numerous fires started by the explosions. This may yet prove to have the most detrimental effect on survival after a nuclear war. Surely these problems call for detailed, multi-disciplinary investigations on an international scale.

But even in the well-established effects — blast, heat and radiation — large gaps exist in our knowledge, allowing widely differing estimates of casualties to be made. For example, the Home Office calculates that in an attack on the UK with nearly 200 megatons, deaths from radiation exposure would number less than one million, whereas a group of independent scientists showed that about four million radiation fatalities might occur in the London area alone after a 13 megaton attack! Very considerable differences also appear in estimates of blast casualties.

The medical profession — nationally and internationally — is profoundly concerned about these issues, not least because doctors are being asked to participate in medical planning for the aftermaths of a nuclear war. In 1981 the Annual Representative Meeting of the British Medical Association passed a resolution calling for a review of the medical effects of nuclear war and the value of civil defence, to help the BMA in formulating a policy. A special Working Party studied the problem for 18 months; its results are now presented in *The Medical Effects of Nuclear War.*

In order to assess the magnitude of the medical problem, the Working Party first discussed the scale of a presumed Soviet attack on the UK. It concluded that the attack is likely to be of about 200 megatons, which corresponds to over 3 tons of high explosives for every inhabitant of these isles. This happens to be the same quantity as available in the nuclear arsenals for every inhabitant of the globe. Considering the large number of targets in the UK, an attack on this scale seems a very conservative estimate. Indeed, the Working Party adds that the level of attack might be several times higher should cruise missiles be deployed.

The next step was to calculate the short-term casualties from such an attack in the light of the divergent estimates mentioned above. After a detailed analysis, the conclusion reached was that the independent scientists — who used mainly semi-official American data — gave a more realistic estimate of the blast, heat and radiation effects than the Home Office. As a result of questioning of the Home Office, the latter is revising its calculations; this can be chalked up as an important concrete achievement of the BMA study.

The actual number of fatalities is estimated as between 25 and 40 million, depending on various assumptions made. From the point of view of medical involvement, the number of injured people (estimated to be several million) is of prime importance, but the exact number does not matter a great deal since even the most optimistic estimates far exceed the capability of the medical profession to cope with the situation. Surprisingly, this aspect is not discussed as widely as might have been expected in a report from a medical group. For example, the difficulty of triage (segregation of victims into three groups: with a poor chance of survival; with a reasonable chance if treated; with a good chance even without treatment), which is bound to be a major problem, is mentioned but is not considered in detail.

In a revised edition of the book, these aspects ought to be given more weight (and greater care taken in the editing and proof-reading). But the conclusions are not likely to change: the National Health Service could not deal with the casualties even from a single one-megaton weapon. "It follows that multiple nuclear explosions over several, possibly many, cities would force a breakdown in medical services across the country as a whole". □

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Tango with a quango

Philip Lowe

Policing Pollution: A Study of Regulation and Enforcement.
By Genevra Richardson with Anthony Ogus and Paul Burrows.
Oxford University Press: 1983. Pp.204. Hbk £15, $34.95; pbk £6.95.

"MEMBERS of the public do not commonly concern themselves with the maintenance of sewage quality", remark the authors of *Policing Pollution.* Quite so. Instead, the necessary task of checking what is discharged into the public sewers of England and Wales is relegated to the Regional Water Authorities, set up in 1974. The sewers have to carry not only domestic sewage but industrial wastes, and that is where difficulties arise. For some liquid wastes may pose a health risk to sewerage personnel; other wastes may damage or overwhelm the capacity of treatment plants and thus pollute the watercourses which receive the treated effluent.

To prevent such occurrences, all discharges from trade premises must be licensed by the Water Authorities. The licences are called consents and they impose specific conditions on the composition, volume and rate of discharge of effluent. The Water Authorities are accorded considerable latitude in respect of the conditions and payments they may impose. They also have the power to prosecute any trader who discharges without consent or in breach of the consent conditions.

It is the way in which these wide discretionary powers are exercised that is the focus of *Policing Pollution.* One of the authors, Genevra Richardson, spent several months with the enforcement officers of two Water Authorities interviewing them about their work. What emerges is the officers' extreme reluctance to use the legal sanctions available to them. Breaches of consent conditions are routinely overlooked. Indeed, one of the Water Authorities had never brought a prosecution, even though in some areas as many as 30% of all sampled effluents were technically criminal.

The reason was that the officers regarded co-operation, rather than confrontation, as the better means of achieving their objectives. Most breaches of consent conditions did not pose a real threat to the sewerage system or the people working in it, and therefore could be safely ignored. The officers were more concerned with what might happen if their relationship with local traders broke down. The ability of industry to "pull out the plug" seemed a constant threat to be averted only by careful negotiation and mutual understanding. "If we lose co-operation, we lose control", one senior officer explained.

Law enforcement was regarded as a means of preventing harm, rather than an end in itself. This attitude fitted in with the view that officers had of themselves as technical experts helping industry overcome its treatment problems. As one officer put it: "We come in as consultants rather than as stick-wavers". They were certainly very sensitive to the practical problems, both technical and financial, faced by firms making an effort to comply. Prosecution was regarded as a mark of failure — a last resort to be used only against rogue firms.

The book breaks new ground in the empirical analysis of the enforcement of regulatory controls, demonstrating the subordinate role of the criminal law and the extensive use of non-criminal sanctions. However, it has shortcomings. No survey of traders' attitudes to enforcement was carried out, even though perceptions of these attitudes were so salient in determining the attitudes of the enforcement officers. The effectiveness of enforcement is not evaluated, despite the opening chapter's general exposition of the economics of government regulation and the claims made in the third chapter for the superiority of Britain's flexible and non-legalistic approach to pollution control.

Finally, there is no effort to draw on social or political theory to characterize the relationship between the enforcement authority and industry. It is a relationship which resembles a couple performing the tango: first one takes the lead, the other responds; and then vice versa. But throughout they remain locked in a firm embrace. □

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