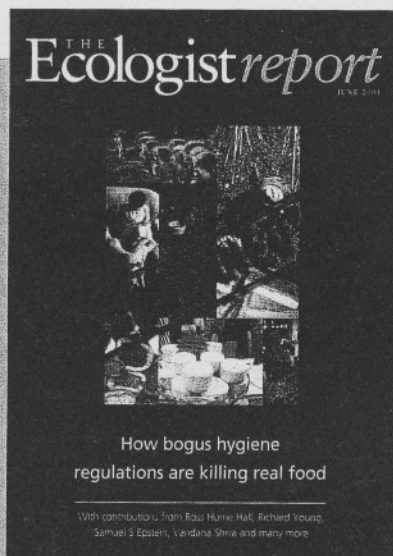


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We have produced this special issue of *The Ecologist* to examine a disturbing trend; regulations that impose unbearable costs on small food producers. This trend is one of the primary reasons why, all around us, small food producers are disappearing, and the multinational behemoths are increasingly taking control of what we eat.

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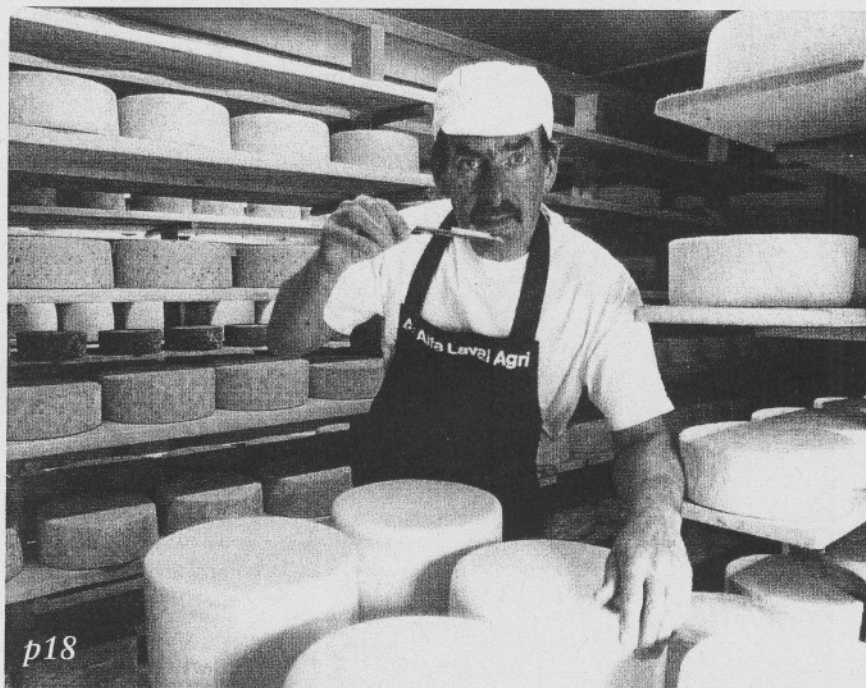
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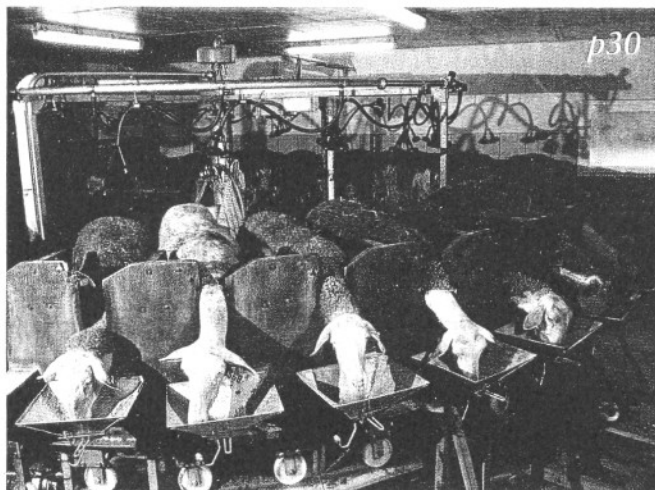
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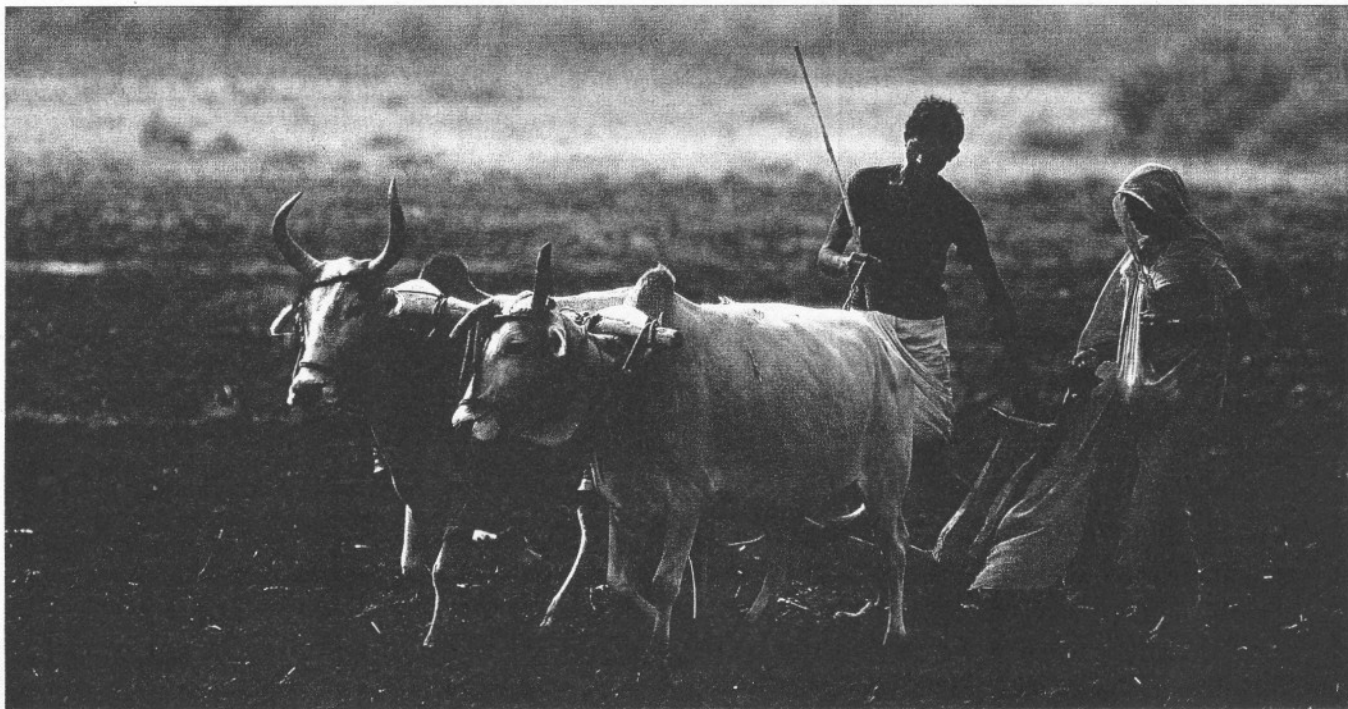
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UNHYGIENIC – OR JUST SMALL SCALE?

— An introduction by **Teddy Goldsmith** —

'Science is the new religion and disinfectant is its holy water.'

George Bernard Shaw

It is increasingly difficult for small food producers and retailers of any kind to survive, let alone thrive, within the context of a global economy committed to the maximisation of trade and development.

Among other things, their plight is drastically increased by the World Trade Organisation (WTO) regulations that force governments to open up national markets to imported and highly subsidised food from the USA in particular. The price of soya imported into India from the US would be \$348 a ton, instead of \$155 if the US government did not subsidise it.¹ No small farmers in India or elsewhere can compete with that.

Another problem is that we are now living in a world that is increasingly dominated by huge global, vertically-integrated corporations that increasingly control every aspect of the world economy. Thus, just five corporations control some 77 per cent of the cereal trade while 83 per cent of the cocoa trade is controlled by three companies, as is 80 per cent of the banana trade and 85 per cent of the tea trade. Under such conditions small food producers, more often than not, must buy their inputs from the same monster corporations to whom they must also sell their produce and which are thereby in a position to decide exactly what margin the small food producers are to be allowed (see José Lutzenberger pp16–17 in this issue). It is thereby not surprising, for instance, that only about two per cent of the price we pay for bananas in a supermarket goes to the field worker, five per cent to the farmer, with the rest going

to the various intermediaries, or more often, to the subsidiaries of the same transnational corporation.

Big corporations can also afford to sell below cost. They don't mind losing money for a while, long enough in any case, to put their small and even quite big rivals out of business. Wal-Mart, the world's biggest retailer, does just that. When it establishes itself in a new town, it often sells staple foods below their cost price. This is sufficient to kill off small shops in the area and even smaller supermarkets. But once these have closed their doors, then Wal-Mart puts up its prices.²

The same thing happens, of course, in Third World countries where big American, European or Japanese exporters are quite often willing to sell below cost in order to kill off local producers. Vandana Shiva refers to this as 'pseudo competition'.³ It can also be referred to as 'dumping', which is illegal, but it is difficult to win a case against these giants whose activities nearly always have full government backing.

In addition, when small food producers manage to find a new niche which enables them to survive in such an economically and politically hostile environment, they are only allowed to do so until it is big enough for the big companies to regard it as worth taking over for themselves, which they then proceed to do, often by getting the government or the relevant international agency to pass the requisite new regulations.

Thus, in the USA, organic food is now a five billion dollar market and is growing at the rate of 20 per cent per annum. But

From a Circle of Harvest to a Circle of Debt

Consider this hypothesis: An American farmer who grows wheat and raises some cattle and chickens purchases a new tractor from a company owned by the Cargill corporation. He also purchases some irrigation equipment from a second Cargill subsidiary. He also needs seeds, chemical fertilisers, and feed for his livestock, all of which are purchased from still other Cargill subsidiaries. At harvest-time he brings his wheat to Cargill's milling operation; unhappy with the price he is offered, he decides to store his crop in a grain elevator, also owned by Cargill, which ships it to Europe or Japan. His cattle, meanwhile, are sold to a feedlot owned by a Cargill subsidiary, which in turn send them to a Cargill-owned meatpacking plant. He sells his chicken to one of Cargill's poultry-processing plants. Unfortunately for him, the prices he has received for his wheat, his cattle and chickens are too low for him to make ends meet, so he goes to a local bank for a loan. The bank, as it turns out, is also owned by Cargill. Tough the farmer just described is imaginary, Cargill is involved in all aspects of farm production mentioned – and many more besides. And while this farmer could have purchased some of his needs from a Cargill competitor, chances are this company, too would have been a big corporate agribusiness.

Adapted from: Joel Dyer, *Harvest of Rage*, Westview Press, 1998.

to the big corporations, the idea that it should remain outside their grasp, and in the hands of a host of small local companies, is more than they can bear. In 1999, the US Department of Agriculture (USDA) was persuaded to propose new regulations that would allow the sort of food that it is most profitable for them to produce (genetically modified, nuclear irradiated, grown on land that has been 'fertilised' with toxic sludge and that contains very high levels of pesticides) to be classified as organic, while making it illegal for any non governmental organisation (NGO) to set more stringent standards.

Fortunately there was a tremendous public outcry and the USDA was made to withdraw its proposal, at least for the time being. However, the mere fact that it had dared suggest passing such an outrageous regulation clearly shows to what extent it is willing to sacrifice the health of the American public, and that of its environment, to the immediate interests of the large corporations in the food business.

This is of course, but an instance of a much wider trend that is occurring everywhere today: the systematic replacement of regulations that have been specifically designed to protect small companies, the local economy, local communities, people's health and the natural environment by regulations designed exclusively to protect the interests of the large corporations.

This *Ecologist Report* examines just one such set of regulations – those that impose costly installations on small food producers on the pretext that their activities are not hygienic, which few can afford and which thereby pushes many of them out of business.

These hygiene regulations were drawn up in 1995 by the World Trade Organisation (WTO), but governments were allowed a five year period before having to apply them. They are designed to assure that food production conforms to the Hazard Analysis and Critical Control Limit (HACCP), originally designed by Pillsbury, a multinational food company that markets Häagen-Dazs and Burger King, at the request of NASA that, at the time, wanted to assure the purity of the food available to its astronauts.

In the 1970s the US Food and Drug Administration (FDA) also adopted the HACCP as a means of doing this for the food sold on the US market and in 1991 it was also adopted by the Codex Alimentarius, an agency of the United Nations, that sets food-safety standards. This agency, that is totally controlled by transnational corporations, as has been carefully documented

in *The Ecologist*, is at present playing a leading role in enabling pharmaceutical corporations to take over the fast-growing food-supplement market, in particular that for vitamins, which up till now has largely remained in the hands of smaller companies. In addition, both the Codex and the FDA have clearly shown what their real priorities are when, under heavy corporate pressure, they authorised the use of sex hormones in meat and fully accepted the production and distribution of genetically modified foods.

It goes without saying that corporations usually want the regulations governing their activities to be as lax as possible, as are most of the regulations set by the Codex regarding the acceptable levels of the different chemicals in the food we eat – but this is not always the case. Sometimes it is in their interests to ensure that the regulations are stringent, as a means of eliminating weaker competitors which cannot afford to comply with them.

Significantly, the biotech giant Monsanto opposed a bill in the US Congress that proposed to ease Environmental Protection Agency (EPA) regulations on genetically engineered plants. Dr Miller of the Hoover Institution openly states that: 'Monsanto has had a policy of trying to keep regulatory barriers high so as to assure that other companies, even the large seed companies with which they compete, would find compliance too expensive for them to enter the market.'⁴

As Steve Gorelick has commented, if regulatory barriers can limit the options of large seed companies, then 'it is not difficult to imagine the burden they can place on really small scale business.'⁵ Wendell Berry in his seminal book, *The Unsettling of America*, also notes how 'sanitation laws have almost invariably worked against the small producer, destroying his markets and prohibitively increasing the cost of production', and as a result 'nowhere now is there a market for minor produce: a bucket of cream, a hen, a few dozen eggs. One cannot sell milk from a few cows any more, the law-required equipment is too expensive. Those markets were done away with in the name of sanitation, but of course, in reality to the enrichment of the large producers. Future historians will no doubt remark upon the inevitable association, with us, between sanitation and filthy lucre.'⁶

Ross Hume Hall notes in this *Ecologist Report* (see pp12–15) how, in the state of Vermont, where cider has never been linked to any illness, the FDA proposes that all apple cider be pasteurised or else carry a label that warns consumers that the product 'might contain harmful bacteria known to cause serious illness', a rule which would put many of the state's small cider makers out of business.⁷ Needless to say, the two largest cider producers – who account for 80 per cent of production – already pasteurise their product and would benefit from the losses of their 45 smaller competitors.⁸ He also describes how hygiene laws are killing off small cheese makers. This is particularly true of those who make their cheese from raw milk that the FDA claims to be unsafe, in spite of the fact that an FDA study in 1988 identified nine cheese-related outbreaks of disease, all of which were caused by contaminated pasteurised cheese.

Arthur Cunynghame points out (see pp18–20) that in the UK, even though less than 1 per cent of the cases of food poisoning in the country have occurred as the result of the consumption of dairy produce of any kind, stringent hygiene laws have been passed that threaten small cheese producers and in particular those who use unpasteurised milk.

Jose Lutzenberger (see pp16–17) notes how the hygiene laws in the State of Rio Grande del Sul in Brazil ban free-range chickens on family farms, as they are accused of transmitting diseases to battery chickens. Chickens must also be packed in special rooms of a prescribed size, and the walls to the height of

■ four metres must be tiled, which few small producers can afford. He shows too how hygiene laws are killing off citrus nurseries so that they can be taken over by the large citrus companies.

Giorgio Ferigo notes (see p24) how hygiene laws are putting at an end the production of an ancient local Italian delicacy called the 'Lardo di Colonnata' – which has been produced for five centuries without causing any health problems of any kind.

Richard Young (see pp21–23) shows how 50 per cent of Britain's abattoirs have closed down because they too were judged unhygienic and could not comply with preposterous EU regulations. As a result, it is now necessary for farmers to transport their cattle great distances, all crammed together in very unhygienic conditions, to the few remaining abattoirs, putting the cattle under considerable stress, reducing the quality of the meat and forcing small producers to incur transport costs that most of them cannot afford.

Vandana Shiva (see pp27–29) describes how, in India, a case of mustard oil adulteration, which even the Health Minister considers was probably the work of those who would profit by it, provided the government with a pretext for passing a regulation that bans the production and consumption of that key crop. This, as Shiva points out, can only lead to the extinction of a crop that is central to the Indian farming system and food-culture, and to the destruction of the livelihoods of millions of small farmers. The only possible purpose of this new regulation, she insists, is to justify the mass importation of soya oil from the USA – much of which seems to have been made from genetically-modified Round-up Ready soya beans produced by Monsanto, which is now very difficult to sell in Europe and, increasingly, in other parts of the world too.

In May of last year, the French government went a little too far when it issued a directive requiring that electricity and running water as well as refrigerated cabinets where fish, meat and dairy produce must be kept at a set temperature, be installed at every point of sale in open-air markets, which needless to say are seen to be totally unhygienic, and hence a serious threat to our health. It is generally recognised that these markets are a centre of social life in rural areas throughout France, and a large proportion of France's small farmers are dependent on them for the sale of their produce. It goes without saying that a large number – possible as many as 40 per cent – of the local councils that run the 6,000 towns and villages in which some 20,000 street markets still thrive, cannot afford these costly installations. Fortunately, there was a huge public outcry which led the government to withdraw the directive, presumably waiting for a more opportune moment in which to reintroduce it in a less visible form.

Killing off family cooking

But hygiene regulations are not only being introduced to kill off small commercial food-producers and retailers, the big companies even seek to take over those activities that have always been fulfilled for free in the home itself. Cooking the family meal, they realise, can be monetised and commodified, thereby providing the food industry with a lucrative market. In the UK a compliant Ministry of Education has removed 'domestic science', which included cooking, from the National Curriculum, and a modernised, technology-intensive version has replaced it. It is appropriately called 'food technology', just as a kitchen is now referred to as a 'food technology unit'. The curriculum seems to include teaching children how their food is manufactured (not cooked) in factories. It is made quite clear that this is the most 'efficient' and the most 'economic' way of producing what is at once the most nutritious, the most hygienic and hence the safest food

One of the things that students learn on the food technology

course is how to make a pizza. Of course they must use hygienically produced ready-made ingredients. Once these have been chosen, they must be keyed into the computers. The students must then analyse the pizza for its 'nutritional content', and design the appropriate plastic packaging, on which the nutritional information, calculated of course by the computers, will figure prominently.

If home kitchens are now seen as little more than relics of our unhygienic past, school kitchens, or rather 'food technology units' are also seen as terribly unhygienic and are being systematically closed down so that our children can be fed on cheap, industrial, mass-produced and largely devitalised food, churned out on the assembly-lines of large ultra-hygienic food-catering companies.⁹

But 'the blame' as Tim O'Brien makes it clear, 'should not be heaped on hygiene in the kitchen but on the squalid conditions in the intensive farms' (see pp30–34). He documents how factory farming, by its very nature, can only lead to the spread of disease. He rejects the prevalent view that small unhygienic food producers are responsible for the current food poisoning epidemics. Indeed, government policies have already killed off most of them, and there have never been less of them than there are today. Instead food production is now in the hands of a tiny number of massive companies with 80 per cent of dairy production in the United States controlled by three companies – Parmalat, DeanFoods, and Suiza¹⁰ (and we now learn – 5 April 2001 – that Suiza has just bought Dean Foods) and just five multi-national food giants accounting for 80 per cent of the UK grocery trade.¹¹

Of course, under such 'ideal conditions' food poisoning should now be a thing of the past, yet the very opposite is true. In the UK it has actually grown sevenfold, to a figure of approximately one million cases a year,¹² and in the USA according to the Center for Disease Control (CDC) 81 million Americans suffer from food poisoning every year, though the figure of 266 million that is suggested by Maurice Potts, one of its officials, may be closer to the mark. This should make it perfectly clear that it is the big intensive food producers, not the small ones, that are responsible for the epidemic of food poisoning and, as it happens, for the growing incidence of other diseases as well.

The health of our intensive-farm animals

When one considers the hideous conditions in which they are kept, it comes as no surprise that the health of our intensively reared farm animals is atrocious. In addition to foot and mouth disease, which has just broken out again in the UK and Mad Cow disease, we learn from our Ministry of Agriculture that there is now a high incidence among our cows of Bovine Aids (referred to as BIV instead of HIV) the antibody for which is apparently found in 10 per cent of our milk supply.¹³ There is also a growing incidence of bovine viral diarrhoea. Bovine tuberculosis like mastitis is also a growing problem, which is blamed on the badger whereas the real cause is the stress to which our cows are being subjected by being fed on a disgraceful diet and made to produce more milk than they can possibly do with impunity.

The health of our intensively farmed animals can only further deteriorate if our government accepts the use of rBGH, a genetically modified form of a naturally recurring hormone that will apparently increase milk production by 15 per cent or more, which Monsanto has been aggressively marketing. This will make cattle much more prone to develop mastitis, to increase the number of deformed and stillborn calves, and reduce the life span of the cattle themselves.

Only a fool can believe that feeding people with milk derived from such unhealthy animals can be done without risks. This is



true of milk obtained from animals that have been treated with rBGH. Among other things, we know that the milk of cows suffering from mastitis contains pus, and the disease is usually treated with antibiotics, traces of which are found in the milk produced, which has also been found to contain high levels of another hormone, IGF-1. The consumption of IGF-1 by humans has been linked to an increased incidence of cancer.¹⁴

If keeping animals in intensive conditions, and in particular in factory farms must lead to the spread of disease, in this *Ecologist Report* Stephanie Roth (see pp35–38) also makes it quite clear that much the same can be said for the highly intensive salmon-farming industry in Scotland. I doubt if anyone who reads her article will now want to eat too much of the produce of intensive-fish farms.

The use of antibiotics

Richard Young (see pp39–40) also makes it quite clear that one of the most serious problems associated with intensive food production is the use of antibiotics as growth promoters and for therapeutic purposes. It is largely such use of antibiotics that is responsible for the resistance developed by pathogens to these drugs, which are the same as, or very similar to, the drugs used for the treatment of human diseases, including pneumonia and tuberculosis. Such resistance is apparently building up so quickly that we may well now be entering the 'post-antibiotic age', in which few developments will have a greater impact on human health. Though it is possible that the use of antibiotics as growth promoters could be dispensed with, their therapeutic use is essential if vast numbers of animals are to be crammed together in the same restricted space and subjected to such highly stressful conditions.

Irradiation of our food in the name of hygiene

Equally worrying is the fact that the vulnerability of intensive farming operations to outbreaks of food poisoning is providing a pretext, as Samuel Epstein notes (see pp 41–43) for industries to lobby governments to pass regulations imposing food irradiation, in particular of food which is imported from abroad, where livestock may be kept in even worse conditions than in the industrialised world.

This is a very cynical move as, among other things, irradiated beef will contain untested chemical compounds which have the potential for causing cancer. In particular it will contain a level of benzene, a powerful and well-established carcinogen, that is some ten times higher than is found in non-irradiated beef.

It is true that outbreaks of infectious diseases have already occurred as the result of importing food produced abroad in poor conditions. A large outbreak of *Shigella sonnei* infections

occurred in Great Britain, Norway and Sweden in 1994, due to contaminated lettuce imported from southern Europe. But the answer is simply to import less food from abroad. Such importation is dangerous in any case, as it is likely to contain micro-organisms to which the importing population have not had the opportunity to develop any immunity and that will thereby be pathogenic to those consumers.

The growth in imports is, among other things, already straining the food safety system. David Kessler, ex-commissioner of the FDA, complains that 'we built a system 100 years ago that served us very well for a world within our borders. We didn't build a system for the global market place.'¹⁵

In addition, within the context of our global trading system, the massive increase in imports and exports makes it inevitable that a disease that affects farm animals in one locality, which in normal conditions would only affect the local population, can now rapidly spread to just about everywhere in the world. This is exactly what happened with dioxin-tainted chicken, which caused a scandal in Belgium in 1999. The same has happened with Mad Cow disease and is now also happening with foot and mouth disease. The latter is something we will have to learn to live with and slowly our cattle will adapt to it as has happened in India, where it is now but a very minor ailment. If each time this disease makes its inevitable reappearance we decide to slaughter all the cows in the affected areas, and do nothing to prevent the long-term incidence of the disease, we shall wipe out our farming communities. If we really want to prevent its periodic reappearance, we have no alternative but to get out of the global economy, ban the import of cattle and the meat derived from it, and raise cattle exclusively for our own use. In other words, it is only in a strictly local economy that the incidence of this and other such diseases can be reduced, and in some cases, eliminated.

This is still more obviously the case with the BSE contaminated feed. The feed derived from old dairy cows, which is likely to be the most contaminated, as is pointed out by the *International Herald Tribune* Insight Team, 'is pooled in beef patties, meat pies, and pasta fillings, meat from as many as 60 animals may go into a hamburger mix. Some of the cheapest meat is stripped by machines and high-pressure jets from the bone, which is likely to be highly infectious in a sick cow. Each cow provides about seven kilograms of machine-recovered meat that is incorporated into five to seven tonne batches of material. The EU Standing Scientific Committee estimated that each batch contains from about a thousand animals, any one of which could infect the whole, and expose as many as 400,000 persons to the agent.'¹⁶

For this reason alone, it is not just beef eaters who in the UK run the risk of contracting BSE (assuming of course that it is actually caused by the prion that is incriminated), but worse still, potentially infected beef derivatives are used in all sorts of processed foods such as caramel candy, marshmallows, doughnut glaze, fruit juice, wine and beer, sour cream and yoghurt, cottage cheese, ice cream, margarine and chewing gum.¹⁷ They are also used in a whole range of manufactured goods such as pharmaceuticals, including vitamins, which are often encased in gelatine, 65 per cent of which comes from crushed cow bones. It is also used in capsules, coated pills, blood replacement solutions, arthritis and plastic surgery treatments, bandages, dental sponges (which are used in surgery)¹⁸ as well as baby food, pet chow and beauty preparations. Derivatives find their way into vaccines, including polio-vaccine, activated from British bovine serum produced when mad cow disease was at its height, and which, believe it or not, was administered to 11 million children. The serum was also used in vaccines against measles, mumps, rubella, diphtheria and whooping cough until as late as 1993.¹⁹ ■

✦ This being so it seems clear that the entire population of England and vast numbers of people in countries throughout the world may well have been exposed to infected material, which is very worrying indeed.

Germophobia

The present hysteria over germs, based on our vision of them as implacable enemies of humanity that must be exterminated at all costs, regardless of consequences, is not without precedent.

As early as the 1890s, the work of Koch and of Pasteur, the two fathers of modern microbiology, was interpreted in such a way that it gave rise to a veritable hysteria over hygiene. As Joanne Brown explains: 'People stripped their homes of allegedly microbe-laden furnishings,' they learned to 'avoid other people's sneezes and coughs' and to shy away from familiar social customs such as handshaking and baby kissing. Hotels, she adds, 'began to use extra long sheets so that sleepers might fold them back over potentially germ-ridden blankets ... churches adopted individual communion cups, and cities installed sanitary water fountains to replace the contagion-spreading common cup.'

Brown tells us how all efforts to avoid contact with germs was seen as 'a fine action, a sort of religion, a step in the conquering of evil, for dirt is sin.'²⁰

Microbes, as Nancy Tomes notes, were often described in martial terms as 'attacking, invading and conquering their human host', and the public was also egged on by members of the medical profession. Thus Dr William Mays assured everybody that germs 'hunt in packs' and another physician referred to them as 'atmospheric vultures.'²¹

All this, of course, presented a bonanza for entrepreneurs, providing a market for all sorts of products that could contribute to the war against germs. Thus the Johnson and Johnson Company informed readers of the *Ladies Home Journal* that: 'there are invisible, ever-present living particles (called germs) everywhere, they quickly lodge in the open flesh by contact with the air, dirt, unboiled water, clothing, skin, unclean bandages, and unsterilised hands. The consequences may be blood poisoning, inflammation, gangrene, fever, lockjaw, and a train of complications,' hence they must rush off and buy Johnson and Johnson's 'Red Cross Absorbent Cotton' while there is yet time.²²

The advertisements for the antiseptic Listerine, in the *American Home Journal*, focused on the dangerous germs carried on a human hand, which was supposed to carry no less than 17 diseases. Mothers were warned that, 'if you could look at your hands under a microscope you would hesitate to prepare or serve baby's food, or give him a bath, without first rinsing the hands with undiluted Listerine.'²³

However, in the inter-war years, the gospel of germs, 'started to lose its credibility. It was shown, for instance, that 'air drawn from the foulest of rooms and the dankest of sewers contained no live bacilli capable of causing disease.' In Cuba, an American Commission led by army surgeon Walter Reed showed that 'the bedding and clothing of yellow fever patients could not convey the disease to a well person, no matter how laden these fabrics were with their discharges.' Under these conditions the sales talk had to change.²⁴

From that point onwards, the reason given for waging the war against germs was less that they caused disease and more that they reduced one's social acceptability, and of course one's personal attractiveness. A girl with 'halitosis' was made out to be 'always a bridesmaid, and never a bride.' However, today, public hysteria over germs is rampant again, resuscitated largely by commercial interests that seek to maximise the market for the countless disinfectants and antibiotics that they wish to market.

On purely theoretical grounds, this war is idiotic. Microbes are everywhere. They can flourish in almost any conditions (see Gary Hamilton, pp46-55). As Bernard Dixon tells us, 'microbes have a unique capacity to adapt... microbes were not only here before us, it is they, not humankind, that will inherit the earth.'²⁵

It is equally idiotic to wage chemical warfare against the vectors of disease. Mosquitoes for instance, although they cannot adapt to the poisons we spray on them as quickly as microbes, still learn pretty quickly, and in a variety of different ways. For instance, during the WHO's campaign to eradicate malaria in South Asia, some mosquitoes quickly learned not to alight on the walls of the huts that had been sprayed with DDT, others simply became much fatter so that the poison could be correspondingly diluted. Others developed a thick cuticle through which DDT could not penetrate, while still others developed an enzyme that breaks down DDT into a perfectly harmless substance. Let us face it, life processes are intelligent, contrary to what neo-Darwinists and sociobiologists tell us.²⁶

The war that we continue to wage against weeds, fungi, nematode worms, rodents, and God knows what else, is equally futile. We have no chance of winning it, except in very rare conditions. However, the war goes on regardless, as a lot of money can be made in selling the poisons. Unfortunately for us, the reductionist and mechanistic science that is still taught in just about all our universities serves to rationalise and hence legitimise this simplistic approach.

Vandana Shiva sums it up very well with reference to the war we are waging against agricultural pest. 'Reductionist science,' she writes, 'was concerned with merely the existence of pests, not with the ecology of pests. The solution that suited both science and the pesticide industry was the production and sale of poisons to kills pests.' In the same way that for the miners and loggers who invaded the American West 'the only good injun was a dead injun', as a pesticide company announced in a television advertisement: 'The only good bug is a dead bug.'²⁷

The truth is that man does not live in an ecological vacuum. The great microbiologist, René Dubos, arguably the founder of what we might refer to as 'the ecology of health', warns us explicitly that the 'elimination of one type of micro-organism simply creates better opportunities for other potential pathogens.'²⁸ Thus the pasteurisation of milk creates a sterile, and hence highly hygienic, medium that could not be more vulnerable to colonisation by a potential pathogen. Raw milk on the other hand harbours a large number of different micro-organisms providing only a small niche for the potential pathogenic invader to occupy. René Dubos fully realised this. 'It is far from certain,' he wrote, 'that trying to eliminate living species is a wiser and more effective course than learning to achieve peaceful coexistence with them through an understanding of their habits.' He even refers to the attempt to exterminate them as a 'Utopian strategy.'²⁹

Dubos also notes that 'among people who live without sanitary facilities, polio viruses are ubiquitous and contaminate everyone; as a result, immunization to them occurs spontaneously during the first months of life, and paralytic disease is rare. In our communities, sanitary practices minimise early contact with polio viruses and thereby prevent the spontaneous development of immunity.'³⁰ What we have here is a disease caused by hygiene.

In any case, if we are really interested in maintaining our own long-term health and that of other living things including our farm-animals, then we have no choice other than coexistence with 'germs'. We must realise that humans, like all other biological organisms, is not just made up of animal cells (eukaryotes) but also of microbial cells (prokaryotes), the latter outnumbering the former by something like 10 to one. What is

more, we couldn't live without them. For instance, we desperately need micro organisms such as the enteric bacteria and the yeast of our gut, which manufacture vitamins and help metabolise our food.

We must realise, as Dubos notes, that our anatomical structures and physical needs have been determined, in part at least, 'by the microbiota that prevailed during our evolutionary development.' That we are desperately dependent on those organisms is made clear 'by the anatomical and physiological abnormalities displayed by germ-free animals.'³¹ Dubos catalogues these, showing that a small number would preclude the animal's survival under normal conditions.

Our dependence on our indigenous microbiota is further confirmed by the fact that many of the abnormalities one finds in germ-free animals are rapidly corrected if the animals are brought into contact with the right kind of bacteria.³²

One of the most important things that Dubos insists on is that, in normal conditions, even potential pathogens can persist in our bodies without causing any evident disease. Indeed, it is only in rare instances that they do. As Dubos puts it, 'more often than not humans can harbour all sorts of extremely

Large-scale fruit and vegetable plantation, Spain



dangerous bugs like Salmonella and Diphtheria with total impunity, while it is only in exceptional circumstances that they develop the diseases associated with them.'³³

Louis Pasteur, towards the end of his life, said exactly the same thing. 'Le microbe n'est rien,' he wrote, 'le terrain est tout' [the microbe is nothing, the [environmental] conditions are everything].

But, we might ask, in what conditions do microbes become pathogenic? For Dubos, the answer is under conditions 'that differ from those under which the evolutionary equilibrium between host and microbes became established.'³⁴ This occurs, for instance, when 'the host species suffers a nutritional deficiency, or is exposed to toxic agents or certain types of stress', which thereby create a 'physiological disturbance.'

Dubos might have equally have called this physiological crisis, a disturbance in our internal ecology, produced when the host is exposed to microbes to which it has not developed any immunity during its childhood, or to microbes of alien origin, or even worse, to genetically modified microbes of which our species as a whole has never had any experience.

I am sure that he would have agreed. In any case, what Dubos is saying, and this is his most important contribution to the whole issue, is that it is not the microbe that causes a disease in humans or other forms of life, but a breakdown in the balance

between them and the microbial population that is an essential part of them. This, in essence, is the ecological or holistic approach to the subject, as opposed to the reductionist and mechanistic approach, which is fundamentally wrong.

Pasteur himself noted that, in certain cases, the physiological disturbance Dubos refers to could be the primary cause of the infectious process rather than its consequence. The virus that causes influenza for instance, may well not be the cause of influenza at all; but merely one of its consequences or, one might say, of its symptoms. In certain cases, a disease itself, whatever its unknown original cause, may well have been a 'condition' which actually made possible the development of the pathogen.

The real answer, except of course in emergency situations in which an antibiotic may still be life-saving, is to restore the balance between humans and their indigenous microbiota. It is interesting to note that non-human animals do just this, by indulging in coprophagy when their internal ecology has been disturbed. They do so 'if fed on diets deficient in thiamine, riboflavin, vitamin B12 and other vitamins which are presumably synthesised by microbes that form part of their indigenous biota.'

That the prevention of coprophagy in rats has a deleterious effect on their health is evidenced from the fact that it 'reduces their (normal) growth rate by some 20 per cent even when fed on a complete diet.' What is particularly interesting is that this seems to apply to humans as well, which, as Dubos notes, is suggested by the ability of vegans to remain healthy even though their intake of vitamin B12 is extremely low. This is because 'bacterial synthesis of the vitamin takes place in the intestine of these vegans much as it does in sheep and other animals.'³⁵

Dubos sums up his position on the subject very clearly. I think it is worth quoting it in full:

'The more important reason for the stubborn persistence of infection lies in our lack of understanding of the inter-relationships between man and his

biological environment. There are many forms of infectious diseases that are not prevented or cured by sanitation, vaccines, or drugs, and indeed are probably not amenable to control by these approaches... The microbial diseases most common in our communities today arise from the activities of micro organisms that are ubiquitous in the environment, persist in the body without causing any obvious harm under ordinary circumstances, and exert pathological effects only when the infected person is under conditions of physiological stress. In such a type of microbial disease, the event of infection is of less importance than the hidden manifestations of the smouldering infectious process, and than the physiological disturbances that convert latent infection into overt symptoms and pathology. This is the reason why the orthodox methods based on the classical doctrines of epidemiology, immunology, and chemotherapy are not sufficient to deal with the problem of endogenous disease. The need is to develop procedures for re-establishing the state of equilibrium between host and parasite.'³⁶

People are just beginning to understand this. Thus, for Dr John Warner of the Department of Child Health at Southampton University, 'there is less and less dispute that the absence of dirt in our lives is responsible for the dramatic rise in asthma rates' (5 per cent of children were affected 20 years

ago and today the figure is 20 per cent). He notes that in developing countries the rates are rising too and in particular among the affluent who have adopted westernised lifestyles.

'All the evidence in asthma research,' he tells us, 'is beginning to make it clear that our relatively sterile lives fail to expose a baby, at the right time, to bacteria that should flourish in the bowel and kick-start the immune system to fight off allergens.' For Warner, 'the theory gains credibility with every new piece of research that comes along.'³⁷ According to Warner, children sometimes only a few weeks old are already being fed bacteria in order to build up their immune system against certain diseases that may be prevalent in their area, lactobacillus bacteria that are an essential part of our indigenous microbiota for instance, and even BCG, a tuberculosis type bug, in areas where TB has become rife.

Michael Doyle, director of the university's Centre for Food Safety notes that, 'in most animals these friendly bacteria have killed all the 0157 bacteria by germ warfare inside the gastrointestinal tract within two weeks.' Gary Hamilton goes into this key issue in greater detail (see pp46-54).

A new veterinary medicine, called CF-3 or 'Preempt', has been launched which contains a mixture of 'beneficial microbes' that occur naturally in chickens. It was approved by the FDA in the USA in March 1998. This is indeed a very encouraging development. However, if one wished to be a purist, one could argue that Preempt is merely providing, in a contrived and expensive way, a measure of immunity against the action of pathogens that would be naturally transferred from a mother hen to her chicks largely through her faecal droppings, if she were not totally isolated from them in her factory environment. The real solution is thus to return to smaller-scale, more natural and indeed less 'hygienic' methods of rearing chickens.

A paper presented at the annual meeting of the American Association for the Advancement of Science describes experiments recently conducted at the University of Georgia which has successfully removed the *Escherichia coli* O157 strain, so seriously implicated in recent outbreaks of food poisoning in the UK and elsewhere, by administering 'probiotic' cultures of other *E. coli* strains that are harmless to people and animals, including the cattle that harbour the bacterium.

It must be clear by now that the hygiene regulations that are

the subject of this *Ecologist Report*, have very little to do with reducing the incidence of food poisoning among the general public. Their object is to make a further contribution towards all the disgraceful policies whose object it is to transfer food production and distribution to a handful of colossal transnational corporations that increasingly control government policies in just about every sector of the economy. If we are really to improve our health, and in particular the incidence of food poisoning, then this policy must be totally



reversed. Significantly, both the German and the Italian ministers of agriculture have recently stated in so many words that the era of industrial food production is now over. Not so in Britain, where the Minister of Agriculture has just announced (11 April 2001) that it is now official government policy to kill off what remains of the small farming community, for intensive large-scale farms, we are told, are more productive and - I suppose - more hygienic too.

I think any sensible person today must realise that industrial food production must be phased out, and phased out very quickly. At the same time, the appropriate regulatory measures must be taken to assure the re-emergence of a decentralised food production system in the hands of small independent farmers, cheese makers, bakers, butchers, and grocers, geared to producing healthy, natural, organic foods, catering for a largely local market.

The public is now ready for this transition. It is totally disenchanted with industrially-produced food and it has every reason to be. Sales of organic food are booming. The market in the UK is increasing at the rate of 40 per cent per annum and will continue to increase, especially if the government cooperates in creating the right conditions, which it has totally failed to do so far. Only such a food production system is compatible with ensuring the health of the general public, providing a stable livelihood for a significant proportion of our population, and providing the economic infrastructure for a healthy community-based rural society. I would go further, and say that only such a food production system can begin to satisfy basic biological, social, ecological, and moral imperatives.

Teddy Goldsmith is the founder of The Ecologist.

Hygiene regulations: big supermarkets rarely apply them in any case

Within the last two years, 44 supermarkets in the Detroit area were issued 'insanitary notices' because of conditions of extreme filth or pest infestations that could cause serious food contamination. More than 20 per cent of Detroit-area stores are cited for so many problems that they fall under the E-rated group of grocers - those that have to be re-inspected every month.

Corporate Crime Reporter, 1 May 2000.