Who Can be Morally Obligated to be a Vegetarian?

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Abstract *Kathryn Paxton George has recently argued that vegetarianism cannot be a moral obligation for most human beings, even if Tom Regan is correct in arguing that humans and certain nonhuman animals are equally inherently valuable. She holds that Regan's "liberty principle" permits humans to kill and eat innocent others who have a right to life, provided that doing so prevents humans from being made worse off. George maintains that abstaining from meat and dairy products would in fact make most humans worse off. I argue that Regan's "liberty principle" either contradicts his "equal rights view" or does not permit the slaughter of another for food. I show that a different view recognizing the moral rights of nonhumans but according them less value than normal adult humans, "the unequal rights view," would permit such action if human survival or health depended upon it. However, it would also permit the slaughter of innocent humans in the same circumstances. Finally, I argue that current nutritional research does not support George's contention that most humans would suffer if they ceased eating other animals and their products.*

Keywords: Equal rights view; liberty principle; nutrition; unequal rights view; vegetarianism; strict vegetarianism.

Introduction

As far as we know, humans are the only beings on our planet who are capable of moral agency. We alone, unlike our carnivorous, herbivorous, and omnivorous cousins, are in a position to let moral principles shape our diets, and we alone can have an obligation to do so. Human vegetarians have chosen not to consume other animals. Those who are "strict" vegetarians ("vegans") also forgo eating the products of other animals, such as eggs, milk, butter, and cheese. During the past

several years, a number of philosophers have presented moral arguments that strongly support the refusal to raise, slaughter, and eat certain sentient nonhuman animals. If they are correct, vegetarianism, even in its strict form, may be morally obligatory, at least in those cases in which nonhuman animal food is obtainable only through inhumane methods and unjustifiable death. Moral philosophers Peter Singer (Singer, 1975), Bernard Rollin (Rollin, 1981), and Tom Regan (Regan, 1983) hve led recent systematic philosophical attacks on all forms of human exploitation of nonhumans, including the raising and slaughtering of other animals for their meat. Arguing that we humans do not need animal flesh to live and thrive, they have urged us to abandon a practice that causes considerable suffering and (according to some of them) wrongful death. It is difficult indeed to understand how it would be morally permissible to pen, slaughter, and roast a fellow rights-holder, or a being whose interests should receive the same consideration as one's own.

Recently, however, philosopher Kathryn P. George has argued in the pages of this journal that, even if we accept the most stringent thesis about the moral rights of certain nonhuman animals, the thesis defended by Tom Regan, most of the human animals on this planet would still be justified in consuming nonhuman animals and their products (George, 1990). According to her, Regan and others mistakenly urge all of us to become strict vegetarians. She believes that they have ignored key facts about many humans' physiology in making such a recommendation. In fact, she claims that a key moral principle defended by Regan, in conjunction with data on human nutritional needs, actually justifies the opposite conclusion. If she is right, the strongest case that can be made for ethical vegetarianism collapses ignominiously.

I will argue that she is incorrect. In particular, two of her major contentions are mistaken: (1) the implications of Regan's view for vegetarianism are not as she (or he!) suggests; and (2) data on the nutritional needs of humans do not support her contention that most humans need to consume nonhuman animals and their products.

1. Implications of Regan's View for Vegetarianism

For the sake of argument, let us assume with George that Regan is correct in holding that all "subjects of lives," i.e., beings with beliefs, desires, and preferences about how they are treated, with the ability (even if quite limited) to act in pursuit of goals, having a "psychophysical identity over time" and a "welfare," be they human or nonhuman, have equal inherent value and an equally strong *prima facie* (i.e., overrideable under certain strict, specified conditions) right to life and respectful treatment (Regan, 1983, 243–48). Suppose too, as Regan does, that human life and health in general do not require us to eat animals and their products. Does this commit him to strict vegetarianism?

1a. Fit Objects of Consumption

It does not, for several reasons. First, many nonhuman animals may not be "subjects of lives": Regan believes that the only *clear* cases are normally developed mammals over one year of age (Regan, 1983, 79). He suspects that birds, fish, young mammals, etc., all fall short of this criterion for moral rights. On his view, consuming those who fail to be subjects-of-lives, even if our lives or health do not require it, would not in itself be wrong. Regan acknowledges this point in a footnote, but he reasons that we should refrain from eating these nonhumans on other grounds: concerning some of them we cannot be highly confident that they are not subjects of lives; we devalue subjects of lives if we casually consume those animals who do not quite measure up (especially infants who would otherwise have become subjects of lives); and in general we encourage a habit of viewing animals as products that threatens undeniably genuine rights-holders (Regan, 1983, 416–17).

Regan's appeal to the formation of bad habits and the imperiling of rights-holders are reminiscent of Thomas Aquinas' contention that the only wrongness involved in cruelty to animals (who have no moral status whatever, on his view) by morally significant beings is the likelihood that these beings will generalize that cruelty to humans (Aquinas, 1989, 9). The appeal is not terribly persuasive: both of these very different philosophers overlook the outstanding human ability to make discriminations among even the most similar beings. White supremacists who have no difficulty being kind to those of their own ilk and vicious to those of the "wrong" color are not likely to confuse chickens with their fellow cross-burners. Regan is on stronger ground in urging us to give birds, infant mammals, fish, and crustaceans the benefit of the doubt when there is a reasonable doubt. We cannot pretend to know so much about the inner lives of these beings as to declare them without beliefs, desires, or preferences, especially given their apparently purposive behavior. This is particularly true in the case of birds, who are able to vary their behavior appropriately in the face of changing circumstances, sometimes to the point of apparently outwitting humans. In one famous scientifically documented case, English blue tits (chickadees) even displayed creative *cooperative* behavior in their several successful strategies against villagers trying to protect their milk bottles from avian invasion (Wilson, 1985, 172–3). Even domesticated poultry, not noted for their intellectual prowess, appear to care about what happens to them. At a 1991 "International Conference on Farm Animal Welfare," held under the auspices of the University of Maryland Departments of Animal and Poultry Sciences at the Aspen Institute for Humanistic Studies in Maryland, I heard a number of scientific poultry experts discuss the "feelings" and preferences of chickens. The birds were acknowledged to have a "welfare," and that welfare was discussed in explicitly subjective terms by several animal science researchers. Infant mammals too should receive the benefit of the doubt: they are neurologically complex enough to have sensations, and appear to prefer pleasurable sensations over painful ones. It is true that they are less well able to exhibit purposeful behavior than the adult members of their species, but this also holds for human infants. Given the Regan perspective, those who believe that the sentience of human infants is sufficient

for full moral status, or who extend moral status to them by virtue of their *future* status as subjects-of-lives, should do the same for infants of other mammalian species. It is more doubtful that fish and reptiles could be subjects-of-lives. However, as Singer points out, they have complex nervous systems and display most of the same behavior exhibited by mammals in pain (Singer, 1990, 172). In an important sense, they appear to have a "welfare." Considering how high the stakes are for such beings, i.e., suffering and death, it seems that we are justified in extending to them the benefit of the doubt. The same applies to crustaceans: although they do not have the kind of complex neurological organization as vertebrates, they behave as if they are sentient (Singer, 1990, 174). The behavior displayed while they are being boiled alive is not unlike the behavior any of us would display in those circumstances, apart from the fact that we would be noisier. One gets the overwhelming impression that such beings do have preferences, that they are acting as best they can to escape their situation. Given this behavior, and given the high stakes involved, one would be justified from Regan's and Singer's perspectives in not inflicting gratuitous death and probable suffering upon them.

Mollusks are another matter. With the exception of the octopus, as Singer reminds us (Singer, 1990, 174), their extreme simplicity makes it probable that they lack the neurological wherewithal to be subjects-of-lives. Sentience is very likely beyond their ken. They, at least, would appear to be "fair game" for the human who fancies their taste. Ethical vegetarians like Regan and others choose not to indulge in such fare, but their principles do not require them to refrain from it. Be that as it may, for health reasons, in these days of polluted ocean bottoms and inadequate or nonexistent seafood inspection procedures, many have prudently chosen not to indulge. Those who prefer to give mollusks the benefit of every possible (as opposed to reasonable) doubt make the same choice.[1]

Yet another reason for saying that Regan is not theoretically committed to strict vegetarianism is the fact that it is possible to treat chickens, cows, goats, and the like respectfully, with full regard for the rights we might accord to them, while enjoying their eggs or milk. Regan and other ethical vegetarians could have no objection to such a mutually beneficial arrangement. As Steve Sapontzis has written in an earlier issue of this journal, "animal liberators" can even go beyond non-strict vegetarianism by eating these animals once they have died a natural death (Sapontzis, 1988, 149–50). So, strictly speaking, the Regan rights view is committed neither to strict nor to non-strict vegetarianism.

However, in practice, very few nonhumans raised for eggs or milk in industrialized countries are treated humanely, let alone respectfully. Farmers with the best intentions also find it very difficult to engage in milk and egg production without occasioning some death. For example, the kindliest dairy farmers find themselves with male calves they cannot include in their enterprise. Few can afford to keep such animals: males who are not needed for breeding are killed at some point, even if they are not subjected to the veal crate. The same problem holds for male chicks, as Hugh Lehman has pointed out (Lehman, 1988, 160). Unless animal products can be obtained from unimpeachable sources, those who hold that these nonhuman animals have the same right to life as human beings violate their principles by

consuming milk or eggs. Moreover, while there can be no rights violated by the consumption of animals who have led happy lives and undergone natural deaths, it would be *psychologically* difficult for most believers in nonhuman animal rights to partake of this flesh (Sapontzis, 1988, 152). Few of us can eat those whom we have respected as fellow sentient beings and rights-holders, even if they have peacefully dropped dead. We tend to identify the dead body with the former living, morally significant being, even though that being has ceased to exist. (Imagine barbecuing Aunt Betsy, after extensive tenderizing.) Perhaps we could extinguish our abhorrence: it is said that in some cultures, dead relatives were eaten as a sign of respect. It would not be easy for most of us to do, however. Thus, unless certain facts about animal husbandry and most humans' attitudes change, and given the fact that there are risks to humans who presently eat mollusks, a diet that is strictly vegetarian (assuming, for the moment, that such a diet does not endanger human health), seems to be the most ethical, psychologically acceptable choice for those committed to both human and nonhuman rights.

1b. Implications for "Human Carnivores"

Again for the sake of argument, let us now assume with George (unjustifiably, as I shall soon argue) that most humans need to consume flesh, milk, or eggs to sustain a healthy life. Would Regan's rights view militate against vegetarianism if this were the case? George correctly points out that Regan believes that it would. He does indeed claim that none of us would be required to be vegetarians in such circumstances (Regan, 1983, 337). His basis for claiming this is his "liberty principle":

> 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, 331.)

Refusing to eat meat when your body requires it would surely make you worse-off, and, Regan believes, even the innocent being you are contemplating ingesting cannot exact such a sacrifice from you. You should therefore be at liberty to kill and eat the other animal, though you should do so with the maximum amount of respect. Thus, humane subsistence hunting would be justified, as would animal husbandry practices far more humane than those prevailing now. Minimum suffering and death, maximum care and respect, would be required here, but these other innocent beings with an equal claim to life as oneself could be consumed. At least this is what Regan and George have concluded.

This conclusion is said to follow from the conjunction of the liberty principle and the assumption that most or any humans need to eat meat for health or life itself. However, the liberty principle itself bears further examination. As we shall see, it can be interpreted in two ways. On one interpretation, the anti-vegetarian conclusion does indeed follow from it, but so does the sanctioning of the killing of

innocents in circumstances we would all agree to be wrong. On the rival interpretation, the anti-vegetarian conclusion does not follow.

On a straightforward interpretation of the liberty principle, other innocent beings with a right to life equal to our own can be harmed, even killed, if it is our only way to avoid being made worse-off. The principle so interpreted is quite plausible in cases of innocent threats or innocent shields: we are justified in killing an attacking rabid dog or deranged human if there is no alternative way to avoid being harmed. The right to life is *prima facie,* not absolute. This issue has been discussed in this journal before (Lehmann, 1988, 156–57; Pluhar, 1988, 212–13), so I will not belabor it further here, other than to point out that one need not subscribe to the liberty principle in order to believe that innocent threats and shields can sometimes justifiably, regretfully, be harmed. But now let us consider another example. Suppose you, near death from heart disease, have your healthy young neighbor imprisoned (in the most humane conditions possible, of course) for the purpose of obtaining her heart for yourself. In order to cause her as little distress as possible, you keep her sedated. Imagine thinking to yourself shortly before the slaughter: "With the utmost respect and sorrow, I must kill her for her heart. After all, without it I will be considerably worse off. I have no other options: experts assure me that a cadaver transplant would not work for me, and my body cannot tolerate an artificial heart. I know she is innocent and has a *prima facie* right to life, but I have the right to prevent myself from being made worse-off."

This situation is parallel to that of the human carnivore (assuming that there is such a being). Both the carnivore and the heart patient need part of the body of another in order to survive: an alternative that would not require the death of the other is not open to them. Each, in accordance with the liberty principle as we are now interpreting it, treats the innocent rights-holder as respectfully as possible. Yet, is it not obvious that one is not entitled to pluck the heart from another innocent being, a being who, by hypothesis, is just as morally significant as oneself, with an equal claim to life? If one does it anyway, one can hardly pretend to be following Regan's egalitarian rights view. The same considerations hold for the hypothetical human carnivore. According to Regan's basic view, the human and the pig the human allegedly needs to consume in order to sustain healthy life are equally inherently valuable: thus, they have rights to life that are equally difficult to override.[2] If we deny the moral justifiability of the heart transplant, we should do the same for the pork transplant. So construed, the liberty principle is far too broad: it is at odds with Regan's rights view.

At this point, Regan might reply that the principle is qualified by "assuming that no special considerations obtain," and object that my heart transplant scenario introduces such considerations. This vague phrase can be interpreted in such a way that my case could be dismissed. He provides the following example of such "special considerations":

> The "special considerations" proviso explains why I am not at liberty to take my neighbor's Mercedes just because not having it would make me worse-off relative to him. For since it is his car, he has a right, assuming the car was acquired justly, in

> addition to our mutual right not to be harmed, and the possession of this additional property right is a special consideration that limits my liberty (Regan, 1983, 331).

Regan's example allows us to reinterpret the liberty principle as follows:

> Provided that all those involved are treated with respect, and assuming that no prior rights in addition to the mutual right not to be harmed would be violated, any innocent individual has the right to act to avoid being made worse-off even if doing so harms other innocents.

On this second interpretation of the liberty principle, the neighbor-heart-transplant would not be permissible. If my car has just coughed its last and taking my neighbor's Mercedes would allow me to avoid being made worse-off, but it would be wrong for me to do so because I would be violating her property rights, surely I would be wrong to snatch her heart, even if I will cough *my* last without it. If she has a right to keep her Mercedes, she surely has a right to retain her organs. It seems that the liberty principle as reinterpreted yields a much more plausible result.

Indeed it does. But it also yields the result that a "human carnivore" would be wrong to kill a fellow subject-of-a-life for body parts, even if he needs them to survive. The pig's right to keep her loins to herself is as strong as a human's right to keep her heart where it has always been. Surely these rights cannot be weaker than a car-owner's right to her justly obtained Mercedes! Hence, on this interpretation, we are not at liberty to consume those who are on an equal moral footing with ourselves, regardless of our alleged need for their flesh.

Thus, the liberty principle under either interpretation cannot be used to show that Regan's rights view would permit killing and eating other animals for food. Either it is inconsistent with his egalitarian principles or it proscribes such actions. If humans and certain nonhuman animals are equally morally significant (have "equal inherent value") and thus have an equally strong *prima facie* right to life, human moral agents would be no more allowed to kill and eat these animals than they would be allowed to "harvest" the organs of their fellow humans.

There is only one way for a defender of nonhuman animal rights to justify the killing and eating of these animals. One must forgo Regan's egalitarianism. As I have argued elsewhere (Pluhar, 1988, 216), his "equal rights view" is not the only position that one could take. According to an "unequal rights view," morally considerable beings with richer experiential lives are more morally significant than those with less mental complexity. Thus a normal adult human and a pig would not be equally morally significant. They could nevertheless both have the right to respectful treatment as subjects-of-lives, and both could have a *prima facie* right to life. The pig, however, could have her right to life overridden more easily than the human. In particular, the human's right to life could trump the pig's.

Although Regan's basic assumption of equal inherent worth for all subjects-of-lives bars him from making this move, it is noteworthy that he actually does appeal to such a principle. He argues that if we humans needed animal flesh but chose to die rather than kill and eat the animal, we would foreclose "a greater variety

and number of opportunities for satisfaction than those within the range of farm animals" (Regan, 1983, 337), thus making ourselves "worse-off" in comparison to them. He claims to be invoking the liberty principle here, but he is really assuming that the lives in question are of unequal value. Although it sounds paradoxical to claim that death can make an individual "worse-off," it does make sense to say that death imposes a loss. A soldier going off on an extremely dangerous mission can sensibly say "I have (or don't have) a lot to lose if I fail." But if two individuals are killed, and each enjoyed living, they have each lost the same: everything. One is no more "worse-off" than the other. What difference does it make if one individual had fifteen interests in life and the other had eight? A concert pianist loses just as much as a concert pianist who is also a foreign language enthusiast. A pig who is killed also loses everything, suffers the ultimate harm, even if her chief interests in life were rooting, eating, and porcine companionship. She loses no less — is no more "worse-off" — than a human, for the simple reason that her life was just as satisfactory to her as the human's was to him. No, being "worse-off" is not the issue here: the basis for Regan's claim that the human's life should be preferred is his implicit assumption that a life open to fewer and less complex satisfactions than another is less inherently valuable than the latter.[3]

This assumption is not at all compatible with Regan's rights view, although it is in accord with many humans' virtually automatic assumption that their lives are more valuable than the lives of other animals. Those who are not already wedded to Regan's theoretical moral framework can quite consistently adopt the unequal rights view.[4] If it is the case that humans cannot survive without killing other animals for their flesh or products, the unequal rights view would justify their acting to survive. Thus, although George (and Regan himself!) are wrong about his rights view's implications for the obligatoriness of vegetarianism, she is correct in holding that a rights view could consistently accord rights to nonhuman animals while permitting humans to kill and eat them.

Unfortunately, however, the unequal rights view has implications that will not please many humans who take for granted that they are more morally significant than any nonhumans. If the basis for their claim of superiority is the greater number, variety, and complexity of their interests and desires, it will follow that humans with reduced mental capacities also have a lesser claim to life. George addresses this issue in her discussion of cannibalism. She concludes that humans who fall short of the norm would not become fodder for their (allegedly) meat-dependent "betters" because (1) their maximally morally significant relatives have a strong interest in their protection, and (2) the practice of consuming members of our own species would pose disease risks (George, 1990, 183). Regarding (1), those reduced-capacity humans who have never been held dear by anyone (and, sadly, there are many such cases) cannot rely on sentiment for protection. As for (2), even if humans could not learn how to properly "sterilize" human meat, and had to forgo "long pig burgers," the unequal rights view would still sanction the sacrifice of under-endowed humans for the benefit of normal adult humans. We might be able to replace them at the table with safer "unequal" meat, but their organs are far more likely to save our lives than the organs of other species. If 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 that the unequal rights view is correct. Those who cannot accept this implication, as I cannot, should reject that view.

Whether one accepts the unequal or the equal rights view, it is of the utmost importance to determine whether our survival and health depend upon the consumption of other sentient beings and their products. Are most of us tragically compelled to violate the rights of others in order to sustain ourselves? George believes that we are. In her view (the unequal rights view, as I have argued), raising and killing nonhuman animals for their flesh is morally permissible if and only if *not* doing so would make one seriously worse-off. To make her case against vegetarianism, she must show that an animal-free diet puts one at *serious* risk *in comparison to* an omnivorous diet. If a diet requires fortification or supplementation for some individuals in some circumstances, this fact in itself does not imply that the diet should not be followed. If that were so, *no* diet should be followed, as we shall soon see. Let us now turn to her case against vegetarianism.

2. Is Vegetarianism Incompatible with Human Health?

According to George, most of the world's population is in need of food from nonhuman animals. She singles out seven such groups: (1) infants and children; (2) pregnant and breast-feeding women; (3) older humans, especially women; (4) allergic and vitamin/mineral deficient humans; (5) poorly educated humans; (6) humans living in poverty or in impoverished surroundings; and (7) humans who are not genetically suited for vegetarianism (George, 1990, 175). In accordance with the unequal rights view, she believes that none of these humans can be morally obligated to forgo meat. Who, then, can be morally obligated to be a vegetarian?

> If you are an adult male, non-allergic, healthy, well-educated, middle or upper class individual or a young adult non-allergic, healthy, well-educated, middle or upper class female unable to bear children, then you may be reasonably assured by the scientific evidence on nutrition that you do not need to eat meat (George, 1990, 179).

If she is correct, only materially, physically, and educationally well-off males (and a handful of females) should regard vegetarianism as a live option. However, there is excellent reason to believe that she is not correct. All her nutritional claims have been successfully challenged, especially in recent years. I will briefly assemble the key points below in ways that cut across her seven categories.

2a. Calcium and Osteoporosis

George argues that women put themselves at serious risk for osteoporosis (dangerously thinning bones) in their later years if they do not consume good sources of dietary calcium. She believes that calcium supplements are not good sources, because they "may contain significant concentrations of lead and other heavy

metals;" e.g., dolomite and bone meal supplements (George, 1990, 177, 176). Although George does not say so here, she probably accepts the view that plant sources of calcium (dark green leafy vegetables, beans and peas, citrus fruits) are poorly absorbed by humans,[5] for she goes on to claim that women put themselves at risk if they do not consume dairy products, "the best source of calcium" (George, 1990, 177).

Clearly, George's target here is strict vegetarianism, not vegetarianism as such. Animal flesh does not provide adequate calcium. The lacto-vegetarian diet not only does not put one at risk for osteoporosis: several studies have shown that lacto-vegetarians actually have lower rates of osteoporosis than omnivores (*ADA Reports*, 1988, 354). But is it in fact the case, as George and many conservative nutritionists claim, that the woman who refuses to consume dairy products makes herself worse off by courting calcium deficiency? Given current animal husbandry practices in much of the world, the production of dairy products certainly makes many non-humans worse off, so it behooves us to examine this question carefully.

First of all, it is worthy of note that George's concerns about calcium supplements are directed at certain types of supplements, not at calcium supplements as such. Dolomite and bone meal are not the most commonly used supplements at all, as any visit to a pharmacy or health food store will show. Vegetarians, especially, are not likely to partake of bone meal to fortify their calcium level! Calcium carbonate supplements are, by contrast, readily available, free of lead or other questionable by-products, and easily absorbed. In recent years, women who cannot or who prefer not to consume substantial amounts of dairy products have often been advised by their physicians to take calcium carbonate supplements instead (Gott, 1990). Women have other, quite safe choices as well: supermarkets have calcium-fortified products on their shelves (e.g., orange and grapefruit juices) that allow one to satisfy the RDA cheaply, easily and effectively without taking any tablets. I hasten to add at this point, however, that while George seems incorrect in dismissing calcium supplements as such as risky, it is without doubt the case that only some women living on our planet have the opportunity to make use of them or calcium-fortified products. Moreover, as she would probably also point out, one must be educated enough to eschew the unsafe calcium supplements still on some pharmacy shelves. Still, those women with knowledge and opportunity would have the obligation, on the unequal rights view, to avail themselves of these options — *if* it is the case that an unsupplemented strict vegetarian diet cannot provide sufficient protection against osteoporosis.

Recent research does not suggest that this is the case. In 1984, the US National Institute of Health recommended that US women, who are of course overwhelmingly omnivorous, consume at least 1000 mg of calcium daily, in the form of dairy products (e.g., a quart of milk) or calcium supplements, in order to protect themselves against osteoporosis (*Science*, 1986, 519). However, according to Dr. Michael Parfitt, an osteoporosis expert, even at that time the recommendation was based on "at best tenuous evidence that the mineral might help" and the assumption that it probably would not harm women (*Science*, 1986, 519). Parfitt and a number of other osteoporosis experts challenge the recommendation as unnecessary and

potentially harmful. *Science* reports that their views are "consistent with a large body of evidence indicating no relationship between calcium intake and bone density within populations" of adults (*Science*, 1986, 519). According to the same report, numerous studies of populations where osteoporosis is a concern have found that those adults[6] who habitually consumed the largest amounts of calcium had no denser bones than those who consumed the least in that population (adjustments were made for body frame and ethnicity). For example, B. Lawrence Riggs, a well-published and frequently cited osteoporosis researcher at the Mayo Clinic, conducted a recent study on this issue that focussed on Minnesotan women. The 106 women were aged 23–84 years, and they were followed for a mean of 4.1 years. Even after adjustments were made for age and serum estrogen levels, it was clear that the women's spinal bone densities did not vary significantly with their consumption of dietary calcium. Riggs concluded that "These data do not support the hypothesis that insufficient dietary calcium is a major cause of bone loss in women" (Riggs et al., 1987, 979). J.C. Stevenson reached the same conclusion in 1988 after conducting a more limited study (Stevenson, 1988). Interestingly, Riggs continues to advise his patients to consume 1000 mg of calcium from dairy products daily, despite his research results, on the grounds that "the nutritional value in dairy products goes beyond calcium" (*Science*, 1986, 519–20).[7] However, a strict vegetarian diet can be just as nutritious, as we shall see. Moreover, unless Rigg's patients stick to skim milk or low-fat yogurt and avoid most cheese, they risk problems from high levels of saturated fat and cholesterol. Even then, some researchers warn that such high consumption puts one at risk for kidney stones (*Science*, 1986, 520). Dairy products are also implicated in the formation of cataracts (Simoons, 1982) and, more seriously yet, the incidence of the usually fatal disease of ovarian cancer (Cramer, 1989). It is far from clear that a diet containing dairy products is less risky than one that omits them.

Studies that compare different populations' dietary habits and their incidence of osteoporosis are also revealing. A large number of women live in cultures in which dairy products are seldom or never consumed. The latter group are genetically lactose-intolerant, unlike dairy-product-dependent humans in whom the capacity to digest milk has evolved (Wilson, 1985, 172). Thus, if George were correct, one would expect to find widespread calcium deficiencies and rampant osteoporosis, with attendant crippling, fractures, and premature death, in areas of the world where little or no dairy products or calcium supplements are consumed, and the opposite effect where there is abundant consumption of these products.

However, this is not what one finds at all. In general, osteoporosis in older women is most common in countries where dairy products are commonly consumed and the intake of animal protein in general is high. Calcium deficiencies as well as osteoporosis are rarer in countries where the reverse is true (Hegsted, 1986, 2316). For example, The Chinese take in only half the amount of calcium that Americans do, and none of it comes from dairy products. Their calcium all comes from plant sources, which allegedly provide the mineral in a much less bioavailable (absorbable) form. Nevertheless, osteoporosis is rare in China (Varkonyi, 1990). If dietary calcium is required for bone health, as it probably is for children and adolescents,

it appears that plant sources provide it in an amply bioavailable form, since these people consume much less of it than those living in areas where osteoporosis is common. Of course, other factors might be involved: small-framed women, especially those past menopause who exercise little, are more susceptible to the disease (Hegsted, 1986, 2317), as are heavy smokers. Being Caucasian also increases one's risk of getting osteoporosis (Hegsted, 1986, 2316). One might object, then, that the Chinese are perhaps genetically protected from the disease, unlike Caucasian women. They are also far more physically active than whites in countries where osteoporosis is common. However, they also have small frames and smoke heavily. Moreover, it should be pointed out that the Inuit, who are no more Caucasian than the Chinese, although they do have heavier bone frames, and are quite physically active, have one of the highest rates of osteoporosis in the world, as well as extremely high consumption rates of both animal protein and calcium (Mazess, 1974). In addition, Yugoslavian women, who are Caucasian but who consume considerably less dietary calcium than is consumed in the United States, have a much lower incidence of hip fractures than do their US counterparts (Hegsted, 1986, 2317).

This poses a puzzle for George (and all the physicians who tell women to drink an extra quart of milk a day to prevent or ameliorate osteoporosis). Why is osteoporosis in older women much more common in countries with high dairy consumption patterns than those without that pattern? More studies need to be done, but some conclusions seem warranted. Hegsted points out that the bodies of persons with high calcium diets are much less efficient in absorbing dietary calcium than lower calcium utilizers, even during periods of bone growth, pregnancy, and lactation (Hegsted, 1986, 2316–7). He notes that "This almost certainly explains why calcium deficiency is so rare throughout the world wherever calcium intakes are low by American standards" (Hegsted, 1986, 2316). A number of researchers have also found that those who consume 96 g or more of animal protein per day[8] excrete significant amounts of calcium, instead of retaining it in the body (Linkswiler, 1981; Hegsted, 1986, 2316; Zemel, 1988). As Zemel states, "Dietary protein exerts a significant calciuretic effect" (Zemel, 1988, 880). *Animal* protein appears to be the culprit here, since research subjects who followed a strict vegetarian diet did not exhibit the calciuretic effect, even when ingesting 90 g of protein daily (Zemel, 1988, 880). Zemel concluded that vegetarian diets, including strict ones, allow "increased retention of Ca" (Zemel, 1988, 883). Could a meat-centered diet[9] actually make one more susceptible to osteoporosis? Could the recommendation that meat-eaters add yet more animal protein to their diets in the form of dairy products actually *increase* one's chances of getting the disease? Hegsted fears so:

> Thus, if American women are being advised to increase their consumption of dairy products, they should probably also be advised to reduce their meat consumption proportionately. It seems unlikely that most Americans would find this acceptable . . . . It will be embarrassing enough if the current calcium hype is simply useless; it will be immeasurably worse if the recommendations are actually detrimental to health (Hegsted, 1986, 2316, 2318).

It must be pointed out here that George certainly does not advocate the consumption of large amounts of animal protein, although she does support liberal use of dairy products. She believes that for most people probably only a small amount of meat is needed for good health (George, 1990, 182). Research subjects consuming only 48 g of protein daily, even animal protein, did not exhibit the calciuretic effect. Those who had higher levels of animal protein in their diets (more typical for many Western countries) needed far more dietary calcium to maintain a calcium balance than the lower protein group (Zemel, 1988, 880).[10] Thus, animal protein *as such* is apparently not a cause of osteoporosis, although the typical western omnivorous diet may well be implicated. Nevertheless, George has not shown that a strict vegetarian diet puts one more at risk for osteoporosis than her version of a healthier omnivorous diet. Considering dairy products' troubling role in increased rates of heart disease, cataracts, and ovarian cancer, strict vegetarianism not only does not make one worse off in this regard: it may actually be an advantage.

2b. Iron

George quotes The Dairy Council Digest as saying that "Women on vegetarian diets, particularly during their child-bearing years, may have difficulties in obtaining adequate iron on a diet without meat or eggs" (George, 1990, 177). She fears that women and children, who need more iron than adult men, will suffer from vegetarian diets, because the most bioavailable form of iron is to be found in meat. Plant sources have been attacked by some nutritionists because of their high fiber content, on the ground that fiber prevents the body from absorbing essential nutrients. Many nutritionists have cautioned against vegetarian diets because of this, but current research does not support the view that vegetarians tend to be iron-deficient.

In 1983, Colin Campbell of Cornell University, with colleagues in China and England, began a multi-year study of the nutrient/mineral intake and the health of 6500 Chinese men and women, aged 35–64 (Roberts, 1988). These people ate three times the amount of fiber (found only in plants) that Americans consume, and ate very little meat (seven percent of their protein comes from animal sources, compared to 70% for Americans). But they were not deficient in iron! Their blood levels of this and other minerals were excellent. Campbell reported that "[h]emoglobin levels are positively correlated with fiber intake" (Roberts, 1988). Barbara Deskins, a registered dietician and an associate professor at the University of Pittsburgh, points out that Campbell's data show that those Chinese who had the highest fiber intakes (77 g daily as opposed to 11 g for the average American) actually had the best iron levels (Deskins, 1991, F 6). J.L. Kelsay et al. (1988) found the same result in their study comparing the iron levels of male and female vegetarians (including strict vegetarians) and nonvegetarians. They concluded that "[i]n general, the higher percentage of carbohydrate intake or the higher level of fiber intake did not appear to affect mineral utilization by the vegetarians" (Kelsay, 1988, 875).

Of course, vegetarians as well as omnivores may suffer from iron deficiency. Nevin Scrimshaw, who in 1949 founded the Institute of Nutrition in Central America and Panama, points out that iron deficiency remains a common world health problem, even in affluent countries (Scrimshaw, 1991). In Europe, Japan, and the US, 10–20% of women of childbearing age have the severe form of iron deficiency: anemia. Those in developing countries (although apparently not in China) are also subject to the disease: as many as 30% may be anemic (Scrimshaw, 1991, 46). Although Scrimshaw claims that "poor absorption from the predominantly vegetarian diets of most people in developing countries" is a cause of iron deficiency (Scrimshaw, 1991, 48), he adds that widespread loss of blood due to parasites, complications from malaria, and abnormal uterine bleeding are also major causes. As Scrimshaw's own estimates indicate, omnivorous women of childbearing age in industrial nations, who are not plagued by parasites, malaria, or (most of them) abnormal bleeding, are almost as subject to anemia. Scrimshaw's own work also shows that sufficient amounts of iron can be absorbed from average servings of plant sources. He provides a chart in his article that compares the amount of iron that can be absorbed from a typical serving of different sources of the mineral (Scrimshaw, 1991, 48). The data show that a portion of soybeans, although only 7% of the iron content can be absorbed, provides almost the same *amount* of absorbable iron per serving as a portion of ground beef (20% of the iron from red meat can be absorbed). Moreover, it provides far more absorbable iron than a portion of fish, and somewhat more than a portion of chicken. Scrimshaw's abbreviated chart does not include navy beans, great northern beans, lima beans, garbanzo beans, or lentils: all compare favorably to soybeans in terms of iron content (Robertson, 1976, 505 and 547–8). Scrimshaw's chart shows that corn flour, or black beans, provide the same iron to the body as fish, and two portions of either supply the same iron to the consumer as a serving of chicken, without chicken's saturated fat or cholesterol. Scrimshaw does not include egg yolks in his chart, but they are known to provide only half the absorbable iron (and three times the cholesterol) that one can get from a serving of chicken (Carper, 1985, 123, 233). The most impressive sources of absorbable iron are livers and kidneys, followed by beef. However, advising persons to make organ meats or beef a frequent part of their diets in order to avoid iron deficiency,[11] as in fact many western physicians do, opens them to greater risks of heart disease, stroke, colon cancer, hardened arteries, etc. (Of course, these meats are excellent protein sources, but so are grains and legumes.) George concedes that vegetarians are at lower risk of getting these diseases. When one considers that the already impressive amount of absorbable iron one can obtain from plant sources can be doubled or even quadrupled if one consumes 25 mg or more of vitamin C (Dwyer, 1991, 64),[12] it is clear that a strict vegetarian diet does not make one worse off than an omnivorous diet.

Individuals who require extra iron at times in their lives, such as pregnant or breast-feeding women and children, might need to include some iron supplements in their diets. *This holds for omnivores too!* Iron supplements are "commonly prescribed," in the words of *New York Times* nutrition writer Jane Brody, for infants and young children, and "routinely recommended" for pregnant and lactating

women (Brody, 1982, 194, 336, 355). The American Dietetic Association makes this point explicitly in its 1988 review of vegetarianism (*ADA Reports*, 1988, 354). This is often forgotten in discussions of the alleged vulnerability of vegetarian women and children to iron deficiency. Consider, for example, the women and children of "The Farm," a primarily vegan commune in Summertown, Tennessee. Very early in the commune's existence, before they had become self-sufficient, Farm members were visited by a team of Public Health experts. The team arrived in December 1971, fully expecting to find iron, protein, and vitamin B_{12} deficiencies in this colony of "radical" vegetarians (Carter, 1987, 693). No protein deficiencies were documented in the 28 pregnant or lactating women or the 44 children, but the team did find some B_{12} deficiencies (this is the one vitamin that strict vegetarians might miss in their diets, as I discuss below) and some iron deficiencies. A close look at what was actually found regarding iron deficiency is illuminating. The women were supplementing their diets, as pregnant and lactating omnivorous women are also advised to do, but the researchers said their "low hematocrit values" called for further supplementation. In fact, however, *none* of the women was anemic, and their mean hematocrit values were within the *normal range* (Carter, 1987, 694).[13] Further, the article claims that "iron deficiency anemia was common among the children," who had apparently not been receiving supplements (unlike many omnivorous children), but the data show that only *8%* of the children were anemic. Omnivorous children are also often anemic, as Scrimshaw found.[14] The team returned ten months later to retest The Farm women and children. It is interesting to note that after almost a year of increased supplementation for the women, their hematocrit values actually *declined* slightly instead of improving (Carter, 1987, 694)! Increased supplementation, as I am sure George would agree, it not always the solution. In any case, no further problems of iron (or other) deficiency[15] have been documented at The Farm, where pregnant and lactating women and young children continue to modestly supplement their diets — just as their omnivorous counterparts are advised to do. Nothing in the data suggests that these individuals put themselves at serious risk of being worse off by continuing to be vegans. On the contrary, Carter's study shows that pregnant Farm women (who had been vegan for an average of six years before becoming pregnant) are significantly less prone to pregnancy-induced high blood pressure than omnivorous women.[16] Would this still have been the case if they had chosen to bring up their already normal-range iron levels by eating beef, liver, and egg yolks?

2c. Absorption of other Vitamins and Minerals

George fears multiple deficiencies will afflict many vegetarians, especially strict vegetarians. She warns against reliance on a large array of supplements to correct these alleged deficiencies because of interactions and (in some cases) questionable compounds (George, 1990, 176–177).[17] Some earlier studies did indeed warn of vitamin and mineral deficiencies. Vegetarians on Zen macrobiotic diets in the early 1970s subsisted largely on brown rice, hardly a balanced vegan diet. As Dwyer points out, "Malnutrition due to poor dietary planning or secondary to disease is

largely avoidable or preventable, and is not a necessary concomitant of vegetarian diets" Dwyer, 1991, 73). Apart from the easily solvable problem of vitamin B_{12} (discussed below), current research indicates that vegetarians are not at serious risk of vitamin and mineral deficiencies compared to omnivores. For example, a 1989 French study compared male and female omnivores to lacto-vegetarians and vegans. They concluded that the vegetarians, including the strict vegetarians, were not deficient: they actually absorbed the minerals and vitamins from their food better than the omnivores did (Millet, 1989).

In the French study, unlike in many earlier studies, blood and urine samples were taken in addition to food samples. Earlier studies warning of deficiencies relied primarily on dietary assessment, along the lines conservative nutritionists advocated, instead of examining the vegetarians themselves (Millet, 1989, 718). Naturally, nutritionists who assumed that high fiber diets had to be mineral and vitamin deficient "found" deficiencies in those diets! It is simply not the case that vegetarians cannot be healthy, or that they must rely on a plethora of supplements, watching ever vigilantly for bad reactions, in order to be healthy.[18] The American Dietetic Association's review of current literature on the nutritional status of vegetarians has led it to conclude that "vegetarian diets are healthful and nutritionally adequate when appropriately planned" (American Dietetic Association, 1988, 351). This includes strict vegetarian diets.

Nonetheless, there is one vitamin deficiency that strict vegetarians are more susceptible to than lacto-vegetarians or omnivores: B_{12} deficiency. The body needs very little B_{12}, and stores it very efficiently. This fact notwithstanding, strict vegetarians in affluent countries who do not use supplements or consume fortified products will develop a deficiency in about twenty years (Herbert, 1988, 856). This could lead to pernicious anemia. The problem is that B_{12}, which is made by bacteria, is not naturally found in plant sources although it is readily available in dairy products and meat. (Strict vegetarians in developing countries are, by contrast, able to get B_{12} from plant sources, because less hygienic conditions result in contamination by the desired bacteria (Herbert, 1988, 854).

This is hardly a disaster, since all the strict vegetarian need do is take an occasional B_{12} supplement (in the form of cobalamin) or consume foods fortified with the vitamin, as soy "milks" and many breakfast cereals commonly are. Thus, strict vegetarians in industrial countries can easily avoid being made worse off in this regard, just as dark-skinned omnivores in northern climates can avoid being vitamin D-deficient by drinking fortified milk. No one claims that the omnivore diet is unacceptable on that account; thus, no such claim should be made about a strict vegetarian diet.

2d. General Nutritional Needs during Pregnancy

We have already addressed the issue of iron. Do women and fetuses have other special needs during pregnancy that a vegetarian or strict vegetarian diet cannot supply? George thinks so, as do many conservative nutritionists. However, in its recent review of the literature on this issue, the American Dietetic Association

concluded that this is not the case (American Dietetic Association, 1988, 354). In fact, as we saw, pregnant vegans are at an advantage: they are much less prone to "preeclampsia," or pregnancy-induced high-blood pressure (Carter, 1987). Nutritionists have also worried that pregnant vegan women might not be able to gain enough weight to sustain healthy pregnancies, but this has not been a problem at The Farm (Carter, 1987, 695). The authors of this study closed it by saying that "The foregone conclusion that a vegan diet during pregnancy is or even could be harmful seems unwarranted" (Carter, 1987, 696–7). Of course, pregnant vegans should take care to eat a balanced diet of grains, legumes, vegetables, and a product fortified with B_{12}. Neither they nor their fetuses will be healthy on a diet restricted to brown rice and water. The same holds for omnivores addicted to pork rinds and Big Macs.

2e. Infants and Children

But what happens once the children are born? George is convinced that they (and their lactating mothers) will suffer from a vegetarian diet:

> Because vegetarian diets pose a significant health risk to infants and children, parents are probably under an obligation to include some meat and animal products in the diet of their children (George, 1990, 176).

Some studies of vegans on inadequate macrobiotic diets have shown problems for adults as well as children. This has not been found in studies of vegans who follow balanced diets (Sanders, 1977, O'Connell, 1989). The American Dietetic Association has concluded that infants and children, as well as pregnant and lactating women, are not at risk if they follow "a well-planned vegetarian diet" (American Dietetic Association, 1988, 354). Nor is adequate growth a problem, as we shall now see.

The most extensive research on this issue was done by the US Center for Disease Control, which followed children born on the aforementioned "Farm" over a period of ten years (O'Connell, 1989). The height and weight of 288 vegan children were monitored for a decade, then compared with norms for omnivorous children. They found that the children had normal birth weights and were healthy, but at first grew somewhat more slowly than children in the comparison group. However, they rapidly caught up, and in their tenth year were on the average only 0.7 cm shorter and 1.1 kg lighter than the reference group (O'Connell, 1989, 480). These differences are statistically insignificant. The researchers speculated that the early slower growth may well have been due to the fact that Farm children are breast-fed for a relatively long period of time, solid food not being introduced until they are six months old. Such infants may well be slower to grow than those who are weaned earlier (this holds for omnivorous infants too). It is also possible, although no protein deficiencies have been documented for Farm children, that the weaning foods in the early days of The Farm's existence were not sufficiently calorific.[19] However, the US Centre for Disease Control believes that "perhaps the

most important possible explanation" for the early differences in height between vegan children and the omnivorous reference group is "intrinsic irregularities" in that reference group. These irregularities, once resolved, would show a lesser difference in growth patterns (O'Connell, 1989, 480). The researchers concluded that:

> According to the results of this study, with attention to weaning foods and nutrient intake, a group of children raised with a relatively strict vegetarian diet can achieve adequate growth (O'Connell, 1989, 480).

Clearly, parents of vegan children must be careful to provide their children with enough calories and a balanced diet. At The Farm, an extremely poor but now self-sufficient community, they have succeeded in doing this (e.g., they manufacture their own B_{12}-fortified soy milk). Omnivorous parents have the same obligation to provide adequate diets for their children. They seem to be succeeding rather less well than vegan parents on The Farm, at least in the United States. The American Heart Association, the American Academy of Pediatrics, and the American Medical Association have joined the National Heart, Lung, and Blood Institute in warning parents that their children are at risk from too much saturated fat in their diets, leading to elevated cholesterol readings (Toufexis, April 22, 1991).[20] US children have high cholesterol levels, especially compared to children in countries where much less meat is eaten, and a relatively high percentage of them are obese. Even children as young as two or three have fat deposits in their arteries.[21] George has far more cause to castigate these omnivorous parents for failing to meet their obligations to their children than she has to accuse vegetarians of child abuse (George, 1990, 176).[22]

2f. Nutritional Needs for the Elderly and Ill

George holds that only healthy young adults (preferably male) in affluent countries could have an obligation to be vegetarian. Once again, current research does not support this contention. We have already seen that meat and dairy consumption is not the solution to the osteoporosis problem afflicting so many elderly women (and some men). The belief that high fiber, all-plant diets cause vitamin and mineral deficiencies has also been shown to be unwarranted (with the exception of eventual B_{12} deficiency, a problem easy for the strict vegetarian to solve). The American Dietetic Association has advised that those with "special needs" can get proper nutrition on strict vegetarian diets (American Dietetic Association, 1988, 354).

Ironically, many people are actually harmed by the belief that they must eat meat. Elderly people on restricted incomes would probably not eat dog or cat food if they realized that they could get cheap, delicious, high quality nutrition from plant sources. Nor would they die quite so prematurely from heart attacks, stroke, and cancer. Moreover, although George claims that only the healthy dare consider vegetarianism, there is quite a lot of evidence indicating that typical omnivores in developed countries can improve their health by turning to a vegetarian diet.

Those who are ill with angina and other cardiac disease, rheumatoid arthritis, kidney stones, diverticulosis, gall bladder disease, peptic ulcer, diabetes, asthma, and high blood pressure have all been shown to benefit by making the switch (Ellis and Sanders, 1977; Coe, 1979; Lucas and Power, 1981; Rouse 1983; Lindahl, 1985; Science News 1989). Even patients with AIDS-caused Kaposi's sarcoma have improved their conditions by switching to a strict vegetarian diet, in comparison to those who do not (Levy, 1985). (Of course, no one could responsibly claim that such a diet would cure a terminal disease.) In short, the evidence not only does not support George's claim that the ill or elderly need animal flesh and products in their diets; it suggests that they may be better off without them. We are given no evidence to show that they would be significantly better off still with the moderate omnivorous diet George recommends.

2g. Nutritional Needs of the Poor or Less Educated

George believes that one should be at least middle-class in order to safely contemplate vegetarianism. Presumably, her assumption that vegetarians need a large array of supplements and constant medical supervision plays a role in her claim here. As we have seen, that assumption is not justified. Those who are far too poor to buy fillet mignon and the like could only benefit from a cheaper, less hazardous source of nutrients. Grains, legumes, nuts, seeds, and fruits are enjoyed by impoverished people all over the world. The hundreds of vegans living on The Farm in Summertown, Tennessee, live below the poverty line, but they are neither hungry nor unhealthy. It must be pointed out, though, that these obviously idealistic people are quite highly educated (O'Connell, 1989, 476), and do get frequent medical checks from curious researchers.[23]

In view of this, George would probably reply that while some educated poor people could perhaps reasonably accept an obligation to be vegetarian, most poor people are not blessed with abundant nutritional knowledge. She holds that the "under-educated," who are often also the poor, can have no obligation to be vegetarian, because they cannot change their diets without risking their health. The real issue here, though, is what obligations those who do have the knowlege have to those who do not. What of the fact that the typical omnivorous diet of even affluent Americans imposes serious health risks upon them, as many studies, including the studies on high cholesterol levels in children, indicate? The situation is worse yet for the poor. Many poor people in America spend money on hamburgers, lard, and other nutritionally questionable food, which leads to the common combination of malnourishment and obesity (Gorman, 1991, 52). It is hardly surprising to find that they are disproportionately subject to high blood pressure, cardiac disease, a high rate of infant deaths (due in considerable part to malnourished mothers), and ill health in children caused by poor diet (*Pittsburgh Press*, 1989). Where is the evidence that they would be *worse off* if they chose to adopt a vegetarian diet? What reason can there be for saying that such a diet should not even be advocated?

Undeniably, strict vegetarians should eat a balanced diet of grains, legumes, other vegetables, and fruit, and fortify their diets occasionally with B_{12}. This calls for some education. But surely George cannot want us not to advocate a diet for certain individuals because it would require us to inform them about it. After all, such a rule would require us to reject her own view! Committed as she is to the contention that nonhuman animals have rights (although she clearly does not believe that their rights are equal to those of humans), she holds that meat and dairy products should be eaten only if they are required for human health, and then never to excess:

> Those not required to be vegetarian, however, are not permitted to eat as much meat and animal products as they wish. Rather, they are permitted to eat only enough to ensure adequate nutrition and health, with a reasonable margin for safety (George, 1990, 178).

Those who are not "required" to become vegetarians, in her own view, include the poor and under-educated. They too, then, are "not permitted" morally to eat more animal flesh than health demands, and we are not permitted to continue keeping them in the dark about it. Therefore, the need to educate people about nutrition cannot be an insuperable barrier in the voluntary adoption of a new diet. (No one suggests that vegetarianism be shoved down anyone's throat.) Education, as we have seen, reveals that strict vegetarians do *not* put themselves at serious risk of being worse off compared to omnivores. As researchers have found, "[i]t should be recognized that both vegetarian and nonvegetarian diets have the potential to be either beneficial or detrimental to health" (*ADA Reports*, 1988, 351). The fact that omnivorous diets can be healthful does not imply that vegetarian diets are unsafe. Even conservative organizations like the ADA and conservative nutritionists like Dwyer agree that strict vegetarian diets (including diets for women, children, and the elderly) are safe and even beneficial when well-planned (*Ada Reports*, 1988; Dwyer, 1991, 82–83; 86). The view that nonhumans have a moral right to life that should be overridden only when one's life or health depends upon it requires moral agents to act accordingly, whenever possible. This includes educating ourselves and others.

This is not such a difficult task. People in less-developed countries have known for centuries how to combine plant foods into balanced diets. Those who do not have or who have been cut off from traditions like these, e.g., many in the United States, can easily be reached. One can start in primary school, following up in a more sophisticated way as children grow older, as well as emphasizing the general message in media public service announcements. We know such methods are highly effective: witness the "Four Basic Foods Groups" (meat, dairy products, bread and cereal, fruits and vegetables) message that has been drummed into so many of us from our first days in school. No wonder so many people think they must eat meat and dairy products.

In the US, not coincidentally, the "basic food groups" are promoted and packaged by the Department of Agriculture, which has more than a passing interest

in what foods people buy. Any suggestion that the dietary guidelines should be changed or educationally "marketed" differently meets fierce resistance if it de-emphasizes animal food sources. Recently, the US government's own nutritional experts, always a very conservative group, suggested that meat and dairy products should be used more sparingly, and recommended that the "Four Food Groups" be represented by a pyramid (meat, milk products, and fats/sweets are on the small end of the pyramid) (Toutfexis, July 15, 1991, 57). Government scientists also recommended a stricter definition for "low fat" than the one favored by the Department of Agriculture. Apparently, there is considerable respect for the impact of "education," because the uproar in the US meat production industry on both counts was tremendous. As a result, the food pyramid scheme was put on hold by the Department of Agriculture, and the new "low fat" definition has yet to be adopted. (Gary Wilson of the National Cattlemen's Association objects that "you won't have any meat items being able to meet the criteria" (Toufexis, July 15, 1991, 58). How true.) The educational methods that have spread the meat and dairy products message throughout the land can be used just as effectively to impart correct nutritional information.

This is precisely what a number of scientific researchers want to do. Recently, Colin Campbell, the Cornell researcher conducting "The China Health Project," has joined the Physicians' Committee for Responsible Medicine in suggesting that it is time to promote "The New Four Food Groups": whole grains, vegetables, legumes, and fruit (PCRM, 1991). Meat and dairy products are conspicuously absent from their list. Education is really not the problem here: political considerations are. Given the scientific evidence, those committed to the health of humans and the moral standing of nonhuman animals have a moral obligation to replace propaganda with information.

We should also not underestimate the force of education about the conditions that lead to the dead animal on the dinner table. In the author's experience, most people are shocked and revolted when they learn what those conditions are. It is possible for a public to become sufficiently incensed to force changes. In the space of a few years, major cosmetics companies have been increasingly obliged to eliminate or at least sharply reduce testing on sentient nonhumans, because ordinary humans are sickened by the gratuitous death and suffering caused. Outraged people have chosen to forgo the infliction of suffering involved in many food enterprises as well: veal crates have been banned in Britain, chicken factory farming has been rejected in a number of areas in Europe, and an entire country (Sweden) has decided to phase out factory farming in general (Singer, 1990, 245). Popular movements, not bureaucratic decisions, have led to these results. When people learn that the confinement and slaughter of sentient nonhumans is not in general required for human health, a number will take the further step of adopting vegetarianism. This is already happening.

2h. Which Humans Would Risk Health on a Vegetarian Diet?

From all that I have said, it does not follow that every human can, without risk, adopt a strict vegetarian diet. George is correct in noting that, in some parts of

the world, an adequate supply of nutritionally rich plant-based food is not available (George, 1990, 178).[24] In those areas, if meat or milk products are available (although often they are not), humans must consume them to survive. This assumes, of course, that no alternative course of action (e.g., food assistance, voluntary birth control) is possible. *Whatever measures we would take before killing and eating "lesser" humans we should take in regard to nonhumans*, if they also have moral rights, as George does not deny. Even the unequal rights view requires that much of us.

Moreover, it is conceivable that, as George claims, some individuals might be so allergic to grains or legumes that they would be unable to obtain complete protein on a strict vegetarian diet. I am not sure that any such people exist, although George claims that they are "a significant number of individuals" (George, 1990, 178). One would have to be allergic to every combination of plant foods yielding the amino acid profile necessary for the protein humans need. Many people are allergic to some grains (e.g., wheat) and some legumes (the author of this article cannot manage peanuts), but are there really cases of such global allergies? The most common food allergy is to milk products, not to plants. Even if someone were allergic to every grain, she or he could get ample calories and usable protein from soybean products, since soybeans have an amino acid profile only slightly less favorable than meat (Lappe, 1982, Chapter Three). Are there individuals who are allergic to all grains and to soybeans? George cites no cases for us.[25] However, it is possible that such humans exist. The *unequal* rights view would permit them to consume animal protein, provided that they do it in a maximally humane, respectful way.

In conclusion, morality and human health are in general not at tragic odds. If sentient nonhuman animals do indeed have a *prima facie* right to life, a large number of humans are in a position to recognize and honor such a right. Research on nutrition does not support George's contention that most of the world's population must eat animals and their products to be healthy. Honoring that right could in fact bring many benefits to humans, nonhumans, and the environment.[26] We are fortunate indeed when prudence and morality go hand in hand.[27]

Notes

1. Peter Singer has taken this course. He argues that: "But while one cannot with any confidence say that these creatures do feel pain, so one can equally have little confidence in saying that they do not feel pain . . . Since it is so easy to avoid eating them, I now think it better to do so" (1990, 174). The neurological evidence suggesting that they do *not* feel pain is actually quite a bit better than evidence to the contrary, as Singer's own discussion of the topic reveals.
2. The reader might be tempted to think we can resolve this problem in favor of the innocent human, but not the pig, on the grounds that the human's greater intelligence and self-conscious awareness of death outweigh the need of her would-be killer, whereas the pig cannot suffer the same degree of dreadful anticipation. The temptation to take this way out should be resisted. Of course, the human as well as the pig can be sedated, but even apart from this fact, such a move would be incompatible with Regan's "equal inherent value" position. On Regan's view, the *degree* to which one is intelligent or self-conscious

is utterly irrelevant to one's moral status; he explicitly rejects the view to the contrary, which he calls "perfectionism" (Regan, 1983, 240–1). As we shall soon see, however, he sometimes contradicts this egalitarian pillar of his moral system.

3. I have argued this at greater length in my "When Is It Morally Acceptable to Kill Animals," *op. cit.*, pp. 215–16. Regan uses the same reasoning in his discussion of "lifeboat" cases in which either a human or a dog must die. There he appeals to what he calls "the worse-off principle" to conclude that the dog should be thrown overboard (Regan, 1983, 308–351). For different interpretations of Regan's appeal to this principle, see Lehman's "The Moral Acceptability of Killing Animals," *op. cit.*, and my response in the article above.
4. Of course, they could also simply deny that nonhumans have any rights or claims to respectful treatment at all. No "meat eaters dilemma" would then ever arise. They would find it, however, very difficult to show that their view is justified rather than simply biased. This is the challenge that Singer, Regan, and Rollin, followed by many others, have posed to traditional human-centered ethical views. George's defense of meat-eating is far more subtle than the standard homocentric response, presupposing as it does the nonhuman animal rights framework. Lehman's article (Lehman, 1988) provides a more general defense of the human killing and use of animals: he too tries to use Regan against Regan.
5. Many nutritionists have believed that fiber, phytic acid, and oxalic acid in plants inhibit calcium absorption. Some labratory studies support this, but actual human vegetarians do not seem to suffer from poor calcium absorption. The American Dietetic Association, hardly a radical group, points out that "this effect may not be significant," since "calcium deficiency in vegetarians is rare" (*ADA Reports*, 1988: 354).
6. The researchers are careful to say that their studies and conclusions apply only to adults (*Science*, 1986, 520). Children and adolescents appear to need dietary calcium to build bone density. However, as we shall see, young people in countries where few or no dairy products are consumed appear to get sufficient dietary calcium from plant sources. Older adults in those same countries are also less susceptible to osteoporosis than adults who have grown up in cultures where dairy products are commonly consumed.
7. He also advises them to take estrogen replacement therapy if they are past menopause (*Science*, 1986, 520). Many researchers agree that this is the best thing one can do to prevent or slow osteoporosis. As we shall see, however, women in some other parts of the world who have no such opportunity rarely get the disease.
8. Note that this is not an artificially high protein count: persons in the United States and New Zealand, for example, consume well over 100 g of protein daily on the average (Hegsted, 1986, 2318). Perhaps not coincidentally, the rate of osteoporosis in these two countries is very high.
9. The phosphorus in meat helps to counteract the loss of calcium, but the increased absorption ability it facilitates is "small" albeit significant (Zemel, 1988, 882). One still loses more calcium than one gains at high protein levels, unlike the strict vegetarians. Lacto-vegetarians also rarely suffer osteoporosis, as noted above: perhaps their lower levels of total animal protein consumption compared to typical omnivores protects them.
10. This helps to explain why so many researchers have found that adult women who eat the most amount of dietary calcium in countries where overall meat consumption and dairy product consumption are relatively high have no denser bones than those in the same population who eat the least amount of dietary calcium.
11. Scrimshaw offers no such advice. Instead, he urges UNICEF and the WHO to commit resources to fighting parasitic infestations and malaria. He also suggests that fortification of staple foods might be helpful (52).
12. Cooking in iron pots, as the Chinese do, may also boost absorbable iron significantly.
13. The mean for pregnant women was 35.5; lactating women had a mean of 39.2. The normal range for women is 38 plus *or minus* 7 (Henry Clay Frick Community Hospital

laboratory figures).

14. I was diagnosed with anemia as a child, despite the frequent consumption of large portions of beef and beef liver as well as eggs. After several years without animal flesh or eggs in my diet, and no supplementation, my hematocrit values are entirely normal. There is no reason to think that this case is unusual.
15. Pregnant women at The Farm also take calcium supplements, although no calcium deficiency has been documented at the commune (Carter, 1987, 695). The research on calcium discussed above indicates that this may well be unnecessary, although apparently it is not harmful.
16. They may even be better off with regard to iron. The ADA notes that "With both vegetarian and nonvegetarian diets, iron and folate supplements are usually necessary during pregnancy, although vegetarians frequently have greater intakes of those nutrients than do nonvegetarians" (*ADA Reports*, 1988: 354).
17. Her warnings are misplaced with regard to the most commonly used calcium supplements, as we saw above. Otherwise, her warnings here are well-taken.
18. This is compatible with the fact that pregnant or lactating women and very young children may benefit from modest iron and vitamin D supplementation or fortification. As the American Dietetic Association points out, this is true for both vegetarians *and nonvegetarians* (*ADA Reports*, 1988, 354).
19. If such a problem existed, it was not documented by any medical advisors. Carter in his separate study, which includes conditions on The Farm from 1971 to 1987, notes that protein intake for Farm children is sufficient to sustain growth (Carter, 1987, 695).
20. Animal flesh and animal products are the only sources of dietary cholesterol, and the major sources of saturated fat. The only plant sources of saturated fat are tropical oils like palm oil and coconut oil. Public eduction about the latter danger has led to the dropping of such oils as ingredients from most fast foods and many supermarket products.
21. Some critics charge that the concern is exaggerated, because high cholesterol levels in childhood do not necessarily translate into high levels for adults: a twelve-year study recently published shows that 30% of boys and 57% of girls with high levels as children had normal levels as adults (Toufexis, 1991). This still leaves 60% of the boys and 43% of the girls at significant risk of getting heart disease. In view of this the recommendation of the American Heart Association, et al., does not seem to be in the least alarmist.
22. Since George herself holds that unhealthy amounts of animal flesh and animal products should not be consumed, I think that she would agree with the need for low-fat diets, especially for those who are not able to make their own informed dietary choices. The point here is that her severe criticism of vegetarian parents is one-sided as well as unwarranted.
23. Remember, however, that the medical attention they receive does not reveal any need for high-tech intervention. They got good advice about the need for B_{12} supplementation and iron supplements for children under six from the initial team of medical advisors in 1971, but subsequent checks have repeatedly confirmed the health of the community. These people are no "frailer" than omnivores (in fact, their pregnant women are healthier, as Carter found). There is no reason to think that vegetarians need *more* medical attention than meat-eaters.
24. Hugh Lehman made the same point in his earlier article (Lehman, 1988, 159).
25. We are also given no actual cases of humans who are, in George's view, genetically unsuited to be vegetarians (George, 1990, 1975).
26. As George herself quite correctly points out, the nonhuman animal food production industry is responsible for considerable ecological damage (George, 1990), 178–79). I have chosen not to focus on that set of ills here (ills that would be lessened on her own "moderate omnivore" view), but we should all be aware of them. See my "When Is It Morally Acceptable to Kill Animals?," 220–21. See also the latest "Worldwatch" report, "Taking Stock: Animal Farming and the Environment" (Durning and Brough, 1991).

27. I wish to thank an anonymous referee for useful comments on my manuscript.

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