

To the extent that consideration of GMOs arises in this Inquiry I submit the following article I wrote in:
EUREKA STREET, 3/2003,14-15.

Being scared of GM. An environmental scientist responds to a science writer.
[a response to Graeme O'Neill's "GM scare hots up", *Science Watch, Sunday Herald Sun*, 29.12.2002, p.30]

Being scared of GM [Gene/Genetic Manipulation] may not be rational but it is reasonable. Here's why.

Humans are still very much taken by their apparent power over nature. The insights of science have heightened both the scope and extent of that power and genetic manipulation represents a quantum leap in both.

Science however, is not itself power. It is the careful attempt to theorise and build insight that stands the tests of repeated experimentation and open criticism over time and varied practice. The creation of theory is the domain of informed inspiration. Transforming theories into science however, is the domain of rationality. It involves finding and running experiments that fit into what is already accepted as science and then subjecting the results to repeated criticism. In this effort, science is our most noble creation and so the recently released (12/02) Australian Academy of Technological Sciences and Engineering report that worries about poor science teaching in schools is well justified in its concern.

For all that nobility, science is not and never can be, ultimate truth. It does not aspire to that. It "simply" is the most able set of interpretations we have at any time and is, by its nature, always open to questions about its insights (laws and accumulated details) and methods. We definitely are not in a situation to say, as Graeme O'Neill does, that we have "nothing to fear from GM foods". We can only say, as he does a little earlier, that "GM ingredients have been on our supermarket shelves for six years without a single scientifically reputable report of any adverse impact on human health". Even then, as a scientist I must have misgivings about how well Graeme knows the field of writings on the topic and about what he regards as reputable.

A more important concern with GM is one that goes beyond direct health implications to humans. It arises from the doubt we must always have about scientific knowledge and the contexts within which it is applied. These are *reasonable* concerns rather than rational ones; one cannot substantiate them with science because both arise outside science and its apparatus of proof.

Science doesn't offer directions or prescriptions although it can be used to *test* directions and prescriptions when testable bases of direction and prescription are found. Uses or "contexts of application", on the other hand, arise from priorities applied imaginatively and priorities arise from social and personal expectations.

In common with all fields of innovation genes are engineered according to the priorities of those with influence. Such priorities are supported by the ways of living of most of the rest of us; that is, probably by yours and certainly by mine. While these priorities may well reflect market opportunities offered as a result of scientifically illuminated possibilities, the opportunities are neither science nor necessarily benign. They depend on interpretations and interpretations are, in part at least, idiosyncratic and unpredictable; and most of us would fight for it to remain so.

If we accept evolutionary theory, we might say that organisms develop within the possibilities available to them in their own structures and in the structures of their surroundings, propelled by the mutations chance brings their way. Genetic manipulation involves imposing the usual two sets of interpretations and priorities on nature: those embodied in existing

science (what we know) and those represented by the existing market (what's important to us). These provide new sources of mutations which are the kick or motivator in the evolutionary process. While human manipulation can be regarded as just another evolutionary propellant which the built in structures of nature can be relied on to accept/reject, the equation is not quite that simple.

Humans are already sufficiently powerful to suppress nature's attempts to reject us, indeed as a still-living sufferer of an auto-immune disease (Crohn's) I am a living example of that power.

We have become a global or nature-wide influence. This in itself may not be a problem. However, we have no choice but to exercise influence through the interests and interpretations available to us. The influences that attract mass market support command most of our resources and effort and therefore dictate the scale of application. They become world-wide forces with world-wide implications. To the extent that we like them, we buy and invest in them and they become entrenched, part of our vested interests and therefore very difficult to remove quickly. Moreover, because we have vested so much in them we set out to protect them, deliberately making them difficult to change. The devices we use to do this are our world-spanning risk management infrastructures: insurances, legislation, markets, armies and especially the political policy-making infrastructures that underlie the acceptability of all the others.

So, with only the shallow public assessment structures we currently have to judge what the market presents to us we are determining the future of something whose implications are very broad. And again, while this is not new - indigenous Australians went ahead and transformed the continent with fire without the benefit of an environment impact statement - we have now established world-spanning systems that make it difficult for nature as a whole to protect us. Worse, many of us who understand the importance of these systems to our everyday lives willfully disregard the social rigidification they represent in part, I imagine, because they cannot appreciate the *natural* consequences. Of course and inevitably, nature will prevail but it may do so in ways that are unpredictable to us and we may not like them. Indeed much of nature may not like them either!

CS Lewis explained much of this 60 years ago in his punchy little book, *The Abolition of Man*. I recommend it (still in print).

Am happy to respond to any queries the committee might have.
Yours sincerely,

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