F O R U M

What causes environmental conflict?

David Clutterbuck

WHENEVER A COMPANY'S PRODUCT comes under suspicion of being an environmental pollutant or a health risk, a clash with a public pressure group seems to be inevitable. For a long time the company's managers could take a kind of cold comfort in the fact that the public generally has a highly distorted idea of relative risks, and thus dismiss the pressure group because it did not know what it was talking about. Several studies in the US have shown that people tend to differentiate between risks they take voluntarily, such as riding a motorcycle, and involuntary risks, such as cancer from food additives or radiation from nuclear power stations. Their resistance to the involuntary risks is up to 1000 times higher, even though the statistical likelihood of being affected is far smaller.

Over the past three years, however, research by Dr David Ford of Bath University has shown that the companies behave equally irrationally. Ford has traced the development of a considerable number of conflicts between companies and environmental groups and found that the majority follow the same pattern. The managers, it seems, tend to work within equally blinkered viewpoints and are only deceiving themselves when they believe they are in control of the situation. This may explain why, in all but a handful of cases, the companies ultimately either lose the conflict in the long term, or have to make costly compromises.

Ford divides the typical environmental conflict into six stages. The first of these is peace, the calm before the storm. The company is not doing any serious studies into possible ill-effects of its products, or, if it is doing such studies, no one is likely to take much notice because a lot of careers are tied up in making the product work and getting it sold. A campaign may already have started against the product somewhere else, but everyone prefers to assume "it couldn't happen here". A current example of this might be junk foods, sales of which are already restricted in some developing countries, and which are under attack in the US for their low nutritional value.

The company, having failed to take advantage of the time of peace to formulate realistic strategies, is caught on the hop when matters enter the stage of skirmish. The instinctive reaction of the company is to treat the matter as a minor nuisance, assume it will go away and either issue blind denials that there is any problem at all, or simply refuse to comment. The initial concern of the pressure group is quickly turned into hostility and battle lines are drawn.

The role of the media then becomes significant. If journalists receive the same unsatisfactory replies, the hunt is on, and the company may well end up with a straight flush of opposing groups—the press, the public and the legislators. If it can convince the media it has nothing to hide, the company may be able to deaden the conflict and even obtain public and governmental support. Ford quotes as an example of how not to do it, Shell's reaction to suggestions that Vapona was a health hazard. By refusing to discuss the issue, the company escalated the conflict, brought the issue to wide public notice, with inevitable effects on sales, and was faced with calls in several countries to ban the product.

Skirmish quickly leads to outright conflict, in which the company, stung by the bad publicity and still convinced it is being unfairly treated (usually without more than a surface analysis of the issues involved) strikes back. It calls press conferences takes advertisements in newspapers, lobbies government and generally tries to put its side of the case.

In a small number of cases, the industry's argument is so strong that the pressure group is defeated in the public debate. One such example is the conflict between the water industry and the anti-fluoride lobby. Usually, however, the company's position has been so eroded that no one will now believe it. Legislation may be passed to force it to accede to the demands of the pressure group. For example, non-returnable glass bottles have now been banned in several US states. Alternatively, the company may see the way the tide has turned, and quietly withdraw while it works out how to cope with the inevitable.

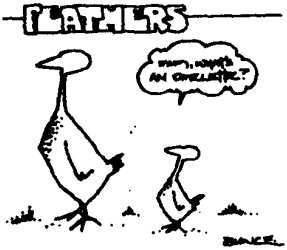
After this fourth stage of *defeat*, comes what Ford calls *"Victory from defeat"*. The company does what its critics had said it should have done all along, or offers major concessions that are a long step in that direction. It then uses the concessions it has had to make as positive selling points that distinguish its product from those of competitors.

Finally, Ford maintains, companies reach the sixth stage, called *pre-emptive strike*, in which it learns to design other new products to meet environmental and health needs.

According to the analysis at Bath University, it is the company, through the inflexibility of its reaction at the initial stages of this development, which is largely to blame for the progression of events. However, there are examples of companies which have been able to skirt the most damaging of these stages.



One of these is Monsanto, whose reaction to the possibility that polychlorinated biphenyls (PCBs) might be an ecological disaster was a classic of how such issues should be handled, says Ford. Monsanto began to investigate the dangers as soon as they were seriously voiced. It insisted on keeping an open mind about them. As soon as evidence appeared that there was a strong chance PCBs were a hazard, it published the results of its investigations, admitting the danger. It thus established a reputation of honesty even among the environmentalists. At the same time, it divided its market into two—those sections where it could control what happened to the PCBs when their useful life was over, and those where it could not. All those where it could not exercise control, it stopped supplying. By this swift action, maintains Ford, Monsanto prevented PCBs from being banned completely, and preserved a market that has since grown but is no longer a serious environmental hazard. ▶



Poison pen

SOME humourist at Shell evidently believes in the adage "The pen is mightier than the sword". Bored with those uninspiring strips of yellow plastic that drive away house flies with pyrethroid vapours, the company's technologists must have spent some considerable time gazing through laboratory windows. At the height of summer, their musings will have been disturbed by buzzing insects looking for the shortest, if not the easiest way out.

What, they asked themselves, if we were to apply the poison to the windows, to catch the little devils at the moment of maximum panic?

Well, to cut a long story, as they say, short, Shell has announced a felt-tip pen that writes an invisible tale of carnage on innocent glass. Wandering flies blunder into a short note and expire—on the dotted line. Which all suggests hours of endless fun thinking of suitably doom-laden scribblings to leave for posts: how about "sugar is bad for you" or, for the ecumenical fly, *"Mene, mene, tekil upharsin"*? □

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A similar tale concerns Clark's, the Street shoemakers, who were approached by Friends of the Earth to stop using leather cured with sperm whale oil. At first the company replied that it bought its supplies from several hundred sources around the world, and could not possibly exercise any control. FoE would have to take on the producers themselves. While FoE was gearing itself up for a "Schweppes" style conflict, chairman Daniel Clark went back to fundamentals. Was it really true, he asked his managers, that they could not oblige the producers not to use sperm whale oil in leather destined for the firm?

Eventually it was decided that Clarks was such a big customer that the majority of suppliers probably would comply. The company sent a letter to all of them explaining that leather cured with sperm whale oil would no longer be accepted after a given date. Three months later it told them it had installed an electrospectrometer to test samples of leather delivered. After the return of several lots of leather, supplies with the offending traces dwindled to a trickle and the company is now convinced that virtually every shoe it produces has been produced without whale oil. □

Science teachers

Eric Deeson

OK, THERE ARE LIES, damned lies, and statistics. The 1981 annual meeting of the Association of Science Education produced many of the last. During the meeting, held at windy Warwick University, there seemed almost as much concern about the future supply of science teachers as about the effects of "these cuts".

I don't think many people thank Maggie for the latter. All the same, while the depression has devastated science education, there are those who reckon that the cuts should make our work more efficient, get rid of the dead wood, allow us to concentrate on real science rather than fancy schemes. You know the sort of thing; I heard such views from teachers, publishers and equipment manufacturers.

Here I want to concentrate on the supply of science teachers. Here, maybe, you, as ratepayer or parent, can thank Maggie for one clear benefit of the depression. More people are coming into science teaching *from industry!* At the same time, more students seem to be looking towards education rather than to industry for a career. If teaching is the last resort of the graduate—yes, that ridiculous statement is still often made—there must be hope for us if all other resorts are closing!

The "lies, damned lies, and statistics" comes up because there is clearly quite amazing uncertainty about the "quality" and quantity of our present and future science teaching force. Any number of surveys have been carried out; their



criteria vary—so do their resultant conclusions. Thus, according to the Department of Education and Science, a couple of years ago there were about 12 000 folk teaching physics in England and Wales. (I shall tend to concentrate on the physics as this is where there is most concern.) Only two-thirds of those are qualified in physics, and they average less than half a full time-table in physics classes.

On the other hand, it seems that there are about 8000 qualified physicists in the schools who are not teaching the subject. This figure excludes head teachers and deputy heads, a fair proportion of whom are physicists. It also excludes physicists who head non-science departments; there are perhaps another couple of thousand there. No, most of these people are into maths, apparently.

So it does seem clear that the main problem with physics teacher supply is that of deployment. Or does it? As soon as one examines the meaning of the word "qualified", one starts to get stuck. In most cases it seems to mean having made some tertiary level study of the subject in question.

Now there aren't many single-subject graduates, so in all these statistics there is a huge amount of unquantified double-counting. I myself read two subjects in my first degree, and took maths as subsidiary. Buried in DES figures I have three bodies. I am a qualified physics teacher, teaching physics for 40 per cent of the week. But I am also (they say) a qualified economics teacher, and a qualified maths teacher—and I count as having left the profession as far as these two theories are concerned.

The surveys, however varied in their criteria and frames of reference, do tend to agree that there is a shortfall in physics teacher supply of about 5 per cent a year. If we want to improve things, so that 90 per cent of physics classes have a qualified physics teacher to play up, we are 20 per cent below strength. If we want to let physics teachers take a fair share of general science classes (and we do, don't we?), we must raise that figure much further.

Agreement then? Ah, no. All the above applies to the late 1970s. Now we must start to consider the future; the effects of these famous falling rolls are only now beginning to become obvious. Even demographers can be entirely categorical here. Excluding the holocaust or a huge rise in births, in 10 years' time there will be only two-thirds as many 16-year-olds to teach as there are now. After that the new bulge starts. How far does that go? Back to the crystal ball.

Surely, however, the solution is obvious. There is a 30 per cent shortage of physics teachers; demand will fall by 30 per cent over the next 10 years. Back to you, Maggie. Let us use falling rolls to solve the shortage of teachers in some subjects. Well, I know it is not so easy. Practising science teachers tend to be younger than colleagues in other departments. (We have the 1960s expansion to thank for that.) But wastage rates are high, and unpredictably variable. And computing is beginning to take physics teachers out of the laboratory. And the curriculum is changing. And some schools don't have physics teachers to retain anyway. And without state direction (vaguely attempted only in Scotland) discontinuities appear too easily.

Now in early 1981, there is great concern in education about redundancies and closures. We science teachers are not immune from that. Yet perhaps 3000 attended all or part of the ASE annual meeting at Warwick, an extremely good number considering that many had to pay much of the cost. Rumours abounded of suppliers on the point of sinking, but the number of new books and items of equipment remains fairly high. It is interesting, to note, by the way, that several suppliers admit that it's only sales to the Third World that are keeping them alive—is this not supposed to be a world recession?

At Warwick the mood was of great optimism. All I know is, I have just lost $1\frac{1}{2}$ Advanced-level chemistry teachers and there's no sign of replacement. Thank you, Maggie. □

Why American scientists are up in arms

Dan Greenberg

IS IT POSSIBLE to glimpse signs that might suggest the science policy of the Reagan administration?

Nothing has been explicitly stated on the subject, which isn't out of line for this stage of a presidency. And there's still no presidential science adviser, though one is expected to be appointed shortly to take charge of a scaled-down

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