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Now reason can prevail

SIR Gordon Wolstenholme, Chairman of Britain's Genetic Manipulation Advisory Group, said on London Weekend Television last Sunday that GMAG's new system of guidelines for assessing the risks of genetic manipulation experiments "will be so full of sense in the end that it will be the one which will predominate." GMAG has not yet formally adopted the system (which is based on a version of numerical risk analysis) and has opened the subject for debate with the article below (p 104).

The revised guidelines proposed by the US National Institutes of Health are in many ways arbitrary. They are thus open to bitter public attack. The new GMAG system, on the other hand, is rational and therefore more defensible; and it is flexible in that experiments on risk are encouraged and new data can easily be incorporated. GMAG should be encouraged to adopt the new system. But GMAG's path is not strewn with roses.

First, there are internal problems. While the procedure outlined below is clearly rational, it still leaves many of the cards in GMAG's hands. 'Qualitative' biological judgements have to be made alongside the calculations, and it would help if GMAG were to be more explicit about these judgements. It would help also if GMAG's existing case law—which will still be applied where data is not available to support the more scientific system—were to be published.

It would also help if the history of the more numerical parts of the procedure were known. Sydney Brenner had the original idea of calculating a number of separable 'risk factors' for each experiment (last week he said: "I don't believe anything until I see numbers"). His idea was developed in the Safe Vectors Sub-Committee of GMAG, where a trial was run of numerical assessment. Individuals were given a list of experiments whose risks were to be calculated; but they came up with very different figures. However the *ranking* of the experiments with respect to risk was highly consistent, and hence the stress on the use of the figures for rank rather than as absolute numbers in the GMAG document. Also, there is no mention of a 'scale-up' factor in the report. The system is flexible enough that one could be included, but it is not the easy matter it might at first seem. As one GMAG member said "which would you be more afraid of: an experimenter dropping a one-litre glass flask, or an escape from a sealed stainless steel industrial plant containing 10,000 litres?" These and other matters should be aired in the debate to follow, and the new procedure should become better understood and refined in the process.

The second problem GMAG faces is international. GMAG—unlike the National Institutes of Health in the US—controls industrial research as well as academic work. So—certain industrialists argue—British firms will be penalised in the early stages of the potentially enormous business of biotechnology if GMAG's controls are any stiffer than those adopted voluntarily or by fiat elsewhere. It is important for industry that the controls on this research are internationally uniform. But the NIH guidelines, for example, take no care of what GMAG calls the 'expression factor'—whether the foreign gene is translated into protein or not. As industry clearly wants expression (that gives it its product) it is to industry's advantage that that factor is ignored. And this is just one example. To make such things uniform internationally is no easy matter, and it is important that it should be pursued at the highest government level.

International uniformity becomes a further cause why GMAG must make its procedures crystal clear. The European Science Foundation's Liaison Committee on genetic engineering adopted the earlier British (Williams) guidelines used by GMAG; but its members were lost in applying them to their own countries. What exactly were GMAG's internal procedures? And how could the smaller countries apply them, where there were too few researchers to set up a GMAG equivalent? The NIH system has won in many countries for its transparency—its look-up table of containment—despite its evident logical shortcomings. Europe needs a European GMAG. Perhaps the ESF Liaison Committee itself could take on the role?

The third problem facing GMAG is the research on risks it so welcomely recommends. How is it to be done? Who is to do it? And who pays? Surprisingly, perhaps, the last question is the easiest to answer. Britain's Minister of State for Education and Science, Mrs Shirley Williams, interviewed last week on London Weekend television by MP Brian Walden, promised "tens of millions of pounds" for risk research in Britain. With that much, risk research might become like cancer research in the US: everybody will be doing it because the money is there. £10 million would certainly answer the previous question—who is to do it?

There remains the problem of careers for 'riskers'; as Brian Walden put it "there are no Nobel prizes for risk research". (Though who knows? One of the risks is of the escape of a bacterium producing large amounts of insulin, and no-one knows what such a bug would do. Another risk is of a bacterium expressing, say, cell surface proteins upsetting the immune system and inducing an autoimmune disease. Again, too little is known about the immune system to predict the consequences. Experiments on such matters might throw up new knowledge.) But if university researchers cannot be drawn away from their present interests what of the civil service scientists? What about those ex-Ministry of Defence people at Porton Down, now under Shirley Williams' control? Could they begin work on risk research?

Then there is also the problem of how risk research is to be commissioned. Surely GMAG should do that. GMAG has already expressed a willingness to do so, through the 'technical panel' GMAG recommends in its new proposals. And one final point. That panel should not consist entirely of academics, as its name appears to suggest. One of GMAG's strengths has been the breadth of interest represented by its members. It should not abandon that strength in what will become its inner sanctum. □