Cows, Pigs, Wars, and Witches
The Riddles of Culture
by Marvin Harris

One of America's leading anthropologists offers solutions to the perplexing question of why people behave the way they do.
WHENEVER I get into discussions about the influence of practical and mundane factors on lifestyles, someone is sure to say, “But what about all those cows the hungry peasants in India refuse to eat?” The picture of a ragged farmer starving to death alongside a big fat cow conveys a reassuring sense of mystery to Western observers. In countless learned and popular allusions, it confirms our deepest conviction about how people with inscrutable Oriental minds ought to act. It is comforting to know-somewhat like “there will always be an England”—that in India spiritual values are more precious than life itself. And at the same time it makes us feel sad. How can we ever hope to understand people so different from ourselves? Westerners find the idea that there might be a practical explanation for Hindu love of cow more upsetting than Hindus do. The sacred cow—how else can I say it?—is one of our favorite sacred cows. Hindus venerate cows because cows are the symbol of everything that is alive. As Mary is to Christians the mother of God, the cow to Hindus is the mother of life. So there is no greater sacrilege for a Hindu than killing a cow. Even the taking of human life lacks the symbolic meaning, the unutterable defilement, that is evoked by cow slaughter.

According to many experts, cow worship is the number one cause of India’s hunger and poverty. Some Western-trained agronomists say that the taboo against cow slaughter is keeping one hundred million “useless” animals alive. They claim that cow worship lowers the efficiency of agriculture because the useless animals contribute neither milk nor meat while competing for croplands and foodstuff with useful animals and hungry human beings. A study sponsored by the Ford Foundation in 1959 concluded that possibly half of India’s cattle could be regarded as surplus in relation to feed supply. And an economist from the University of Pennsylvania stated in 1971 that India has thirty million unproductive cows.

It does seem that there are enormous numbers of surplus, useless, and uneconomic animals, and that this situation is a direct result of irrational Hindu doctrines. Tourists on their way through Delhi, Calcutta, Madras, Bombay, and other Indian cities are astonished at the liberties enjoyed by stray cattle. The animals wander through the streets, browse off the stalls in the market place, break into private gardens, defecate all over the sidewalks, and snarl traffic by pausing to chew their cuds in the middle of busy intersections. In the countryside, the cattle congregate on the shoulders of every highway and spend much of their time taking leisurely walks down the railroad tracks.

Love of cow affects life in many ways. Government agencies maintain old age homes for cows at which owners may board their dry and decrepit animals free of charge. In Madras, the police round up stray cattle that have fallen ill and nurse them back to health by letting them graze on small fields adjacent to the station house. Farmers regard their cows as members of the family, adorn them with garlands and tassels, pray for them when they get sick, and call in their neighbors and a priest to celebrate the birth of a new calf. Throughout India, Hindus hang on their walls calendars that portray beautiful, bejeweled young women who have the bodies of big fat white cows. Milk is shown jetting out of each teat of these half-woman, half-zebu goddesses.

Starting with their beautiful human faces, cow pinups bear little resemblance to the typical cow one sees in the flesh. For most of the year their bones are their most prominent feature. Far from having milk gushing from every teat, the gaunt beasts barely manage to nurse a single calf to maturity. The average yield of whole milk from the typical humpbacked breed of zebu cow in India amounts to less than 500 pounds a year. Ordinary American dairy cattle produce over 5,000 pounds, while for champion milkers, 20,000 pounds is not unusual.
But this comparison doesn’t tell the whole story. In any given year about half of India’s zebu cows give no milk at all—not a drop.

To make matters worse, love of cow does not stimulate love of man. Since Moslems spurn pork but eat beef, many Hindus consider them to be cow killers. Before the partition of the Indian subcontinent into India and Pakistan, bloody communal riots aimed at preventing the Moslems from killing cows became annual occurrences. Memories of old cow riots—as, for example, the one in Bihar in 1917 when thirty people died and 170 Moslem villages were looted down to the last doorpost—continue to embitter relations between India and Pakistan.

Although he deplored the rioting, Mohandas K. Gandhi was an ardent advocate of cow love and wanted a total ban on cow slaughter. When the Indian constitution was drawn up, it included a bill of rights for cows which stopped just short of outlawing every form of cow killing. Some states have since banned cow slaughter altogether, but others still permit exceptions. The cow question remains a major cause of rioting and disorders, not only between Hindus and the remnants of the Moslem community, but between the ruling Congress Party and extremist Hindu factions of cow lovers. On November 7, 1966, a mob of 120,000 people, led by a band of chanting, naked holy men draped with garlands of marigolds and smeared with white cow-dung ash, demonstrated against cow slaughter in front of the Indian House of Parliament. Eight persons were killed and forty-eight injured during the ensuing riot. This was followed by a nationwide wave of fasts among holy men, led by Muni Shustril Kumar, president of the All-Party Cow Protection Campaign Committee.

To Western observers familiar with modern industrial techniques of agriculture and stock raising, cow love seems senseless, even suicidal. The efficiency expert yearns to get his hands on all those useless animals and ship them off to a proper fate. And yet one finds certain inconsistencies in the condemnation of cow love. When I began to wonder if there might be a practical explanation for the sacred cow, I came across an intriguing government report. It said that India had too many cows but too few oxen. With so many cows around, how could there be a shortage of oxen? Oxen and male water buffalo are the principal source of traction for plowing India’s fields. For each farm of ten acres or less, one pair of oxen or water buffalo is considered adequate. A little arithmetic shows that as far as plowing is concerned, there is indeed a shortage rather than a surplus of animals. India has 60 million farms, but only 80 million traction animals. If each farm had its quota of two oxen or two water buffalo, there ought to be 120 million traction animals—that is, 40 million more than are actually available.

The shortage may not be quite so bad since some farmers rent or borrow oxen from their neighbors. But the sharing of plow animals often proves impractical. Plowing must be coordinated with the monsoon rains, and by the time one farm has been plowed, the optimum moment for plowing another may already have passed. Also, after plowing is over, a farmer still needs his own pair of oxen to pull his oxcart, the mainstay of bulk transport throughout rural India. Quite possibly private ownership of farms, livestock, plows, and oxcarts lowers the efficiency of Indian agriculture, but this, I soon realized, was not caused by cow love.

The shortage of draft animals is a terrible threat that hangs over most of India’s peasant families. When an ox fails sick a poor farmer is in danger of losing his farm. If he has no replacement for it, he will have to borrow money at usurious rates. Millions of rural households have in fact lost all or part of their holdings and have gone into sharecropping or day labor as a result of such debts. Every year hundreds of thousands of destitute farmers end up migrating to the cities, which already teem with unemployed and homeless persons.

The Indian farmer who can’t replace his sick or deceased ox is in much the same situation as an American
A farmer who can neither replace nor repair his broken tractor. But there is an important difference: tractors are made by factories, but oxen are made by cows. A farmer who owns a cow owns a factory for making oxen. With or without cow love, this is a good reason for him not to be too anxious to sell his cow to the slaughterhouse. One also begins to see why Indian farmers might be willing to tolerate cows that give only 500 pounds of milk per year. If the main economic function of the zebu cow is to breed male traction animals, then there’s no point in comparing her with specialized American dairy animals, whose main function is to produce milk. Still, the milk produced by zebu cows plays an important role in meeting the nutritional needs of many poor families. Even small amounts of milk products can improve the health of people who are forced to subsist on the edge of starvation.

When Indian farmers want an animal primarily for milking purposes they turn to the female water buffalo, which has longer lactation periods and higher butterfat yields than zebu cattle. Male water buffalo are also superior animals for plowing in flooded rice paddies. But oxen are more versatile and are preferred for dry-field farming and road transport. Above all, zebu breeds are remarkably rugged, and can survive the long droughts that periodically afflict different parts of India.

Agriculture is part of a vast system of human and natural relationships. To judge isolated portions of this “ecosystem” in terms that are relevant to the conduct of American agribusiness leads to some very strange impressions. Cattle figure in the Indian ecosystem in ways that are easily overlooked or demeaned by observers from industrialized, high-energy societies. In the United States, chemicals have almost completely replaced animal manure as the principal source of farm fertilizer. American farmers stopped using manure when they began to plow with tractors rather than mules or horses. Since tractors excrete poisons rather than fertilizers, a commitment to large-scale machine farming is almost of necessity a commitment to the use of chemical fertilizers. And around the world today there has in fact grown up a vast integrated petrochemical-tractor-truck industrial complex that produces farm machinery, motorized transport, oil and gasoline, and chemical fertilizers and pesticides upon which new high-yield production techniques depend.

For better or worse, most of India’s farmers cannot participate in this complex, not because they worship their cows, but because they can’t afford to buy tractors. Like other underdeveloped nations, India can’t build factories that are competitive with the facilities of the industrialized nations nor pay for large quantities of imported industrial products. To convert from animals and manure to tractors and petrochemicals would require the investment of incredible amounts of capital. Moreover, the inevitable effect of substituting costly machines for cheap animals is to reduce the number of people who can earn their living from agriculture and to force a corresponding increase in the size of the average farm. We know that the development of large-scale agribusiness in the United States has meant the virtual destruction of the small family farm. Less than 5 percent of U.S. families now live on farms, as compared with 60 percent about a hundred years ago. If agribusiness were to develop along similar lines in India, jobs and housing would soon have to be found for a quarter of a billion displaced peasants.

Since the suffering caused by unemployment and homelessness in India’s cities is already intolerable, an additional massive build-up of the urban population can only lead to unprecedented upheavals and catastrophes.

With this alternative in view, it becomes easier to understand low-energy, small-scale, animal-based systems. As I have already pointed out, cows and oxen provide low energy substitutes for tractors and tractor factories. They also should be credited with carrying out the functions of a petrochemical industry. India’s cattle annually excrete about 700 million tons of recoverable manure. Approximately half of this total is used as fertilizer,
while most of the remainder is burned to provide heat for cooking. The annual quantity of heat liberated by this dung, the Indian housewife’s main cooking fuel, is the thermal equivalent of 27 million tons of kerosene, 35 million tons of coal, or 68 million tons of wood. Since India has only small reserves of oil and coal and is already the victim of extensive deforestation, none of these fuels can be considered practical substitutes for cow dung. The thought of dung in the kitchen may not appeal to the average American, but Indian women regard it as a superior cooking fuel because it is finely adjusted to their domestic routines. Most Indian dishes are prepared with clarified butter known as ghee, for which cow dung is the preferred source of heat since it burns with a clean, slow, long-lasting flame that doesn’t scorch the food. This enables the Indian housewife to start cooking her meals and to leave them unattended for several hours while she takes care of the children, helps out in the fields, or performs other chores. American housewives achieve a similar effect through a complex set of electronic controls that come as expensive options on late-model stoves.

Cow dung has at least one other major function. Mixed with water and made into a paste, it is used as a household flooring material. Smear over a dirt floor and left to harden into a smooth surface, it keeps the dust down and can be swept clean with a broom.

Because cattle droppings have so many useful properties, every bit of dung is carefully collected. Village small fry are given the task of following the family cow around and of bringing home its daily petrochemical output. In the cities, sweeper castes enjoy a monopoly on the dung deposited by strays and earn their living by selling it to housewives.

From an agribusiness point of view, a dry and barren cow is an economic abomination. But from the viewpoint of the peasant farmer, the same dry and barren cow may be a last desperate defense against the moneylenders. There is always the chance that a favorable monsoon may restore the vigor of even the most decrepit specimen and that she will fatten up, calve, and start giving milk again. This is what the farmer prays for; sometimes his prayers are answered. In the meantime, dung-making goes on. And so one gradually begins to understand why a skinny old hag of a cow still looks beautiful in the eyes of her owner.

Zebu cattle have small bodies, energy-storing humps on their back, and great powers of recuperation. These features are adapted to the specific conditions of Indian agriculture.

The native breeds are capable of surviving for long periods with little food or water and are highly resistant to diseases that afflict other breeds in tropical climates. Zebu oxen are worked as long as they continue to breathe. Stuart Odend’hal, a veterinarian formerly associated with Johns Hopkins University, performed field autopsies on Indian cattle which had been working normally a few hours before their deaths but whose vital organs were damaged by massive lesions. Given their enormous recuperative powers, these beasts are never easily written off as completely “useless” while they are still alive.

But sooner or later there must come a time when all hope of an animal’s recovery is lost and even dung-making ceases. And still the Hindu farmer refuses to kill it for food or sell it to the slaughterhouse. Isn’t this incontrovertible evidence of a harmful economic practice that has no explanation apart from the religious taboos on cow slaughter and beef consumption?

No one can deny that cow love mobilizes people to resist cow slaughter and beef eating. But I don’t agree that the anti-slaughter and beef-eating taboos necessarily have an adverse effect on human survival and well-being. By slaughtering or selling his aged and decrepit animals, a farmer might earn a few more rupees or temporarily improve his family’s diet. But in the long run, his refusal to sell to the slaughterhouse or kill for his own table
may have beneficial consequences. An established principle of ecological analysis states that communities of organisms are adapted not to average but to extreme conditions. The relevant situation in India is the recurrent failure of the monsoon rains. To evaluate the economic significance of the anti-slaughter and antibeeef-eating taboos, we have to consider what these taboos mean in the context of periodic droughts and famine.

The taboo on slaughter and beef eating may be as much a product of natural selection as the small bodies and fantastic recuperative powers of the zebu breeds. During droughts and famines, farmers are severely tempted to kill or sell their livestock. Those who succumb to this temptation seal their doom, even if they survive the drought, for when the rains come, they will be unable to plow their fields. I want to be even more emphatic: Massive slaughter of cattle under the duress of famine constitutes a much greater threat to aggregate welfare than any likely miscalculation by particular farmers concerning the usefulness of their animals during normal times. It seems probable that the sense of unutterable profanity elicited by cow slaughter has its roots in the excruciating contradiction between immediate needs and long-run conditions of survival. Cow love with its sacred symbols and holy doctrines protects the farmer against calculations that are “rational” only in the short term. To Western experts it looks as if “the Indian farmer would rather starve to death than eat his cow.” The same kinds of experts like to talk about the “inscrutable Oriental mind” and think that life is not so dear to the Asian masses.” They don’t realize that the farmer would rather eat his cow than starve, but that he will starve if he does eat it.

Even with the assistance of the holy laws and cow love, the temptation to eat beef under the duress of famine sometimes proves irresistible. During World War II, there was a great famine in Bengal caused by droughts and the Japanese occupation of Burma. Slaughter of cows and draft animals reached such alarming levels in the summer of 1944 that the British had to use troops to enforce the cow-protection laws. In 1967 The New York Times reported:

Hindus facing starvation in the drought-stricken area of Bihar are slaughtering cows and eating the meat even though the animals are sacred to the Hindu religion.

Observers noted that “the misery of the people was beyond imagination.”

The survival into old age of a certain number of absolutely useless animals during good times is part of the price that must be paid for protecting useful animals against slaughter during bad times. But I wonder how much is actually lost because of the prohibition on slaughter and the taboo on beef. From a Western agribusiness viewpoint, it seems irrational for India not to have a meat-packing industry. But the actual potential for such an industry in a country like India is very limited. A substantial rise in beef production would strain the entire ecosystem, not because of cow love but because of the laws of thermodynamics. In any food chain, the interposition of additional animal links results in a sharp decrease in the efficiency of food production. The caloric value of what an animal has eaten is always much greater than the caloric value of its body. This means that more calories are available per capita when plant food is eaten directly by a human population than when it is used to feed domesticated animals.

Because of the high level of beef consumption in the United States, three-quarters of all our croplands are used for feeding cattle rather than people. Since the per capita calorie intake in India is already below minimum daily requirements, switching croplands to meat production could only result in higher food prices and a further deterioration in the living standards for poor families. I doubt if more than 10 percent of the Indian people will ever be able to make beef an important part of their diet, regardless of whether they believe in cow love or not.
I also doubt that sending more aged and decrepit animals to existing slaughterhouses would result in nutritional gains for the people who need it most. Most of these animals get eaten anyway, even if they aren’t sent to the slaughterhouse, because throughout India there are low-ranking castes whose members have the right to dispose of the bodies of dead cattle. In one way or another, twenty million cattle die every year, and a large portion of their meat is eaten by these carrion-eating “untouchables.”

My friend Dr. Joan Mencher, an anthropologist who has worked in India for many years, points out that the existing slaughterhouses cater to urban middle-class non-Hindus. She notes that “the untouchables get their food in other ways. It is good for the untouchable if a cow dies of starvation in a village, but not if it gets sent to an urban slaughterhouse to be sold to Muslims or Christians.” ~ Dr. Mencher’s informants at first denied that any Hindu would eat beef, but when they learned that “upper-caste” Americans liked steak, they readily confessed their taste for beef curry.

Like everything else I have been discussing, meat eating by untouchables is finely adjusted to practical conditions. The meat-eating castes also tend to be the leather-working castes, since they have the right to dispose of the skin of the fallen cattle. So despite cow love, India manages to have a huge leathercraft industry. Even in death, apparently use less animals continue to be exploited for human purposes.

I could be right about cattle being useful for traction, fuel, fertilizer, milk, floor covering, meat, and leather, and still misjudge the ecological and economic significance of the whole complex. Everything depends on how much all of this costs in natural resources and human labor relative to alternative modes of satisfying the needs of India’s huge population. These costs are determined largely by what the cattle eat. Many experts assume that man and cow are locked in a deadly competition for land and food crops. This might be true if Indian farmers followed the American agribusiness model and fed their animals on food crops. But the shameless truth about the sacred cow is that she is an indefatigable scavenger. Only an insignificant portion of the food consumed by the average cow comes from pastures and food crops set aside for their use.

This ought to have been obvious from all those persistent reports about cows wandering about and snarling traffic. What are those animals doing in the markets, on the lawns, along the highways and railroad tracks, and up on the barren hillsides? What are they doing if not eating every morsel of grass, stubble, and garbage that cannot be directly consumed by human beings and converting it into milk and other useful products? In his study of cattle in West Bengal, Dr. Odend’hal discovered that the major constituent in the cattle’s diet is inedible by-products of human food crops, principally rice straw, wheat bran, and rice husks. When the Ford Foundation estimated that half of the cattle were surplus in relation to feed supply, they meant to say that half of the cattle manage to survive even without access to fodder crops. But this is an understatement. Probably less than 20 percent of what the cattle eat consists of humanly edible substances; most of this is fed to working oxen and water buffalo rather than to dry and barren cows. Odend’hal found that in his study area there was no competition between cattle and humans for land or the food supply: “Basically, the cattle convert items of little direct human value into products of immediate utility.”

One reason why cow love is so often misunderstood is that it has different implications for the rich and the poor. Poor farmers use it as a license to scavenge while the wealthy farmers resist it as a rip-off. To the poor farmer, the cow is a holy beggar; to the rich farmer, it’s a thief. Occasionally the cows invade someone’s pastures or planted fields. The landlords complain, but the poor peasants plead ignorance and depend on cow love to get their animals back. If there is competition, it is between man and man or caste and caste, not between man and beast.
City cows also have owners who let them scrounge by day and call them back at night to be milked. Dr. Mencher recounts that while she lived for a while in a middle-class neighborhood in Madras her neighbors were constantly complaining about “stray” cows breaking into the family compounds. The strays were actually owned by people who lived in a room above a shop and who sold milk door to door in the neighborhood. As for the old age homes and police cowpounds, they serve very nicely to reduce the risk of maintaining cows in a city environment. If a cow stops producing milk, the owner may decide to let it wander around until the police pick it up and bring it to the precinct house. When the cow has recovered, the owner pays a small fine and returns it to its usual haunts. The old age homes operate on a similar principle, providing cheap government-subsidized pasture that would otherwise not be available to city cows.

Incidentally, the preferred form of purchasing milk in the cities is to have the cow brought to the house and milked on the spot. This is often the only way that the householder can be sure that he is buying pure milk rather than milk mixed with water or urine.

What seems most incredible about these arrangements is that they have been interpreted as evidence of wasteful antieconomic Hindu practices, while in fact they reflect a degree of economizing that goes far beyond Western, “Protestant” standards of savings and husbandry. Cow love is perfectly compatible with a merciless determination to get the literal last drop of milk out of the cow. The man who takes the cow door to door brings along a dummy calf made out of stuffed calfskin which he sets down beside the cow to trick it into performing. When this doesn’t work, the owner may resort to phooka, blowing air into the cow’s uterus through a hollow pipe, or doom dev, stuffing its tail into the vaginal orifice. Gandhi believed that cows were treated more cruelly in India than anywhere else in the world. “How we bleed her to take the last drop of milk from her,” he lamented. “How we starve her to emaciation, how we ill-treat the calves, how we deprive them of their portion of milk, how cruelly we treat the oxen, how we castrate them, how we beat them, how we overload them.”

No one understood better than Gandhi that cow love had different implications for rich and poor. For him the cow was a central focus of the struggle to rouse India to authentic nationhood. Cow love went along with small-scale farming, making cotton thread on a hand spinning wheel, sitting cross legged on the floor, dressing in a loincloth, vegetarianism, reverence for life, and strict nonviolence. To these themes Gandhi owed his vast popular following among the peasant masses, urban poor, and untouchables. It was his way of protecting them against the ravages of industrialization.

The asymmetrical implications of ahimsa for rich and poor are ignored by economists who want to make Indian agriculture more efficient by slaughtering “surplus” animals. Professor Alan Heston, for example, accepts the fact that the cattle perform vital functions for which substitutes are not readily available. But he proposes that the same functions could be carried out more efficiently if there were 30 million fewer cows. This figure is based on the assumption that with adequate care only 40 cows per 100 male animals would be needed to replace the present number of oxen. Since there are 72 million adult male cattle, by this formula, 24 million breeding females ought to be sufficient. Actually, there are 54 million cows. Subtracting 24 million from 54 million, Heston arrives at the estimate of 30 million “useless” animals to be slaughtered. The fodder and feed that these “useless” animals have been consuming are to be distributed among the remaining animals, who will become healthier and therefore will be able to keep total milk and dung production at or above previous levels. But whose cows are to be sacrificed? About 43 percent of the total cattle population is found on the poorest 62 percent of the farms. These farms, consisting of five acres or less, have only 5 percent of the pasture and grazing land. In other words, most of the animals that are temporarily dry, barren, and feeble are owned by the people who live on the smallest and poorest farms. So that when the economists talk about getting rid of 30 million
cows, they are really talking about getting rid of 30 million cows that belong to poor families, not rich ones. But most poor families own only one cow, so what this economizing boils down to is not so much getting rid of 30 million cows as getting rid of 150 million people—forcing them off the land and into the cities.

Cow-slaughter enthusiasts base their recommendation on an understandable error. They reason that since the farmers refuse to kill their animals, and since there is a religious taboo against doing so, therefore it is the taboo that is mainly responsible for the high ratio of cows to oxen. Their error is hidden in the observed ratio itself: 70 cows to 100 oxen. If cow love prevents farmers from killing cows that are economically useless, how is it there are 30 percent fewer cows than oxen? Since approximately as many female as male animals are born, something must be causing the death of more females than males. The solution to this puzzle is that while no Hindu farmer deliberately slaughters a female calf or decrepit cow with a club or a knife, he can and does get rid of them when they become truly useless from his point of view. Various methods short of direct slaughter are employed. To “kill” unwanted calves, for example, a triangular wooden yoke is placed about their necks so that when they try to nurse they jab the cow’s udder and get kicked to death. Older animals are simply tethered on short ropes and allowed to starve—a process that does not take too long if the animal is already weak and diseased. Finally, unknown numbers of decrepit cows are surreptitiously sold through a chain of Moslem and Christian middlemen and end up in the urban slaughterhouses.

If we want to account for the observed proportions of cows to oxen, we must study rain, wind, water, and land-tenure patterns, not cow love. The proof of this is that the proportion of cows to oxen varies with the relative importance of different components of the agricultural system in different regions of India. The most important variable is the amount of irrigation water available for the cultivation of rice. Wherever there are extensive wet rice paddies, the water buffalo tends to be the preferred traction animal, and the female water buffalo is then substituted for the zebu cow as a source of milk. That is why in the vast plains of northern India, where the melting Himalayan snows and monsoons create the Holy River Ganges, the proportion of cows to oxen drops down to 47 to 100. As the distinguished Indian economist K. N. Raj has pointed out, districts in the Ganges Valley where continuous year-round rice-paddy cultivation is practiced, have cow-to-oxen ratios that approach the theoretical optimum. This is all the more remarkable since the region in question—the Gangetic plain—is the heartland of the Hindu religion and contains its most holy shrines.

The theory that religion is primarily responsible for the high proportion of cows to oxen is also refuted by a comparison between Hindu India and Moslem West Pakistan. Despite the rejection of cow love and the beef-slaughter and beef-eating taboos, West Pakistan as a whole has 60 cows for every 100 male animals, which is considerably higher than the average for the intensely Hindu Indian state of Uttar Pradesh. When districts in Uttar Pradesh are selected for the importance of water buffalo and canal irrigation and compared with ecologically similar districts in West Pakistan, ratios of female to male cattle turn out to be virtually the same.

Do I mean to say that cow love has no effect whatsoever on the cattle sex ratio or on other aspects of the agricultural system? No. What I am saying is that cow love is an active element in a complex, finely articulated material and cultural order. Cow love mobilizes the latent capacity of human beings to persevere in a low-energy ecosystem in which there is little room for waste or indolence. Cow love contributes to the adaptive resilience of the human population by preserving temporarily dry or barren but still useful animals; by discouraging the growth of an energy-expensive beef industry; by protecting cattle that fatten in the public domain or at landlord’s expense; and by preserving the recovery potential of the cattle population during droughts and famines. As in any natural or artificial system, there is some slippage, friction, or waste associated with these complex interactions. Hall a billion people, animals, land, labor, political economy, soil, and climate
are all involved. The slaughter enthusiasts claim that the practice of letting cows breed indiscriminately and then thinning their numbers through neglect and starvation is wasteful and inefficient. I do not doubt that this is correct, but only in a narrow and relatively insignificant sense. The savings that an agricultural engineer might achieve by getting rid of an unknown number of absolutely useless animals must be balanced against catastrophic losses for the marginal peasants, especially during droughts and famines, if cow love ceases to be a holy duty.

Since the effective mobilization of all human action depends upon the acceptance of psychologically compelling creeds and doctrines, we have to expect that economic systems will always oscillate under and over their points of optimum efficiency. But the assumption that the whole system can be made to work better simply by attacking its consciousness is naive and dangerous. Major improvements in the present system can be achieved by stabilizing India’s human population, and by making more land, water, oxen, and water buffalo available to more people on a more equitable basis. The alternative is to destroy the present system and replace it with a completely new set of demographic, technological, politico-economic, and ideological relationships-a whole new ecosystem. Hinduism is undoubtedly a conservative force, one that makes it more difficult for the “development” experts and “modernizing” agents to destroy the old system and to replace it with a high-energy industrial and agribusiness complex. But if you think that a high-energy industrial and agribusiness complex will necessarily be more “rational” or “efficient” than the system that now exists, forget it.

Contrary to expectations, studies of energy costs and energy yields show that India makes more efficient use of its cattle than the United States does. In Singur district in West Bengal, Dr. Odend’hal discovered that the cattle’s gross energetic efficiency, defined as the total of useful calories produced per year divided by the total calories consumed during the same period, was 17 percent. This compares with a gross energetic efficiency of less than 4 percent for American beef cattle raised on Western range land. As Odend’hal says, the relatively high efficiency of the Indian cattle complex comes about not because the animals are particularly productive, but because of scrupulous product utilization by humans: “The villagers are extremely utilitarian and nothing is wasted.”

Wastefulness is more a characteristic of modern agribusiness than of traditional peasant economies. Under the new system of automated feed-lot beef production in the United States, for example, cattle manure not only goes unused, but it is allowed to contaminate ground water over wide areas and contributes to the pollution of nearby lakes and streams.

The higher standard of living enjoyed by the industrial nations is not the result of greater productive efficiency, but of an enormously expanded increase in the amount of energy available per person. In 1970 the United States used up the energy equivalent of twelve tons of coal per inhabitant, while the corresponding figure for India was one-fifth ton per inhabitant. The way this energy was expended involved far more energy being wasted per person in the United States than in India. Automobiles and airplanes are faster than oxcarts, but they do not use energy more efficiently. In fact, more calories go up in useless heat and smoke during a single day of traffic jams in the United States than is wasted by all the cows of India during an entire year. The comparison is even less favorable when we consider the fact that the stalled vehicles are burning up irreplaceable reserves of petroleum that it took the earth tens of millions of years to accumulate. If you want to see a real sacred cow, go out and look at the family car.