Use and Abuse Revisited: Response to Pluhar and Varner

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Abstract In her recent "Counter-Reply" to my views, Evelyn Pluhar defends her use of literature on nutrition and restates her argument for moral vegetarianism. In his "Vegan Ideal" article, Gary Varner claims that the nutrition literature does not show sufficient differences among women, men, and children to warrant concern about discrimination. In this response I show how Professor Pluhar continues to draw fallacious inferences: she begs the question on equality, avoids the main issue in my ethical arguments, argues from irrelevancies, misquotes her sources, equivocates on context, confuses safety with morality, appeals to fear, confuses correlation with cause, fails to evaluate scientific studies, draws hasty conclusions from insufficient data, ignores a large amount of data which would call her views into question, does not follow good scientific or moral argumentation, objectionably exceeds the limits of her expertise, and resorts to scapegoating. I also argue that Professor Varner fails to make his case because he offers virtually no evidence from scientific studies on nutrition, relies on outdated and fallacious sources, makes unsupported claims, ignores evidence that would contravene his claims, draws hasty conclusions based on weakly supported hypotheses rather than facts, employs a double standard, appeals to ignorance, does not evaluate arguments from his sources, and makes an ad hominem attack on a respected nutritionist when his focus should be on evaluating the evidence and arguments from the scientific studies themselves. Neither Varner nor Pluhar have responded sufficiently to the real issue in my arguments, that of discrimination and bias in the vegan ideal.

Keywords: animal rights, animal welfare, children, diet, morality, ethics, scientific reasoning, vegan, vegetarian, women’s health.

Introduction

Part I responds to Pluhar (1993); Part II comments on Varner’s “In Defense of the Vegan Ideal” (1994, this issue). I will assume the reader’s familiarity with my “Discrimination and Bias in the Vegan Ideal” (1994a, this issue), which is a
distillation and clarification of my central point in George (1990, 1994b) concerning
morality and vegan or vegetarian diets. My contention is that the vegan ideal is
culturally relative rather than universal, and is discriminatory with respect to
infants, children, adolescents, gestating and lactating women, elderly persons, and
all persons who live in circumstances where food, education, and healthcare are
limited. For reasons given (George, 1990, 1994a, 1994b), I reject traditional Western
moral theory (rights and utilitarianism) and, with it, any principle of exceptions
(including the Liberty Principle) because these necessarily incorporate a monistic
perspective. At the same time, I affirm equality, the value of semi-vegetarian diets, and condemn excessive meat consumption and so-called "factory farming."

Part I: Response to Pluhar

Professor Pluhar (1993) makes several charges in her response to my (1992). These
I take to be: (1) that I have not responded to her philosophical arguments concerning
animal rights; (2) that I do not give adequate attention to the safety and benefits
of vegetarian diets; (3) that I have now moderated my position on the safety of
vegetarian diets; (4) that I misrepresent her attack on my views; and (5) that her
uses of scientific studies are neither fallacious nor misleading. Numbered sections
below correspond to these complaints to aid readers interested in particular issues.
George (1992), to which Pluhar (1993) responds, is an indictment of the misuse
she made of many scientific studies cited in her (1992). Only section 1 that follows
is a response to Pluhar's (1992) philosophical arguments; sections 2 through 5 show
that Professor Pluhar (1993) continues to misuse and misappropriate the scientific studies she cites.

1. Response to Pluhar's Philosophical Arguments on Animal Rights

In evaluating Pluhar's unequal rights view, I conclude that she has done a good
job of defeating it herself. The unequal rights view has the implication that "[i]f
you are fortunate enough to have a healthy but unloved mentally deficient neighbor
whose heart would allow you to survive, your right to life would trump hers—
provided the unequal rights view is correct" (Pluhar, 1992, pp. 196–97). Yet,
unpalatable as that implication is, she is apparently willing to embrace the une-
qual rights view, even though she rejects that particular implication. She gives
no reasons or criteria for rejecting this or similar implications. Without such criteria
the theory itself falls into arbitrariness (see 1.2 below). Professor Pluhar’s explica-
tion shows why the moral rights view, in general, is inadequate to guide ethical
conduct in the modern world. She should reject it as I do. 3

1.1. The Equal Rights View. In my (1990) I accept the (equal) animal rights view
for purposes of argument, and my (1990) contributes to an understanding that moral
rights theory is internally inconsistent and fails. Rights theory cannot properly
guide choices about food practice and is inappropriate for an interspecies ethic.
As Pluhar contends, if Regan (1983) takes the equal rights view, he cannot consist-
tently assert his Liberty Principle (p. 333). 4 A consistent equal rights view would
not permit override of any being's right not to be killed, except perhaps for self-defense. If another human attacks you, then you are permitted to fight back. If a lion attacks, you may defend yourself. But otherwise, you must remain passive and let things occur as they will. If some humans are in danger of starvation, then they are still not permitted to eat animals (unless the animals have died naturally first). Likewise, if the Liberty Principle permits exceptions to humans about eating animals for food, it can grant exceptions for experimentation and anything else humans want to do with animals, or humans for that matter. However, Regan (1983) clearly rejects animal experimentation altogether. Because Regan accepts the Liberty Principle, Pluhar (1992) concludes that Regan must accept an unequal rights view.

The "equal rights" view provides no guidance in crucial situations. Suppose that we really must decide between the lives of a human and an animal, or a human and another human, for that matter. Each being has the same right not to be killed. How shall we "break the tie?" A principle of exceptions is usually proposed that permits a decision based on "other factors"—the Liberty Principle, for instance. These "other factors" are often arbitrary and serve the class in power or beg the question by re-asserting one of the assumptions that was rejected to make the initial argument—as I will show in 1.2. Professor Pluhar apparently accepts the Liberty Principle and opts for "unequal rights." She holds an abolitionist position on killing animals for food, but anyone who would be made seriously worse off by being denied such food is granted an exception.

1.2. The Unequal Rights View—Begging the Question. Pluhar's unequal rights view is even more unacceptable than the equal rights view. Those who argue for moral rights may accept or reject the principle of equality. Almost no one rejects equality, however, for rather obvious reasons: "rights" quickly become privileges of the superior (more equal?) class. This was the old meaning of the word in Western feudal society (Feinberg, 1973). In the modern world, "rights" have been described as "side-constraints" (Nozick, 1974) or "trumps" against the common good (Dworkin, 1977) or "valid claims" to the satisfaction of an objective interest (Feinberg, 1973). In the modern era, rights constitute protections for individuals against the majority, even when the sacrifice of some individuals will benefit the others. Under rights theory, all have equal rights not to be harmed or killed. If these rights are held unequally, then some individuals have fewer protections—while others have more privileges and immunities. For example, in an "apartheid" society, blacks have far fewer and different kinds of rights than whites. The white majority claims that the unequal rights view is correct, but what morally relevant criterion can be used to identify the classes "deserving" better or worse treatment? It is relevant to give more or fewer rights based on moral behavior, intention, or choice: law-abiding citizens may vote and move freely in society; criminals may be incarcerated and denied the vote. It is also relevant to grant protections (as rights) to those who cannot enforce their own rights but are vulnerable to suffering—children, mentally incompetent persons, animals, and others. These conditions (and perhaps others) describe the concept of moral relevance.
Historically, when mistakes have been made about who has rights and who does not, some irrelevant features have been chosen to isolate the rejected from the included classes. In racism, physical characteristics were chosen, such as skin color. Intelligence was used to justify the genetic purification that occurred in the U.S. in the 1930s, when thousands of “mental defectives” were forcibly sterilized (Gould, 1981). An unequal rights view about nonhuman animals will inevitably be “speciesist” because certain physical and/or mental characteristics are selected as morally relevant, even if used only for breaking ties. Regan (1983), Singer (1979), Pluhar and others claim to avoid this kind of arbitrariness (speciesism), but it sneaks back in anyway: Professor Pluhar claims that “beings with richer experiential lives are more morally significant than those with less mental complexity” (1993, p. 195; emphasis added) and should be granted more rights. This begs the question. In order to extend rights to animals at all, one must argue, as Regan (1983), Rollin (1981), Sapontzis (1987), Singer (1975), and others do, that having the capacity for reason and superior intelligence is not a morally relevant criterion for the ascription of rights. Yet, the only possible meaning of “less mental complexity” seems to be “less intelligent.” “Richer experiences” must also depend on intelligence. By re-asserting the intelligence criterion to break a tie in conflicts of interest, Professor Pluhar assumes what she was attempting to prove; i.e., she begs the question. Her view simply restates the entirely traditional place of nonhuman animals in the human universe. Animals count, but humans count for more. Why do humans count for more? Because they enjoy “richer experiential lives.” But then university professors probably have richer experiential lives than many ordinary persons. Does that mean we count for more? Or that we are better than our students and fellow citizens?

At times, Professor Pluhar appears to equate “less mental complexity” with less neurological complexity. Neurological complexity must be important because it permits sensitivity to pleasure and pain and, in turn, permits poorer or “richer experiential lives.” In her examples, molluscs illustrate the least mental complexity, and humans demonstrate the most complexity. So, capacity for sensitivity is the deciding factor.

That criterion is likewise objectionable. Some people are less sensitive than others—“hard as nails” if you will—and empirical studies even show rather large variations in sensitivity to pain stimuli among humans (see Rollin, 1989, pp. 150–151). Are the sensitive ones entitled to more moral consideration than the tough ones? Morally relevant characteristics are defined by the intentional and rational choices of beings, or by the vulnerability of a human or nonhuman animal to caring about being harmed. Animals cannot exhibit the former—they are not moral. But some do exhibit the latter. On those grounds, animals count if children and “marginal” humans count, as surely they must. But no consistent criterion has been given for saying “humans count for more than animals” even if we deeply believe they do. And how would we decide how much more? It would be quite arbitrary.

I affirm the value of equality, while rejecting the traditional moral theories. Equality is an important principle because of its association with impartiality and
justice. Impartiality requires the moral person to judge based only on the *morally relevant conditions*: Did the person do the crime, and so should be found guilty and punished? Is the being vulnerable and in need of protection? To be impartial we must give equal consideration to each being affected by our decisions. For the above reasons and others, the “unequal rights” view is inadequate; it is not a rights view at all, in many ways, but simply a thinly disguised cover for discrimination. Professor Pluhar is correct that the equal rights view fails, but the unequal rights view is even more unacceptable. She is also mistaken about my own view, because I reject moral rights theory as untenable (George, 1994b).

2. On the Safety and Benefits of Vegetarian/Vegan Diets

2.1. *Risk is Not the Main Issue*. Professor Pluhar misunderstands my discussion of differential risk (George, 1990, 1994b). My writings do not deny the general safety of vegetarian or vegan diets for adults who monitor their diets carefully and live in our society or a similar society where a wide variety and quantity of food, education, and medical care is available. Professor Pluhar spends a great deal of time defending their safety. But this is beating a dead horse. Both Pluhar and Varner focus on risk. But risk is not the primary issue. What *is* at issue is this: From whose perspective shall moralists assess risk? From the perspective of relatively affluent Western males whose bodies and circumstances make them well-suited to the vegetarian or vegan lifestyle? Or from the perspective of Third World women or their children? To choose one rather than the other is to be arbitrary, and no ethics may arbitrarily assume that the perspective of men is better than that of women or children or that the cultural context of the First World is better than that of the Third.

2.2. *Consequences of a Monocular Perspective.* Apart from the inherent discrimination in the vegan ideal, attending to perspective and context is morally required because American ideals have great power to influence what is done around the world. Transforming the entire globe into a vegan world would have enormous implications for the environment and human and animal welfare. Arguments for the vegan ideal assume that making individuals morally better will make the whole society and environment better, and consequences are assumed to be all to the good (see Professor Pluhar’s (1993) optimistic recommendations that there will be less suffering for everyone if vegetarian diets are adopted, p. 29). Unfortunately, history has shown that many noble aspirations have gone before terrible destruction. Regan, Pluhar, and others who espouse the vegan ideal suppose that we can and should work to eliminate all or almost all of the food animals on the globe; then we can grow more grain for humans; and this will improve society morally by reducing suffering and teaching humaneness. These philosophers do not ask the people in those other cultures what they want or would consider right. The perspective adopted views the problem solely through the eyes of Western ideals and values. It is “monocular.” This idealistic perspective permeated much of the Western thinking that drove the Green Revolution: “We will develop those ‘inefficient’ farms in other countries so that their yields will improve and these societies
can follow the West into complex industrialization. It will just take (Westernized) education, better methods that include hybrid seeds, irrigation, and chemical and mechanical inputs that we can sell them.” Moral ideals and high-minded appeals to a spirit of helping others permeated the arguments for giving this kind of aid and sometimes still do. Unfortunately, the Western monocular perspective has resulted in the loss of indigenous knowledge about sustainable agricultural systems and the destruction of forests and farmland (Lappé and Collins, 1986). In many parts of Latin America, Africa, and Asia, peasants who once fed themselves from their own garden plots were forced off the land to make way for large farms. These farms now grow a single crop and are owned by a few wealthy families, who hire the landless peasants, often at lower than subsistence wages. Monocropping in areas that once raised a variety of plants and animals cuts local availability of foods (Lappé and Collins, 1986). In some areas, malnutrition is a constant problem, and workers subsist by trying to take large amounts of vitamin supplements.

The attempt to transform these “inefficient” farmers was based on “noble principles,” but lack of attention to equity, culture, community, and the value of local knowledge (their perspectives) has disenfranchised millions. Better solutions will grant validity to the indigenous knowledge and to the cultural perspectives of other peoples (Norgaard, 1987). Then, the world’s people will be able to regain an understanding of what a regenerative agriculture and a humane culture could be. Many of these sustainable farming systems depend heavily on the integration of livestock with crops (Shiva, 1989). It is worthwhile studying these with an open mind rather than coming with an ideal that these conditions should be “overcome” in a humane world. It is a demand of equality that we do so.

2.3. Focussing on Benefits is Irrelevant. My (1990) argues that the rule of ethical vegetarianism is culturally relative. Claims about benefits apply mostly to our society and thus are not universal or global. Moreover; appeals to benefits are better applied to arguments for self-interest (i.e., personal health), but Professor Pluhar and I are arguing about morality, not self-interest. Claims about benefits are irrelevant in moral rights arguments because no one has a duty to accept or seek benefits. In addition, because perspective and context are central to my arguments, emphasis on benefits would be extraneous.

2.4. Misquoting Sources and Continued Bias. Even if appeals to safety and benefits are irrelevant, we can still ask whether Professor Pluhar has given an adequate picture of them. Pluhar picks out lower blood pressure as a benefit of vegetarian diets. Studies do indicate lower blood pressure in lactoovovegetarians than in the general population. I do not question that claim. The real question is: Is there enough evidence to show that vegetarian diet is the sole causal factor or even the most important one in lowering blood pressure versus some other aspect of the vegetarian lifestyle? The answer is no. Taking Pluhar’s references first, some of what she cites is incorrect: In the main body of the paper, she cites “Rouse 1983” and then cites “Rouse and Armstrong 1983” in the bibliography, as an article published in the Lancet in January 1983. Professor Pluhar claims that the article...
reports a study of "omnivorous Mormons and ovo-lacto-vegetarian Seventh Day Adventists" comparing blood pressure between the groups and finding lower blood pressure in the vegetarians. As in the past, I obtained all of Professor Pluhar's citations and read them. The correct citation for the article (Rouse et al., 1983) appears in my bibliography. From the first sentence it is clear that the subjects studied were not of any particular religious affiliation and none of them were vegetarians by habit. They were "59 healthy, omnivorous subjects aged 25-63 years..." (p. 5). Rouse et al. (1983) did find "a blood-pressure-lowering effect of a lacto-ovo-vegetarian diet in healthy, normotensive, omnivorous subjects" (p. 8). They had also done an earlier study that Professor Pluhar is probably trying to refer to (Rouse et al., 1982). These studies are now over 10 years old. Professor Pluhar should follow up on them by reading the original reports of a great many recent studies to get current information. She seems to have overlooked some rather obvious sources. She cites three articles (Herbert, 1988; Kelsay et al., 1988; Zemel, 1988) from the proceedings of the "First International Congress on Vegetarian Nutrition," published in a single issue of the American Journal of Clinical Nutrition in 1988. In those proceedings, under the section on "Vegetarian Dietary Practices and Hypertensive Disorders," an article co-authored by Rouse appears (Beilin et al., 1988); another article is authored by Rouse's colleagues; a third article is co-authored by Sacks and Kass (1988), whose 1981 (Sacks et al.) study she refers to in footnote 18 (Pluhar, 1993). These more recent studies by the same scientists show a more complex picture than the researchers had presented a decade ago. In the "Executive Summary of the Congress [on Vegetarian Nutrition]," Calkins (1988) summarizes the conflicting findings as follows: "Lower blood pressure levels among Norwegian, Australian, and Boston-area vegetarians are noted in papers by Fmneba Beilin, and Sacks, but are not confirmed by studies of other vegetarian groups conducted by Fraser or Burr" (p. 709). In the same volume, Fraser (1988) reviews the confounding factors in deciding about the relative importance of vegetarian diets to ischemic heart disease in Seventh-Day Adventists. He says that his "best conclusion would be that the decreased risk of IHD [ischemic heart disease] in Adventist men (and perhaps women) is related to lack of cigarette smoking and the trend towards vegetarianism with some possible influence of exercise and social support" (p. 835). He also notes earlier that "similar data [of reduced mortality from IHD] for women are somewhat conflicting" (p. 833). Calkins also notes that lowered risk applies particularly to males on these diets (p. 709). In addition to showing that vegetarian diets cannot be the sole factor in lower blood pressure in these studies, the findings at least suggest that men are benefitting more from adopting these diets, which supports my contention that the vegan ideal is discriminatory.

Because much of the Third World lives on largely vegetarian diets, it will be important to assess the health of these populations. Their health is often not very good (Scrimshaw, 1991). Chen et al. (1990), cited as "Campbell [T.C.] and Li (1990)" in Pluhar (1993) and as "Colin Campbell" in her (1992), have collected a large amount of data from China, most of which remains unanalyzed, but which suggests that semi-vegetarian diets are correlated with lower risk of cancer and heart
disease. There are also a number of other relevant correlations that will be considered, no doubt, in the analysis, such as differences in life-style, smoking habits, exercise, and social support. Semi-vegetarian diets are what I support, and the diets in China are neither vegan nor wholly vegetarian. Professor Pluhar stresses the importance of the China study, but because the findings support semi-vegetarian lifestyles, the relevance of including it in a reply opposing my views is dubious.

3. Have I Modified My Position?

3.1. Another Fallacy: Pluhar’s Equivocation on Context. From the foregoing, readers should see that I have not modified my position about the facts. Vegetarian or vegan diets are reasonably safe (if we set aside the question of standpoint for the assessment of risk) within a certain social context. But Professor Pluhar continuously equivocates between a Western, wealthy context and the conditions present in societies where food availability and environmental conditions are very different from ours. She asks why I did not cite Dwyer’s (1991) remark that “malnutrition due to poor dietary planning or secondary to disease is largely avoidable or preventable, and is not a necessary concomitant of vegetarian diets” (p. 73). There was no reason to cite this phrase because the phrase is false in a global context, although it is true in a Western context. Dwyer makes specific reference to “Americans,” “the U.S.,” or “U.S. diets,” throughout the review (pp. 63, 64, 68, 69, 72, 80, 81, 84) with references also to Dutch, Australian, and French vegetarians. My arguments have explicitly focussed on the global context. Although Professor Pluhar (1998) acknowledges that my arguments concern “the world’s population” in her first paragraph, she attempts to show the moral principle is universally valid because these diets are safe in our society. But showing the diets are safe here does not show they should be adopted everywhere.

Perhaps she would answer that Dwyer’s (1991) phrase is false in a global context only because the conditions for proper planning are not present in other parts of the world. If the conditions could be changed, malnutrition on vegan diets could be made to disappear. This is an empirical claim to which no one has the answer, and the history of the Green Revolution brings into question the wisdom of pursuing such goals. But aside from that, the claim also harbors a value assumption to which I strongly object—that our way of life is morally better than those of other cultures and that the adult male body is, by implication, more ideal than a female’s or a child’s. If Pluhar supposes that all those other contexts could be developed to resemble our culture, then she commits a philosophical error in presupposing the superiority of a Western adult male perspective. She also makes an empirical error in supposing that all environmental contexts could be successfully transformed to resemble our cultural and agricultural systems because she overlooks the very different climatic conditions present around the world.

3.2. Universal Morality and Global Context. Why does context matter for the morality of vegetarian practice? Moral philosophers usually claim that there are a set of universal moral principles that are binding upon everyone; that is, they require truth in a global context. Regan (1983), Singer (1975), and Pluhar (1992, 1993) all make this claim or agree to it. One can deny that there are any such universal moral principles, but this leaves a person in the rather uncomfortable position of being a cultural relativist or a nihilist. Nihilists claim there are no
moral principles at all, and no one here agrees to that. Cultural relativists have little recourse when they wish to condemn the practices of, say, Nazi Germany, Iraq, or South Africa. If all practices are culturally relative, then we must simply say that in those cultures whatever is done must be right. If we wish to claim instead that some practices are really right or wrong (charity, cooperation, or slavery, rape, and punishing the innocent might count here), then one cannot be a complete cultural relativist and is instead an objectivist. Anyone who argues for human rights and welfare, or animal rights and welfare must be an objectivist. The task of the objectivist is to sort out the relative and the universal. I count myself an objectivist, and my arguments (George, 1990, 1992, 1994a, 1994b, and here) show that the rule of ethical vegetarianism is culturally relative at the very least. But I also argue the problem is worse than that: The inherent perspectival bias towards males and towards those in power causes traditional moral theory to be internally inconsistent.

Philosophers hope to discover the related, often unstated assumptions that accompany any argument, whether it is philosophical or scientific, and this work is accomplished by continued reflection. As the argument progresses and I have tried to explain my position to others across the country, it is actually becoming clearer to me. And I hope it is also becoming clearer to readers. So, I have not modified my position with respect to the facts, but I have attempted to explicate the philosophical arguments begun with George (1990).

4. Have I Misrepresented Pluhar's Attack on My Views?

4.1. Persistent Fallacies in Pluhar's Arguments. In her reply to my (1990), Professor Pluhar (1992) makes several caustic condemnations of meat-eating and claims that I advocate "omnivorous diets" (pp. 201, 207) and "meat-eating" (pp. 193). While she admits, particularly in footnotes, that eating excessive amounts of meat "is not George's view," her thinking continues to be fallacious. In her counter-reply (Pluhar, 1993), she claims that her admissions absolve her of a straw person fallacy or of false dilemma. But then, if she is not intending to accuse me of advocating meat-centered diets, why does she attack excessive meat consumption at all in a reply to me? I conclude that she commits a fallacy of relevance (better named fallacies of irrelevance) (see also 5.4 below).

4.2. Confusion of Safety with Morality. Why does this happen? Fallacies of relevance often occur because a thinker is confusing one or more concepts or ideas. Possibly, Professor Pluhar conflates what it is safe to do with what one is morally required to do. Pluhar focuses on risk and claims that since it is safe to be a vegan or a vegetarian, then (unless certain conditions about chickens and cows can be met), one is morally required to be a vegan. The connection to morality is through the moral principle that it is wrong to kill or harm animals, even if Pluhar thinks that nonhuman animals are not the equal of humans. You may agree that it seems safe to do an action X that may affect your health and still rationally refuse to do X. Bungee-jumping is much safer than driving a car, yet it is not irrational to refuse.
For morality, this is not a fair example, of course. Bungee-jumping doesn't cause anyone else to be killed or injured. But suppose you are trying to decide whether to put your newly weaned, one-year-old daughter on a vegan diet. Whether this is safe for infants is much more questionable than whether it is safe for adults, even in our own society. Your infant cannot choose for herself. If you make the wrong choice, she will suffer. Let us say that you have read the reviews of Bothwell et al. (1989), Dallman (1989), Dwyer (1991), Hercberg and Galan (1989), Jacobs and Dwyer (1988), Peacock (1991), and others. You know the importance of iron to her neurological development and calcium to her skeletal development. You could rely on vitamin drops in our society. You are probably giving them to her anyway since most infants get them. Will withdrawing food sources mean that you are withdrawing a significant source of nutrients? It undoubtedly will. Can you replace those nutrients in the food choices you have left? With "careful planning" is the guarded affirmative answer (Jacobs and Dwyer, 1988; Dwyer, 1991; American Dietetics Association (ADA), 1988). You also know that the American Academy of Pediatrics (1992) recommends that milk remain a part of children's diets. Your own vegetarian cookbook prefers not to recommend vegan diets for children (Robertson et al., 1986). Are you still morally required to give her a vegan diet? No. You may be permitted to give her a vegan diet if you exercise all precautions, but you cannot be morally required to do so, even from Pluhar's unequal rights perspective.

4.3. Imposing Risks and Choosing Them. Choosing benefits or safety for others differs from choosing them for ourselves. Making the right choice for others requires that we provide a measure of protection—that we not impose any greater risk than the person herself would wish to take if she were able to decide. Getting into their perspective is required. To see how having even a small risk imposed on you can be objectionable, consider nuclear power generation. Some policymakers and utility companies continue to assure the public that the plants are safe, wave away the concerns of environmentalists, and try to build the plants near population centers. But people may rightly have a very different concern about very small risks imposed upon them versus very serious risks that they choose for themselves. So, even if a nuclear plant poses only a small risk, part of what may be objectionable about nuclear plants is that the risk imposed on the plant's neighbors is chosen for them by others.

An ethical vegan might reply that, since these diets are marginally safe, parents must adopt them because if their infants were moral agents, they too would be required to take the risk. However, parents cannot reasonably be required to adopt any strategy that is deemed marginally safe for their children. For example, suppose that a toddler has a chronic disease that might be cured by undergoing a somewhat risky surgery—the surgery is marginally safe according to surgeons, but they admit that even under the best conditions serious side-effects can occur. Alternatively, parents can choose a long-term program of treatment that has known outcomes but does not cure. Let us say it is a diet-modification and medication plan that it is effective nearly all of the time. A cure is ideally preferable.
because once accomplished, the quality of the child's life is improved. If offered such a choice for oneself, adults might rationally choose either therapy (or reject both on grounds of autonomy). When choosing for a child, however, notice that the more conservative diet and medication plan assures that no disastrous results will occur. Similarly, with general food practice, it makes a very big difference in choosing for others if doing nothing (or maintaining, say, a semi-vegetarian diet) is likely to produce no harm at all whereas adopting a very restrictive diet carries some risks. There is no evidence that semi-vegetarian diets are risky for infants or children (ADA, 1988), and semi-vegetarian diets are likely to be less dependent on supplementation than vegan diets. Choosing vegan diets for children, even in our society, should therefore be considered an option, but not a moral requirement. Pluhar's position, in contrast, requires that parents take these risks for their children and put them on vegan diets. But this is to confuse what it is safe to do with what one is morally required to do.

Notwithstanding the above, my main philosophical point does not concern risk as such. Rather, I am concerned about the arbitrary choice of perspective from which to assess nutritional risk. Suppose we were to choose females as our physiological ideal. Things would look different then. Probably, a fixed benchmark will have to be abandoned, especially when using the concept of risk in connection with morality. Details of that argument exceed the scope of this paper, however.

5. Has Pluhar Presented Her Views Fairly, Without Bias or Fallacious Inference?
In George (1992), I made several charges that Professor Pluhar had misrepresented or misinterpreted the studies she cited. Her arguments so seriously misused the author's works that it was most important to reply to the factual claims, and space limited any other kind of reply. I know Professor Pluhar, and I believe her motivations are well-intentioned. My attack on her arguments should not be considered an attack on her person or her character. Nevertheless, I was and still am concerned about the misuse of scientific studies and the unwillingness of many humanists to go to original scientific sources to gather evidence with any degree of thoroughness and objectivity. In George (1992), my method was to set out Professor Pluhar's interpretation as a quotation from her paper and to follow it with an exact quotation from the author's work, showing the misrepresentation or misuse. For the most part, I encourage readers to refer to George (1992) and to the original sources to decide about the fairness of my attack on her arguments. Nevertheless, her counter-reply (Pluhar, 1993) continues in the same vein of misuse and fallacious thinking, and requires a response. As I shall show, Pluhar does not observe the standards of good scientific or inductive reasoning. Occasionally, scientists do not, either. So, all of us must carefully evaluate the studies found in print. In the next two sections, I review some basic rules of scientific (5.1) and moral (5.2) reasoning as a preamble to showing that Professor Pluhar's (1993) reasoning continues to be specious.

5.1. Canons of Scientific (Inductive) Reasoning. Some kinds of studies are more reliable than others (Giere, 1991). The degree of reliability also depends on the
kind of study being done (Giere, 1991). Their relative reliability, from most to least, is as follows: (1) double-blind trials; (2) blind trials; (3) prospective studies; and (4) retrospective studies. Anecdotal reports, because they are not experiments, are not classified as studies, but they can serve to pose questions around which studies may be designed. If a hypothesis has been tested and confirmed over and over again, in study after study, it is more likely to describe reality, even if a few experiments do not confirm the hypothesis (see Giere (1991) and Copi and Cohen (1990)). In their reports, scientists always review similar studies because a hypothesis can only be tested in context. Reviews, such as Dwyer (1991), are often published to give scientists (and educated others) a sense of everything that has been done recently that is thought to contribute to knowledge about the problem. So, reviews can be a good place for non-scientists to look for a summary of the most current evidence about any particular problem. When reading particular studies, nonspecialists need to realize their professional limitations. Every scientific specialty relies on specialized kinds of testing procedures, each of which has its own relative reliability. For instance, nutrition studies rely on excretion studies of specific minerals such as calcium (in urine) and iron (in blood loss); reports of daily food intakes over a specific time period; the use of radiography, spectroscopy, and other instruments which measure the uptake of vitamins and minerals into the body, and many other procedures, all offering different confidence levels for belief. Attempting to analyze the meaning of particular studies without a thorough acquaintance with the methodological pitfalls of testing procedures in a particular study area and/or without an understanding of the historical context of the studies can lead the nonspecialist or untrained reader into false assumptions and conclusions.

Meta-analyses are also published; these are not experimental studies. Meta-analyses (e.g., Abeloe et al., 1992) attempt to take data from a number of studies and apply them and perhaps other correlations to a particular problem to propose a new hypothesis or buttress an old one so that further study may be encouraged. For the reasons set out below, meta-analyses cannot be regarded as predictive or conclusive. Raw correlations, whether from epidemiological studies, anecdotal reports or meta-analyses, must be analyzed and tested to see whether their occurrence together is significantly greater than what could be expected by chance. Scientists are very careful about not taking correlations for fact, and the rest of us should be, too. There are innumerable events that occur together, some of which are accidental and some of which are causally related. Even in causal relations, interacting correlations and/or intervening steps may mask the determining cause. All meaningful relationships or implications must be causal to be acceptable in experimental scientific reasoning. If A is implicated in B, then A is a causal factor in the occurrence of B. If A does not cause B, then some other factor, C, must be causing B, and we should look for C instead.

5.2. The Nature of Moral Argumentation. Moral arguments are made as guides to action; the person making such an argument is, undeniably, telling others (and himself) what to do and that certain actions are required and must be done or omitted, while others are permitted. Contrary to Professor Pluhar's attempts to
say that she is not arguing for forcing vegetarianism down anyone's throat, morality
is about forcing ourselves and others to respect the right moral rules. Usually, we
first use the force of reason and argument to tell ourselves and other people what
it is right and wrong to do, what we must do even if we must force ourselves to
do it. Moral rights advocates use rational argument to claim that ethical vegetari-
amism is one of the right moral rules and therefore should be followed. If reason
does not work, we eventually enforce morality through social sanctions, condem-
nations, and even punishments when the moral rule is written into law. Animal
rights advocates quite clearly want those rights written into law, with appropriate
sanctions and punishments for lawbreakers. In their ideal world, most everyone
would be taught or conditioned to be vegans, but surely the rule-breakers would
not be benignly tolerated—Professor Pluhar's own moral outrage at the eating of
"fellow rights-holders" is evidence of that.

Professor Pluhar has claimed, though, that any person who is ignorant of the
moral rule or rejects the rule in good faith would be granted an exception from it.
Her view is undefended; the Liberty Principle permits exceptions only for serious
harm to oneself and would not permit exceptions for ignorance or resistance.
Rational adults are expected to know right from wrong; ignorance is no defense.
Similarly, simply rejecting a right moral rule or argument is insufficient. We do
not excuse a murderer who "in good faith" rejects a moral rule against killing.

5.3. Factual Evidence and Moral Arguments. In moral arguments, we must know
the facts before we can take the right action. We must be able to say with reasonable
certainty that A causes (or does not cause) B. Requiring people to take moral
action on the basis of sheer speculation, simple correlation, anecdotal reports, poorly
constructed studies, one or two disconfirming reports in the face of other substan-
tial confirmation, or hypothesis alone would often require them to do contradic-
tory and even harmful actions since many hypotheses, correlations, and anecdotes
give reasons to do conflicting actions. Some past examples of actions based on false
correlations include witch-burning and using "snake oil."

5.4. Confusing Hypothesis with Fact, Fallacy of Irrelevance, and Appeal to Fear.
That Professor Pluhar still does not understand the difference in inductive war-
rant between a hypothesis and fact is apparent in the use of Simoons (1982) in
her counter-reply (1993). Simoons (1982) is a decade-old discussion of a hypothesis
about an apparent geographical correlation between cataracts and dairying. Pluhar
claims that when she said "is implicated in" she did not mean "has been demon-
strated to be a cause of." But, if she wishes to present any good reasons for us to
be concerned about dairy products and cataracts, the canons of scientific and moral
reasoning require that there be a causal relation (Copi and Cohen, 1990; Giere,
1991). She cannot have it both ways. If she affirms the relation is causal, then
clearly she mistakes hypothesis for fact. If she denies the relation is causal, then
we can ask, "Why bring it up?" What is the relevance of including this bit of infor-
mation? If she really believes there is no causal relation (or just a weak one), then
we have no rational cause for concern—especially in a moral argument where we
are trying to influence by force of reason the actions of others. Since she denies a causal relation, bringing up this purported "implication" is an appeal to fear—note her use of the word "troubling." No one wants cataracts, and even the hint that dairy products are "implicated" in these could cause consumers to avoid them. "Implicated" is one of those "weasel" words that can be used in ordinary language to signify the connection of ideas and is often found in the media (Kahane, 1984), but is generally avoided in scientific argumentation and should be avoided in making factual claims used in moral argumentation as well.

5.5. Confusing Validity with Soundness; False Cause and Appeal to Fear. An even more blatant appeal to fear occurs in Professor Pluhar's (1993) use of the Cramer et al. (1989) conclusions. Here again she confounds hypothesis with fact. She quotes Cramer et al. (1989):

*If* our findings are confirmed, however, *then* avoidance of lactose-rich food by adults may be a way of primary prevention of ovarian cancer, particularly in those women with low transferase activity [italics added, p. 70].

She now denies that she is claiming any causal association in order to avoid a false cause fallacy (Pluhar, 1993), but if so, she commits the fallacies of irrelevance and appeal to fear.

Pluhar may be making her mistakes because she confuses a valid argument with a sound one. Sound arguments are valid and have all true premises. The only conditionals ("if-then" statements) that may appear in a valid and sound scientific argument are those in which the antecedent and the consequent are both true and are causally connected, i.e., correspond to the world. Neither Cramer et al. (1989) nor Pluhar can show that both the antecedent and the consequent in the hypothesis correspond to the world and are causally linked. For that, their findings must be tested further, as Cramer et al. (1989) point out. As for Simoons (1982), Pluhar should try to find actual tests of the hypothesis, although I doubt she will find any confirming evidence. As it is, her only reason to include these sources is apparently to frighten readers.

5.6. Failure to Evaluate Arguments. Professor Pluhar does not evaluate Cramer et al.'s (1989) evidence to decide whether they are indeed warranted in drawing the conclusion they do. This retrospective study does not permit extrapolation to the main population and the data are applicable at most to women with low transferase activity; see Giere's (1991) basic logic text on scientific reasoning and my (1992) for a restatement on the limitations of the Cramer et al. study. Professor Pluhar pleads that she cannot be blamed for taking the authors' own conclusions. However, evaluating the validity and soundness of arguments is the work of philosophers as well as scientists. Indeed, philosophers claim the evaluation of arguments as their primary expertise.

5.7. Confusing Correlation with Cause; Fallacy of Hasty Conclusion. Pluhar cites Abeloe et al. (1992) as evidence that we should not be concerned that withdrawing
milk as a calcium source from the diets of adult women will cause greater incidence of osteoporosis; thus, adult women are morally required to be vegans. She apparently thinks Abeloe et al. (1992) provide good evidence that withdrawing milk may even help. Abeloe et al. do not claim this. They use a meta-analysis to correlate high protein and high calcium consumption with high incidence of hip fracture. Meta-analyses cannot establish cause and effect relationships. The authors wish to encourage study of the "endogenous acid-osteoporosis hypothesis." She quotes the authors' qualification about considering a causal relation not to be proven. Yet, if no causal relation exists, there can be no relevance to including this hypothesis in a moral argument. We do have experimental evidence from many studies (cited in Dawson-Hughes (1991), Peacock (1991) and Sandler et al. (1985)) given in George (1992) that consumption of dairy products protects against osteoporosis.

Abeloe et al. (1992) cannot provide evidence for strong belief or for decision making because a meta-analysis pools data from studies done under a variety of conditions. Data pooling yields very low reliability because of the likelihood of confounding factors; this is part of the reason the work is hypothetical. And, sometimes scientists try to "massage" their own data to produce a more desired result, by pooling data from a number of different studies done at different times under different conditions. Abeloe et al. (1992) are not trying to do that and they remind readers that their work does not confirm anything. Professor Pluhar is misusing Abeloe et al. (1992) by citing their work as evidence strong enough to require us to change our moral behavior, when there is only an untested hypothesis claimed based on correlation. Therefore, she commits the fallacy of hasty conclusion.

Perhaps further testing will show that excessive consumption of animal protein is a cause of osteoporosis, but it seems highly unlikely that milk will be a culprit. Lactovegetarians have lower incidences of osteoporosis (ADA, 1988). And until we have evidence strong enough to show a causal connection, we have nothing to include in any moral argument except suspicion. And for the argument between Pluhar and me, the evidence would have to indicate that semi-vegetarian, not curent omnivorous diets pose a threat, and that seems unlikely, too.

5.8. Ignoring Evidence that Contravenes Her Claims Professor Pluhar makes a similar mistake when she cites the hypothesis about calcium, protein, and osteoporosis (Abeloe et al., 1992) as if it could somehow negate the data about calcium requirements supplied in the other studies cited in George (1992). Shouldn't she tell us what is methodologically wrong with those studies? Instead, she simply ignores a large body of evidence gathered over years of study by numerous scientists and nutritionists. She still draws her main conclusions from only a few articles, most of them hypothetical and some single studies rather than from large reviews and/or many studies. When she uses reviews at all, the author's main conclusions are discounted without adequate explanation; most of the time she just ignores them, as she has done with the whole issue of American Journal of Clinical Nutrition (1991) devoted to the question of the calcium requirement, which I cited in "Use and Abuse" (George, 1992).
5.9. Scapegoating. In her counter-reply (1993), Professor Pluhar continues to make empirical claims based on no data or media reports (that often have the status of anecdotal reports). For instance, she claims, on the strength of one media report that “underprivileged persons in affluent countries are suffering from badly balanced meat-heavy diets” (p. 29). Yet, a little reading in the sociological literature suggests otherwise. The vignette from Kozol (1988) at the beginning of my “Discrimination and Bias in the Vegan Ideal” (this issue) illustrates that many inner city poor do not have access to balanced diets and their diets are not meat-centered. Instead, many live largely on “peanut butter and jelly.” It is scapegoating to say that the poor make bad nutritional choices because bureaucracies and politics play an inappropriate role by blocking dissemination of information. Not just information but actual food and the means to prepare it are out of the reach of many of the poor. Whom should we blame for this? In the U.S., power is held by the people, and apparently many ordinary people (not simply bureaucrats and politicians) in our country are making moral judgments about the worthiness of such people to receive food and other opportunities (Kozol, 1988).

5.10. Mistakes about Facts and Disagreements in Nutrition. Both Professor Pluhar and Professor Varner approach dietary adequacy as an informational problem only. The whole question of adequate nutrition is treated as if some single noncontroversial, general diet exists that is good for everyone and that can be easily taught and accepted (see in particular Varner (1994) "In Defense of the Vegan Ideal"). Pluhar and Varner appear to think that once this diet is learned it will be rather simple to follow and should cause few concerns or questions. But, if anything has been learned from the exchange between Professor Pluhar and me, it is that there are deep disagreements within nutrition itself about necessary levels and sources for certain requirements such as calcium. Should premenopausal women, adolescents, and children drink milk and/or take calcium supplements or neither? Will more calcium help or be ineffective? Should we include more supplementation or fortification for vitamins and minerals in the diet, or are people already using too many? These questions are the basis for ongoing research, and at the edge of knowledge there are no noncontroversial answers. Varner (1994) charged that I have accepted the “conservative view” as if it were noncontroversial. It is easy to label the views of others as “conservative” when they do not fit with an argument for social change. But it is the arguments themselves that should be addressed. I have tried to present what I found to be the “all things considered” judgment of nutritionists based on experimental research, as given in textbooks, reviews, and whole issues of prestigious journals devoted to answering questions about diet and lifestyle. I do comprehensive computer and library searches using broad search terms such as “calcium and diet” with the intention of getting to both sides of these questions; I obtained all of the abstracts and a great many articles and read them. I presented what I found, not to argue that there is no controversy, but to show that there are undisputed differences in the nutritional requirements among women, men, children, the old, and those in other cultures. These nutritional differences indicate physiological differences that are reflected in the RDAs, but I did
not expect readers to see my point from mere citation of the RDAs. Moralists must do more than look for studies tending to support their prior beliefs, but must make a good faith effort to see the whole context within which the questions about vegan diets occur. It is one thing to choose a lifestyle from preference and quite another to be morally required to do so.

5.11. Professional Responsibility and Exceeding the Limits of One’s Expertise. Professor Pluhar (1993) admits she made only one mistake in her initial critique of my work. She admits that she claimed Levy et al. (1985) did not say AIDS patients had “switched” to vegan diets. She forgets that she also claimed they had “improved” their conditions when Levy et al. report no such findings (Pluhar, 1992); they report that the ten men who refused treatment were apparently no worse (than the general population of AIDS/Kaposi sarcoma males), although some of the ten had died. In her (1993) Pluhar continues to ignore the explanation that Levy et al. (1985) do offer—that the men who had refused treatment had strong family support and positive attitudes. Professor Pluhar fastens on Levy et al.’s incidental comment about their patients’ macrobiotic diet and freely interprets the diet as an underlying factor in their “improvement.” She picks out diet as significant; the physicians themselves (Levy et al., 1985) do not. She offers no reason why we should think her intuitions should be attended to—not nutritional training or expertise, not medical or scientific training, not even extended supporting data that readers could use to causally link her speculation to AIDS and veganism. Contrary to good inductive–scientific reasoning, she grants this letter to the editor, reporting simple clinical observations, the same kind of warrant as a controlled study. She does not question the small sample size—ten men; the lack of matched controls, lack of randomization, and so forth, although she should see that this report has extremely low reliability for generalization.

Undaunted, Professor Pluhar (1993) tries to rescue her earlier claim (1992) about the benefits of vegan diets for AIDS patients with a speculation that, as it stands, would never be permitted for publication by a scientist. She cites one single study (Malter et al., 1989) and then improvises her own hypothesis about why vegan diets might actually improve the survival of AIDS patients: Malter et al. (1989) claim a relation between natural killer cells and reduced cancer risk in vegetarians, so she supposes there must be a relation between vegetarianism and AIDS survival. If these men were on vegan diets before getting AIDS (something we do not know, she admits) they would have “stronger immune systems.” She does not explain what having a “stronger immune system” is supposed to mean. She also supposes that the omnivorous cancer patients may have had immune systems which were “already compromised.” I know of no evidence that omnivorous diets “compromise” the immune system, and Professor Pluhar certainly presents none. There are important differences between AIDS and cancer that she makes no effort to address; she gives no credible explanation about how Malter et al. (1989) could be germane to a discussion of AIDS. To give so little support as Pluhar gives for a speculation that vegans have “stronger” immune systems and people with “stronger immune systems” can resist the AIDS retrovirus would be considered
pointless if proposed by a scientist. What possible place can this shallow speculation have in any moral argument?22

Because Professor Pluhar's comments are appearing in an academic journal, they take on the air of authority, and responsibilities go with that. Many ordinary, moderately educated and even well-educated people believe what professors write simply because we are professors. In my (1992), I commented on this indirectly, saying that it would be too bad if an AIDS patient were to read Pluhar's comments and think "switching" to a vegan diet could "improve" his chances. Pluhar has protested that she did not claim that such diets could cure. But, doesn't she see that she may still give some people false hope? Now she hypothesizes that vegetarian diets provide a measure of protection for AIDS patients. Supposing that a speculation or an unsupported hypothesis provides strong enough evidence for action is fallacious. However, we have already seen that university professors sometimes cannot tell how much weight to give a hypothesis, so we can be reasonably sure ordinary people may not be better skilled. Professor Pluhar forgets that many terminally ill people seek out alternative remedies, no matter how useless, often giving up other treatment. Most often, to protect themselves from fraud, the purveyors of such remedies do not claim a cure. Laetrile, a worthless and even harmful drug, was sold to thousands of desperate cancer patients with the promise of "cancer control," "nutritional therapy," "food supplement," "alternative therapy," among others (Herbert, 1980, p. 22). Laetrile is documented to have directly killed several persons in the U.S. and indirectly contributed to the deaths of thousands of others through their abandoning therapy which might have extended their lives (Herbert, 1980). And two popular books from the early 1980s advocated vegetarian diets as cancer therapy (Sattilaro's *Restored by Life* and Kushi's *A Diet for Cancer*, both cited in Dwyer (1988)), so there is good reason to be cautious in making claims and hypotheses about the benefits of vegetarian diets for those who are ill.

5.12. A Glaring Error. Exceeding the limits of one's expertise can lead to overlooking the simplest sort of objections. Because I am not an AIDS researcher, I did not initially notice the biggest error in Pluhar's (1992, 1993) thinking about the AIDS patients reported in Levy et al. (1985). I immediately saw Pluhar's (1992) misinterpretation of the language and the conclusions—that is what I am trained to look for. But a glaring factual mistake escaped me until I read a recent issue of *Science* devoted to the question of AIDS. The Levy et al. letter was published in July 1985, and they report following the men since May 1984. At that time there were no effective treatments for AIDS. The first drug known to have any effect on the progress of HIV infection is AZT. But AZT was first released for controlled trials in the United States in 1985 (Cohen, 1993, p. 1258). The "average survival rate" for treated men which Levy et al. (1985) cite would come from a group that had received no effective therapy. What Levy et al. (1985) refer to as "conventional therapy" was largely symptomatic treatment that we now know would not necessarily prolong life. So, the fact that their untreated patients survived about as well as average only shows that the "treatment" that others in the country received was ineffective and neither group was better off. Apparently, the vegan diets and
social support were also no more effective than the psychological support the treated group may have gotten from believing they were being helped. So Pluhar's "hypothesis" is worthless.

5.13. Conclusion. For the reasons cited above, I conclude that Professor Pluhar continues to draw fallacious inferences; relies on insufficient data to support her claims; ignores a large amount of data which would call her views into question; appeals to fear; does not follow good scientific or moral argumentation; and does not address my philosophical claims about perspective and context.

Part II: Response to Varner

My critique here refers only to Professor Varner's (1994) "In Defense of the Vegan Ideal". Dialogue with Professor Varner on the claims in his "What's Wrong with Animal By-Products?" must await a later paper.

1. General Philosophical Errors

1.1. Side-stepping the Issue. To his credit, Professor Varner does not equivocate between contexts. He assumes the American or Western context and readily admits that the vegan ideal is culturally relative. The demerits of such a view, though, are adumbrated in Part I, 2.2 and 3.2 above. He claims to be critiquing Dwyer (1991) in an effort to show that the factual support for my claims about risk fail and with them the whole argument for discrimination against women, children, and the old in our culture. Like Pluhar, Professor Varner focuses on risk to attack my arguments (see Part I, 2.1). But as I have said above, risk is not the primary issue. Differential risk points to different physiologies. If the adult wealthy male is not the paradigm, then the benchmark for the assessment of risk will be different. If women's bodies, or children's bodies, are benchmarks instead, then different kinds of assumptions will be made, and these will affect how we think about our bodies and our food. Nevertheless, even his claims about risk fail and his attack on Dwyer is specious.

1.2. "Separate but Equal" is No Defense. Professor Varner argues that veganism is the correct moral ideal because, even if women and children have different nutritional needs, in our society there is not much difference among women, children, the elderly, and men, or when there is, these could be met by the use of supplements. That argument does not address my charges of ageism, sexism, or cultural bias. For even if it is not too risky for an infant, child, adolescent, pregnant, lactating, perimenopausal, post-menopausal, or elderly female to be a vegan in our society, that judgment will surely be made from a male-biased perspective of assuming that all those women, children, and seniors can fix, mend, or correct their imperfect bodies as necessary (by supplementation, fortified foods, or eating in special ways) to meet a vegan ideal that is much less burdensome for men. Varner's reasoning is reminiscent of the "separate but equal" status in education that was argued for by segregationists during the Civil Rights era. By analogy, women and
children must work harder to be “equal.” Adult males rarely suffer anemia; they do not lose iron through periodic menstruation; they do not carry fetuses in their bodies or nurse infants; their growth is completed and they almost always have larger skeletons than women and so have a much lower incidence of osteoporosis.

1.3. Minimizing Sociological Concerns about Dietary Practice. Professor Varner appears to think of American or Western society as homogeneous; thus, he supposes that he can at least rightly assert the vegan ideal here. He says that anyone “who can learn the meaning of ‘legume’ and find the vitamin section in the supermarket can understand” the ADA (1988) guidelines (p. 39). Can they? We professors writing for academic journals may have little practical grasp of what a challenge that may be. For instance, it is estimated that from 75 to 100 different languages are spoken in the Los Angeles schools; parents of these children do not speak English (Taliaferro and Murr, 1991; Meyer, 1992). Can these people read a bottle to find out nutritional information? Do they know the English word “legume”? The people who live in the Hotel Martinique cannot even buy vegetables; there is no supermarket nearby (Kozol (1988), vignette cited in George, this issue). Shall we simply excuse them then? But there really is something quite arrogant about excusing all of these people from attaining the ideal; it supposes the richer are better. They are not; they are just luckier.

2. Mistakes and Fallacies
Like Professor Pluhar, Professor Varner does not follow the requirements of good scientific reasoning and does not apply scientific evidence properly in moral argumentation (see Part I, Sections 5.1 and 5.2).

2.1. Unsupported Claims and Questionable Sources; False Cause; Hasty Conclusion. Surprisingly, in his section on vitamin B₁₂ Professor Varner’s first paragraph gives a brief overview of what he terms scientists’ “beliefs” about vitamin B₁₂ without citing any sources for his information. Some of that information is false or open to misinterpretation: He claims that fungi and algae produce vitamin B₁₂ (p. 35). Scientific assays have shown that none of this B₁₂ occurs in forms that the human body can metabolize (Herbert, 1984, 1988; Dwyer, 1991). Professor Varner then notes that “from the first scientific studies of vegan nutrition until the present, nutritionists have been puzzled by the fact that so few vegans actually develop B₁₂ deficiencies” (p. 35). He does not entertain the most likely reason—that vegans in industrialized countries commonly take supplements. Without citing any recent literature, Varner concludes the section leaving the reader thinking that B₁₂ supplements are probably not necessary in vegan diets—a false (and dangerous) supposition that Professor Pluhar is wise enough to avoid. The only support Professor Varner offers for his conclusion is a 13-year-old review by a Scottsdale, Arizona, chiropractor (Immerman, 1981) and a Nutrition Reviews (1978) anecdotal report of a 57-year-old man who had followed a vegan diet for 25 years, had not taken supplements, and developed apparent B₁₂ deficiency. In 1974, the patient noticed “weight loss,...weakness, loss of balance, positional dizziness and ankle edema”
(Nutrition Reviews, 1978, p. 243). The patient consulted a chiropractic nutritionist, who "specifically discounted vitamin B₁₂ when the patient inquired about a possible deficient state" (p. 243). Later, the patient consulted the reporting physicians and was diagnosed with B₁₂ deficiency complicated by "gastric atrophy and suboptimal intrinsic factor," which the authors propose contributed to later malabsorption and resistance to B₁₂ therapy. This single case is of little value for making any generalizations, although without citing further support Professor Varner draws this (false) conclusion from this article: "Researchers have found that deficiencies are only likely to develop when accompanied by absorption problems which are unrelated to the diet itself" (p. 35). The authors of the Nutrition Reviews (1978) essay do not draw Varner's conclusion; instead they propose a hypothesis from what was known at the time: "It can be reasoned...that the few who do develop clinical abnormalities may have dietary inadequacies complicated by a coexisting disorder" (p. 243). Recent research (as opposed to speculation) shows, that while gastric atrophy occurs in everyone with aging (Herbert, 1988), the general conclusion that gastric atrophy is the only cause of vitamin B₁₂ dietary deficiency is false (see Herbert, 1984, 1988; Herbert and Subak-Sharpe, 1990, and references cited in all).

Professor Varner, like Professor Pluhar, reinterprets this hypothesis to stand as fact and then incorrectly claims it as sufficient evidence to move us to belief and moral action, and thus commits false cause and hasty conclusion fallacies (see Part I, 5.1–5.3).

2.2. Failure to Evaluate the Arguments. Immerman (1981) is a poor source. First, it is very old, having been written 13 years ago. Newer reviews of more current research do not support Immerman's conclusions. Second, old as the review is, Immerman's sources are even older: He reviews 109 sources, 82 of which were over 10 years old when he wrote the article (and so are now over 22 years old); 41 (or over one-third) were over 20 years old; 10 were over 30 years old. Only 11 had been published within 5 years of his review. Third, Immerman purports to show that there have been no credible cases of dietary deficiency but he uses excessively stringent and mutually exclusive criteria to do so. A critical analysis of the logical structure of Immerman's argument shows this: Immerman begins by stating that "no consensus has appeared regarding the criteria for...a diagnosis [of dietary deficiency of B₁₂]" (p. 39). He then proposes seven criteria, the first five of which he decides are essential for the diagnosis of dietary B₁₂ deficiency. In justifying his decision, he cites only one published paper from 1945 (Dann and Darby, cited in Immerman (1981)), and a book on megaloblastic anemias written in 1969 (Chanarin, cited in Immerman (1981)). Immerman makes no reference to current conventional medical textbooks of the time, which very likely give different criteria for diagnosis. Immerman (1981) proceeds from anecdotal case to case, claiming to show that none of the case reports of researchers or physicians of patients with B₁₂ deficiencies meet all of his criteria, although many meet several. In one case all five are apparently met, but he explains this away to show that it could not have been a case of "pure diet deficiency" (p. 40, citing Winawer et al. (1967)). Immerman's criterion 4 is particularly stringent, "megaloblastic anemia and/or
subacute combined degeneration” (p. 39) and criterion 5 requires the “abnormal signs and symptoms [to be correctable] by oral administration of about 1 μg B₁₂ per day” (p. 39). From the cases, it is clear Immerman will not call a condition “vitamin B₁₂ dietary deficiency” unless all five are satisfied.

Immerman’s argument is fallacious on two counts: (1) He sets arbitrary standards and then claims to show that his opponents are wrong in their diagnoses. (2) The criteria are almost certainly self-contradictory. Physicians are usually concerned to prevent the kind of irreversible neurological damage present in megaloblastic anemia, required in criterion 4. But because criterion 4 requires neurological damage and requires that it be cured by oral administration of B₁₂, if criterion 4 is met, criterion 5 cannot be met if the damage is irreversible (see Herbert and Subak-Sharpe, 1990). Likewise, if a criterion 5 is met, criterion 4 may not be present in a degree sufficient to satisfy Immerman’s strictness. Criterion 5 may not be met because oral administration is less effective than parenteral administration in some cases if gastric atrophy and suboptimal intrinsic factors have developed with concomitant malabsorption via the stomach, as reported in the Nutrition Review (1978) case. Thus, Immerman’s reasoning is spurious; Varner’s reliance on this source is spurious.

2.3. Ignoring Sources that Contravene His Claims. Varner should explain why we should reject the more recent work of Herbert (1984, 1988), cited in George (1990, 1992, and 1994b). Herbert (1988) notes that evidence for bioavailable B₁₂ production in the ileum is inconclusive—the experiments were flawed. Vitamin B₁₂ deficiency can be self-cured (or avoided) if one is willing to drink a strained extract of one’s own feces. That unpalatable experiment was done in 1962 by Sheila Callender with vegan volunteers who were B₁₂ deficient (cited in Herbert, 1988, p. 852). She showed that colon bacteria of vegans make enough vitamin B₁₂ to correct B₁₂ deficiency but that B₁₂ is not absorbed in the colon and is instead absorbed in the small bowel (Herbert, 1988, p. 852). Herbert (1984, 1988) describes in detail the biochemistry and metabolism of this vitamin. He explains the assays and experiments that show that most supplements sold in stores contain useless analogs, many of which actually block true vitamin B₁₂ uptake. “There is no active vitamin B₁₂ in anything that grows out of the ground” (Herbert, 1988, p. 852). Herbert (1984, 1988) recounts as well the serious consequences of not supplementing a vegan diet.

Varner claims that “the scientific research hardly shows that vegans, whether male or female, face significantly higher risk of developing B₁₂ deficiency, because no reason has been given to believe that they are any more likely than omnivores to develop...absorption problems which trigger deficiency” (p. 35). Varner’s statement here is false on several counts; on absorption etiology as noted above, but also on the differences between males and females: Herbert (1984) explains why women are indeed more vulnerable to B₁₂ deficiencies than men: “During the latter half of pregnancy, the fetus removes approximately 0.2 μg of vitamin B₁₂ daily from maternal stores. To compensate for this drain, the FAO/WHO group recommends the total daily intake of vitamin B₁₂ be increased in pregnancy to 3 μg [from 2 μg]. The RDA...recommends 4 μg....
Approximately 0.3 µg of vitamin B\textsubscript{12} is lost daily in the breast milk of nursing mothers. To compensate for this, the FAO/WHO group recommends a total daily intake during lactation of 2.5 µg, and the RDA recommends 4 µg" (p. 352). Moreover, Herbert (1988) has been an outspoken critic of excessive use of vitamin B\textsubscript{12}, so he cannot be indicted as a researcher with a bias towards its use. Dwyer (1991) cites several case studies of infants and mothers with vitamin B\textsubscript{12} dietary deficiency.

Varner claims that the research does not support the need for vitamin B\textsubscript{12} supplementation in anyone, much less a greater need in women. He presents little evidence of having read any of the empirical research at all. He relies on one outdated, fallacious, and very likely biased "review" plus one anecdotal report and ignores citations readily available to him in my own work (Herbert, 1980, 1984, 1988) that give empirical evidence on the vitamin B\textsubscript{12} requirement. I am mystified that my colleagues Varner and Pluhar, whose strictly philosophical work I respect so much, can have so little facility with understanding how to draw conclusions about facts. Varner can have no warrant whatsoever for drawing the conclusions he does from his cited sources.

2.4. Misconstruing a Hypothesis; Taking a Hypothesis as Strong Evidence. In his discussion of the calcium requirement, Varner cites no experimental studies nor reviews of studies; he cites only the now 10-year-old statement of the National Institutes of Health on calcium and osteoporosis (U.S. Government, 1984) and two articles that set out hypotheses (Hegsted, 1986; Eaton and Nelson, 1991). Varner attempts to use a theory proposed by Eaton and Nelson (1988) to show that "it is not obvious why vegans should be at increased risk given that many plants are rich in calcium" (p. 36). Varner appears to misconstrue the main point in Eaton and Nelson (1991). They argue for a return to a meat and vegetable diet, eliminating virtually all cereal grains in order to increase calcium availability in our diets. The fossil record shows widespread malnutrition with skeletal deformations common at the time of Paleolithic transition from hunting to agriculture (p. 284S). These skeletal abnormalities are attributed to poor calcium absorption when grain was substituted for meat (Eaton and Nelson, 1991). Cereals are not only poor sources of calcium; some (especially wheat) contain phytates that bind calcium tightly and may inhibit absorption in the human gut (Eaton and Nelson, 1991, p. 284S). Reliance on grains rather than meat as a protein source has, in their view, decreased calcium absorption because of phytates and consumption of fewer vegetables (which I suppose has to do with the greater volume of grains versus meat that must be consumed to get similar protein). Varner claims it is "not obvious" that vegans would suffer calcium malabsorption, but if Eaton and Nelson (1991) are correct, they show just that. Eaton and Nelson advocate a diet of meat, fruit, and vegetables only; Varner would not have us eat meat. But a diet of only fruits and vegetables would be protein-deficient. So, I do not understand why Varner thinks that Eaton and Nelson's hypothesis supports his case; rather, it seems to support my case. Nevertheless, an untested hypothesis cannot stand as strong evidence in a moral argument or even in an argument that appeals to health (see Part I, Section 5.3),
and I do not consider Eaton and Nelson (1991) to offer any important support for my own claims.

2.5. Ignoring Sources that Contravene His Claims; Double Standard. Professor Varner purports to show that "the research to date does not unambiguously indicate that vegans, even vegan women, face significantly higher risks of deficiency than do omnivores, ... [and] there are reasons to believe vegan women face no greater risks at all" (p. 37). What research has he referred to, cited, or read? One outdated statement from NIH on osteoporosis and calcium. He cites no studies on vegans or on the calcium requirement at all. In fact, Professor Varner ignores experimental evidence (cited in my 1992, 1994a,b) as if studies have nothing to tell us about the calcium requirement. His critique of nutritional risk amounts to simply raising (rather ill-founded) questions about it. But, from the fact that questions remain about the mechanisms of calcium metabolism and the calcium requirement, it does not follow that nothing is known or that we have insufficient data to draw any conclusions at all. In my (1992, 1994b), I cite Peacock (1991) and Dawson-Hughes (1991) from the same volume in which Eaton and Nelson (1991) appeared. The studies cited in these reviews provide good support for a causal relation between higher milk ingestion in adolescence and lower incidence of osteoporosis in older women; and lactovegetarians have a lower incidence of osteoporosis (ADA, 1988). Finally, Varner inappropriately demands "unambiguous" evidence, when he should know sound inductive reasoning can only provide relative warrant for belief. Moreover, he himself thinks we should change our behavior to veganism based on only hypotheses and theories while demanding certainty on the other side—a double standard.

2.6. Arguing from Ignorance. Perhaps Professor Varner believes that because he has not seen or cannot find studies on vegan women and osteoporosis (I have not seen any either) "there is good reason to believe [vegans] face no greater risks at all." This is the fallacy of arguing from ignorance: because we have no evidence that a particular belief is false, therefore it must be true; e.g., "perhaps animals do advanced calculus, but we just don't know that." Because we have no evidence that they do not, then we are warranted in believing that they do. Similarly, because we have no unambiguous evidence that vegan women will face greater risks we are warranted in believing they will not. Professor Varner uses this sort of claim throughout his essay. Arguing from ignorance throws reason out entirely, of course, and opens the door to all sorts of superstitious beliefs, including entities proposed to exist even though we have no evidence that they do.

2.7. The Need for Better Understanding. Varner's criticisms do not indicate a good understanding of nutrition and dietary practice. For instance, Varner comments that "calorie for calorie, spinach, lettuce, green beans, tofu, and black-eyed peas all contain more iron than even the leanest cuts of sirloin steak" (p. 38). Professor Pluhar (1993) makes a similar comment that "a portion" of such foods all contain similar amounts of iron (p. 40). These statements are misleading because neither considers
the bulk in most of these foods and their relatively low calorie count. Apart from the fact that heme (meat-source) iron is better absorbed than nonheme (plant-source) iron, what quantity of the above foods would a 14-year-old girl have to eat to get the same iron as in a 3-ounce lean hamburger patty (3 mg Fe; 25% of her RDA)? She would have to eat 4 cups of lettuce (0.8 mg Fe/cup), 3/4 cup spinach (4 mg Fe/cup), 2 1/2 cups of green beans (1.2 mg Fe/cup). Would she get the same number of calories from these "portions"? The hamburger provides 190 kcal; the lettuce, 40 kcal; the spinach, 30 kcal; the green beans, 75 kcal (calculated from values in Saltman et al. (1987)). None of these quantities of vegetables provide much energy, and teenagers are still growing and require more energy than adults. Infants and younger children have a small stomach capacity, but are adding tissue continuously in growth. They need adequate energy, protein, and nutrients, but may be unable to get them from the bulky sources Varner mentions above.

2.8. Unfairness and Ad Hominen. Professor Dwyer also writes for this issue; and, as a nutritionist, she will be a much better authority on the factual questions than I can be. Yet, Varner questions her authority. Has he been fair in his attacks on Dwyer? I do not think so for the following reasons: (1) Varner cites only 15 sources with the intention of defeating the claims of Dwyer and her colleagues on five separate vitamin or mineral requirements. I have shown that two of these are unreliable, and two others are hypothetical only. Varner questions the findings in Dwyer (1991), Dwyer et al. (1978), Dwyer et al. (1980), Shull et al. (1977), and Jacobs and Dwyer (1988) and so does not rely on them as sources; that leaves only six sources (one of which (ADA, 1988) may also be Dwyer's work). The reader should examine these six sources to see whether they contain evidence that would overturn Dwyer's work. They do not. (2) Varner claims that the nutrition literature is "subtly biased against vegetarian diets in general and vegan diets in particular" (p. 39). Yet he does not present much evidence of having read any great amount of the literature, and only cites five of Dwyer's many articles. Varner should have at least researched Professor Dwyer's other writings before making that charge; if he had, he would find her "Health Aspects of Vegetarian Diets" to be a long review of the benefits of vegetarianism (Dwyer, 1988). (3) Moreover, even if bias were found in Dwyer's work, it would not follow that her conclusions were wrong. The reviews and her studies would have to be evaluated on their own merits. That some of Dwyer's research was done on religious groups Varner considers "fanatics" does not invalidate what was learned. Every generation has its "new" reasons for adopting food practices. Because Varner's ideal vegans would adopt diets on moral grounds (i.e., reasons similar to religious ones) and not on health grounds or from self-interest, the "new new" vegans may also ignore their self-interest (as he complains macrobiotics do) and avoid forbidden foods while failing to provide adequate diets for themselves and their children. Dwyer's work and that of her colleagues provides valuable information about the consequences of more or less restrictive diets in young children and remains a resource for people who wish to adopt vegan diets (Shull et al., 1977; Dwyer et al., 1978). Moreover, Dwyer (1991) does not rely on her own work alone but on the work of many other
researchers working independently; she cites 135 sources, many of which were not studies on macrobiotics. (4) Varner questions Dwyer's (1991) use of phrases such as "not well-supported" versus "suggests" with respect to the relative reliability of the evidence, claiming this shows her bias. As Giere (1991), who is a philosopher, points out, different kinds of experimental studies have better or worse reliability. Dwyer's use of terms to indicate differences in confidence may reflect the experimental design of the studies. Before accusing Dwyer of bias, a scientist would make it his personal and professional responsibility to gain a thorough understanding of the 135 sources Dwyer cites, evaluating the studies for their methodology and reliability according to the standards of good scientific reasoning and comparing them to Dwyer's conclusions to see if she is biased (see Part I, 5.1 and note 13). Philosophers claim the evaluation of arguments as their expertise, and Professor Varner should be no exception. He has not evaluated her studies and references on their own merits, as science. So, he appears to be making an idle accusation. (5) Varner accuses Professor Dwyer of trying to define "vegan" as a person who is always associated with a religious or other belief. He then defines the term as a "nutritional category" only, as if people are vegans for no reason whatsoever. All research on vegetarians shows that there is a lifestyle that must be studied, and there are always other habits that are adopted with vegetarianism associated with beliefs about right living. Varner is no exception; he would himself adopt veganism on moral grounds. Varner's attitude betrays an excessively positivistic view of science—that there are entities in the world to be described apart from their teleology and our evaluation of them. Dwyer refers to the actual vegans found in the world; Varner refers to the ones he "predicts" are out there. What good evidence have we to accept his intuitions versus empirical data? (6) Professor Varner claims that Dwyer (1991) has ignored the work of Colin Campbell in China (although he himself cites none of that work and claims Campbell's publications, presumably on the China project, "are legion"). Although Campbell has used his data to advocate vegan diets (PCRM, 1991), he probably has better ground to advocate semi-vegetarian diets, since that was the diet of the subjects he studied. Because his subjects were not vegetarians, the relevance of his work to Dwyer's (1991) review is highly questionable. Even if it were relevant (a question Professor Dwyer is better able to decide than I), Varner's attack is unfair. Chen et al. (1990) published only the raw data and a general commentary. Campbell et al. (1990a,b) published two papers that same year, neither of which addresses vegetarian diets. Finally, the lag time for publication in a good journal is usually one to two years. Because Varner does not attack the studies, but attacks Professor Dwyer instead, he commits an ad hominem fallacy.

2.9. Concluding Remarks. Even if the question were about risk, Varner has failed to make his case. He offers virtually no analysis of the literature in nutrition, relies on outdated and fallacious sources, ignores evidence that would contravene his claims, makes unsupported claims, draws hasty conclusions based on weakly supported hypotheses rather than evidence, employs a double standard, appeals to ignorance, and unfairly attacks a respected nutritionist when his focus should be
the scientific studies themselves. Like Pluhar, he avoids the real issue in my arguments, that of discrimination and bias in the vegan ideal.

Notes

1. In denying the validity and adequacy of moral rights theory, I still affirm the usefulness of “rights” as a political concept. Given the realities of our world and the inequities that continue to exist, the language of “rights” should still be employed in arguments that seek the protection and liberation of many different individuals and groups. In saying this, though, I realize that I am making a theoretically untenable claim: moral rights (as separate from civil, legal, or political rights) only have great utility. Within traditional moral theory, that claim is untenable because rights work to constrain what may be done in the name of utility (the greater good) (see Nozick (1974) pp. 28–33 for a fuller explanation of the incommensurability of rights and utility).

2. By this term, I refer to a diet which includes dairy products and eggs and small amounts of fish, chicken, and other meats.

3. Professor Pluhar received an early draft of my (1994b) in 1991 and the penultimate draft in early 1993; in that article, I also argue for an alternative contextual ethic.

4. The Liberty Principle would permit people to eat meat or animal products if they have no other recourse and need them for health—we are not required to make ourselves “worse off” for the sake of some other being, even if the being is “innocent” or “non-threatening”: “Provided that all those involved are treated with respect, and assuming that no special considerations obtain, any innocent individual has the right to act to avoid being made worse-off even if doing so harms other innocents” (Regan, 1983, p. 333).

5. Professor Pluhar uses these old studies but excuses herself for not using nutrition textbooks on the grounds that even the newest texts are already outmoded.

6. Dwyer’s (1988) review of health benefits also provides a broad overview and would be a better start for the nonspecialist than picking through individual studies.

7. Chen et al. (1990) present no analysis of data. Their large and very expensive ($172.50) volume gives raw data, but the media have been quick to draw many conclusions that the authors caution against:

   More than 100,000 correlation coefficients have been generated by this project and these must, of course, be interpreted with particular caution, for the play of chance might be expected to yield a few thousand falsely significant results. Moreover, in a geographic survey such as this, many other variables may exist that confound any true relationship (p. 2).

Members of the research team published three analyses (Campbell et al., 1990a,b; Forman et al. 1990) in that year in U.S. journals, none dealing with vegetarian diets as causally connected with the incidence of chronic disease in the U.S. Since the debate in this journal began, Campbell et al. (1992) have published a general essay about the likely health benefits of the Chinese diet, which is semi-vegetarian. Lappé and Collins (1986) point out that China’s development differs from much of the Third World, so that we cannot generalize from conditions in China to conditions elsewhere in the Third World.

8. I continue to have serious concerns about vegan diets for infants and children even in our own society. The American Academy of Pediatrics (AAP, 1992) has spoken out in support of milk, and most nutritionists affirm the safety of vegan diets for infants with many qualifiers.

9. Climate and soil conditions are two of the most important limiting factors for “transformation” of all cultures to westernized agriculture. People living in zones which are arctic, arid, alpine, isolated, tropical, or oceanic cannot adopt these practices. The cultures of many indigenous peoples have been destroyed by the attempts of powerful First World peoples to force them to live as we expect.
10. On 29 September 1992, the Academy (AAP, 1992) issued a response to the claims of Physicians Committee for Responsible Medicine (PCRM) (1991) that milk and other dairy products were no longer needed for children's health. While the AAP recommended that only breast milk or iron-fortified infant formula be used in the first year of life, they affirm the value of milk as a nutritional source in childhood. Since 1976, the AAP has advised that skim milk not be given in the first two years of life because infants need more calories than skim milk can provide; whole or perhaps two percent milk (if the physician recommends it) may be given after one year. The Center for Science in the Public Interest has also responded to PCRM's claim that "green leafy vegetables such as kale are as good or better than milk as calcium sources" (quoted in Liebman, 1992). Liebman (1992), writing for the Center, counters that "a cup of milk has 300 to 350 mg of calcium. A cup of cooked kale has 90 to 180 mg. And how many kids eat kale by the cup?" (p. 2). Also, young children must have enough calories for growth, and the stomach capacity of a young child is too small to permit digesting large amounts of fibrous foods; the low caloric content of these foods may not meet the energy needs of young children (Jacobs and Dwyer, 1988; see also Dwyer, 1991).

11. My supposition here does not imply that infants are moral agents, as Professor Pluhar (1993) incorrectly assumes; but parents must decide based upon what they believe is in the child's best interest and so they must decide what kind of diet they should feed their children.

12. Pancreatic implantation of insulin-producing cells for cure of diabetes could be considered as a hypothetical example, although to be more analogous we should assume the surgery has gone beyond the experimental stage.

13. "[A] study is blind if the subjects cannot tell whether they are in the experimental or control group....A study is called double-blind if the experimenters making the diagnosis are also kept in the dark about which subjects are in which group." (Giere, 1991, pp. 253-254). Subjects in the control group are typically given placebos (pills or procedures to match what is done to the experimental group) so that in every outward way each group is treated the same. Blind and double-blind studies are to be randomized. The study group is chosen from a random sample of the whole population of interest, and the sample members are, in turn, randomly assigned to the experimental group or to the control group (Giere, 1991, p. 227). Randomization to each group is so standard that it is sometimes assumed in reports and may not be mentioned. It is usually reasonable to assume random assignment to one group or the other, but it is always important to look for a control group.

Prospective and retrospective studies cannot be completely randomized. Instead, these studies look at populations that either exhibit a suspected cause (such as smoking) of an effect (such as cancer)—a prospective study; or that exhibit the effect already—a retrospective study. In a prospective study, because the population is picked out for study based on a particular cause, the group cannot be chosen at random (e.g., smokers only are picked). The researcher can still randomize among the group by assignments to control or experimental group, however. In a good prospective study, a second, matched group is chosen (e.g., nonsmokers) so that the "two groups...are, on average, similar in every feature except the expected causal factor" (p. 237). So, if researchers want to know whether smoking causes lung cancer, only smokers with no signs or symptoms would be included in the study. The two groups are followed over time to see whether those in the group with the suspected cause develop significantly more cases of the effect (lung cancer) than those who do not exhibit the cause. These studies are called "prospective" because they look to the future and the effect occurs later in time. A retrospective study "begins with a sample of subjects that already have the effect... and attempts to look back in time to discover the cause.... Random sampling plays almost no role in retrospective studies" (Giere, 1991, p. 245). A "control group is still chosen to match the subjects in the experimental group for other variables that might be causally relevant" (p. 246). With prospective and retrospective studies, the self-selection present in the experimental group may bias the study (Giere, 1991, p. 247). Retrospective studies have the further defect that the experimental group itself is not at all a random sample—the subjects "get into the experimental group because something special has happened to them" (p. 248).
Retrospective studies cannot estimate "the percentage of the population that would or would not get the effect depending on whether they all had the cause" (p. 248). Giere (1991) notes that retrospective studies offer "limited usefulness in decision making" and other more reliable information must be used in conjunction with them (p. 249).

14. Giere (1991) gives the example that lung cancer is highly correlated with the use of ashtrays; if correlation were as good as cause, one could conclude that ashtray use causes lung cancer. But it is the third factor interacting with these—smoking—that is the real cause of lung cancer.

15. Absolute certainty is not possible in inductive or scientific reasoning about events in the world. It is always possible that we will find some evidence that dashes the best warranted beliefs. To paraphrase David Hume, we have no certainty that sun will rise tomorrow. We might find out it will supernova instead. But, of course, we are well-warranted in believing that it will rise; it would be irrational to believe that it will not, given all the evidence we have to believe that it will. When scientific evidence conflicts, as it often does, we must study the conflicting reports for the reliability of the methods used, the construction of the experimental group, the presence of confounding factors, the likelihood of the results occurring by chance (whether results are significant), check statistical analyses for accuracy, and so forth.

16. See also Liebman (1992) for a discussion of why the evidence linking dairy products with cataracts or ovarian cancer is so weak that it cannot form the basis for a change in diet. 17. The "attributes of validity and invalidity can belong only to deductive arguments, never to propositions" (Copi and Cohen, 1990, p. 50). Arguments of a certain form are said to be valid. Copi and Cohen (1990) define truth relations in valid deductive arguments as follows: "If an argument is valid and its conclusion is false, not all of its premises can be true. And also: if an argument is valid and its premises are true, we may be certain that its conclusion must be true also" [emphasis removed, p. 52]. Arguments may be valid, even if all the sentences are false, because validity concerns the logical relations among predicate terms in the sentences. Deductive arguments with false sentences are not sound, however. By contrast, absolute certainty is not possible in inductive (scientific) arguments (Copi and Cohen, 1990); instead, the arguments are all more or less warranted by empirical observation and experimentation.

18. The "correspondence theory of truth" is much more complex than can be explained here. This theory has occupied much scholarship in the philosophy of science, and what it may mean for a proposition to "correspond to the world" is still being debated. The point here is to distinguish logical validity from empirical soundness.

19. For an example from studies done on the safety of bovine growth hormone (BGH) in dairy cattle, see Kronfeld (1993).

20. In the interests of saving space, I include some of Pluhar's other unsupported, false, ambiguous, or fallacious claims briefly here: Pluhar ambiguously claims, without citing sources, that the Swedes are "phasing out factory farming over a ten-year period." Readers might incorrectly conclude that the Swedes are becoming ethical vegetarians. A recent report shows that the Swedes are replacing gestation stalls for swine with deep straw systems and other barn environments more suitable to the animals' nature (Halvorsen, 1993). The Swedish Law provides for more natural conditions and humane slaughter (Swedish Ministry of Agriculture, 1988). Professor Pluhar and I both attended a conference that she is probably referring to in her (1993); the Swedish representative showed more humane poultry cages with fewer laying hens each (Tauson, 1991). Perhaps Pluhar does not count this as factory farming. Their methods are more humane, but the Swedes still intend to eat animals. Pluhar uncritically accepts Brody's (1990) quotation about life expectancy in China as "about 70 years" as the only important concern. Infant mortality in China is still more than three times what it is in the U.S. (which is not usually cited as exemplary): 32 per 1,000 versus 9 per 1,000 in the U.S. (United Nations, 1991). Adults alive in China today live longer due to the improved medical care and food distribution that have taken place in their lifetimes. The China study
(Chen et al., 1990) was done on persons aged 35–64, did not include children, and does not take their high child mortality rate into account. Mortalities and correlations for diseases are based on exclusion of those who died earlier. Pluhar refers to Nordin (1966) as if only Indian women were studied, but women in seven countries, some of which were nondairying (such as Japan), were included. Professor Pluhar claims that Hegsted’s (1986) hypothesis has received little attention, but countries where osteoporosis occurs also have the largest populations of older people and so have more cases of osteoporosis. These same countries also have higher intakes of animal products and dairy products, so correlations for animal product use, osteoporosis, and longevity (among others) are noteworthy—to separate cause from chance association, tests are needed and are being done, but the jury is still out. Pluhar echoes PCRM (quoted in Liebman (1992)), saying there is “frightening new evidence that cow’s milk could trigger juvenile diabetes in genetically susceptible young children” (citing Karjalainen et al. (1992) and again appealing to fear). These studies are far from conclusive and are the subject of active controversy in immunology at this time partially because the autoimmune theory is also being questioned (see Rennie, 1992). Liebman (1992), writing for the Center for Science in the Public Interest, comments on PCRM’s news release indicting milk as a trigger of diabetes in children: “the ABBOS theory is still largely theory.... [and even if so] doesn’t mean that milk should be banned from older children’s diets. It’s largely in the first few months of life...that large chunks of protein like ABBOS enter the blood in one piece” (p. 3). Although people with strong family histories of diabetes may wish to inquire about this with their physicians and use soy-based formulas rather than formula made from cow’s milk in the infant’s first year, Pluhar’s emotive language and ambiguity on the American Academy of Pediatrics “warning” on the use of skim milk in infancy make her remarks an appeal to fear (see note 10). Professor Pluhar is rightly concerned about the ability of our planet to feed the human population. But she does not examine the issue in any depth. Predictions about future disasters are notoriously unreliable, and there are factions at both extremes that Charles C. Mann (1993) dubs “Cassandras and Pollyannas.” “In 1972 a group of researchers...used advanced computer models to predict that the world would run out of gold in 1981, oil in 1992, and arable land in 2000” (Mann 1993, p. 48). We should certainly reduce our demand for meat and animal products, but the reasons Pluhar gives do not justify abolitionism. Mann argues that we should attend to political and quality of life concerns if we want to solve problems of hunger and population. On Professor Pluhar’s claims about the iron content in food, see Part II, Section 2.7.

21. The Malter et al. (1989) study is a retrospective study and has several confounding factors that make it a source with low reliability, so there is not space for analysis of that study here; Professor Pluhar should have scrutinized it before making any argument that includes it.

22. I am not saying that Malter et al. (1989) cannot have some connection to work on AIDS; my claim is that Pluhar’s comments involve too many leaps for credibility and border on appeals to popular notions about immune function and exaggerated health claims for certain diets. Scientists are studying the role of all kinds of killer cells in AIDS and many other diseases because killer cells are an important component of the immune system in general (Cohen, 1993). Scientists are also working on a few patients who are HIV positive but who have not developed the disease over a long period of time. It is hypothesized that there are at least two major types of HIV infection, one of which does not cause the patient to develop symptoms. Evolutionary theory predicts that the virulent forms of a virus or disease organism will die out and attenuated forms will survive. A virulent form cannot survive because its victims die and cannot transmit the virus. Virulent forms also die out when hosts modify their behavior so that the virus is not transmitted. In such cases, only modified and less deadly “versions” of the virus survive in the population. For the parasite to survive, so must its host (Ewald, 1993).

23. Since some citations among the thousands of reports published each year can be difficult to locate, I have sent Professor Pluhar a copy of the English abstract of Zhu (1990), which
she complains she cannot locate. Data would be available in the Zhu article, published in Chinese. Interested readers may obtain the English abstract by using Medline No. 90374194 or by using Index Medicus.

24. For instance, iron supplements are expensive, are best prescribed by a physician to avoid overdose, are usually not covered by insurance, and are an added inconvenience. They often cause constipation in those who use them; and they are a frequent cause of poisonings in young children (Herbert and Subak-Sharpe, 1990).

25. Both Professor Pluhar and Professor Varner state that they themselves are vegans without any health problems and know of no one who consults nutritionists or nutrition literature. Each minimizes the importance of the “careful planning” requirement, saying that general guidelines about protein complementation and nutrition are sufficient for vegan health. The idiosyncratic experiences of individuals are of little value for parents making decisions for their children; more generalized knowledge is needed, and the continued reports of nutritional deficiencies among vegan children that appear in the literature offer good reasons to take the “careful planning” requirement very seriously. Patricia Mutch (1988) has reviewed the practical uses of food guides developed by nutritionists and finds that, although all of them have problems, their use combined with general guidelines would be much more satisfactory in achieving nutritional adequacy than using general guidelines alone.

26. During the 1970s, algae was promoted as a source of food for the world. Hills and Nakamura (1978), writing for the World Hunger Project, for instance, claim that chlorella contains “0.02–1.7 \gamma [sic] of vitamin B_{12}/1 gram chlorella” (p. 224) and that spirulina also contains vitamin B_{12} (p. 313). What Hills and Nakamura (1978) did not know at the time is that none of these forms of corrinoids can be used by the human body. Victor Herbert has shown this with spirulina: “We also studied most of the spirulinas sold in health food stores as sources of vitamin B_{12} there is practically no vitamin B_{12} in them. The so-called vitamin B_{12} is almost exclusively analogues of vitamin B_{12}... and they actually block vitamin B_{12} metabolism” (1988, p. 857). He reports testing some soy products that claim to provide vitamin B_{12} and found these to contain “practically no vitamin B_{12}” (1988, p. 857). Some seaweeds may produce usable forms of B_{12}, but they are quite unreliable (Herbert, 1988; Dwyer, 1991).

27. Varner notes that “it therefore seems likely that most vegans get enough B_{12} without supplementation. Possible sources are contamination from root crops by B_{12}-producing microorganisms in the soil....” (p. 35). What he does not say is that in Western countries where we wash our vegetables well, there will be no B_{12} on them (Herbert, 1988).

28. Only Immerman’s first three criteria coincide with some of the diagnostic criteria given in Herbert and Subak-Sharpe (1990); i.e. (1) less than the daily requirement of B_{12} in the diet, (2) low serum B_{12} level, and (3) the presence of normal absorption. According to Herbert and Subak-Sharpe (1990), the presence of criterion (3) does not rule out dietary deficiency if (1) is present. In addition, folate dietary deficiency may engender vitamin B_{12} deficiency, so folate levels in both serum and red cells must be determined to find the cause of the deficiency (pp. 513–517). For the later stages of vitamin B_{12} deficiency, Herbert (1988) gives the following diagnostic symptomatology: “anemia and pancytopenia, low white counts, low red counts, low platelet counts, and slowed DNA synthesis” (p. 857). None of these specific criteria for advanced B_{12} deficiency is given by Immerman (1981), but Immerman’s criterion (4) could be interpreted to mean these symptoms (see main text).

29. Advance copies were sent to him for my (1994b).

30. Herbert (1988) comments: “Careful studies from England... on several hundred vegans showed that they all eventually get vitamin B_{12} deficiency disease with anemia and pancytopenia, low white counts, low red counts, low platelet counts, and slowed DNA synthesis” (p. 857).

31. For example, 20% of the iron from lean beef is absorbable and 18% from chicken compared with 7% from soybeans, 1.6% from black beans, 1.4% from spinach, and 4.4% from lettuce (Scrimshaw, 1991, graph, p. 48). If only absorbable iron were counted, the adolescent in the text example would be required to eat 12 times as much spinach as given or 4.5 times as much lettuce to get the same iron as in the beef patty.
32. Even though my Ph.D. is in genetics as well as philosophy, I realize that I am not a nutritionist; I try to be very conscientious about not overstepping the limits of my knowledge by reading a large amount of material and checking my factual claims with nutritionists. In this article, my criticisms are primarily directed at the use and interpretation of what Pluhar and Varner cite.

References


