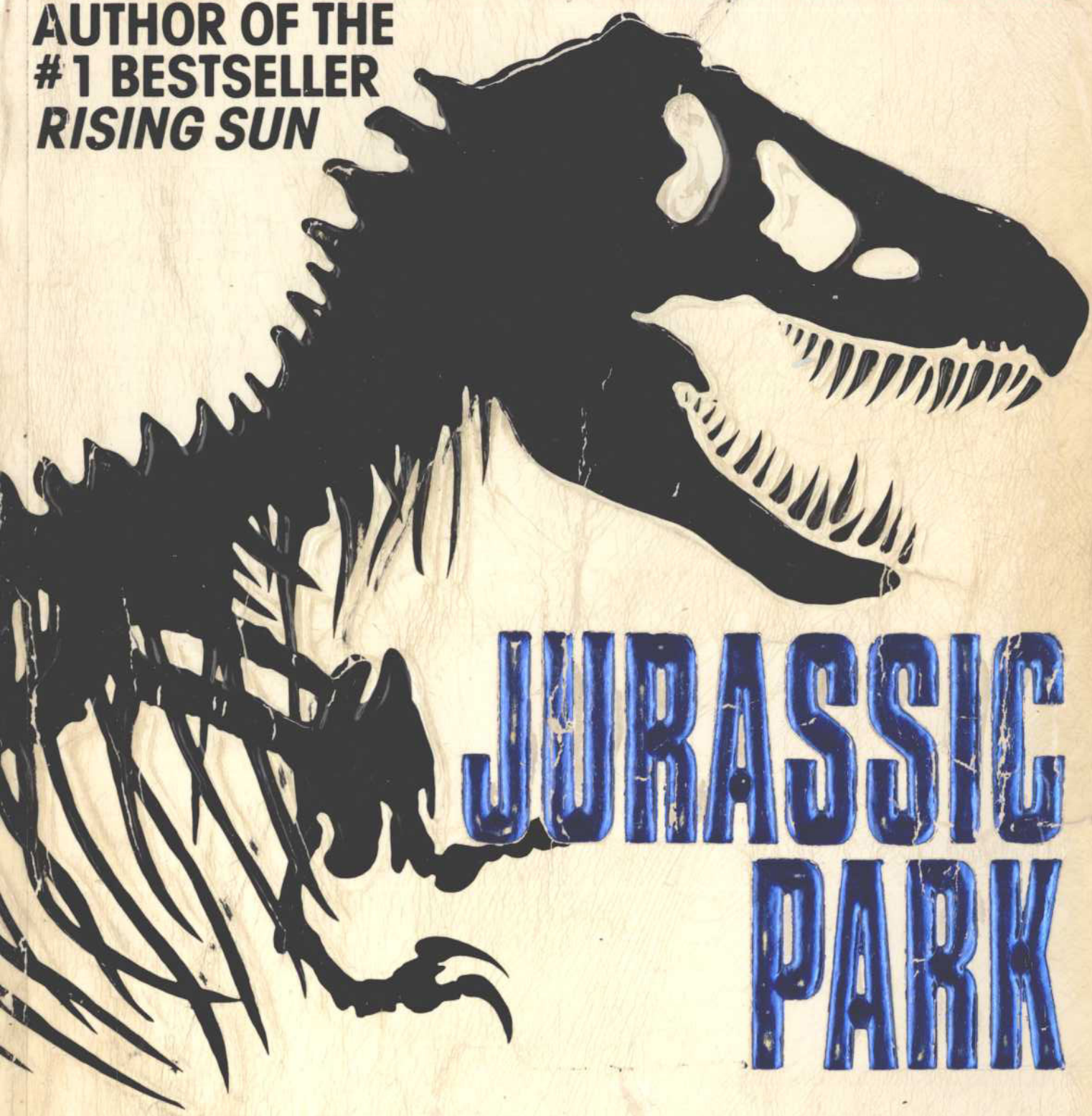


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**AUTHOR OF THE
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JURASSIC PARK

Michael Crichton

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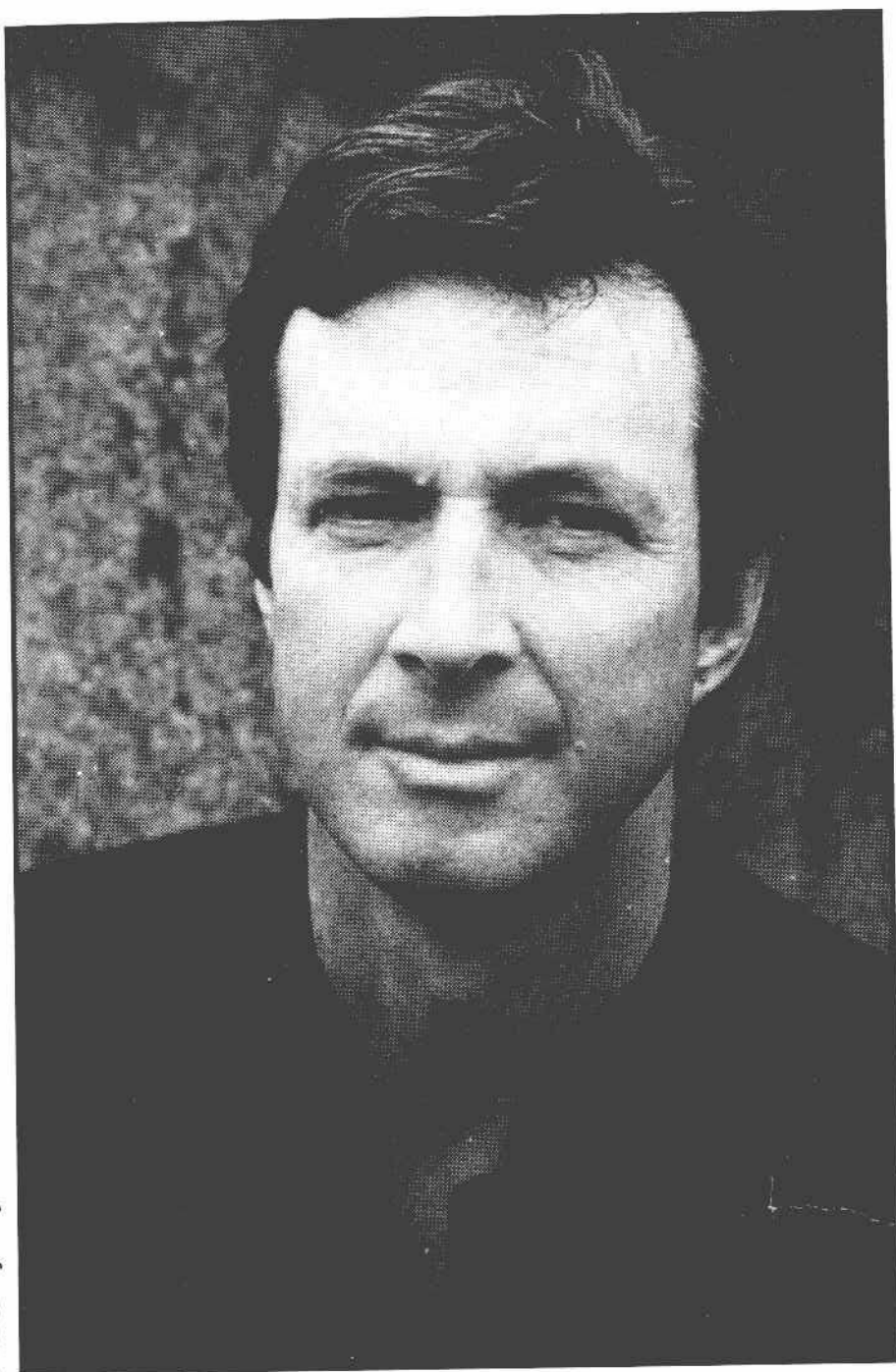
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MICHAEL CRICHTON was born in Chicago, in 1942. He was educated at Harvard College and the Harvard Medical School, and in 1969 was a postdoctoral fellow at the Salk Institute in La Jolla, California. His novels include *The Andromeda Strain*, *The Terminal Man*, *The Great Train Robbery*, *Eaters of the Dead*, *Congo*, and *Sphere*. He is the author of four works of nonfiction: *Five Patients*, *Jasper Johns*, *Electronic Life*, and *Travels*. Among the films he has directed are *Westworld*, *Coma*, and the movie version of his own *The Great Train Robbery*. In 1988 he was Visiting Writer at the Massachusetts Institute of Technology.

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**For A-M
and
T**

“Reptiles are abhorrent because of their cold body, pale color, cartilaginous skeleton, filthy skin, fierce aspect, calculating eye, offensive smell, harsh voice, squalid habitation, and terrible venom; wherefore their Creator has not exerted his powers to make many of them.”

LINNAEUS, 1797

“You cannot recall a new form of life.”

ERWIN CHARGAFF, 1972

INTRODUCTION

“The InGen Incident”

The late twentieth century has witnessed a scientific gold rush of astonishing proportions: the headlong and furious haste to commercialize genetic engineering. This enterprise has proceeded so rapidly—with so little outside commentary—that its dimensions and implications are hardly understood at all.

Biotechnology promises the greatest revolution in human history. By the end of this decade, it will have outdistanced atomic power and computers in its effect on our everyday lives. In the words of one observer, “Biotechnology is going to transform every aspect of human life: our medical care, our food, our health, our entertainment, our very bodies. Nothing will ever be the same again. It’s literally going to change the face of the planet.”

But the biotechnology revolution differs in three important respects from past scientific transformations.

First, it is broad-based. America entered the atomic age through the work of a single research institution, at Los Alamos. It entered the computer age through the efforts of about a dozen companies. But biotechnology research is now carried out in more than two thousand laboratories in America alone. Five hundred corporations spend five billion dollars a year on this technology.

Second, much of the research is thoughtless or frivolous. Efforts to engineer paler trout for better visibility in the stream, square trees for easier lumbering, and injectable scent cells so you’ll always smell of your favorite perfume may seem like a joke, but they are not. Indeed, the fact that biotechnology can be applied to the industries traditionally subject to the vagaries of fashion, such as cosmetics and leisure activities, heightens concern about the whimsical use of this powerful new technology.

Third, the work is uncontrolled. No one supervises it. No federal laws regulate it. There is no coherent government policy, in America or anywhere else in the world. And because the products of biotechnology range from drugs to farm crops to artificial snow, an intelligent policy is difficult.

But most disturbing is the fact that no watchdogs are found among scientists themselves. It is remarkable that nearly every scientist in genetics research is also engaged in the commerce of biotechnology. There are no detached observers. Everybody has a stake.

The commercialization of molecular biology is the most stunning ethical event in the history of science, and it has happened with astonishing speed. For four hundred years since Galileo, science has always proceeded as a free and open inquiry into the workings of nature. Scientists have always ignored national boundaries, holding themselves above the transitory concerns of politics and even wars. Scientists have always rebelled against secrecy in research, and have even frowned on the idea of patenting their discoveries, seeing themselves as working to the benefit of all mankind. And for many generations, the discoveries of scientists did indeed have a peculiarly selfless quality.

When, in 1953, two young researchers in England, James Watson and Francis Crick, deciphered the structure of DNA, their work was hailed as a triumph of the human spirit, of the centuries-old quest to understand the universe in a scientific way. It was confidently expected that their discovery would be selflessly extended to the greater benefit of mankind.

Yet that did not happen. Thirty years later, nearly all of Watson and Crick's scientific colleagues were engaged in another sort of enterprise entirely. Research in molecular genetics had become a vast, multibillion-dollar commercial undertaking, and its origins can be traced not to 1953 but to April 1976.

That was the date of a now famous meeting, in which Robert Swanson, a venture capitalist, approached Herbert Boyer, a biochemist at the University of California. The two men agreed to found a commercial company to exploit Boyer's gene-splicing techniques. Their new company, Genentech, quickly became the largest and most successful of the genetic engineering start-ups.

Suddenly it seemed as if everyone wanted to become rich. New

companies were announced almost weekly, and scientists flocked to exploit genetic research. By 1986, at least 362 scientists, including 64 in the National Academy, sat on the advisory boards of biotech firms. The number of those who held equity positions or consultancies was several times greater.

It is necessary to emphasize how significant this shift in attitude actually was. In the past, pure scientists took a snobbish view of business. They saw the pursuit of money as intellectually uninteresting, suited only to shopkeepers. And to do research for industry, even at the prestigious Bell or IBM labs, was only for those who couldn't get a university appointment. Thus the attitude of pure scientists was fundamentally critical toward the work of applied scientists, and to industry in general. Their long-standing antagonism kept university scientists free of contaminating industry ties, and whenever debate arose about technological matters, disinterested scientists were available to discuss the issues at the highest levels.

But that is no longer true. There are very few molecular biologists and very few research institutions without commercial affiliations. The old days are gone. Genetic research continues, at a more furious pace than ever. But it is done in secret, and in haste, and for profit.

In this commercial climate, it is probably inevitable that a company as ambitious as International Genetic Technologies, Inc., of Palo Alto, would arise. It is equally unsurprising that the genetic crisis it created should go unreported. After all, InGen's research was conducted in secret; the actual incident occurred in the most remote region of Central America; and fewer than twenty people were there to witness it. Of those, only a handful survived.

Even at the end, when International Genetic Technologies filed for Chapter 11 protection in San Francisco Superior Court on October 5, 1989, the proceedings drew little press attention. It appeared so ordinary: InGen was the third small American bioengineering company to fail that year, and the seventh since 1986. Few court documents were made public, since the creditors were Japanese investment consortia, such as Hamaguri and Densaka, companies which traditionally shun publicity. To avoid unnecessary disclosure, Daniel Ross, of Cowan, Swain and Ross, counsel for InGen, also represented the Japanese investors. And the rather unusual petition of the vice consul of Costa Rica was heard behind closed doors.

Thus it is not surprising that, within a month, the problems of InGen were quietly and amicably settled.

Parties to that settlement, including the distinguished scientific board of advisers, signed a nondisclosure agreement, and none will speak about what happened; but many of the principal figures in the "InGen incident" are not signatories, and were willing to discuss the remarkable events leading up to those final two days in August 1989 on a remote island off the west coast of Costa Rica.

PROLOGUE: THE BITE OF THE RAPTOR

The tropical rain fell in drenching sheets, hammering the corrugated roof of the clinic building, roaring down the metal gutters, splashing on the ground in a torrent. Roberta Carter sighed, and stared out the window. From the clinic, she could hardly see the beach or the ocean beyond, cloaked in low fog. This wasn't what she had expected when she had come to the fishing village of Bahía Anasco, on the west coast of Costa Rica, to spend two months as a visiting physician. Bobbie Carter had expected sun and relaxation, after two grueling years of residency in emergency medicine at Michael Reese in Chicago.

She had been in Bahía Anasco now for three weeks. And it had rained every day.

Everything else was fine. She liked the isolation of Bahía Anasco, and the friendliness of its people. Costa Rica had one of the twenty best medical systems in the world, and even in this remote coastal village, the clinic was well maintained, amply supplied. Her paramedic, Manuel Aragón, was intelligent and well trained. Bobbie was able to practice a level of medicine equal to what she had practiced in Chicago.

But the rain! The constant, unending rain!

Across the examining room, Manuel cocked his head. "Listen," he said.

"Believe me, I hear it," Bobbie said.

"No. *Listen.*"

And then she caught it, another sound blended with the rain, a deeper rumble that built and emerged until it was clear: the rhythmic thumping of a helicopter. She thought, *They can't be flying in weather like this.*

But the sound built steadily, and then the helicopter burst low

through the ocean fog and roared overhead, circled, and came back. She saw the helicopter swing back over the water, near the fishing boats, then ease sideways to the rickety wooden dock, and back toward the beach.

It was looking for a place to land.

It was a big-bellied Sikorsky with a blue stripe on the side, with the words "InGen Construction." That was the name of the construction company building a new resort on one of the offshore islands. The resort was said to be spectacular, and very complicated; many of the local people were employed in the construction, which had been going on for more than two years. Bobbie could imagine it—one of those huge American resorts with swimming pools and tennis courts, where guests could play and drink their daiquiris, without having any contact with the real life of the country.

Bobbie wondered what was so urgent on that island that the helicopter would fly in this weather. Through the windshield she saw the pilot exhale in relief as the helicopter settled onto the wet sand of the beach. Uniformed men jumped out, and flung open the big side door. She heard frantic shouts in Spanish, and Manuel nudged her.

They were calling for a doctor.

Two black crewmen carried a limp body toward her, while a white man barked orders. The white man had a yellow slicker. Red hair appeared around the edges of his Mets baseball cap. "Is there a doctor here?" he called to her, as she ran up.

"I'm Dr. Carter," she said. The rain fell in heavy drops, pounding her head and shoulders. The red-haired man frowned at her. She was wearing cut-off jeans and a tank top. She had a stethoscope over her shoulder, the bell already rusted from the salt air.

"Ed Regis. We've got a very sick man here, doctor."

"Then you better take him to San José," she said. San José was the capital, just twenty minutes away by air.

"We would, but we can't get over the mountains in this weather. You have to treat him here."

Bobbie trotted alongside the injured man as they carried him to the clinic. He was a kid, no older than eighteen. Lifting away the blood-soaked shirt, she saw a big slashing rip along his shoulder, and another on the leg.

"What happened to him?"

“Construction accident,” Ed shouted. “He fell. One of the back-hoes ran over him.”

The kid was pale, shivering, unconscious.

Manuel stood by the bright green door of the clinic, waving his arm. The men brought the body through and set it on the table in the center of the room. Manuel started an intravenous line, and Bobbie swung the light over the kid and bent to examine the wounds. Immediately she could see that it did not look good. The kid would almost certainly die.

A big tearing laceration ran from his shoulder down his torso. At the edge of the wound, the flesh was shredded. At the center, the shoulder was dislocated, pale bones exposed. A second slash cut through the heavy muscles of the thigh, deep enough to reveal the pulse of the femoral artery below. Her first impression was that his leg had been ripped open.

“Tell me again about this injury,” she said.

“I didn’t see it,” Ed said. “They say the backhoe dragged him.”

“Because it almost looks as if he was mauled,” Bobbie Carter said, probing the wound. Like most emergency room physicians, she could remember in detail patients she had seen even years before. She had seen two maulings. One was a two-year-old child who had been attacked by a rottweiler dog. The other was a drunken circus attendant who had had an encounter with a Bengal tiger. Both injuries were similar. There was a characteristic look to an animal attack.

“Mauled?” Ed said. “No, no. It was a backhoe, believe me.” Ed licked his lips as he spoke. He was edgy, acting as if he had done something wrong. Bobbie wondered why. If they were using inexperienced local workmen on the resort construction, they must have accidents all the time.

Manuel said, “Do you want lavage?”

“Yes,” she said. “After you block him.”

She bent lower, probed the wound with her fingertips. If an earth mover had rolled over him, dirt would be forced deep into the wound. But there wasn’t any dirt, just a slippery, slimy foam. And the wound had a strange odor, a kind of rotten stench, a smell of death and decay. She had never smelled anything like it before.

“How long ago did this happen?”

“An hour.”

Again she noticed how tense Ed Regis was. He was one of those