

## THE SCORN OF HERETICS

My topic is the unexpected close-mindedness of scientists, and people generally, when confronted with new ideas, and why this may occur. But now I feel at a small disadvantage. The previous speaker has challenged our own open-mindedness by telling us that nuclear fusion in a bottle is a promising avenue of research, and would be known as such but for its concealment by military interests.

Like many people, I am afraid I find this difficult to credit without knowing more. After all, mainstream sources inform us that the claimed phenomenon, once it was announced by two scientists, was investigated by many others, who were unable to replicate it. This, of course, is how professional science works. We confirm or deny the truth of a new claim after a review of the logic and the evidence.

But the theme of my own talk is the origin of the unreasonable close-mindedness that I and others have documented in the science establishment today, the combination of politics, system flaws and psychology which shores up ruling paradigms against review. Surely, if I reject nuclear fusion in a bottle without researching the issue, I will be acting no differently from the mainstream scientists in, for example, AIDS, my case study, who reject dissent out of hand?

The difficulty in AIDS, however, is that an unproven scientific claim has *not* been dismissed, as in fusion in a bottle. On the contrary, it has been universally adopted as valid, even though conventional scientific review has called it into very serious, in fact, overwhelming doubt.

So I would like to make clear that my contention is that scientific review should be respected as a process in all fields. Reviewing is a standard and necessary part of the professional scientific process. In the case of cold fusion, the experimental reviews invalidated the claim; in the case of viral, contagious AIDS, a thorough, high level, peer reviewed theoretical review invalidated the claim.

In the absence of new evidence, we must accept both reviews, if they are well done. Instead, we have massive resistance to any review in AIDS, and this behavior is not atypical of science at large. My intentionally naive question today is: what causes this lack of professionalism?

I speak to you as a journalist who has written on the subject of the disputed science of supposedly viral, contagious AIDS. That is, I have devoted a large amount of time to researching, thinking and writing about the topic, and have interviewed a wide range of people with different perspectives in the field. So while

I am not academically qualified in the specific field of retroviruses, my view is informed by personal dealings with its leading figures and their arguments on both sides of the divisive issue: is AIDS viral and contagious or not?

And to cite another credential, I do not have a personal axe to grind. I have no direct career involvement within science or medicine. I was trained as an economist, and I first wrote in national British and US magazines such as *Fortune* about business and industry. In the past twenty years I turned to writing about science and scientists in *Omni* and other popular venues, and my interest today remains focused on the future of science and technology.

### **A resistance to review**

What I must tell you is that working as a journalist in science, after writing articles in business and economics, was a revelation. Given privileged press access to the leaders of many scientific fields, some of whom I interviewed at length on their life's work, I discovered a dismaying fact: while many distinguished scientists were strictly truth seeking professionals, more than a few were not.

Sad to say, the leaders of science were not always the exemplary torchbearers of truth I had fondly imagined. A few of them, and this included more than one Nobel prize winner, were very capable of defending the ideas on which their careers were based as if they were immune to review of the evidence, or even to logic. In other words, these generals of science were unprofessional according to the standards that scientists implicitly profess.

This tough resistance to review has been obvious from the late eighties among the retrovirologists of the purportedly new science of AIDS.<sup>1</sup> I came across the phenomenon as a result of a suggestion in 1988 from the editor of *Nature's* sister journal *Biotechnology*. He alerted me to the existence of Peter Duesberg, a prominent researcher of retroviruses, and his dissenting view. In 1987, Duesberg was assigned by the very reputable journal *Cancer Research* to review the new hypothesis that AIDS was caused by a retrovirus, now named Human Immunodeficiency Virus or HIV.

Having thoroughly reviewed the claim, he published a most unexpected conclusion. Duesberg found no convincing evidence for the hypothesis at all. Much more likely, he wrote, was the possibility that AIDS in the US was brought on by the toxic assaults of drugs. Neither the lab nor the epidemiological evidence for HIV as the cause of AIDS was sufficient, or even impressive.

As an independent writer my response to this news was to interview sources

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<sup>1</sup> LIVERSIDGE, A.F. 1995: "The Limits of Science", *The Cultural Studies Times*, Fall 1995, reproduced on this Conference web site.

on both sides of the debate and this soon established an equally unexpected finding. The replies of the leaders of the field to his points were hardly purely scientific. In fact, they were consistently specious, biased and personal, rather than scientific.

Determined to get to the bottom of this conflict, I conveyed point and counter point between the two camps until the issues involved seemed exhausted. In doing so I noticed a key difference in behavior. Duesberg would act responsibly. He would take every point raised against him into account, and answer it fully from the evidence. His opponents would typically answer his points with disparagement and dismissal. Politics, rather than science, was being brought to bear to repress rather than answer his arguments.

### **Power politics**

This politics of incuriosity soon extended into my own profession, I found. There was an initial honeymoon period, in which my sense that Duesberg had a most convincing case provoked surprised interest from editors. But eventually it became difficult to sell them on covering the dispute, despite the enormous stakes involved in terms of dollars and lives. Eventually, prejudice became almost complete. An editor at *Science* asked me if I could find something else to write about. An editor at *Omni*, a popular science magazine, ordered me not to mention Duesberg's name ever again, though I did manage later to include Duesberg in a roundup article on heresy in science which is reproduced on the conference site.<sup>2</sup>

Not all such moves were in private. *Nature's* then-editor John Maddox took a part in publicly repressing Duesberg, cutting short the debate in his pages and limiting Duesberg's responses to critics.<sup>3</sup> At one point he advised his readers not to read the *London Sunday Times*, a British weekly newspaper that covered the dissent at length. Maddox would inform them if anything significant was reported, he said. On the bureaucratic level, a senior NIH official, Anthony Fauci, was quoted in an NIH newsletter warning that reporters who covered Duesberg would be cut off.

Lacking the power to flout lack of editorial interest and the resistance of mainstream sources, I moved on to other topics. As I checked back from time to time over the decade I found that AIDS media politics never improved. Major reporters have won medals for coverage of AIDS which resolutely ignores

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<sup>2</sup> LIVERSIDGE A.F., 1993: "Heresy: Three Modern Galileos", *Omni*, June.

<sup>3</sup> MADDUX, J. 1993: "Has Duesberg a right of reply?" Editorial, *Nature*, 363, 13 May, p. 109. HODGKINSON, N. 1994: "Poppers and Propaganda-Censorship is blocking the debate vital to discovering the truth about AIDS", *London Sunday Times*, May 1.

Duesberg's views, and young reporters who know no better are now being warned not to cover Duesberg's equally revisionist views on the cause of cancer in case they lend him credence and "isolate" themselves.

For example, the editor of the *California Monthly* magazine at the University of Berkeley was recently put under a "Duesberg embargo" from his board of directors. Even though the topic is now not Duesberg's AIDS heresy but his new and promising theory of cancer,<sup>4</sup> Duesberg is not to be "legitimized". The editor chafing under these guidelines is, as it happens, a long time friend of Duesberg's.

In that case, it may be no coincidence that Duesberg's new view of cancer contradicts the oncogene paradigm, which has proved a rich lode of funding for cancer researchers for the last fifteen years. Duesberg's skepticism on oncogenes, genes that supposedly cause cancer, is all the more significant if we consider that he was once on the fast track to the Nobel prize for being the first scientist to isolate an oncogene, from the Rous sarcoma virus.

The point is that this close-mindedness is not the standard filtering out of an untutored crackpot whose new and iconoclastic theory is founded on ignorance. This is remarkable ostracism of an established scientist of impeccable reputation, whose papers and results have never otherwise been questioned. This is the establishment repressing the establishment, and suppressing the free exchange of views with an equal.

In the battle of credentials, one might even rate Duesberg superior. He has been a member of the National Academy of Science, the premier self-elected body in US science, longer than his major opponents in his fight against the hypothesis that HIV is the cause of AIDS. The discoveries of two of his most powerful foes, moreover, have been questioned in two celebrated instances and their claims disproved and withdrawn. None of Duesberg's scientific statements or work has been challenged except his skeptical view of two unproven theories—oncogenes, and of HIV as the cause of AIDS.

### **Still an open question**

There is little point here in going through all the many stark problems in the AIDS-HIV paradigm that Duesberg and others have pointed to. But one can mention the main ones. They begin with the fact that tests for HIV were positive in only 88% of the patients sampled by Robert Gallo in the papers on which the unconventional hypothesis was founded, and HIV was claimed isolated in only 41%

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<sup>4</sup> GIBBS, W.W., 2001: "Dissident or Don Quixote?", *Scientific American*, August.

(26 of 63).<sup>5</sup> They end with the fact that no better proof of cause has been produced in the years since. Instead, there have been years of accumulating outrages to common sense. Among them: the blood of AIDS patients contains too little HIV, it infects too few T4 cells, it replicates in vitro harmlessly in the same cells, and too many AIDS patients test negative for HIV.

The chief difficulty for dissenters now is that virtually all of the data of the field rests on the assumption that HIV *is* the cause. The presence of the virus defines AIDS. Even its name is self-serving: Human Immunodeficiency Virus. This circularity is one of the paradoxical complications that wall off the ruling paradigm from examination and protect it from public review.

A short list of the inconsistencies inherent in the paradigm is included in "The Limits of Science" on this conference's Web site, and many more can easily be found on the Internet.<sup>6</sup> The most impressive are the different symptoms in different global regions, and the strange inability of the phenomenon to behave like an infectious disease in North America, where cases are tracked by actual testing, with the number of Americans who are positive for HIV remaining steady at one million or less throughout the sharp rise and recent fall of the epidemic. Instead, the sensationally heralded US heterosexual outbreak has never occurred, while African and Asian AIDS is reported as entirely heterosexual, actively infectious and spreading alarmingly, though confirming testing is severely limited, and the totals of all deaths in the countries concerned do not rise significantly.

Proponents have an answer for every point, critics have an answer for them, and so on, in the manner of Ptolemaic astronomy defending itself against Copernicus. This zig-zag of point-counterpoint makes for a logical hall of mirrors. Added to this, the skeptics are asked to prove a negative, namely, that HIV *cannot* be the cause of AIDS, which is notoriously difficult as a matter of logic, and especially in this instance, since many cases where HIV is not detected are still counted as AIDS cases, because it is nonetheless assumed that HIV is present. If it is accepted that it *isn't*, then the condition isn't counted as AIDS. They are also asked to provide and prove an alternative cause, which is also difficult when all the data gathering assumes that HIV is the cause.

In sum, it is not possible to drive home or refute the critique until independent research is funded. Those versed in traditional biology can, however, judge a priori how far fetched the HIV hypothesis's rationale is, and how unlikely its logical pillars, set against conventional understanding of retroviruses and disease.

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<sup>5</sup> GALLO, R. 1984: *Science* (224:497-508, May 4)

<sup>6</sup> See especially <http://www.virusmyth.com> and <http://www.duesberg.com>

Suffice it to say that the AIDS-HIV hypothesis is still literally unproven, as implied by the incessant use of the otherwise needless phrase "there is overwhelming evidence that HIV causes AIDS". While anyone may choose to believe that HIV causes AIDS, after seventeen years there is not yet any objective, demonstrable proof of this. The latest medications, protease inhibitors, are trumpeted in the media as a great success, and as a clinching argument that HIV causes AIDS, though the mechanism of its depredations is still unknown. But David Rasnick, who worked with protease inhibitors for many years, will tell us that these claims are hollow.<sup>7</sup>

After seventeen years, incredibly, there is still no paper in science which anyone can reference which rises to the level of proof that Duesberg is wrong, and that HIV causes AIDS or indeed any illness of any kind.<sup>8</sup> The truth is that the HIV theory of the cause of AIDS should not even be called a 'theory'. It should properly be known as a hypothesis rather than a theory. In science, the word 'theory' refers to an underlying principle of observed phenomena that has been tested and verified.

To repeat, this is not the case with the hypothesis that HIV causes AIDS, which remains mere speculation. Unfortunately, the assumption that it has been proven is universally used as the premise of any research, and there is virtually no data free of it. Thus, what was a supposition to be tested has become accepted as a fact, proven by a circularity. Data gathered using the assumption that HIV causes AIDS are offered as 'overwhelming' evidence of the assumption.

None of this establishes that it is wrong, of course. Whether the hypothesis is in fact wrong an outsider can judge only from a detailed study of argument and counter argument for which few people, even in science, have the motivation or time. I can say that after such research I find it impossible not to conclude that the

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<sup>7</sup> PHILLIPS A.N, SMITH G.D., 1997: "Viral load and combination therapy for human immunodeficiency virus. *The New England Journal of Medicine* 336, no. 13, pp 958-9; ALTMAN, L (2001c). U.S. warns doctors to limit use of anti-HIV drug. *New York Times*, Jan. 5, p A12.; Associated Press (2001). Delaying HIV drugs may be OK. *New York Times*, November 27; HOGG, R S, YIP, B, CHAN, K J, WOOD, E, CRAIB, K J, O'SHAUGHNESSY, M V, MONTANER, J S (2001) Rates of Disease Progression by Baseline CD4 Cell Count and Viral Load After Initiating Triple-Drug Therapy. *Jama* 286: (20) 2568-2577.; PHILLIPS, A N, STASZEWSKI, S, WEBER, R, KIRK, O, FRANCIOLI, P, MILLER, V, VERNAZZA, P, LUNDGREN, J D, LEDERGERBER, B (2001) HIV Viral Load Response to Antiretroviral Therapy According to the Baseline CD4 Cell Count and Viral Load. *Jama* 286: (20) 2560-2567.

<sup>8</sup> MULLIS, K: 1994: "Interview", *California Monthly*, Sept. p. 20.

HIV hypothesis is a worthless assumption and a superstition embarrassing to the reputation of science. Short of this, there is, first of all, the phenomenon that resistance to review is so strong, which reminds one of a remark by James Mason as Mr. Jordan, the celestial administrator in *Heaven Can Wait*: "I have learned that the likelihood of one individual being right increases in direct proportion to the intensity of others trying to prove him wrong."<sup>9</sup>

### **The litmus of common sense**

But the most significant signal to outsiders is the endless list of challenges to common sense inherent in the seventeen year old hypothesis.

As Duesberg has pointed out again and again, to believe in AIDS, we have to believe in a infectious viral disease where the virus's rate of infection (1 in 500 sexual contacts) is outdone by the rate of human impregnation (1 in 10); a cell killing retrovirus, when otherwise retroviruses never kill cells; indeed, a virus provided to labs in immortal cultures of the same T cells it is said to kill off; a fatal virus that cannot easily be found in most patients, even dying ones, only antibodies to it; a disease where patients merely with antibodies can nevertheless die of the disease; a disease whose nature varies from place to place, being almost exclusively a homosexual and drug user ailment in North America and Europe, but heterosexual elsewhere; a disease that correlates with drug use in North America and Europe, yet is alleviated or prevented by a bowl full of other damaging and lethal drugs, never proved to be directly helpful; a disease whose mechanism, including an up-to-twenty-year delay in onset, is as yet quite unexplained; a cell killing disease that also causes cell multiplying cancer, with no trace of the virus in the cancer; and a disease said to be a killer epidemic in Haiti and South Africa, with no significant change in overall mortality, and long endemic in sub-Saharan Africa, where a population explosion has nonetheless added 250 million people in two decades.

Let's pause for a breath before we complete the list, for that's hardly all. We also have to believe in an epidemic mapped in Africa by the World Health Organization almost entirely without the benefit of AIDS tests, which themselves are problematic; a viral epidemic uniquely without initial exponential growth or bell-shaped rise and fall; a viral epidemic which has not found immunity anywhere; a killer disease where no doctor, nurse or researcher working with it has caught the disease; a disease with risk group, lifestyle, and malnutrition specific symptoms; a disease whose every symptom is shared with other diseases--in fact, a disease which would in every case be counted as those other diseases except for the supposed presence of antibodies to the "virus that causes AIDS"; a viral epidemic without a sign of a promising vaccine despite the best funded army of researchers in history; a viral disease which quickly achieves the antibodies of vaccination of its own accord;

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<sup>9</sup> *Heaven Can Wait* (1978). Directed by Warren Beatty.

and a virus transmitted 25-50% through birth which has produced no epidemic among children.<sup>10</sup>

That list is long enough, I think you will agree, that a New Yorker such as myself might be forgiven for saying "If you can believe all that, I have a bridge I would like to sell you." Duesberg asserts that all these paradoxes are resolved if we simply accept that AIDS is a drug phenomenon, or elsewhere a picture artificially created by gathering other diseases under the AIDS umbrella, where any occurrence of disease is relabeled AIDS if HIV antibodies are reckoned to be present. I know of no good reason to disbelieve him. One good reason to believe him is that there is no AIDS disease among HIV positive patients who abstain from recreational and medicating drugs.<sup>11</sup>

Still, while it is an enormously important question whether the hypothesis is right or wrong, for the purposes of this talk it is irrelevant. My topic here is the influences on science which bias judgement, pervert its practice and handicap dissenters with prejudice, so that we all are deaf to their analysis.

Under that heading I suggest that those influences are political and psychological, that they are exemplified in the case of AIDS science, and that I have had personal experience of them at work. But such claims of political rather than professional behavior among scientists in dealing with Duesberg do not have to be credited on my testimony alone.

### **The evidence in *Challenges***

All this and more has been documented with excruciating precision in Yale mathematics professor Serge Lang's book *Challenges*, ably reviewed by Marco Mamone Capria in his article reproduced on the Web site of this Conference.<sup>12</sup>

*Challenges* is a masterful performance. Lang has extraordinary attributes as an investigator of political behavior, and *Challenges* is a collection of clear documentations of the ways in which members of the science and academic establishment evade responsibility on a number of issues.

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<sup>10</sup> DUESBERG P., KOEHNLEIN C., RASNICK D., 2002: "The chemical bases of the various AIDS epidemics: recreational drugs, anti-viral chemotherapy and malnutrition. " Paper prepared at the invitation of *Naturwissenschaften*.

<sup>11</sup> LEVY, J.A.1998:"Caution: should we be treating HIV infection early?"*Lancet* 352: (9132) 982-3.

<sup>12</sup> LANG S., 1998: '*Challenges*' Springer-Verlag, New York. 816 pages.

Lang is a distinguished mathematician who has an infinite capacity for insisting on factual statements from people who are more inclined to give political and misleading responses to inquiry. In each case he builds a complete record of the exchange he conducts in corresponding with the various officials and luminaries he challenges. He rounds off the exchange of letters with reprints of the published articles and other material evidence of the case at issue. All this documentation enables the readers to be fully informed and judge the case for themselves, and the 'Files', as he calls them, are as factually objective as good mathematical proofs.

One of the cases in *Challenges* is that of AIDS. Here Lang's concern, as mine is today, is not the weakness of the case for HIV as cause of AIDS, although he has now concluded that "the hypothesis that HIV is a harmless virus is compatible with all the evidence that I have studied."<sup>13</sup> His concern is that the data purveyed by the scientists and official organizations is based upon this hypothesis, is corrupted by circularity and inconsistency, and is poorly defined, misleading and self serving. When Lang drew these flaws to the attention of the CDC and other institutions, their officials behaved unresponsively, and with respect to their obligations towards the public, irresponsibly.

Anyone can read irrefutable documentation of this in his book, and Lang and his publishers must be congratulated for providing this overwhelming evidence for the evasions and fallibility of the establishment in this field.

There is other published literature where the phenomenon is clearly seen at work. You can easily access my two verbatim interviews with Robert Gallo, the scientist originally responsible for the HIV-AIDS hypothesis.<sup>14</sup> These revealing exchanges were published in *Spin*, a popular US magazine, and are now carried on the Web at the [virusmyth.com](http://virusmyth.com) and [duesberg.com](http://duesberg.com) sites. These sites carry other interviews and articles which demonstrate arrogant indifference on the part of scientists entrenched on top of the AIDS hill, and examples of how the debate has been manipulated politically.

The poor level of logic employed in these defenses of his hypothesis by Gallo, while perhaps shocking, is not the point here. What matters is the political nature of his comments and his dismissive style of discussion. The reader can see from these texts the unprofessional way in which this scientific debate has been

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<sup>13</sup> LANG, S. 1999: "The Case of HIV: We Have Been Mised", *Yale Scientific*, Spring 1999, p. 9.

<sup>14</sup> LIVERSIDGE A., 1988: "Words from the Front: Interview with Robert Gallo", *SPIN*, February 1988; "Words from the Front: Interview with Robert Gallo", *SPIN*, March 1989. See <http://www.virusmyth.net/aids/index/aliversidge.htm>

conducted from its beginning.

This lesson that scientists may serve interests and impulses other than the logic and measures of science is nothing new to social cynics or historians of science, of course. Unreasonable resistance to new ideas from the leaders in medicine and science has been a notorious phenomenon for centuries. Max Planck put it succinctly: "Science advances funeral by funeral." As I reported in "Heresy: Three Modern Galileos", science still frequently imitates the Roman Catholic Church at the time of Galileo. What should be intellectual debate becomes a bitter power struggle.

Violent reaction was less camouflaged in the early days. One famous case is William Harvey, who decided correctly in 1628 that blood circulated. The accepted teaching was that the blood began in the liver and, after nourishing the body, simply disappeared in the tissues. Detractors invented opposing evidence, his apartment was ransacked and his notes and manuscripts stolen, and he was harassed by the College of Physicians. Harvey took to walking around with a dagger.

Another example came in 1721, when minister Cotton Mather's house in Boston was firebombed because he supported smallpox inoculation. Mather had learned from a slave that Africans had used it successfully, and tried it on his own son. This, his opponents objected, indicated "distrust of God's overruling care".

Obviously violent prejudice against innovation is deplorable in medicine or science, which are supposedly objective professional fields. The point, however, is that it is still with us. Nowadays the violence is more psychic than physical. No one has to trash Duesberg's lab. He is ostracized and his lab is simply starved of funds.

### **The mystery of blind acceptance**

The real surprise today is not even the resistance of leaders in science to threatening new ideas. The interesting puzzle is: what motivates those among the rank and file, and the intelligent public, to choose blindly to accept authority in AIDS despite the many warning signs—the evidence of prejudice, the now extensive public literature questioning the hypothesis, and the obvious inconsistencies in almost every news story in AIDS as presented by authority?

To any skeptical mind the unquestioning acceptance of the conventional wisdom by intelligent people among the general public, in the health sciences, in medicine, and in the ranks of science reporters and writers seems unreasonably naive. Even more credulous is the behavior of AIDS patients themselves. In most fields, physicians are no longer treated as gods, and patients often arrive with handfuls of their own research from the Web. Yet so many AIDS patients bow to the prescriptions of their doctors and resolutely refuse to read the literature which suggests they might be saved by taking another route.

For example, tennis professional Arthur Ashe read about Duesberg and his

views, but consciously put them aside as too late for him even as he acknowledged they were persuasive.<sup>15</sup> A writer for *Vanity Fair*, a national magazine in the US, had the same response when I alerted him to the full situation a few months before his death. "I have no alternative now but to rely on my doctors," he said.

Such emotional dependence is understandable when patients believe themselves in danger of dying. But given the media exposure of the fallibility of the medical profession in recent years, and the new availability of medical information to laymen on the Web, it is surprising that it continues. In recent years meta-analysis and other research has checked beliefs against evidence and exposed much conventional medical wisdom as myth. Contrary to the previous belief of most doctors, the placebo effect does not exist, mammogram screenings do not save lives, the heart can repair itself and bed rest is not the right treatment for lower back pain (light exercise and getting back on your feet are now prescribed).<sup>16</sup> Meanwhile, gross individual fallibility has been found even among surgeons. At least 150 times since 1996 in the US, surgeons in hospitals have operated on the wrong arm, leg, eye, kidney or other body part, or even on the wrong patient.<sup>17</sup>

Both in AIDS science and medicine, however, there is this almost universal reflex rejection of even the possibility that we are on the wrong track. Yet many of the statements of AIDS theory conflict with conventional science, not to mention plain common sense, the chief heretic is a member of the establishment of otherwise unchallenged credentials, and statistical predictions of cases based upon this hypothesis continue to fail completely.

The urgent question for science is: what is it that can cause an expert establishment reviewer to be irrationally disdained, and can the system be reformed to remove this flaw? Given that Serge Lang, myself and other reporters have well documented the fact that a majority of professional scientists in AIDS do actively resist or scorn the reasoned review of a scientific idea, rather than fairly debate it, what are the possible reasons that lie behind this behavior?

Having spent a decade and a half watching the course of events in AIDS, I

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<sup>15</sup> BHATTACHARYA, T. 2000: "The HIV Hoax", *The Pioneer*, New Delhi, July 16.

<sup>16</sup> HITT, J., 2001: "Evidence Based Medicine", *New York Times Magazine*, Dec 9, p 69.

<sup>17</sup> ALTMAN, L. K. 2001: "The Wrong Foot, and Other Tales of Surgical Error", *New York Times*, Science Section, Dec 11, p.1

would say there are dozens of interrelated influences, motivations, and mechanisms, some rational but many irrational. Some are obvious to the worldly, some more unexpected. Those that are not flaws of the system are elements of the political and psychological atmosphere of present day science and society, and human failings that are always with us—but against which science should be on guard. The most visible are various forms of self-interest in the arena of power. But ultimately, I believe, the most overlooked are various aspects of one of the oldest traits of humanity, the religious impulse.

All of them are important because they are reasons why we may flout common sense, and credit the possibility that a virtually universal belief in science, one of extreme consequence, may be highly questionable, yet reign undisturbed.

### **The politics of disdain**

First, there are the obvious political mechanisms, motivations and pressures. As Jacob Bronowski has proclaimed, "No science is immune to the infection of politics and the corruption of power." Paradigms are defended by political arguments, as well as or in place of reason and evidence.

In AIDS, for example, the dissenters have long been accused of endangering the public welfare by encouraging sex without condoms, since they are undermining the acceptance of HIV as the cause. The fact that this argument makes no scientific sense at all hasn't prevented it from being used effectively for years. As Lang has written, "sometimes when I have given a talk on HIV, questioning the orthodoxy, members of the biomedical establishment have not come to my talk and have refused to answer scientific questions, giving to colleagues the reason that what I do is 'dangerous'."<sup>18</sup>

Even more political and irrational was the one page advertisement in the *New York Times* published to counter dissent in AIDS, signed by a list of mainstream scientists and health officials. This declaration of faith in the ruling hypothesis was graced with the headline: "HIV Causes AIDS: To Argue Otherwise Costs Lives." The claim was another blatant paralogism, of course. If the dissenters are right, "arguing otherwise" will save lives.

Defenders who use political arguments to sustain a ruling paradigm are self-evidently unscientific, and it is always disappointing to see that philosophers of science such as Thomas Kuhn accept this as an inevitable flaw in the practice of science. According to Kuhn a scientific paradigm is never overturned by logic and

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<sup>18</sup> LANG, S. 1999: "The Case of HIV: We Have Been Misled", *Yale Scientific Spring*, p. 19.

evidence alone, but the revolution is achieved only after a political struggle.<sup>19</sup>

Given that politics *is* brought to bear, though, related factors are relevant in explaining how review can be successfully buried. Dissenters may be ineffective public leaders, for example. History shows that the acceptance or rejection of ideas in science or medicine often hinges on the personalities of the researchers involved.<sup>20</sup>

A dissenter may not be interested in fighting the political battle. One has only to think of Barbara McClintock and her "jumping genes" in maize, a discovery that was initially resisted, especially because she was a woman. A determinedly independent researcher, McClintock did not devote much energy to politics and her visionary achievement was ignored for decades. Only after 35 years, at the age of 81, was she awarded the Nobel.

Research scientists are not always suited to political roles, after all, though their ability to raise funds for research is important in their work today. They may be poor at persuading their peers or the public that their ideas deserve consideration. For example, Peter Duesberg is a fine logician and a leading researcher, a fully paid up member of the establishment, and a socially adept personality. But I believe he was at first handicapped as a dissenter in AIDS by his quicksilver wit, often exercised at the mild expense of his slower opponents. Given their endless obstruction, his alleviating humor was understandable. But a uniformly sober stance might have been more influential for a dissenter in a life and death matter in which vast career and financial interests were involved.

On the other side disparagement and scorn for the heretic may be liberally applied by defenders. In the AIDS debate, the leaders of the field, the major media and other supporters of the status quo have generally preferred not to answer the arguments raised, but to ignore them or detract from and vilify the dissenter. Duesberg is routinely painted as a tiresome maverick in media reports that prejudice the public against him and demean his status as a respected, qualified reviewer.

### **Conformist pressures**

Along with this there are institutional pressures to conform in the political arena. One is the ethos of collegiality among established practitioners. Members of an establishment tend to close ranks when under attack. Senior people avoid

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<sup>19</sup> KUHN, Thomas, 1962. *The Structure of Scientific Revolution* (University of Chicago)

<sup>20</sup> HELLMAN, H., 1998, *Great Feuds in Science: Ten of the Liveliest Disputes Ever* (John Wiley) and 2001, *Great Feuds in Medicine* (John Wiley).

fighting their peers, even when scientific truth is at stake. The participants recognize that dissent should be muted for the common good. For example, Yale's Provost in a 1987 letter implored Serge Lang not to "turn upon our own" but to give "an extra ounce of trust and forgiveness" in exposing serious flaws in the thinking of a prominent Yale political scientist.<sup>21</sup>

A factor in the US may be a general pressure to conform in this once revolutionary democratic society, a pressure long ago characterized as a new 'tyranny' by Alexis de Toqueville in *Democracy in America*:

"I know no country in which, speaking generally, there is less independence of mind and true freedom of discussion than in America....

"In America the majority has enclosed thought within a formidable fence. A writer is free inside that area, but woe to the man who goes beyond it. Not that he stands in fear of an *auto-da-fe*, but he must face all kinds of unpleasantness and everyday persecution. A career in politics is closed to him, for he has offended the only power who holds the keys. He is denied everything, including renown. Before he goes into print, he believes he has supporters; but he feels he has them no more once he stands revealed to all, for those who condemn him express their views loudly, while those who think as he does, but without his courage, retreat into silence as if ashamed of having told the truth.

"Formerly tyranny used the clumsy weapons of chains and hanging; nowadays even despotism, though it seemed to have nothing more to learn, has been perfected by civilization."<sup>22</sup>

Though Duesberg has not yet given up, this fairly describes the road he has travelled.

The power of the media in modern society helps impose this kind of conformity, many agree. Noam Chomsky, professor of linguistics at the Massachusetts Institute of Technology, has pointed out that the corporate lockstep mentality that imbues the media has resulted in an epidemic of mainstream thinking

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<sup>21</sup> LANG, S. 1998: *Challenges* (Springer-Verlag), p 38.

<sup>22</sup> De TOQUEVILLE, A. 1850: *Democracy in America* (tr. George Lawrence, ed. J.P. Mayer, Doubleday-Anchor, 1969).

in the US. <sup>23</sup>

Anyone marching out of step is subject to the pressure of conformity in any human group, a herd instinct which no doubt reflects the survival value of group cohesion. After all, it is adaptive for primitive social animals to coordinate their behavior, whether fleeing threats or hunting. Apparently this applies to ideas as well as actions, and, like laughter, the mimicry tends to be contagious. In science as elsewhere, the crowd is going to resist new ideas which disturb the shared status quo. With this ingrained aspect of human nature to cling to the prevailing wisdom, the more widely a notion is received, the harder it will be to dislodge.

But this kind of bonding emotion is exactly what the principles of professional science are supposed to guard against. The outcome of a properly controlled scientific experiment is wholly independent of the wishes and fears of both the subjects and the experimenters. The thinking of any good scientist should be immune to the opinion of the crowd.

All that should go without saying, yet it is being ignored in AIDS. Instead, conformity acts as a wall against review, and is enhanced by institutional endorsements, prizes and awards, ostracism of the heretic, and overvaluation of public consensus.

The current paradigm in AIDS has enjoyed unprecedented endorsement from all major institutions in science, government and health around the world, including the US federal government, the National Institutes of Health, the *New York Times*, the National Science Foundation, the United Nations and national governments around the world. The now almost automatic support of overseas governments is possibly related to the prospect of expanded aid from the US and the UN if they adopt the HIV-AIDS model. In July 2000, for example, the US announced a plan to offer \$1 billion annually to sub-Saharan nations to buy American AIDS drugs and medical services. <sup>24</sup>

The outcome is a situation where the unproven claim of one individual scientist, Robert Gallo, certified by the federal government before publication, confirmation or review, has been adopted by colleagues in the field without final proof and despite contradicting review, and certified by national and international institutions around the world.

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<sup>23</sup> CHOMSKY, N. & HERMAN, E.S. 1988: *Manufacturing Consent: The Political Economy of the Mass Media*, (Pantheon)

<sup>24</sup> KAHN, J., 2000: "U.S. Offers Africa \$1 Billion a Year For Fighting AIDS", *New York Times*, July 19, p.1

### **Self-reinforcing belief**

Thus the conformity reinforces itself. Set against this universal institutional endorsement, any challenge to orthodoxy appears ridiculous to the general public. There is a California society, for example, which holds that Alice in Wonderland was not written by Lewis Carroll, but by Queen Victoria. In a context of universal endorsement, the challenge to the AIDS paradigm appears just as outlandish.

The single, rather unexpected exception to this unanimity among governments is South Africa, whose president Thabo Mbeki is a thinker who went to the Web to examine the debate for himself. He concluded that Duesberg had a point, and convened a review panel on the topic before the AIDS conference in 2000 in Durban.<sup>25</sup>

His own officials were embarrassed by his skepticism, however, as concerted detraction was brought to bear from every quarter. The *New York Times* questioned his sanity, and *Nature* printed the "Durban Declaration", a statement signed by "over 5000 scientists including Nobel prizewinners reaffirming their faith in the HIV paradigm."<sup>26</sup> The schoolboy fallacy here, of course, was the misapprehension that science is a democracy and that its truths are decided by vote. Some readers must have also wondered why, if the paradigm was so solidly based, it needed a group declaration of faith in its virtue.

Unfortunately, the idea that a universal belief must be true is as appealing to some scientists, it seems, as it is to the general public. One reason may be the deluge of scientific data, and the impossibility of keeping up in one's professional reading, given the endless array of journals in every field. Another reason is that unusual ideas are usually wrong, in science as in society. Statistically, a maverick is likely to be a misguided crank, so it saves a lot of time for practitioners in a field to disregard unconventional views.

Certainly a widely accepted idea is a priori difficult to dislodge. Right or wrong, ideas can be tyrants, as John Maynard Keynes remarked:

"The ideas of economists and political philosophers both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority,

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<sup>25</sup> The panel released an interim report in April 2001 recommending 10 experiments and studies to double check the AIDS hypothesis.

<sup>26</sup> 2000: Commentary, "The Durban Declaration", *Nature* vol. 406, p15-16.

who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back. I am sure that the power of vested interest is vastly exaggerated compared with the gradual encroachment of ideas."<sup>27</sup>

What is the chief mechanism of this gathering entrenchment? On the sociological level it must surely come down to some form of multiplying utility. Since we share a group susceptibility to the conventional wisdom, it infects us like an intellectual virus, a meme. To replace it, a new meme must have social advantages of some kind, above and beyond logic.

Perhaps these social advantages, which must be one big root of conformity in science, add up to the so-called 'network utility' of an idea. I refer to a phenomenon noticed in the realm of computer marketing: in any social network, the more established an assumption becomes, the more useful it becomes for an individual to hold it.

Network utility is seen most visibly in the spread of commercial software and other products used with networks. The network utility of an operating system for desktop computers increases with the number of people that adopt it. When only 10 per cent of computer users use the Windows operating system, its attraction for newcomers is limited. As the number of users expands, however, its value to individual users grows. Exchange of advice, assistance, instruction, and files is facilitated by a shared language. By the time 80 per cent use Windows, it becomes overwhelmingly attractive for newcomers, since it is common to so many users.

The network utility of an accepted idea in science presumably increases in the same way. The more people believe in an idea, the more entrenched and useful it becomes, economically and politically. Like computer software, ideas - the software of the intellect - become more useful and valuable the more people share them. Good or bad, a received notion acquires massive social utility. As Mark Twain noted, "scientists have odious manners, except when you prop up their theory; then you can borrow money off them."

The network utility of the ideas of a dissenter is, on the other hand, almost negligible, at least until he or she acquires a substantial following. Like the attractive Apple operating system which now barely survives in a sea of Windows machines, the ideas of a dissenter tend to stay confined to those who already understand their quality. Proselytizing is an uphill battle.

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<sup>27</sup> KEYNES, J.M., 1936: *The General Theory of Employment, Interest and Money* (New York, Harcourt Brace and World, 1964), p. 383.

## Flaws in the system

Secondly, there are flaws in the system of administration of science, and its institutional framework, which protect an idea from ruthless review.

A notorious reason for conformist thinking in science is the system of peer review, where the research or journal article proposal of a dissenter is anonymously judged by the high priests of the orthodoxy. The result in many cases, as Cornell's Thomas Gold has pointed out, is that

"it is now virtually impossible to do any research outside the widely accepted position. If a young man with no scientific standing were to attempt this, however brilliant he might be, he wouldn't have a hope."<sup>28</sup>

Duesberg, who as I said also opposes the oncogene theory of cancer, has described the peer review problem he has experienced well:

“(Peer review is) the little known practice of the US government to deputize its authority to distribute and control funding for research to committees of "experts". These experts are academic researchers distinguished by outstanding contributions to the current orthodoxy. They select each other to judge the merits of research applications of competing peers.

“Outwardly, this "peer review system" appears to the unsuspecting government and taxpayer as the equivalent of a jury system-free of all conflicts of interest. But, in view of their many professional and commercial conflicts of interest including even the financial interests of their universities and institutions...."peer reviewers" select applications for funding that confirm and extend their own professional investments.

“These "experts" are very unlikely to fund an application that challenges the current orthodoxy. The corporate equivalent of American science's "peer review system" would be to give General Motors and Ford the authority to veto all innovations by lesser car makers competing for the American consumer. Since "peer review" is protected by anonymity, does not allow personal representation of the applicant, and does not allow an appeal, its powers to defend the

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<sup>28</sup> GOLD, T. 1989: *Journal of Scientific Exploration*, **3**, No. 2, 103.

orthodoxy are unlimited.<sup>29</sup>

"Moreover, the experts are now even legally rewarded for their investments in the orthodoxy by income from commercial applications of their work via patents, shared with universities!"<sup>30</sup>

As Duesberg implies, as science becomes commercialized, the sums at stake are large. The Nobel prize winner David Baltimore, one of Duesberg's chief opponents in reviewing AIDS, is said to have sold a company for \$30 million.

In AIDS, the money and political system formed around the paradigm is vast. There is no need to accuse the members of the establishment of conscious corruption. But most people in the field and their laboratories, not to mention their houses, wives, children, dogs and vacations, are funded by the reigning paradigm, and it would be an economic earthquake for them if there was a sudden turnaround in the world's belief in HIV as the cause of AIDS.

Ruling paradigms are always closely bound up with flows of finance and benefit, but the unique factor here is the sheer size of the funding involved—over \$100 billion thus far in Federal funding, and countless billions in private investment and marketing of drugs, not to mention state and local spending on health and education, and the spending of the World Health Organization, and other national governments.

If the weight of this influence leads to unconscious or even conscious conformity in science, as one is bound to suspect, it is hard to demonstrate and even harder to counter. It cannot be prosecuted, since it contravenes no laws except the rules of good science. Competent, massive and thorough journalistic exposure of reasons for doubt in AIDS science, most notably in the *London Sunday Times* and

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<sup>29</sup> DUESBERG P., KOEHNLEIN C., RASNICK D., 2002: "*The chemical bases of the various AIDS epidemics: recreational drugs, anti-viral chemotherapy and malnutrition.*" Private communication of paper prepared for Naturwissenschaften

<sup>30</sup> DUESBERG P.H., 2001: Personal email to Higgins H., the Randolph Foundation, New York, March 19th. But see also DUESBERG, P.H., 1992: "AIDS Acquired by Drug Consumption and Other Non-contagious Risk Factors ", *Pharmacology & Therapeutics* 55: 201-277,

in a number of books, has had no effect in slowing the bandwagon. <sup>31</sup>

A reinforcement of general belief is the awards and other social benefits that flow to it, which seem intellectually confirming. When medals and Nobel prizes are awarded to the high priests of a scientific dogma, onlookers tend to assume their faith must be valid. But awards are drawn from the same self-serving process as government grants. Prize committees are staffed or advised by the same cosy club as NIH grant committees, usually those who are senior in the field and have already won awards themselves.

In science, there are few alternative platforms for dissenters. Invitations to give lectures or write articles tend to dry up for heretics, who are weakened by increasing lack of acknowledgement. They are no longer invited to conferences.

Such ostracism is not inevitable if the dissenter has political support from outside the field. Richard Lindzen of MIT is a well established scientist who for ten years has been a vocal skeptic that humans have caused global warming, yet he retains respect and reputation, and advises the White House on climate trends. <sup>32</sup>

### **Coopting the media**

The fallibility of science journals is another factor with which a dissenter has to contend. The public generally assumes that anything in print in a respected scientific journal is correctly researched and argued. After all, it is peer reviewed. But this is not always true. One seasoned Harvard researcher and Nobel prize winner, Walter Gilbert, once told me he always repeats experiments upon which he is going to base new research. Even with peer review, the limits of expertise lead to error. Statisticians point to errors in the design of published AIDS studies, and dissenters have exposed poor controls and other flaws in studies of AIDS, HIV and the drugs used to medicate AIDS.<sup>33</sup>

In these days of big science, key periodicals such as *Science* and *Nature* may publish thousands of papers based on a paradigm, as they have in the case of AIDS. The investment of their authority makes the prospect of invalidation almost

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<sup>31</sup> 1993: *London Sunday Times*, Fall editions, and 1994: April 3.  
HODGKINSON, N., 1993: Editorial, *London Sunday Times*, Dec. 12. For book list, see <http://www.virusmyth.net/aids/books.htm>

<sup>32</sup> GROSSMAN, D. 2001: "Dissent in the Maelstrom", *Scientific American*, November, p 38.

<sup>33</sup> LIVERSIDGE, A. 1990: "Words from the Front", *Spin*, February 1990.

inconceivably embarrassing. Perhaps this is the cause of one journal editor's overt hostility to the review of the HIV hypothesis. I am referring to John Maddox, former editor of *Nature*, though he has vigorously denied the suggestion to me.

There is an experiment in social psychology which seems relevant here, a trial which found that false contradiction from an authority has greater staying power in the mind than the evidence of one's own eyes. People were given a flawed account of some slides they had just witnessed. At first they detected the false descriptive elements and recognized them as misinformation. Soon, however, the memories of the original slides faded, and the misinformation became dominant.<sup>34</sup>

Unfortunately, there is a general lack of independent authority in science aside from the scientists themselves. The hard won expertise of a specialist field is the stock in trade of its members, and puts it comfortably beyond the investigation and adjudication of most outsiders. In law, medicine and science the public is forced to trust the experts who speak the technical language and understand the data, some of whom may use jargon and special knowledge as camouflage for ignorance and incompetence.

Usually such system flaws are the specialty of investigative journalists, but in science there have been very few of these. Science reporters and editors use the leaders of the scientific communities they cover as their reliable sources on new developments, and they are not usually equipped to second guess them. The dependence of media reporters on established sources tends to make them fellow travelers. They cannot risk alienating the top scientists they rely on for briefing and guiding them. They need their support and recognition, and they need their quotes.

Thus the media have become the megaphones of mainstream scientists. The AIDS science writers of major newspapers in the US, even if aware of the problems with the HIV-AIDS hypothesis, have rarely written about them or Duesberg. If they do report on Duesberg, mainstream reporters don't hesitate to inform us that his views ignore "overwhelming evidence" and have been "convincingly rebutted" and "debunked point by point by scientists all over the world."<sup>35</sup>

Nor will they or other science journalists write about the one thing the public needs to know in assessing any scientific dispute: when faced with a threat to the

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<sup>34</sup> LOFTUS, E. F. and HOFFMAN H. G. "Misinformation and Memory, The Creation of New Memories," *Journal of Experimental Psychology: General* 118(1):100-104 (March 1989).

<sup>35</sup> GARRETT, L., 1994: *The Coming Plague* (Penguin) 1995, p. 383.  
GIBBS, W.W., 2001: "Dissident or Don Quixote?" *Scientific American*, August.

status quo, the leaders of science will typically behave very partially. This knowledge is commonplace among those who know science and scientists, yet it is still widely unappreciated in society at large. Perhaps we should all reread Tolstoy, who once said:

"I know that most men, including those at ease with problems of the greatest complexity, can seldom accept even the simplest and most obvious truth if it be such as would oblige them to admit the falsity of conclusions which they have delighted in explaining to colleagues, which they have proudly taught to others, and which they have woven, thread by thread, into the fabric of their lives."

Along with these circumstances, dissenters have to contend with the inability of outsiders to assess a clash between experts. When experts disagree, it is often said, outsiders cannot decide who is right. The expertise that is the stock in trade of scientists, lawyers, doctors and other professionals protects their judgement from review by outsiders.

### **Accessible to outsiders**

But the scientific debate in AIDS, at least, is not beyond informed assessment by non-specialists. If investigative reporters or others are able and willing to spend the time, they can read through and assess the reasoning involved in the debate. A few courageous mainstream media reporters have interviewed and reported on dissenters and their publications, and members of the public can read their coverage of dissent, or even read the original material to advantage.

Reason, after all, is not the private preserve of professionals. The data may be technical but the question is whether editors and publishers wish to devote the time and resources to the project. Unfortunately, in the system at present, only independent reporters and filmmakers have devoted the time and effort needed to assess the issue for themselves.

The review material in AIDS, notably the articles by Peter Duesberg in *Cancer Research* in 1987 and *The Proceedings of the National Academy* in 1988, can be read to advantage by any intelligent layman who wishes to check the reasoning involved in challenging the AIDS-HIV claim. Significantly, virtually all the points made are still valid.<sup>36</sup>

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<sup>36</sup> DUESBERG, P.H. 1987: "Retroviruses as Carcinogens and Pathogens: Expectations and Reality", *Cancer Research*, March 1, 1987, vol.47, pp.1199-1220; DUESBERG P.H., 1989: "HIV and AIDS: Correlation but not causation" *Proceedings of the National Academy of Sciences USA* Feb. 1989, vol.86 pp.755-764.

Even in a field as thick with the accumulation of technical research as AIDS, the intelligent outsider can review the argument over the basic notion on which all that research is based. As a reporter, I did so, and anyone can now do so by going to the Web sites mentioned above for article reprints.

Another important facet of US society is involved in repressing review. The doubtful practice of divorcing business goals from moral and social responsibilities has long been a striking feature of business in the US. Ideals of social justice and welfare are mentally set off from business concerns. Recently, for example, the chief executive of Nike, Inc learned that the University of Oregon had joined the anti-sweatshop Workers Rights Commission. His response was to stop attending the school's athletic events, and to withdraw his promise of a \$30 million gift to the university.<sup>37</sup>

Could this happen in science? Absolutely. One company developing an AIDS vaccine, Immune Response of Carlsbad, California, acted in precisely the Nike manner when scientists reported in the Journal of the American Medical Association that its HIV vaccine was not effective, according to a study carried out by the company itself. Immune Response sued to block publication of the paper, threatening damages of \$7 million. JAMA published the report anyway. The company's fears were evidently justified, for it was later abandoned by its chief sponsor, Pfizer, a drug company.<sup>38</sup>

These commercial pressures are now permeating science and medicine, and an ever more amoral and possibly antisocial mentality is spreading, as the rush to patent the genetic sequences of individual patients indicates. There seem all too few moral and social qualms as riches beckon. In AIDS, as I noted earlier, the amount of money involved is vast. By the end of this year over \$100 billion will have been spent on HIV-AIDS research and other thus far ineffective action to combat the growth of the AIDS phenomenon.

### **Ticket to success**

What such totals suggest is that a scientific hypothesis today can be a ticket to millions in funding and personal income to those who climb aboard the bandwagon, and that huge interests may act, visibly or not, to curb review.

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<sup>37</sup> JACOBSON, S. E, 2000: "Nike's Power Game", *New York Times*, Tuesday, May 16.

<sup>38</sup> HILTS, P.J. 2000: "Company Tried to Block Report that its HIV Vaccine Failed.", *New York Times*, Nov 1.

Medicine is particularly subject to venal influences. The commercial ties involved in drug studies and the pressure of big pharmaceutical companies on the FDA in the US have recently been deplored by Richard Horton, editor of *The Lancet*. The relationship between many doctors and pharmaceutical companies is now "close to corrupt", he acknowledges. One of his concerns is that the UK equivalent of the FDA, the Committee on Safety of Medicines, has members who personally or professionally often depend on industry money. In December 2000, 26 of 36 members declared industry interests in the form of shares, fees, consultancies, non-executive directorships, grants and financial support to attend meetings from up to 26 companies each.

Horton writes that "the research process itself is also immersed in a financial quagmire of conflicts of interest. At the University of California at San Francisco a third of the faculty investigators were found to have received payments from companies for lectures and consultancies. Prestigious medical conferences are thick with industry sponsored symposia promoting a product or a company or both."

Studies have shown that "doctors who take money from drug companies are more like to hide anxieties about drug safety than those who keep their hands firmly in their pockets," Horton notes. "Such is the atrocious venality of modern medicine." <sup>39</sup>

As paradigm supporters accumulate riches and influence, including patent royalties, dissenters are starved of access to resources. In AIDS, Peter Duesberg lost his unusually generous federal grant of \$320,000 a year, after his peers withdrew their support when it was up for review at the National Institutes of Health. It became increasingly difficult for him to find a platform for his views. Sometimes invitations to lecture, or to appear on television, were withdrawn after they were extended, as his opponents intervened behind the scenes.

There is of course the same problem of resources for any other scientist, journalist or member of the public who wishes to double check the claims of AIDS scientists, and compare them to Duesberg's review.

For example, owing to other priorities I have not yet had time to research fully the puzzling dispute on whether the HIV retrovirus per se actually even exists as a stable form. Australian researcher Eleni Papadopulos-Eleopulos and her colleagues of the Perth Group and others assert that no complete "HIV" RNA molecule or DNA genome has been identified or isolated as a stable particle, and

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<sup>39</sup> HORTON, R., 2001: "Thalidomide Comes Back", *The New York Review of Books*, May 17.

that no photograph of an isolated HIV particle has been published. 40

No doubt you think this view sounds farfetched, as do most people who hear it for the first time. A cursory review of the debate, however, indicates the claim is argued with some expertise and a total of \$50,000 in rewards is offered for anyone who establishes they have properly isolated HIV, so far not successfully claimed.<sup>41</sup> If such critics are correct the validity of AIDS tests, already very questionable,<sup>42</sup> would approach zero and many positive HIV tests, known to cross-react with many other substances, and the sensational narrative of AIDS in Africa and Asia retailed by the media might be even better explained.

On the other hand, Duesberg finds the claim without merit, pointing to the electron micrographs of HIV published by Gallo and others, the cell lines mass-producing HIV and especially the infectious HIV DNA clones which have enriched the AIDS scientists who hold HIV patents. Given the last, he says the prize is bogus, since he claimed it on that basis and was turned down.

The point is that with so many other assumptions exploded I naturally find this claim interesting, yet have not made time to study the material exhaustively. Precisely like those who reflexively dismiss dissent on the cause of AIDS, I discount the claim instinctively, though it appears at least worth attention. This lack of time or inclination to pursue extreme dissent from a well established premise is reasonable. None of us has unlimited time. Yet, it is an enormous obstacle to the dissenter.

Faced with these flaws in the system and the obstacles they raise to being heard, not to mention the penalties of ostracism, ridicule and exclusion from economic and social benefits, the dissenting reviewer in science, like any other whistleblower, may simply give up.

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<sup>40</sup> PAPADOPULOS-ELEOPULUS, E. 1988: "Reappraisal of AIDS: Is the Oxidation Induced by the Risk Factors the Primary Cause?" *Medical Hypotheses* (25:151-162); PAPADOPULOS-ELEOPULUS, E. 1993: "Is A Positive Western Blot Proof of HIV Infection?" *Bio/Technology* (11:696-707). LANKA S., 1995: "HIV: Reality or Artefact?", *Continuum* April/May

<sup>41</sup> <http://www.virusmyth.net/aids/award.htm>. See also <http://www.rethinkingaids.com/Archive/1999/RA9912PapadopFinalAct.html>

<sup>42</sup> PAPADOPULOS-ELEOPULOS E., TURNER V.F. 1993: "Is a Positive Western Blot Proof of HIV Infection? *Bio/Technology* 11(June):696-707."

## Human weaknesses

Finally, beyond the flaws and politics of the system, there are many human weaknesses that may maintain scientific paradigms against review.

A familiar factor is the stultifying effect of high position and advancing age which make it harder in some ways for people to keep up with new material, let alone revise their ideas. For senior scientists, other priorities assert themselves and crowd out the time for personal research. The appetite for revising the basic premises of one's work tends to weaken over time, for they form the foundation of one's lengthening career.

Applying for grants takes up the bulk of the time of senior researchers in science; administering their labs and the projects that get funded, faculty politicking, and expanding professional horizons take up the rest. Under such conditions, not all senior scientists do their own experiments, let alone have time to conduct a serious review of the basic premise on which their group's work is founded.

Closemindedness may therefore become a facet of aging even in science, a field which advances only through a constructive subversiveness. As a World Bank official recently put it:

"Science advances by having a new paradigm overthrow the old, or at least expand its applicability in new ways. Thus inherent in the scientific outlook is a willingness to overthrow the established order of thinking, or else there will be no progress. Frequently, those who come up with the new insights are remarkably young. Einstein was 26 when he wrote his five papers, and Dirac was 27 when he hypothesized anti-matter, and so on. This means that seniority cannot rule unchallenged."<sup>43</sup>

Not that breakthroughs are always made by the young, of course. Oswald Avery was 67 when he made the landmark discovery that DNA is the substance of the genes. But once a paradigm reigns, the attractions of an alternative dwindle rapidly for its leading representatives. Its replacement means loss of status and stipend.

In AIDS, as mentioned, there would be enormous penalties for its leading personalities in moving to a different view of the cause of AIDS. Entire professional careers are based on the ruling idea, large laboratories have been funded, the media have put many in the limelight as authorities on AIDS trends,

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<sup>43</sup> SERAGELDIN, I. 1999: "Women in Science: Time to Recognize the Obvious." Address to The Women in Science International League, London, November 26.

prizes have been awarded, royalties paid on patented tests, speaking platforms have been provided by the federal government, universities and other institutions, journals such as *Nature* and *Science* have devoted enormous space to articles, and the *New York Times* and other major papers and magazines have devoted acres of newsprint to uncritical stories and profiles, including the selection of one AIDS scientist as *Time's* Man of the Year.

At present, conventional AIDS scientists are highly respected and well endowed. To expect them to welcome review and demolition of their reigning hypothesis is unrealistic. They have no practical alternative to resistance if they are to keep their perks.

### **Thinking for oneself**

Beyond aging, there are undoubtedly the same range of human weaknesses among scientists as in any other group. Sheer intellectual laziness is surely one of them. "Our minds are lazier than our bodies," as La Rochefoucauld remarked. Even among experts, it is often not too hard to see that the sheer boredom and discomfort of dutifully considering skeptical counter arguments motivates prejudice against the dissenters' case.

I interpret this as partly the disinclination to think hard, which in my experience occurs as often among scientists as in the general public. Thoughtfulness seems to me to be an individual genetic trait. One indication may be that Ritalin, a drug prescribed for overexcitable children in American schools, is believed by some to enhance reasoning power among normal adults. But daily life on its own shows us that while some people actively like to think, others avoid the effort if they can.

Surely La Rochefoucauld is right. Most people do not like to think very hard. In fact, despite the nature of their vocation, I believe that many scientists do not. The easiest way of avoiding thought is, of course, to subscribe to the accepted wisdom. As indicated, I find that in AIDS scientists, doctors and health workers question received wisdom far less than one would expect. If generally true, this is unfortunate. Science and medicine are essentially exploratory activities and they should attract people who have the gene for questioning what they are told, and what they 'know'. As anthropologist Claude Levi-Strauss put it, "the scientific mind does not so much provide the right answers as ask the right questions."

Of course, everyone in this audience is a thinker, otherwise he or she would not be here at this meeting! Paradoxically, however, in gathering here we ourselves have to contend with the same human disturbances to effective thinking that interfere with the clear reception of dissenting reviews in science.

For example, the effect of proximity. In this meeting we will tend to confirm our ideas as we meet and like others who share them. This herd instinct is

independent of the sense or lack of it of the ideas. Here is a simple, but surely profoundly important mechanism. Humans need shared assumptions to consort and converse when they meet, so they instinctively subscribe to any shared idea they can to get along with others. The repeated mutual acknowledgement will have another effect. Psychologists and marketers confirm that people tend to like what is familiar, whatever the stimulus—whether words, melody or brand name. The more often concepts are seen or heard, the more they become ‘family’. Paradigms in science are reinforced by repeated meetings and discussion among peers where they are the fundamental premise.

Large scientific meetings are thus a big factor in inducing conformity, I am sure. A richly funded paradigm will engender many conferences and seminars that bond participants in mutual ideology in the same way as political rallies. The assemblies in huge auditoria that have characterized AIDS conferences over the last decade have boasted trappings that remind one of the hysterical rabble rousing of Nazi Germany—vast stages, spotlit speakers, loud microphones, giant screens with graphs and slides projected too rapidly for critical inspection. In smaller AIDS seminars, the hypnotic effect may be weaker, but there is the same paralyzing effect on independent thought, since the paradigm is ever present as an unexamined premise.

These means of inducing conformist beliefs are straight from a textbook of social psychology. Research in that field tells us that when people do not have enough information to form a judgement, they are very influenced into going along with the group which provides the information they don't have. Only if we are convinced that we are more knowledgeable than the group will we be likely to flout their judgement. Even then, in matters of expertise the pressure to conform is great. We may conform even though we believe we are right, for fear of ridicule.<sup>44</sup>

Another danger is "the lynch mob mentality" that one can see aroused in the US by 'whistleblowers', people who alert the authorities to illegal activity in their own organization. Whistleblowing is generally punished by group rejection in America, for instance, even though nominally and financially backed by the federal government with awards. Even whistleblowers who are completely vindicated as

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<sup>44</sup> WIESENTHAL et al., 1976. "Reversibility of relative competence as a determinant of conformity across different perceptual tasks." *Representative Research In Social Psychology* Vol. 7, pp. 319-42 ; CAMPBELL, J.D., TESSER, A. and FAIREY, P.J., 1986. "Conformity and attention to the stimulus: Some temporal and contextual dynamics." *Journal of Personality and Social Psychology* Vol. 51, pp. 315-24. ASCH, S.E. 1955 "Studies of Independence and conformity: A minority of one against a unanimous majority." *Psychological Monographs* 70 Vol 9, Whole No. 416.

their allegations are confirmed tend to be fired and ostracized.

In science, dissent from a profitable paradigm evokes the same tyranny. Copious evidence of this kind of behavior in US science can be read on the Web.<sup>45</sup>

### **Obedience to authority**

Where authority reigns, intimidation may enter in. Science is a field where subtle bullying is particularly likely to flourish because its leaders are accorded great authority by their juniors, their peers in other fields, and by outsiders. The assumption is that if we don't know what they are doing, at least they do.

Let's recall the most famous experiment to demonstrate the power of supposed scientific authority, Stanley Milgram's behavioral study of obedience at Yale University in 1961 and 1962.<sup>46</sup>

Ordinary residents of New Haven were invited into a scientific laboratory to participate in a pretended study of the effects of punishment on learning. They were asked by an 'experimenter' (like all the other role players in the study, an actor) in a white lab coat to administer an electric shock of increasing intensity every time a 'learner', strapped into an electric chair, made a 'mistake'.

As the supposed shock intensity was increased, the 'learner' began to shout and scream and plead for mercy. The authority in the white coat would ask the subject to continue administering shocks, nonetheless. Nearly two out of three subjects eventually raised the shock level to the maximum "450 volts", which they had been told was the level administered in legal executions.

Wrote Milgram:

"With numbing regularity good people were seen to knuckle under to the demands of authority and perform actions that were callous and severe. Men who are in everyday life responsible and decent were seduced by the trappings of authority, by the control of their perceptions, and by the uncritical acceptance of the experimenter's definition of the situation, into performing harsh acts. A substantial proportion of people do what they are told to do, irrespective of the content of the act and without limitations of conscience, so long as they

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<sup>45</sup> STEWART, W.S., *Site on Scientific Misconduct* at <http://home.t-online.de/home/Bernhard.Hiller/wstewart/main.html>

<sup>46</sup> MILGRAM, S. 1963 Behavioral study of obedience. *Journal of Abnormal and Social Psychology* vol. 67, pp. 371-78.

perceive that the command comes from a legitimate authority.<sup>47</sup>

"It may be that we are puppets—puppets controlled by the strings of society."<sup>48</sup>

Presumably public scorn of the scientific dissenter arises from the same impulse of blind acceptance of scientific authority. Obedience to authority is an essential oil for the machinery of a complex modern society but, let's face it, it runs counter to an essential principle of good science. As Darwin's defender, Thomas Henry Huxley stated, "Every great advance in natural knowledge has involved the absolute rejection of authority."

But how likely are scientists to overcome this innate impulse, rooted as it is deep in human nature? I think Milgram's experiment tells us to beware. Obedience may stifle reason more widely than we imagine. There is a long running television show in the US, 'Candid Camera', which brings this point home weekly. Recently, a convincing actor in the uniform of a security guard demonstrated that respectable middle aged airline passengers would obey when commanded to put themselves as well as their baggage on a (false) X ray machine conveyor belt, lie down and ride horizontally through the machine's interior being 'X-rayed'.

### **The religious impulse**

In all these ways, any shared belief excused review is self-reinforcing and becomes authoritative over time. Eventually, it becomes emotionally ingrained. The natural human assumption is that a well established faith must be valid, and in the face of the otherwise unknown, it becomes an emotional support.

If that sounds like the mechanism of religion, I think it is. It seems clear that scientists as professionals are not always immune, as they should be, to one of the oldest traits of humanity, the religious impulse.

We do know that even well known, highly rational scientists admit they feel the power of superstition. For example, the firmly atheistic Richard Dawkins and another scientist recently wrote in *Nature* about a St Jude chain letter, which promised recipients "good luck in four days" as long as they forwarded it to ten others. The authors said they were resistant to its blandishments but nonetheless they did experience "waves of mild, irrational anxiety" when they decided not to

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<sup>47</sup> MILGRAM S. 1965 "Some conditions of obedience and disobedience to authority." *Human Relations* Vol 18, pp. 57-76.

<sup>48</sup> MILGRAM S. 1974 *Obedience to Authority*, New York, Harper and Row.

comply with its suggestions.<sup>49</sup>

We also know that there is a strong human need for some kind of transcendent meaning in life, and this need is conventionally served by a belief in God. Does a paradigm tend to become in a way confused emotionally with the innate drive to have a faith of some kind? Trivial as it sounds at first, I suggest it could be so. Scientific theory accepted without question is, after all, ideology, and ideology is the major tool a guru or religious leader uses to entrain and control his or her flock. In terms of group bonding one effect of religious belief is to reward each member of the group according to the depth of his or her faith in the dogma, and his or her inability and unwillingness to question it effectively.

The behavior of scientists and the public in AIDS is, in my experience, very reminiscent of such factors.

Perhaps talk of religion sounds too grandiose for an unexamined liking for an overriding idea. But let's note that distinguished scientists warn against the habit of growing too fond of one's own hypothesis. Peter Medawar advised "Never fall in love with your hypothesis." Konrad Lorenz said "It is a good morning exercise for a research scientist to discard a pet hypothesis every day before breakfast."

Why such unthinking fondness for an explanatory idea? For an individual scientist hanging on to his or her own inspiration, it may simply be ego. But for people in general, perhaps it is the emotional mechanism of religion, excited by the reliable rationality of scientific truths. In a sense, there is a religious appeal in a comforting set of basic, unchanging assumptions. Scientific certainties might be a security blanket for the anxious. Perhaps it is that reassuring quality of scientific belief that renders some loathe to give up ground to heretics, even though in this they flout the very rationality they take comfort in. If so, as Medawar and Lorenz lightly suggest, this clinging is misplaced. In science, progress tends to bring change, sometimes radical change in beliefs.

### **Science embracing religion**

I am speculating, but let me pursue this thought a step further. Religion around the world is thriving in reaction to the sterility of materialism. Last year there were 2,657 titles on religious topics published in the United States. There is a fervor in the US for all kinds of churches from establishment institutions to cults, and a century old tradition of pilgrimage to the East for spiritual enlightenment. In Russia and its satellites, a renaissance of the church has followed the downfall of

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<sup>49</sup> POLLACK R.,2000: *The Faith Of Biology And The Biology Of Faith: Order, Meaning, and Free Will in Modern Science*, Columbia University Press, p 31.

communism. In China, we see a tragic determination to cling to a new spiritual movement, Falun Gong, despite fierce penalties including torture and execution by the state. The religious impulse cannot be denied for long in any society.

Nowadays science seems to be moved by the same social wave to rethink its divorce from religion. Einstein once said that "science without religion is lame", and many scientists today seem to agree with him.

One example is Robert Pollack, a biologist who heads the Center for the Study of Science and Religion at Columbia University. He argues that religious faith and science might ally themselves without irrationality, to inform each other of the other's world. "Nothing intrinsic to either the scientific method or the discoveries of science," he says, "precludes any person from holding to any religious faith."<sup>50</sup> Recently Pollack explained to me that he had felt the sterility of science, its lack of spiritual and emotional truths, and it was this that had sent him to religion for its lessons, from which he hoped scientists might benefit.

A surprising number of other leading US scientists believe in God, or credit the notion that there may be a spiritual side to existence. About 39 per cent of scientists in the US believe in a God who can answer prayer. As many as seven per cent of the National Academy of Sciences do so.<sup>51</sup> Quite a few books are being written to try to close the gap between religion and science. The Pope and the Dalai Lama are in dialogue with scientists. Lecture series are mounted on the topic. A typical recent volume is *Twilight of the Clockwork Gods*, which features eight scientists who argue that science must make room for a spiritual dimension of some kind. None of them, however, are able to adduce any concrete evidence for the spiritual plane they suggest should be added to science.<sup>52</sup>

Thus we have a serious effort being made by many people to somehow bring science and religion together. But how much science can there be in this movement? For one thing, it flouts a great lesson of history. Western science flourished after it was liberated from the church, while Arab science, once supreme, slept under Islam, where church and state are one.

I think we are safe in saying that any effort to join science and religion must

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<sup>50</sup> POLLACK, R. 2000. Ibid. p 37.

<sup>51</sup> LARSON E.J. And WITHAM L. 1996: *Nature* 386:435-436. 1998: *Nature* 394:313.

<sup>52</sup> EBERT, J.D., 1999. *Twilight of the Clockwork Gods: Conversations on Science and Spirituality At the End of an Age* (Council Oak 1999).

be motivated more by the religious impulse than the scientific one. As a description of the external world, religious belief can never be scientific. Its very nature is superstitious, involving a faith in supernatural reality beyond any proof by practical investigation. Not to be too reductionist about it, but the practice of science is like the law. It asks, Where is the proof? or at least, Where is the evidence? This is the question that religious faith survives and flourishes by proudly ignoring.

As long as one is playing the role of professional scientist, religious beliefs which concern external reality must be rigorously excluded from the mind, even as one explores what evidence there may be, if any, for a spiritual plane. Certainly the religious impulse must be prevented from making a religion out of science, and a God out of a paradigm!

To achieve this, perhaps we need a more scientific and less excessively polite view of religious fantasy among scientists. Many scientists are understandably reluctant to confront and rebut the claims of established religion to miracles and other influences on the material world. Yet they would not hesitate to challenge or at least examine very closely any secular claims to astrology, dowsing, reincarnation, Feng Shi, UFO visitations, alien abductions, or ghosts. Scientific assessment of the evidence for any factual claim must be impartial if it is to be of professional value.

After all, from a properly scientific point of view the factual claims of traditional Western religions or any others are no more likely than the claims of astrology or any other pseudo-science. As a physicist pointed out recently,

"In December of each year, nearly a billion Christians around the world celebrate the birth of a Jewish charismatic leader whom they credit with, among other things, walking on water and turning it into wine, creating bread and fish out of nothing, and bringing dead people back to life. Furthermore, he himself was supposedly born from a virgin and came back to life three days after being executed. The sole evidence for any of these wondrous events is found in a single book, written decades after this leader's death by his followers, who were promoting him as divine. This same book also describes such things as a speaking bush, the miraculous parting of the Red Sea, and a person being turned into salt." <sup>53</sup>

So I think we have to disagree with Pollack. We might have a sincere respect for religious belief for its moral influence and spiritual uplift, but we must recognize that it corrupts science insofar as it encourages the adoption of belief without evidence. As Huxley noted, "science commits suicide when it adopts a creed."

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<sup>53</sup> ANDERSON, R. 1998. "Why Would People Not Believe Weird Things?" *Skeptical Inquirer*. Sep.

Professional scientists must exorcise the religious impulse in their work, just as they banish any other kind of psychological bias. No laboratory can be housed in a church. Belief in the supernatural conflicts with the rationality and logic of naturalism. As a habit, it may foster unquestioning faith in real world claims.

The yearning of Pollack for the spiritual comfort of religion, and for its emotional and moral content, is understandable and even admirable in human terms, but it does not imply the external existence of any kind of God. To a scientist qua scientist, the texts of religion must remain moral metaphor, reflecting internal truths.

What I am saying is only that the religious impulse has nothing to contribute to science except confusion. I am not saying that religion has nothing to contribute to our lives, of course, or indeed, that science has nothing to contribute to religion. As it happens, Einstein also observed that "religion without science is blind." Science might very well cleanse religion of the more irrational dogma, rituals and beliefs that constrain adherents or excite prejudice and violence, and liberate the human spirit to find genuinely transcendent emotion and moral inspiration.

Science may even already have illuminated the source of religious revelation of the experiential kind. "In all organized religions I am aware of," writes Pollack, "revelation takes the form of a sense of being overwhelmed by sheer feeling arising within without reason or cause." <sup>54</sup> As a matter of fact, experiments at Laurentian University in Ontario have shown that a classic sense of religious revelation can be produced at will by stimulating a locus in the brain with an electromagnetic pulse. <sup>55</sup> Disappointingly reductionist to many, perhaps, but a new field of 'neurotheology' is exploring such links between feelings of spirituality and prodding the brain.

### **Mindsets in the brain**

If the feeling of religious epiphany is a function of how the brain works, perhaps rigid opinion has the same source. Experiments which may be even more pertinent to our topic have been carried out by physicist Allan Snyder in Canberra, Australia, producing interesting results related to closemindedness.

Snyder, studying the brain patterns of autistic savants, has found that normal subjects can be induced to think as literally and non-preconceptually as savants by directing magnetic pulses into their left arterial temporal lobe, paralyzing their conceptual ability. The objectivity in perception that results is revealed by their improved drawing of familiar objects, which is no longer interfered with by their

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<sup>54</sup> POLLACK, R. 2000. Ibid. p. 17

<sup>55</sup> ANJANA, A.,2001: "Brain Storm," *The Times* of London, Oct 29th.

preconceptions.<sup>56</sup>

This suggests that the unreasonable close-mindedness demonstrated by so many people in scientific debate may on one level simply reflect the active functioning of their left temporal lobe. To enable us to function in the world, Snyder now reasons, the lobe engenders preconceptions to map our perceptions. These pre-concepts must be dismantled or shifted before our understanding can change. If received wisdom fosters strong presumptions of this kind, this could cause imperviousness to reasoned argument.

Snyder concludes that we must all try to escape the influence of such mindsets to achieve useful new and creative perceptions: "Be forewarned of the blindness and the prejudice that is inseparable from your discipline," he says.<sup>57</sup>

### **The need for skepticism**

Whether systemic, social, psychological or religious in nature, or simply inherent in the way our brains work, then, there is a long list of factors which may prevent effective review in science from taking place. Yet if the heretic's will to reform is dissipated, there will be little progress in theory. There are numerous examples of Nobel prizes won by scientists who initially suffered debilitating scorn for their revolutionary idea.

As the case of Peter Duesberg shows, even a very well established heretical reviewer may be dismissed as a crank if he pursues the matter too long without flinching. But, of course, it is not crankish to try and debate an open scientific issue to agreement. Similarly, Thabo Mbeki, the South African president who independently researched the validity of AIDS heresy, is now called "irresponsible" by the *New York Times*. But it is not irresponsible for a head of state to demand a review of a genuine scientific dispute with such enormous economic and health consequences for the country he leads.

Skepticism in science is indispensable to progress and to correcting errors. In the debate over evolution, for example, the standard theory is still resisted by

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<sup>56</sup> SNYDER, A. W., 1997: "Breaking Mindset", *Mind and Language* 13, 1-10; and "Shedding light on Creativity", *Australian and New Zealand Journal of Medicine*.

<sup>57</sup> SNYDER S., 2000: "Blinded by Your Expertise", Address to Health Sciences Conference, *From Cell to Society*, Pepper's Fairmont Resort, Leura, Blue Mountains, November 1-2,. (See <http://www.med.usyd.edu.au/research/conf2000/speech.html>)

proponents of "intelligent design". Most scientists dismiss these heretics as creationists who refuse to accept the implications of scientific evidence. But the truth is that the paradigm still has gaps in its explanation of how evolution has worked, and the opponents' review has proved useful in pointing up these and, as well, some embarrassing mistakes in leading biology textbooks.

Design proponents have drawn attention to the 19th-century drawings of the German biologist Ernst Haeckel, who claimed that the early embryonic stages of many animals, including humans, were virtually identical. Haeckel claimed that the resemblance was proof that all animals had a common ancestor. The drawings were reproduced in textbooks for more than a century, until biologists discovered a few years ago that many were fraudulent and that the true resemblances were not nearly so striking.

Nevertheless, some textbooks still contain them, including the third edition of *Molecular Biology of the Cell*, the bedrock text of the field. The authors include Dr. Bruce Alberts, biochemist and president of the National Academy of Sciences, and Dr. James D. Watson, the geneticist who shared a Nobel Prize for unraveling the structure of DNA.<sup>58</sup> The mistake will be corrected in the next edition and the findings do not disturb the confidence of biologists in the theory of evolution. But it was dissent that produced the correction.

### **Empowering the individual**

Once again, one has to say that none of all this proves that the HIV theory, or any other paradigm which excites mindless resistance to review, must a priori be wrong. But unless review is given free rein, no theory can be considered validated.

Given the many origins of scorn for heresy, what is the lesson for the state and its relationship with science? Regardless of all we have said, only if and when the HIV hypothesis is exploded once and for all will this question seem truly relevant to most of the public. But let us acknowledge that it is relevant now, given the poor behavior of established scientists in debating that issue.

The overall lesson is surely that in science the individual should be empowered. Huge and centralized state funding of science magnifies the influence of the group over individual minds, and it is group influence which tends to defeat the rationality of science in almost every case we have quoted above, from network

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<sup>58</sup> ALBERTS, B., BRAY D., LEWIS J., RAFF M., ROBERTS K., WATSON J. D., 1994, *Molecular Biology of the Cell* Third Edition (Garland)

utility to the religious impulse. Social power consolidates the ruling idea and fosters an emotional defense of it as group ideology. Supposedly scientific and logical arguments are adduced in its favor by those under its spell, but the effect is really to awaken and reinforce blind faith.

Pathbreaking science is a process which is likely to be most successfully practiced by an individual, much like any other practice of initiative and originality. Science is an art of asking curious questions, and reevaluating truths, activities which tend to be dampened and even oppressed by membership of a large group. Groups and committees can accomplish brilliant engineering and lift men in rockets to the moon and back, but acting as groups they can't accomplish breakthrough conceptual science much more effectively than they can compose music or paint a picture of genius.

Fund a field in science, such as research in AIDS, with billions, and you will powerfully distort science by enlarging the herd to vast numbers and empowering the herd instinct accordingly.

So let us promote the individual in science, whether he is an originator or a dissenter. Madman or genius, if he is talented he is more likely to be the source of new truth than comfortable conformists who seek to please their peers who control state funding. Let us also foster the independent investigator in science journalism. This role has to be filled by the freelancer in a society if big media and their executives and editors are too much the servants of their business owners. But science editors could be more imaginative, and courageous.

We need to educate everyone in critical thinking and awareness of the sociology of large organizations. Editors must recognize and keep the public informed of the fierce politics of repression, an open secret among scientists. They must not strangle the free flow of information in debate, which is the lifeblood of good science as well as the press. Too many leading editors, not only Maddox of *Nature* but the editors of the *New York Times*, *Science*, *The Lancet* and *New York Review of Books*, have suppressed or curtailed critical responses to pro-HIV claims in their columns.<sup>59</sup>

Let us make reviewing a well-financed activity within science today and protect it from political interference. We must not forget the independent minded physicist Richard Feynman on the panel of the Challenger investigation, and that he was crossing the bureaucrats trying to protect the reputation of NASA management when he publicly placed a piece of the rocket's O ring in a glass of iced water, and solved the puzzle.

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<sup>59</sup> LANG S., "Richard Horton in The New York Review", *Challenges*", pp 699-714.

Following in Feynman's footsteps, we need to reclaim total impartiality, the principle of good scientific work that he called "utter honesty":

"There is one feature I notice that is generally missing in cargo cult science... It's a kind of scientific integrity, a principle of scientific thought that corresponds to a kind of utter honesty—a kind of leaning over backwards. For example, if you are doing an experiment, you should report everything that you think might make it invalid—not only what you think is right about it: other causes that could possibly explain your results...

"If you make a theory, for example, and advertise it, or put it out, then you must also put down all the facts that disagree with it (and) try to give all the information to help others judge the value of your contribution."<sup>60</sup>

Power politics has to be quarantined from scientific theory and research if innovators are to flourish. Duesberg has suggested that five per cent of public funds for science be set aside for work on theories that could be revolutionary. Whatever the sum, independent and subversive minds should be financed.

We should bring science to bear on scientists, and recognize that they are inevitably subject to all the human frailties that flesh is heir to as they exercise their professional judgment. Just as we demand scientifically controlled experiments, we might insist on scientifically accountable scientists. Review of any theory should be open and firmly institutionalized, pursued to a conclusion accepted by all, and preserved from political and economic influence as far as is feasible. Peer reviewers, traditionally anonymous, should be named and held responsible for the reasoning behind their verdicts. Conflict of interest should be acknowledged, and preferably avoided by choosing impartial reviewers from nearby fields. As far as possible, the disposition of public funds should be a public process.

Not least, let us support knowledgeable dissenters from the establishment such as Peter Duesberg, who sacrifice so much in the service of the public good. Let us unabashedly celebrate and finance the courage of this kind of public spirited heretic, who is one kind of scientific hero.

We might even say, with one enthusiastic reader writing a review of *Inventing the AIDS Virus*, Duesberg's book, on Amazon.com:

"Dr. Duesberg stands astride the pathetic sycophants of establishment science like a colossus."

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<sup>60</sup> FEYNMAN, R. 1985: *Surely You're Joking, Mr. Feynman* (W.W. Norton). P 341

This talk was given at the Conference for Science and Democracy, Institute for Philosophical Studies, Naples, Italy on April 20, 2001. Rewritten with additions up to Sunday, September 22, 2002..

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