly cites reports of separation of the toes in this manner.
10. Rabbi Fisher, *loc. cit.*
11. Cf., Rashi, *Hullin* 59a, where he defines “*doreš*” as a bird that seizes its food with its claws and lifts it from the ground. Rashi, in his commentary on *Niddah* 50b, adds the comment “But I say that [the bird] stomps on its food with its feet to hold [it] so that [the food] does not come to [the bird’s] mouth in its entirety.” *Tosafot*, *Hullin* 61a, define “*doreš*” as a bird that stomps upon its prey and eats it when it is yet alive. Many early-day authorities understand the term as a reference to a bird that kills its prey by piercing it with its claws and emitting a poison. See *Shakh, Yoreh De’ah* 82:3 and *Arukh ha-Shulhan, Yoreh De’ah* 82:5.
12. Cited by Rabbi Fisher, *Teshuvot Avnei Hen*.
13. This author is indebted to Dayan Y.Y. Lichtenstein of London’s Federation of Synagogues for having made those responsa available to him. See Dayan Lichtenstein’s article, “Halachic Aspects of Cloning Chickens,” *Hamaor*, vol. 34, no. 2 (Pesach 5761), pp. 6-7.
14. The gene of sea coral has been successfully transferred to zebrafish causing the latter to appear red in normal light and to glow under ultraviolet light. The transgenic GloFish is readily available in pet stores. See *New York Times*, January 25, 2004, section 3, p. 5.
15. The operative principle is that the hen produces eggs as a result of stimulation experienced in intercourse. Alternatively, the egg may be produced without benefit of a rooster by means of “friction from the dust.” In the absence of a contributory cause attributable to a rooster, the *Gemara*, *Hullin* 58a, expressly categorizes the egg laid by a hen that is a *treifah* as prohibited because it is the product of a single non-kosher cause.
16. See *Bi’ur ha-Gra, Yoreh De’ah* 142:29 and *Teshuvot Avnei Milu’im*, no. 7.
17. Rabbi Fisher asserts that, even if *zeh va-zeh gorev* is regarded as forbidden, if the gene of the forbidden animal is taken from a non-kosher father

rather than from a non-kosher mother the offspring must be regarded as permissible on the basis of the talmudic opinion, *Hullin* 79a, that "No cognizance is taken of the seed of the father." *Arnei Nezer, Yoreh De'ah*, no. 75, sec. 8, similarly declares that, even if "No cognizance is taken of the seed of the father," a bird born of a non-kosher mother and a father of a kosher species is permissible on the basis of *zeh va-zeh gorev muttar*. That conclusion is at variance with the thesis developed by R. Chaim ha-Levi Soloveitchik, *Hiddushei R. Hayyim ha-Levi al ha-Rambam, Hilkhos Ma'akhalot Assurot* 3:11. According to R. Chaim, the latter principle is dispositive only with regard to determination of membership in a species in instances of crossbreeding or in establishing a paternal-filial relationship in animal species but is not applicable to determination of the kosher or non-kosher status of particular offspring. Thus, even if "No cognizance is taken of the seed of the father" who is a *treifah*, the offspring is permissible only on the basis of *zeh va-zeh gorev*. Or, as expressed by *Tosafot, Hullin* 58a, "No cognizance is taken of the seed of the father" is applicable only if both father and mother are kosher animals. Similarly, if the father is a member of a non-kosher species, even though "No cognizance is taken of the seed of the father," the *kashrut* of the progeny can be established only by incorporating the principle *zeh va-zeh gorev*. See also R. Menachem Ziemba, *Zera Avraham*, no. 11, sec. 16 and *Arnei Nezer, Yoreh De'ah*, no. 75, secs. 5-8.

Rabbi Fisher, however, further asserts that, if the female is genetically altered in this manner, poultry produced by her eggs are certainly prohibited since, on the basis of the principle "No cognizance is taken of the seed of the father," the rooster's role is of no consequence. Rabbi Fisher does not seem to grasp the fact that the hen does not represent a single non-kosher cause but is itself an amalgam both of kosher and non-kosher causes.

18. *Teshuvot ha-Rivash*, no. 492, asserts that determination of the *kashrut* of animals is made solely on the basis of physical criteria to the exclusion of other otherwise relevant considerations. Thus, he rules that the principle of *rov* does not apply to determination of the identity of a particular animal as a member of a kosher versus a non-kosher species. Rivash explains that the Torah commands Jews "to distinguish between the clean and the unclean" (Leviticus 11:16), i.e., that determination of the *kashrut* status of an animal be made on the basis of examination for the presence of the biblically described physical characteristics. That admonition, asserts Rivash, requires that discrimination between kosher and non-kosher animals be predicated *solely* upon the basis of those physical criteria and not on the basis of other halakhic principles such as *rov*. See R. Yitzchak Ya'akov Rabinowitz' elucidation of that position in his *Zekher Yizhak*, I, no. 80 as well as this writer's *Be-Netivot ha-Halakhah*, I (New York, 5756), 129-131. That ruling is, however, limited to reliance upon the principle of *rov* for the purpose of identification of an animal as a member of a species (*kol de-parish*) but not to *rov* in the sense of nullification in instances of adulteration (*bittul be-rov*). In discussing a related point, Rabbi Fisher seems to have missed that important distinction.
19. Cf., however, *Tosafot, Niddah* 50b, who suggest that any species manifesting the four criteria of an eagle (*nesher*) enumerated by the Gemara, *Hullin* 61a (*viz.*, members of the species lack an "extra" or separated digit;

- lack a craw; the lining of the stomach does not peel away; are “*dores*” their food), is forbidden even if not included in the biblical list of forbidden birds. For the identity of the “*nesher*” see *Tosafot, Hullin* 63a; for an elucidation of various opinions regarding the denotation of the term “extra digit” see the comments of Rashi and Ran, *Hullin* 63a. See also *Arukh ha-Shulhan, Yoreh De’ah* 82:3.
20. There is, however, a difference between the offspring of a non-kosher animal and the eggs or milk produced by that creature: the prohibition attendant upon the offspring of a non-kosher species is identical to that of its forebears, *viz.*, a negative commandment punishable by forty stripes; whereas the prohibition against partaking of the milk or eggs derived from non-kosher species represents a lesser infraction. In effect, the identity of the mother is transferred to the young while the prohibition against consumption of a foodstuff produced by a member of a non-kosher species reflects only the derivative nature of that foodstuff. See *Tosafot, Hullin* 58a and *Hiddushei R. Hayyim al ha-Ramban, Hilkhhot Ma’abkalot Assurot* 3:11.
 21. See also *Bet Me’ir, Yoreh De’ah* 86, who attributes such a view to *Pri Hadash, Yoreh De’ah* 86:8 as well as to *Imrei Binah, Hilkhhot Treifot*, no. 11. Cf., however, R. Nathan Gestetner, *Teshuvot le-Horot Natan*, VI, no. 58, sec. 8.
 22. The Gemara, *Hullin* 62b and *Niddah* 50b, records a dictum attributed to Rav Pappa to the effect that a certain *tarnegol de-agma* is forbidden but that a certain *tarnegalta de-agma* is permissible. Rashi, noting that *tarnegol* is a male noun and *tarnegalta* is a female noun explains that the birds are members of the same avian species known as *tarnegol de-agma* (the chicken of the swamp) but that within that species the female is kosher while the male is not kosher. The problem is that, logically, the species is either kosher or non-kosher and, accordingly, all young of the species, whether male or female, should have the halakhic status of their progenitors. Accordingly, *Tosafot, Hullin* 62b, identify the *tarnegol de-agma* and the *tarnegalta de-agma* as entirely different species rather than the male and the female of the same species. For an analysis of that controversy, see *infra*, note 27.
 23. In his talmudic novellae, *Hullin* 63b, reprinted in his *Teshuvot Hatam Sofer, Yoreh De’ah*, no. 74, *Hatam Sofer* explains an otherwise difficult biblical verse: Deuteronomy 14:11 declares, “Of all clean birds you may eat.” The immediately following verse reads: “And this is what you shall not eat of them.” Scripture then continues with an enumeration of the twenty-four non-kosher avian species. The term “of them” appears to be incongruous. Grammatically, the governing noun is “birds” and is modified by the adjective “clean.” But the enumerated prohibited species are certainly not “clean birds!” *Hatam Sofer* explains that the term “of them” (*mehem*) should not be understood as “of them” but in the equally correct linguistic sense of “from them,” *i.e.*, produced by them. In context, then, the verse tells us that the enumerated forbidden species are prohibited (even) when they are produced by parent birds that are “clean birds,” *i.e.*, the progeny of kosher birds are prohibited if they are recognizable members of any one of the enumerated non-kosher species because the principle of *yozei* is not applicable.
 24. *Hatam Sofer, Hullin* 66a, observes that, since fish also develop from eggs

deposited by the female outside her body, this principle applies to fish as well. Thus the rule that "the impure which emerges from the pure is pure" does not apply to fish. Accordingly, he asserts, since the egg putrefies before the young are produced, a fish that emerges from the egg of a mother that is a member of a kosher species but which, as a result of genetic mutation or of some other cause, is born without fins and scales is to be regarded as non-kosher. That conclusion reflects the position of *Tosafot*, *Niddah* 50b, as cited by *Hatam Sofer*. However, according to the contradictory opinion of Rashi and *Tosafot*, *Hullin* 62b, who maintain that species identity is transmitted by the mother to her young even in the case of birds, a fish lacking fins and scales that is born of the egg of a kosher fish would be kosher. [Cf., however, *Teshuvot Hatam Sofer*, *Yoreh De'ah*, no. 75, in which he declares that a fish born of a non-kosher species is kosher even if it lacks fins and scales. In that responsum *Hatam Sofer* presumably maintained that, unlike the eggs of birds, the eggs of fish do not putrefy in the course of gestation.]

The converse, however, would not be the case. Even according to the position expressed by *Hatam Sofer*, *Hullin* 66a, a fish possessing fins and scales born of a non-kosher fish would not be kosher because, according to the controlling opinion expressed by the Gemara, *Avodah Zarah* 40a, non-kosher fish do not deposit their eggs in water. See *Be-Netivot ha-Halakhah*, I, 131-133.

Accordingly, some years ago, the late R. Shlomoh Zalman Auerbach, *Minhat Shlomoh*, II (Jerusalem, 5759), no. 97, sec. 29, cautioned that non-kosher fish might one day be genetically modified to develop fins and scales. Since such fish and their progeny would remain non-kosher, the presence of fins and scales, he cautioned, would no longer in itself demonstrate the *kashrut* of a particular fish.

25. This is also the opinion of Ramban, *Bekhorot* 6b; *Ba'al Halakhot Gedolot*, as cited by Ramban, *loc. cit.*, and Rabbenu Nissim, *Hullin* 64b. See *Bet Me'ir*, *supra*, note 21.
26. See, however, *Arnei Nezer*, *Yoreh De'ah*, no. 75, sec. 8, who accepts the position of *Tosafot*, *Hullin* 62a, but asserts that the mother remains a "cause." Nevertheless, he rules that the hatchling is permitted because even if "No cognizance is taken of the seed of the father" the father is nevertheless also a "cause" and *zeh va-zeh gorev* is permissible.
27. It seems to this writer that the controversy between the Tosafists should be understood in light of the recognition that there are in fact two distinct aspects to the doctrine of *yozei*. As recorded by the Gemara, *Bekhorot* 6a, the offspring of a kosher animal is kosher regardless of its physical characteristics. The principle reflected in that ruling is that the identity of the mother as a member of a particular species transfers to her progeny making the offspring a member of that species as well. However, the milk of a non-kosher animal is forbidden for consumption, not because the identity of the non-kosher mother is in some manner transposed to its milk, but because it is produced by, or derived from, a non-kosher entity. Since the identity of the mother is not transposed to the milk, that form of *yozei* is prohibited solely on the basis of a pleonasm as formulated by the Gemara, *Hullin* 112b, *Hullin* 120a and *Bekhorot* 6b, and punishment for violation

of the stricture against partaking of such *yozei* is less severe than the punishment for consuming the flesh of the mother. Nevertheless, the punishment for eating the meat of the progeny of members of non-kosher species, even if the offspring lacks the identifying criteria of a non-kosher species, is identical to the punishment for eating the meat of its mother for the simple reason that the species identity of the young of the species is identical to that of its progenitor. To put the matter somewhat differently, the offspring of a species are descriptively *yozei* but are halakhically indistinguishable from the progenitor. However, the product of a forbidden animal, e.g., milk or eggs, has the halakhic status of *yozei*, i.e., of a derivative, but not the intrinsic status of the forbidden entity from which it is derived.

It is because of precisely that distinction that, as a forbidden animal grows and matures, the weight that it gains is not regarded as having the halakhically less severe status of *yozei* but as having the same status as the newly-born offspring. Thus, the status of all parts of a mature cow is the same as that of the calf at the time that it emerges from its mother's womb. Cf., Rashi, *Hullin* 90a, s.v. *alma*. The halakhic identity of the newly-born calf is transposed to the mature cow and, indeed, common sense readily agrees that they are the same animal. Insofar as identification as a member of a species is concerned, Halakhah similarly attributes the species identity of the mother cow to the calf to which it gives birth in the sense of "Your sons shall be in the stead of your father" (Psalms 45:17).

As has been explained, the Gemara, *Temurah* 31a, establishes that a hatchling of a bird born of an egg laid by a *treifah* is kosher despite the fact that it is the *yozei*, i.e., it is derived from, and produced by, a non-kosher bird. The rationale is that the egg turns to "dust" before the hatchling is formed and hence is not at all the *yozei* or product of a non-kosher bird. *Tosafot*, *Hullin* 62b, maintain that the same is true with regard to species identity. The egg of every bird is destroyed in the process of gestation. Hence Halakhah regards the young as born *sui generis* and prohibited, not because it acquires the identity of its progenitor, but because of its own intrinsic identity as a non-kosher bird. However, Rashi and *Tosafot*, *Niddah* 50b, disagree and maintain that the species identity is transmitted even to a bird hatched from an egg. It may be posited that Rashi and the author of *Tosafot*, *Niddah* 50b, maintain that species identity is a function of spatio-temporal contiguity rather than of causal factors. The causal agent of a bird hatched from an egg is indeed "dust" which, since it itself is not non-kosher, cannot yield a non-kosher derivative. Nevertheless, with regard to species identity, *Tosafot*, *Niddah* 50b, apparently maintain that status as a member of a species does not at all depend upon causal factors but upon transposition of identity alone and the latter can readily be explained simply in terms of spatio-temporal contiguity. Cf., however, *Arnei Nezer*, *Yoreh De'ah*, no. 75, sec. 7, who explains the distinction between the status of hatchlings of non-kosher species and the hatchling of an egg laid by a *treifah* in a different and more strained manner.

28. Cf., *Tosafot*, *Bekhorot* 7b, who express some equivocation with regard to such a distinction.

29. Note should be taken of one additional consideration. As reported by R. Shalom Mordecai Schwadron, *Da'at Torah*, *Yoreh De'ah* 60:5, R. Shlomoh

Kluger, while serving as Chief Rabbi of Brody, was asked to rule upon an anomaly in a goose. Rabbi Kluger noticed that the goose was uncommonly fat. Upon questioning its owner, he discovered that it had been fattened by being fed pig meat and consequently he ruled that, quite apart from any problem associated with the anatomical defect it manifested, the goose was forbidden for that reason alone. *Da'at Torah, Yoreh De'ah* 60:4-7, follows that ruling in forbidding geese fattened on horsemeat. Those decisors assert that the controversy among early-day authorities is limited to animals raised on forbidden food other than meat. In such instances, they argue, the identity of the foodstuff is changed, e.g., fruit that has been consumed is metamorphasized into the flesh of the animal. However, they reason that if a goose consumes horsemeat or flesh of a pig no intrinsic change takes place in the nature of the consumed meat. The meat that was consumed simply becomes the flesh of the animal that consumed it. Hence, they assert, even *Shakh* would concede that the geese fattened on the flesh of forbidden animals are impermissible.

Applying this consideration to transgenic animals or poultry, it would follow that, according to R. Shlomoh Kluger and *Maharsham*, since the gene of the non-kosher animal undergoes no change in transplantation, the recipient animal and its progeny would be forbidden, unless, of course, the principle of *zeh va-zeh gorev* is applicable. Cf., however, R. Moshe Feinstein, *Iggerot Mosheh, Orach Hayyim*, I, no. 147, who draws no distinction between meat and other foodstuffs and rules that the digestive process destroys the identity and status of all foods.

30. Rabbi Sternbuch attributes the statement to *Teshuvot ha-Rambam* but does not cite a specific responsum. R. Dov Eliach, *Me-Shulhan Gevoha* (Jerusalem, 5754), *Va-Yikra*, p. 94, cites an anecdote reported in the name of R. Chaim Soloveitchik by R. Yissachar Dov of Retova in an unpublished source that serves to illustrate the same point. The identical anecdote concerning Rambam was earlier reported by R. Ya'akov Yosef ha-Kohen of Polennoye, *Zofnat Pa'aneah*, ed. Gedalyah Negal (Jerusalem, 5749), p. 221, as having been related to him by his "teacher," apparently the Ba'al Shem Tov. *Be-Netivot Rabboteinu le-Bet Brisk* (Jerusalem, 5762), vol. II, *Parashat Shemini*, p. 17, reports that while in Warsaw R. Chaim came upon a work containing a responsum authored by Rambam as recounted by the Ba'al Shem Tov. The editor of *Be-Netivot Rabboteinu*, II, 18, note 24, cites an earlier reference to that responsum in *Degel Mahaneh Efrayim, Parashat Ekev*, authored by a grandson of the Ba'al Shem Tov, as well as a report recorded in a work entitled *Shomer Emunim*. In actuality, the point is amply established by the statement of the Palestinian Talmud, *Haggigah* 2:1, as cited in the text.
31. See, however, *Me-Shulhan Gevoha, Va-Yikra*, p. 91, who reports that R. Yitzchak Zev Soloveitchik asserted that forbidden foods do not cause *timtum ha-lev* unless consumption of the foodstuff entails an actual halakhic infraction. Cf., *Teshuvot Hatam Sofer, Orach Hayyim*, no. 83. *Teshuvot Rav Pe'alim*, IV, *Sod Yesharim*, no. 6, similarly declares that no harm can result from inadvertent consumption of forbidden foodstuffs in situations in which such ingestion of a forbidden food could not have been foreseen. That view seems to be contradicted by the further statement of Rema,

Yoreh De'ah 81:7; "Similarly, even a Jewish nursing woman should not eat forbidden things." *Taz*, *Yoreh De'ah* 81:12 and *Shakh*, *Yoreh De'ah* 81:25, explain that Rema is speaking of a woman who is halakhically permitted to partake of forbidden foods. They understood Rema as advising that, despite the permissibility of her conduct in this regard, she should not nurse an infant because of considerations of *timtum ha-lev*. R. Meir Simchah ha-Kohen of Dvinsk, *Mesbekh Hokhmah*, Deuteronomy 6: 10-11, explains those verses as reflecting the concept that the phenomenon of *timtum ha-lev* is present even in situations involving no transgression.

Cf. R. Abraham Rubin, *Or Yisra'el*, no. 16 (Tammuz 5759), who cites Maharal of Prague, *Tiferet Yisra'el*, chap. 8, as asserting that *timtum ha-lev* is attendant only upon culpable transgression. This writer does not concur in that understanding of *Tiferet Yisra'el*. In that discussion, *Tiferet Yisra'el* develops the thesis that the dietary code is not predicated upon considerations of health. In that context Maharal comments that, were dietary laws designed to serve as health regulations, the Torah could not possibly have permitted forbidden foods in conjunction with war: "If the root of the prohibition is because of *mezeg ra*, whither did the prohibition go?" *Tiferet Yisra'el*'s point is only that the prohibition cannot be regarded as a health measure because, were the prohibition to be regarded in that light, since the nature of the foodstuff does not change, in time of war the prohibition would not have been suspended. Quite to the contrary, *Tiferet Yisra'el* must be understood as stating that otherwise forbidden foodstuffs may have deleterious effects even when they are permitted, e.g., in time of war. Cf. the earlier cited comments of *Mesbekh Hokhmah*. See also R. Pesach Fried, *Or Yisrael*, no. 18 (Tevet 5760).

Rabbenu Nissim of Gerondi, *Derashot ha-Ran*, drush 11, s.v. *ve-anisover*, makes the interesting point that a food erroneously declared permissible by the Sanhedrin can cause no harm to a person who follows the Sanhedrin's ruling. For a discussion of *timtum ha-lev* with regard to foods rendered permissible by reason of adulteration, see *Pithei Teshuvah*, *Yoreh De'ah* 116:10; R. Menashe Klein, *Mishneh Halakhot*, V, no. 104 and VII, no. 104; and R. Yosef Yitzchak Lerner, *Shemirat ha-Guf ve-ha-Nefesh* (New York, 5748), introduction, chap. 13.