



## The Passion of Peter Duesberg

If Peter Duesberg's name sounds familiar, it's because he has long been branded by the mainstream media as the virologist who is wrong about HIV. His name entered the popular culture in the late 1980s pre-stamped with wrongness. You knew he was wrong before you knew what he had said in the first place. The wrongness cut through the layers of the scientific question itself, and down into the very roots of social identity and cognition. Peter Duesberg split the academic culture, at a time of unprecedented hysteria, into two kinds of people: Knowers and doubters. The knowers controlled all means of information dissemination, while the doubters dwelled in the shadows. When the doubters grew to include hundreds of PhDs, including three Nobel laureates and eventually even the president of South Africa, the labels "kook" and "denialist" were quickly to encompass them too, creating an equivalence between a doubter and a deviant.

It's been one hellish ride for the iconoclastic professor since 1987 when he first published his critique of the HIV-AIDS hypothesis in a lengthy, highly technical, invited review in the prestigious journal *Cancer Research*. It is a paper that in the words of his biographer, Harvey Bialy, "sealed his scientific fate for a dozen years". Only one year previously, at the age of 50, he became one of the youngest inductees of the US National Academy of Sciences for his pioneering work in the 1970s that defined the first cancer gene and mapped the genetic structure of retroviruses. He argues in this post-induction, and career-defining article that the ordinary retrovirus, HIV, is not a killer, and therefore not the cause of AIDS. His case is by now impressively documented, but not surprisingly, still unfamiliar to most people, even though a Google search of his name will easily provide abundant reading. Also impressively documented, and even more unfamiliar to the general public, are his ideas about the genetics of cancer, which have begun to receive serious and favorable attention in the mainstream scientific media, much to the chagrin of his powerful AIDS foes.

The sun is hot on my head as I cross the campus of UC Berkeley, looking for Donner Lab, the university's oldest science building, where molecular biologist Peter Duesberg has recently been relocated. I stop two students and ask for directions. They've

never heard of it and produce a map, which we study intensely but uselessly. Finally they just give me the map and wish me luck. Eventually I find it.

The Berkeley campus is looking very grand these days, its important halls adorned with impressively shaped, oblong hedges clipped to perfection. It's very quiet. Hard to imagine this having once been a bastion of radical protest. Thanks to large donations from two pharmaceutical companies, Berkeley biology is undergoing an extensive renovation. There are bulldozers all over, and near Donner Lab is a huge gaping hole where a building that was Duesberg's home for almost forty years has just been demolished. In the distance, I spot Duesberg weaving on his bicycle past the bulldozers on his way into the lab. In the heat of the sun, it seems to me that their jaws might just reach down and snap him up, putting a quick, merciful end to the nearly two decade long battle between the Establishment and the Professor. In the 17 years since Duesberg wrote the *Cancer Research* paper detailing, primarily, his critique of the then half-formed hypothesis that retroviruses caused human cancers, and adding almost as an afterthought that the garden-variety retrovirus HIV could by no means cause a "disease" such as AIDS, he's been facing bulldozers almost wherever he goes. Reviled by the AIDS establishment, de-funded by the NIH, ostracized and all but exiled within the university where he is a tenured professor, Duesberg was invited back to his native Germany eight years ago to resume work on cancer. During this time, commuting bi-annually between Mannheim and Berkeley, he formulated and tested a theory that has brought a new glitter to his complicated name. Some cancer-theorists say it's nothing short of the genetic answer to cancer. Others say it is at least part of the answer. It's lucky for Peter Duesberg that AIDS and cancer are distinct fields. In what is shaping up to be a denouement of Shakespearean proportions, his enemies in the AIDS field have made clear that they want him sunk to the bottom of the deepest sea, even if the answer to cancer goes with him.

Their feelings aside, it looks as though America's most controversial biologist may be poised for resurrection. When *Scientific American* recently published a lengthy article on where we stand in our understanding of cancer genetics, Duesberg's picture was on the timeline at 1999, the year he formalized and published his new theory. He recently broke by nearly twofold the record for undergrad students applying for research assistantships. Breaking a 17 year embargo against inviting Duesberg anywhere, to address anything, the

NCI has invited him to their headquarters to speak on cancer. And a first biography, *Oncogenes, Aneuploidy, and AIDS: A Scientific Life and Times of Peter H. Duesberg*, by Harvey Bialy, has just been published by The Institute of Biotechnology of The Autonomous National University of Mexico, where Bialy is resident scholar. Still, at Berkeley, where the administration remains overtly, almost flamboyantly hostile, Duesberg has had to hire a lawyer to fight for a simple raise, a so-called merit pay increase which usually comes automatically to professors of his stature, but which UC Berkeley has denied him for ten years, claiming his work is “not of high significance.”

For all these recent signs of rehabilitation, Duesberg remains 100% cut off from NIH funding, despite continuing to submit grant proposals regularly, now exclusively on cancer. Prior to his 1987 paper, he was one of the most generously funded scientists in the nation, and never had a grant turned down. Since 1987 he has submitted a total of 30 grant proposals and every single one has been rejected.

In orthodox AIDS circles, his name still engenders true fury. A recent documentary, *The Other Side of AIDS*, contains a remarkable scene in which Canadian MD, Mark Wainberg, President of the International AIDS Society, (the world’s largest organization of AIDS researchers and clinicians,) angrily calls for Duesberg and others who “attempt to dispel the notion that HIV is the cause of AIDS,” to be “brought up on trial,” calling such people, “perpetrators of death.” He goes on to say that he would hope the US Constitution could be re-written to accommodate such arrests.

In the film, Wainberg’s large face grows pale with fury as he realizes that the interviewer himself is one of the so-called dissidents. He unleashes a lengthy tirade, accusing all HIV skeptics of wanting “millions of people in Africa and elsewhere” to get HIV and die and finally, his eyes crazed with fury, shouts:

*“I suggest to you that Peter Duesberg is the closest thing we have on this planet to a scientific psychopath.”*

Then he declares the interview over, rips the microphone from his lapel and storms off.

It was what happened next that was interesting, and maybe a sign of changing tides.

The audience erupted in laughter, which turned to boos as the screen flashed a piece of text: It was a list of Wainberg’s patents and other financial ties to the HIV industry.

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“Are we clear that what you are going to do is at least *try* to present things as they are?” said Harvey Bialy, Duesberg’s scientific biographer, in a deep, stern voice over the phone from his office in Cuernavaca, Mexico.

“I’m not going to answer questions about *why* these things are, only *how* they came to be. Speculations about motives don’t interest me. You can’t document motives the way you can ideas.”

“Yes,” I said, and felt like somebody had just strapped me into a safety harness before a flight.

I wrote on my notepad: “Things as they are.”

Bialy, a Berkeley educated molecular biologist and friend of Duesberg since 1966 is a longstanding HIV critic in his own right, and also the founding scientific editor of *Nature Biotechnology*. His book is an extremely fine-boned history of the papers, review articles and letters that Duesberg published between 1983 and 2003, and the responses they generated, seamlessly woven with first hand, insider stories that are always revealing, sometimes shocking and often quite funny. He writes as though inside a space capsule, in airless, acute prose untouched by any of the usual attitudes, convictions and emotions that have colored virtually every word written or uttered about Duesberg since the fateful year of 1987.

Perhaps the most unusual quality of Bialy’s treatment is that he writes about Duesberg as though he exists as a scientist. Not as a disgraced, fallen scientist, but a scientist, period. He does not disparage him, but neither does he elevate him, he simply records Duesberg’s scientific arc, through the three fields of study on which he has now had an almost immeasurable impact: Oncogenes, Aneuploidy, and AIDS. Let’s shorten that to: Cancer and AIDS.

In sharp contrast to his controlled and often comic prose, Bialy’s temperament is volatile and acerbic. He doesn’t particularly wish to be interviewed and is indignant about all the non-science that has clouded Duesberg’s biological *oeuvre* since the mid 1980s, a time he refers to as “celebrity-culture science”

I hoped it was safe to question him about his *own* motives, and asked him why he wrote this book—a project that took four years.

"OK. It was when I first read his third aneuploidy paper in 1999", he said, and punctuated his reply with a faint chuckle, obviously registering the interrogatory with which I began my question, and deciding that it was "OK" to answer. He continued, "I was persuaded then that Peter has found the real genetic reason for cancer. The most immediate application of it will be improved early diagnosis. So when aneuploidy, or genetic instability as it is sometimes called, gets reincarnated as the dominant explanation for the genesis of cancer, Peter Duesberg will have been a major contributor. I wanted to make sure that his contributions were not ignored. "

"Scientifically," he adds as an afterthought, "cancer is still an interesting question. AIDS has not been an interesting question for 10 years."

"Why do you say that?"

His voice rises. "Doesn't the book demonstrate very clearly that scientifically, nothing happened between 1994 and 2003? Zero. Absolutely nothing except one wrong epidemiological prediction after another, one failed poisonous drug after another. 0.000,000 cured, as AmFAR likes to remind in their never-ending fundraising. There is still no vaccine. They've got nothing to show for twenty years and tens of billions of US taxpayer dollars. Nada, nothing. HIV/AIDS has been a total scientific and medical failure. And to think we've turned virology inside out and upside down to accommodate this bullshit hypothesis." "It's enough to make *me* use indecorous language", he says, imitating Claude Raine's famous line in *Casablanca*. "Gambling, here? I'm shocked."

I imagine Wainberg's livid face, and imagine how it would look if he heard *this* conversation.

"Look, AIDS is a political thing, and Peter's stuck in it. I show in the book how he came to get stuck, but other than that there's nothing to discuss anymore."

I was stuck on the question of how people can talk about Peter Duesberg the way they do, and recited a few examples to Bialy, who made what I later realized was a critical point. Science is amoral and should be. There is no right and wrong, only correct and incorrect, which is (or should be) its own, self-regulating "right and wrong."

“Peter is not a *good* scientist, a *bad* scientist, a *mediocre* scientist, a *great* scientist, a *brilliant* scientist, or an unstable one for that matter. If you must use an adjective to characterize him: classical works. Peter is a *classical*, molecular biologist. All he has ever done is rigorously test dueling hypotheses. The “Twin Towers,” AIDS and Oncogenes, are both crumbling because of the questions he put in motion.”

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Peter Duesberg is bent over a metal tray with 12 Petri dishes filled with pink gel, squirting each carefully with the tip of a long thin nozzle. He hears me come in and without looking up he starts to talk. “These are breast cancer cells that have been treated with chemotherapy.” He leans in closer and his cadence slows. “Fortunately... this time, it is in the Petrie dish and not...in somebody’s... body. “

I haven’t been in here one minute and already he’s saying something faintly unorthodox.

He finishes, pushes his goggles up on his forehead, and darts over to the microwave at the other side of the lab where he is heating two cups of green tea. “You want some?” he says. “It’s good stuff.” He moves very fast and he talks almost constantly, punctuating serious scientific arguments with a kind of absurdist black humor, all in a fairly pronounced German accent. Many people may be anguishing about what was done to him but he himself doesn’t seem too upset. He jokes about it. Remarking on his current ironic position, in what he calls “the semi-outhouse” of Donner, he tells me about his private funders, who keep him in business. “It’s small compared to NIH grants but not bad for what I’m doing, which is perfect terrorist science. You can do it almost undercover. All you need is a belt and a little dynamite and a microscope.” He laughs, and hands me a mug swirling with tea leaves and puts a long, thin glass ‘Pasteur Pipette’ in it for me to stir with. “Those are disposable,” he says. “Don’t worry, there’s no radioactivity on them.”

He sits on a stool, stirs his tea and says, distractedly, “I really think we may have found it.”

His colleague Ruhong Li, looks up for a moment.

What he means by “it” is the one thing all cancer cells he has ever come across have in common. For the past three decades, genetic cancer theory has assumed that cancer results from one or several gene mutations, in so-called onco-genes. Every human being has about 35,000 genes arranged, as I was taught, like beads to form the strings of our 46 chromosomes. For most of the last century, cancer researchers have been focusing on the beads. Now the focus is shifting to the strings.

Duesberg has revived, honed, and mathematically formalized a view of cancer causation that was first articulated in 1914, by another German geneticist, Theodor Boveri. It is based on the numerical chromosome abnormalities, called aneuploidy, that are seen in all cancers. The “aneuploidy hypothesis”, as distinct from the “mutation-cancer” of current dogma, posits that the cellular catastrophe that is cancer is caused not by a series of genetic mutations, but by miscues in the critical events of chromosome duplication and partitioning during cell division.

Duesberg reinvigorated Boveri’s original theory, which was obviously without any of the biochemical and genetic supports available from today’s fearsome armories, and provided, in a series of experiments that are elegantly explained in Bialy’s book, impressive functional evidence for his hypothesis that places aneuploidy at the center of the genetic tragedy that is cancer, while relegating gene mutation to the deepest wings. Many cancer researchers are willing to follow him up to the point where he discards gene mutation, arguing that both are an important part of the picture. But Duesberg, despite isolating the first oncogene (cancer gene) in the early 1970s, has been arguing since the early 1980s that in general mutant genes don’t cause cancer, (and incidentally almost, nor do retroviruses.)

Boveri’s critical experiment was to take sea urchin eggs and soak them in sperm, managing to doubly fertilize some and the creating some embryos with excess chromosomes. “Instead of sea *urchins* he got *monsters*,” Duesberg quips.

They had tumors. Boveri concluded that cancer was a result of excess or disturbed chromosomes.

“The basis of speciation is changing the content and the number of chromosomes,” says Duesberg. “Cancer is essentially a failed speciation. It’s not mutation. Cancer is a *species*. A really bad breast, lung, or prostate cancer has 70, 80, or more chromosomes.

Those are the real bad guys—they're way outside our species. But it's a rare kind of species that as a parasite is more successful in its host than the normal host cell is."

Duesberg maintains that 100% of solid tumors are aneuploid. "We're not the first to see this. Boveri was. But we're a close second, with a hiatus of 80 years," says Duesberg. "Boveri had a great theory, but even then they started attacking him because they were all for mutation. Genes were the sexy thing. That's the smallest unit in biology, the atom of biology. So they wanted it to be genes and they still do. "Chromosomes", as [Nobel laureate Michael] Bishop once said in a speech, were "something little old ladies could see peering through a microscope." They're so obvious."

"All mammals," he continues, "have the same kit of 35,000 genes. So how do you go from a bat in the air to a whale cruising underwater for days at a time? Well, by regrouping these same old genes in different sets of chromosomes."

"If you are outside of 46, you can have any dates you want. You can have a date with a gorilla. It may be traumatic but it's harmless, because it's incompatible. This is the species barrier."

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In January of 2004, Duesberg hosted the first ever "Aneuploidy Conference," inviting 50 cancer researchers from all corners of the world, who also have been working on the connections between aneuploidy and cancer. Seventy showed up. They included such luminaries as NCI's head of genetic oncology, Thomas Ried, Gert Auer from the Karolinska Institute in Stockholm, and Walter Giaretti who heads the equivalent of the NCI in Italy.

"It was an even bigger success than we hoped for," says David Rasnick, Duesberg's collaborator on aneuploidy theory, who worked on the mathematical formalization, while Duesberg designed and carried out experiments. "You see, the cancer establishment is a lot older than the AIDS establishment, for one thing. Virtually everybody in the cancer establishment realizes that the mutant gene theory is a dead end. There's just no functional evidence for it. Everybody is very open to this right now and we had a wonderful conference. Very civilized."

Rasnick makes the following analogy to explain why, mathematically and logically, a few mutant genes can't cause cancer: Let's say the whole genome is a biological dictionary, divided into volumes called chromosomes, then the life of a cell is a Shakespearean drama. "If one were to misspell a word here and there, in Hamlet for example, it wouldn't affect it much. But you could reduce it to gibberish if you deleted entire portions of text, copied others and shuffled them around at random. That's what aneuploidy does to the cell."

So what about carcinogens?

"This is hard to bite," says Duesberg, "I think we all agree on that. It's kind of hopeless --- diet, cigarettes? I mean... early last century they put tar on bunnies, all the Western guys didn't see cancer in the next week and gave up. Well, the Japanese who are, you know, really known for their patience, they did it for two years, and *then* they saw cancers. The point is, there is no *really* good carcinogen. If there was we would not be alive."

But, he added, every carcinogen they tested did cause aneuploidy. "Every one we tested, asbestos, hormones, hydrocarbons. What they all do is screw up the spindle apparatus, the proteins that balance the chromosomes."

When a cell divides, it doubles its chromosome number, briefly, and all the chromosomes line up in the middle of the two future cells. "The pairs of chromosomes are lined up in the middle," Duesberg explains, "like soccer teams before they blow the whistle and start the game."

At either end are tiny cables, one attached to each pair of chromosomes. At a certain time in the division process, each pulls from its side and the chromosome pairs are forever parted. "Mechanically, it's an unbelievable achievement," says Duesberg. "It almost always happens perfectly, and each cell gets one half."

But sometimes it fails. The only chromosomal failure nature lets slip in humans is one extra chromosome, number 21, which produces Down's Syndrome. People with Down's Syndrome are mildly aneuploid in their whole cellular system, and they are 30 times more likely to develop cancer during their lifetime than other people.

Several cancer researchers I spoke to, both here and in other countries, acknowledged that aneuploidy is "important." What they differ on is how important. Is it sufficient by

itself to explain cancer, a, and b, do you find it in all cancers? Duesberg, Rasnick, and Li are insistent that to date, nobody has produced a diploid (chromosomally normal) cancer cell.

MIT cancer researcher Robert Weinberg published a paper in *Cancer Research* in 2003 claiming Duesberg was wrong and that his lab had diploid (chromosomally normal) cell lines. Duesberg asked Weinberg to send the cell lines so he could study them. “To his credit, he sent them,” Duesberg says. Things got a little ugly after that. Duesberg and Li analysed the cells using their state of the art technology, and found that every one was aneuploid. They published this finding in *Cancer Research*, to which Weinberg’s team replied in a letter to the journal, that Duesberg’s lab must have somehow contaminated the cells after receiving them.

“That’s the only time I’ve ever seen Ruhong get angry,” recalls Dave Rasnick. “Ruhong was furious.”

It’s dizzying standing in the middle of these kinds of disputes when you are not a scientist. You can’t judge the actual scientific data but you can try to decipher differences in scientific manner and style. Duesberg is unique, or at least highly unusual, in one regard: He is as ruthless with his own discoveries and data as with others. This is how he generated a reputation for being stubborn and dogged, but those words are not used as compliments by most of his colleagues. Sitting there in his office that day, he reflected on this. If you gloss your data even slightly, he says, “science becomes arbitrary.”

“This is something I don’t understand,” he says, with a look of genuine confusion over his face. “I mean, you put in 34 years in these rooms. OK, you have *some* fun but most of the time you grind and grind and grind and then it gets contaminated and...this is your biggest fear. That is why I would prefer to be honest even against my own interests.”

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The *Scientific American* article broke the current state of cancer-think into four essential camps: Standard dogma, Modified Dogma, Early Instability, and All-Aneuploidy. Those who have followed the 67 year old Duesberg’s scientific career, from the heights to the depths, and now once more on the rise, were not at all surprised to see Duesberg take the most uncompromising position, all aneuploidy.

Many experts disagree with him, of course, but they all disagree from some place on the *aneuploidy* spectrum, which ranges from—it's important but not causative, to its very important but not causative, to the Duesberg position, it is the very heart and soul of cancer.

Thomas Ried, NCI's director of Genetic Oncology, attended Duesberg's conference, and has been focusing on aneuploidy himself for most of his career. I visited him in his lab at the NCI, and he said that aneuploidy has been well known and incorporated into American cancer research for many years. He shrugged. "Duesberg is right. But it's not like a big paradigm shift. If anyone had looked at chromosome aberrations in cancer and not realized that it's important, he or she would have been stupid. The director of the NCI called me up not long ago and said, "I would like to discuss aneuploidy." "We've invited Duesberg here to give a talk on aneuploidy."

That's odd, considering that the NCI still refuses to fund Duesberg. He has submitted numerous grant proposals to study aneuploidy, and one of the most influential cancer researchers in the country, Bert Vogelstein, Clayton Professor of Oncology at Johns' Hopkins Medical School, has written a letter urging them to reconsider. "I agree with him that aneuploidy is an essential part of cancer," he wrote. "Duesberg continues to have a major impact on this burgeoning area of research, through his careful experimental observations as well as through his thoughtful reviews and critiques of the subject. There is no question that he is a world leader in this field of investigation."

Ried deflected the question of why or whether the NCI might fund Duesberg, saying only that he hadn't personally reviewed any of his grant proposals, and assuring me that if he wrote a good one he would be considered for funding in the future.

I asked Ried if he had hesitated before accepting Duesberg's invitation to speak at his conference. "No," he said simply. Then he got up and pulled a copy of a book by Theodor Boveri from a shelf. He tossed it on the table. He smiled. "Duesberg won't get jailed for talking about aneuploidy. Actually I was curious to meet with him and discuss this with him. I don't understand why he has to polarize the issue so much though. He says gene mutations don't play a role. I disagree with that. It doesn't serve a scientific purpose to say that."

“Peter Duesberg is one of the top aneuploidy researchers in the country,” said William Brinkley, Vice President and Dean, Graduate School of BioMedical Sciences, Baylor College of Medicine. “I don’t agree with him that gene mutations don’t play any role, but he’s a stellar scientist. I cite him all the time, and I was pleased to attend his conference on aneuploidy.”

“A lot of people have said to me, ‘Don’t cite that guy. Don’t go there.’ Because of the associations with his name.”

“I think he’s a very creative scientist, but he has blinders on,” says John Murnane, a cancer researcher at UCSF, who also attended the conference. “I don’t have anything against Peter, but I do think he made a mistake in not being more careful about the HIV issue. It had so many social implication and I think it would have been more responsible if he’s said he thinks people should avoid HIV.”

I asked him if he considered not attending the conference because of Duesberg’s name. “Honestly? Yes. I thought about, what if somebody sees my name on this list. But then I decided to go anyway.”

“His ideas are very brilliant,” says Walter Giaretti, director of Italy’s National Cancer Institute, who also came to the conference. “I still think gene mutation are important. I’m a partisan of both theories together, but we confronted each other in a passionate, beautiful way.”

“This is the most important question in oncology. It’s difficult. 95% of the research is on gene mutations and so we have to cope with this. Not just give up. Anyway, it was a very stimulating conference.”

George Miklos, director of *Secure Genetics* (a DNA sequence data analysis company in Sydney, Australia), departs strongly from this centrist view of aneuploidy. “I read Duesberg’s 1998 *PNAS* [*Proceedings of the National Academy of Sciences, USA*] paper on aneuploidy. I read it, I put it down and I said ‘This guy has got it right.’ It was a revelation and it was instantaneous. I was a prepared mind though. I’d been reading up on cancer for like 25 years and the literature was a shamble. Nothing was making sense. It was all over the place. They’re all talking tumor suppressors and oncogenes, and every time you read another paper the data were slightly different and contradictory. If you’ve

been in science long enough you know that is a very bad sign. Whenever something is right in science it is very clean. It's very simple and very clean."

Miklos reviewed Bialy's book in *Nature Biotechnology*, and gave it extremely high praise. "I actually saw the book as not really being about cancer or AIDS at all. I saw it as being a book about maintaining standards. It's following in the tradition, the German tradition actually, of people like Gunther Stent and Max Delbruck. Duesberg comes from that tradition, and that's why I get so passionate about him. He's put a stake in the sand and said, 'Look, you cross that line and you're lost. You've lost everything. Not just how you do your science but how you maintain your standards everywhere.' That's why it's so important. Once you make that first little step on your downward slope there is no way you can come back."

We discuss the changing image of Peter Duesberg, and the strange polarity between the way he was depicted in AIDS and the way he's talked about now. We talk about the American formula for success, and what success in science really means.

"Just because your culture identifies you as a loser doesn't mean you are one. I can tell you something, when all the dust settles from the mess of this era, only the Titans will stick up. And they will be very, very few. The present generation may see Duesberg as a loser because of what happened to him, but to the next he will appear very much a winner."

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We walk around the corner to Duesberg's office and he kneels down and pulls out the 1987 *Cancer Research* paper, the one that started all his problems. It turns out the very first reference listed is Theodor Boveri. "I was really a free thinker at that time more than I knew," he says, and shows me that the paper contains early contours of the aneuploidy theory, which Duesberg got to by way of first eliminating all the unproven but fashionable cancer theories of his generation, which he unwittingly helped launch in the 1970s.

Together with virologist Peter Vogt, Duesberg isolated the first real cancer gene (oncogene) from a very rare kind of retrovirus. But Duesberg himself had doubts about

the relevance of these extremely rare viral oncogenes to common human cancers. These doubts would grow, as doubts do in the terrain of Duesberg's mind, to the point of critical urgency. Peter Vogt hasn't spoken to him in 20 years.

"I was a hero. They loved it. Great idea! Every M.D. around the globe took his favorite cancer and looked for onco-genes. They awarded several Nobel prizes for this stuff, without ever proving it really happened, that genes caused cancer. Bishop and Varmus became the kings of cancer and all the rest of it. The trouble was none of these guys bothered to clone them and put them in normal (diploid) cells and see if they're transforming, which was what I was trained to do with viruses."

Before the bio-tech boom of the mid 1980s, Duesberg's fastidiousness and insistence on functional evidence were not only tolerated, they earned him a reputation as a fierce scientific debater with whom one did not want to tangle. But by the time AIDS appeared, these qualities would be recast as "obsessive to the point of pathological" by some of his former friends. Duesberg continues to note with wry amusement that on the very day the US Government announced it had found in HIV the "probable cause of AIDS," it also patented the HIV antibody test.

The retroviral-cancer, and now the retrovirus-aids fields, both powered by the emerging biotech industries were no places for doubts, and Duesberg was all about doubts. More accurately: He was all about transparent data, at a time when biology was becoming increasingly post-modern and opaque. "If the gene would do what it is said to do it would be very simple," he says. "You would take the gene out of the cancer cell, put it in a normal cell, and get a cancer cell. But that has never worked, despite Nobel prizes and twenty years of mutation-cancer."

"There is no functional proof for a cancer gene. When you put it in mice nothing happens. In fact I was the one who did that systematically, all these mix and match experiments, with viral and cellular exchanges. As a father of oncogenes I was in a privileged position because I had solid controls."

By the late 1980s, Duesberg concluded that he and his colleagues had gotten tangled up in a whole lot of complex ideas about retroviruses and oncogenes that were leading nowhere. Bialy likens the situation to the epicycles of those who were determined to make the earth the center of the solar system no matter how baroque the explanation.

“So I hit the library,” he says. “and aneuploidy was everywhere. In my mind I was already conditioned to think about aneuploidy because there you have thousands of genes changing species. I was thinking, as soon as I finish this AIDS thing I have to go look at that.”

But this “AIDS thing” instead crashed down on him and shattered his scientific career. When, in 1987, he wrote the paper in *Cancer Research*, he unleashed a fury from the high priests of the NIH that had already been brewing for some time. It became one of the most sensational, vicious, and personalized battles in the history of modern science.

In 1986, waters were still calm. Duesberg received a special NIH cancer fellowship, as well as the highly coveted Outstanding Investigator Grant, which is reserved for the top scientists in the country and designed to let them push the boundaries of scientific thought. He was also inducted into the elite National Academy of Sciences, the Hall of Fame for scientists, at the unusually young age of 50.

Then came the 1987 paper, and all hell broke loose. Its title was hardly incendiary: *Retroviruses as Carcinogens and Pathogens: Expectations and Reality*, and in it Duesberg argues against the ideas that retroviruses cause leukemia, other cancers, and finally AIDS (the cellular opposite of cancer). Retroviruses, Duesberg reminded his colleagues in this paper, are not ‘cytotoxic,’ meaning not cell-killers. AIDS is a disease of cell death, while cancer is a disease of cell proliferation. However you may feel about the veracity of the HIV/AIDS hypothesis, it is certainly true to say that to accept it, one has to accept a sudden and total reversal of what was held to be true about retroviruses until April of 1984.

The *Cancer Research* paper is, for the purposes of the layperson, essentially a sweeping reality check against overblown claims for the ferocity of retroviruses, written by the man who at that point was said to know them better than anybody. Duesberg was never really a rebel, as Bialy makes clear with some delightful prose in his biography, although he was quickly characterized in the press, both lay and scientific, with that epithet. In fact, Duesberg was a reformer. But given the hysteria of the time, the sense of emergency that AIDS had generated, he was seen as a dangerous extremist.

Shortly after the *Cancer Research* paper appeared, a memo was sent from the office of the secretary of Health and Human Services, (HHS) with the words “MEDIA ALERT”

that castigated the NIH for allowing the paper to have been published in the first place. “The article apparently went through the normal pre-publication process and should have been flagged at NIH,” it read. “This obviously has the potential to raise a lot of controversy....I have already asked NIH public affairs to start digging into this.” The memo listed the few media outlets that had covered Duesberg’s review—primarily the *New York Native*, a gay weekly that has since gone out of business-- and cited a few journalists by name it promised to check up on.

The notion that the NIH expects to vet every scientific paper in every cancer journal is surprising to people who think of science in the old fashioned, soft-fuzzy way. But to anybody who knows the system it is no surprise at all. The NIH exerts a militaristic control over the ideas that emanate from US government science, and the control extends to the media, who are rewarded and punished in accordance with their suspension of curiosity.

The NIH and all its branches are not only part of the “government,” they are part of the US military. Public Health has its roots in the military; The NIH began during WW1 as an organization that solely focused on the health of soldiers. This remained its core mandate through WW2, after which it expanded to a more sweeping public health institution. Still, top NIH scientists hold military rank—the only openly stated one being the Surgeon General.

The NIH, UC Berkeley, the respectable science press, and needless to say the world’s many thousands of AIDS organizations choked on Duesberg like a bone lodged sideways in its throat. Ironically though, his achievements and reputation had lodged him deep in the system and it would take a while for them to expel him.

The Outstanding Investigator Grant Duesberg had received was designed for a handful of elite scientists to be able to focus on their work with a seven year grant cushion, the idea being that they shouldn’t take precious time away for grant-seeking. So they were unable, legally, to close the spigot of funds from the NIH until the seven years had passed, in 1993. When Duesberg’s grant came up for renewal he had “the proverbial snowball’s chance in summer”, as Bialy puts it. The review committee included one AIDS researcher who had financial ties to the company that made AZT, a drug Duesberg continually criticized for its extreme toxicity, and one who had mothered a child by the

very scientist who spawned the HIV-AIDS hypothesis, Robert Gallo. Three reviewers never even read the proposal. Moses himself could have been on the committee and it would have made no difference. Duesberg was doomed. The US government unceremoniously pulled the plug and would never again give him a single research dollar. So he went from being the government's most highly funded scientist to being totally unfunded—but that was only the half of it. A kind of anti-Duesbergism swept the field and grew to near-frenzied levels. Gallo gave an entire interview in 1988 that was laced with furious profanities: "Cock and horseshit, baloney! HIV kills like a truck!" he hollered. "HIV would kill Clark Kent!" This was in the early days of virus-AIDS of course, when HIV was a potent, muscular killer that ate T-cells like a Pac Man, not the "mysterious" virus it is today, billions of research dollars later. The scientific evidence on which this portrayal was based is apparently so flimsy that Bialy deals with it in less than one page. When I asked him about this he noted that the T-cells used to grow the "kilograms of the *deadly*-virus required for the lucrative AIDS tests" were not noticeably harmed by them after hundreds of generations. (*footnote: It is somewhat paradoxical that in the glamorous field of human gene therapy retroviruses are used as the method of choice to deliver genes for therapeutic reasons precisely because they almost never kill cells.*)

Duesberg's unblinking rejoinder at the time was that he was so convinced HIV is harmless, he wouldn't mind being injected -- so long as the sample didn't come from Gallo's lab.

Then for a while, a silence fell. The official position became that not only were Duesberg's arguments wrong, but to even acknowledge the arguments existed was itself wrong, because it deflected valuable time from the business of "saving lives," and lent credence to dangerous nonsense. AIDS organizations posted warnings about Duesberg and the "denialists" on their websites. Project Inform's Martin Delaney personally campaigned to get every journalist who interviewed Duesberg fired. He didn't have to write many letters because very few journalists wanted to interview Duesberg. Those who did were quickly set straight. Anthony Fauci personally made sure Duesberg never appeared on national television, by intimidating the producers who in some cases had already booked Duesberg and flown him to New York. A few times he was cancelled

within an hour of air-time, only to turn on the TV and see Anthony Fauci himself on the show.

As for the inhabitants of the ivory towers in the groves of the Berkeley academe, they were against him from the beginning, and wished they could get rid of him, which they couldn't because he had tenure. They did refuse to endorse any Duesberg appeal to the NIH, however.

He was in short order “dis-invited” from all scientific conferences, and colleagues even declared that they themselves would refuse to attend any conference that included Duesberg. The university dissuaded grad students from working with him, telling them that it would destroy their careers—so he lost them all. He was banished also from publishing in the scientific press, most theatrically by *Nature's* editor, John Maddox, himself, who wrote a bizarre editorial stating that Duesberg should not be entitled to the standard scientific publishing practice “right of reply” in the wake of attacks on him that were frequently published in his journal. The record of this unique and enlightening exchange is rendered in vivid, biting wit in Bialy's book. Even the National Academy's journal [*Proceedings of the National Academy of Sciences, USA*], where members are entitled to unfettered access, cancelled a Duesberg paper on HIV after he spent over a year revising and re-submitting it to meet various editing requests.

Those who tried to help Duesberg were themselves attacked, and in any case, it did no good. Virologist Harry Rubin (himself a member of the academy) intervened on Duesberg's behalf to try to get the *Proceedings* article published, but to no avail. Duesberg's paper in 1992 became only the second by a member of the Academy in the 128 history of the *Proceedings* to be blocked from publication. (The other was by Linus Pauling.)

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There are striking similarities in the dramatic arcs of dissenting scientists, from the middle ages to the present. One classic feature is the organized denunciation; another is the recant offer. In Duesberg's case, both left him utterly undeterred.

In 1994, a high ranking NIH geneticist, Stephen O'Brien, called Duesberg and said he urgently needed to see him about a professional matter. He flew from Bethesda the next

day and the two met at the opera in San Francisco. After some small talk about the good old days, O'Brien pulled a manuscript from the inside pocket of his tuxedo jacket. Headlined, "HIV Causes AIDS: Koch's Postulates Fulfilled," it had three very incongruous names at the bottom: Stephen O'Brien, William Blattner, and Peter Duesberg.

Remarkably too, the essay had been commissioned by Duesberg's implacable foe at *Nature*, John Maddox. If Duesberg would only sign, O'Brien implored, he could have everything back, be back at the top again, back in "the club". O'Brien told Duesberg that if he signed it, the essay would be in press by the following Tuesday—that he would even fly to London immediately and deliver it to Maddox.

Unfailingly polite, Duesberg drove his old friend to the airport (where he was headed for China as Bialy informs us, not England), and said he would give the matter careful consideration. Duesberg already knew what he was going to do. He faxed the manuscript to London the next day, but this time it was two essays. One, the original, with his own name removed, and a second that consisted of his rebuttal. Neither was published, and Duesberg hasn't been published in *Nature* in the decade since.

"So he was given a chance to recant," Bialy laughs, "and we got the Marx brothers."

I asked Duesberg whether O'Brien actually spelled out that the signing of the paper would reverse his fortune.

"Yeah, of course," he said. "He said I would be accepted again... That I had done such good work on cancer and oncogenes but in the case of AIDS I was out of my depth. And there I had made unfortunately a tragic misjudgment which could be corrected now, and I would be back in the lap of the establishment back in my deserved position. This is how he said it."

Not wanting to embarrass him, Duesberg withheld his identity when he published his book *Inventing The AIDS Virus* in 1997. But he revealed it in the Italian edition of the book, once O'Brien had put his name to two anti-Duesberg pieces claiming Koch's postulates had been fulfilled and HIV was the cause of AIDS. These were cited in the "Durban Declaration"—a petition of 5,000 duly vested with degrees and titles names insisting that there is no question whatever that HIV causes AIDS, which was published

in *Nature*, and as a full page ad in the New York Times on the eve of that year's International AIDS Conference in Durban in 2002.

Referring to his onetime friend O'Brien, Duesberg said: "So, I didn't spare his name anymore after he published these articles and I realized that he is a hardcore NIH fascist...or whatever it is...NIH *scientist*. But this is really second-rate kind of NIH science, like the NIH web site. These miserable papers are cited as proof that HIV is causing AIDS and meets Koch's Postulates! Science by the declaration of 5000 scientists including Nobel Prize winners! It reminds me of the one-story I know about Einstein. He was told after he left Germany that hundreds of German physicists had signed a declaration that his relativity was 'questionable' and 'dubious' It was considered 'Jewish science.' Many things are said about people who are very famous like him that never happened, but it could well be true. Anyway, his answer was: Why so many? It only takes one if you have proof. That was Einstein's answer. And in a way that was my reaction also. It's intimidating of course if you hear this: Five thousand scientists signing a petition that this is the cause of AIDS including Nobel Prize winners, when you can be sure it will be a long time until you are recommended for a Nobel Prize again." Duesberg laughs.

As recently as last year, when his merit pay increase was denied again, one of the deans at Berkeley wrote in a letter to the administrator who was brought in to examine charges of extreme bias, that Duesberg has "the blood of African AIDS babies dripping from his fingers."

Prior to 1987, Peter Duesberg never had a single grant proposal rejected by the NIH. Since 1987 he has written a total of 30 research proposals; every single one has been rejected. He has submitted several proposals on aneuploidy, as recently as last year—they too have been rejected.

"They just took him out," says Richard Strohman, a UC Berkeley emeritus professor of cell biology, recognized in the past for his work on muscle, and recently for his widely read critiques of the extravagant claims made for the medical benefits that will come from the completion of the sequencing of the human genome. "Took him right out."

“The system works,” says David Rasnick. “It’s as good as a bullet to the head.”

Not quite.

Over the years, a number of private cash infusions have kept Duesberg afloat. They have come from foundations and from individuals, who simply give him what he needs because they believe in what he is doing. His most important, hands-on benefactor is a San Francisco venture capitalist named Bob Leppo, who bought Duesberg and Li the \$80,000 state-of-the-art Zeiss microscope on which no aneuploid cell would ever be taken for diploid. He also pays Li’s part time salary, and he sponsored the 2004 Aneuploidy Conference in Oakland.

I met up with Leppo, a self-described Libertarian, in San Francisco, at a restaurant on Geary Street. He said he estimates he has given Peter Duesberg more than half a million dollars since 1995.

“My main motivation was anger at the way I saw him being treated,” says Leppo, a tall man of about sixty, who looks more like a professor than a venture capitalist. “And it’s been very gratifying to watch this all play out.”

We talked about whether it actually is critical for a scientist to be funded by the government.

“I’m here to tell you that there are two types of scientists. There are the ones that need government funding, and there’s everybody else. You’ll pardon the expression but the government is the sow, with all these nipples, and all the dependent scientists attached to them. Even the pharmaceutical companies depend on them. They are just as afraid of the government as the scientists are because the government has the power to decide which drugs people can buy and which they can’t”

“Historically, a great many scientific discoveries were accomplished by either a single person or a tiny group with negligible funding, and what little funding they had didn’t come from government. The basis of Peter Duesberg’s genius is that he thinks about things differently. And that’s the most important thing in science—not to see new things necessarily. A thousand scientists are seeing the same thing. Peter Duesberg is thinking differently about the things that he sees.”

“Duesberg’s problem was that everybody was driven by fear. The core of the condemnation of him by fellow scientists was the fear that if they didn’t condemn him

publicly, they would lose their government funding. They were taking out insurance against that. But that fear is not there in cancer. Peter Duesberg's notoriety has everything to do with AIDS and nothing to do with cancer. When we were planning the conference, he listed the crème de la crème in the field. The majority of cancer scientists that he wanted to come to his aneuploidy conference came."

Leppo laughs, and I turn my tape recorder off.

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I asked her if we could talk about Peter Duesberg and she nodded, and walked me down the corridor into her office. She asked that I not identify her, and that I say only that she has known him for "a considerable time," and that she is a UC Berkeley scientist.

"I am not fond of this topic," she said, as I sat down in the chair opposite her, and explained what I was there to examine: Peter Duesberg's potential rehabilitation. The scientist knew Duesberg well, as did her husband, who apparently was "furious" at him when he, in her words, "disgraced" himself with the HIV debate. .

"I don't think Peter is necessarily wrong," she said. "But he had a fatal flaw. He went public. I think he hurt himself. He didn't understand the real world."

She kept talking, as though she'd been thinking about this for years, and was waiting for somebody to walk in there with a notepad. I got the same feeling from others who'd known Duesberg from the early days. Almost a sense of guilt, but threaded around an argument that places the blame at Duesberg's feet. For not playing ball.

"Peter doesn't have a bad bone in his body but he's childish. I think he sees the world in bright colors."

"Bright colors?" I said.

"Yes. He did it to himself, you know. Everything that's happened. You see, he wouldn't give up an idea. He went at it with a hammer. He may well be 3000% right but he upset an awful lot of people through his doggedness, which only made him more dogged."

"So that's not a value then, in science...being dogged?" I asked.

"He's been unpopular his entire career. You can't help but love him. He's here because nobody will have him."

“I realize that,” I said.

“Nobody believed in him because what he was doing was overturning generally held views. They felt betrayed.”

“*They* felt betrayed?”

“Yes, they felt attacked.”

She paused. “Let me explain something. Political savvy is intrinsic to a scientific career. You don’t just stand up and say that everybody is wrong.”

“What should he have done though, given that he did think they were wrong?”

She shook her head and smiled.

“There’s no such thing as totally right or totally wrong.”

I leaned forward in my seat. “In *science*? There’s no such thing as totally right or totally wrong?”

She waved her hand, as though we were talking about something faintly banal.

“Listen, it’s passé now. He would have been ok if he had just done things as convention dictates.”

I tried to write down every word she said because it felt like I had at long last gotten to The Answer, and I could scarcely believe my ears. The case she was making was a case for bourgeois science-- rosebushes and garden parties and playing along.

“I wouldn’t want his life,” she said.

We sat silently for a moment.

“In the department, they’d laugh and talk about him. He was very irritating to the department. He carried his ideas too far.”

At no point did the conversation circle around to the question of the scientific arguments themselves. It was all about the culture of science, the codes and unspoken rules.

“If he had just *apologized*, he would have been resurrected long ago,” she said.

“But how could he apologize unless he felt he had done something wrong?” I begged.

“And how could he feel that unless he thought he was incorrect. *He doesn’t think* he is incorrect.”

She sighed. And what she said next weighed no heavier on her than anything else she had said.

“Peter may be right about HIV. But there’s an industry now.”

It was *entirely* implicit that the scientist should adapt to the industry, shape his views to please it. If he wants to succeed.

“I don’t think Peter understands what’s going on,” she said again. “He thinks everybody should be friendly. Maybe that’s it. He’s like a child, he really is.”

Before I left she wanted to stress one more time that Peter Duesberg had brought all his miseries and punishments onto himself, that there was so “conspiracy,” which I heard repeated by several others on the anti-Duesberg side of the fence.

“You’re saying there was never any conspiracy to ruin him, as a scientist,” I said.

“That’s right,” she said, “It’s just....”

I waited.

“Just what?”

And then she smiled and shrugged.

“That’s the way the cookie crumbles.”

Before I left I asked her if I could feel free to quote her and she adamantly said she did not want to be identified in this story. We negotiated what I could say about her, and wound up with the elliptical set of identifiers I have used. She feared “they” would figure out who she was. I hope, for her sake, the identifiers are sufficiently “elliptical.” As I was leaving she said something else odd. “I don’t want to go on record saying anything for *or* against Peter.”

It was as if, at this point, she could no longer be sure *which way* the cookie was crumbling around the name Peter Duesberg.

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“Oh my God,” whispers Nobel Laureate Kary Mullis when I read him the Mark Wainberg quote about putting HIV dissenters in prison.

“No real scientist would ever talk like that, ever,” he said.

I caught up with Mullis by phone at his home in La Jolla, to discuss Duesberg, who he has defended in the past, being himself a fierce critic, in fact ridiculer, of the HIV hypothesis. In 1991, he told me that he had been searching in vain for the reference or

references that demonstrate HIV causes AIDS when writing an invited review of the applications of PCR in biomedical research. He wanted to be able to attach a reference to it because, as he sarcastically put it, “I didn’t want it to be *my* idea.”

Mullis won the 1993 Nobel Prize in chemistry for his invention of PCR (the polymerase chain reaction) the DNA amplification technique that has revolutionized forensics and DNA manipulations in general. The basis of the invention appeared in Mullis mind, complete and finished, while he was driving down a winding Pacific Coast road in the mid 1980s. He pulled over and scribbled it down. Whatever it was that appeared in his head, it was correct, and out of it came PCR. In the context of HIV and AIDS, Bialy called it “The ideal post-modern biochemical tool for the post-modern virologist: The ability to make more and more out of less and less.” Mullis has been as vocal and bitingly sardonic a critic of the HIV-AIDS hypothesis since the early 1990s, when the AIDS establishment tried, without success, to use PCR to prove Duesberg wrong when he claimed that only an insignificant number of cells were ever infected by the “deadly virus”. He said at the time: “PCR made it easier to see that certain people are infected with HIV, and some of those people came down with symptoms of AIDS, but that doesn’t *begin*, even, to answer the question: Does HIV cause it? Human beings are *full* of retroviruses.”

I asked Bialy about this and he said: “It is the most singly important explanation the hypothesis *should* have had to provide before it was taken seriously in the first place. How do you account for the pathogenicity of this sleepy virus that has 98,000 very, very close genetic relatives quietly residing in the human germline according to the most recent and exhaustive study. In the germline! Not in your body cells! In your sperm and eggs! Getting passed on from generation to generation for as long as human beings have been on this planet. Every single one of them is clearly harmless.”

Scientists like Mullis and Bialy (who were graduate students together at Berkeley in the 60s) remember where they were when they first heard the rumor that the NIH’s Robert Gallo had found the cause of AIDS and that it was a retrovirus the way some people remember where they were when JFK was shot. “A friend at a biotech company told me,” says Bialy. “I was in the process of returning to New York from the University of New Mexico in Albuquerque where I had spent a year as a visiting research professor.

January '84. I remember shivering and shuddering. A cytopathic retrovirus? This is just more Gallo bullshit, I said. It will never fly."

"Look there's no sociological mystery here," says Mullis." It's just people's income and position being threatened by the things Peter Duesberg is saying. Their personal income and positions are being threatened and that's why they're so nasty. In the 1980s a lot of people started being dependent on Tony Fauci and his friends for their livelihood. All these people really wanted success in the sense of lots of people working for them and lots of power. But in the AIDS field now there is a widespread neurosis among scientists. There's so much accumulating evidence against them, they really don't know how to deal with it. They really did make a big mistake and they're not going to ever fix it. They're still poisoning people."

Mullis has reviewed Duesberg's aneuploidy grant proposals and written letters on his behalf.

"His critics say he's extreme and unreasonable to say that its all aneuploidy, but it's also an extreme and unreasonable position to say that it's all oncogenes and tumor suppressors. There's no real strong evidence for that and they sure haven't made any great strides curing cancer with that idea. I think his ideas are much more intellectually interesting and in line with the facts. It makes more sense. But you know Peter does have a part of his personality that invites these attacks. He has a biting wit. But those AIDS guys, they deserved it. Peter doesn't really write his papers in a way that tries very hard to make a point to somebody who's not smart. He doesn't try to appeal to the lowest common denominator."

Before we sign off Mullis tells me he has just emailed his son in Australia to suggest he name his soon to be born son after a molecule.

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The word "empire" is on people's minds these days, along with a queasy feeling that ours is collapsing on us. Just about anyplace you choose to look, standards have eroded and imploded, even reversed themselves. Truth doesn't pay and doesn't matter, because we live in bursts of fraud that carry us along to the next burst of fraud, and who has time

to sort it all out, except possibly future historians? William Blake said that the foundation of empire is art and science. "Remove them or degrade them and the empire is no more."

Today's scientists are wholly dependent for their survival upon the crushing will of a conjoined financial megalopolis connecting government, academia, and the biotech and pharmaceutical industries. If you talk to them, they almost all speak of fear--fear of losing their funding. They have to write more and more grants, in much shorter intervals than they used to, and they write the grants that will please the system, perpetuate it. "Nobody is safe," one NIH-funded cancer researcher told me.

"You have to write a grant a year almost. And you have to write four to get one, if you're any good. I got out just in time. Everybody who's still in there says the same thing. It's going to hell in a hand basket," says UC Berkeley Professor Emeritus Richard Strohman.. "Before the biotech boom, we never had this incessant urging to produce something useful, meaning profitable. Under these circumstances, everybody is caught up in it: Grants, millions of dollars flowing into laboratories, careers and stars being made. The only way to be a successful scientist today is to follow consensus. The academy has become the technology it invented. It's lost its scientific edge and replaced it with a technology that follows the market. The tension between the two is that science is primarily a generator of surprises, whereas technology is anything but surprises. If you're going to produce something and put it on the market you don't want any goddamn surprises. You've got the next quarter to report and you don't want any bad news. It's all about the short term now. Science has totally capitulated to corporate interests. Given their power and money, it's going to be very hard to work our way out of this."

"Fifty, sixty years ago there was still pluralism in the life sciences. I used to be the chairman of the zoology department at Berkeley. It's gone now. I call this the intellectual urban renewal program. They tore down the neighborhoods and put up all these high-rises and people stopped talking to one another."

We imagine science to be a profession that prizes curiosity, confusion, and wonder. We think of Gregor Mendel poking around in his pea garden in Brno, or Darwin studying his fossils in the candle-lit cabin of the H.M.S. Beagle, or Alexander Fleming with his

magnificent, moldy Petrie dish. But the mold that became penicillin would never be discovered today. The window in the lab doesn't open.

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Peter Duesberg is alone at his favorite outdoor table of the Berkeley coffee house La Strada, typing on his laptop. At 67, he is a slender man of average height, with white, wavy hair that doesn't do anything crazy. Professorial hair. Blue eyes that have been described as having a twinkle and a Nordic face that you could call boyish. He's wearing a white shirt and a navy knit vest, and he's typing, with an empty cappuccino cup next to him and a plate with crumbs.

The café is noisy, students, adorned with the body-décor of trendy rebellion — piercings, tattoos, torn clothes-- stream past and take no notice of him.

Every day he has to write letters of appeal to the tribunal of deans and department heads at Berkeley, about his merit pay case. One of them is sitting around the corner, laughing loudly. If only it were possible to pull the entire story, thread by thread, into the frame. The laughing dean may or may not be the one who wrote a letter accusing Duesberg of having the very blood of African AIDS babies dripping from his hands. He's got his point of view. But if he walked around the corner and peered down onto Duesberg's screen, he'd see an email of the sort Duesberg gets almost every day, from people he doesn't know, thanking him for saving their life.

An African-American of about 45 arrives just as I sit down, and greets Duesberg warmly. He is a Chomsky-leftist, and graduate student in political science who thinks Duesberg is correct about HIV and AIDS. "I have friends here on campus who think 9/11 was an inside job. But your stuff..." he tell him, shaking his head and laughing, "It's too radical for them. They refuse to even talk about it."

He walks away, and I scribble down what he said. One more thread in my collection. I'm trying to figure out how people build their "airy citadels" as Keats put it, of what they know, don't know, think they know, and don't want to know.

I contacted the prominent, Berkeley academics who oppose Duesberg and asked if they would speak to me. None agreed to an interview. Some didn't reply and others said

they were leaving on vacations. One professor, Michael Botchan, replied via email with this:

“Conspiracies in the academy don’t exist as they did in Galileo’s time—really. Now, Peter Duesberg has a theory that aneuploidy is necessary *and* sufficient for all cancers. If he is having trouble getting funded over an extensive period of time, it means that his peers really don’t think much of his notions. Any other slant would in my opinion be way off the mark.”

David Steele, Duesberg’s attorney, who is also litigating against GlaxoSmithKline charging that they harmed and even killed people who took the anti-AIDS drug AZT without being informed that it is a chemotherapeutic agent, hands me a large black folder of correspondences between Duesberg and the Berkeley administration. “Read it yourself,” he says. “They are egregiously biased and take shots at him at every turn. The ethic among these guys is if you have a chance to take a whack at Duesberg, you never miss that chance. It’s a whole culture. They reward each other for it.”

At least twice, his request for merit pay increase has had to go to a new reviewer, as mediators have found them to be biased in their assessment of Duesberg’s work. But it is difficult if not impossible to find an impartial reviewer in the virology department at Berkeley. At one point, they tried to find somebody in the math department. Reviewing the dossier, one exchange in particular caught my attention. It was a simple thing: Duesberg had written to one of the administrators asking about the teaching schedule for the upcoming semester. The administrator, Stuart Linn replied:

“Surely, Peter, as a member of the NAS [National Academy of Sciences], you can look up the lab days and divide them by 3. In the event that you cannot, there are 44 days of class and an exam at the end of each (unless you want to have the exam at the beginning, or don’t want to have one), leaving 41 days of lab. “

He lists the exams, then goes on to say: “If this doesn’t work for you, you are free to give lectures on AIDS, not give an exam, etc., but don’t ask Sharon Lindley to worry about it as it is not her responsibility.”

This was a rare instance where Duesberg showed emotion in his reply.

“Surely” Stuart,” he wrote his colleague, “I would like you to answer the following four questions.”

The first one is: “Why would you have to address me as a member of the NAS in criticizing me for not knowing when exactly my section of MCB 110L starts next February? I can not help it that I was elected into the NAS—but, I also can not help it that you were not.”

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“I can’t even go to the campus. The hostility just pours out from every corner,” says Siggie Sachs Duesberg, Peter Duesberg’s wife, an attractive, athletic German woman in her mid 40s, with whom Duesberg has an eight year old son, Max. He also has two grown daughters from a previous marriage. She puts down a plate of cheese on the table and says, insistently: “Science is such a rotten thing: A bunch of completely mediocre people who don’t want to risk anything. *And on top, they’re egomaniacs!* “

She spoke of the social ostracizing the family suffers. “We are never invited anywhere. Never. It even extends to Max, how they treat him in school. It’s very hard and I’m so tired of it. The AIDS thing that they will never give up, they will fight it to the end.”

Max climbs into his father’s lap and Duesberg whispers something to him and they laugh. I ask Max if he wants to be a scientist when he grows up. “I want to be that last,” he says. “In the last part of my life.”

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## **CODA**

While *The Passion* above was in production, a scientific article and several commentaries appeared in *Nature Genetics*, *Science* and in *Nature* itself that represent the scientific equivalent of suddenly hoisting a new flag, almost like the pirates of the Caribbean. The abstract of the article that generated the fusillade of praise concludes: "These data strongly support a causal link between aneuploidy and cancer development". While the paper does not go so far as to suggest that specific mutations are no longer required for carcinogenesis, it does come close. Neither the article itself nor any of the commentaries take more than one, very muted note of Duesberg’s tireless efforts in bringing aneuploidy this new luster. He has not, however, been completely air-brushed out of the picture,

having just received word from the editors at *Science* that a letter -- which raises a few of the problems associated with attributing to aneuploidy the essentials of cancer cell initiation and yet still insisting that this massive genetic change is brought about by mutations in specific genes -- has been accepted for publication. The letter also calls understated attention to the fact that he has published extensively on the importance of aneuploidy in the evolution of a cancer cell. "In view of these problems, my colleagues and I have proposed that carcinogenesis is initiated by a random aneuploidy, which is generated either by a carcinogen or spontaneously", and cites three, quality publications, the most recent being February 2004, in support.

When I asked his biographer, many months ago, why he wrote his book now, his answer was that aneuploidy was clearly going to become the most important idea in cancer and he did not want to see his good friend relegated to irrelevant when it did. When I asked him, very recently, what he thought about the developments sketched above in light of this, he wrote. "Given that the head of the laboratory at Johns' Hopkins from which two of the commentaries originated, Bert Vogelstein, is quoted in the book crediting Peter as a "leading champion" of aneuploidy, it is actually a little surprising that these most recent, prominently endorsed attempts by the Ptolemaists to make functionally all important chromosomal imbalance a consequence of insignificant gene mutation, nonetheless make only the most passing of reference to him. It is significant, however, that the establishment appears to be only a short step from a Copernican enlightenment. Ultimately this will be to the benefit of cancer patients, and I believe that it will also ultimately reflect on the good name of Peter Duesberg."

Celia Farber  
4.12.04  
NYC  
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## Notes

1. Exactly how "mysterious" is described in the usual, challenging prose of a *NY Times* science reporter in an article that opens with the following lede: *Who knows what evil*

*lurks in the lymph nodes of men? The immunologist knows. But the body may not even suspect it. That evil is the AIDS virus, which has the power to hibernate, virtually forever, even in patients taking their triple-therapy cocktails with religious devotion.* Mcneil, Jr., D. Trying to Kill AIDS Virus by Luring It Out of Hiding. *The New York Times*, September 23, 2003.

2. It is somewhat paradoxical that in the glamorous field of human gene therapy retroviruses are used as the method of choice to deliver genes for therapeutic reasons precisely because they almost never kill cells.

3. According to Duesberg's biographer: "It was 'three' "more than a dozen years" ago, and it could certainly be argued that the parting of the ways had as much or more to do with Peter's AIDS notoriety as irreconcilable intellectual differences over the epistemological foundations of cellular oncogene theory. In either case, it is scientific gossip, and so is not recorded in the biography, even though such "gossip" is sometimes not only true, but interesting and instructive as well. That being said, as I recall from a contemporaneous phone call from Peter, their final conversation was shortly after the 1989 Nobel Prize in Medicine was awarded to J. Michael Bishop and Harold Varmus for "their discovery of the cellular origin of retroviral oncogenes". Peter's longtime friend and coworker phoned to say: "Thank you, you bastard. You cost me my Prize", and quickly put down the phone. I think I remember Peter telling me that he said, "I'm sorry," which would make it a conversation, even though a brief one. But I can't be sure my memory of that is accurate.

4. Stuart Linn's name is in the textbooks, but not in the rolls of the NAS, for *his* work in the 1960s and 70s, which was not on retroviral oncogenes, but on the restriction endonucleases that became so important as the enzyme scissors with which to cut DNA molecules "for biotech, and even a few academic uses", Bialy informed me with a by now familiar, irony in his voice. He added, with a touch of regret in light of the "Surely Peter" letter, that "Professor" Linn was a member of his thesis committee."

\* It is frequently said by persons like Anthony Fauci, David Baltimore and other prominent advocates of HIV/AIDS that Duesberg's arguments have been refuted many times over the years. The anonymous NIH website is usually given as the first source, followed closely by the Durban Declaration. Whenever I hear this I cannot help think how empty the verb "refuted" is without the adverb, "convincingly."