#1
BEST SELLER

# James A. Michener

A Novel

# SPACE

39 WEEKS ON THE NEW YORK TIMES BESTSELLER LIST

# SPACE

## James A. Michener

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# ACKNOWLEDGMENTS

ON 4 JULY 1976 I WAS INVITED BY DR. DONALD P. HEARTH of the National Aeronautics and Space Administration to participate in a round-table discussion of the meaning of America's Viking landing on Mars, and with that heady introduction to the greatest minds of the space age I began my serious study.

In the spring of 1979 I was appointed to the NASA Advisory Council, which advises NASA, and there I met repeatedly with men who conducted our space effort, and visited several times the great NASA bases at which the work was done. I was allowed to participate in the full life of the agency. I did this uninterruptedly for four years.

Lacking specialized training in science, I was disadvantaged, but my long experience with mathematics and astronomy repaired some of the deficiency, and my work with various aspects of our program repaired other gaps. Most of all, I talked incessantly with experts, visited laboratories, and studied procedures.

My acquaintance with NASA engineers and scientists was extensive, and to them I owe a great debt, especially those at Langley, Wallops, Ames, Houston, Huntsville, Goddard and the Jet Propulsion Laboratory.

My acquaintance with astronauts was more spotty, for I

met only those who bumped into me as I went about my other duties. Deke Slayton was most helpful. John Young was an inspiration. Donn Eisele, a neighbor, gave me many insights. Because the Shuttle dominated the horizon in the years of my incumbency, I knew its pilots: Robert Crippen, Joe Engle, Dick Truly. Ed Gibson was extremely helpful in my study of the Sun, about which he has written brilliantly. Joe Kerwin, a medical astronaut with weeks in orbit, was unusually helpful on four different occasions. I had brief but rewarding interviews with Mike Collins, a graceful writer about space, and the two elegant women astronauts Judith Resnick and Anna Fisher.

At headquarters I was accorded courtesies by Dr. Robert Frosch, the administrator, and by Dr. Alan Lovelace, his assistant. They made available the consultative services of General Harris Hull, Dr. John Naugle, NASA's chief scientist, Nat Cohen, the executive secretary of our council, and Jane Scott, who supervised my movements. Before his untimely death in the Himalayas, Tim Mutch met with me many times to discuss scientific and managerial points.

Certain experts were recommended to me as unusually informed and helpful in their fields, and to these I am indebted:

*Battle of Leyte Gulf:* Admiral Felix Stump, who commanded one of the baby flattop squadrons in that historic naval engagement, and Bill Lederer, his witty assistant.

*Peenemünde:* Dr. Ernst Stuhlinger and Karl Heimburg, both of whom made the hegira from Peenemünde to El Paso to Huntsville.

*Patuxent River:* Marshall Beebe, USN, who explained the area in 1952. Admiral John Wissler, who showed me around in 1981.

*Operation of a Large NASA Base:* The following were especially instructive during my extended stay at the Marshall Space Flight Center in Huntsville: Dr. William Lucas, James E. Kingsbury, Thomas Lee, Robert Lindstrom, John Potate, Harry Watters, Joe Jones.

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Gene Krantz, in charge of present flights, who allowed me to sit in for an entire day to watch how it was done.

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*Lunar-Orbit Rendezvous:* Dr. John C. Houbolt of Langley, who led the fight for this mode.

*Supersonic Flight:* John V. Becker of Langley, who pioneered this field.

*Wind Tunnels:* William P. Henderson of Langley, who twice demonstrated his 16-foot tunnel.

*One-Sixth Gravity:* Donald E. Hewes of Langley, who invented the device for creating an approximation of Moon gravity on Earth.

*Interplanetary Navigation:* Frank Hughes, Richard Parten, Duane Mosel, all of Houston. Frank Jordan of JPL. Dr. Philip Felleman of MIT was especially instructive.

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*Space Telescope:* Dr. C. R. O'Dell, of the University of Chicago and Huntsville.

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*Life on Other Planets:* Dr. Carl Sagan of Cornell, who has written brilliantly on this arcane subject.

I am particularly indebted to the following distinguished scholars and administrators who agreed to read portions of the manuscript to help me weed out error. They gave help

beyond the call of duty or friendship. Such errors as remain are my fault.

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*Wallops Island and Atmospheric Research:* Abe Spinak, long an official on the island and a formidable research man.

*Photo Imaging on the Mars and Saturn Expeditions:* Dr. Bradford A. Smith, University of Arizona, who served as Imaging Team Leader during the Voyager missions to Jupiter and Saturn.

*Solar Flares:* Dr. Jack Eddy, High Altitude Observatory, one of our leading authorities on solar physics.

*Circadian Rhythms:* Dr. Richard J. Wurtman, Massachusetts Institute of Technology.

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*Medical Data Regarding Apollo 18:* Joe Kerwin, astronaut and medical doctor.

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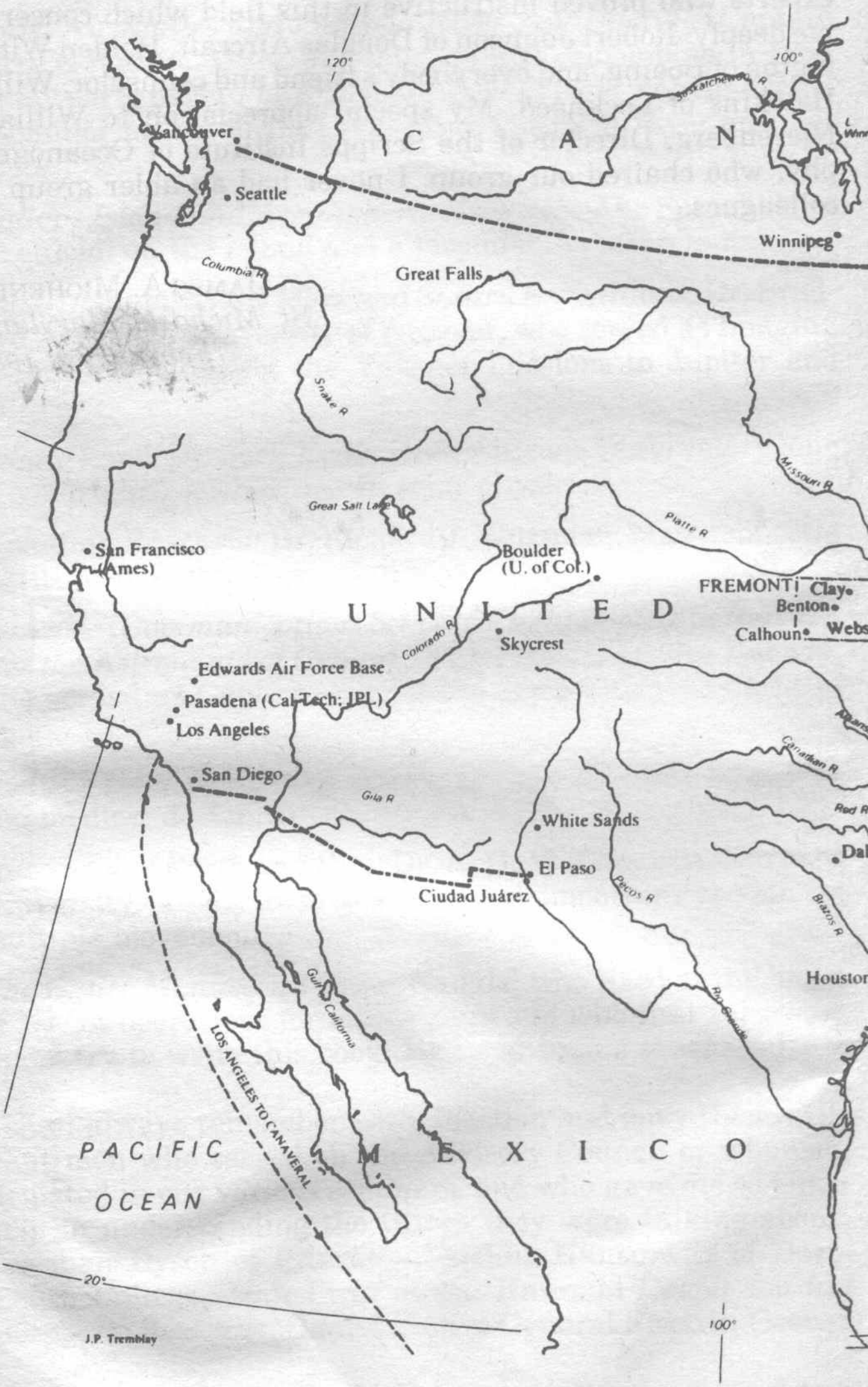
*The Entire Manuscript:* John Naugle, who lived at the heart of NASA operations for many years and who first suggested that I try to write this book. He taught me a great deal.

I shall always remember with affection and envy those brilliant men who served on the Advisory Council or who participated in our various seminars, and who gave me so much help in understanding the things they were talking about: Freeman Dyson of Princeton, Arthur Kantrowitz of Dartmouth College, John Firor of the National Center for Atmospheric Research, Daniel Fink of General Electric, George

Field and A. G. W. Cameron of Harvard, who helped especially in advanced astronomy, and the three aeronautical experts who proved instructive in this field which concerns me deeply: Robert Johnson of Douglas Aircraft, Holden Withington of Boeing, and everybody's friend and counselor, Willis Hawkins of Lockheed. My special appreciation to William Nierenberg, Director of the Scripps Institute of Oceanography, who chaired our group. I never had an abler group of colleagues.

JAMES A. MICHENER
*St. Michaels, Maryland*
*February 2, 1982*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Saskatchewan R.
C A N
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Winnipeg
Columbia R.
Great Falls
Snake R.
Missouri R.
Great Salt Lake
Platte R.
San Francisco
(Ames)
Boulder
(U. of Col.)
FREMONT
Clay
Benton
Calhoun
Webs
U N I T E D
Colorado R.
Skycrest
Edwards Air Force Base
Pasadena (Cal-Tech; JPL)
Los Angeles
San Diego
Gila R.
Canadian R.
Red R.
White Sands
El Paso
Ciudad Juárez
Pecos R.
Brazos R.
Houston
Rio Grande
Gulf of California
LOS ANGELES TO CANAVERAL
PACIFIC
OCEAN
M E X I C O
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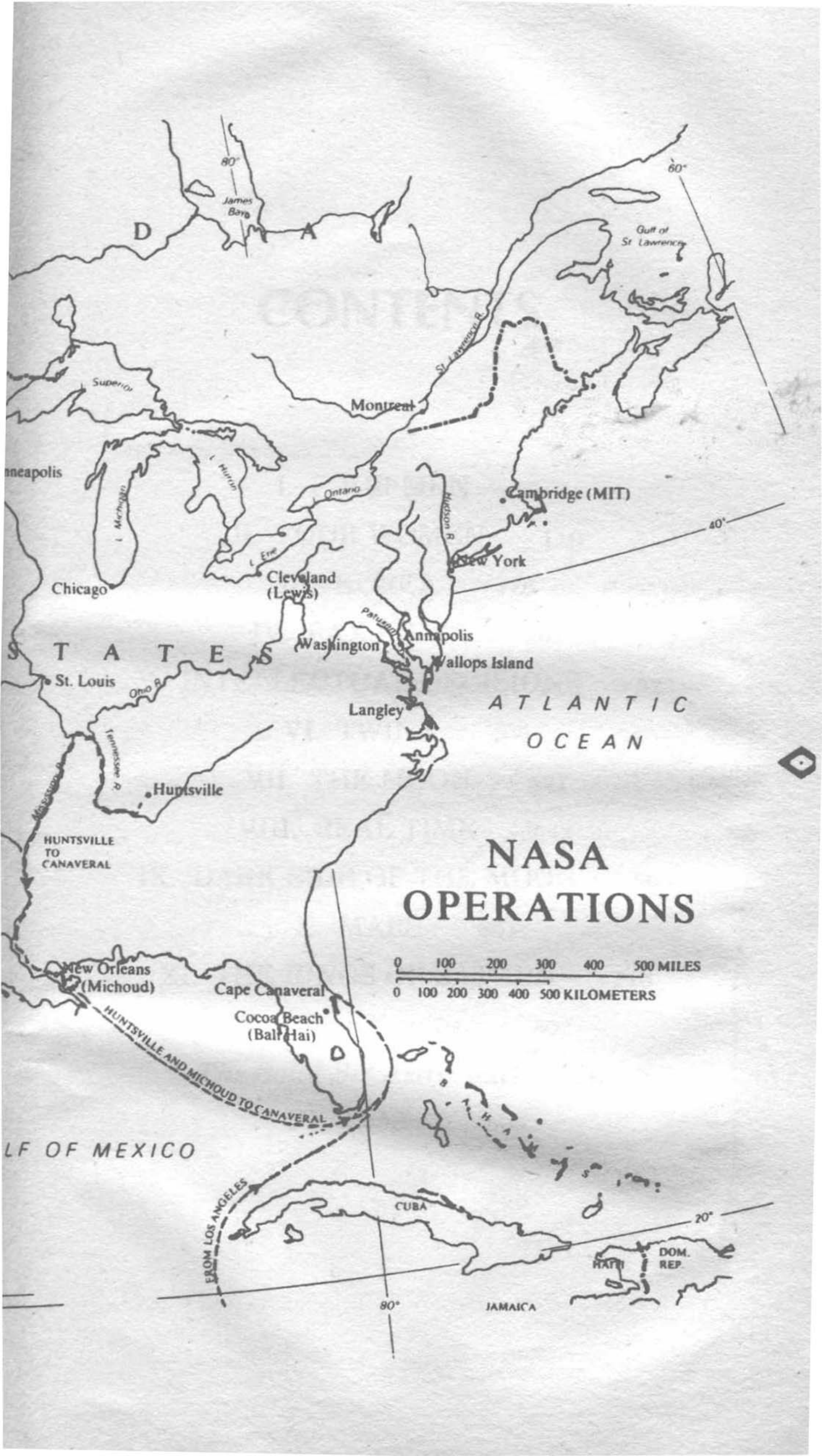
NASA
OPERATIONS
0 100 200 300 400 500 MILES
0 100 200 300 400 500 KILOMETERS
HUNTSVILLE TO CANAVERAL
HUNTSVILLE AND MICHOUD TO CANAVERAL
FROM LOS ANGELES
Montreal
Cambridge (MIT)
New York
Cleveland (Lewis)
Chicago
Washington
Annapolis
Wallops Island
Langley
St. Louis
Huntsville
New Orleans (Michoud)
Cape Canaveral
Cocoa Beach (Bali Hai)
CUBA
HAITI
DOM. REP
JAMAICA
ATLANTIC OCEAN
80°
60°
40°
20°

This is a novel and to construe it as anything else would be a mistake. The Mott, Grant, Pope and Kolff families are imaginary and are based upon no real prototypes. The Solid Six group of astronauts did not exist, nor was there any Gemini 13 or Apollo 18.

However, the great NASA bases, the Patuxent River experience, the battle operations in Korea and the general activities of the astronauts are realistically presented.

Certain historical personages do appear briefly, such as Lyndon B. Johnson, President Eisenhower, Secretary Wilson, the astronauts Deke Slayton and Mike Collins, and the scientists Jack Eddy, John Houbolt and Carl Sagan, but they are not given fictitious roles or inflated speeches.

The Battle of Leyte Gulf and the behavior of the admirals, American and Japanese, are faithfully reported. There was no destroyer escort *Lucas Dean*, but there were warships like it, and its exploits are not exaggerated. The major bombing of Peenemünde occurred as stated in August 1943 and was an exclusive British affair, but there were follow-up bombings the next year and I have expanded one of these. Generals Breutzl and Funkhauser are imaginary, but of course, Wernher Von Braun was real and even more powerful and impressive than I state.

# SPACE

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# 1

# FOUR MEN

ON 24 OCTOBER 1944 PLANET EARTH WAS FOLLOWING ITS orbit about the sun as it has obediently done for nearly five billion years. It moved at the stunning speed of sixty-six thousand miles an hour, and in doing so, created the seasons. In the northern hemisphere it was a burnished autumn; in the southern, a burgeoning spring.

At the same time, the Earth revolved on its axis at a speed of more than a thousand miles an hour at the equator, turning from west to east, and this produced day and night.

As a new day broke over the Philippine Islands, two navy men, one Japanese, one American, were about to perform acts of such valor that they would be remembered whenever the historic battles of the sea were compared and evaluated.

Later, when the ceaseless turning of the Earth brought high noon to the island town of Peenemünde on Germany's Baltic coast, a small, quiet mechanical genius working for Adolf Hitler would find himself in the middle of an ordinary day which would have a most extraordinary conclusion.

A few hours following, when midafternoon reached London, a youthful American engineer, not in uniform, would see for himself the power of Hitler's vengeance weapon, the A-4, and would take steps to destroy it but

not its makers, because even then the American government could foresee that when the war ended, they would need these German scientists.

And toward the close of that long day, when the Earth had revolved the western region of America into the hours of sunset, in a small city in the state of Fremont a boy of seventeen would experience three resplendent moments, and would realize as they were happening that they were special in a way that might never be exceeded.

In the early afternoon of that October Tuesday, Stanley Mott, an American civilian twenty-six years old, displayed a sense of almost frantic urgency as he watched the radar screen at a tracking station thirteen miles south of London.

'It's coming!' an English sergeant cried, trying vainly to keep the excitement out of his voice. And there on the screen, as Mott watched, the sinister signal showed, a supersonic, unmanned monster bomb coming at London from some undetermined spot in Holland.

Even on the radar it displayed its silent speed, more than two thousand miles an hour. It would not be heard at this station until some moments after it had passed. Then sonic booms would thunder through the air, reassuring the listeners that this bomb at least had passed them by. 'If you hear it,' the sergeant explained to Mott, 'it's already gone.'

In the fragile moments of final silence, everyone in the room listened intently for the tremendous sound which would indicate that the rocket bomb had struck, and sensitive devices were pointed toward London. K-k-k-krash! The bomb had fallen. The listeners turned antenna to new directions and soon an ashen-faced young man from Oxford University announced: 'The heart of London. But I do believe east of Trafalgar Square.'

'Hurry!' Mott snapped, and within three minutes he and the Oxford man and a driver were speeding toward London with a set of red cards showing on their windshield, allowing them to pass roadblocks and salute policemen who barred certain thoroughfares. 'Bomb squad,' the Oxford man called as the car sped past. This was not exactly true. He and Mott were not qualified to defuse unexploded bombs, as the real squad did; they collected data on the damage

inflicted by these new and terrible bombs which Hitler was throwing at London in what he boasted was 'our act of final revenge.'

From the manner in which confusion grew as the car approached the area leading to Trafalgar Square, it was apparent that the trackers had been correct; the rocket had landed in the vicinity but well to the east. This was confirmed when wardens shouted, 'It landed in the City.'

Then apprehension doubled, for this meant that the crucial business heart of London, termed the City, was once more in peril. The Bank of England, St. Paul's, the Guildhall, from which Churchill spoke—how Hitler would gloat if his spies wirelessed tonight that one of these enticing targets had been struck, how smug Lord Haw-Haw would sound as he ticked off the losses on the midnight radio.

But when the weaving car entered Cheapside—with the driver crying 'Bomb squad! Bomb squad!'—Mott and the Oxford man saw with relief that the symbolic targets had once more been miraculously spared, but this discovery gave them short comfort, since they must now inspect the hideous consequences of wherever the bomb had fallen.

'Many lives gone this time,' muttered an elderly warden with pale face and drooping mustaches. He led the way through to a gaping hole where a short time before a small news kiosk had served businessmen working in the City. It and the shops near it had been eliminated—erased and fragmented as if made of sticks—with all their clerks and customers dead.

'I don't know which is worse,' Mott said to the Oxford man. 'That ghastly hole in the ground or the splinters of wood and bone.'

'Thank God, that monster in Berlin doesn't have fifty of these to send at us every day,' the English expert muttered.

'How many have hit London?' Mott asked.

'If my count is correct, this is only number seventy-three. Since September, when they started. Something's badly wrong with the German supply system.'

'Our bombing of Peenemünde is what's wrong,' Mott said. 'Your boys have wrecked their hatching ground.'

'Let's be grateful for that,' the Englishman sighed as he poked among the wreckage for any shreds of the bomb.

His team was still not quite certain how the horrible thing operated. 'You know, Mott, before they started to arrive, we calculated Hitler could throw a hundred a day right at the heart of London. One hundred thousand civilians dead each month. We've been lucky. We've been terribly lucky.'

'How many dead here?'

The two experts consulted with wardens and came up with a figure of less than fifty, and when Mott repeated the number, almost with a sense of gratification, the Oxford man gave a convulsive sob. 'Look at one of the fifty,' and he pointed to the body of a young girl who had been serving in the shop of a tobacconist. She was torn apart, but her head was untouched and her pretty face was still smiling, or so it seemed.

Mott looked away. Seeking out a member of the real bomb squad, he asked professionally, 'Did you recover any metal parts? Any at all?'

'Total fragmentation,' the man said.

'Damn. Always we work in the dark.' He kicked at some rubble, gave a last survey of the wreckage, and stepped aside as hospital orderlies moved in to start recovering bodies.

'Shall we go on to Medmenham?' the Oxford man asked.

'That we shall,' Mott said. 'We'll hit those Nazis tonight with such a rain of destruction they'll forget London.' He looked up at the sky and said, 'Moonlight will be good till ten o'clock. Stand back, Hitler, you bastard.'

They sped from London on an emergency route leading to the west, and three times they crossed the winding River Thames, beautiful in its autumn coloring, with great trees crowding its rural banks. Heading in the direction of Windsor Castle and Eton, they could make excellent time, since the roads were free of traffic, and soon they were turning off onto a country lane that led to a remarkable site at which a remarkable meeting was about to take place.

Medmenham, a rustic village, was the site of England's ingenious Air Force Signal Center, where data on the bombing of Germany were evaluated. Some of the brightest men and women in the world, English mostly but with a cadre of Americans and French, grabbed at aerial photographs as the plane crews delivered them and then made