

The title was suggested by my partner Libuse Mikova, and is better than mine, “Totalitarian Science”, which has lingered in the text.

# The Decline of Science

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Ivor Catt

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## Abstract

A Google search for “censorship in science” scores 30,000 hits; a large number of cases are discussed. In particular is the suppression of a paradigm change, occurring less than once per century, unethical if the censor merely fails to distinguish between the multiplicity of cranks and the very rare seer, who seems much the same? Does ethics develop within the accepted paradigm, or can it cope with paradigm change? Will there ever again be a paradigm change in today’s professional science?

*When people cooperate for an unacknowledged purpose their association is called a conspiracy, yet suppression of novelty by [peer] review is not a plot cooked up between referees and the establishment. But conspiracies can arise by evolution instead of by design, with the members falling into their roles by accident and finding them congenial. The establishment gives referees great power over other peoples’ lives. The referees repay the establishment by suppressing new discoveries. It is not necessary that either side understand the arrangement. — Dr. Charles McCutchen<sup>1</sup>*

*Without barriers to communication there can be no communication. — Dr. Anatol Holt<sup>2</sup>*

*I am not saying that the forces of decadence know that they are strangling their social group’s future — indeed the essence of their decadence is their ignorance of what they are doing. Generally, they believe they are maintaining standards. — Ivor Catt<sup>2</sup>*

Are professors, editors, referees and textbook writers behaving unethically?

The professor or peer reviewer or textbook writer has a duty to maintain



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standards. How much of his time should he spend on this? Should he spend more time, or less time, reading and understanding an alleged paradigm change? Would it be unethical if he did not read beyond the title, "The End of Electric Charge and Electric Current as We Know Them"?<sup>3</sup> When the ruling paradigm was phlogiston, were those who read or published or taught nothing about the new (bizarre) theory of combustion by oxidation unethical?

Nothing on the scale of the removal of phlogiston or caloric has occurred for 200 years. Therefore the suppression of such a major proposed paradigm change, "Theory C," may not be unethical. We should not blame a system that fails to deal with an event that occurs less than once in a century. Perhaps we should not blame those who, "maintaining standards," 200 years ago, may have suppressed the new oxidation theory which was for them obviously absurd. Anyway, I have published that "it is important for a professional scientist to not understand something which it is in his interest to not understand." That would probably have applied to oxidation. The safest career option is to not understand heresy, or better, to not have heard of it.

What happened with AIDS is not on the scale of paradigm change, but all the same it is very interesting. Sir Gregory Winter, the Master of my undergraduate college, Trinity College, Cambridge, told me that it was correct to suppress Peter Duesberg because otherwise hundreds of thousands of lives would be lost. The opposite is Duesberg, who says that since he is suppressed, further hundreds of thousands of lives will be lost.<sup>4</sup> He says that AIDS is not a sexually transmitted disease and HIV does not cause AIDS. Obviously, both parties think they are acting ethically. For seven years, while Andrew Neil was editor of the *Sunday Times*, Neville Hodgkinson was medical and science correspondent. He published numerous articles<sup>5</sup> and a book supporting Duesberg. In his autobiography, Neil says his greatest achievement as editor was to publish the Hodgkinson articles. The reaction of the editor of *Nature* to Hodgkinson's articles was to say that everyone should boycott the *Sunday Times*. He cited a slim book<sup>6</sup> by the NIH that he said proved Duesberg was wrong. However, the book has no authors; the NIH refused to give me the names of the authors. It seems the NIH could not get any of its staff to append their names to the book, so I cannot write to them. Neville Hodgkinson told me that when Neil left, the new editor sent two executives to him telling him to write nothing more on AIDS. Ten years later, when I asked the new people running the *Sunday Times* why their recent published articles on AIDS read as though Hodgkinson and Duesberg never existed, they did not reply. Neville tells me that now he cannot publish anywhere, let alone in peer reviewed journals.

My friend, Dr. Harold Hillman,<sup>7</sup> late of Surrey University, believes that more or less all research and publication in his field is fatally flawed. He cannot publish. He says that privately, colleagues tell him he is right, but they will never put anything in writing. The university withdrew all his students, but did not fire him. Phil Holland says that in the saga about climate change he

cannot publish, asking how we can have a “greenhouse effect,” when the relevant “greenhouse” has no roof. When two people flew ’round the world in opposite directions and then checked their very accurate quartz ring clocks, developed by the late Louis Essen RFS, they published in *Nature* that their results proved relativity. Essen told me that *Nature* refused to publish him saying that his clock was not accurate enough to give their results. My friend the late Gordon Moran and also Michael Mallory<sup>8</sup> have a very long list of key journal editors and accredited experts who have behaved unethically when confronted by heresy, the attempt to correct the attribution of a famous work of art to the wrong artist for more than a century. Gordon Moran’s magnificent book<sup>9</sup> deals more generally with the problem of “Silencing Scientists and Scholars....”

## My Career

After graduating in 1959, I arrived at Ferranti Limited in Manchester and started work on the first transistorized computer, the Sirius. There was very little memory (5,000 bytes) and very little software.<sup>10</sup> Sirius sold for £25,000 when my salary for the year was £800. I did some of the hardware design, including the addition of the “divide” instruction to the instruction set, and upgraded memory from magnetostrictive delay line to the new magnetic core memory, where each bit was stored in a small magnetic doughnut. I noticed a curious piece of hardware in the design, and asked what it was for. There was no desire to tell me. However, I worked it out for myself that it was to deal with what I now call “The Glitch,” the way a computer would crash from time to time and leave no clue as to why. This piece of circuitry would reduce the frequency of these crashes to an acceptable level. Other names for “The Glitch” are “Synchronizer” and “Arbiter.” Nobody wanted to talk about it, and some engineers wrongly claimed the circuitry was unnecessary. Usually getting fired after three years, I worked in the United States at Ampex, Data Products, Motorola, and Sperry Semiconductor, and then in additional companies in England. My book *The Catt Concept* did not advise on how to avoid getting fired, but rather bewailed the incessant firing of nearly everyone, myself and those near to me, in my industry in the United States.

To avoid having to tell everyone about “The Glitch,” I submitted an article to the relevant peer review journal. Once published, I would not have to talk about it repeatedly, but could merely hand out copies of my article. It was published in a peer reviewed journal in 1966.<sup>11</sup> The McCutchen and MacRoberts articles about censorship had not been written. McCutchen’s “An evolved conspiracy”<sup>12</sup> was published in 1976 and MacRoberts’ “The Scientific Referee System”<sup>13</sup> appeared in 1980.

Aged only 31, I should not have yet known there were barriers to communication in high technology, but I did give my article a misleading title so that

my peer reviewers would not realize how serious the problem, which they probably would not understand, was claimed to be. It would become worse as computer speeds increased. All I wanted was publication, so that I could avoid having to talk about it repeatedly. I knew that the world's view at the time was that computers never went wrong, but the people who programmed them did. All problems were in the software. The hardware was perfect. "The Glitch" undermined that fervently held belief, and so was heresy. That was probably the reason for my misleading title: I realized I was trying to preach heresy.

Nobody else succeeded in getting past peer review for seven years until 1973, and it did not appear in any university course, and probably still does not today, half a century later, except perhaps at Newcastle University, England. Professor Jerry Cox, Jr., at Washington University, St. Louis, was in charge of building computer systems that were attached to patients who had had heart attacks.<sup>14</sup> The medicament had to be used sparingly, because too much of it would harm the patient. Jerry's monitoring computer could forecast another heart attack, and only then would the treatment be given. Jerry was concerned about "The Glitch," because if one of his computers crashed, a life would be at stake. Together with the late Professor Charles Molnar, they set up a two day conference on "The Glitch" in 1972. As the only person who had published, I was invited, and flew from England, my fare, expensive at the time, being paid for by the Pentagon. It is discussed in my 1973 book.<sup>15</sup> At the beginning of the conference, Alan Kotok, who was designing the computer attached to the missile launchers to go in the Trident nuclear submarine, said there was no problem. At the end of the conference, he agreed there was a problem, and said he would not dare to try to explain it to his boss. In spite of this conference, little else could be published for many years. My book co-author of later years, Malcolm Davidson,<sup>16</sup> when receiving a rejection from a non-peer reviewed journal, was told that they only published problems if they could also publish the cure. "The Glitch" has no cure; it can only be ameliorated, and the time between crashes increased, but only if the computer designer understands the problem.

GEC did the "fly by wire" electronics for the Concorde, the first aircraft that did not have cables going from the pilot to the wing and tail control surfaces; they were replaced by wires carrying electronic signals.<sup>17</sup> The controls were analog, and GEC was successful. So when developing a short take-off and landing (STOL) freight aircraft, Boeing gave the task of designing electronic controls to GEC. But the new "fly by wire" was to be digital, and so susceptible to "The Glitch." The reason for STOL was that in Vietnam it was necessary when taking off from the airfield to reach height as quickly as possible to get away from the locals to whom the Americans were bringing freedom and democracy. If the plane was to get up and away as quickly as possible, it would be flown close to stalling speed, and a pilot would not have quick enough responses. However, if a computer, faster than a human, flew the plane, the computer might fail at the crucial moment of take-off. So the plane would have

three computers controlling three independent sets of control surfaces. The problem was, if one computer wanted a little more lift and another wanted a little less, they might fight. This would be resolved by the computers talking to each other, but remaining independent. Unfortunately, two computers talking to each other brought in “The Glitch.” I found out about this project, and became very interested. This was because since failures due to “The Glitch” are only occasional, it was possible that none of these freighters would crash. In that event, the same system would be used later in passenger aircraft, with the loss of hundreds of lives. To find out more, I got GEC Rochester to employ me as a contract engineer. I went to interview the designer of that part of the system, whose name turned out to be Mr. Death. He did not seem to know about “The Glitch” and neither did the boss of computer hardware design, whose name I think was Pearce. To deal with the unnecessary trouble I seemed to be creating, Mr. Pearce falsely reported that I had been seen coming out of a restricted area at midnight. I was fired. I went home and ethical considerations meant I had to do something about it. I wrote to higher and higher people in the GEC organization. At a very high level, I got a letter assuring me that his GEC experts said there was no problem. I wrote back saying I was his expert, to which I received no reply. I left it at that. I later heard by word of mouth that the project was abandoned because of problems over the computers talking to each other.

My success in publishing a revolutionary 20 page article in 1967 and two later very short articles<sup>18</sup> in the 1980s weakens but does not undermine McCutchen’s thesis, or my thesis, that the professionalization of science means that major advances—a suggestion of paradigm change or even less blatant (for instance “The Glitch”)—can no longer be published in peer review journals because of the damage it would cause to careers, prestige, and salaries. This is particularly true of the need for a sudden updating of electromagnetic theory in the 1960s, to deal with the new digital computer electronics. In the half century that followed, university courses and textbooks clung to the earlier sinusoidal theory of radio, which includes radar, and ignored the insights gained from the new digital electronics, the pulses in computers. None of the content of our 1979 book *Digital Hardware Design*, published by Macmillan,<sup>16</sup> or any of my other books has been touched on in any university course or textbook during the next half century. Professors and textbook writers are ignorant of the insights gained in researching high speed digital systems.<sup>20</sup>

Apart from my 1967 article and the short 1980s articles, all my work has been rejected for publication by peer reviewed journals worldwide for 50 years. This includes my biggest achievement, “Theory C,” which I discovered in 1976.<sup>20</sup> “Theory C asserts that if a battery is connected via two wires to a lamp, there is no electric current in the wires.” Today, more or less, no relevant professor or textbook writer knows of the existence of “Theory C,” or he must not admit to having heard of it. As a scientific advance, the significance of “Theory C” is similar to the removal of phlogiston or caloric from science 200 years ago.<sup>21</sup>

The appearance of “Theory C” above the horizon would do massive damage to careers and reputations. It is a development from Heaviside’s work of a century ago. Heaviside’s work, although published, has disappeared from the record. His biggest contributions, the concept of “Energy Current” and his “We reverse this... . . .,”<sup>22</sup> are unknown today.<sup>23</sup> He has not been mentioned in any textbook on electromagnetism for nearly a century. Working on sending Morse pulses undersea from Newcastle to Denmark, Heaviside developed the theoretical framework needed for pulses in digital (computer) electronics. Heaviside’s 1890s work disappeared in favor of Marconi’s more glamorous wireless radio, which appeared a few years later.

The imperative that no relevant professor must admit to having heard of “Theory C” was foreshadowed in 1949 by George Orwell: “Crimestop means the faculty of stopping short, as though by instinct, at the threshold of any dangerous thought. It includes the power of not grasping analogies, of failing to perceive logical errors, of misunderstanding the simplest arguments if they are inimical to Ingsoc, and of being bored or repelled by any train of thought that is capable of leading in a heretical direction. Crimestop, in short, means protective stupidity” (G. Orwell, 1984, pub. Chancellor, 1984 ed. p. 225). Orwell said he was discussing the totalitarian state of Russia. Here, we discuss totalitarian science. It is important for a professor to not understand something that is in his interest to not understand. This applied to “The Glitch” and now applies to “Theory C.” With the ban on publication, system designers cannot be taught how to ameliorate the problem of “The Glitch,” and reduce the frequency of computer crashes. Although probably still not in any textbook except Carver Mead, or any university course except perhaps in Newcastle, “The Glitch” has belatedly become kosher (part of “Modern Physics”), or safe, because of the book by the late Professor David J. Kinniment published in 2011,<sup>24</sup> which has extensive coverage of me. Kinniment said Tom Kilburn,<sup>25</sup> in 1968 head of the development of MU5, the £600,000 government funded Manchester University computer development, did not believe there was a problem over “The Glitch.” He told his engineers to deal with it, but they (and later he) failed to do so.

For ten years from 1978, every monthly issue of the non-peer reviewed journal *Wireless World*, circulation 60,000, had articles by me or letters discussing my work. However, professional scientists cannot admit to reading non-peer reviewed journals. By 1982, I had come to accept that none of my work would be validated by successfully passing peer review, and so would be ignored. I decided to ask a simple, fundamental question, which I called “The Catt Question,”<sup>26</sup> about *their* theory, “Classical Electromagnetism.”<sup>27</sup> No accredited expert in the world would comment on my question. However, ten years later, going higher up in the bureaucracies that employed them, I then caused four accredited experts, selected by their employers, to be instructed to write to me. My self-published book *The Catt Anomaly*<sup>28</sup> gives their contradictory

replies<sup>29,30</sup> and discusses their refusal to comment on their disagreement with each other or with us for the next 20 years. Thus, the confusion as to what their theory actually *is* remains. Textbooks and universities continue to teach an internally contradictory theory. Does the man in the street believe that their behavior, which continues today, is ethical? Remarkably, I find that he does. The man in the street thinks that someone like Sir Michael Pepper, having been “knighted for services to physics,” has no further responsibility to help physics toward the truth, for instance by telling me he has changed his view on “The Catt Question.” This general attitude in society rings the death knell for science.

The first peer reviewed article on my work for thirty years, called “Catt’s Anomaly,” appeared in 2012.<sup>31</sup> It is muddled, and confuses my question about classical theory with my own theories. I only recently discovered this paper, and the editor says I will be allowed to reply.

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Ivor Catt was born in 1935 and was a Cambridge engineer who worked in digital electronics for fifty years, specializing in electromagnetic theory. 121 Westfields, St. Albans AL3 4JR, England. <ivorcat@gmail.com>.

#### Footnote 1.

Theory C was misstated on one of my websites, and wrongly slipped into this article. The correct statement is; Theory C. "If a battery is connected to a lamp by two wires and the lamp lights, electric current is not involved."

#### Background.

Conventionally, a battery delivers electric current into the wires. The current and charge in/on the wires cause electric and magnetic field in the dielectric between the wires, together making the Poynting Vector  $E \times H$ . The field, or Poynting Vector, delivers the power into the lamp, and the lamp lights. Battery  $\rightarrow$  current  $\rightarrow$  field  $\rightarrow$  lamp.

One of Oliver Heaviside's greatest contributions was to reverse the sequence. Under Theory H, the battery delivers the Poynting Vector  $E \times H$  into the field. The field causes the electric current. Battery  $\rightarrow$  field  $\rightarrow$  lamp.

Heaviside failed to notice that the current had no role in delivering energy from battery to lamp.

Theory C makes no assertions about electric current or charge.

<http://www.ivorcatt.co.uk/97rdeat4.htm>

Ivor Catt. 3 February 2016.