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THE PLUNDERED PLANET

Why We Must—and How We Can—
Manage Nature for Global Prosperity

CHAPTER 10

Nature and Hunger

SO FAR THIS BOOK HAS BEEN A PLEA that nature can be entrusted to the values of ordinary citizens. But my confidence is conditional upon people taking the trouble to be reasonably well informed about the scientific and economic issues involved. The natural assets of the bottom billion will continue to be plundered unless a critical mass of ordinary citizens realizes the importance of getting the key decisions right: the chain of decisions set out in part II. Carbon will continue to accumulate as a natural liability unless an equivalent critical mass is built, country by country. Informed societies are feasible, but they are not inevitable. Our relationship to nature brings into play powerful emotions and ordinary people can sometimes be misled into beliefs that may seem comforting but ultimately are destructive.

Between 2005 and 2008 the world price of basic foods jumped by over 80 percent. In the slums of the poorest countries the children of the poor went hungry; had the price spike persisted they

would have suffered stunting. This adverse shock had its origins in muddled popular beliefs about nature that have become increasingly common in the rich societies. In this chapter I am going to show how three such misconceptions exposed some of the world's poorest children to hunger.

In the poorest societies the rise in food prices was a major political event. To the typical household in these societies food is the equivalent of energy in America: if the price rockets people expect their government to do something. There were riots in some thirty countries; in Haiti they brought down the government. The increase in prices proved to be temporary; the global economic crisis was an effective though catastrophic remedy. But we cannot rely upon economic crises to come to the rescue. We need to understand why it happened and what can be done to prevent its recurrence.

The immediate policy responses to the food crisis were dysfunctional even by the dismal standards of most international responses. They included beggar-thy-neighbor, pressure for yet larger farm subsidies, and a retreat into romanticism. Neighbors were beggared by the imposition of export restrictions by the governments of food-exporting countries. This had the immaculately dysfunctional consequences of further elevating world prices while at the same time reducing the incentive for the key producers to invest. Unsurprisingly, the subsidy-hunters seized their opportunity: Michel Barnier, the French agricultural minister, urged the European Commission to reverse the incipient reforms of the Common Agricultural Policy. The romantics who had long found scientific commercial agriculture distasteful portrayed the food crisis as demonstrating its very failure. They advocated the return to organic small-scale farming. Yet a return to antiquated technologies simply cannot feed a prospective population of nine billion.

Cheap food is going to be increasingly important because the poor will increasingly be unable to grow their own. As populations grow and the Southern climate deteriorates due to global warming, the South will necessarily urbanize. The future populations will live not on quaint little farms but in the slums of coastal megacities. They will not grow their food but buy it, and they will buy it at world prices. The only way it will be affordable is if it is produced in abundance. The technical challenges to producing reliably cheap food are surmountable but political opposition will be intense.

Feeding the world will involve three politically difficult steps. Contrary to the romantics, we need more commercial agriculture, not less. The Brazilian model of large high-productivity farms could readily be followed in areas where land is underused. For example, half of the land area of Zambia—a vast expanse of around 150,000 square miles—is arable yet uncultivated. Again, contrary to the romantics, the world needs more science. The European and consequential African ban on genetically modified crops is slowing the pace of productivity in the face of accelerating demand and Americans need to face down the romanticism that bio-fuels will secure energy supplies. Beneath the rhetoric of self-sufficiency lurks the lobby for subsidies. I propose a political deal: mutual de-escalation of folly. In return for Europe's lifting its self-damaging ban on GM (genetic modification), America could suspend its self-destructive subsidies on bio-fuel.

Why Did Food Prices Rise?

Typically, in an attempt to find a solution to a problem people look to its causes, or yet more fatuously, to its *root* cause. However, there need be no logical connection between the cause of a problem and appropriate or even feasible solutions. Such is the case with the food crisis. The root cause of the sudden spike in prices was the

spectacular economic growth of Asia. Asia is half the world and its people are still poor and so devote much of their budgets to food. As Asian incomes rise, so, too, does demand for food. Not only are Asians eating more, they are eating better: carbohydrates are being replaced by protein. It takes six kilos of grain to produce one kilo of beef, and so the switch to protein is raising grain demand. The two key parameters in demand are income elasticity and price elasticity. As a rule of thumb, the income elasticity of demand for food is low: if income rises by a fifth demand for food will rise by around a tenth. The price elasticity of demand for food is only around one-tenth; people simply have to eat. This implies that were the supply of food fixed, to choke off an income-induced increase in demand of 10 percent the price would need to double. As this example illustrates, quite modest increases in global income will drive prices up alarmingly unless matched by increases in supply.

The rise in Asian incomes, though spectacular, was not abrupt. The price spike of 2005–8 was reinforced by supply shocks, such as the prolonged drought in Australia. Supply shocks will become more common because the rising levels of carbon in the atmosphere increase climatic volatility. Against a backdrop of relentlessly rising demand, supply will fluctuate more sharply.

Who Gets Hurt by Expensive Food?

By no means all poor people are adversely affected by expensive food. Those who are farmers are largely self-sufficient, and though they may buy and sell food, the rural markets on which they trade are often not integrated into global markets and thus impervious to the surge in prices. Where poor farmers are integrated in global markets, they are likely to be beneficiaries. However, the good news needs to be qualified. Although most poor farmers will profit

most of the time, they will lose precisely when they are hardest hit: during famine. The World Food Programme is designed to act as the supplier-of-last-resort to famine-stricken localities. Yet its fixed budget shrinks in terms of buying power when food prices surge. Paradoxically, the world's insurance program against localized famine is itself acutely vulnerable to global food shortages. High global food prices are good news for farmers but only in good times.

The unambiguous losers from high food prices are the urban poor. Most of the developing world's large cities are ports and, barring government controls, the price of their food is set on the global market. Crowded in slums, the urban poor cannot grow their food; they have no choice but to buy it. By a cruel implication of the laws of necessity, the poor spend a far larger proportion of their budget on food, typically around a half; high-income groups in contrast spend only around a tenth. Hungry slum dwellers are unlikely to accept their fate quietly. For centuries sudden hunger in slums has provoked violence. This is the classic political base for demagoguery and the food crises would provoke its ugly resurgence.

But we have still not arrived at the end of the food chain. Among the urban poor those most likely to go without food are children. If young children remain malnourished for more than two years the consequence is stunting. We now know that stunting is not merely a physical condition; stunted people are not just shorter than they would have been, their mental potential is impaired. Stunting is irreversible: it lasts a lifetime, and indeed, some studies find that it echoes down the generations. Although high food prices are yesterday's news, a few successive years of them will create tomorrow's nightmare. And tomorrow would last a long time.

Global food prices *must* be kept down. The question is how. Short of repeated global economic crises there is nothing to be done about the increase in the demand for food. The solution must be to

increase world food supply. Of course, world food supply has been increasing for decades; it has more than kept up with population growth. But we now need it to be accelerated. Global food production must increase more rapidly than it has in recent decades. Because prices need to be kept down during the demand rebound that will be part of the postcrisis recovery, we need to see a substantial expansion of the food supply soon. However, the “root cause” of the food crisis is a faster rate of increase in demand, and although a step increase in the short-term supply is urgently needed, it will soon be overtaken by continued growth in demand. Hence, we also need to increase the rate of growth of food production over the medium- and long-term.

Our own policy makers have the power to increase supply by changing regulations; by encouraging organizational changes; and by encouraging innovations in technology. However, each of these is currently blocked by a giant of popular romanticism: all three giants must be confronted and slain.

Giants of Romanticism I: Peasants-in-Aspic

The first giant that must be slain is the middle-class love affair with peasant agriculture. With the near-total urbanization of the middle classes in both America and Europe, rural simplicity has increasingly acquired an allure. The simple farm life is prized as organic in both its literal and its metaphorical sense: Prince Charles is one of its leading apostles. In its literal sense, organic agricultural production is now a premium product, a luxury brand: indeed, Prince Charles has one such brand. In its metaphorical sense, it represents the antithesis of the large, hierarchical, impersonal, and pressured organizations in which so many in the middle classes now work. Prince Charles has built a model village, in traditional architectural style. Peasants, like pandas, are to be preserved.

Distressingly, peasants, like pandas, show surprisingly little inclination to reproduce themselves. Given the chance, smallholder farmers in poorer countries seek local wage jobs and their offspring head to the cities. This is because at low-income levels rural bliss is precarious, isolated, and tedious. The life forces millions of ordinary people into the role of entrepreneur, for which most are ill-suited. In successful economies a majority of people invariably opt for wage employment, so that they can leave to others the worry and grind of running a business; entrepreneurship is a minority pursuit. Reluctant peasants are right: the mode of production is ill-suited to modern agricultural production where scale is helpful. Technology is constantly evolving; investment is lumpy; consumer food fashions are fast-changing and met by integrated marketing chains; and regulatory standards are rising toward the Holy Grail of traceability of produce back to source. All these modern developments are better suited to large, commercial organizations. Of course, they could be ignored were agriculture to return to subsistence cultivation—the romantic vision taken to its *reductio ad absurdum*. Far from being the answer to global poverty, organic self-sufficiency is a luxury lifestyle.

Local self-sufficiency in rich countries is being encouraged through the concept of “food miles”—the ideal being the shortest route between production and consumption. But there is no virtue in minimizing the transportation of food. Indeed, from the perspective of carbon emissions it usually makes more sense to grow food in the most conducive climates, wherever they are, and transport it. The image of vegetables being flown around conjures up carbon profligacy, but the key carbon emissions are in cultivation not transportation. While *food miles* do not reduce carbon, they do reduce incomes in the bottom billion: horticulture for export creates scarce rural jobs.

Nor will organic self-sufficiency produce the food the world needs. It might be appropriate for burnt-out investment bankers, but it won't feed hungry families. Large organizations are better suited to cope with innovation, investment, marketing chains and regulation. Yet for years the development agencies have been basing their agricultural strategies upon encouraging smallholder farm production. This approach is all the more striking given history. For example, the standard account of how English economic development started in the eighteenth century is that the enclosures movement enabled by legislative changes permitted the development of large farms, which in turn sharply raised productivity. Although current research qualifies this conventional account, reducing the estimates of productivity gains to the 10–20 percent range, to ignore commercial agriculture as a force for rural development and enhanced food supply is surely ideological.

Large organizations can internalize those effects that in smallholder agriculture are localized externalities, and thus not adequately absorbed. In the European agricultural revolution innovations indeed occurred on small farms as well as on large ones, and today many small farmers, especially those that are better off and better educated, are keen to innovate. Nonetheless, agricultural innovation is highly sensitive to local conditions, especially in Africa, where soils are complex and variable. Innovators create benefits for the locality and, to the extent that these benefits are not fully captured by the innovators, improvement will be too slow. One solution is to have an extensive network of publicly funded research stations with advisors who reach out to small farmers. However this model has largely broken down in Africa, an instance of more widespread malfunctioning of the public sector. In eighteenth-century Britain, the innovations in smallholder agriculture were often led by networks among the gentry, who corresponded with each other on

the consequences of experiments. But such processes are far from automatic; they did not occur in continental Europe. Commercial agriculture makes it easier.

Over time African peasant agriculture has fallen further and further behind and based on current trends the region's food imports are projected to double over the next quarter-century. Indeed, during the recent phase of high prices the United Nations Food and Agriculture Organization (FAO) worried that smallholder farmers would *reduce* their production because they could not finance the increased cost of fertilizers. While there are partial solutions through subsidies and credit schemes, large-scale commercial agriculture simply does not face the problem. If output prices—the cost of food—rise by more than input prices—the cost of making the food—production will expand not contract.

Successful agriculture is, indeed, staring us in the face. The Brazilian model of large, technologically sophisticated agro-companies has demonstrated how food can be mass-produced. To give one example, the time between harvesting one crop and planting the next—the downtime for land—has been reduced to an astounding thirty minutes. The Brazilian model has provoked horror because one of its effects has been the depletion of the rain forest and the displacement of indigenous populations. Parts of Brazil had the conditions in which unregulated commercialism would indeed inevitably lead to these outcomes. But much of the poor world is not like that: the land is not primal forest, it is just badly farmed. Sometimes the Brazilian model can bring innovation to smallholder farming, such as in the “out-cropping” or “contract farming” model, by which small farmers supply a central business with specified qualities to schedule. Depending upon the details of crop production, this may be more efficient than wage employment.

The leading international expert on African agriculture is Hans Binswanger, now a professor emeritus of economics at the University of St. Gallen in Switzerland. In 2009 the FAO invited us both to Rome to debate the issue of large commercial farming versus smallholder farming. Our common ground turned out to be that the future of African agriculture is unquestionably *commercial*; the issue on which we disagree is that of *scale*. Hans believes that family farms, albeit consolidated into larger units than at present, will prove to be the most viable, whereas I think that much larger farm units might be more efficient.

We each came up with an analogy to make our point. Hans's analogy was that farms are like restaurants. Yes there are large cafeteria-style eateries, but family-run restaurants predominate because the advantages of having motivated workers offset the disadvantage of not being able to purchase food in bulk. Customers know this and vote with their feet. My analogy was that farming is like retailing. Africa's peasant farmers are the equivalent of the vendors you find on every street corner in African cities. Street vending is an activity of desperation, one that will be wiped out by supermarkets, which benefit from technology, finance, and logistics in ways that street vendors cannot hope to match.

Large farms are the supermarkets of agriculture. Scale has become more important because technology, finance and logistics have all changed. The decades of productivity stagnation in African peasant agriculture has opened up a huge gap between family farms and commercial agriculture. As cultivation has become more sophisticated, the inputs (like fertilizer) have become more expensive. Whereas industry has been able to economize on inventories of inputs by just-in-time production systems, agriculture has intrinsically long lags between planting and harvesting and so is now more finance-intensive than most other activities. Logistics loom

much larger because agricultural output is no longer mainly for local consumption. It is global. Technology, finance, and logistics are all inherently replete in economies of scale.

Hans and I did not resolve our differences, but I suspect that we are not that far apart. Many family farms will indeed be viable: they will commercialize and take over the holdings of neighbors whose children leave for the cities. However, such farms will be a far cry from the peasant of the romantic idyll—producing for subsistence rather than the market, and using traditional, organic techniques uncontaminated by science. These family farms will co-exist with much larger commercial farms, with whom they will both compete and cooperate. Co-existence will in part be competitive but it can also be cooperative. Large farms can buy the raw output of surrounding small farms for processing and marketing. They can also provide the financing for inputs.

There are many areas of the world that have land which could be used far more productively were it properly managed by large companies. Indeed, large companies—some of them Brazilian—are queuing up to manage them. Yet over the past forty years African governments have adopted the opposite approach. Large-scale commercial agriculture has been scaled back. At the heart of the matter is a reluctance to let land rights be marketable, and the likely source of this reluctance is the lack of economic dynamism in Africa's cities. In the absence of "investing in investing," cities have not generated sufficient decent jobs. In consequence, land is still the all-important asset; there has been little investment in others. As a natural asset, land, unlike those assets produced by investment, has no natural owner. It is a gift of God and its ownership conferred by a political act. In more successful economies, land has become a minor asset and so the rights of ownership, though initially assigned politically, are simply extensions of the rights on other assets, and thus can be acquired commercially.

A further consequence of a lack of urban dynamism is that jobs are scarce, and so the prospect of mass landlessness evokes political fears: the poor are safer on the land where they are less able to cause trouble. President Mugabe traded on these fears in denuding Zimbabwe of its commercial agriculture. The right response to the illegitimacy of colonial land acquisition was to nationalize land and lease it back, rather than to destroy the productive value of commercial agriculture. In the process of returning his country to subsistence cultivation President Mugabe has brought a once-fertile country to conditions of mass hunger, with famine averted only by emigration and food aid.

How large should large farming be? The global food crisis panicked the governments of some food-scarce countries into a scramble for African land. The political panic button was not just the sharp rise in global food prices, but the export bans that many of the food-exporting governments promptly imposed. Those bans signalled that market relationships could not be relied upon to feed people; in fact they were liable to be overridden just when they were most needed. South Korea struck a deal with the government of Madagascar to acquire a huge area of the country on a 99-year lease. As news leaked out the deal destabilized the government and led to a successful coup d'état. Other such deals are apparently underway. Saudi Arabia is purchasing land in Ethiopia, and the United Arab Emirates is purchasing land in Sudan. While the United Nations has denounced such deals as a new wave of colonialism, the analogy doesn't always apply. In 2009 an African nation, Libya, purchased 100,000 hectares of Europe in the Ukraine.

Although I favor commercial agriculture, these new land deals are not properly commercial. The motivation behind them is primarily to bypass the global market, not to participate in it. The deals are too opaque, too large, and too long. As a result, they take us back to the deficiencies of trying to sell prospecting rights to a single

company. If land is to be farmed in large commercial units, those units should be auctioned among an adequate number of bidders. If, as is likely, the first investors face radical uncertainty as to what the returns will be, only a few such blocks should be sold during the first wave. The price bid will inevitably be heavily discounted to take that uncertainty into account. But as the pioneers learn how best to cultivate the new lands, this knowledge is likely to raise the value of the remaining land which should therefore be sold later. Nor should any single commercial farm be allowed to become so large that it becomes the dominant employer in a whole region. An important role of government is to prevent the abuses that follow from private monopolies. The largest food-importing country not to have joined the scramble for African land has been Japan. Instead, the Japanese government has pressed the G20 to restore order in world food markets by banning the bypass deals. The trigger point for the land grabs was the export bans on food. That is precisely what should be regulated, and the appropriate institution to do that is the World Trade Organization. The equivalent behavior on imports, bans and quantitative restrictions, is now prescribed by WTO rules; the same principles should be extended to exporting.

Even if such land grabs are contained, global agribusiness is still too concentrated, and a sudden switch to an unregulated land market within the poorest countries would probably have ugly consequences. But allowing commercial organizations gradually to replace some smallholder agriculture would increase the global food supply in the medium term.

Giants of Romanticism 2: The GM Ban

The second romantic giant is the European fear of scientific agriculture, which has been manipulated by the agricultural lobby into

yet another form of protectionism: the ban on genetically modified (GM) crops. GM crops were introduced globally in 1996 and already account for around 10 percent of the world's crop area, some 300 million acres. But due to the ban virtually none of this is in Europe or Africa. Robert Paarlberg brilliantly anatomizes the politics of the ban in his recent book *Starved for Science*. By ill-luck, in 1996 Europe was in the grip of a food health crisis: Bovine spongiform encephalopathy, or BSE. The BSE tragedy was caused by the sway the farming interests had over the British public agency of health regulation: they were literally in the same government ministry. Government officials and ministers initially tried to reassure consumers that British beef was safe. Famously, the Minister of Agriculture made his young daughter eat a hamburger in front of television cameras. No sooner had she done so than the minister was forced to eat his words: around the country people began to die in the most ghastly way imaginable—by their brains rotting away. (As of October 2009, the number of deaths from Creutzfeldt-Jakob disease—the human variant of BSE—stood at 165 in Britain, and 44 elsewhere.)

Across Europe pro-protectionism groups seized the opportunity and called for the ban of British beef. BSE has nothing to do with genetically modified food, but it set the precedent. Genetically modified food, so disastrously named as to be a car crash waiting to happen, became portrayed as Frankenfoods: a scientific experiment on consumers. To cap it off, GM came from research by American corporations like Monsanto and so provoked predictable and deep-seated hostility from the European left. Thus were laid the political foundations for a winning coalition—protectionism and anti-Americanism—amplified by the paranoia of health-conscious consumers who no longer trusted government assurances.

In the years since the ban was introduced, the political coalition has expanded its base, even though the scientific case for lifting it has become progressively more robust. The latest high-profile supporter of the ban is Prince Charles, who represents an important constituency of opinion distinct from the founding trio. His views on GM reflect his broader opposition to scientific-commercial agriculture. His vision is, of course, appealing to those of us hemmed into modern industrial life. But watching the aristocracy farm in imitation of the ways of a bygone rural society, another image crept into my mind: that of Marie Antoinette playing at being a dairy maid in Versailles. It soothes the soul, but it does not feed the stomach.

The GM ban, which immediately followed BSE, has had three adverse effects. Most obviously it retards productivity. Prior to 1996, when the ban was introduced, European grain yields tracked those in the United States, whereas since they have fallen behind by around 1–2 percent per year. European grain production could be increased by around 15 percent were the ban lifted. Europe is a major cereal producer, so this is a large loss. And because Europe is out of the market for GM technology, the pace of research has slowed. Research takes a very long time to come to fruition and its core benefit—the permanent reduction in food prices—cannot fully be captured through patents. Hence, there is a strong case for supplementing private research with public money. European governments should be funding this research, which instead is entirely reliant upon the private sector. Private money, in turn, depends upon the prospect of sales, so the European ban has not only blocked public research it has stifled private research.

The worst consequence of the European ban is that it panicked African governments into banning genetic modification (the only exception being South Africa). They feared that otherwise they would permanently be shut out of selling to European markets.

Because Africa banned GM, there was no market for discoveries pertinent to the crops that Africa grows, and therefore no research. In turn, this led to the critique that GM is irrelevant for Africa.

Africa simply cannot afford this self-denial. It needs all the help it can possibly get from genetic modification. For the past four decades African agricultural productivity per acre has stagnated. Increased production has been dependent on the expansion of the area under cultivation. But with population still growing rapidly, this option is running out. On the horizon is climatic deterioration due to global warming. The climate forecasts are that most of Africa will get hotter, that the semi-arid parts will get drier, and that rainfall variability will increase, implying more droughts. Indeed, it seems likely that in southern Africa, the staple food, maize, will become unviable. Whereas for other regions the challenge of climate change is primarily about mitigating carbon emissions, in Africa it is primarily about agricultural adaptation.

It is conventional to say that Africa needs a Green Revolution. The reality is that the Green Revolution has been fueled by chemical fertilizers, and even when fertilizer was cheap Africa did not adopt it. With the rise in fertilizer costs—as a by-product of high energy prices—any African Green Revolution will perforce not be chemical. To counter the effects of a rising population and a deteriorating climate, Africa needs a biological revolution. This is what GM offers, but only if sufficient money is put into research. There has as yet been no work on the crops of key importance to the region, such as cassava and yams. GM research is still on the first generation: single-gene transfer, in which a particular gene that gives one crop an advantage is identified, isolated, and added to another crop. But even this infancy stage offers the credible prospect of vital gains. Maize can be made more drought-resistant, buying Africa time in the struggle against climatic deterioration. Grain can be made

dramatically more resistant to fungi, reducing the need for chemicals and cutting storage losses. For example, stem borers—insects that do just that—cause storage losses in the range 15–40 percent of the maize crop; a new GM variety is resistant.

Like commercialization, genetic modification will not be the magic fix for African agriculture; there is no such fix. But without it, the task of helping African food production keep abreast of its population looks daunting. While Africa's coastal cities can be fed from global supplies, the vast African interior cannot be fed in this way (other than in emergencies). Lifting the ban on GM, both in Africa and Europe, could hold down global food prices in the long term. Recently, African governments have begun to rethink the ban. Burkina Faso, Malawi, and most recently Kenya have lifted it.

Giants of Romanticism 3: Grow Your Own Fuel

The final romantic giant is the American fantasy that it can escape dependence upon Arab oil by growing its own fuel. There is a good case for growing fuel, but not from grain: the conversion into ethanol uses almost as much energy as it produces. This basic fact has not stopped the grain lobby from gauging out grotesquely inefficient subsidies. Around a third of American grain has been diverted into energy, a switch that demonstrates both the superb responsiveness of the market to price signals, and the shameless power of subsidy-hunting lobbies. If the U.S. wants to run off agro-fuel instead of oil Brazilian sugar cane is the answer; it is a far more efficient source of energy than grain. The smoking gun of the protectionism at work here is that the American government has actually *restricted* imports of Brazilian ethanol to protect American production. The sane goal of reducing dependence on Arab oil has been sacrificed to the self-serving goal of pumping yet more tax dollars into American agriculture.

The huge diversion of grain for ethanol has had an impact on world prices. Quite how large that impact is has been hotly debated. The Bush administration claimed initially that it had raised prices by only 3 percent, but a study by the World Bank suggests much higher. Were the subsidy lifted there would probably be a swift impact on prices: the supply of grain for food would increase.

The Politics of Change: Deals and Alliances

The three giant-killing policies—permitting the expansion of large commercial farms, lifting the GM ban, and lifting the subsidies on ethanol—fit together both economically and politically. In economic terms they fit together both in their implications for the timing of increased production and through linkages in production. Lifting the ethanol subsidies would bring short-term relief. The expansion of commercial farms could, over the next decade, raise world output by a few percentage points. And both measures would buy the time needed for GM to deliver its potential. The lag between starting research and its mass application is around fifteen years. The expansion of commercial farming in Africa would encourage GM research in Africa-suited crops, and these innovations would find a ready market less sensitive to political interference. It is not by chance that the only African country in which GM was not banned is South Africa, where the organization of agriculture is predominantly commercial.

In political terms the three policies are also complementary. Home-grown energy, the banishment of Frankenfoods, and preserving the peasant way of life are each classic populist programs. They sound appealing but they do harm. They must be countered by messages of equal potency.

One such message is the scope for international reciprocity. Although Americans are attracted to home-grown fuel, they are

rightly infuriated by the European ban on GM. They see the ban for what it is: anti-American protectionism. Conversely, Europeans cling to the illusory comfort of the ban on high-tech crops, but are rightly infuriated by the American subsidies on ethanol. They see the subsidies for what they are: a selfish desire to maintain American energy profligacy that condemns the world to global warming. Over the past half-century America and Europe have learned how to cooperate. The General Agreement on Tariffs and Trade, inaugurated in 1947, virtually eliminated tariffs on manufactures over the ensuing decades. NATO was an accumulating partnership in security. The OECD was an accumulating partnership in economic governance (the collective ban on bribery to win contracts is an instance of the cooperation it has achieved). Compared to the challenges of finding agreement in these areas, a deal calling for the mutual de-escalation of environmental follies scarcely seems daunting. America should agree to scrap the ethanol subsidies in return for Europe's lifting the ban on GM. Each side can find this deal infuriating and yet attractive, since each side should find it politically feasible to persuade its constituencies that the result will be better than the status quo.

Overcoming the hostility toward commercial and scientific agriculture will be more demanding. It will require some soul-searching among environmentalists as to their true priorities. Many feel acute concern for the poorest countries. In both America and Europe millions of decent citizens are appalled by global hunger; each time news of a famine reaches the popular media the response is overwhelming. The combination of concern about poverty and concern about the environment can be a potent force for good. The ethics of the custody of natural assets provides a secure foundation for policy toward the natural world.

Nonetheless, the alliance between environmentalists and economists to harness nature for development cannot elide the hard

choices. We will not beat hunger by returning to prescientific, precommercial agriculture. Environmentalists will need to agonize over their priorities. Some may decide that the vision articulated by Prince Charles is the more compelling: a historic lifestyle must be preserved regardless of its consequences. Personally, I find that vision highly attractive. Once I become a burnt-out professor it may be the lifestyle I choose. But faced with the prospect of stunted children I balked: for me the vital matter for public policy is to increase food supplies. I believe that many people, once they do the painful thinking, will share my priorities. Commercial agriculture may be irredeemably unromantic, but if it is part of the route to full stomachs then it should be harnessed to that purpose.

American environmentalists will also need to do some painful rethinking. The people most attracted to energy self-sufficiency through ethanol are potentially the constituency that can save America from its ruinous energy policies. The cruel truth is that the United States indeed needs to reduce its dependence upon imported oil, but that growing bio-fuel is not the answer. America is quite simply too profligate in its energy use. Europeans, themselves pretty profligate, use only half the energy per capita and yet sustain a high-income lifestyle. The American tax system needs to be shifted from burdening work to discouraging energy consumption.

A key quality of good politicians is guiding citizens away from the kind of populism that, unless countered, will block the policies needed to address the food crisis. For those living in the United States and Europe high food prices will be an inconvenience, not dire enough to force us to overcome the three giant myths on which populism rests. Our political leaders need to deliver this message and forge new alliances. If they don't children will go hungry and their futures will be impaired. The painful task of dismantling our romantic illusions cannot be avoided.

PART V

Natural Order