

A Journalist's View

by David Fishlock

The professional scientist or engineer's constant complaint about science reporters is that they get it wrong; that they imbue with all the authority of Science some observation, opinion or conclusion which at best is open to argument and at worst is factually incorrect or misleading. It is a grievance I hear in many laboratories I visit, as well as in Whitehall and corporate headquarters. It is one of which I was made very firmly aware soon after I joined the *Financial Times* in 1967. A British scientist who has since risen to become one of the government corps of scientific advisors told me bluntly that he didn't waste time reading newspaper reporting of science.

More recently the indifference this physicist then showed has changed into a genuine concern at the top of the profession for the damage that misunderstandings, inaccurate reporting and biased comment can do when published by newspapers under the authoritative sounding by-line "Our Science Correspondent". Examples range from an interruption, on wholly spurious grounds, to efforts to clean up the oil leaking into the English Channel from the wrecked tanker Torrey Canyon — the writer had done some calculations of his own which assumed that the Channel had only two dimensions — to fears unnecessarily aroused by hypothetical representations of the "hazards" of pesticides, herbicides, drugs, toiletries, nuclear reactors, nuclear chemistry and nuclear by-products. Reports that readers might reasonably expect to be written from a standpoint of some knowledge and expertise are all-too-often characterized largely by indignation and prejudice.

Indignation has tended to be the keynote of much science writing in the past few years. When, in the second half of the 1960's, it dawned on the public that science and technology did not have pat solutions to man's social ills, and that if they were exploited too greedily might even exacerbate those ills, many science writers joined enthusiastically in the assault on scientists' motives. They competed for space in some journals to the point where it was hard to distinguish their writing from that of a new speciality of journalism which emerged at that time, called the Environment Correspondent, deliberately created by many newspapers to provide "gloom and doom" stories forecasting the imminence of mankind's destruction. For editors it was a fresh angle on the insatiable public thirst for bad news.

Now I have deliberately begun with these rather critical comments about science reporters because, whether you like it or not, we are the specialist writers who, so far, have been most concerned with reporting nuclear energy to the general public. The industrialist or administrator may find it odd that the very wide range of activities now associated with a major new industry — from some of the world's most ambitious construction projects to complex matters of financing, insurance, international law and politics — still tend to fall within the bailiwick of the Science Correspondent.

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I think the explanation is simple — the attitude of news media is merely reflecting a wider public attitude towards nuclear energy.

Let us explore this public attitude by contrasting nuclear energy with oil —

“Disgusting oil, Father of blood and sweat and tears and toil!”

— as the poet Sir Alan Herbert once wrote. For all that, oil has long attracted immense public interest. This earthy industry touches almost every citizen intimately, because it provides the fuel for his automobile — his overriding personal symbol of freedom and independence. The industry has all the glamour and drama of freebooting entrepreneurialism, at every level from the rough neck and the daredevil fighter of oilwell fires or gushers to the men who make fortunes from finding oil. It offers a wealth of oil multi-millionaires — such names as Rockefeller, Gulbenkian, Getty, Rothschild and the royal families of Araby. In short, oil seems to have something exciting for everyone.

In stark contrast, nuclear energy is widely seen as a highly cerebral activity, understandable only to someone with a degree in science (and you certainly don't need to understand any chemistry or physics to get a big thrill from many aspects of oil). Initially it was shrouded in secrecy, and even today it is still most closely associated in most people's minds with nuclear weapons and the bombs dropped on Japan a third of a century ago. This is understandable, however, if only because people have not been able to relate to nuclear energy in the way nearly everyone relates to oil. Nuclear electricity is exactly the same as any other utility-generated electricity — even the nuclear industry's most rabid opponents have not yet accused you of making radioactive electricity — and is all the more uninteresting for that reason.

Far from being a freebooting activity, nuclear energy has been regulated at every step by government from the outset and controls are still tightening. Few of its big names are truly public figures. There were a few “cowboys” in the wartime nuclear laboratories — one or two even lost their lives in foolhardy experiments — but these incidents were kept secret at the time, and the safety record since the war far outshines that of any other industry of comparable size. Unfortunately, no journalist ever made front-page news out of a good safety record. Early enthusiasm in the industry generated ideas for a wide diversity of “nuclear engines” for rockets, aircraft, vehicles, even personal powerpacks, but they all evaporated when the cost and risk of a proliferation of radioactive sources were considered more carefully.

The immense cost of nuclear development and the desire of governments to preserve secrecy also severely cramped the opportunities for financial entrepreneurialism. No-one, no company, to my knowledge, has made a fortune out of nuclear energy yet. Even the biggest companies have needed generous support from government and handsome terms from electrical industries. The fate of Royal Dutch Shell, the oil major which plunged heavily in 1973 in a bid to buy its way into the nuclear business, is surely too fresh in the minds of industrialists to encourage further large scale speculative ventures.

Nuclear energy is therefore left with a public image which might roughly be summarized as providing a source of immense stimulation to relatively small numbers of scientists and engineers, while remaining a heavy burden on the pockets of the public at large. Add to this public apprehension about something it feels it does not — and cannot — understand and you have a fertile medium for the highly disturbing situation which is described so

lucidly by Britain's Royal Commission on Environmental Pollution, in a report released two months ago called "Nuclear Power and the Environment".

Let me quote from the chapter on Nuclear Power and Public Policy in the Flowers Report:

"Nuclear power provides a dramatic focus for opposition in some countries to technological development and we have no doubt that some who attack it are primarily motivated by antipathy to the basic nature of industrial society, and see in nuclear power an opportunity to attack that society where it seems likely to be most vulnerable, in energy supply. In the USA in particular we see a situation in which the debate between the nuclear industry and the environmental movement has become increasingly vociferous. The environmentalist tends to see those in the industry as being so committed to furtherance of their technology as to be wilfully blind to its dangers to the world. Those within the industry, many no doubt sustained by the thought that they are thereby making an essential contribution to the well-being of mankind, tend to see environmentalists as people opposed to all technology who are prepared to denigrate their work on the basis of drummed-up and nebulous fears of future catastrophes".

I shall return to this important report, for I hear that it is being widely – and quite mistakenly – quoted in the USA as strong evidence for abandoning nuclear energy. But let me consider first the role of the science reporter, since all too often it is the science reporter who has the task of writing about an industry mostly considered too cerebral – or simply too dull – for other specialist writers.

The science reporter has to fight for space with other journalists in what is a highly competitive situation. Time was when he could do this successfully with nuclear energy because of the profusion of new ideas and inventions spilling from the laboratories. Nowadays the scientists are deeply embroiled in the earthier problems of making the handful of brilliant ideas which have survived work safely, efficiently, reliably. They are deep into problems of structural integrity, of fatigue, of corrosion and lubrication, of radiation damage – matters which make the front page only when something goes disastrously wrong. Since in the nuclear industry things have gone seriously wrong very rarely indeed – far less often than laden airliners fall out of the sky – the science reporter has been under increasingly strong temptation to speculate, to ask such questions as: "What if your safety systems had failed to work?" – and then paint a lurid picture of the imagined consequences.

A British science writer, Maurice Goldsmith, writing in the journal *Nature*, has stated one of the basic difficulties of contemporary science writing in these words:

"The populariser of science, as he functions today, cannot disseminate the subtle ideas of science. These really cannot be understood without hard, disciplined effort".

I believe this, broadly speaking, to be true. How many of you can say he has read a simple, lucid newspaper article on the objectives of research in high-energy physics which did not lean heavily on description of the machines and instruments and skate hastily over the science?

Now personally I am not greatly worried about the difficulties of communicating the more esoteric reaches of science in prose. Perhaps that is because I find sufficient variety and challenge in communicating, for a daily business paper, the activities of applied

scientists, of engineers, and of industrialists wrestling with the greatly understated difficulties of transplanting science from the highly protected environment of the laboratory into the jungle of commercial practice. I do not find, however, that most of my colleagues or their journals share my interests in the application of science and the manifold difficulties of its transplantation. I'm afraid that old complaint from the Moon programme — that a success was heralded as a triumph for science but a mishap was criticised as engineering failure — is equally true of nuclear energy today.

Lord Zuckerman, who as Sir Solly Zuckerman was chief scientific adviser to the British Cabinet until 1971 and still serves informally in that role and is, I know, well-known and respected in the USA, is fiercely critical of current presentation of science and technology by the Press and the media. His criticisms were set out starkly in his Romanes Lecture on "Advice and Responsibility" in Oxford last year.

Scientific advice to government was becoming an increasingly complex task, despite all the elaboration of the government's scientific machinery, said Lord Zuckerman. But this was not just because of the rate at which new knowledge is emerging, nor because the application of science now pervades every aspect of our social life. It was also — and I quote — "because the daily Press and the broadcasting services are continually subjecting the government, Parliament and the electorate to a barrage of comment about scientific and technological matters, with the result that official advice is almost always tendered against a background of what is usually well-publicised, but not infrequently superficial, fact and opinion".

One of the major problems which governments and scientists appointed as official advisers to government faced today was how to sift responsible from irresponsible advice, how to prevent public knowledge about science from becoming overwhelmingly tinged by emotion or even from assuming some political intent.

Lord Zuckerman went on to provide his Oxford audience with an exhaustive catalogue of major scientific issues which in his opinion had been greatly distorted in presentation to a wide public. They included atmospheric pollution, drugs of all kinds, genetic engineering, pesticides, nutrition, and of course nuclear energy and plutonium. His examples deserve to be studied carefully by anyone interested in the presentation of science and its achievements to a wider audience, for whatever reason, for they make it clear just how much harm can be done, and has been done by the more successful attempts to whip up public emotion about a scientific issue. They also make it clear that the nuclear industry is by no means alone in suffering from these assaults.

Scientists and engineers have, understandably, been at a loss to know how to respond to assaults from science reporters. As that formidable figure of American physics, the late Dr. Edward Condon, once said ruefully, when attacked by a Congressman for allegedly being a security risk:

"If you say I've got a wart on my nose, I can deny it. But if you just say that I'm one of the ugliest men in town, all I can do is argue that I'm really quite pretty".

There are very many ways, I believe, in which the nuclear industry is "really quite pretty" in comparison with other industrial practices, past or present. Let me offer as evidence the experience of a new and very important UK government agency set up two years ago, born of a major new piece of legislation on safety at work. It was designed, as a top official

has put it, to afford British working people "from bishops to tarts" much greater protection against the hazards of their occupations. And, as you well understand, no less than it is the coalminer who gets killed by coal industry disasters, it is the nuclear plant worker who will suffer first and worst in any major nuclear accident.

One of the most important studies to be undertaken by the new Health and Safety Commission is that by the Advisory Committee on Major Industrial Hazards, set up following the explosion of a chemical plant in the north of England one Saturday in the summer of 1974. For years before the violent explosion at Flixborough killed 28 and badly damaged the nearby village, Bryan Harvey, in his annual reports as the UK's chief factory inspector, had been warning of something called "major industrial hazards". His fears lay elsewhere than the dangers so vociferously voiced in Britain by environmental groups – nuclear explosions, radioactive releases, plutonium poisoning, and so on. Nuclear activities were very tightly regulated – and anyway, to quote Harvey, "the worst of all carcinogens is sunlight".

Harvey's fears focused on ordinary chemical installations – energy storage as well as processing plants – where he knew there was all too little official regulation of the quantities and conditions of containment for many substances rich in energy or toxicity, and sometimes scant effort to protect people living close to such installations. Soon after Flixborough confirmed his worst forebodings, Harvey was asked to head the advisory committee investigating major industrial hazards.

The committee spawned its first report in September. According to Harvey between 100 and 300 installations in Britain in the broad areas of petrochemical and chemical processing or storage could be presenting a major hazard. The report proposes that a wide range of such installations, including large-scale LPG storage, should become "notifiable" to government inspectors because of their intrinsic stored energy content, or because of the risk that pressures involved could widely disperse toxic or flammable gases.

Although the committee was specifically excluded from considering nuclear installations – already subject to strict regulation by the Nuclear Installations Inspectorate, which reports to the same agency – nuclear experience has contributed importantly to the 20-month study. Harvey himself pays generous tribute to Reg Farmer, the UK's foremost authority on reactor safety, as a "tower of strength" on his committee "in trying to get to grips with the more philosophical problems". And a nuclear inspector served as assessor to the committee.

"Nothing in life is to be feared, it is only to be understood", said Madame Curie, who discovered that most deadly poison radium, and put it to such valuable use until cheaper sources of radioactivity became available.

Hard on the heels of the major hazards report came the report I mentioned earlier, of Sir Brian Flowers and the Royal Commission on Environmental Pollution. Flowers is a physicist with a rather flamboyant style, who once served as a very distinguished young Head of Theoretical Physics at the Harwell nuclear research centre. But he left Harwell at 29, choosing instead a career in the politics and administration of science. In this capacity, Flowers has played a very important role in the development of basic research in physics, chemistry and engineering science in Britain since the mid-1960's.

The Royal Commission, of which he was Chairman until September 1976, is a **standing** Royal Commission, and is empowered to consider any subject in the field of Environmental Pollution in which it sees a need for independent investigation, as well as any subject the government might ask it specifically to undertake. It elected to study radiological pollution arising from Britain's civil nuclear power programme.

The Royal Commission's report finds surprisingly little to worry about in the UK nuclear programme today, or the way it is regulated by government. One by one it examines and dismisses unequivocally all the horrors nuclear energy's opponents have recently been parading: "hot particle" theories, excessively low radiation safety standards, reactor dangers, inadequate emission and effluent standards. It acknowledges that the nuclear debate has, and I quote, "not always been well-informed"; and that, to quote again, "sometimes relatively minor matters receive attention to the exclusion of others potentially more important". In fact, it firmly rejects every major attempt over the past decade to condemn current UK nuclear practice as unsafe.

The Royal Commission's worries focus exclusively on the risks it imagines could present themselves in the next century from a "major commitment" by Britain to nuclear energy. It does not define "major commitment" other than by recording forecasts that Britain could need 20 times its present nuclear capacity by the year 2000, and 80 times by the year 2030. If certain technical problems are not solved before then, the report concludes, the UK could have put itself severely at risk from, for example, the proliferation of plutonium sources and from the accumulating stockpile of highly radioactive liquid waste. Moreover it manages, quite subtly, to get the impression across that the fast breeder reactor is at the heart of all its fears of the future — that it is the technology that is forcing us into a dreaded "plutonium economy".

What has assured Flowers of wide publicity for a conclusion that few, I imagine, would quarrel with in principle is the tactics adopted in writing his report. A document which, for the most part, is logically argued and sensibly presented, with a wealth of background data, has been spiked with enough highly quotable phrases and contentious passages to assure nuclear energy's avowed opponents of widespread publicity for their crusade. One of the current UK nuclear "watchdogs" described it as "rather like a patchwork quilt, hastily stitched together..." This literary ploy allows nuclear energy's opponents to ignore the fact that, according to Flowers, they have been consistently wrong in the past. As a contribution to policymaking, Flowers founders sadly when compared with the taut, emotion-free presentation of the study of major non-nuclear hazards I have mentioned — so plainly a much larger and more urgent problem for government, and one where the cost of remedial action is going to be a severe burden to a major UK manufacturing industry.

In fact, the Flowers report, not by its content or its basic conclusions, but by the way the Royal Commission has chosen to present its case, has probably provided a more vivid example than any science reporter has conjured alone of the very problem for Government that Lord Zuckerman spelled out in his Romanes Lecture:

"... How to sift responsible from irresponsible advice, how to prevent public knowledge about science from becoming overwhelmingly tinged by emotion or even from assuming some political intent".