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TRUTH AND SCIENCE: BILL HAMILTON'S LEGACY

by Maria Luisa Bozzi

'Is it possible for minds to be completely free (...)?
Thucydides' dedication to truth in history in the opening pages of his Peloponesian War *is a more realistic example of what I have in mind,'*[1] *(...)*
'telling how he intended to stick to the truth about the recent war with Persia and not to be swayed by Athenian wishfulness and pride- and how he well knew that his truth was going to be disliked.'[2]

W. D. Hamilton
1999

I owe this talk to many people. First to Professor Floriano Papi, whose determination to keep his word with the late Professor Bill Hamilton caused this Conference to be held and its original intentions to be preserved. Then to Bill, as his companion of the last 6 years of his life, I owe to speack in his account about what he believed. For this privilege, my deep gratitude goes to the President of the Accademia dei Lincei and to the organizers of this meeting. It is a great honour for me to speak in one of the oldest and most prestigious academies in Europe. And I also thank doctor Mary Bliss, Bill's sister, for her generous support and help with the manuscript.

William Donald Hamilton (1936-2000) – Bill, for everybody – is regarded as 'the most influential evolutionary biologist of the second half of the 20th century'[3]. His wide knowledge of the natural world, combined with a creative imagination, a deep free spirit and a very rational mind allowed him to give birth to bold theories that opened new fields of inquiries in social behaviour and in the

evolution of sexual reproduction. He was honoured with many prizes, including in 1993 the Crafoord Prize of the Royal Swedish Accademy of Science, equivalent to the Nobel Prize.

Bill's 1982 'sex and parasites' theory brought him to focus his thinking on the field of health and medicine. According to Bill Hamilton, sex was the invention of metazoans and large plants to counteract the pressure of co-evolving parasites. He postulated that parasitism has caused not only arrays of varying traits concerned directly with disease resistance, but also the evolution of meiosis itself. Sexual reproduction is thus able to provide every generation with a new combination of alleles with potential to resist disease.[4]

The light shed by his theory about the role of parasites in our evolution changed Bill's view of life and of the future of human beings.[5] He developed a very pessimistic long distance vision about the fate of our species if modern medicine will continue to develop without taking into account the biological environment in which humans and all other species have evolved and are still evolving.[6] In this very grim picture he believed that 'the immensely powerful medical and pharmaceutical interest, busy with ever more and more profits' plays a huge role.[7]

Connected to this theme was Bill's feeling about the responsibility of scientists. According to him, scientists 'ought to let their providers know of any dangers that they find, in the course of their studies, affecting society.' [8]

This combination of rational ideas and deep ethics must be taken into account if we want to understand why, since 1991, Bill Hamilton began to be interested in a theory considered by the scientific establishment to be unfashionable if not cranky: the oral polio vaccine (OPV) hypothesis of the origin of AIDS. According to this hypothesis, originally published in two

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articles in 1991 and 1992 by Louis Pascal[9] and Tom Curtis[10], HIV-1 Group M arrived in our species via a live oral polio vaccine which had been accidentally contaminated by chimpanzee SIV. This vaccine was tested on a million Africans in a mass campaign of polio eradication conducted in Central Africa (mainly in the Congo) in the late fifties.

Impressed by this theme, Bill became more and more converted to the OPV/AIDS theory during his intellectual partnership with Edward Hooper, who spent 9 years of intensive research on the origin of AIDS epidemics. As he described in his book *The River*, Hooper reached the conclusion that OPV/AIDS was more plausible than other theories.[11] During this time Bill simply watched Hooper's discoveries from the sidelines. He thought that although none of Hooper's discoveries by itself amounted to a proof, taken together 'the steady trend and accumulation was very impressive'. [12] To Bill there was a 95% probability that the theory was right.[13]

However, from its outset in the early 90's, the OPV theory was not taken seriously by scientists or by the medical profession. Threats of litigation against its authors, including Hooper, were used by the people directly involved in this postulated medical misadventure, in an attempt to suppress any publication on the subject. Bill himself had a similar experience.[12] In the last 9 years of his life the reactions he met ranged from an embarrassed avoidance of the topic by his peers, to the refusal of the editors of *Science*, *Nature* and *Lancet*, to publish his comments about the OPV theory and its implications. Therefore, Bill reached the conclusion that 'the best known and seemingly most indipendent science and medical journals joined forces on the side of the countercritique', while rejecting papers or letters about the original issue.[14,15]

As a consequence, with the exception of his Foreword to Hooper's *The River*, what Bill Hamilton thought about the OPV theory is unpublished; and

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is only available in correspondence with Hooper, Pascal and Curtis, letters to colleagues, friends and relatives and in the memory of discussions with members of his family and with me. With few exceptions, the articles devoted to Bill after his death suffer from this lack of information.

According to Bill, the implications of this hypothesis were dreadful. As he wrote in a letter to a collegue of the Royal Society, in October 1999:‘the AIDS disaster, if the OPV theory is right, (I rate the chance at about 95%) arose out of well-meaning (though also, it must be said, egotistical and profit-seeking) medical motives. But, the potential compaunding of this, through failure to find the truth, to publicise and to study what happpened, is that medical science continues virtually unwarned towards other equal –or conceivably greater- disasters.’[13]

The ‘greater disasters’ that Bill had in mind were the effects of unknown viruses contaminating live animal products which are administered to our bodies in modern medical treatments. Bill’s concern was that the basic evolutionary knowledge of the long term consequences of these treatments is very poor in the medical industry. In December 1999, just before his final illnes and death, he wrote about his fears with these words:‘transplants of pig organs to humans may indeed soon be endowing more years of life to millions (...). Those wonderful millions of immunosuppressed human bodies are the prepared feather-beds for potentially vaster billions of virus bodies to lie in (...) and a few of them hatching, via mutations and recombinations,’ new fatal deseases. ‘Evolution is relentless, undirectional, caring not who it slays: these viruses, too, in a few years may be acquiring the capacity almost to end our species.’[16]
In this context, Bill felt that doctors needed to be more aware of the dangers of ‘the effects of the millions of profit that dangle before the

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nascent industry proposing to transplant organs into humans from other species.’[14]

After *The River* was published, Bill decided to try to find out more facts himself to test the OPV hypothesis.[17] He thought that was his duty, because he was convinced that, as an evolutionary biologist, he better than any other person might be able to help the scientific community understand the biological factors implicated in the possible transfer of viruses to humans. He was convinced that an unwanted transmission of a virus from another species via a vaccine was possible; and that if it did not happen in this case, it could have happened; and could happen with vaccines or with other treatments in the future, if we are not properly aware of the possibility.[13]

First, he asked the Royal Society to hold an open scientific debate about the OPV hypothesis. This meeting was held on September 2000. Second, he made two expeditions to the Congo to search for lentivirus infection in wild chimpanzees living in the forests where, in the fifties, hunters caught these animals for medical tests connected to the polio vaccine campaign. Before his second mission in January 2000, virtually no samples had been taken from wild adult chimpanzees, especially in the Congo, to test for SIV. Bill had two goals,as he wrote at the end of December 1999, few days before leaving for his second expedition: ‘Our line is that we are on a mission that should be close to the hearts of all Africans of whichever faction- a better understanding of the awful epidemic that has struck them and a step towards a possible vaccine or cure. This is an idea which I really believe in and which I hope I can persuade them that I believe.’[17]

He was aware of the danger of these missions in a country affected by a civil war, and where it was easy to get sick. As he told many people, including myself, he was prepared to go to jail

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and even to die, if that was needed to find the truth.[13]
The second mission –in January 2000- was indeed fatal to him.

A year and half after Bill's death and a year after the Royal Society's Conference on the Origin of AIDS, the prevailing opinion is that the OPV hypothesis is weaker or has even been disproved. This is because of recent findings about the phylogeny of HIV-1[18,19] and negative tests of the few surviving vials of original OPV CHAT stocks[20,21]. I will not discuss these matters: they are not my business. But, what can be said from an Hamiltonian point of view is that the general approach to the OPV hypothesis is virtually unchanged. The scientific reports have focused their attention on results which they believe show the theory to be wrong[22] and have avoided the arguments of counter critics. As an echo of the attitude of the medical and scientific establishment, which seems to be one general relief, most of the media -not all, it must be said- have relayed the news to the public with irony and triumphant derision.

Still, something has changed. Scientists are well aware that the assumptions based on negative results can be faulty. Further examination may produce different findings and conclusions. For this reason, many scientists believe that the doubt -in the case of the OPV theory and its implications- is still alive. This meeting itself, which covers a wide range of subjects about the emerging persistent viruses, is encouraging. Bill's intention to look at this topic with an evolutionary point of view could not have been better served. The goal of the OPV controversy is not to find the villain of the story, but to protect our future via a wiser use of modern medicine and science.

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