THE 30th Report from the Select Committee of the House of Lords on the European Communities is a slender pamphlet which at first glance seems too trivial to merit a column in *Nature*. It comments on two draft directives from the EEC: one about pollution on bathing beaches (an unseasonable topic anyway, at this time of year), and the other about pollution from wood pulp mills, of which there are only seven in Britain.

In fact the report is anything but trivial. It raises a matter of high principle in Britain's relations with the EEC, affecting our whole policy for the control of pollution. On October 13, the House of Lords "took note" of the report and there was a short debate on it. The debate ought to go on outside Parliament as well.

The matter of principle is this. The Council of the European Communities agreed, in a declaration on November 22, 1973, that "improvement in the quality of life and the protection of the natural environment are among the fundamental tasks of the Community". Admirable. No-one would dissent from this. It follows that there must be a policy among the member states for the abatement of pollution. This policy is now being worked out through numerous draft directives from Brussels prescribing standards for car emissions, lead in petrol and crockery, sulphur in oils and, most recently, the pollution per tonne of product from pulp mills and the quality of water in which bathing is "authorised or tolerated".

The philosophy underlying these directives is to fulfil the 1973 Declaration by imposing identical and uniform standards upon all member states, from Italy jutting into the Mediterranean to Scotland jutting into the Atlantic, irrespective of the diversities in the environments of these states. There is a Gallic elegance and simplicity about this, but it is quite inconsistent with the pragmatic policies which determine the procedures for pollution control in Britain. Do we stick to our present practice and persuade the EEC to accept it? Or do we submit to these inflexible directives from the Community?

Before arguing this point we have to distinguish three kinds of standard, for this controversy with the EEC is concerned with only one of these three kinds. There is a good case for uniformity over product and design standards (for example, the level of pesticide residues in foodstuffs and the emission standards from car exhausts) because food and cars move from one part of the Community to another. There is also a case, provided it is not made too rigid, for long term objectives for the purity of the air and of

the sea. The controversial question is whether there should be Europe-wide identical standards for the quality of emissions into the air from smoke stacks and of effluents into rivers and the sea from outfalls. In other words, must specifications for the discharge of wastes into the environment be identical irrespective of the capacity of the environment to disperse or dilute the wastes?

The practice in Britain is empirical. The consents to discharge effluents, issued by a Regional Water Authority, depend on the capacity of the river or estuary, the uses to which it is being put, the pollution load it is already carrying and so on. The licence to discharge "noxious vapours" into the

elastic band ever tightening as chemical science advanced". Thus in the sulphuric acid industry in Britain there are plants emitting 5%, 4%, 2% and now 0.5% of the sulphur burnt. These different levels are related to the best practicable means for control at the time the plants were built. Had we been obliged to adopt a uniform emission standard it would either have been too lax for new works or it would have added unreasonably to the costs of running older works.

Consider now the EEC's draft directive for effluents from wood pulp mills. It lays down that within 10 years pollution shall be reduced to levels set out in the directive. These prescribe the biological oxygen demand (BOD) and suspended solids (SS) per tonne of product, above which discharges from mills will not be permitted. There is an escape clause which allows derogations from these standards if the discharge is into tidal waters, provided the discharges "do not cause an appreciable deterioration in the quality of the receiving water" ("appreciable" is not defined!). But the derogations expire after a maximum of 10 years. So this is what the directive means: that ultimately the permitted effluent standard from a wood pulp mill shall be identical, whether the mill discharges into the Thames or the Rhine or into the Atlantic Ocean off the Scottish or the French coast.

It requires no subtlety to see that this sort of rigidity would be a wasteful way to deploy the limited resources we have for the abatement of pollution. But the EEC has another reason for pressing uniformity on member states. It asserts that if the Scottish mill discharging into the Atlantic can get away with less stringent effluent standards, this will constitute unfair competition against the mill on the Rhine, which has to comply with very stringent standards. This is a phoney argument, for you might as well say that the wage rates and the transport costs for the Scottish mill will constitute unfair competition unless they, too, are identical with the rates and costs for the mill on the Rhine. "Harmonisation" of practices (as the EEC calls it) among member states is obviously a sensible objective, but it becomes irrational if it disregards the great diversity of environments in the Community.

The draft directive for the quality of bathing water is unacceptable for a different reason. It is not that we are content to bathe in dirtier water than our common market cousins bathe in; it is that a code of control which might be appropriate on a Mediterranean beach at a temperature of 27 °C would be inappropriate on an Aberdeenshire beach at a temperature

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air, issued by the Alkali Inspectorate, depends on the best practicable means for controlling the vapours at the time the works were erected, the cost of installing new equipment, the economic state of the industry and so on. In brief, the British "philosophy" (if one can call it that) is not to minimise pollution, nor to bring all discharges of any pollutant down to some uniform level (though there are guidelines for quality standards for emissions): it is to optimise pollution levels so that the capacity of the environment to accept (and in many cases to recycle) pollutants is fully used, but not abused, and industry (and thus employment) are not unduly put at risk. (Rabid conservationists need to be reminded, sometimes, that all pollution except that from atomic weapons is a by-product of processes which benefit society.) This "philosophy" can be defended on two counts: it makes the best use of the limited resources available for the control of pollution; and it acts (as the Alkali Inspector put it in a report published in 1888) as "an

(under favourable conditions) of 10 °C. The EEC directive goes into great detail about the monitoring of beaches where bathing is to be authorised or tolerated. (How does one deal with a bather who persists in bathing in a place which is not tolerated? The directive is silent on this point.) Monitoring must be carried out for each beach once a week, or once every two weeks, or once a month, depending on "the mean density of bathers per kilometre of beach" and bathing is defined as "prolonged immersion of the whole body". Bathing water is "deemed to conform to the mandatory values of the relevant parameters if 95% of the samples . . . comply with the limits specified in column I of annexes 1 and 2". Now turn to the list of parameters in the annex. They include: total coliform, faecal coliform, faecal streptococci, *Salmonella*, viruses, pH, mineral oils, surface active substances reacting with methylene blue, phenol indices, pesticides, and the following: As, Cd, Cr, Pb, Hg, CN, NO₃, phosphates and dissolved oxygen. Consider the task of carrying out these acts of monitoring, even for the major watering places round the coasts of Britain. The Department of the Environment hazarded a guess that the cost of complying with the directive might be of the order of £100 million a year. If there were a demonstrable health hazard this enterprise might be justified, but such data as we have (from a Medical Research Council report published in 1959) indicate that although many beaches in Britain are offensive to the eye and the nose, they are not a hazard to health; and the WHO still takes the view that "there are no internationally accepted criteria for the quality of coastal water for bathing with respect either to microbial contamination or chemical pollution".

There are no grounds for complacency about the state of the environment in Britain. We are certainly not in disagreement with the EEC's Declaration to protect the environment and we have, in the Control of Pollution Act, the best legislative arrangements in Europe for doing the job. The matter of principle, on which I hope Britain will stand firmly, is that each member state should be free to fulfil the objectives of the Community's environment policy in the light (as the Declaration states) "of health and ecological requirements"—that is to say, taking into account the uses to which the environment is being put, and its capacity to dilute or disperse wastes. This is the basis of our pragmatic style of pollution control. This is the style we shall have to abandon if we cannot persuade the EEC to make its directives more flexible. □

Candle power at Browns Ferry

In his third article on the state of the US nuclear industry, Colin Norman recalls the bizarre and dangerous accident at a nuclear power station earlier this year.

A FIRE, started by an electrician with a candle, disabled the Browns Ferry nuclear power station in Alabama on March 22, 1975, and sent shock waves through the nuclear industry. Officially described as the most serious accident to occur so far at an operating nuclear power plant in the United States, the fire knocked out several key safety systems, caused problems in shutting down one of the plant's two reactors, and rekindled the long-smouldering debate about nuclear safety.

A bizarre and dangerous accident which destroyed some 2,000 electric cables and caused millions of dollars worth of damage, the fire has put the Browns Ferry power station out of action for an indefinite period. It has also raised a number of serious questions about the vulnerability of nuclear power plants to such unforeseen incidents, and it may result in some costly modifications to other nuclear power stations in the United States.

The nuclear industry has, however, managed to salvage some good news from the incident. Although several key safety systems were disabled by the fire, enough reserve systems were left intact to shut the plant down safely and to avoid a major accident. That, industry spokesmen suggest, supports their contention that there are so many safety features built into a nuclear power station that if one device fails, others will be left to take over if necessary.

The Nuclear Regulatory Commission (NRC), the agency responsible for regulating the nuclear industry and ensuring that nuclear power plants are safe, shares that interpretation. In testimony before the Joint Committee on Atomic Energy last month, for example, the Chairman of the NRC, William A. Anders, said "we believe that this unfortunate and serious occurrence has shown that the reliance on the defence-in-depth concept is sound for the protection of public health and safety".

The NRC is now in the midst of analysing the Browns Ferry fire and its implications. It has already published a factual report on the accident, and in the next few weeks, the NRC will

recommend changes in design and operating procedures at other nuclear power stations to prevent similar incidents from occurring elsewhere. Its report on the fire itself is a disquieting document which reveals an astonishing lack of fire precautions, considerable confusion during the fire fighting operations, and some quick thinking in the control room to avert a major nuclear disaster.

The fire began at about 1215 on March 22, when two reactors at Browns Ferry were each generating about 1,100 MW of electricity. A third reactor, of similar size, was under construction. The fire was touched off by two electricians who were testing for air leaks around cables passing through the wall of a room enclosing the Unit 1 reactor.

The air in the reactor room is maintained at a lower pressure than the air outside, so that if radioactivity were released from the reactor, it would not immediately be dispersed into the atmosphere—fresh air would tend to leak into the reactor room rather than contaminated air out of it. The electricians were checking for leaks in a part of the wall separating the reactor room from a cable spreading room, immediately beneath the reactor's control panels. They were using the highly unofficial but time-honoured method of holding a lighted candle to the outside of the wall at the point where cables pass through it—if the candle flame is sucked horizontally, air is leaking from the cable spreading room into the reactor room.

An electrician's mate, who was doing the candle work, told NRC investigators that a fire started when the candle flame was sucked into a hole in the wall and ignited polyurethane foam surrounding some cables. He tried to beat out the smouldering foam with a flashlight, but succeeded only in burning the flashlight lens. He then tried to smother the fire with rags, but that didn't work. Somebody brought him a carbon dioxide fire extinguisher, but the CO₂ blew straight through the hole without extinguishing the fire. Fanned by the air rushing through the hole, the fire began to get further back into the wall. He tried firing off two dry chemical fire extinguishers, but without success, and about 15 minutes after the fire started, the evacuation alarm sounded in the cable spreading room where he was working.

The cable spreading room was evacuated in preparation for triggering the permanent carbon dioxide fire extinguishing system. In the meantime, another electrician raised the alarm in a roundabout way (the correct fire alarm telephone number was not listed in some plant emergency manuals, so there was some confusion)