A MARS ODYSSEY

BY

MICHEL POULIN

A MARS ODYSSEY

A science-fiction novel

By Michel Poulin

WARNING TO POTENTIAL READERS

THIS FICTION NOVEL CONTAINS SOME COARSE LANGUAGE UNSUITABLE FOR CHILDREN.

ABOUT THIS NOVEL

This novel is meant to describe the reasons, motivations, means and achievements that would eventually land Humans on Mars, where they could then establish viable settlements. As such, it is not meant to be some sort of space thriller or action novel, but rather to be a celebration of the human spirit of adventure and exploration.

BOOKS BY THIS AUTHOR

(Available free online at Free-ebooks.net, at Goodreads.com or on request by email to natai@videotron.ca)

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THE LOST CLIPPER

ODYSSÉE TEMPORELLE (novel in French)

FRIENDS AND FOES

SPACE-TIME ODYSSEY

A MINOR GLITCH

A MARS ODYSSEY

TABLE OF CONTENT

CHAPTER 1 – A WORSENING SITUATION

09:56 (Washington Time)
Tuesday, March 5, 2041
White House Situation Room
Washington, D.C.
U.S.A.

President Ronald Mason looked quickly around the large table and, seeing that everyone that needed to be present was in the Situation Room, nodded to the staffer standing ready to brief him.

‘’Now that we all are here, you might as well start, Mister Blake.’’

‘’Thank you, Mister President!’’ replied the State Department briefer before switching on the first slide of his briefing on the large digital screen set against one wall of the room. With a laser pointer in his right hand, he then started speaking in a measured tone.

‘’Mister President, ladies and gentlemen, this is the latest State Department update on the World situation as it refers to the progressive global warming and consequent rise in sea levels. Yesterday, the last line of dikes protecting what was left of Bangladesh, along with the Indian city of Kolkata, broke and let the sea in. With the situation in that region already catastrophic and with little local government resources left, the flooding that ensued swamped the totality of the Ganges Delta, including the cities of Dacca and Kolkata. The millions of refugees that had been sheltering in and around those two cities never had a chance to escape and were swept away by the incoming waves. Our estimates are that most of the 43 million people who were in that region are now dead.’’

Ronald Mason, a slightly overweight big man approaching his sixties, lowered his head for a moment, saddened by such a tragedy. Unfortunately, such tragic news had become way too common in the past few years, with the steadily rising sea levels and increasing global temperatures causing a litany of floods and droughts. Those floods and droughts had in turn cost the lives of hundreds of millions of people around the World. While the floods could be prevented, at great cost, by the building of defensive dikes, there was little that could be done about the droughts and accompanying high

temperatures, which burned down the crops on which so many people depended. Most of the Indian sub-continent, Arabic Peninsula, North Africa and parts of Southeast Asia were now routinely experiencing ambient temperatures above forty degrees centigrade, with spikes up to fifty or more degrees centigrade. Millions of people had died from the excessive heat, while tens of millions more had died from the famines caused by the droughts. The stampede by millions of refugees trying to find more livable places in other countries had further aggravated that chaotic World portrait. Shaking off those dark images from his mind, Ronald Mason looked back at the briefer.

‘’How are the Indian and Bangladeshi governments responding to this?’’

An embarrassed look appeared on the briefer’s face as he recalled the information he had himself read only a couple of hours ago.

‘’From badly to not at all, Mister President. In the case of the Bangladeshi government, it was already in a state of deep turmoil, with the various local politicians blaming each other for not dealing effectively with the situation. From the last report received from our embassy in Dacca, the government’s senior members either fled to higher grounds or were swept away by the floods, leaving nobody in effective charge. Our assessment is that Bangladesh is now probably finished as a viable country, with its agricultural system destroyed for good. The already insufficient arable lands are now under seawater and will not be able to raise crops afterwards even if the sea withdraws, due to salt contamination. As for the Indian government, it has had to deal with more than its fair share of ecological disasters during the past decade and the Indian Army and police forces are having a hard time dealing with multiple mass riots by starving refugees and rural populations dislodged by the floods and droughts. The latest disaster which erased Kolkata from the map may just be the one that will break the Indian government’s back. And that is not all for that region, Mister President. General Ismail Khan, who took power last year in Pakistan via a military coup, is apparently preparing to deal with the floods and droughts that also ravaged his country by getting ready to grab some higher, safer and cooler lands, namely parts of the Indian Punjab and of Kashmir.’’

From sad, Ronald Mason suddenly turned to irritated.

‘’Is Khan crazy or just dumb? Has he forgotten that India has at least as many nuclear-tipped missiles than Pakistan has? Does he really think that the Indians will give up such vital lands without a fight?’’

‘’Well, Mister President, satellite imagery is clearly showing us that the Pakistani Army has started to mass itself along the border with the Punjab and the Kashmir.

Maybe Khan is counting on the floods in India to distract the Indians and thin out the Indian Army units in or near the Punjab. To be fair, I must say that the Pakistanis are presently as desperate as the Indians and have little left to lose by attacking India. On the other hand, the Punjab, being located at high altitudes, is basically safe from floods and is notably cooler than the rest of the Indian sub-continent, two points that make it invaluable right now in terms of real estate to both the Indians and the Pakistanis.''

''True, but that real estate won't be worth much once it is contaminated with radioactive fallouts.'' replied Mason before looking at his secretary of state, James Barrow. ''James, once we are finished here, I want you to call Khan and try to put back some sense in him. Make him understand that he will gain nothing by starting a war with India now.''

''I will do my best, Mister President.'' said the graying African-American man, nodding his head once. Mason then looked back at the briefer.

''Sorry if I keep interrupting you, Mister Blake. You may continue.''

''Thank you, Mister President! In terms of new international developments linked to sea levels and global warming, these were the sole items on our agenda today, Mister President. However, numerous spots and situations are considered critical and we will keep a close watch on them. Those spots and situations were included in the last weekly watch list that you received, Mister President. Do you have any questions, Mister President?''

''Not at this time. I read the watch list and I must say that it makes for some grim reading. Thank you, Mister Blake! Jena, do we have anything new on the domestic front?''

The Secretary of the Interior, Jena Westwood, a tall and still very pretty woman at the age of 58, nodded her head at Mason's question.

''Yes, Mister President! The last group of citizens from New Orleans and the Louisiana coast has arrived in their new designated homes in Birmingham and Atlanta. Other displaced citizens from along the banks of the Mississippi are still streaming in and are being processed as quickly as humanly possible. However, this still makes over half of the states of Louisiana and Mississippi irremediably lost to the rising waters, with their arable lands contaminated by seawater. I am afraid that completing the relocation and rehabilitation of so many people will take lots of time and money, Mister President.''

''Yes, we went through the same drill six years ago, when we lost most of the state of Florida to the rising sea, and that despite all our efforts to build protective sea

walls. Short of a miracle that would make the sea lower to its original level of a century past, I am afraid that we will continue to experience such losses, both in lives and in infrastructures and lands. In fact, if I can believe the latest studies from the Environmental Protection Agency, we will continue to face rising sea levels and warmer temperatures, unless we can somehow reverse that trend by cutting the proportion of CO2 and other warming gases in our atmosphere. I know that our Ecological Corps is doing a fantastic job of building and putting in operation more and more atmosphere scrubbing towers, or ASTs, across the country, but this problem is truly a global one and not strictly an American one. Even if we do everything possible here, we will still be affected by the pollutants produced in other parts of the World. Let's just say that experience from the past couple of decades on that subject does not make me optimistic. We thus have to continue focusing on our 'Plan B', on top of doing what we can in America to reverse this global warming or at least stop it. Administrator Cardona, how is the Mars Home Project doing? Do you still get all the help and cooperation promised by Russia, China and Europe?''

The small but energetic Latino woman in her mid fifties who was the new head of the NASA cleared her throat before answering, speaking in measured words.

''I still am very pleased with the degree of cooperation and assistance that I get from them on the Mars Home Project, Mister President. As for the project itself, it is actually slightly ahead of schedule and within budget, thanks to the incredible efforts of its project manager and chief engineer and designer, Mister Robert Lithgow. That man is truly accomplishing miracles. As a result of his good work, the main section of our first Mars ship has been completed and will be launched in orbit in two months. Once in orbit, the other sections of the ship will follow up aboard our new heavy space shuttles, to be assembled together in low Earth orbit. If all goes well, the FRIENDSHIP should leave Earth's orbit in two years, on its way to Mars.''

''Hopefully, that trip will fare better than what happened to the Mars One Mission.'' interjected Vice-President Dana Crawford, a tough politician in her early sixties. Everybody around the table was silent for a moment as they reminisced about the tragic outcome of that doomed space mission. Meant to be the first manned Mars mission, with six astronauts due to land on Mars and do some ground exploration there, the Mars One Mission had been launched with great fanfare in 2032. That hoopla had however covered a litany of mistakes and politically-motivated bad decisions, as the chief motive to launch the mission had been more for the Washington administration of

the time to make the people forget about the growing threat of environmental disasters to come than to truly start the exploration of Mars. As a result, too few astronauts had been launched in too small a ship, with grossly insufficient anti-radiation protection and no rotating carrousels aboard to create some artificial gravity. The nine month-long trip to Mars had proven to be a Calvary for the six astronauts, with growing interpersonal conflicts, cumulative physical and brain damage from constant radiation exposure and progressive degeneration of their bones and muscles due to the effects of long term exposure to zero gravity. A powerful, unexpected solar storm in mid-trip had then dramatically increased the radiation dosage absorbed by the astronauts. When they had finally arrived in Mars orbit, still facing nearly two more years either on Mars or in space, the six astronauts were weak, sick and mentally diminished. The 'coup de grâce' to the mission however came when the astronauts went down in their lander capsule to set foot on the Red Planet. With their automated controls damaged by radiation exposure, the landing had been a lot more brutal than planned. The bones of the astronauts, already weakened by a long period in zero gravity, broke on impact at landing, incapacitating the unfortunate astronauts in their seats. Unable to move even inside their small lander, the six men had died a slow, painful death under the remote, sad eyes of Humanity. The sole good thing out of that disaster had been that the politicians in Washington had finally understood that such long, manned space missions were no place to cut corners or provide insufficient budgets. More importantly, a sensible, long-term plan with clear and justifiable goals was needed. Another result from that disaster had been a mass purge of NASA's top and medium levels administrators and the scrapping of its stuffy bureaucratic, cover-your-ass culture. What replaced them was inspired by the examples provided by the first pioneering commercial firms that had joined the space adventure, notably SpaceX and Virgin Galactic.

Getting over those sad souvenirs, Mason redirected the meeting on more mundane subjects, like budget appropriations and the continuing sea walls building and Atmospheric Scrubbing Towers programs. After another fifty minutes of discussions, the President called an end to the meeting, making the participants disperse back to their respective offices and buildings around Washington. Going back to the Oval Office, Mason went to the large windows behind the presidential work desk and spent a couple of minutes contemplating the Washington scenery while thinking. The capital had been built originally over low, swampy grounds, making it quite vulnerable to the rising sea

levels of the 21st Century. What had saved it up to now was a high sea wall that had been built at a huge cost in the third decade of this century, along with elevated highways to connect it to the higher grounds of the Appalachian Mountains to the West, where many of the original residents of the American East Coast had moved to when the waters had started to seriously rise. A similar solution had been used to save the major cities along the East Coast, but that had cost money, lots of money. That in turn had forced a massive shift in spending priorities at the federal level, a shift made mostly at the expense of military budgets. With the United States fighting for survival against the rising sea tides and hotter temperatures scorching its lands, the traditional World policeman role that the United States had assumed by itself could not be sustained and much of its military personnel and equipment had been recycled into an enlarged Army Corps of Engineers, which had then been renamed the 'Ecological Corps'. The Ecological Corps was now at the forefront of sea wall building and AST network expansion, plus was charged with disaster relief work and refugee relocation. The other major military powers of the planet, Russia, China and Europe, also having to fight large scale environmental disasters, had quickly imitated the United States in this, understanding that long term survival as viable nations was more important than short term gains via military means. Yes, there were still a number of small wars going on around the globe, but the days when the World population feared a World War 3 and a nuclear holocaust were well over by now. Only a few stubborn, radical governments, like the Pakistani one, still believed in the use of military force as a mean to survive and grow. Ronald Mason couldn't help then wonder if that new international spirit of peaceful cooperation would survive long enough to permit the Mars Home Project to attain its ultimate goal: the colonization of Mars and its transformation into a second home for Humanity in the Solar System.

CHAPTER 2 – A REAL NAIL BITTER

14:44 (California Time)
Friday, May 17, 2041
Launch Control Center, Vandenberg Space Center
California, U.S.A.

Despite his deep faith in the project he led, Robert Lithgow couldn't help feel somewhat nervous as he looked at the video image of the huge disk and its six booster rockets displayed on the giant plasma screen of the Launch Control Center, situated inside a bunker at the Vandenberg Space Center. While he had carefully reviewed every possibilities for a launch failure and done his best to prevent them, nothing in space exploration and travel was risk-free. One seemingly insignificant mistake or oversight could be enough to delay the launch of the main section of the Human Space Ship FRIENDSHIP or, worse, lead to its destruction and loss at launch. If that last thing occurred, then it would set the Mars Home Project back by at least three years. Worse, it could shake the political support that the project so depended on in the long term to achieve its ultimate goals.

Lithgow briefly looked to his right at the other important guests who had come to Vandenberg to watch this critical space launch. Maria Cardona, the NASA Administrator, was here of course, along with Doctor Misha Borisovich, the head of Roskosmos, the Russian Space Agency, Wang Lao Xi, the head of the Chinese Space Agency, Michel Dupré, the head administrator of the European Space Agency, and Shinzo Kurozawa, the head of the Japanese Space Agency. Normally, the head of the Indian Space Agency, which had participated in the development and design of the H.S.S. FRIENDSHIP, would have been present as well. Sadly, Doctor Chandra Sahriman was now dead, along with his whole technical team and more than half of India's population. Faced with an impending Pakistani land invasion of its parts of Kashmir and of the Punjab, the Indian government had issue an ultimatum to Pakistan to cease and desist, to which General Khan had replied by launching a 'preemptive' nuclear strike on India, concentrated against the main cities and military bases east and

south of the Punjab. With over 140 Pakistani nuclear-tipped missiles in the air and with dozens of Pakistani combat aircraft loaded with tactical nuclear bombs flying into Indian airspace, the Indian government had no other option but to launch a retaliatory nuclear strike of its own on Pakistan. The subsequent explosion of over 290 nuclear warheads around the Indian Sub-Continent had killed instantly tens of millions of Indian and Pakistani citizens, with hundreds of millions more dying from radiation exposure in the weeks to follow. The radioactive fallouts, apart from irremediably contaminating most of the arable lands in both countries and ensuring mass famines in the near future, had also played havoc with a number of neighboring countries, contaminating vital agricultural lands, forests and rivers and forcing the mass evacuation of millions of Iranian, Afghan and Burmese citizens. Ismail Khan, the man who had started it all, had then compounded his stupidity with cowardice, fleeing by plane to China and abandoning his people to its grim fate. However, instead of being given refuge by the Chinese, who had been up to now his allies, Khan had been summarily executed on arrival by the furious Chinese, who were also suffering indirectly from the nuclear war that had happened on their doorstep. Sadly, that lone act of justice could not erase the fact that over a billion people had died in the last month, while tens of millions more would die from either famine or radiation poisoning during the next few months. Robert Lithgow momentarily felt a flash of anger as he remembered some of the cruel, racist comments he had heard on some of the most extreme right wing American radio stations, in which a few radio talk show hosts and their listeners had exchanged gleeful comments about the nuclear destruction of India and Pakistan, calling the deaths of over a billion people ‘an overdue culling of excess population’. However, the storm of public outrage that had followed had shut up those racists and even forced the closure of two of the most extreme right wing radio stations.

Chasing away with difficulty those awful souvenirs, Lithgow concentrated his attention back on the giant disk resting vertically on its edge, supported by six big integrated rocket-ramjet engine pods attached at the vertical to its underside and topside. The disk section itself, which had a diameter of 190 meters and a thickness of 36 meters, was capped with an aerodynamic cover along its top edge. That cover would prevent damage from air pressure and friction heat as the assembly would rise and take up speed within the atmosphere. It would also help make its flight more economical in fuel by virtue of its shape, which would make the disk section form an airfoil with

appreciable aerodynamic lift coefficient and would cut drag as well. The cover would then be jettisoned before the disk section attained Low Earth Orbit, or LEO. As for the rocket-ramjet engine pods, they were essentially similar to the engine pods used by the new fleet of heavy cargo shuttles now in NASA service. Once their work of orbiting the disk section would be completed, the six integrated engine pods were going to detach themselves from the disk section and then individually reenter the atmosphere, to return and land in Vandenberg, which was now the prime space launching base in the United States. Cape Canaveral and its huge space complex had unfortunately been lost six years ago, along with most of the state of Florida, when it had been submerged by the rising sea.

''ONE MINUTE TO LAUNCH!... THIRTY SECONDS TO LAUNCH!... TEN SECONDS TO LAUNCH!... FIVE, FOUR, THREE, TWO, ONE! IGNITION!''

Lithgow felt Maria Cardona's hand search for his right hand and then press it nervously as the final seconds of the countdown were called. In response, the systems engineer and astrophysicist gave her a reassuring smile.

''Everything will be fine, Maria.''

He didn't have time to say more before the overhead speakers of the launch control room suddenly blared with the powerful rumble of six engine pods coming to life simultaneously, while huge flames came out of their exhaust nozzles, to be deflected sideways by specially built concrete-lined trenches. With a total initial thrust of 52,000 metric tons from the chemical rocket engines of the six pods, which burned liquid oxygen and RP-1[1], the huge 42,000 metric ton assembly, 16,000 tons of which was the disk section, started rising vertically at once from its launch pad. With nearly everyone in the launch control room excitedly shouting encouragements, the disk and its six engine pods quickly acquired speed, accelerating continuously as the volume of air entering the pods via their forward intake nozzles increased with speed, boosting further the mighty thrust of the engines via what was called 'ram air effect' and also making the engines more fuel efficient.

''GO, FRIENDSHIP, GO!'' shouted Maria Cardona as the main section of her future spaceship reached the speed of sound while still climbing and accelerating. Once

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[1] RP-1 : A form of refined kerozene fuel that is commonly used by many types of liquid chemical rocket engines, mixed and burned typically with liquid oxygen.

at a speed of Mach 2.1, the six integrated engine pods switched to nearly pure ramjet mode, injecting liquid hydrogen inside the ramjet tubes surrounding the chemical rocket engines, while the rocket engines throttled down to idle. The hydrogen, vaporized by the air heated via compression after entering the intake nozzles, helped greatly lower the temperature of that ingested air, thus improving the efficiency of the ramjet part of the engine pod. It was then mixed with the oxygen in the atmospheric air and ignited, creating huge thrust while operating at a fuel efficiency rate, or specific impulse in aerospace parlance, much greater than that of any pure chemical rocket engine. The ramjet engines went on until the big structure reached a speed of Mach 5.5 and an altitude close to 30,000 meters, where the air started becoming too rarefied to let the ramjet function. Then, the liquid oxygen and liquid hydrogen chemical rocket engines of the pods ignited, taking over at an altitude where they could perform much more efficiently than at sea level. That ultimate thrust phase finished pushing the main disk section into its initial low Earth orbit, where the six integrated engine pods detached themselves under remote control and started flying back to Earth, where they would be inspected, refurbished and reused for other launches. The aerodynamic nose cover also detached itself a few seconds before that moment, but went down only to burn on reentry, as planned.

More wild cheers greeted the reaching of low initial orbit by the main section of the H.S.S. FRIENDSHIP, prompting Lithgow and Cardona to exchange happy handshakes and hugs with their foreign colleagues. Misha Borisovich in particular proved quite effusive, in line with his reputation for joviality and cheerfulness. He nearly crushed Maria Cardona in his arms when he cheerfully hugged her while celebrating the success of the launch.

‘’We did it, Maria! We did it!’’

‘’I know, Misha, but could you press a bit less strongly?’’

‘’Oh, sorry!’’ said the Russian astrophysicist, who was built like a bear. ‘’Still, to launch in orbit such a huge mass, and this without a single hitch. It must be a record.’’

‘’It is a record, Misha, and one that we can be extremely proud of. However, there is still a lot more to be done before we can send the H.S.S. FRIENDSHIP towards Mars and even more to be done before we end up with a self-sustaining colony on Mars. Hopefully, we will be able to achieve all that before Humanity destroys itself through sheer stupidity and lack of vision.’’

‘’Or is able to reverse this damn global warming and make the sea lower to its previous levels.’’ added Michel Dupré, of the European Space Agency, or ESA. Robert Lithgow nodded his head at that but inserted a comment of his own.

‘’That would definitely be nice to see, but even then I hope that our political leaders will understand that this project must be brought to its ultimate end state: a viable, self-sustaining colony on Mars. This global warming crisis was brought on by us, through our own lack of common sense. There is no way to know what other stupidity we will do in the future that could kill for good Earth’s ecosystems. We need to invest into space colonization, no ifs or buts!’’

‘’I fully agree with you, my friend.’’ said softly Misha Borisovich. ‘’Right now, we still don’t know the true extend of the damage done worldwide by that stupid Indo-Pakistani Nuclear War. As things grow worse, with seas rising and temperatures increasing, more such follies could easily happen.’’

The group slowly nodded their heads at those words before Robert Lithgow clapped his hands together and smiled to the others.

‘’Well, enough about the doomsday talk! How about if we go celebrate this success in style? I know a very good restaurant near the base where we could have supper together. I’m paying!’’

‘’Well, in that case, what are we waiting for?’’ exclaimed Borisovich, making the others laugh.

02:46 (Greenwich Meridian Time)

Monday, May 20, 2041

NASA light space shuttle AURORA

On approach to the H.S.S. FRIENDSHIP’s main section

Low Earth orbit

‘’Shuttle AURORA on final approach to docking station Alpha of main FRIENDSHIP’s section. Fifty meters and closing!’’

Denise Wattling, who was piloting the light shuttle, waited until her craft was within twenty meters before speaking again to the Vandenberg controller via radio.

‘’Going down the glide path nicely, autopilot and automated approach system fully synchronized. Approach speed: 0.4 meters per second… Five meters to docking port… Docking clamps engaging!’’

Denise then pressed a couple of buttons in sequence, tightening the docking clamps to render the docking collar airtight, then filling the nose airlock with warm, breathable air. She nodded her head inside her spacesuit's helmet when an indicator light turned green.

''Nose airlock pressurized! We are now going to go inside FRIENDSHIP.''

''Understood, AURORA! Proceed at your own pace.'' replied the NASA controller. Denise then looked at her team leader, Mark Dempsey, sitting in the copilot's seat.

''We can go inside the ship, Mark.''

''Good! There is quite a lot to do for us in there.''

Dempsey released the safety harness of his seat, then got up and put one boot down on the deck plate between the two forward seats of the light shuttle. As was now standard in all spacesuits, be they produced in the United States, Russia, China or Europe, the soles of his boots had a number of small permanent magnets incorporated into them. That allowed astronauts to cling to a spacecraft or ship's decks, which were lined with very thin steel sheets. While that cost a bit in terms of mass, the fact that one could move and walk nearly normally even in zero gravity conditions made working and living in space so much easier. Even the soles of the astronauts' inner slippers incorporated small magnets, for the same reason. Being cautious not to walk at a too brisk pace and thus risk breaking completely contact between the deck and his boots, the activation team's leader walked down the wide central aisle of the light shuttle, passing by the seven members of his team who were sitting in their padded, crashworthy seats.

''Come on, guys and girls: time to get to work!''

Imitated by Denise Wattling, who put her shuttle into dormant mode first, the members of the activation team got out of their seats and followed Dempsey down to the lower deck, where the airlock chamber of the nose docking ring was situated. Double-checking first that the airlock was properly pressurized, Dempsey then opened its wide, aluminum alloy door and entered the airlock. He let two members of his team join him, nearly filling the airlock, then gave a couple of orders.

''Seal your suits! Omar, close and secure the airlock's door.''

In theory, and with all instruments indicators telling him that the airlock on FRIENDSHIP's side was pressurized, he could have simply left both doors of the shuttle's airlock opened, thus accelerating greatly the rate at which his team members would enter the huge main section of the spaceship. However, instruments could go wrong for all kinds of reasons, while a bitterly learned lesson about space work was that