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# 2010: ODYSSEY TWO

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ARTHUR C. CLARKE

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ARTHUR C. CLARKE

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Dedicated, with respectful admiration, to two great Russians, both depicted herein:

General Alexei Leonov—Cosmonaut, Hero of the  
Soviet Union, Artist  
and  
Academician Andrei Sakharov—Scientist, Nobel  
Laureate, Humanist.

## AUTHOR'S NOTE

The novel *2001: A Space Odyssey* was written during the years 1964–1968 and was published in July, 1968, shortly after release of the movie. As I have described in *The Lost Worlds of 2001*, both projects proceeded simultaneously, with feedback in each direction. Thus I often had the strange experience of revising the manuscript after viewing rushes based upon an earlier version of the story—a stimulating, but rather expensive, way of writing a novel.

As a result, there is a much closer parallel between book and movie than is usually the case, but there are also major differences. In the novel, the destination of the spaceship *Discovery* was Iapetus (or Japetus), most enigmatic of Saturn's many moons. The Saturnian system was reached via Jupiter: *Discovery* made a close approach to the giant planet, using its enormous gravitational field to produce a "slingshot" effect and to accelerate it along the second lap of its journey. Exactly the same maneuver was used by the Voyager space probes in 1979,

\* xiii

when they made the first detailed reconnaissance of the outer giants.

In the movie, however, Stanley Kubrick wisely avoided confusion by setting the third confrontation between Man and Monolith among the moons of Jupiter. Saturn was dropped from the script entirely, though Douglas Trumbull later used the expertise he had acquired to film the ringed planet in his own production, *Silent Running*.

No one could have imagined, back in the mid-sixties, that the exploration of the moons of Jupiter lay, not in the next century, but only fifteen years ahead. Nor had anyone dreamed of the wonders that would be found there—although we can be quite certain that the discoveries of the twin Voyagers will one day be surpassed by even more unexpected finds. When *2001* was written, Io, Europa, Ganymede, and Callisto were mere pinpoints of light in even the most powerful telescope; now they are worlds, each unique, and one of them—Io—is the most volcanically active body in the Solar System.

Yet, all things considered, both movie and book stand up quite well in the light of these discoveries, and it is fascinating to compare the Jupiter sequences in the film with the actual movies from the Voyager cameras. But clearly, anything written today has to incorporate the results of the 1979 explorations: the moons of Jupiter are no longer uncharted territory.

And there is another, more subtle, psychological factor to be taken into consideration. *2001* was written in an age that now lies beyond one of the Great Divides in human history; we are sundered from it forever by the moment when Neil Armstrong set foot upon the Moon. July 20, 1969, was still half a decade in the future when Stanley Kubrick and I started thinking about the “proverbial good science-fiction movie” (his phrase). Now history and fiction have become inextricably intertwined.

The Apollo astronauts had already seen the film when they left for the Moon. The crew of *Apollo 8*, who at Christmas, 1968, became the first men ever to set eyes upon the Lunar Farside, told me that they had been tempted to radio back the discovery of a large black monolith: alas, discretion prevailed.

And there were later, almost uncanny instances of nature imitating art. Strangest of all was the saga of *Apollo 13* in 1970.

As a good opening, the Command Module, which houses the crew, had been christened *Odyssey*. Just before the explosion of the oxygen tank that caused the mission to be aborted, the crew had been playing Richard Strauss' *Zarathustra* theme, now universally identified with the movie. Immediately after the loss of power, Jack Swigert radioed back to Mission Control: "Houston, we've had a problem." The words that Hal used to astronaut Frank Poole on a similar occasion were: "Sorry to interrupt the festivities, but we have a problem."

When the report of the *Apollo 13* mission was later published, NASA Administrator Tom Paine sent me a copy, and noted under Swigert's words: "Just as you always said it would be, Arthur." I still get a very strange feeling when I contemplate this whole series of events—almost, indeed, as if I share a certain responsibility.

Another resonance is less serious, but equally striking. One of the most technically brilliant sequences in the movie was that in which Frank Poole was shown running round and round the circular track of the giant centrifuge, held in place by the "artificial gravity" produced by its spin.

Almost a decade later, the crew of the superbly successful *Skylab* realized that its designers had provided them with a similar geometry; a ring of storage cabinets formed a smooth, circular band around the space station's interior. *Skylab*, however, was not spinning, but this did not deter its ingenious occupants. They discovered that they could run around the track, just like mice in a squirrel cage, to produce a result visually indistinguishable from that shown in *2001*. And they televised the whole exercise back to Earth (need I name the accompanying music?) with the comment: "Stanley Kubrick should see this." As in due course he did, because I sent him the telecine recording. (I never got it back; Stanley uses a tame *Black Hole* as a filing system.)

Yet another link between film and reality is the painting by *Apollo-Soyuz Commander*, Cosmonaut Alexei Leonov, "Near

the Moon." I first saw it in 1968, when *2001* was presented at the United Nations Conference on the Peaceful Uses of Outer Space. Immediately after the screening, Alexei pointed out to me that his concept (on page 32 of the Leonov–Sokolov book *The Stars Are Awaiting Us*, Moscow, 1967) shows exactly the same lineup as the movie's opening: the Earth rising beyond the Moon, and the Sun rising beyond both. His autographed sketch of the painting now hangs on my office wall; for further details see Chapter 12.

Perhaps this is the appropriate point to identify another and less well-known name appearing in these pages, that of Hsue-shen Tsien. In 1936, with the great Theodore von Karman and Frank J. Malina, Dr. Tsien founded the Guggenheim Aeronautical Laboratory of the California Institute of Technology (GALCIT)—the direct ancestor of Pasadena's famed Jet Propulsion Laboratory. He was also the first Goddard Professor at Caltech, and contributed greatly to American rocket research through the 1940s. Later, in one of the most disgraceful episodes of the McCarthy period, he was arrested on trumped-up security charges when he wished to return to his native country. For the last two decades, he has been one of the leaders of the Chinese rocket program.

Finally, there is the strange case of the "Eye of Japetus"—Chapter 35 of *2001*. Here I describe astronaut Bowman's discovery on the Saturnian moon of a curious feature: "a brilliant white oval, about four hundred miles long and two hundred wide . . . perfectly symmetrical . . . and so sharp-edged that it almost looked . . . painted on the face of the little moon." As he came closer, Bowman convinced himself that "the bright ellipse set against the dark background of the satellite was a huge empty eye staring at him as he approached . . ." Later, he noticed "the tiny black dot at the exact center," which turns out to be the Monolith (or one of its avatars).

Well, when *Voyager 1* transmitted the first photographs of Iapetus they did indeed disclose a large, clear-cut white oval with a tiny black dot at the center. Carl Sagan promptly sent me a print from the Jet Propulsion Laboratory with the cryptic an-



notation "Thinking of you . . ." I do not know whether to be relieved or disappointed that *Voyager 2* has left the matter still open.

Inevitably, therefore, the story you are about to read is something much more complex than a straightforward sequel to the earlier novel—or the movie. Where these differ, I have usually followed the screen version; however, I have been more concerned with making this book self-consistent, and as accurate as possible in the light of current knowledge.

Which, of course, will once more be out of date by 2001 . . .

Arthur C. Clarke  
Colombo, Sri Lanka  
January, 1982

# 2010: ODYSSEY TWO

# CONTENTS

AUTHOR'S NOTE	xiii
I. LEONOV	
1. MEETING AT THE FOCUS	3
2. THE HOUSE OF THE DOLPHINS	9
3. SAL 9000	16
4. MISSION PROFILE	22
5. LEONOV	27
II. TSIEN	
6. AWAKENING	41
7. TSIEN	43
8. TRANSIT OF JUPITER	46
9. THE ICE OF THE GRAND CANAL	53

10. A CRY FROM EUROPA	59
11. ICE AND VACUUM	64

### III. DISCOVERY

12. DOWNHILL RUN	73
13. THE WORLDS OF GALILEO	77
14. DOUBLE ENCOUNTER	82
15. ESCAPE FROM THE GIANT	88
16. PRIVATE LINE	91
17. BOARDING PARTY	95
18. SALVAGE	101
19. OPERATION WINDMILL	105
20. GUILLOTINE	110
21. RESURRECTION	112

### IV. LAGRANGE

22. BIG BROTHER	117
23. RENDEZVOUS	119
24. RECONNAISSANCE	123
25. THE VIEW FROM LAGRANGE	126
26. PROBATION	131
27. INTERLUDE: TRUE CONFESSIONS	134
28. FRUSTRATION	137
29. EMERGENCE	142

### V. A CHILD OF THE STARS

30. HOMECOMING	147
31. DISNEYVILLE	153
32. CRYSTAL SPRING	156
33. BETTY	160
34. VALEDICTION	165
35. REHABILITATION	171

36. FIRE IN THE DEEP	176
37. ESTRANGEMENT	183
38. FOAMSCAPE	186
39. IN THE POD BAY	191
40. "DAISY, DAISY . . ."	197
41. GRAVEYARD SHIFT	202

## VI. DEVOURER OF WORLDS

42. THE GHOST IN THE MACHINE	211
43. THOUGHT EXPERIMENT	216
44. VANISHING TRICK	221
45. ESCAPE MANEUVER	227
46. COUNTDOWN	234
47. FINAL FLYBY	241
48. OVER THE NIGHTSIDE	249
49. DEVOURER OF WORLDS	255

## VII. LUCIFER RISING

50. FAREWELL TO JUPITER	261
51. THE GREAT GAME	265
52. IGNITION	268
53. A GIFT OF WORLDS	277
54. BETWEEN SUNS	280
55. LUCIFER RISING	283

EPILOG: 20,001	285
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ACKNOWLEDGMENTS	289
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I \* LEONOV



## 1. MEETING AT THE FOCUS

EVEN IN THIS METRIC AGE, IT WAS STILL THE THOUSAND-FOOT TELESCOPE, not the three-hundred-meter one. The great saucer set among the mountains was already half full of shadow, as the tropical sun dropped swiftly to rest, but the triangular raft of the antenna complex suspended high above its center still blazed with light. From the ground far below, it would have taken keen eyes to notice the two human figures in the aerial maze of girders, support cables, and wave-guides.

"The time has come," said Dr. Dimitri Moisevitch to his old friend Heywood Floyd, "to talk of many things. Of shoes and spaceships and sealing wax, but mostly of monoliths and malfunctioning computers."

"So that's why you got me away from the conference. Not that I really mind—I've heard Carl give that SETI speech so many times that I can recite it myself. And the view certainly is fantastic—you know, all the times I've been to Arecibo, I've never made it up here to the antenna feed."



"Shame on you. I've been here three times. Imagine—we're listening to the whole universe—but no one can overhear us. So let's talk about your problem."

"What problem?"

"To start with, why you had to resign as Chairman of the National Council on Astronautics."

"I didn't resign. The University of Hawaii pays a lot better."

"Okay—you didn't resign—you were one jump ahead of them. After all these years, Woody, you can't fool me, and you should give up trying. If they offered the NCA back to you right now, would you hesitate?"

"All right, you old Cossack. What do you want to know?"

"First of all, there are lots of loose ends in the report you finally issued after so much prodding. We'll overlook the ridiculous and frankly illegal secrecy with which your people dug up the Tycho monolith—"

"That wasn't my idea."

"Glad to hear it: I even believe you. And we appreciate the fact that you're now letting everyone examine the thing—which of course is what you should have done in the first place. Not that it's done much good . . ."

There was a gloomy silence while the two men contemplated the black enigma up there on the Moon, still contemptuously defying all the weapons that human ingenuity could bring to bear upon it. Then the Russian scientist continued.

"Anyway, whatever the Tycho monolith may be, there's something more important out at Jupiter. That's where it sent its signal, after all. And that's where your people ran into trouble. Sorry about that, by the way—though Frank Poole was the only one I knew personally. Met him at the '98 IAF Congress—he seemed a good man."

"Thank you; they were *all* good men. I wish we knew what happened to them."

"Whatever it was, surely you'll admit that it now concerns the whole human race—not merely the United States. You can no longer try to use your knowledge for purely national advantage."

"Dimitri—you know perfectly well that your side would have done exactly the same thing. And you'd have helped."