FOREWORD

JANE GOODALL

I well remember how horrified I felt when I learned that scientists had succeeded in reconfiguring the genetics of plants and animals. The first genetically engineered (GE) plants were created in the 1980s, but I did not hear about them until the 1990s when they were first commercialized. It seemed a shocking corruption of the life forms of the planet, and it was not surprising that many people were as appalled as I was – and that these altered organisms became known as 'Frankenfoods'.

In fact, there were good science-based reasons to mistrust the new foods; yet GE crops have spread throughout North America and several other parts of the world. How has this come about? The answer to that question is to be found in Steven Druker's meticulously researched book. Several years in the making, it is a fascinating, if chilling story.

I did not realize what a formidable task the bioengineers faced as they struggled to introduce new genes into a variety of agricultural crops. Their intent was to make them produce toxins that would deter insect pests, or enable them to resist herbicides, and so on. A major challenge was the need to overcome the various defensive mechanisms of the plants themselves, which did their best to repel the alien material. Another was to compel the foreign genes to function in a cellular environment where they would ordinarily remain dormant. It is a testament to human persistence and ingenuity that the scientists finally succeeded!

But the reconfigured plants they eventually created were, as Druker explains in engaging detail, different in a variety of ways from their parents; and from the outset many qualified scientists expressed concerns about the safety of the new crops for both the environment and human and animal health. He further demonstrates that this very real difference between GE plants and their conventional counterparts is one of the basic truths that biotech proponents have endeavored to obscure. As part of the process, they portrayed the various concerns as merely the ignorant opinions of misinformed individuals – and derided them as not only unscientific, but anti-science. They then set to work to convince the public and government officials, through the dissemination of false

information, that there was an overwhelming expert consensus, based on solid evidence, that the new foods were safe. Yet this, as Druker points out, was clearly not true.

As the chapters progress, we read how the advocates of genetic engineering have steadfastly maintained that the crops created by this radical technology are essentially similar to those from which they have been derived, that the process is splendidly exact, and that GE foods, therefore, are if anything *safer* than their traditionally bred 'parents' – when in fact, there's significant dissimilarity, the process is far from exact, and the risks are greater, especially the risk of creating unexpected toxins that are difficult to detect.

Druker describes how amazingly successful the biotech lobby has been – and the extent to which the general public and government decision-makers have been hoodwinked by the clever and methodical twisting of the facts and the propagation of many myths. Moreover, it appears that a number of respected scientific institutions, as well as many eminent scientists, were complicit in this relentless spreading of disinformation.

Chapter 5 shows how the key step in the commercialization of GE foods occurred through the unbelievably poor judgment – if not downright corruption – of the US Food and Drug Administration (the FDA). This regulatory body is supposed to ensure that new additives to foods are safe before they come to market, and it had a responsibility to require that GE foods were proven safe through standard scientific testing. But the information that Druker pried from the agency's files through a lawsuit revealed that it apparently ignored (and covered up) the concerns of its own scientists and then violated a federal statute and its own regulations by permitting GE foods to be marketed without any testing whatsoever. The evidence further shows how the agency assured consumers that GE foods are just as safe as naturally produced ones – and that their safety has been confirmed by solid scientific evidence – despite the fact it knew that no such evidence existed.

Druker makes the case that it was this fraud that truly enabled the GE food venture to take off. And he asserts that the fraud continues to deceive the public and Congress, despite the fact that the lawsuit he initiated thoroughly exposed it. His description of the proceedings surrounding this lawsuit was, to me, one of the most astounding and chilling parts of the book.

And what of the role of the media? How have the American public been so largely kept in the dark about the realities of GE foods – to the extent that until quite recently, a vast majority of the populace did not even know they were regularly consuming them? Druker describes, in Chapter 8, how

the mainstream media have been highly selective in what they report – and have consistently failed to convey information that would cause concern about these engineered products. Moreover, Druker demonstrates that the policies imposed by the media magnates have been, in his words, "not merely selective, but suppressive." And he relates several dramatic incidents in which journalists who tried to bring unsettling facts to light had their stories altered or totally quashed by higher level executives. So it is not surprising that the American public, and a good many key decision-makers, believe that there are no legitimate concerns regarding GE foods.

I am personally grateful to Steven Druker for writing this book. It has been a monumental task and reflects the passionate desire of a man with a true scientific spirit to reveal, as precisely as possible, the truth behind the misrepresentations of the truth. Nonetheless, despite its integrity, *Altered Genes, Twisted Truth* can be expected to meet fierce criticism from those who promote the GE food venture; and, like all who attempt to disclose the venture's underside, its author will probably be attacked and branded as anti-science and anti-progress. BUT it seems to me that it is not those who point to the problems of the venture who are anti-science: it is quite the other way around. Nevertheless, Druker will almost surely be subjected to the same sort of criticisms as those leveled against Rachel Carson when she published *Silent Spring* in 1962.

I think it is important that you read this book carefully, assessing for yourself how firmly it is grounded in fact and logic. You may well come to the same conclusion as I have: that Steven Druker is upholding the tradition of good science. Then read some of the books and articles written by pro-GE scientists – especially some of those by prominent biologists – and you may well decide that their standards often fall significantly short of his.

In fact, he points out several instances in which it appears that such publications are downright deceptive, not only portraying genetic engineering in a misleading manner, but even misrepresenting some basic features of biology. Further, although these scientists may genuinely believe that GE foods are the solution for world hunger, it appears that many of them have vastly overestimated the benefits of these foods – and that even *if* these products did *not* entail higher risks, it's doubtful they could significantly reduce malnutrition or solve any major problems of agriculture.

Although this book tells a story that's in many ways distressing, it's important that it has finally been told because so much confusion has been spread and so many important decision-makers have apparently been deluded. Fortunately, the final chapter shows how the story can have a

happy ending, and it clearly points the way toward realistic and sustainable solutions that do not involve genetic engineering. Thus, just as my own books aim to instill hope, this book is ultimately a hope-inspiring one too. For it describes not only some of the mistakes that we have made but how they can be rectified in creative and life-supporting ways.

Druker has, without doubt, written one of the most important books of the last 50 years; and I shall urge everyone I know, who cares about life on earth, and the future of their children, and children's children, to read it. It will go a long way toward dispelling the confusion and delusion that has been created regarding the genetic engineering process and the foods it produces.

To me, Steven Druker is a hero. He deserves at least a Nobel Prize.

– Jane Goodall, PhD, DBE and UN Messenger of Peace

INTRODUCTION

How I Reluctantly Became an Activist

– And Uncovered the Crime that Enabled the Commercialization of Genetically Engineered Foods

Most people would be surprised to learn that Bill Clinton, Bill Gates, and Barack Obama (along with a host of other astute and influential individuals) were all taken in by the same elaborate fraud.

They'd be even more surprised to learn that it was not perpetrated by a foreign intelligence agency, an international crime syndicate, or a cabal of cunning financiers but by a network of distinguished scientists – and that it did not involve change in the climate but changes to our food.

And, if they're Americans, they would be shocked to discover that the US Food and Drug Administration has been a major accomplice – and that because of its deceptions, for more than fifteen years they and their children have been regularly ingesting a group of novel products that the agency's scientific staff had previously determined to be unduly hazardous to human health.

This book tells the fascinating and frequently astounding story of how such a remarkable state of affairs has come to be; and I'm uniquely positioned to tell it, because I uncovered one of its key components.

In early 1996, I did something few Americans were then doing: I decided to learn the facts about the massive venture to restructure the genetic core of the world's food supply. And the more I learned, the more I became concerned. It grew increasingly clear that the claims made in support of genetically engineered foods were substantially at odds with the truth – and that there were strong scientific grounds for viewing such products with a cautious eye.

Of special concern was the behavior of the Food and Drug Administration (FDA), which has refused to regulate genetically engineered foods

and instead has energetically promoted them.[1] I found it problematic this agency had adopted a presumption that genetically engineered (GE) foods are as safe as natural ones and was allowing them to be marketed not only without testing but even without labels to inform consumers about the genetic reconfiguration that had occurred. I believed this was unscientific, irresponsible, and fundamentally wrong.

I also had a hunch it was illegal – a hunch my research eventually confirmed.

As my knowledge grew, there also grew a conviction that a lawsuit should be brought against the FDA to overturn its policy on GE foods and compel it to require the safety testing and labeling that consumers were being wrongfully denied. At that point, I didn't envision playing an active role in the legal proceedings or even getting extensively involved in the developmental phase of the suit. My intention was to present the idea to others who had greater expertise and resources and inspire them to carry it out. Although I have a law degree from the University of California at Berkeley, practicing law has not been the central focus of my professional life, and I had scant experience in litigation. Further, I was immersed in a project that was dear to my heart and didn't want to get sidetracked.

Yet, in the process of trying to inspire others to do the lawsuit, I gradually became the main person organizing it and driving it forward. The executives of public interest organizations with whom I spoke all thought the suit was a great idea, but none felt ready to take it on. After some weeks of attempting to find an organization that would shoulder the suit, I discussed the situation with a molecular biologist who was concerned that in the push for rapid commercialization of GE foods, the risks were being unduly discounted and testing irresponsibly neglected. As I explained how my ideas for the lawsuit had been uniformly greeted with enthusiasm but that none of the groups was prepared to turn them into reality, he said: "Steve, don't you realize this is your baby? If you don't do it, it's not going to happen." Much as I desired to have someone else do the suit so I could get back to my other project, and much as I wanted to reject his assessment, deep down I had an inescapable feeling he was right.

So I set my project aside, founded the Alliance for Bio-Integrity (a nonprofit public interest organization), and as its executive director, devoted myself full-time to organizing the lawsuit. In a few months, I gained the collaboration of the International Center for Technology Assessment, a respected public interest organization in Washington, D.C. with a skilled team of lawyers. They had substantial experience in litigation with federal

administrative agencies, and they agreed to be the attorneys of record, on the condition that I would continue to coordinate the various elements of the project and to raise the necessary finances. In time, I also became actively involved as an attorney, undertaking key research and contributing to the briefs and other documents filed with the court.

During the preparation phase, a primary goal was to attain an impressive set of plaintiffs. Over the following months, through numerous phone calls, emails, and journeys to personal meetings, I assembled an unprecedented coalition to join the suit and sign the complaint against the FDA that was submitted to the court. For the first time in US history, a group of scientific experts became involved in a lawsuit challenging the policy of a federal administrative agency, not as advisers or expert witnesses, but as plaintiffs – plaintiffs who formally objected to the policy on scientific grounds. In a bold move highlighting the unsoundness of that policy, nine well-credentialed life scientists (including tenured professors at UC Berkeley, Rutgers, the University of Minnesota, and the NYU School of Medicine) stepped up to sue the FDA and formally assert that its presumption about the safety of GE foods is scientifically flawed because they pose abnormal risks that must be screened by rigorous testing.

Equally unparalleled, they were co-plaintiffs with a distinguished group of spiritual leaders from diverse faiths who objected to the FDA's policy on religious grounds. Within this group were the President of the North American Coalition on Religion and Ecology, the chaplain at Northeastern University, and a lecturer in theology at Georgetown University. In all, there were seven ordained priests and ministers from a broad range of Christian denominations (including Episcopalian, Lutheran, Baptist, and Roman Catholic); three rabbis (Orthodox, Conservative, and Reform); the chancellor of the Americas Dharma Realm Buddhist University; and a thousand-member Hindu organization from Chicago. These plaintiffs stated that in their view, the manner in which biotechnicians are reconfiguring the genomes of food-yielding organisms is a radical and irreverent disruption of the integrity of God's creation – and that they felt obliged to avoid consuming the products of such interventions as a matter of religious principle. They alleged that by failing to require proper labeling, the FDA was unavoidably exposing them to these foods and preventing them from the free exercise of their religious beliefs. (Some of the religious-based reasons for rejecting GE foods are more fully described in Chapter 14.)

Although proponents of GE foods attempt to portray any religiously motivated opposition as due to ignorance about the facts of genetic

engineering and a resultant failure to appreciate its similarity to traditional breeding, these plaintiffs *were* well-informed; and they therefore understood how deeply it does differ from natural processes. (These differences are thoroughly discussed in Chapter 4).

Alliance for Bio-Integrity, et al. v. Shalala, et al. was filed in US District Court in Washington, D.C. in May 1998. The first named defendant was Donna Shalala because, as the Secretary of the Department of Health and Human Services at that time, she oversaw the FDA, which is one of the agencies within that department. The acting commissioner of the FDA was the other defendant.

The suit quickly achieved a major effect because, as part of the discovery process, it forced the FDA to hand over copies of all its internal files on GE foods. Eager to delve beneath the agency's public pronouncements and see if they jibed with what it really knew and how it had actually operated, I assumed responsibility for analyzing this trove of documents. As I combed through the more than 44,000 pages of reports, messages, and memoranda, I made several startling discoveries. By the time my investigation was finished, I had compiled extensive evidence of an enormous ongoing fraud. It revealed that the FDA had ushered these controversial products onto the market by evading the standards of science, deliberately breaking the law, and seriously misrepresenting the facts – and that the American people were being regularly (and unknowingly) subjected to novel foods that were abnormally risky in the eyes of the agency's own scientists.

This fraud has been the pivotal event in the commercialization of genetically engineered foods. Not only did it enable their marketing and acceptance in the United States, it set the stage for their sale in numerous other nations as well. If the FDA had not evaded the food safety laws, every GE food would have been required to undergo rigorous long-term testing; and if it had not covered up the concerns of its scientists and falsely reported the facts, the public would have been alerted to the risks. Consequently, the introduction of GE foods would at minimum have been delayed many years – and most likely would never have happened.

So it's vital that the story of the FDA's crime be fully told; and this book does so in a comprehensive and vivid manner, disclosing how a government agency with the duty to safeguard the nation's food supply was induced to perpetrate such a fraud, how the fraud was carried off, and how, even after being exposed and conclusively documented, it has maintained its strength and continued to deceive the public.

Moreover, in fully telling this story, the book relates a much bigger one, a story in which the FDA's behavior does not stand as an isolated aberration but forms an integral part of a broader pattern of misconduct. It presents a graphic account of how the genetic engineering venture arose, the stages through which it has advanced, and how, at every stage, the advancement relied upon the sustained dissemination of falsehoods. In line with its title, it demonstrates that the broad-scale altering of genes has been chronically and crucially dependent on the wholesale twisting of truth – and shows how for more than thirty years, hundreds (if not thousands) of biotech advocates within scientific institutions, government bureaus, and corporate offices throughout the world have systematically compromised science and contorted the facts in order to foster the growth of genetic engineering, and get the foods it produces onto our dinner plates.

Thus, the narrative that unfolds in the following pages is fundamentally a story about the corruption of science and its concomitant corruption of government, not through the machinations of a scientific fringe group in league with a pack of powerful political ideologues, but through the workings of the mainstream scientific establishment in concert with large multi-national corporations – and their co-optation of government officials across the political spectrum, and across the globe. Further, by the time the story ends, it will be clear that the degradation of science it depicts has not only been unsavory but unprecedented: that in no other instance have so many scientists so seriously subverted the standards they were trained to uphold, misled so many people, and imposed such magnitude of risk on both human health and the health of the environment.

A variety of documents (including transcripts of scientific conferences, statements by government agencies, newspaper reports, journal articles, and books by historians of science) collectively chronicle the bioengineering venture. Together, they amply illumine its underside, revealing how the integrity of science and the integrity of government have both been routinely sacrificed so the enterprise could advance. I have drawn deeply from these resources, often crystallizing key facts that were not widely known. Additionally, because I was engaged in the campaign to properly regulate GE foods for many years on several continents (meeting a broad range of government officials, interacting with scientists and journalists, and participating in conferences and debates), I have repeatedly witnessed the corrosive processes firsthand; and the narrative has been enhanced by a number of these experiences.

Further, many striking accounts of the corrosion were imparted by scientists who have striven to stop it. One of the foremost is the eminent biologist Philip Regal, who for twenty years spear-headed the endeavor to get the genetic engineering enterprise aligned with solid science and tempered by responsible regulation. His story, which forms part of several subsequent chapters, illustrates the diverse and often shocking ways in which the scientific establishment and the government consistently frustrated this endeavor – to the extent he became convinced that when dealing with GE foods, the US executive branch would not honor science and the law unless compelled by a court, and so decided to become a plaintiff in the lawsuit I organized. By sharing his insights and experiences with me over the course of many personal meetings, phone conversations, and emails, and by giving me the extensive set of recollections he had recorded, he has enabled me to expose the infirmities and delinquencies of the bioengineering venture in a much richer way than would otherwise have been possible.

Like Dr. Regal, a growing number of experts have recognized that this enormous venture rests on shaky assumptions and relies on questionable claims – and that increased creativity is required to chart the best way forward. Among them is Evelyn Fox Keller, a distinguished professor of the history and philosophy of science at the Massachusetts Institute of Technology. In her book, *The Century of the Gene*, she notes that the apparent efficacy of genetic engineering provides no assurance that it's free from unintended harmful effects.[2] She further points out that with the rise of this technology, an "unprecedented" bond has grown between science and commerce – and that as this bond has tightened, scientists have become increasingly invested in the rhetorical power of a persuasive mode of "gene talk" that imputes a precision and predictability to bioengineering that it does not possess.[3] Keller emphasizes that the "shortcomings" of such gene talk necessitate its transformation.[4] Her book concludes with the hope ". . . that new concepts can open innovative ground where scientists and lay persons can think and act together to develop policy that is both politically and scientifically realistic."[5]

The following chapters aim to help clear the way to such innovative ground by revealing that the most scientifically realistic policy can easily coincide with the most politically realistic one – and that it's only because the politics of genetic engineering became detached from the scientific realities that the current problems we face were allowed to arise. It's my hope that the information they contain and the insights they convey will

end the confusion that has caused the split and speed the implementation of needed reforms, the reinstatement of scientific standards, and the growth of an agricultural system that yields abundant wholesome food in a safe and sustainable manner.

Ways to Enhance Your Enjoyment of this Book: Utilizing the Executive Summary and Easily Accessing the Endnotes

I've endeavored to make this book a good story and have employed a narrative style as much as feasible. But because the story is about science – and the corruption of science by many of its practitioners – it was necessary to explain many technical facts and examine some rather complex scientific issues. And because I've aimed to produce a book that's not only accessible and enjoyable for the general reader but also serves as a reliable and comprehensive resource for experts, some chapters discuss a substantial amount of information. Many readers will find these discussions stimulating and will appreciate their depth; but others may, at some stage in one of the longer chapters, develop a desire to simply get the gist of the remainder and move on to the next chapter.

In the event such a feeling arises, you can skip to the Executive Summary and read that chapter's main points. (It can be downloaded at: http://alteredgenestwistedtruth.com/executive-summary/) You can also look at a chapter's summary after you've completed it in order to crystallize the basic facts. And even if you read the entire book without glancing at the summary, you may then wish to read it to gain a holistic overview and solidify your understanding.

Of course, some individuals with limited time may prefer to read the Executive Summary first and later read the entire book (or selected chapters) to gain more detailed knowledge.

However, I don't encourage this, because if you read it first, it might spoil the experience that can be gained by allowing the story to unfold chapter by chapter. Several of those who reviewed the book have remarked that it's engaging and often imbued with drama, and some have described it as a "page-turner." But the drama could be dampened by reading a summary of each chapter ahead of time.

So, if you intend to read the entire book, I advise that you initially ignore the Executive Summary. Further, if you want to examine the issues even *more* thoroughly than is done in the main text, you will find that many significant points are discussed in greater depth in the appendices and the endnotes – which leads to an important note about these notes.

For those of you reading the e-book version, hopping to an endnote and returning to the text is simple. But if you're reading the printed book, it would ordinarily be a lot more complicated and time consuming. So to make the endnotes more readily accessible in this situation, they're located not only at the end of the physical book but also online at http://alteredgenestwistedtruth.com/endnotes/. That way, you can download the endnote section and either print it or store it on your computer, tablet, or e-reader. Then, as you read a chapter, you can have a copy of its endnotes nearby and easily transition between the two.

Further, so you won't need to travel back and forth between the notes and a bibliography that contains the full references for the sources that are cited, when a source is cited in a chapter's note section for the first time, it will be fully referenced (even if it's already been fully referenced in the notes for an earlier chapter). Then, subsequent citations of that source will indicate at what preceding note within that section the full reference can be found.

A Note Regarding Terminology

The term "biotechnology" is sometimes broadly employed to refer to all techniques that utilize (or modify) biological processes, including ancient practices that rely on fermentation such as making wine, brewing beer, and leavening bread. But the term can also be used in a narrower sense, to refer exclusively to modern techniques, such as genetic engineering, that depend on highly artificial interventions and that have no established history of safe use. In this book, I employ the terms "biotechnology" and "biotech" in their restricted sense to denote only this latter group of techniques that have not stood the test of time.

Further, because instances of "misrepresentation," "misstatement," "misinformation," "inaccuracy," and "falsehood" can occur through ignorance of the truth, and none of the terms necessarily denotes an intent to deceive, I do not use them to imply that one existed – even though it may have. Instead, I reserve the words "fraud," "lie," "deception," and "disinformation" to denote deceit. Moreover, when I refer to a fraud, deception, or disinformation campaign that was propagated by many individuals, I do not imply that every person who in some way abetted it has been guilty of deception – merely that some have. Furthermore, due to the difficulty of discerning who spoke from ignorance and who did not, unless I specifically assign guilt, it should not be assumed that anyone in particular has been accused.