

Nick Kanas

The Protos Mandate

A Scientific Novel



Springer

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ISSN 2197-1188

ISSN 2197-1196 (electronic)

ISBN 978-3-319-07901-1

ISBN 978-3-319-07902-8 (eBook)

DOI 10.1007/978-3-319-07902-8

Springer Cham Heidelberg New York Dordrecht London

Library of Congress Control Number: 2014942134

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Cover illustration: Uniformed couple on the observation deck of a starship gazing at a passing comet.

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Preface

The Protos Mandate is first and foremost a science fiction novel. It is a tale of the first group of people sent to an extrasolar planet to begin the process of expanding our species into the cosmos. It takes us from the building of the starship, through the long outbound period to reach the planet's star, Epsilon Eridani, to the landing and colonization of the planet itself, named Protos. The vicissitudes of this journey for the people involved, and what they discover on the planetary surface, forms the core of the story.

As suggested by the subtitle of this book, *A Scientific Novel*, the story will be followed by an appendix that reviews the current science and technology behind the story. This addition is one of the unique features of the science fiction stories that are part of the new "Science and Fiction" series being introduced by Springer Publications. I am proud to say that *The Protos Mandate* is my second novel in this series, the first being entitled *The New Martians*.

Trying to extrapolate the science and technology of the present into the future is difficult, since no one knows for sure what the future will be like several centuries from now. For example, where are the flying cars that were predicted several decades ago to be cluttering up our air-borne freeways? Nevertheless, we have robots and wrist telephones, so all was not lost! The best the present can do is to stimulate our interest and show us ways that the future could develop. It is up to us to actualize it.

The appendix will include a review of important science fiction stories over the years that have dealt with interstellar travel, of which there have been many. So, why write another such story? For many reasons. Much has been discussed in recent years about interstellar propulsion systems, psychological and sociological issues related to space travel, and the discovery of exoplanets, and it is time to incorporate the latest information about such issues into a novel that deals with a mission to a distant star. In addition, the story line explores an interstellar expedition from soup to nuts: from the origins of the mission, through its century-long flight phase, to the landing and colonization of a new world. It is very human-oriented, tracking the problems and vicissitudes of the people initiating the mission as well as their descendants. It also explores issues related to both suspended animation and multigenera-

tional space travel, and what it might be like to have people cohabitating a starship with both experiences. This certainly increases the complexity of the mission! Finally, what might we expect to find on a distant planet that is similar to the way Earth was eons ago? No green men, but perhaps something else that is green (and brownish-yellow).

In writing *The Protos Mandate*, I want to thank a number of individuals whose help and influence contributed to its final publication. First are the staff members at Springer Publications, especially Dr. Harry Blom and Maury Solomon, who published the textbook I co-wrote with Dr. Dietrich Manzey entitled *Space Psychology and Psychiatry*. Special thanks go to Mr. Clive Horwood, the respected former publisher of Praxis Publications. Clive produced my two celestial cartography books under the Springer/Praxis label: *Star Maps: History, Artistry and Cartography* (now in its second edition), and *Solar System Maps: From Antiquity to the Space Age*. Clive put me in contact with Dr. Christian Caron, the co-editor of Springer's Science and Fiction series. He and his staff selected both *The New Martians* and *The Protos Mandate* to be part of this exciting new series.

I am grateful to Chris for his helpful comments to an earlier draft of this novel, along with the comments made by an anonymous member of the editorial board. I am also grateful for the useful comments made by a number of friends and colleagues: Drs. Ruth Corwin, Shirley Huang, Lyn Motai, Richard Ray, and my wife Carolyn, who has continued to support me in this and many other writing activities over the years. Of course, I am solely responsible for the ideas and concepts that appear in this book.

June 15, 2014

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Part I

The Novel

The Protos Mandate

I. LAUNCH

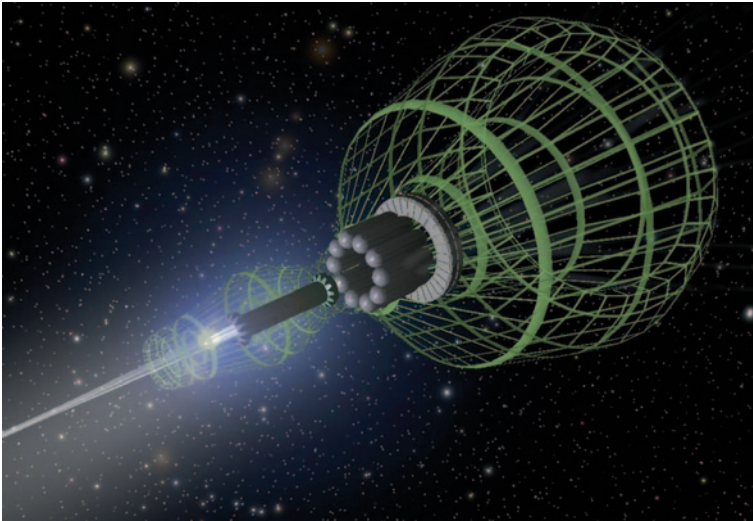


Image of a Ram-augmented Interstellar Rocket (RAIR) type of multigenerational starship moving through space. Through its forward-facing ramscoop, it collects interstellar hydrogen that is used as reaction mass to produce thrust. The hydrogen is energized by the fusion reaction of helium-3 and deuterium, which in this image is stored in tanks located behind the rotating wheel that houses and provides gravity for the crewmembers. Figure credit: © Steve Bowers (Orion's Arm Universe Project).

1. Prologue I

The rocket gleamed silver against the starry sky. Secured to its launch pad with trusses and clamps, it looked like a permanent extension of the desolate construction site. The site was built on a small rocky asteroid that had been moved decades earlier to its orbit around the Neptunian moon Triton. At the appointed time, the trusses silently separated and the clamps detached, ac-

accompanied by the ignition of the rocket's chemical engine. It strained upward to clear the site, then moved with gathering speed toward the faint laser beam ahead. The beam was generated from the Sun's light, collimated by the giant Fresnel lens orbiting Uranus, and directed toward the star Epsilon Eridani.

As the rocket entered the beam, it aligned itself in parallel and continued accelerating until its fuel ran out, at which point the chemical stage separated away into space. This left Probe EE-1 to continue the journey. At the front end of the two-meter long probe, a solar sail only a few millimeters in thickness began to unfurl, extending outward and outward until its three-kilometer diameter was reached. Pushed by the light beam, the probe began to accelerate toward its goal of 85 % light speed. When this cruising speed was attained, the Fresnel lens would be redirected to point the light beam toward another destination for another probe. Explosive charges would detach the solar sail into deep space so that its massive size would not interfere with the sensors that would be activated when Probe EE-1 arrived at its destination.

Some fifteen years later, upon reaching the Epsilon Eridani system, the probe's deceleration rockets would ignite to slow it down to a speed that would allow examination of the star's planetary system. The data would arrive back to Earth ten and a half years later, and the probe would continue on into the infinity of space. With any luck, one of the rocky planets known to orbit in Epsilon Eridani's habitable zone would have liquid water and an Earth-like atmosphere, temperature, and gravity, unlike the planets already examined around stars closer to Earth's Solar System. If deemed suitable, this remote planet would be targeted as the site of the first interstellar colony.

There was hope that the favorable conditions existing on such a planet would allow for the presence of life forms more complicated than the primitive forms found on Mercury, Mars, and the moons Europa and Titan. Whether or not intelligent life would be found on such a planet revolving around another star was actively debated by astrobiologists, but the consensus was that if the conditions allowed for a human colony to survive without expensive terraforming, then some sort of life would certainly be possible, if not likely. Time would tell.

2. Agwar

As the lunar shuttle lifted from the San Francisco District Space Port, Agwar Cinat looked out the window at the hazy scene below. As far as he could see through the polluted air, the skyscrapers extended south, interspersed here and there with the towers of the fusion reactors. The dike system holding back the rising waters of the Pacific Ocean and the inner Bay provided a clear out-

line of the region. This was not the case farther inland, where the inhospitable deserts extended toward the Rockies.

Agwar reflected on the richness and relative comfort of the region as compared with the conditions in his native state of Central Africa. Despite worldwide technological advances in climatology and agriculture that mitigated some of the climate changes produced by global warming, poverty continued to be widespread back home, the heat forced people to live indoors, and food production could barely keep up with the population of nearly three billion people. In contrast, the numerous fusion energy reactors, the desalination plants, and the genetically-engineered macro-farms and algae-supported micro-farms allowed the wealthy strip of land that extended from the San Francisco District to the San Diego District to support its 283 million inhabitants in relative comfort within their hermetically sealed and oxygen enhanced living structures. Interconnected up and down the coast like a massive spider web, these structures soared hundreds of stories into the sky and almost as deep into the depleted Earth. Indeed, the San-San Region was much more livable than the bordering Phoen-Houst and Mexico Regions, although none were as comfortable as the state of Canada, whose northern location kept the ambient temperatures under 50 degrees Celsius and moderated the titanic wind storms and tornadoes that were a fact of life elsewhere. In addition, the absence of polar ice had created a string of ice-free ports along the northern coastlines of Canada and Russia, which together with the mineral wealth helped support the 843 million inhabitants of the two states in relative comfort.

Agwar's reverie was interrupted by the space plane's intercom: "All passengers—please prepare for rocket drive."

His seat automatically reclined and the back cushion inflated as the shuttle accelerated upward and he was forced back into the cushion. As the angle of ascent increased, the seat pivoted to accommodate the *g*-force. After a few minutes, the force diminished as the murky sky gave way to the blackness of space and a carpet of stars. The Moon lay ahead.

I hope the Senate meeting is more civil this time, he thought. Wu Cheng and Johann Schmidt will likely get into another verbal sparring match and make my life more difficult!

Indeed, the Chinese and Martian Senators were always competing for power at the monthly 3-S Senate meetings, and lately he seemed to find himself in the middle of their outbursts.

I guess that's part of the job, he reflected further.

Project Protos was his main responsibility these days, and this put him in competition with several of the Solar System States. After all, trillions of dollars going into the *Protos 1* starship were taken out of the funds that could

be used to relocate the billions of people crowded into the polluted regions of China or to assist the terraforming activities in the state of Mars. Furthermore, the relatively wealthy states of North America and Europe were having their own problems building dikes and desalination plants to support the billions of people in their own regions.

The Solar System is getting too crowded, the Earth too polluted ... we just can't build enough space stations or hollow out enough asteroids for colonies or terraform Mars or the gas giant moons fast enough to take care of everyone, Agwar thought. *The stars must be our future!*

He found himself getting tense, and realizing he needed to conserve his energy, he took a Calm-doz tablet and drifted off to sleep. But his sleep was fitful and punctuated by dreams of people fighting with each other in blistering deserts.

Agwar awoke with a start to the announcement that the lunar landing was imminent. Glancing out the window, he saw miles of sealed buildings and their connectors, surrounded in the distance by a rim of craters.

There are even too many people here, he thought as he surveyed the city of 15 million.

The shuttle descended to the space port and landed with a slight bump, coming to a stop in front of the pressurized walkway that slid out to meet their airlock.

"Welcome to Luna City District Spaceport!" blared the voice on the intercom. "It is 1955 Solar System Universal time, and the date is September 30, 2444. We hope you enjoy your visit and fly again on Virgin Selene Spaceways."

Agwar stood up and walked out of the shuttle through the enclosed walkway that led into the spaceport. He spoke into his surgically implanted wrist compuphone and asked for a roboporter to retrieve his bag and summon a taxi. He got on the people-mover that went to the exit. He passed a number of stores and restaurants that were intermixed with corridors leading out to arrival gates bringing other passengers to the lunar capital from Earth, on-orbit stations, and various colonies in the Solar System. He also noticed a number of very tall, wiry people with lean muscles and long arms and legs.

Lunates, he thought to himself. *Nothing like growing up in 1/6th Earth gravity.*

With his Earth muscles, he felt buoyant but resisted the temptation to bound into the air in giant leaps. How would it look for the General Secretary of the Space Alliance to be playing air games on the Moon?

At the exit portal, a beautiful woman in a tailored jumpsuit awaited him with his bag. She had long auburn hair tied up in a bun, blue eyes, red lips, a gorgeous figure, and perfectly smooth skin.

A giveaway, he thought. Skin without so much as a blemish screams 'robot'. The robotics industry here truly is the best in the Solar System.

“Here is the bag that links to your wrist compuphone, sir. Can I assume it is yours?”

“Yes, thank you.”

“No problem, sir. Your robotaxi is just outside. I hope you have a nice stay in Luna City.”

Thinking how human-like her voice sounded, he entered the battery-powered vehicle and gave it directions to the Colony Hotel. It moved along almost silently within the pressurized connecting roadway to the nearest intersection, where it veered right into a large enclosed freeway. It then picked up speed with the other vehicles until turning again to first one, then a second, roadway that took him to the hotel. He got out, swiped his money card, and gave his bag to a waiting curbside roboporter who was very officious and dressed in a uniform with the red and gold colors of the hotel.

“Good day, sir. Welcome to the Colony Hotel. Do you have a reservation?”

“Yes I do, one room for three nights under the name of Cinat.”

Pausing a moment to link with the reservation computer, the roboporter said: “Yes, sir, you are now checked in. All charges will be made to your money card. Let us know if you decide to stay longer. I will show you to your room.”

“OK, thank you.”

They walked by the stores and the bar/restaurant of the hotel into an outside-facing plexiglass elevator. As they ascended along the side of the hotel, Agwar marveled at the view of the city, with its gleaming metallic buildings and enclosed roadways. The Earth, visible in the brilliantly star-studded black lunar sky, appeared as a dusty blue and white marble through its polluted atmosphere. He glanced at his image that was reflected in the thick, pressurized glass: medium height and a bit plump, jet black skin, genetically-enhanced blue eyes, and thick white hair that mirrored his 72 years. Until the rigors of his job led to his divorce eight years ago, his ex-wife liked to run her hands through his hair, as did several of his recent partners, both male and female. He wondered if he would keep his hair when he got old, or if he would lose it as he entered the next century of his life.

The elevator stopped at his floor and they got out. As they approached his room, the roboporter turned on the voice activator unit and asked Agwar to speak clearly into the microphone to command the door to open. He did, and the now imprinted circular door silently enlarged like the iris of an eye, reveal-

ing a nice but standard room with a large bed, food center, voice activated holovideo monitor, bathroom, and glass-enclosed balcony.

Wonderful, he thought. *I have an Earth view.*

Placing the bag on the bed, the roboporter wished him a pleasant stay and departed as the door irised shut. Agwar unpacked, ordered a sandwich and scotch and soda from the foodbot, quickly imbibed both, and got ready for bed. Taking another Calm-doz tablet, he could not resist the impulse to leap into bed in the low gravity. He ordered the clock to wake him 9 hours later, at 0700 SSU time. Tomorrow he would be facing some confrontive senators, and he wanted to get as much sleep as he could.

3. Wu Cheng

Wu Cheng's arrival in Luna City was not very relaxed. He was met coming out of the shuttle walkway by embassy staff, hurried through the spaceport, and whisked directly by private car to the Chinese State Embassy, where the Ambassador awaited him. After some tea and cookies were promptly delivered, the two of them got down to business, switching their speech from Universal English to Mandarin.

"What has been the political opinion here the past few weeks about *Protos I*?" Wu Cheng asked.

The Ambassador thought for a moment, then said: "The Luna State Senator and most of the other senators who reside here are in favor of the starship mission. The holovideo press and the polls of the populace of Luna City are also in support. Everyone seems to believe that colonizing exoplanets around other stars is worth the expense and that we have gone as far as we can in our Solar System. Ever since the Epsilon Eridani probe began sending back reports 29 years ago about the potential viability of Protos, people have seen the stars as a salvation."

The diminutive, prim 62-year-old Senator looked down at his manicured fingers and his immaculately tailored suit, then up at the Ambassador.

"I met with the Emperor before coming here, and he is most unhappy with the mission. He and the General Staff are very concerned with the unrest in our regions. The five billion people in the Beijing and Shanghai Regions alone are smothering in the pollution and heat. We barely have enough food to feed everyone, despite the increased imports from the Earth-orbiting hydroponic farms. The Emperor believes that we should conserve our resources, and he wants me to ask for additional relief funds at the 3-S Senate meeting tomorrow. This will be difficult. I expect other senators to point out that their states have also sacrificed tax money for the Protos expedition and that we need to