science for PEOPLE
No 28: 25p

FIGHT POLLUTION AT WORK
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Production
We apologise for the delay in production of this issue. This issue was assembled collectively by the following people: Charlie Clutterbuck, Alan Dalton, Tony Fletcher, Andy Solandt, Janet Whelan. Thanks to Maryanne Gold for the graphics and Nick Lumsden for typesetting.

Articles
Unsolicited articles on any aspects of the social and political implications of science and technology are welcomed. Contributions should be typed, double spaced and should generally be less than 2000 words. Longer articles require consultation with the collective.

Correspondence intended for publication should be clearly marked “for Publication”.

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BIOLOGICAL HAZARDS

For two years now, research workers in the Cambridge Medical School have been trying to show the existence of a virus causing human leukaemia by isolating it from human cells. It's important work. It's also potentially dangerous, not only because the human leukaemia virus itself (if it exists) may be dangerous, but also because in the process of isolating it, any other viruses present in the tissues grown, will be concentrated too. In the context of cutbacks in research funding, to do such work safely may demand funds that research workers haven't got. Of course with cuts in Government spending accompanying the economic crisis, safety is likely to be sacrificed more and more often.

There was some concern among scientists late in 1973, and a local virologist was called in by the Board of the Laboratory of Molecular Biology which shares the same building as the Medical School. He gave the work the all-clear. At the same time the board set up a committee; all its members were scientists and several of the nominees weren't asked before they were put on it. One of them resigned because he knew nothing about health hazards. The committee did nothing.

By April 1974, the laboratory branch of the Association of Scientific, Technical and Managerial Staffs (ASTMS) with a membership among technical and scientific staff in the lab had become stronger. The issue was raised at a meeting. A report was prepared and circulated, getting board members moving immediately. It was pointed out to them that none of the safety measures laid down for this kind of work, had been adopted. A section of the report follows:

First, there is the known and established risk from the non-oncogenic (non cancer producing) viruses. There are many well-documented cases of deaths and even minor epidemics from laboratory experiments involving accidentally infected cells (see for example, Biohazards in Biological Research, pp.3-38, Cold Spring Harbor, 1973). Second, there is the unknown risk from the oncogenic C-Virus used in the work in the Medical School. Todaro, ibid., p.127, states: "... these viruses and the cells that produce them must be treated as potentially hazardous agents." Similarly in the National Institute of Health report, it is stated: "Although to the best of our knowledge no leukaemia or tumour attributable to laboratory infection has occurred in Man, there is reason to believe that one should utilise protective measures while working with animal oncogenic viruses ..." "In considering the epidemiology of potential laboratory acquired oncogenic viral infections in Man, it should be recognised that the mode of transmission will most probably be unnatural, with agent concentrations far in excess of those found in Nature." No reasonable man could deny that there is a risk. In view of this, safety precautions must be taken. The NIH report advises, "Each room within a laboratory suite should be so designed that it is possible to accomplish the following steps in decontaminating the area:

1) Seal the room from all adjacent areas;
2) Completely shut off the air supply and exhaust;
3) Introduce decontaminants into the room.

Change rooms, rest rooms, pass-through showers and lockers should be provided in each suite for both men and women. Personnel may thus change from contaminated clothes to clean garments prior to leaving. An airlock should be provided for incoming and outgoing equipment.

Some scientists accused us of being 'politically motivated'. They said we were infringing scientific freedom, by telling them to use normal precautions or stop the work; their careers, their freedom. A colleague of the scientists involved in the research project showed the career pressure that was involved in the work, when he said: "If it had been successful you would know—he would have a Nobel Prize."

As a result of the report we prepared, the board of management and the Medical School passed letters to one another for two months, but by June equipment was being installed to make the work safer. The unions however, were not strong enough to push home this advantage. The branch would not strike for one hour to get all the safety precautions put into practice, by drawing attention to the lack of precautions and receiving coverage in the press. Complete acceptance of the rules laid down was only achieved once a University Safety Committee composed, once again, of scientists only, had made its recommendations.

So, two years after the work was started, established safety standards have been implemented. Had the union been stronger and acted earlier, this implementation might have started much sooner, as it is, for two years we have been living with an unknown but potentially dangerous health hazard in the building. Progress has been slow. The lab safety committee is still comprised only of scientists, not technicians or union representatives, and there is no system by which the ASTMS can ensure that implementation is occurring. Our success illustrates the value of grass-roots union organising on a local basis, relying on our own strength (both technicians and scientists) for analysis and action.

Simon Pickvance

Further reading:
Precautions against Biological Hazards (Imperial College, London SW7 2AZ);
Biohazards in Biological Research (Cold Spring Harbor, New York State);

RADICAL SCIENCE JOURNAL

SPECIAL DOUBLE ISSUE No. 2/3 DECEMBER 1974

GARY WERSKEY "Making Socialists of Scientists" An extended paper on the scientists' movement of the 1930's, and a discussion of the influential essay 'The Radicalisation of Science', by Hilary and Steven Rose.

ALFRED SOHN-RETHEL "Science as Alienated Consciousness" The concept of inertial motion as an exemplar for the thesis that all scientific ideas reflect social relations.

SHEILA YOUNG "The Politics of Abortion" Abortion under the NHS as a case of the structural oppression of women by the medical profession.

DAVID DICKSON "Science and Society: The Case of the BAAS Con-Trick" The implications of incorporating radical ideas into the mainstream curricula of science and technology.

BRIAN HURWITZ An essay review of Brian Easlea's Liberation and the Arts of Science.

Reviews of:
Jürgen Habermas Knowledge and Human Interests
David Layton Science for the People
University of Sussex Thinking About the Future: A Critique of The Limits to Growth
Science Policy Research Unit

This double issue 60p. Annual subscription (3 issues) £1.40, post paid. All correspondence to 9 Poland Street, London W.1.
THE POLITICS OF PSYCHOLOGICAL TESTING

Various forms of psychological tests have been used in the bureaucracies of our society for quite a long time. Administrators and managers feel it necessary to put people in their places on some basis other than whether or not they like their face or who their father is. As far as I am concerned, this is a two-sided coin. It’s good that we’re moving away from appearance and connections as criteria of worth, but it is bad that people are dealt with in batches, rather than in terms of their individuality.

However, this liberal attitude derives from looking at the use of tests in principle, rather than in practice. When we look at where and how they are actually used, I think we have to adopt a more overtly political stance and say that tests are instruments of social control, in the sense of weeding out people who deviate from middle-class standards of thought and behaviour.

USE OF TESTS

Psychological tests are used much more in the USA than here. Over there they use them extensively in education, and in business. Their most important use is in selecting people for promotion, either in the educational ladder or at selection for jobs. Another usage is to assess deviants of various sorts, whether it is criminals, mental patients or ‘problem’ kids. It is this last usage which is most significant in this country.

IQ tests used to be used extensively to select children at 11 for grammar school, but there was a strong reaction against them in the 1950’s and they are now used less. However, they are often used in those areas where selection at 11 still goes on.

IQ tests are also used by educational psychologists and medical officers who see kids referred to them for failure to learn or for ‘behaviour difficulties’, and they form the basis of recommendations for transfer to ‘special schools’ for the educationally subnormal (E.S.N.). Other, ‘personality’ tests help in making decisions about ‘maladjusted’ kids, who may also be sent to special schools (there is currently a great fuss of narrowing the field (the Civil Service is particularly fond of recommendations for transfer to ‘special schools’ for the subnormals and mental patients, have tests used on them in a routine way. Apart from deviant kids, other deviants, especially criminals and mental patients, have tests used on them in a routine way. Indeed, prison psychologists’ main function is to administer tests. The results may then be used in deciding what to do with a particular person, in terms of type of treatment or prospects for discharge. However, the main decision remains in the hands of a psychiatrist, and psychological tests are often used as supporting (‘objective’) evidence for decisions made on other grounds.

DANGERS OF TESTS

With the exception of IQ tests being withdrawn from widespread use at the 11+ exam, it seems that tests are on the increase. ‘Scientific’ psychologists would like them to replace psychiatric diagnoses and other personal opinions in making judgements about people. In fact, Cattell, one of the pioneers of personality tests, thought we should replace the uncertainties of electing leaders by choosing them on the basis of psychological tests!

A lot of the earlier tests used by the profession would not now be defended by the profession. They might even agree that psychologists were involved in ‘proving’ the inferiority of European immigrants to the USA by means of spurious tests (see Racism, IQ and the Class Society). But now it is claimed that ‘objective’ tests can be produced which have been constructed scientifically and are not subject to the biases and uncertainties of earlier tests and personal opinions.

If these tests manage to persuade enough elite members of our institutions (and people like Eysenck and the British Psychological Society are certainly trying), psychologists’ influence in ‘rationalising’ many of the problems of our society will increase. It’s not that I want to defeat psychiatric diagnoses and personal opinions, which are probably even more influenced by political and class biases, but that psychological tests more effectively disguise such biases. The aim of this article is to set out in general terms why such tests do not rule out such bias. In doing this, I am consciously lumping together IQ tests, personality tests and ‘vocational’ tests, since I believe the same general principles apply to all of them. However, ‘aptitude’ tests, which measure relatively specific abilities are less vulnerable to my criticisms.

TEST CONSTRUCTIONS

First of all, how are these tests supposed to be constructed? The general idea is to take a bunch of items (e.g. ‘Can you usually let yourself go and enjoy yourself at a gay party?’) that seem to have some chance of me assuring the thing (intelligence, neuroticism, etc.) you are interested in. You give them to a group of people who are supposed to differ as to how much of this thing they have. You then throw out those items which are answered the same way by the people who have a lot as opposed to a little of this thing, and keep the ones that are answered differently. As a further ‘improvement’ you can keep only those items that are consistent with each other, i.e. the same person tends to answer them in the same way.

This is the basic procedure for intelligence tests, e.g. the Stanford-Binet (S-B) and the Wechsler Intelligence Scale for Children (WISC), and personality tests e.g. Cattell’s 16 Personality Factor Questionnaire (16PF), and Eysenck’s Personality Inventory (EPI). These processes may be mystified by jargon like ‘factor analysis’ but this is just a way of doing what I have described on a large scale with the help of a computer. Other common jargon words are ‘validity’, ‘consistency’ and ‘standardisation’. Validity is supposed to describe the extent to which the test measures what it is supposed to measure. Consistency describes the extent to which all the items on the test are measuring the same thing. Standardisation consists of establishing a standard set of scores throughout the broad population, against which to compare the scores of individuals.
I'm arguing that the question of validity effectively disguises the social and political biases in these tests and is therefore the crucial thing to examine. However, consistency and standardisation are also relevant in that they lead test constructors to produce even more one-dimensional and banal tests than would otherwise be the case. Firstly, though, we ought to look at assumptions behind the whole testing enterprise.

ASSUMPTIONS

The basic assumption of all psychological tests is that there is 'something' inside individuals that we can measure, irrespective of time and situation, i.e. that our personal circumstances at the time (barring dramatic events) won't affect our performances on tests.

Obviously, people differ, but so-called personality characteristics usually arise in the context of specific social relationships. If you are in a housewife role that produces all sorts of unresolved conflicts, you are likely to appear 'neurotic'. If you are black and resentful of daily injustices, you may well appear 'aggressive'. So personality tests can disguise 'relationship characteristics', which could change, as 'personality characteristics', which are supposed to be more fixed.

Another side to this is that the same person shows different 'personality characteristics' in different contexts. I used to use Eysenck's tests and I always came out as a 'stable introvert'. However, I wasn't stable when I got involved in difficult personal relationships, nor when I started to question what I was doing as a psychologist. Now, I think I only come out as stable because I avoided difficult situations and repressed whatever 'neurotic tendencies' I had. And I was only introverted when I was with people I didn't know or didn't like. I always came out as a 'stable introvert' because that was how I saw myself at that time. Changing jobs and interests, I'm not sure what I am, but other people probably see me as a 'neurotic/extrovert' since that is what the job (lecturing) has tended to do to me. Again, it seems, personality is not a fixed thing inside me.

A second assumption is that this 'thing', intelligence, dominance or whatever, is qualitatively the same for all of us. Otherwise it would not be possible to use the same quantitative scale to measure it in different people. But what is dominant or intelligent behaviour, varies with the social situation and the social position of the person concerned. For example, different behaviours get defined as submissive or dominant, depending what age, sex, class you are. A child answering back, a woman initiating sex, a shop-floor worker telling his mates what to do, would all be seen as 'dominant', but in very different ways. All that they have in common is that they are infringing on adult, middle-class prerogatives.

The best example of this squashing of human diversity into one dimension is probably the whole notion of 'intelligence'. People can be intelligent in all sorts of ways: they can deceive people, they can tell stories, they can shrewdly intuit what other people are up to, they can co-operate with others, they can work things out themselves, they can win an argument, they can see another person's point of view, they can pass exams, they can win consistently on the horses. Yet intelligence tests rely upon performance of a special sort in a very special and peculiar situation. And then psychologists have the cheek to claim that this is tapping the innate intellectual capacity of a child. The way this claim is reinforced and legitimised depends upon the validity, consistency and standardisation manipulations that I mentioned before.

VALIDITY

The catch here is basically that 'validity' takes place in terms of middle-class norms.

The original 'pool' of items from which test items are selected, either comes from the psychologist's head, or from other tests, which themselves were constructed out of some other psychologist's head.

Psychologists are middle-class professionals with middle-class ideas about the nature of human qualities and the questions they dream up will reflect their ideas. Then they give this pool of items to a group of people that they think vary on the quality in question (call this the 'criterion group'). Sometimes this group is defined by his own, or other people's, commonsense assumptions, e.g. when 'ratings' by other people are used to select 'extroverts' for the criterion group. More often, the judgement of some sort of expert is relied upon, e.g. psychiatric diagnosis of neurotics or psychopaths, or teacher's opinions about intelligence. But such judgements are notoriously shaky, and in any case will incorporate the values of these so-called experts.

Then, when the items which best sort out the criterion group have been chosen, the test may be 'refined' or improved in various ways. One of these is to submit the items to new 'validation' groups. Often this is not done, especially with personality tests. But the more reputable tests, such as the S-B and WISC, have lots of 'validation data' accumulated after the test was constructed. This information is not objective either since the groups chosen will reflect the same biases inherent in the original criterion group. For instance, it has been shown that people who score highly on intelligence tests do well in their jobs. But teachers' ratings of intelligence
(the original criterion measure) reflect the same assumptions about human worth as are held by the people who control success in our society. Indeed teachers’ judgements may themselves be an important factor in the success of a child after school, both in the effects they have on the child in school (teacher expectations, etc) and after school (references, etc). Most ludicrous of all, intelligence tests themselves can lift people up the success ladder, either at school or at selection for jobs. This is especially true of the US, where most of the validation studies have been done. So it is no good at all to claim that people who do well on intelligence tests also do well in life: all you’re doing is picking out the people who are playing the middle-class game for whatever reasons, from those who aren’t.

To get an idea of what’s going on, look at this item from the Stanford-Binet intelligence test:

“What’s the thing for you to do when you are on your way to school and notice that you are in danger of being late?”

The scoring manual says: “Only those responses which suggest hurrying, an acceptable e.g. ‘Hurry’, ‘Go right ahead to school’, ‘Take the short bus’. Wrong answers would be ‘Go on to school and tell my teacher why I’m late’, ‘Not stop’, ‘Just keep on going’, ‘Get a late card’. Such a question is measuring very specific social values, not innate intelligence.

On the basis of these and other examples, the authors for a recent pamphlet ’Racism, I.Q. and the Class Society’ conclude that the following are high and low IQ characteristics:

<table>
<thead>
<tr>
<th>High IQ</th>
<th>Low IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle-class background</td>
<td>Working class background</td>
</tr>
<tr>
<td>Positive attitude towards work and school teachers</td>
<td>Negative attitude towards work and school teachers</td>
</tr>
<tr>
<td>White</td>
<td>Black or recent immigrant</td>
</tr>
<tr>
<td>English-speaking</td>
<td>Foreign language is native</td>
</tr>
<tr>
<td>Reads a lot—probably somewhat anti-social</td>
<td>Plays with friends instead of doing homework or reading</td>
</tr>
<tr>
<td>Has respect for property</td>
<td>Fears consequences of damaging property, but does not feel he should have to pay for it</td>
</tr>
<tr>
<td>Patriotic</td>
<td>Unconcerned or unpatriotic</td>
</tr>
<tr>
<td>Docile, willing to turn the other cheek</td>
<td>Believes in fighting back as a means of achieving justice</td>
</tr>
</tbody>
</table>

Accepts bourgeois values of promptness and politeness, or (more likely) willing to lie about it to please the teacher (or tester)

If the person on the left (recognise yourself?), ‘does well in society’ will that be because of intelligence?

In case you think this analysis applies to American rather than British tests, here are some items from a British test that is supposed to identify psychiatric disorder in young children, when filled in by teachers:

– squinty, fidgety child
– frequently fights with other children
– tends to be absent from school for trivial reasons
– is often disobedient
– often tells lies
– has stolen things
– fussy or over-particular child
– has twitches, mannerisms or tic of the face or body
– irritable, quick to fly off the handle

Perhaps the most disgraceful thing about these tests is that they are very definitely private property. They are very expensive to buy and in any case, their contents are copyright. Also the crucial data on ‘validity’ is hidden away in test manuals where only test-administrators can find it. So it’s very hard for anyone who is not another ‘expert’ to realise what they contain and object to them on other than emotional grounds.

**CONSISTENCY**

Another way of ‘improving’ a test is to make it more ‘consistent’. This means reducing even further whatever diversity remains in the items.

The technique is to weed out those items which are inconsistent with other items on the test, i.e. when an item shows a different pattern of responses by the group of people taking the test. This ensures that most of the items on a test bear an uncanny resemblance to each other. The practical effect is to make the items conform to the assumptions that guided the original selection and validation of items as described in the last section. For instance, Eysenck’s extraversion scale consists largely of permutaions on the basic question: ‘Are you outgoing in social relationships?’ By the time you have answered about 50 questions on this theme, you’re getting rather fed up and wondering what sort of cardboard picture of humanity these psychologists must have.

**STANDARDSATION**

Before any real life decisions are made about people on the basis of a test, it should be ‘standardised’, i.e. given to a range of people equivalent to those upon whom it is to be used. Where children are involved, this often involves doing separate ‘standardisations’ for each age group.

Theoretically, the idea is to enable an individual to be allocated a score relative to how other similar individuals perform on the same test. This may be in the form of a ‘per centile’ score (what percentage of the population he does better than), or with intelligence, in the form of an IQ. Practically, it involves a further distortion of the position of deviant groups relative to middle-class norms.

The main problem is the standardisation sample. Unbelievably, the S-B and the WISC were standardised on whites only. (Some black psychologists are now misguidedly producing ‘black’ intelligence tests!) To make matters worse, census data were used, which are known to exclude a lot of working-class, no-fixed-abode people, so that the standardisation sample includes more middle-class people than it should. Furthermore, differences between males and females were eliminated by juggling about with the test items, but differences between classes were not and are not corrected. (Perhaps this says something about the social function of IQ tests in justifying class, as well as racial, discrimination.)

On top of all this, the test items are juggled with to ensure a ‘normal distribution’ of scores throughout the population (i.e. a few people with low or high scores and lots of people with medium scores). This artificially created normal distribution is then used to ‘prove’ that intelligence is inherited (since you would expect a normal distribution on a ‘poly-factorial’ theory of inheritance). The items are also juggled with to ensure a smooth, steady rate of improvement with age, so that slow, late or erratic developers are further penalised by ‘scientific’ labelling.

**THE SOCIAL FUNCTION OF TESTS**

I have concentrated on the contexts of the tests, since this aspect is usually ignored while criticism focuses on the test situation and the motivation and style of the working-class or black people who do badly at the tests. Briefly, there is evidence to suggest that the testing situation is particularly inhibiting for such people, that their overall motivation to succeed on a test is quite different from middle-class people and that they express themselves in a style that is not suited to tests of this sort (see articles in Reddie’s Penguin: *Tinker, Tailor: the Myth of Cultural Deprivation*).

When you add all this to my criticisms of their contents, I think we have to conclude that tests are biased against groups who do not conform to white middle-class values. Since this is the case, their use is ethically indefensible and the choice to test groups in society and enable a scientific-sounding number to be produced to justify such discrimination is arbitrary and should be stopped.
training in hard-headed, 'scientific' psychology with its exaggerated respect for tests and numbers.

If Sir Keith Joseph's recent speech is anything to go by, we may be in for a revival of anti-working-class propaganda, blaming them for the problems in our society. One tool in such propaganda could well be the 50 IQ point difference between social classes 1 and 5. Academics have already written articles pointing out that this, rather than the celebrated 15 IQ point difference between blacks and whites, is the significant factor preventing equality. Radical scientists should be ready to combat this particular attack.

Sticking numbers on people only makes sense in a society geared to sorting people into batches or grades for consumption by the economy. When that economy is a capitalist machine oiled by white middle-class values, the social function of tests becomes clear. It is to ensure that the right sort of people are given access to positions of influence, and that deviants are seen as individual problems, rather than as victims of their social circumstances and position in society.

ALTERNATIVES?

Should we be demanding the abolition of all tests? I don’t think so, since there are tests of specific abilities and skills which are both more accurate and less biased. These tests can, I believe, identify latent talents and help get people into situations where those talents can be developed. Other tests can also be used to identify specific difficulties which people have and help in planning remedial action.

However, I think that we should oppose the use of general tests on whole groups of people, as in educational and 'vocational' screening, and routine use of tests on cultural deviants. Instead we should be asking for no selection in education, and where selection is still necessary, for discrimination in favour of women, the working-class and blacks on the grounds that they have been discriminated against in the past and are therefore likely to have at least as much potential as the white, middle-class men who have had things all their own way.

Instead of using tests to diagnose problems in people, we should spend more time listening to that person and understanding why she/he behaves the way she/he does, in terms of her life circumstances. And our remedial actions should be directed at changing the circumstances, as well as trying to build up the confidence and self-awareness of the individual. Fortunately, I think there are more people moving in this direction than being fooled by the 'objectivity' of tests.

Nigel Armestead

More detailed criticisms can be found in:

IQ Tests:
Joanna Ryan, IQ—the Illusion of Objectivity, in the Penguin Race, Culture and Intelligence.
Peter Watson, Can Racial Discrimination Affect IQ?—ditto.
Humpty Dumpty No.4, 28 page issue on kids, tests, ESN, 15p + 5p post from 28 Redbourne Avenue, London N3 2BS.
Racism, IQ and the Class Society, 86 page pamphlet, putting down the whole Jensen/Eysenck argument, including contents of IQ tests, 40p + 10p post from above address.

Personality and Attitude tests:
Humpty Dumpty No.2, article on the 16PF.
Humpty Dumpty No.4, article on 'Behaviour Scales'.

Role of Psychology in Society:
Peter Sedgwick, Ideology in Modern Society.
David Ingleby, The Job Psychiatrists Do.
—all in Reconstructing Social Psychology.

N.B. This article is a modified version of one which appeared in Humpty Dumpty, where the issues raised in the above are taken further (price 15p from 28 Redbourne Avenue, London N3 2BS).

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Our Future Inheritance
Choice or Chance?
Alun Jones and Walter F. Bodmer

Based on a study by a British Association working party, this book is concerned with some of the most significant issues in biology and genetics today: artificial insemination and fertilization of humans; genetic screening and selective abortion; organ transplantation; genetic engineering and cloning. The issues are presented dispassionately and intelligibly to the general public, £4 paper covers £1.25

What is Ecology?
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Ecology is concerned with the control of population size, and the structure of communities and ecosystems. Professor Owen explains how it affects us and our supplies of food, oil, and other raw materials: his book will guide readers to think as ecologists and to make sensible predictions about the future. Illustrated £2.75 paper covers 95p

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Population and its Problems
The Wolfson College Lectures 1973
Edited by H. B. Parry

These lectures provide a critical summary of the factors that determine the size of human and animal communities, and the background knowledge relevant to current population problems and control policies. The editor shows how complex population problems are, how disagreements arise from different theoretical standpoints, and how urgent is the need for further knowledge and investigation. £6.75

Oxford
Ivor Abelson is now 46 years old. He read natural sciences, taking a BSc in 1950, and worked in scientific and technology based industry until 1971, as he puts it, enriching shareholders. He says that he salved his conscience by deciding he was fighting poverty and meeting needs through his work.

Upon redundancy, out in the cold and meeting others in the same condition, including those who had never known anything better, seeing how people were cheated of their rights all the way down the line, he resolved to do what he describes as "a real job of work". He argued his way into a Major County Award to read law and after two years study has been called to the Bar. He is now, and has been throughout his studies, honorary legal adviser to organisations helping the disabled and underprivileged. He is a lecturer in law at the College of Industrial and Commercial Studies in London. He hopes to combine his lecturing with practice as a lawyer in cases where his scientific and commercial experience will be of value. He believes this work will leave him enough time for unpaid work in fields where this work is desperately needed but there is no paymaster. One such field is worker safety, and in reading SfP No 27 he got in touch with the society. He noted what was being done to keep workers safe, where accidents are organised, but submitted a note printed hereunder describing the state of affairs at a smaller concern where working conditions were very unsatisfactory indeed, but where the organisation that exists is virtually non-effective; where safety and health is concerned the union is apathetic to the point of inertia. The project he initiated was aimed to remedy the situation despite the lack of interest on the part of the union. However, he points out that the worker concerned had no knowledge of the right to safety which the law extends to him, and originally he sought legal advice over the risk of dismissal. He submits the following note and suggests that workers in a similar position should form safety and health committees to use where necessary the procedures outlined. The Small Claims Procedure he refers to covers claims of up to £75.

A worker slipped and fell on an oily, scrap-littered floor. His injuries kept him away from work for four days. Instead of being sorry for all this, management gave him a formal warning that he had committed absenteeism so it was now open to give a second written warning, and then the sack if he lost any more time. The worker sought advice and was referred to me. At my behest, he wrote a letter to management rejecting the warning as 'unjust and impertinent'. He then claimed compensation for pain and suffering, for damage to his trousers and shirt, and for his loss of earnings between net wages and National Insurance Benefit. He also asked what steps were to be taken to clean the floor, bearing in mind that the bonus system encouraged machinists to leave the scrap where it fell and not stop production to clear up. The letter was sent to the company by recorded delivery.

My friend, I am sure, expected the sack. Not a word was said, but he sensed tension in the air. Ten days went by so we sent by recorded delivery, a second note, saying that if the worker did not attend to this claim the union would take the firm to Arbitration if they continued to fail to attend to this claim. The only response was a written note withdrawing the warning, 'given in error'. Clearly this would not do, so we issued the claim. Court fees on the appropriate scale were £3.50. The difficult part for an unadvised person was to write out the particulars of the claim as the examples given in a very helpful booklet, issued free from the court, did not cover this incident. Very soon the defence came back in intimidating terms 'without due regard to his own safety', 'failed to use due diligence when walking in an area of known dangers' etc. Probably even more intimidating was the request for 'further and better particulars of claim', couched in highly intimidating and technical language. Again, due to advice, this hurdle was surmounted and a reply prepared and sent away. Also, for good measure, a request for 'further and better particulars of defence' was made.

In due course matters came to a head when the employers suspended the worker, making no arrangements for pay. As they kept his cards he could draw no unemployment money. Also the floor, which had been assiduously cleaned up after the issue of the summons, was allowed to get foul again. So, as we were several weeks away from the pre-trial review, we put in an application with three requests.

1) The suspension be either explained or lifted.
2) The floor be cleaned up and kept clean to prevent a recurrence of accidents, like that giving rise to the claim.
3) That the hearing of the application would be the pre-trial review putting the matter down for arbitration as a matter of urgency in view of the defendant's conduct.

At the hearing of the application the first two points were conceded at once, the second by a denial that the floor was not clean. On the third point the defence was asked for a trial, not arbitration. This was refused out of hand by the registrar. He also asked the defence whether they had attempted to negotiate with the plaintiff; when told 'no' he retorted, 'You had better'. The matter was set down for arbitration the next week. At the arbitration the plaintiff was sworn. The registrar asked him if he had been invited to negotiate. When the answer came back 'No,' he looked at the defence solicitor who said, 'There was no point'. The registrar then asked the plaintiff to describe what happened. Then he invited the defence solicitor to ask questions. When these were of a nature to trip the plaintiff up, the registrar said, 'I have his answer on that point, this is what he said...'. The registrar then questioned the defendant's representative, an under-manager. Then the plaintiff was asked if he had anything to ask. He also wanted to cover ground already covered, so the registrar said, 'No, only new topics please'. Then the foreman came in. Not knowing what the under-manager had said, his tale was markedly different in many points, and very similar to others most closely related to the actual accident. Then the registrar summed up. He said he could not account for the accident or the injuries unless the floor was as described by the plaintiff. He also noted the wilful failure of the defendant to negotiate with the plaintiff. He awarded the sum claimed, less a deduction for fares. He allowed the plaintiff his fares to court however, on both visits. He then required an undertaking from the defendant that they would maintain the floor in a clean and safe condition, and not victimise the plaintiff. He then warned that prison could follow a breach of this undertaking.

This is a story that in my view could be repeated in other contexts, e.g. excessive noise causing headaches; time is lost so claim compensation. If a simple request does not work, use the Small Claims Procedure. If nauseating chemicals make you ill—same approach. If you don't prove your cause, you lose your court fee and perhaps (rarely) you will be asked to pay the other side's fares etc., not more. In the case of fumes or noise, it is best if more than one worker comes forward. But it must be organised. Possibly by printing this, those readers in a position to lead the organisation will act.

Remember, unsafe and unpleasant working conditions exist as they are profitable. If they are made unprofitable they will cease to exist. But action is needed, apathy is a killer.

Ivor Abelson
FIGHT POLLUTION AT WORK

The following is not a series of directives, but suggestions which may be useful in trying to achieve a proper state of health wherever you work. Whether in a factory, laboratory, or office, the following is intended to be of help. It is abstracted from practice, but needs much more practical suggestions before it is really relevant. So as many comments as possible are required.

The main point is that there is no such thing as an 'expert'—we contribute knowledge to each other. It is a matter of the nature of the information and how it is used. Scientists should be providing basic information on monitoring, toxicology, recent developments, engineering etc; workers can supply details of possible design improvements, and the reality of shop floor conditions. Together a whole new area of 'work science' is needed to challenge the present myth of 'neutral' management science—that concerned with 'efficiency, productivity, research for research's sake, and secrecy'. That secrecy stems not from any legal secrecy (although that is still detectable in the new Bill), but from a situation "where workers are used as test subjects, but where data is rarely given to them, if it is ever collected and analysed."

As many of the hazards are new, long-term, and seemingly complex, some sort of organisation is necessary, to undertake the following . . . .

INVESTIGATE
Make a list of the known problems. Get other people to add to the list. Indicate which hazards are the most disturbing.

Ask questions like:
Do any vapours or fumes make you dizzy or give you headaches?
Do any dusts make you sneeze or cough?
Do you ever feel as though you have the flu?
Do you feel drowsy or irritable when you get home?

Keep a permanent record of illnesses. Something that causes mild symptoms now may turn out to be serious later. Long-term health hazards are usually discovered only by post-mortems or by studying large numbers of people. And then it is too late!

Few are doing animal studies or testing for birth defects caused by long-term hazards. If all doctors knew what to look for, clinical studies could reveal occupational diseases. Company doctors have the best chance of spotting work-related problems. But they are employed by the management, so their objectivity is limited.

So have regular and complete medical checks. Get and keep the results, and watch out for any changes since last time. Check with other workers to see if they are suffering in the same way. If they are, the problem could be caused by work hazards. If you eventually have a court case, you will need this information.

MEASURE
You can call in the Factory Inspector to do some monitoring. The local inspector is in the telephone book—the headquarters are at the Department of Employment, Factory Inspectorate Division, 1 Chepstow Place, Westbourne Grove, London W2, telephone 01-229 3456. But the Inspectorate don’t have to tell you what they find—if they don’t consider it "appropriate". If you do call in the Factory Inspector, don’t clean up before he arrives. Make sure he talks to you and not just to the management.

You can measure the hazard yourself. There are a number of ways:
Use your nose. Your nose can soon lose its sensitivity and many solvents don’t smell anyway. But it will detect dangerous levels of certain chemicals. If you can smell chlorine, ammonia, methyl alcohol, trichloroethylene or tetrachloroethylene, you’re getting too much.

Simple monitoring. Handpumps can give immediate—but not particularly accurate—results. There are two suppliers: Draeger Normalair of Blyth, Northumberland, tel: Blyth (06706) 2891, and D.A. Pitman Ltd of Mill Works, Jessamy Road, Weybridge, Surrey, tel: Weybridge (0932) 44405.

A more relevant sample is one that measures the air you breathe for long periods. You will need a personal monitor for this. You can buy one for £75 from Casella of Regent House, Britannia Walk, London N1.

BSSRS has both a hand pump and a personal monitor. But if you (or your union) can get your own, it will mean there are more in circulation. The analysis of samples is where tame scientists can really help. Anybody with access to GLC’s mass specs, atomic absorption apparatus etc, can be invaluable.
It is important to get a sample or estimate. It gives some sort of guide. To management it is a fact that acts like a red flag. They may try to decry your sample. If they do, demand that they install continuous monitoring. Vinyl chloride is already monitored continuously—why not all chemicals?

**EVALUATE**

This is the difficult part. There is such a mass of rubbish that has been produced to uphold the present technologies. 'Acceptable levels', 'reasonable precautions', are some of the terms used in the mystification process. See box for details of sources; but the most useful information is usually very difficult to come by.

A word on threshold limit values. The TLV is 'the level to which all workers may be repeatedly exposed day after day'. It is sometimes called the 'safety level'. There are many reasons to distrust TLVs. They presume the right to pollute, they have NOT been properly researched (many substances have not been found to be harmful, because the proper long-term studies have not been carried out on them), they need to be constantly monitored if they are to be enforced, etc.

The law does not accept them, so there is no need for you to, but if the level of a chemical is near/above the TLV then presume it could be dangerous, and act.

**DISCLOSE**

The most important people to tell are workers in the same type of factories or laboratories. Contact them directly if you can. If not, use union newspapers. Give details of the hazards, any incidents, your demands and suggested improvements. Far too many incidents are forgotten in the files of bureaucracy.

Don't stop there—get wider publicity. Daily papers, and television are mainly interested in new happenings. The left press—particularly Socialist Worker—is probably the best for national coverage.

Get coverage in your local newspapers—you can usually find a sympathetic reporter. Local papers are important for making contact with other groups in the area with similar problems, and with such people as "concerned" scientists who will be useful to you later on.

Tell it too. If other enquiries come in, we can put you in touch.

A more immediate way of getting the point across, and one that has been used to good effect in some factories, is by producing posters. 'Are you sick of sick pay?' has been found to be a good slogan... other entries on a postcard, to...

If you want contacts in the USA, write to Dan Berman, Director of the Occupational Health Project, 558 Capp St, San Francisco, California 94110. He has published Occupational Health—a Safety Guide, which has a good list of sources. It costs 60 cents.

Another group in the USA who will be interested is Boston Science for the People at 9 Walden St, Jamaica Plain, Mass.

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**ELIMINATE**

There are three main ways to stop pollutants reaching you. Stop them at source. Remove them by ventilation. Or, protect yourself. The first way is the best.

You don't have to rely on management to tell you which is the best way to stop pollutants. You can find out yourselves. One useful book is the Pollutant Removal Handbook from Noyes Data Co, Park Ridge, NJ 07656, USA. Price £15.

Check out the ventilators. Make sure that the exhaust systems don't just add a blast of fresh air. It must remove the dangerous pollutant. Check that hoods, ducts and fans work and can cope with the volumes that are needed. Make sure the fans are switched on—and are sucking, not blowing (it's happened before!). Not only do respirators shift the cost of contaminants from management to the wearers, but they can be a con. The efficiency of those working by suction can fall from 95% to 20% during the shift.

Try and get respirators that do the work of pulling air into you. Or better still, get ones that have their own air supply. Several devices have also been developed, such as speaking diaphragms, to enable some sort of talking.

Earplugs/earmuffs can increase the number of accidents— as it is difficult to tell which direction sound comes from. To encourage the use of ear-protectors, Rediffusion Redutone have found a method of piping muzak to workers, without using wires. Rather than having programmed music to improve 'efficiency', this system could be used as a radio station.

**DEMANDS**

Legal aspects

The new Safety and Health at Work etc Act 1974 is a wide piece of legislation. It pulls together a lot of previously separate laws, and is supposed to cover all people affected by work processes. Hospital, research and educational workers will now be covered by the Act. Agricultural workers are excluded.

It is an enabling Act—that is, it sets up a Safety Health Commission which will have powers to introduce further legislation without consulting parliament. Factory, Alkali, Mines and Quarries, Nuclear and Explosive Inspectors will now come under the one Commission, which will be run by the Safety and Health Executive.

A series of General Duties are outlined in the Act. It is the duty of employers to ensure the health of his employees, to produce a statement of his general policy, to consult representatives of employees (which can be appointed by Trade Union, or elected by employees), and to establish a safety committee if requested by safety representatives. Then are also duties on employers to ensure that people not in 'his' employment are covered. This includes employees of subcontractors, and communities outside factories—who should be covered against large scale accidents, but probably not against environmental pollution. Employers have to use the best practical means to prevent the emission of noxious substances into air. All these general duties are qualified by the phrase 'as far as is reasonably practicable'. This loophole will obviously be used by management, with full economic justifications. Other duties require that employers cannot levy any charge on employees for carrying out any specific requirements of the Act. The onus of responsibility is now changed fro user to producer; anyone who designs/manufactures/imports/supplies articles, or substances, for use at work has to ensure their safety—so far as is reasonably practicable. The Act is based on the Robens Committee recommendations of two years ago. It was considered that there was too much law, and that this was responsible for the apathy about health issues. The conclusion was that simpler law was required, but that results could only be achieved by cooperation, not coercion. Powers of
enforcement are increased; maximum fines for summary convictions (trial by magistrate) are up from £300 to £400! Indictable convictions (trial by jury) can lead to limitless fines or two years’ imprisonment. Inspectors will have to power to say ‘you must’, rather than ‘if you don’t do this, we can . . .’.

The most obvious symptom of Robens’ ‘Let’s band together philosophy’ is seen with the codes of practice. “A lot can be written in Codes of Practice which can be framed rather more informally than legal requirements,” according to the new director of the Health and Safety Executive. “A failure on the part of any person to observe any provision of an approved Code of Practice shall not of itself render him liable to any civil or criminal proceedings” (Section 17). Yet the basis of the new Act, and further developments will be these Codes. They cannot be used to bring a court case, although they can be used as evidence in a court action. They are merely directives, and do not protect in the same way as statutes.

Action

A similar Act was passed in the USA in 1971. The Oil, Chemical and Atomic Workers made specific demands—all well within the terms of that Act—see the box.

All major companies, except two, accepted these demands. The odd two were Shell and Chevron, who thought it was up to management to worry about the health of workers.

To get their demands accepted, 5000 workers had to strike for four months. They were supported by a coalition of eleven environmental groups. Women pickets played an important part in the success of the strike.

There should be no need to go to these lengths. But remember that straightforward demands can produce such a response. After the settlement, one member of OCAW said: “This contract is a minor victory. If we get it enforced it will be a major victory.”

The new Act could bring improvements, but only if specific demands are made of the general duties. Use the Act to gain concessions, but—as the OCAW workers showed, don’t rely on the legal apparatus. At best, it is long and tedious. The place to establish health conditions is on the shopfloor, not in courtrooms.

Some of the demands that can be made (other than those in the box) include:

- regular full health checks—and the results of these.
- continuous monitoring of any suspect chemicals.
- evidence of the harmlessness of the materials you’re working with.
- participation in design processes.
- the right to have independent advisors—whether doctors or engineers, on the plant.

NOISE POLLUTION

Loud noise can damage hearing. It is also irritating, tiring and increases the chance of accident.

Investigate Noise level is measured in decibels (dB); an increase of 3dB means a doubling of the noise level. The Government Code of Practice ‘advises’ that no one should be exposed to more than 90dB. Someone 18” away would have to shout to be heard in that noise, assuming that your hearing is not already damaged.

Measure If 90dB is possibly exceeded contact the Factory Inspectorate to measure the noise level. Alternatively you may measure it yourself. To have legal power, the meter must conform to the British Standard (BS). The cheapest we know of are manufactured by Castle Associates, Redborne Hse., North St., Scarborough; £32 for the cheapest, £54 for the cheapest BS meter.

Evaluate If you suspect that your hearing is threatened, demand regular audiometry (hearing testing), say annually. To get any compensation, loss of hearing must be proved by audiometric testing now, and before, when your hearing was better.

Eliminate The noise level in factories should be reduced; press for better designed plant (e.g. quieter motors on better mountings, rubber belts instead of gears etc), enclosure of noise machinery, sound absorbing paneling on walls etc. Personal ear protection, if necessary, should be of good quality, not just cheap badly fitting ear plugs; a choice should be provided by the employers.

Notes: The Code of Practice for Reducing the Exposure of Employed Persons to Noise (HMSO 52.5p) is a good beginning, a useful introduction to this being: Noise and the Worker (HMSO 12.5p). Useful too is the publication, Hearing and Noise in Industry, W. Burns and D.W. Robinson (HMSO £1.75) and Noise: an Occupational Hazard and Public Nuisance, Alan Bell, WHO 1966 (avail. HMSO).
Employment Medical Advisory Service
London & south-east: Atlantic House, Farrington St, London EC4; tel 01-583 5020.
South & West: Oxford House, 40 Clarendon Road, Watford, Herts; tel Watford (0923) 44288.
South-West: Government Buildings Block, 1 Burghill Road, Westbury on Trym, Bristol 10; tel Bristol (0722) 622851.
Wales: St David's House, Wood St, Cardiff 1; tel Cardiff (0222) 43984.
Midlands: Somerset House, 37 Temple St, Birmingham 2; tel 021-643 3752.
North-west: Quay House, Quay St, Manchester 3; tel 061-832 7137.
Yorks & Humber-side: National Deposit House, 1 Eastgate, Leeds 2; tel Leeds (0532) 39571.
North: Government Buildings, Kenton Bar, Newcastle 1; tel Newcastle (0632) 869811.
Scotland: Royal Exchange Assurance House, 314 St Vincent Street, Glasgow 3; tel 041-248 2855.

TUC Centenary Institute of Occupational Health, Keppel St, London WC1; tel 01-636 8636. Really a research group, but helpful with specific requests—and they can analyse samples (free to unions).

University departments
Department of Occupational Health, University of Manchester, Clinical Science Buildings, York Place, Manchester 13.
Department of Pathology, University of Newcastle, Royal Victoria Infirmary, Newcastle 1.
Department of Social and Occupational Medicine, Welsh National School of Medicine, Institute of Preventative Medicine, The Parade Cardiff.
Department of Social and Preventative Medicine, Queens University Belfast, Institute of Clinical Science, Grosvenor Road, Belfast 12.

London School of Hygiene and Tropical Medicine, Keppel St, London WC1.

Medical Research Council
Psychological Research: 15 Chaucer Road, Cambridge; Dept of Psychology, University College, Gower St, London WC1; Social and Applied Psychology Unit, Sheffield University, Sheffield 10, tel Sheffield (0742) 294844 and 78555.

Environmental Physiology: London School of Hygiene and Tropical Medicine (as above).

Epidemiological research: 4 Richmond Road, Cardiff.

Pneumococci: Llandough Hospital, Penarth, Glamorgan.

Radiobiological: Harwell, Didcot, Oxfordshire.

Occupational Health Unit, Central Middlesex Hospital, Park Royal, London NW10.

Dept of Scientific and Industrial Research, Admin Headquarters, Charles House, 5-11 Regent St, London SW1.


British Safety Council, Masen House, 163 Praed Street, London W2. Believes that accidents are caused by individual carelessness.


British Standards Institute, 2 Perk Street, London W1. Draws up industrial standards and promotes their adoption, which might be a good thing.

And for something completely different!

BSSRS, 9 Poland Street, London WIV 3DG; tel 01-437 2728. We can help with identifying dangers, and with sampling. We could do analysis if we had more volunteers.

Socialist Medical Association, 14 Bristol Street, Birmingham; tel 021-622 2020.

Urban Planning Aid, 639 Massachusetts Ave, Cambridge, Mass 02139, USA.

Books and Courses
Pat Kinnear's Hazards of Work, 90p, published by Pluto Press, Unit 10, 7 Chalcot Road, London NW1.

Stellman & Daum's Work is Dangerous to your Health, 90p, Random Vintage. Distributed in UK by Pandemic.

Both of these books are available from BSSRS. Pat's book completely shows up the so-called safety at work regulations. The US book deals more with the chemical aspects.


Donald Hunter's Diseases of Occupations published by English University Press

HMSO publishes technical data notes on many chemicals—available from the Factory Inspectorate.

Methods for Detection of Toxic Substances in Air, from HMSO, 20p each. For SO2, NOx, CO, HCN, Cl2, Pb compounds, trike and more.

D.C. Muir's Hazards in the Chemical Laboratory, RIC, London 1971.

Imperial College Safety Booklets on various hazards—biological (30p), chemical (15p), radiation (15p) and electrical (15p). From Imperial College, Prince Consort Road, London SW7 2AZ.

The Chemical Society's Annual Buyers Guide translates chemical brand names into scientific names. From The Chemical Society, Blackhouse Road, Letchworth, Herts. So does the Merck Index, from Kock-Light Labs, and the London Fire Brigade will also help.

Legislation
Changing daily, please contact us for up-to-date information. Of use to Trade Unionists is: Trade Union Research Unit, Ruskin College, Oxford (Tel. 58545), and a publication, management oriented, which in the absence of any other is very useful: The New Law—Safety and Health; which is not commonly available, but we have a copy at BSSRS.

Courses—both recommended
TUC Training School: Dave Gee, TUC, Gt Russell St, London WC1; tel 01-636 4030.

Rank and File Organising Committee Course. Secretary: Roger Cox, 214 Roundwood Road, London NW10—in January.

It is up to you to choose from that lot!
Since the military coup of April 25th, 1974, that focussed world attention on Portugal and her colonies, the rapid developments in Guinea-Bissau, Angola, and Mozambique (combined with biased reporting in the Western press) have obscured the true nature of the liberation movements PAIGC (African Party for Independence of Guinea and the Cape Verdes), MPLA (People's Movement for the Liberation of Angola), and FRELIMO (Mozambique Liberation Front), and have clouded the realities of the struggle that brought Portuguese Colonisation to crisis point.

For all three movements the success of the military struggle grew out of the comprehensive social revolution that they were leading in the liberated areas. The introduction of health services is part of this process, and the following brief account attempts to illustrate the conditions that FRELIMO's health service had to tackle, and the distinctive approach that they took.

Mozambique covers 297,731 square miles, and, prior to the April coup, there were 200,000 whites and 4,550 assimilated (i.e. black Mozambicans who satisfied high standards of education and literacy to be granted limited social rights) in a total population of 7,500,000. The distribution of health care facilities under Portuguese rule caricatured the situation that prevails throughout the so-called Third World. The few hospitals under the control of the colonialists, disrupted food production and cash-cropping, the crude methods of exploitation adopted by the Portuguese colonialsists, disrupted food production and added malnutrition to the list of problems.

The task facing FRELIMO was clearly formidable. When the first military fronts were opened in the areas of Cabo Delgado, Niassa and Tete in 1964 the education system had failed to produce a single African doctor in Mozambique. Nevertheless, only one year later, they managed to vaccinate 100,000 people during the 1965 smallpox epidemic. This effort was sustained. 150,000 people were given smallpox vaccinations between 1968 and 1970, and a general campaign was launched to vaccinate the whole population. Campaigns of inoculation against other diseases were carried out on a more localised scale. Preventive medical care such as this is one of the pillars of the FRELIMO health service.

General health education and the introduction of public health measures such as the reorganization of sanitation systems and the establishment of safe water supplies at the village level is the springboard of the health system. Bilharzia is an example in point. This chronic, debilitating disease is spread by an infected person urinating or defaecating into a pond or tranquil stream. The ova excreted go through a stage in their life cycle in a snail that lives in the water supply, anyone paddling in the water may contract the disease. The disease is treatable, but clearly it is preventable. In pre-revolutionary China, bilharzia was widespread, but it has been virtually eradicated by educating people about its causes, and mounting a mass campaign to kill the snails which are vital to the life cycle of the disease. It is this type of approach that FRELIMO took. At the beginning of the war, illiteracy ran between 95% and 98%, thus posing vast problems. Clearly the health care system cannot be seen in isolation from the general education drive, or the revolution in agricultural techniques by which FRELIMO has improved food production in the liberated areas.

Education was recognised as a priority early on. Adopting Portuguese as the national language for Mozambique, FRELIMO established its own secondary school in Dar-és-Salaam in 1963, and began producing primary school teachers and other organisers to work in the liberated areas. In this field, as in all others, self-reliance is of prime importance. A 'primary school teacher' is simply someone who has had perhaps one or two years education in a community where the vast majority have had none. At the secondary school and teacher-training school, now based at Bagamoyo, Tanzania, a new syllabus and teaching methods appropriate to the needs of the liberated areas are being developed. Some outside aid is available, this year UNESCO are sponsoring a special seminar on literacy training. Each year a new academic level is added to the secondary school, so that it will eventually achieve six levels. As a result of this painstaking work, 20,000 children who would have had no hope of an education before the national liberation struggle began, are now being taught in open air village classes.

The general provision of primary health care is the aim of the medical service. The health centres vary from simple first-aid posts, where dressings are done and treatments that may have been prescribed at another, more qualified centre, to area hospitals where fractures can be set and minor surgery performed. These area hospitals have a heavy work load. For instance, between September 1968 and August 1969 one hospital in Cabo Delgado treated 3,485 people, and another in Nyassa treated 2,875 people. Cases needing more major treatment and surgery, such as limb amputation, were carried on stretchers to base hospitals like Mtwaras in Southern Tanzania. Many would not survive such a journey, but here again the principle of self help, and making knowledge generally available has borne fruit. Drs Slavcho and Svetla Slobov from Bulgaria, orthopaedic surgeons and paediatrician respectively, worked for three years at Mtwaras up to mid-1974. Slavcho and Slobov reported, on leaving, that at first fractured limbs would arrive at the hospital so poorly splinted that they were beyond treatment. Emphasis on local treatment, proper immobilisation and transportation lead to a great decrease in complications. Mtwaras has 75 beds and in 1973-74 between 800 and 1,000 in-patient consultations were given. As well as the two doctors, there are 37 student medical assistants, 2 laboratory technicians, 10 nurses and 50 general workers. As well as giving sanctuary for the hospital on its territory, Tanzania helps by allowing access to x-ray and other technical facilities in its state hospitals.

This stratified service, making best use of available personnel, however limited their training, was established in the midst of a bitter war. In June, 1974, Palmeira Manheira—one of many witnesses—gave the following evidence to the United Nations Commission on Massacres in Mozambique.

"On September 3rd 1973, two helicopters arrived in the village where
I live. They flew over, looking at the area, and later went away—while the infantry advanced, white Rhodesian soldiers. When they arrived there they began to fire and killed a woman and a child and wounded two women. I was also wounded in the right arm.

"On the same day I went to the FRELIMO Central Hospital "25th of September" in the circle of Chinten-guene. Rhodesian soldiers arrived at this hospital. They captured a child who was in the kitchen, then they found the patients and began to fire, killing one, a girl called Sintiria, and wounding several other women. They stole a box containing medical equipment and killed 21 cows."

This sort of constant threat has meant that district and central hospitals have had to be moved on occasions to avoid bombardment and direct assault. Typically they are constructed of local materials, and the equipment has remained limited and mobile. However, this hasn't prevented them from achieving high patient turnover and levels of hygiene sufficient to support minor surgery.

Training the personnel necessary to man the emergent health services is a major problem. Even those who had previously worked in hospitals in the Portuguese dominated zones had to be retrained in new skills and political perspectives adequate to the task. Statistics are scanty, but in 1968 there were less than 400 health workers in the whole of the liberated areas, while by 1973 Cabo Delgado alone had more than 300 workers manning the regional hospital quarantine station, seven district medical posts, and nine first aid posts.

No-one pretends that there has been uninterrupted success. In a speech at the opening of a course for health cadres, Samora Machel, President of FRELIMO, spelled it out: "There is no war in which there are only victories for us and defeat for the enemy." He was referring to the failure of a previous course to train nurses, which was suspended in 1968. The failure was not technical, but political.

"Tribalism divided the students, made them counter-revolutionary and caused them to fight against the FRELIMO leadership, against FRELIMO and against the people. Each saw himself as representing the interests of this or that region . . . ."

"Racism lead to disunity between students and teachers. Claiming to be very revolutionary, students who had yet to show proof of true revolutionary commitment fought against teachers who had already given ample proof of their dedication to the people's cause, solely because the teachers were white.

"Combining selfishness and ambition, the students rejected a programme of studies planned to meet the immediate needs of the struggle and demanded programmes that would give them diplomas and privileges so that they could exploit the people in the future. They wanted to become an elite of parasites, acquiring wealth and social prominence at the expense of the people's suffering.

"Ignorance, superstition and religious fanaticism also caused the students to believe in non-existent supernatual forces, in amulets and stones, scorning science and rejecting the lessons of the teachers, which were founded on the laws of nature, on objective reality. It was in this climate that indiscipline, anarchy, corruption and chaos were fostered."

But the struggle continued. The nurses' course reopened. A British doctor, visiting Mtwara hospital in 1973, found that the health cadres exist communally sharing the luxuries such as soap and toothpaste that came their way. In their "off duty" the health workers shared child care and looked after the vegetable garden which helped to provide food—the same for patients as for staff. The cadres received no pay and as one of them remarked quite casually to the doctor, "Nobody pays you to fight for your freedom." In other ways, FRELIMO succeeded in realising its line in health care.

Samora Machel: "Our hospitals belong to the people. They are more than centres for dispensing medicine and cures. A FRELIMO hospital is a centre where our political line—that of serving the masses—is put into practice. It is a centre where the principle that the Revolutionary frees the people becomes a reality."

Now that the colonialist armies are no longer fighting in Mozambique, FRELIMO is facing its most difficult task yet. With every prospect of forming the government of a country under-developed by colonialism, and impoverished in the face of the imperialist system, it is having to organise amongst a population, in the ex-Portuguese zones, that did not liberate itself. The political struggle is just starting, and the work of building solidarity in Britain is now more crucial and more difficult.

GAMMA—Guinea, Angola, Mozambique Medical Action—aids the political solidarity work in Britain in conjunction with a medical action campaign. We send health education material, specially designed health kits for use by rural health workers, and freeze-dried plasma, raised at blood-donor sessions, to the health services of Guinea-Bissau, FRELIMO and MPLA. This support is now more important than ever, as the load on the health services is suddenly increased.

Support this campaign. We need your energy, as well as your money!

For details write to :

GAMMA
C/o CFMAG.
12-13 Little Newport Street,
London WC2 H7JJ.
My object here will be to summarise some of the issues of what might be termed the social background to the Flixborough chemical plant disaster. In so doing I will not attempt to provide the definitive account of these or to exhaust the theme; but rather to suggest the areas in which much more fundamental research must be done, not only in the context of Flixborough itself, but with regard to the issues of industrial safety everywhere. Social costs are somewhat intangible, but ultimately it is they that decide whether an industrial site and the materials that it produces are worthwhile. Flixborough causes profound doubts, however, about the extent to which such costs are ever calculated in siting a dangerous plant.

If one looks at a map to locate Flixborough the extremely rural nature of its setting strikes one first, and it is from this fact of location that the first group of issues emerge. The question of siting has hardly been mentioned, not least because the Nypro plant was the last in a succession of factories to exist on the same site, and which have gradually grown bigger, more complex and more dangerous in their processes since before the war. The nature of the activities carried on on the site have therefore changed gradually, and without this always being too apparent (chemicals of some sort have always been the manufactured item). The original reasons for siting a fertiliser plant there in 1937 are now less telling—the river Trent frontage, and the proximity of one of Britain’s most fertile farming zones (Lincolnshire and the north Midlands). From the point of view of the present joint ownership (the NCB and its approximate Dutch equivalent) the site is convenient—near the English coal-producing heartlands and near the Humber route to Rotterdam, the Dutch petro-chemical centre. But in real industrial terms the plant could be practically anywhere provided that communications were reasonable (they are poor at Flixborough, which is near no major rail centre, is cut off from the north and west by the Humber and Trent estuaries respectively) and within reasonable distance of its clients—the nylon-using textile industries.

Not to beat around the bush, the siting of the Nypro plant is peculiar for two sorts of reasons, one set “pre-disaster”, the other set which only became clear when the disaster occurred. Amongst the first can be included the rural setting of a major industrial plant, the poor communications network, especially with Hull the nearest major port, the necessity for labour to migrate out from Scunthorpe and across country from numerous other villages, the encroachment on good farming land, and the general environmental blight of a huge factory in the midst of some of the country’s otherwise most unappreciated and unspoilt countryside. Paramount amongst the second set of reasons is the fact that while the plant could blow up without the risks of devastating a surrounding urban setting, its location away from major urban centres cuts it off from precisely those emergency services that it proved to need when the disaster did finally occur. Fire, police, ambulance and support units had to be sent not only from Hull across the slow and antique river ferry, but from the Midlands as far away as Nottingham and from north Yorkshire. The dispersal of industry in other words, is a two edged sword.

One can extend this argument when one looks at the layout of Flixborough and Amcotts (the forgotten place in all this) villages themselves. Not only were emergency services totally absent (even the police in Scunthorpe thought that the explosion was caused by a bank raid, before recognising its true location) but the villagers were totally unprotected. The houses in lower Flixborough run up to within a quarter of a mile of the plant, while the rest of the village is on a ridge looking down on the factory. Amcotts lies directly opposite the plant, across the Trent. Indeed this factor does not apply just to the epicentre of the disaster. Damage was done miles away, even on the other side of the Humber, and the prospect of evacuating some of the north bank villages (and even Hull itself) was for a while a real one until it turned out that the smoke and fall-out was not noxious (or even radioactive as was thought at one point). Not only however did it take hours for an ‘expert’ to be summoned to sample the gases and pronounce them unpleasant rather than dangerous, but if there was a contingency plan for evacuation, this was concealed from the local inhabitants.

There is a further group of factors which is in many respects even more sinister. The first amongst these is the question of ownership. The managing company is in fact a subsidiary of two nationalised industries (one British, NCM; one Dutch, Dutch State Mines), which in this context have combined to form an international consortium. Yet “Nypro Ltd” have been seen throughout as the evil doers, but they are but a branch of a nationalised industry, and therefore ultimately of the government. The allocation of blame, the flight to bureaucracy (more factory inspectors) and the role of the government in supervising the safety of its own interests are thus intimately connected in the Flixborough case, a fact which at no costs should be obscured.

Secondly, the fact that many workers claimed that the plant was unsafe should be taken into account. Why were such warnings not heeded? Were there channels of communication via which workers’ views could be represented to the management? If not, why not? And if so, why were they malfunctioning? Connected with this was the industrial role of the plant, which, as a major producer of caprolactam, an essential ingredient of nylon, was under increasing pressure to step up production to service a heavy demand industry. Was the plant being pressed too hard to increase output? Certainly it has been said that the loss of the Flixborough quota of caprolactam has had a serious effect on the British textile industry, though whether this is true I cannot assess.

Thirdly there is the question of the rebuilding of the plant in the face of strong local opposition. Who is to have the final say—those who have suffered from whatever negligence will be
proved to have caused the disaster, or the industrialists, whose reasons for having a factory at Flixborough at all have, as we have seen, been steadily whittled away by the changing structure of the economy and of the location of particular industries in relation to this. A related factor in this has been the role of the media, both local and national, which has largely represented the tragedy as a "Disaster"—something unforeseeable, impersonal and of particular interest for the vignettes of personal drama and public breast beating which it revealed and caused. The role of the media is something which could do with scrutiny as an issue in itself.

Finally there is a whole galaxy of further problems—the nature and role of the still continuing public enquiry, and the status of its conclusions when it eventually reports; the role of workers' control within dangerous process factories; the fear that the solution will be in the increase of the bureaucratic structure which so signally failed to avert this disaster. (Indeed the Factory Inspectorate being a branch of government, its role in a nationalised industry should in theory have been best revealed—yet at Flixborough the government failed to avert an explosion in its own camp—no private industrial capitalists there.) There is the question of who will get compensation and from whom? The law relating to compensation in the case of industrial accidents is vague and full of loopholes (see the piece by Bill Thomas in New Society 24 October 1974).

But the wider questions remain, and these I have tried to indicate. Flixborough has blown the lids off a lot of issues, ranging over the questions of social costs, government responsibility, location of dangerous or unpleasant industries, the nature of the countryside we are getting whether we want it or not, and the role of the community and the workers it supplies in regulating the industrial environments imposed upon it. The more technical issues of Flixborough I must leave to others, but I would certainly claim that all the points raised here require answers, and not only from Nypro Ltd.

John Clammer

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Dear Dr Wyatt,

In reply to your letter

1) You can check the figures released by the Chemical Industry Association, by contacting them at 93 Albert Embankment, SE1 (01-735 3001). Ask to talk to Bill Macmillan, who is very helpful regarding VC M. He has also written comments on the article; I found his criticisms constructive.

Regarding the matter of giving references, I agree that it is academically correct to do so. However, I regret the academic veneer of the article (e.g. the et al.), which may have led you to expect me to abide by all the rules. I presumed that if anybody was really interested, they would contact me so that I could forward more up to date information.

2) The 23 deaths have occurred due to angiosarcoma in people exposed to VCM (this is over a period of several years). As less than 30 cases occur spontaneously each year, in the US, this number is significant. The 'maybe' was to infer that there is still some doubt as to the extent of the causal significance, it cannot be 'proved' that a woman living outside one plant who died of angiosarcoma had been exposed to VCM.

3) Your next points concern the game with the CIA press releases. Yes, you spotted it—it was me playing the game. I do not think that was the most important part of the article. It was just saying "If you look at the graph from the start of detailed analysis, there is little improvement. A reduction from 100 to 25ppm is an improvement (if it is that much), but if 25ppm is dangerous, then 25ppm is not good enough.

I am still sceptical of the word typical. As I am of the phrase 'convenient shorthand'. I remember being told that woodlice 'liked' to live under stones. That convenient shorthand not only covered a multitude of anthropomorphic airs, but also prevented anybody really questioning the phenomenon.

4) The 0-2.3ppm point. Ideally, the object of standards for occupational carcinogens should be to achieve zero levels of exposure. From a practical standpoint, interim standards are designed to prevent exposure to the lowest level of carcinogens which can be detected by the most practical and sensitive monitoring methods available. To ask for a level of, say, one ppm, is to ask for a specific level, which is as impossible to attain as exactly zero. I do not care to some sort of pollution. Thus, demands should be made for a no detectable limit, which means that existing monitoring should not be able to detect it, and that as monitoring is improved, so the level comes down.

The recent OSHA hearing in the US was to hear demands for the no detectable limit. Lots of scientists backed the demand. The industry did not want it to be concerned with the zero exposure—so that they could then say that it was silly and impossible. Politics governs the setting of Threshold Limit Values, the economic interest of the employers vs the health of workers. Similarly, the development of monitoring apparatus depends on political will.

I am sorry to have caused any confusion on this issue, and for implying that 0 = 2, and hope that this matter is now clarified.

While welcoming detailed criticism, I object to nit-picking to such an extent as to distort the whole emphasis of the article. Rather than teaching your students the metaphysical limits of measurement, I'd prefer that you emphasise the main points of the article, which were.

If we were to rely on the official ways of solving the problem, we would have little idea even of the dangers. It is no good relying on the various bureaucracies, Factory Inspectorate, Unions, management etc.

The importance of this issue goes beyond a specific number of cancer deaths.

It throws up innumerable questions concerning our present procedures of detecting harmful compounds. How many other so-called harmless compounds will be found to produce similar symptoms? In the absence of "pre-testing", the worker is unwittingly used as an involuntary test subject. Vinyl chloride was considered harmless twelve months ago, the dangers were discovered more by accident than design (due to the efforts of one Earl Parkes, and the unusual rarity of the disease), how will the other chemicals be found to cause cancers if the right procedures are taken?

I am glad that you feel concerned about health hazards, and it is important that you should teach on the subject. I would hope that you could encourage your students to take action—to find out the conditions in local factories, and not spend all their energies emphasising scientific pedantry.

Yours,

Charlie Clutterbuck

Liberation or Escapism?

Dear Editors,

In general I am very impressed by Brian Easlea's book Liberation and the Aims of Science. However, he takes some positions which I regard as questionable, and since these positions are fairly commonly held amongst radical scientists, I feel I must state my criticisms in detail.

The first concerns Kuhn's theory. I do not want to enter into a philosophical argument, but instead I would question the radical nature of his view.

The first is that if there are no grounds for saying that one paradigm is better than another, it hardly seems reasonable to bother inventing new ones. This will not worry scientists who mostly don't care what philosophy philosophers anyway, but what would be the consequences if people became convinced that political revolution (and the analogy is made quite explicit) is 'change but not progress'? Surely they would be inclined to take the much more comfortable course of opposing it. If scientists should pay any attention then the effect of the theory of normal science would be to provide them with a justification for uncritical work, and even more important for uncritical teaching, a justification which they will not get from Popper.

Another serious problem is concerned with mysticism and the attitude to nature, a position taken even further by Roszak, against whom my criticism is directed even more strongly. Basically the attitude to mysticism is totally uncritical. It really is not all Hermetic utopias. The religious outlook has actually...

Workers' health or pseudo-science?

Dear Sir,

I am concerned about the hazards of the use of chemical compounds in industry and in our lives. It is important for teachers that articles about these hazards should be available. But the article "Of Mice and Men and VC M" disturbs me. I have been taught, and teach, that one must give sources; where can I check the graph and how can I ask for the figures released by the Chemical Industry Association? Mr Clutterbuck asserts that twenty-three deaths may be blamed (may be?) on VCM—are they all due to angiosarcomas? As he says that there are only twenty-three cases of angiosarcoma per year in the USA, it seems unlikely—are there other causes of death which are being blamed on VCM?

I cannot understand that jibe, "the forestshortened axis is an old PR trick"; the presentation is perfectly sound, and I should certainly question a student who presented a log scale. What on earth is "scientific PR"? And it (the dotted line) is not based on one sample in mid-1973—in my copy there is plainly another sample of 100ppm for January 1974. A reduction from 100 to an average of about 25ppm in three months seems progress to me. I also use the word typical—"is several virus infection"—it may need a lot of explanation but it is a convenient shorthand and is not necessarily sinister.

Mr Clutterbuck mentions averages for seven plants but gives no figures (except that three were below—how far below?—the emergency level, of I presume 25ppm). He then says "enough of this game". Who is playing the game? It seems to me that Mr Clutterbuck is playing it. Can any scientist demand a reduction to 0ppm? I teach my students that you can't specify 0ppm—you can only specify that the concentration is below a certain figure, depending on the nature of the assay, the apparatus, the sample, etc. Mr Clutterbuck alleges that, "Dow have proved it (0ppm implied) can be done"—but on p.7 he states, "Dow have already reduced their levels to 2-3ppm". So does 0 = 2-3?

We need science in society. We can do without pseudo-science.

Yours faithfully,

H V Wyatt

University of Bradford YORKS
been responsible for a large amount of oppression and warfare. A belief in magic is quite likely to lead to witch-burning. The most important political role of mysticism in Europe was its part in Nazi ideology—hardly a "beautiful world". I could, of course, continue almost ad infinitum through castism, racism and sexual repression, yet these are simply not discussed by Roszak or Easlea, who feed us a line about poetic vision and a Golden Age.

Further, I would suggest that the criticism of a scientific (or more accurately technological) attitude towards controlling nature is incredibly naive. As Brian Easlea says, "Disease is ugly". Unfortunately, it is part of nature, and to eliminate it means controlling nature, and finding out the best way to do so involves rather nasty experiments at times. One can, of course, say that controlling nature has gone too far, but then one should be willing to say how far is enough. As it stands, the view that we should approach nature with respect and love sounds awfully like the gooey sentimentality of an elite maintained at the expense of most of the world's population, by the technological and military might of Western imperialism. I am sure this is not the attitude Brian Easlea means to take (I am not so sure about Roszak), but it is the position he is forced to by his failure, to apply the same critical standards to the anti-scientific outlook as he does to science.

Phil McShane

**BOOK REVIEWS**


This is the first publication of the Technology Assessment Consumerism Centre (TACC), an independent organisation composed of interdisciplinary teams drawn from the Department of Liberal Studies in Science and the Business School at Manchester University.

Although the book only runs to 89 pages, it covers the whole aspect of the British bread industry ranging from the historical origins of the white loaf, through the use of bleaching and improving agents, to the nutritional consequences of low extraction milling and low-fibre white flour. The economic structure of the bread industry is not ignored and the authors present a convincing argument that the development of a monopoly situation (in which three major groups control 70% of bread sales) has led to bread prices increasing 17% faster than average food prices during the period 1962 to 1972.

The section dealing with bleaching agents raises doubts about the effectiveness of government control in enforcing adequate toxicity trials prior to the introduction of new bleaching agents. The case of asogen (nitrogen trichloride) bleaching is used to illustrate this point. As early as 1927 a government committee recommended that asogen should not be used to bleach flour but its use persisted and it was not until 1947 that Sir Edward Mellanby found that bread made from asegenised flour caused running fits in dogs. It took until 1950 before the Ministry of Health and Ministry of Food recommended that chlorine dioxide be used as a substitute for asogen. Subsequent research published in 1961 showed that high doses of methionine sulphonimine (the suspected toxic agent arising from asegenised flour) produced hallucinations and disorientation in human patients.

The authors are far from happy with the existing controls on bleaching and "improving" agents. Apparently, in 1960 the Government's Preservatives Sub-committee specified the need for "further work on some of the bleaching and improving agents," but in 1971 the Food Additives and Contaminants Committee complained that "... much of this work has not been done". The practice of permitting the use of additives, without long term testing of toxicological effects even persists in the Food Standards Committee Second Report on Bread and Flour (1974). Five additives under the classification 'Group B' are permitted on the basis that "the available evidence may be regarded meantime as provisionally acceptable for use in food, but about which further information is necessary..." One of these additives is potassium bromate for which long term tests had been requested in 1961 but were still not available at the time of the review. Whilst one recognises the economic and technological advantages of using bleaching and improving agents, adequate toxicological testing should be a prerequisite to legislative permission to continue the use of an existing additive or the introduction of a new one.

**Boring reformism**

Dear Friends,

I read your magazine *Science for People* (No.27) and began to wonder just who it was written for.

The first article on "A New Form of Workers' Control" suggested a list of demands that can do nothing but bolster up trades union reformism. The only thing you would get out of them is an expanded version of factory safety committees. Fine— if that's what you want to do. That's OK, if you want to make factories more healthy for people to work in so that they can go on creating profits for the employers. If a factory is shitty and unhealthy to work in, personally, I would walk out of it and encourage other people to do the same. So why don't you?

The thing on vinyl chloride monomer might have been a good expose if it hadn't been too technical for most people to understand.

If a radiate community is set up, it would be good to write of the experiences that come out of it.

The article on the NHS was an exercise in statistic spitting that would have sent insomniacs to sleep.

The bit on forced feeding was an excellent expose of the methods of torture used on political prisoners. It is important that it be revealed that members of the medical profession are influenced by political considerations (Soviet Union mental hospitals and not politically expedient to let hunger strikers die in British prisons, etc.).

The campaign on racism, IQ and class society sounds like a promising set up. Eysenck, etc, plus the National Front and other anti-black worker organisations are an obvious target for the campaign.

But tell me, is your magazine supposed to be a people's paper or a boring theoretical journal for radical scientists?

Yours,

Ian, Brixton, LONDON

**Inaccurate**

Dear Sir,

John Scott's otherwise useful article on the demonstrators' strikes at Edin­burgh and Swansea contains a quite inaccurate account of events in the Science Studies Unit at Edinburgh.

The rate agreed on by the Unit was £4.00 per hour for tutorial teaching, not £3.00. The subsequent reduction to £2.50 was the result not of "the inter­vention of the department head", but of a general ruling by the Science Faculty setting standard rates for the whole Faculty. In fact, David Head, the head of the Unit, has consistently supported our demands for higher rates and recognition of ASTMS, and has argued the ASTMS case before the Court/Senate Committee and in the General Assembly of Staff.

Yours,

Donald MacKenzie
(Member, Edinburgh University ASTMS postgraduate group).
The book gives a detailed account of nutritional losses in the production of white flour, in which only 70% of the grain is converted into flour. The authors estimate that 24 vitamins and minerals present in the whole wheat are reduced from between 40 to 96% during the milling process. They correctly point to the limitations of the "enrichment policy" in which only two vitamins (B1 and niacin) and two mineral nutrients (iron and calcium carbonate) are required by law to be added by the miller. The 86% loss of vitamin E during the milling and subsequent losses by bleaching with chlorine dioxide and benzyl peroxide is cited as an undesirable consequence of white flour milling. The authors estimate that a daily intake of 300g (half a small loaf) of bread made from unleached 80% extraction brown flour would increase the vitamin intake of those on a poor diet by as much as 35 per cent.

There is an interesting section on the role of fibre in the diet. Wholemeal flour contains 100% of the fibre originally in the grain but this is reduced to 8% in the case of the standard white flour. The authors quote the theory of Painter and Burkitt that the high incidence of diverticulosis coli in Western civilization is related to the lack of fibre in the diet. The theory maintains that low fibre diets require higher pressures in the walls of the intestines for the movement of faeces, causing small ruptures (or diverticula) of the muscle wall and leading to possible sites of inflammation.

White bread is also seen as a component in tooth decay. Although refined sucrose is thought to be the main agent of tooth decay, the authors feel that, since white bread sticks more easily to the teeth than the coarser wholemeal bread, it provides a better environment for decay-producing bacteria by acting as a vehicle for carrying sucrose between the teeth.

The clear and logical style of the book will appeal to the layman and the inclusion of over 130 references will stimulate the individual reader to further reading. It is to be sincerely hoped that this publication will receive wide circulation and not remain confined to the bookshelves of universities and consumer organisations.

Nigel Wade

STUDY WAR NO MORE: MILITARY INVOLVEMENT IN BRITISH UNIVERSITIES AND COLLEGES. by Zoe Fairbairn, a CND pamphlet.

The pamphlet will be of value to people who wish to find out the extent and range of military support for academic research. Compiling the lists of research grants which are not readily available elsewhere must have been both time-consuming and demanding. While the lists are in themselves of some value it is a great pity that the pamphlet is so thin on any determined analysis. Most academics find nothing distasteful or wrong about military support for what they consider purely academic work whether its military implications can be seen directly or not. The pamphlet could have dealt in much more detail with the prevailing attitudes to military work in Universities instead of largely listing them. The absence of any clearly political interpretation of the purpose of military funding of scientific research makes potentially valuable information seem merely interesting and considerably weakening its impact. However the pamphlet has filled an important gap in providing a workable list of research activity in universities connected in whatever way to the military, and this will be of great help to activists to begin projects of investigation at the universities themselves.

THE MILITARY- INTELLECTUAL ESTABLISHMENT by Alan Lentin. A Cringe pamphlet, Leeds University Union.

The Cringe pamphlet is an example of how a university based study can be conducted and presented. This too could have benefitted from being more concerned with political implications and possible action, rather than just listing the people involved. The most simple activity is to make sure that each university member of staff is aware of the implications of his military work is, and that if he is not prepared to give it up that he justifies it to his students publicly. Many will only be prepared to appreciate the implications of military funding under pressure, some can even be convinced to give up the military support for their individual projects and raise the money elsewhere. However the larger problem is the structure and organisation of scientific advice to the ministry of defence which generates the military support of university research in the first place.

Farooq Hussein
Resource One: Technology for the People

In previous issues of SfP there has been much heated discussion on the use of the computer as a social/political tool in the service of the State but cloaked in radical language to appear to serve people—see "The Liberty Machine for Chile" SfP No. 21.

There are at least two groups concerned with a different vision of computers being used to serve people. The effects of their work may be as contentious as de Beer's Liberty Machine but very worthy of consideration. I write as a sympathiser of Resource One who would like to make SfP readers aware of what they are doing in their interpretation of science for the people. The article is taken from information received and a short visit made in late '72.

Resource One was founded in late 1971 when a small group of ex-computer science students obtained funding from the Stern Foundation and an XDS-940 Time Share Computer. It can communicate with up to 24 users at once. Other funds included money from Bank of America and the Fireman's Fund Foundations.

The environment of Resource One is highly significant. It is housed within Project One, a converted warehouse in San Francisco containing dozens of spaces created out of 84,000 sq ft of concrete. 'One' consists of technologically orientated people, writers and artists who have all been trying to integrate their skills and work with the rest of their lives. It is a truly amazing place for any casual visitor to experience. About 60 people live there and 120 work there. Apart from Resource One there is a film processing lab, experimental high school (free school), alternative magazine, radical welfare departments, workers union and radio/music recording studios.

The actual running of 'One' has been informal and it is difficult, from the little I have seen and read, to be more explicit about its politics. The original impetus for Resource One came during the Cambodian crisis of May 1970 when a group of computer students began thinking of using computers for building communications networks to share information resources.

... "The milieu is anti-profit and directed towards social change with decisions made by consensus at weekly staff meetings. The basic tensions of the situation centre around the problems of a politically diverse, self-managed working group with heavy commitments and considerable resources, and they centre at the fundamental tension between person and machine:

"Can this tool of a militarized society be made directly useful to people? How?

Are the costs of being body-servant to the Beast worth the clearly undefined gains?

Are we risking dependence on an overgrown, high-level technology?

What should we do with all the technological tools we've acquired?"

"So far the dialectic has produced a Directory of Social Services in San Francisco, an information re-settiwal system useful for indexing, searching, sharing an manipulating data for groups doing research directed towards social change, a public access information sharing network, a collection of government (census, housing, election etc.) data about San Francisco made available to individuals and community groups, various services for social change groups, many burn outs, arguments, late nights of hard work, disgust with the whole thing and a continuing feeling of challenge."*

The group claim that it is a people-controlled machine with easy access to it. They seem concerned to develop technology for people into technology by people and as they say in their newsletter "what real work would you do with a computer?"

Dave Hayes

*Resource One Newsletter 2, April 74, 1380 Howard St, San Francisco, Ca 94103.

WOMEN AND SCIENCE

A group of us in and around science have decided to get together to form a Women and Science Group. We believe that the Women's Movement exhibits a certain inconsistency towards science and that this is leading to confusion about our understanding of its role both in our oppression and in our liberation.

Science is a sexist activity, there are few women in science and even fewer in engineering. Women's education does not encourage much interest in science. Our consequent lack of scientific knowledge means that as consumers we are conned by men in white coats flashing test-tubes and describing new wonder ingredients. Aspects of our health not related to enabling us to fulfil our role as baby-producers get neglected because men control the allocation of resources to research. We feel ambivalent about the producers of science—the Pill represents both liberation and oppression for many of us.

Science is used to justify our supposed inferiority—we can't hold responsible jobs 'cos we suffer pre-menstrual tension; nevertheless, we turn to science to justify our sexuality, the clitoral orgasm really only arrived when Masters & Johnson proved its existence "scientifically". Some of us believe that science and technology will contribute to our liberation via a series of wonder gadgets and machines which will relieve us of our traditional drudgeries. We feel such a faith is misplaced.

We believe that all these issues, and more, warrant discussion. We aim to open this discussion by producing an issue of Science for People entitled "Women are People Too!". (Don't worry men, we plan a self-help page for you!) We'd like sisters who feel they'd be interested in joining our discussions, or who'd like to help put the Women's Science for People together (and maybe write something for it?) to contact us. Articles (not too long) should be in by the end of January. Ring Dot on 01-452 6249 or Judith on 01-348 8266 for more details of the group and date of the next meeting. You can write to us via BSSRS, or via 7b Chichele Mansions, Chichele Road, Cricklewood, London NW2 3DG.

Science, Education and the Theatre

In March 1975 six actors will be spending a day in each of ten schools in Newcastle-upon-Tyne. They are all members of the Stagecoach Company, the Theatre-in-Education team attached to the Tyneside Theatre Company. They will spend the day acting for and talking with about 60 sixth formers on the subject of the building of the first Atomic Bomb.

Theatre-in-Education (TIE) has been developing as a form over the past ten years. Expressed simply TIE uses a mixture of theatre and teaching techniques to assist in the child's education. It seeks to aid, not supplant, the teacher. It is much more than just a performance with a moral to illustrate—it invites active and positive response from the children.

Why the Atom Bomb? Firstly it is a prime opportunity to combine the illustration of some simple physical principles with major historical and political events. Secondly it embodies some of the most crucial individual decisions in the history of mankind. Finally, I believe that it is a superb illustration of the scientist's problem—the problem of his knowledge and its use or misuse!

At the time of writing (late October) I am in the early stages of reading meeting people, and attempting to clarify and simplify the mass of information. A picture is beginning to emerge of a potential dramatic structure. I shall have to cheat, and simplify history. Only a few characters can appear—Oppenheimer or course, but who of the others? Sinclair? Teller? Lawrence?

I shall be researching this project for the next three months or so and would be very interested to hear from anybody who was involved and can give me insights on the atmosphere of the times and the personalities involved. I can be contacted at: The University Theatre, Haymarket, Newcastle-upon-Tyne 1.

Simon Dunmore