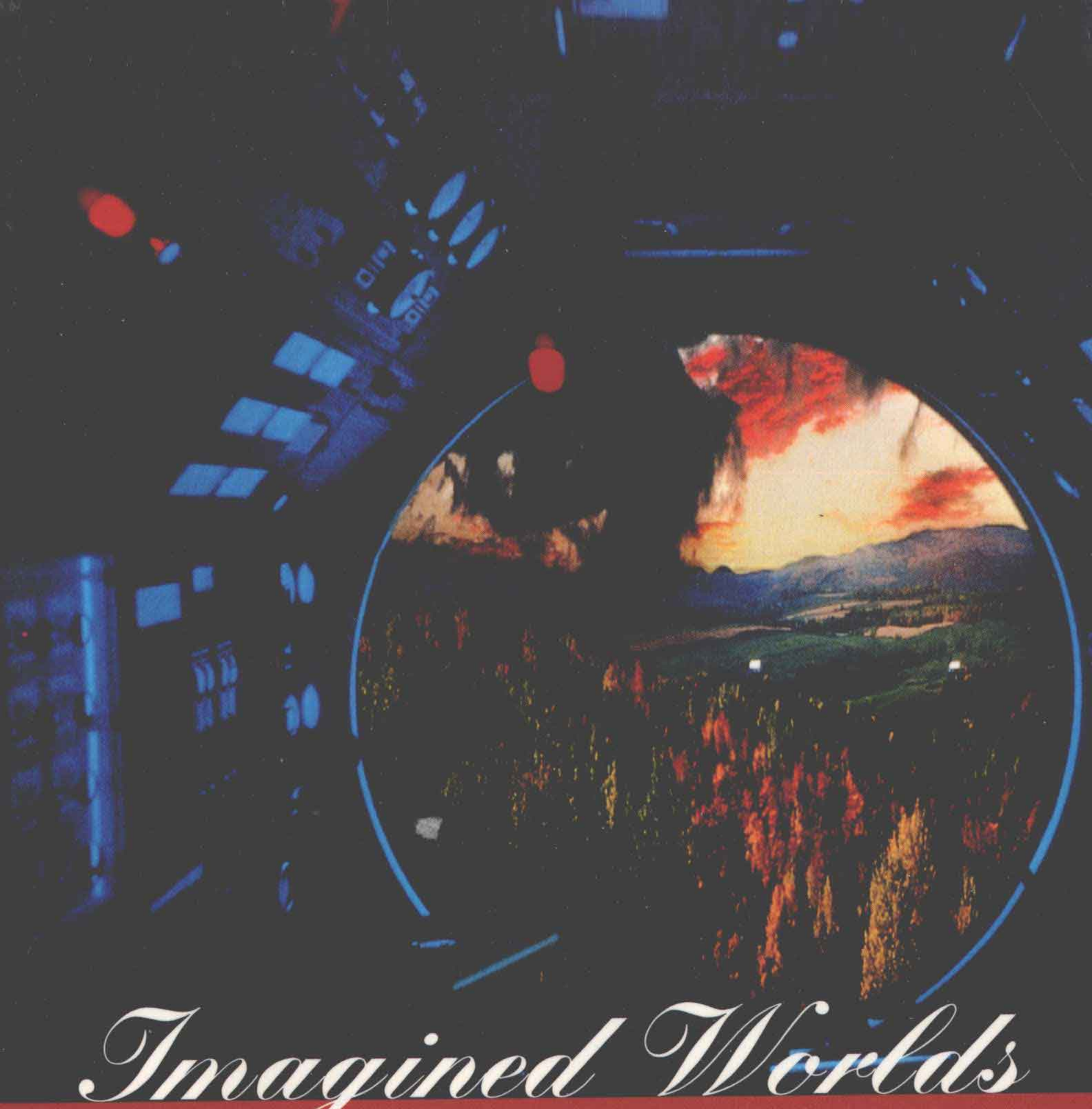

Imagined Worlds

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IMAGINED WORLDS

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Fifteen years ago my friend June Goodfield published *An Imagined World*, a true story of a remarkable woman who combined the vocations of medical research and poetry. June Goodfield's book and mine have nothing in common except the titles. Our titles fit our themes, since her theme is singular while mine is plural.

October 1996

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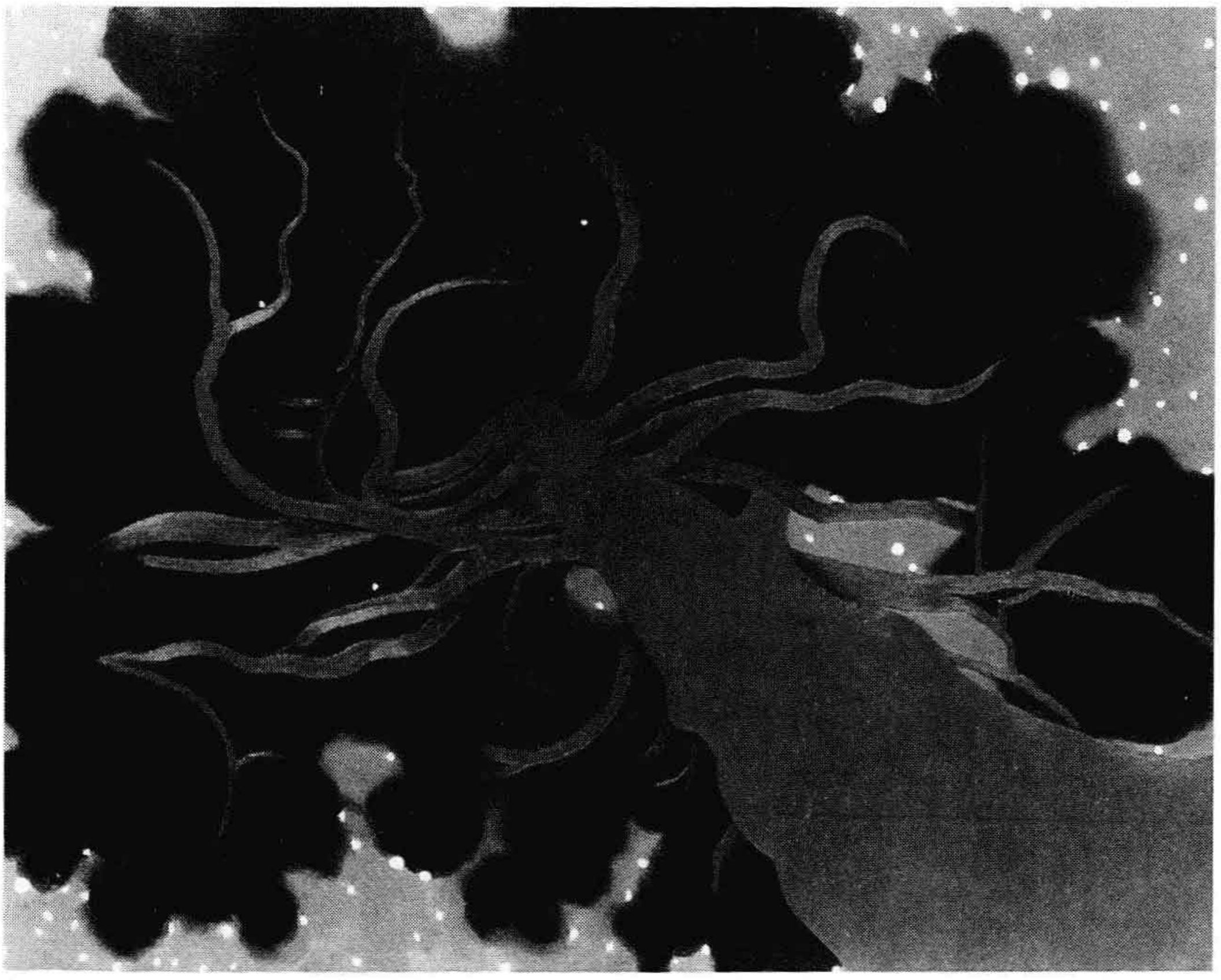
INTRODUCTION



THE LAWRENCE TREE

By Georgia O'Keeffe, 1929. Reproduced by permission of Wadsworth Atheneum, Hartford. The Ella Gallup Sumner and Mary Catlin Sumner Collection Fund. Also by permission of the Artists Rights Society (ARS) New York.

ONKEL BRUNO WAS MY WIFE'S UNCLE, a country doctor who lived in a big house in a village in Germany. He inherited the house, along with the medical practice, from his father, and he stayed in it all his life. During that time, Germany was ruled by potentates of many stripes, imperial, Republican, National Socialist, and communist. Like the vicar of Bray, Onkel Bruno made his peace with whichever party was in power and carried on with his profession. I visited him at his home toward the end of his life, when he was a citizen of the German Democratic Republic. He expressed no enthusiasm for the communist society in

which he lived but was grateful to the communists for leaving him in peace.

His magnificent house and garden were the pride and joy of his declining years. When I admired the large oak tree that stood in front of the house, Onkel Bruno said in a matter-of-fact tone, "That tree will have to come down; it has passed its prime." So far as I could see, the tree was in good health and showed no signs of imminent collapse. I asked him how he could dare to chop it down. He replied, "For the sake of the grandchildren. That tree would last my time, but it would not last theirs. I will plant a tree that they will enjoy when they are as old as I am now." He expected his grandchildren to inherit his practice and live their lives in his home. That is the way it was in the world that he knew. Governments come and go but the family endures. You live for your children and for your grandchildren. Horizons are long, and it is normal and natural to look ahead a hundred years, the time an oak tree takes to grow.

When I was a student in Cambridge, England, my college made a similar decision. The driveway to Trinity on the river side came through a magnificent avenue of elms planted in the eighteenth century. The elms were still beautiful but past their prime. The college decided, like Onkel Bruno, to sacrifice the present for

the sake of the future. The avenue was chopped down and replaced by two rows of scrawny saplings. Now, fifty years later, the saplings are growing toward maturity. The avenue is again beautiful, and it will grow to full height as the twenty-first century goes by. Trinity College has been a great center of learning since it was founded in the sixteenth century, and it intends to remain a great center of learning in the twenty-first.

In October 1995 I attended a meeting in Slovenia, the East–West High-Tech Forum organized by my daughter. The purpose of the meeting was to allow leaders of the computer and software industries from East and West to meet and exchange ideas. Many people came from Russia and Eastern Europe, an equal number from America and Western Europe. All of them were doing well and expecting to do better. They were driving in the fast lane. The Easterners represented the new wave of business executives rising from the ashes of the old communist societies; the Westerners represented forward-looking businesses moving into the newly opened Eastern markets. The two sides shared certain basic assumptions: they believed that they were riding the wave of history; they believed that the triumph of free-market economics was inevitable and that they were helping to bring it about; and their horizons were short.

In the information world to which they belong, five years is a long time; fortunes are won and lost in a year or two. It makes no sense to make plans beyond five years, because the growth of information technology is unpredictable, and the workings of the free market are even more unpredictable. These new young capitalists grew up in a world of long-range socialist plans that failed, and they see no virtue in long-range plans of any kind. In all the discussions that I heard, the twenty-first century was hardly mentioned.

It seems that the modern world has grown increasingly short-sighted in recent years, as if the collapse of socialist economies and the victories of the free market have made all long-range visions of the future illusory. The voices of Onkel Bruno and Trinity College, striving to preserve small islands of natural beauty for our grandchildren, seem to be voices from the past, hardly audible amidst the intensifying winds of change. The public dialogue of our era is mainly a debate between free-market economists and conservationists, conservationists trying to preserve the past, free-market economists devaluing the future at a discount rate of seven percent per year. Neither side of the debate speaks for the future.

Who in the modern age still has dreams that extend beyond the lifetimes of our grandchildren? Two voices

speak for the future, the voice of science and the voice of religion. Science and religion are two great human enterprises that endure through the centuries and link us with our descendants. I am a scientist, and as I attempt to look into the future in this book, I speak with the voice of science. I describe the past and the future from the scientific viewpoint that is familiar to me. But I do not claim that the voice of science speaks with unique authority. Religion has at least an equal claim to authority in defining human destiny. Religion lies closer to the heart of human nature and has a wider currency than science. Like the human nature that it reflects, religion is often cruel and perverted. When science achieved power to equal the power of religion, science often became cruel and perverted, too.

The poet W. H. Auden, who was a Christian, wrote of the importance of Christianity to the birth of modern literature in late antiquity: "One may like or dislike Christianity, but no one can deny that it was Christianity and the Bible which raised Western literature from the dead. A faith which held that the Son of God was born in a manger, associated himself with persons of humble station in an unimportant province, and died a slave's death, yet did this to redeem all men, rich and poor, freemen and slaves, citizens and barbarians, required a completely new way of looking at human

beings; if all are children of God and equally capable of salvation, then all, irrespective of status or talent, vice or virtue, merit the serious attention of the poet, the novelist and the historian."

Auden made a strong claim for the impact of religion on our image of ourselves. In another place he made an equally strong claim for the importance of science: "As biological organisms made of matter, we are subject to the laws of physics and biology: as conscious persons who create our own history we are free to decide what that history shall be. Without science, we should have no notion of equality; without art, no notion of liberty."

In cultures outside Europe, religions other than Christianity have been important to the growth of civilization. Everywhere, religion and ethics are strongly coupled. The coupling between ethics and science is a major theme of this book. We may hope that groups of citizens united by ethical concerns may gain sufficient strength to shape history in the future, as they have done in the past. But ethical considerations can prevail over short-sighted self-interest only if the voice of religion is added to the voice of science. Both must be heard, if our ethical choices are to be at the same time rational and humane.

Science is a friendly international club to which I am privileged to belong. Scientists all over the world are

united in a culture that gives hope of a better future for all of us. But a scientist looking out to the horizon must also try to identify the cloud no bigger than a man's hand that may grow into a deluge. The voices of both religion and science warn us that we must be vigilant. Knowledge is dangerous, as Adam and Eve learned when they tasted the forbidden fruit of the Tree of Knowledge of Good and Evil. The more we know, the greater the power we shall give to our children for good or evil, and the more responsibility we have to give them early warning of disasters.

Science is my territory, but science fiction is the landscape of my dreams. The year 1995 was the hundredth anniversary of the publication of H. G. Wells's *The Time Machine,* perhaps the darkest view of the human future ever imagined. Wells used a dramatic story to give his contemporaries a glimpse of a possible future. His purpose was not to predict but to warn. He was angry with the human species for its failures and follies. He was especially angry with the English class system under which he had personally suffered, a system that divided people into idle rich and exploited poor, the rich enjoying the refinements of art and beauty while the poor were condemned to lives of ignorance and ugliness. Wells was warning his readers, and his English upper-class readers in particular, that

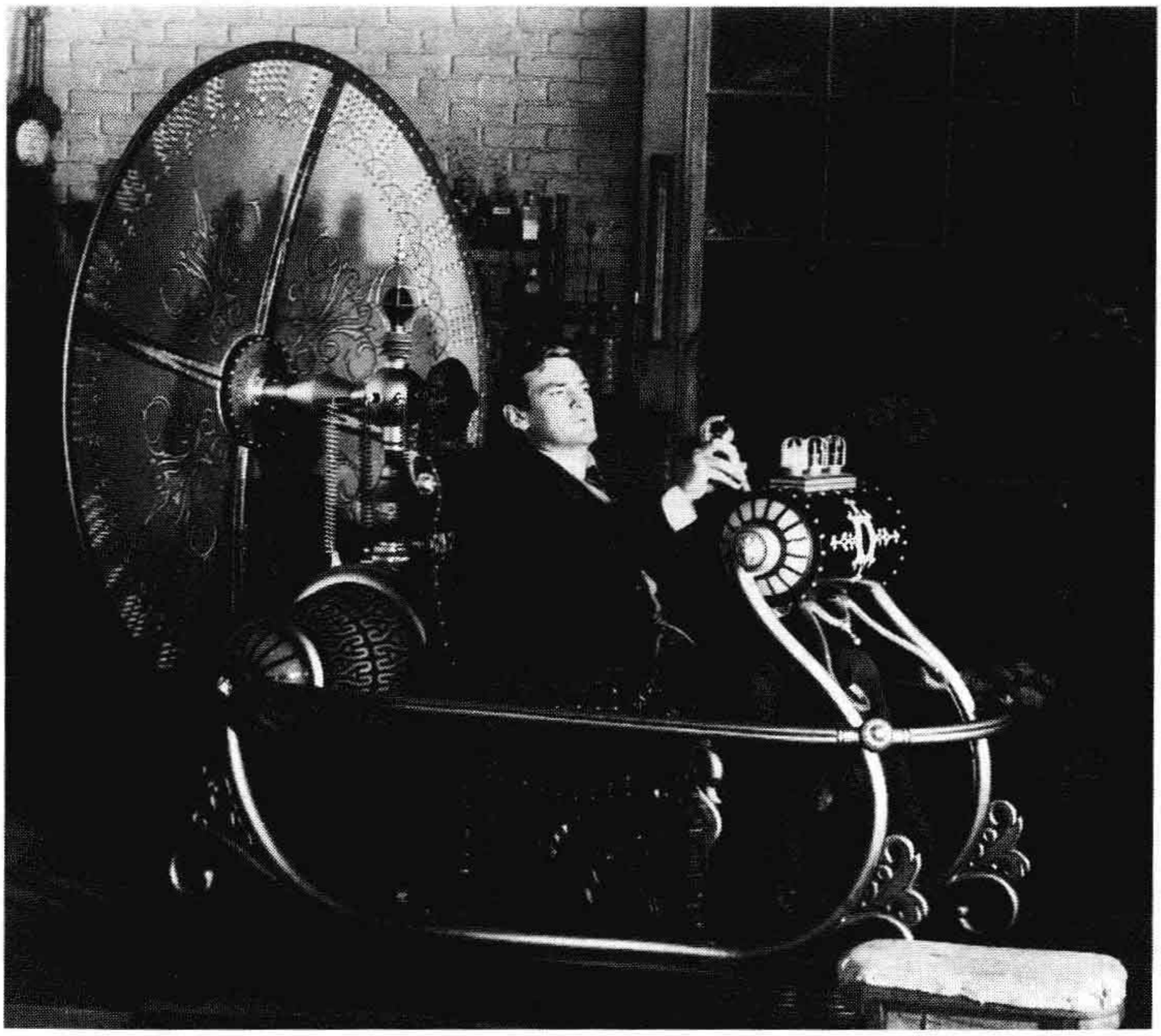
the gross inequality and injustice of their society was leading them to disaster. If you continue along the way you are going, his story told them, here is the way you will end, with humanity split into two species, prey and predators: the Eloi singing and dancing in the sunshine and the Morlocks keeping the machines running underground; the Eloi having lost through indolence their practical and intellectual skills, the Morlocks tending their erstwhile cousins like cattle as a convenient source of meat.

It is impossible to measure how much direct influence Wells's writings had on the social history of England. When I worked as a scientist giving technical advice to the Royal Air Force in the second world war, my chief, Reuben Smeed, formulated a rule to guide our efforts. Smeed's Rule says that you can either get something done or get the credit for it, but not both. To be effective in influencing policy or in changing society, you must make sure that people in positions of power adopt your ideas as their own. You can never know whether your personal influence was or was not decisive. In the case of Wells, we know that *The Time Machine* became an immediate best-seller, and that Wells was for many years the most widely read writer in Britain on social themes. Wells and his friends in the Fabian Society were tirelessly preaching the cause of

social justice. We know that during the fifty years of Wells's working life—from the publication of *The Time Machine* in 1895 until his death in 1946—the social injustices and inequalities of English society were gradually ameliorated, as the British ruling class developed a social conscience. And we know that in the fifty years since he died, England has gradually reverted to a class system with inequalities almost as sharp as those that he fought against as a young man and lampooned in his novels. Based on the evidence, I think we may, in spite of Smeed's Rule, give Wells some credit for the improvements that occurred in English society during his lifetime.

Into *The Time Machine* Wells poured his personal anguish and his scientific detachment, his sympathetic understanding of the individual human soul and his unsympathetic understanding of the human species. He was the first novelist to place his characters, with their individual passions and personalities, within the larger framework of biological evolution. He saw the human species as a deeply flawed biological experiment, likely to fail because of internal weaknesses even if it did not succumb to external calamities. The tragic history of the twentieth century has not made Wells's vision less plausible.

The novel ends on a note of philosophical melan-



ROD TAYLOR, IN *THE TIME MACHINE*

MGM, 1960. Reproduced by permission of the Kobal Collection.

choly. After the Time Traveler's tale of horror and degeneration has been told, and he has vanished from our sight with his machine, the narrator of the story reflects upon the meaning of his voyage. "To me the future is still black and blank—is a vast ignorance, lit at a few casual places by the memory of his story. And I have by me, for my comfort, two strange white flowers—shrivelled now, and brown and flat and brittle—to