

Oncogenes, Aneuploidy, and AIDS: A Scientific Life and Times of Peter H. Duesberg by Harvey Bialy. Institute of Biotechnology, Autonomous National University of Mexico, distributed by North Atlantic Books, 2004. 318 pp. \$19.95 (paper). ISBN 1-55643-531-2.

Two of our major diseases are surely cancer and AIDS, both thought to be causally related to mutated genes: in one case cellular and in the other viral genes. Science historians Ludwig Fleck and Thomas Kuhn would add a third, a malignant epistemological disease: an ideological cancer generated by a dominant thought mutation within scientific communities. As Bialy points out so well, these mutations arise in an interesting but ultimately incorrect, or incomplete, scientific hypothesis: in this case genetic determinism. There is then a premature closure within the research community that stifles alternative approaches outside the paradigm. The defective paradigm is then spread by standard research processes, aided and abetted by cultural forces: mostly an uninformed media and specifically by science journals and textbooks also unable or unwilling to apply corrective questioning or criticism. Standard high technology research practices are also incomplete in that they fail to broaden the scope and context of the research beyond the narrow limits permitted by laboratory constraints necessary for production of repeatable results. Within such a narrow frame the hypothesis may be completely supported by experimental findings. The result is that medical diseases, like human cancer or AIDS, when studied in the best laboratories working within well-supervised limits and with the best of tools, may, from time to time, generate a thought mutation: an incomplete theory that spreads through laboratories, scientific journals, textbooks, university and lower schools, popular press, and in the minds of people everywhere. It is trans-generational and is disseminated not by DNA but by cultural inheritance.

Theoretical physicist and biologist Walter Elasser defined the origins of this kind of mutation: "In the absence of a suitable structure supported by theory, empiricism leads to the accumulation of a pile of data that can only too readily give rise to erroneous interpretation. The famous 'epicycles' of Ptolemy's astronomy are a classical example of a prematurely ordered pattern which completely obscured the true pattern that eventually emerged as a result of the intellectual labors of Copernicus, Galilei, and Newton". Of course, until very recently, few believed that such a thought mutation occurs in either cancer or AIDS. In fact, nearly everyone believes that the genesis of both is a gene mutation. In the case of cancer the genes are known as oncogenes or tumor suppressor genes, and in AIDS we speak of HIV, the acquired human immunodeficiency virus and its genes.

This biography of professor Peter Duesberg by Harvey Bialy is, however, precisely all about the one leading virologist in the world who has maintained from the start that cancer or AIDS could not possibly be accounted for simply by genes alone and that their etiology involved biological processes of a much more

complex nature. In fact, in the past several years Duesberg has convinced many skeptics that genetic instability of cancer cells is proportional to their degree of aneuploidy and that the many experimental anomalies encountered in a mutation-only hypothesis are perfectly assimilative under the aneuploidy theory. The biography itself could not be so convincing, as this one is, unless the author was more than a journalist. He was in fact the founding Scientific Editor of the journal *Nature Biotechnology*. He is also more than a PhD in molecular biology (UC Berkeley), and is more than thoroughly familiar with Duesberg's work. He had also to be familiar with the history and philosophy of science and therefore able to see the historical traces of scholars such as Karl Popper, Thomas Kuhn, Ludwik Fleck, and others, who showed in their writings that thought mutations leading to scientific crises and even revolutions had occurred before in science and had thereby prepared the fertile ground necessary for an awareness that such a mutation might be occurring in time present. Finally, it is no small matter that Bialy began his journalism career with a journal that became, and remains, the leading server of information for the biotech industry worldwide. Seemingly paradoxical, in this setting, the author's radical scientific and philosophical views were, and continue to be, accepted as essential parts of the information needed by that industry.

The book is also one of those rare examples of writing of a technical nature that is understandable and interesting to both scientist and lay reader. It is one lively and ultimately inspiring story of a brilliant scientist correctly pointing to the flaws of major disease theories held by the mainstream consensus, and pointing to the premature closure by biologists on the question "What is causality in complex living systems and their diseases?" It is also the story of a latter-day Galileo. In the final analysis, as we are now discovering, disease causality is found not merely in gene and protein agents at the level of material cause of Aristotelian causality but also in the patterns of organization of those agents that originate in cellular and higher level dynamical systems corresponding to formal causes that impose form or regulate its production, and it is seen as being closely related with final cause, the purposes for which things might be said to exist.

This book is in many ways the ultimate insider's story written by a scientist for scientists and science historians and philosophers who, following a diachronic approach, believe not only that revolutionary ideas in science are easier but that "information is easier to recall when it is embedded in historical context than when it is memorized in isolation".

I highly recommend this book because of its timeliness, its thorough research, its superb notation and bibliography, and the narrative skills of the author. One may hope that it might also serve as a model for authors and books to come in which we will find the error of our ecological ways and also find new and better approaches to solving and preventing the diseases of the land, the air, and the waters of our planet. After all, aneuploidy presents us with a view of life wherein genes are central but also where aneuploidy emerges preemptively as an auto-

catalytic system of genes that ultimately may generate disease phenotypes: genes, of course, are essential but the genome itself is the slave to the epigenetic cellular regulatory systems that interpret the environment and adjust gene expression accordingly. If so, then aneuploidy takes its place with other epigenetic cellular systems that operate to control health/disease patterns of gene expression in a context-dependent manner. In the case of HIV/AIDS we begin to appreciate that causality also resides at higher levels of organization that are affected by environmental and behavioral changes and that there is strong evidence for a premature closure around an HIV-only cause for AIDS. This book deserves attention and open discussion at all levels of our biomedical establishment and by critical readers everywhere.

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Shamans/Neo-Shamans: Ecstasy, Alternative Archaeologies and Contemporary Pagans by Robert J. Wallis. London: Routledge, 2003. xviii + 306 pp. \$109.95 (cloth). ISBN 0-415-30202-1.

Traveling between the Worlds: Conversations with Contemporary Shamans by Hillary S. Webb. Charlottesville, VA: Hampton Roads, 2004. xxii + 247 pp. \$15.95 (paper). ISBN 1-57174-403-7.

Ever since Euro-American academics took interest in shamans, some of their fellow citizens have sought to become shamans. Arguably, the current popularity of shamanism began with religious historian Mircea Eliade's definition of it as a widespread, if not universal, set of techniques for inducing and utilizing nonordinary conscious states (Eliade, 1964). It was furthered by anthropologists Carlos Castaneda and Michael Harner—the former encouraging post-hippie aspirants to engage indigenous experts, the latter formulating an individualized, psychologized "core-shamanism" geared toward Western seekers/consumers. This review engages two recent works treating adapted or novel shamanisms from different ends of the academic-to-popular spectrum. Read in conversation with one another, I suggest they illuminate some key sociological and epistemological debates about scientific/capitalist materialism, if not the nature or practice of shamanism.

In *Traveling Between the Worlds*, Hillary Webb offers selections from interviews with twenty-four shamanic practitioners portraying what shamanism is and what it can offer her readers. More than half of her experts came to shamanism from the First World or as transcultural persons, making them (she