A MOLE IN THE DEPARTMENT

(Orwellian Comment on Research Funding)

from an undisclosed correspondent in a remote part of Cyberia.

Smuggled Minutes of Staff Meeting of the Department of Molecular and Cellular Eugenics. Professor Bengt Axelrod is addressing his Department at the start of the new academic year, sometime in the third millenium.

"Comrades, I've got news for the Department . . bad news . . .very bad news. I have been informed by impeccable sources, which I cannot possibly divulge, that there is a mole in the department. Let me explain what I mean by the word 'mole': It is a small burrowing animal living in the Northern hemisphere, black and furry, with strong front paws for its tenacious digging activities. No-one really understands the ways of moles. Occasionally they produce little mounds of earth in the front lawn, and no-one knows how to interpret them. Moles are widely believed to be blind. Way back in the middle of the second millenium a little known writer by the name of William Shakespeare used the term figuratively to refer to someone who is defective in mental or physical vision. But there are more sinister implications of the term 'mole'. Moles are sometimes thought to be undermining the foundations of our buildings. Some think of moles as secret intelligence agents, who gradually achieve a position deep within the security defenses of a country or an organization. Now, as I say, I cannot possible name my informer, but he did tell me the name of this mole in the department, and I think it is important that you should know who it is - because, whoever it is, he should be hoofed out, root and branch. The name of this undercover agent is a certain Robert Miller - or at least, that is one of his many aliases.

"Now I think you should be aware of how deeply this spy has penetrated our security, and to know something of the tactics he uses for his subversive purposes. He has recently submitted for publication, in a most reputable journal, a paper, which, if accepted, will undermine the foundations of our organization. You may remember that, late in the twentieth century those two pioneers of scientific science policy -

Grünebaum and Bolony - advanced the thesis, now well known, expressed in mathematical notation as follows:

$$\mathbf{Rs=M,} \qquad \mathbf{M>\propto} \qquad \mathbf{Eq.1}$$

where **Rs** = Research success, and **M**=money.

Part of the derivation of this powerful equation is the following empirically proven hypothesis:

$$\mathbf{Rs=\sum nP^{i}} \qquad \mathbf{Eq.\ 2}$$

where n = number, P = papers, and i= Impact factor. From this, it follows very easily that $M=\sum nP^{i}$, or in other words, money is equal to the total number of papers produced, to the power of their impact factor. A most elegant piece of mathematics, you must agree. Now it is exactly this fundamental tenet of our organization which Miller seeks to undermine. He actually purports to have experimental evidence showing that under some extreme conditions, the Grünebaum-Bolony equation does not hold true. Some of this so-called evidence he claims to have obtained over a period of twenty-five years in his own secret laboratory. But he has also traveled and claims to have collected further evidence that there are exceptions to the Grünebaum-Bolony equation. He has traveled in Russia, and claims to have seen things that are, quite frankly, incredible. Laboratories, which in terms of decor, would make an average New Zealand prison look very well appointed. Long, black corridors, without either light or windows. Small offices and laboratories equipped with old-fashioned computers. Snow on the roof, which, as it melts, leaks through the ceiling and drips around the computers. This, of course, was in the days shortly after the end of the Soviet empire, when Russian scientists were actually paid - not much - less than an average bus driver - but still paid. And Miller claims that they were actually doing high quality research. He also claims that they had recourse to a method long abandoned in the West - because of its subjectivity - which they called “thinking” - thinking about scientific questions that is - rather than about scientific politics and economics - a much more fitting task for scientific minds of high calibre, I'm sure you will agree. All these accounts of his visits to Russia are so far beyond belief that we can quite safely dismiss them as sheer fabrication - good science fiction perhaps, but not to be given any weight at all in the scientific formulation of science policy.

“In addition, in support of his claim that the Grünebaum-Bolony equation does not always hold true, he cites the most disreputable of all sources - namely Einstein. I refer here of course, not to the physicist - whose work was shown to be seriously flawed early in the third millenium - but to Mrs Einstein, whose heretical work was also in vogue for a while, but has surely been superceded by scientific newspeak. Apparently, in the late 1940s, a few years after the discovery of nuclear power, the Einsteins were taken to see Mt. Palomar Observatory, in the mountains of Southern California. They stood looking up at the observatory, arching up to the sky, like a cathedral, obviously costing millions of dollars to erect; and Mrs Einstein was heard to utter the words: “All my husband needs is the back of a few envelopes.”

“So this is the sort of strategy used by the subversive Miller. He has some supporters overseas, they tell me, who refer to his revision of the Grünebaum-Bolony equation as the Miller-Einstein inequality.

“Let's go further into the thinking of this seditious upstart, to understand better the conditions under which the Grünebaum-Bolony equation is supposed to break down. You may have noticed in equation 1 the little assumption that M- the money - tends towards infinity. Miller actually has the ridiculous idea that this might not be generally true. In fact, he has the temerity to suggest that money is actually in rather short supply. He derives this from the third law of thermodynamics, the law of increasing entropy (or to put it crudely the idea that disorder in the universe is always increasing); and by a simple piece of mathematics (which I won't bore you with) he deduces that, over millions of years, M tends to zero. As a result he introduces another parameter into the Grünebaum-Bolony equation - Cf - the competition factor. This is supposed to arise because, if the money really is limited, there is not enough to go round, so people have to compete. This takes a lot of time (T) and effort (e), and so the factor Cf has to be subtracted from what is actually achieved in the trivialities of the actual research (Rs). So, according to Miller:

$$\mathbf{Rs=M-Cf} \qquad \mathbf{Eq.3}$$

Next, he cites a little known paper of Grunge and Fudge (2021), which claims empirical support for the idea that Cf is inversely proportional to M. In other words, as Money gets scarcer, competition gets fiercer. So, according to Miller, $M \times Cf$ = a constant. This constant is known as Grunge’s constant, which Miller suggests applies throughout the universe and at all times. Now clearly, if M is always decreasing, there will certainly

come a time when M=Cf, or, in other words,, when the subtraction sum on the left side of equation 3 becomes equal to zero (see fig 1.).

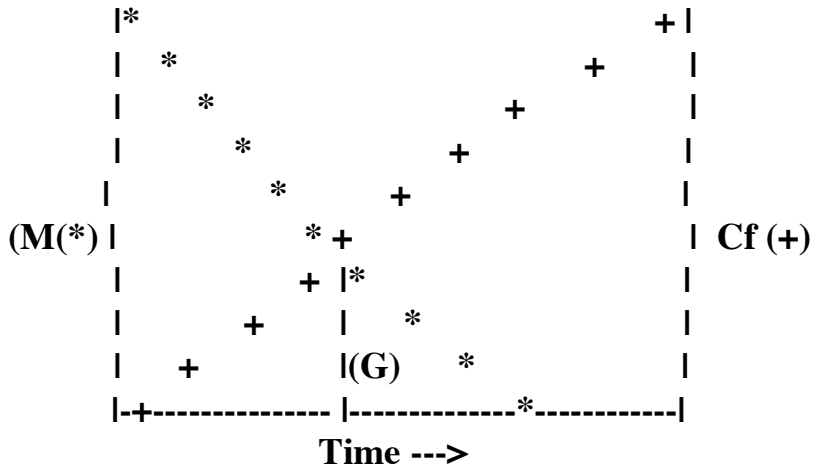

Fig.1. M and Cf in arbitrary units; G= Grunge catastrophe

At this time, research success also becomes zero. In the field, this is becoming known as the Grunge catastrophe (or the Fudge singularity). This catastrophic event is never known to have occurred in our Galaxy, comrades, but Miller and his associates claim to have evidence from analysis of cosmic rays that it has occurred in a number of rather distant nebulae. What happens after a Grunge catastrophe is not entirely clear, though it seems we can no longer justify our existence (or, ε tends to zero). However, the mathematics becomes quite obscure at this point, although it seems to be a plagiarism of the maths used to define black holes, way back in the twentieth century. What is most worrying is that Miller suggests that we are fast approaching a Grunge catastrophe in our own galaxy."

"One more twist to his treacherous reasoning: He suggests an alternative to the Grünebaum-Bolony equation

$$Rs=Tt^{l} \qquad \text{Eq.4}$$

where T=time available for research, t=thought and l=library facilities. Note that the terms on the right contain no reference to either money or competition. From equation 4, Miller has the temerity to suggest that Tt^{l} = M-Cf. In other words, one can achieve equal degrees of research success

without involving either money or competition, as one can if one does employ these two."

"Finally, Miller challenges the very basis of the computation of scientific science policy. He challenges the validity of the fundamental physical variable we call Rs (Research success). He points out that Rs is the success for the individual who succeeds in the competition, and dares to suggest that:

$$N \times Rs \neq \int_{1}^{n} Rs \qquad \text{Eq.5}$$

In other words, he suggests that the overall success of the organization might be greater if everyone has some success, than if they compete like rats and only a few succeed. As an alternative to Rs, he proposes a completely new physical variable - Re - research effectiveness, which he defines as follows:

$$Re = \int_{1}^{n} \frac{nPq100}{M} \qquad \text{Eq.6}$$

where n= number of staff in department, P=papers, q100=quality of papers as judged in 100 years time."

"There are two important features about this equation. First, the variable q100 is a little enigmatic, and of course cannot be judged at the time a paper is published. Miller suggests a pragmatic compromise - that q for all papers be set at unity at the time of publication, and then be incremented or decremented every ten years, according to their perceived success or failure. Second - quite scandalous really, you will admit - Miller proposes that research effectiveness is inversely proportional to money, whereas we all know that research success is directly proportional to M. In other words, according to Miller, if two researchers have equal values for the product $nPq100$, but one uses one tenth of the resources of the other, the former is thereby declared to be ten times more effective. Quite outrageous really. I'm sure you will agree that the one who uses ten times more resources, is ten times more successful."

"Of course, all this is sheer treason and heresy. Miller claims he now has incontrovertible evidence supporting the Miller-Einstein inequality, and its various corollaries. But little does he know of the fundamental principles of scientific science policy. Has he never heard of Cook's Law? The second

lemma of Cook's law clearly states: "If the facts do not agree with the theory, down with the facts."

"Comrades, there is not a moment to lose! We need to nip this pernicious mole in the bud - hook, line and sinker. Miller needs to be apprehended and made answerable for his serious crimes. He should be horsewhipped, and then sent off to our penal colonies in Cyberia for the rest of his natural life. That should cool his ardour."