The Andromeda Strain Study Guide

The Andromeda Strain by Michael Crichton

BOOKRAGS

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Plot Summary

The Andromeda Strain chronicles five days in the life of an alien life form. Brought back to earth by a secret government satellite, the life form acts like a virus or bacteria, but its structural composition resembles nothing on earth. The alien life form spreads its deadly disease through tiny Piedmont, Arizona, wiping out much of the population in a matter of seconds. When the military men sent to retrieve the satellite are killed as well, Major Manchek from Vandenberg airforce base calls in the Wildfire team.

Project Wildfire is housed in a top-secret, $22 million dollar laboratory buried five stories beneath the Nevada desert. When Wildfire is activated, a team of pre-selected scientists arrive at the laboratory to study the alien life form, which they code-name "Andromeda." The members of the Wildfire team are Dr. Jeremy Stone, Dr. Mark Hall, Dr. Peter Leavitt and Dr. Charles Burton.

Project Wildfire is the brainchild of scientist Jeremy Stone. Dr. Stone is a brilliant, ambitious, Nobel Prize-winning scientist, who employs his political contacts and academic clout to secure government sponsorship of his project. The underground laboratory and project protocols are developed in accordance with his design. Stone obtains top-secret authorization for Wildfire, which extends so far as to allow its team scientists to arrest civilians to maintain project secrecy. The lab is a fortress designed to contain any conceivable kind of alien disease, be it gaseous, viral, bacterial or fungal. Built-in safeguards seal off the lab and prevent the disease from escaping into the environment, even if it manages to escape the well-contained central core of the lab. Unfortunately, in the event the lab becomes contaminated, these safeguards also prevent the escape of the scientists and lab animals inside. The computerized facility is programmed to initiate an automatic nuclear self-destruct device in case of emergency.

Only one man, called "The Odd Man," is entrusted with a key that can turn off the self-destruct sequence. Dr. Mark Hall is given this role, because he is the only single man on the team. According to a government study, single men perform best at decision-making during life or death situations. Thus, Hall is selected as the all-important Odd Man, despite the fact that Jeremy Stone has misgivings about allowing him onto the team. These two men are set up as antagonists; Hall represents the strengths and weaknesses of human nature, while Stone represents the impersonal process of automation.

Once they arrive at the Wildfire Lab, the four scientists must undergo a lengthy decontamination procedure as they descend five underground levels to their working quarters on Level V. Stone has designed the entire lab to be fully automated. The men receive physicals and a series of chemical baths from a computerized system. Once on Level V, they may consume only vitamin pills and a nutrient-fortified, artificial orange drink. Stone's goal is to create a totally pure and sterile environment in the Wildfire Lab. This cold, clinically sterile environment has a negative impact on protagonist Mark Hall. His attempts to flirt with the seductively feminine computer voice fall flat, as do his jokes and his refusal to take project protocols seriously enough to please Dr. Stone.

Nevertheless, when they arrive on Level V, all four men plunge into their work with gusto. They are fascinated by this unique opportunity to examine an alien life form, and because the lab is so secure, they believe they have all the time in the world to study it.

The men spend several days testing the Andromeda strain, trying to discover how it kills so quickly, and hoping to find a cure. During the first few days, the scientists seem to have the project well in hand. Their work proceeds smoothly, and Stone's elaborate precautions protect them from the fatal life form. They perform many tests and believe they are close to figuring out its mechanism of action. If they can only learn how it kills, they can figure out how to stop it. Unfortunately, the deadly Andromeda strain finds a way out of its cage. It leaks into the autopsy room, where Dr. Burton becomes trapped. In the ensuing panic, Mark Hall wracks his brain for a way to save Burton. Just as inspiration strikes him, Andromeda leaks out of the autopsy room and floods the laboratory. The nuclear self-destruct sequence is initiated.

Proving The Odd Man Theory that single men work well under pressure, Hall accomplishes three amazing feats in the three minutes before the self-destruct device is set to detonate. First, he figures out a preventive cure for Andromeda. Since the organism kills so quickly, any cure must come in the form of prevention. Before he can implement his cure, Hall notices that four minutes have elapsed, and Burton remains unaffected by the alien life form. Thus, Hall has his second important realization. His cure is unnecessary.

Hall realizes that Andromeda has already mutated into a harmless organism; the cure that the men worked so hard to achieve no longer applies to the ever-changing life form. Andromeda escapes harmlessly into the atmosphere, leaving Hall with his third and final problem. Once initiated, the nuclear device has a three-minute clock, which Hall must race to stop by inserting his key into one of the substations found on every level of the facility. Unfortunately, Hall has been sealed into a room with no substation. He must break into the dangerous central core and evade the computer's attempts to prevent his escape. The automatic sensors shoot him with poisoned darts as he climbs up the core to Level IV. Hall fights off the paralysis caused by the darts just long enough to insert his key into an atomic substation and halt the nuclear detonation.

When Mark Hall comes to, Dr. Stone informs him he has saved the lab and everyone in it with only seconds to spare. This brings to an end the five-day Andromeda crisis. The airborne life form escapes into the atmosphere, eventually working its way back out into space, where it continues to mutate. According to an ominous Epilogue, both the Americans and the Russians have recently been forced to ground their space programs. Officials attribute the reason to a technological systems breakdown.

Part 1

Part 1 Summary

Chapter 1: Lieutenant Roger Shawn stands at the side of the road, looking down over the town of Piedmont, Arizona with a pair of binoculars on a chilly night in February. All is quiet in the tiny town, which boasts a population of forty-eight souls. The narrator indicates that these are the last few moments of Lieutenant Shawn's life. Lieutenant Shawn climbs back into his Ford Econovan, rejoining his electronics technician, Private Lewis Crane. The men have been using the radio-directional equipment on the van to triangulate the position of the Scoop satellite, which it is their mission to recover. The triangulation procedure is time-consuming with a single van, but the Army felt that using more than one van might arouse suspicion amongst the locals. Now, six hours into their recovery mission, they have pin-pointed their quarry. Their equipment indicates the Scoop satellite is in the very center of Piedmont. Yet, their nighttime surveillance reveals no activity in the town. The only signs of life are the large black birds which circle overhead; they appear to be buzzards.

Chapter 2: Mission Control for Project Scoop is located three hundred miles away from Piedmont, at Vandenberg Airforce Base. It is Lieutenant Edgar Comroe's assignment to monitor the reconnaissance van, code named Caper One, which even now is heading into the center of Piedmont. Comroe hopes for nothing more than a quiet night so that he can catch up on some reading. When Lieutenant Shawn radios him from outside Piedmont, Comroe pays minimal attention to the transmission. It is protocol for Lieutenant Shawn to leave his radio on while approaching his target, and Comroe is not much interested in this formality. However, the strained quality of Shawn's voice causes Comroe to put down the medical journal he has been reading.

Comroe listens in as Lieutenant Shawn and Private Crane discover dead bodies in the middle of the street. Lieutenant Comroe quickly calls for a security lock down at Mission Control and requests a telephone connection to Major Manchek, chief duty officer and man in charge of all Scoop Project activities. Meanwhile, Shawn and Crane report that they have sighted a survivor. An old man in a white robe walks amongst the bodies and approaches the reconnaissance van. Crane lets out a high-pitched scream and the radio transmission is broken.

Chapter 3: The narrator discusses the nature of crisis from a historical perspective. Prior to the scientific boom, all national crises were political in nature. The advent of modern science brought about two of the first scientific crises in history, the atomic energy and space capability crises; these initial crises dealt with chemistry and physics. The science of biology was slower to be developed. Not until the end of World War II did the invention of antibiotics spur significant advances in biological science. The narrator informs the reader that the crisis of the Andromeda Strain would prove to be the first major biological crisis in history. Given the rising importance of the biological sciences, however, the narrator believes there will be more crises in the future inspired by the

science of biology. The narrator cites a theory by noted scholar, Alfred Pockran, which observes that crises are created by the individual men involved in the events.

The key player in this evening's events is Major Arthur Manchek. When under stress, Manchek's reaction is to slow down. He moves ploddingly and deliberately, even when those around him are in a panic. This is the key to Manchek's success, and this slow deliberation allows him to remain clear-headed and objective in the face of crisis. Manchek puffs on his pipe as he listens to the taped radio conversation twice through. Comroe informs him that the radio connection was not in fact broken; the line is still open, but the only sound coming from Piedmont, Arizona is the sound of the engine running in the reconnaissance van. Manchek decides they need to acquire more evidence. He orders a Scavenger plane to make a flyby over Piedmont.

A formation of three planes flies over the Mojave Desert en route to Piedmont. Samuel "Gunner" Wilson is the pilot of the sleek, black Scavenger plane. This spy plane is the height of technology in 1969, capable of spotting a submarine two hundred feet below the surface of the water or mapping a city in the middle of a blackout. As they approach Piedmont, Gunner drops back and allows the two lead planes to dump their load of phosphorescent flares, lighting up the small town despite the dark, desert night. The Scavenger is such a fast plane that Gunner has been trained to avoid looking at his target; pilots have been known to crash after being distracted by the scenery, even if only for an instant. Nonetheless, Gunner cannot help but see the sea of bodies stretched out below him in the center of Piedmont.

At Vandenberg, a man named Jaggers is the acknowledged expert of reconnaissance evidence interpretation. His job is to review all information brought back by the Scavenger and make a determination of the situation. In conference with Manchek, Comroe, and Gunner, he first shows them the infrared film images of the town and explains that the white spots on the film indicate human bodies, either dead or alive. There are fifty in all. Based on temperature, forty-seven of the bodies are definitely dead. Two of the remaining three are presumed to be recent deaths; those bodies are located in the reconnaissance van and are probably the bodies of Lieutenant Shawn and Private Crane. However, one of the white images is in motion and indicates the presence of a survivor. Next, Jaggers runs the direct visualization film and the men are able to spot the survivor amidst the bodies; a man in a white robe, just as Shawn and Crane had reported. Manchek decides to call for a state of emergency.

Chapter 4: After declaring the state of emergency, Manchek hesitates before making his next move. He sits before the telephone and recalls the briefing he had received last year about Project Wildfire. Project Wildfire consists of a high-tech laboratory, plus a team of scientists who can be alerted to man the laboratory if needed. The function of Project Wildfire is to investigate possible extraterrestrial life forms introduced to earth by returning American spacecraft. Manchek has been given a business card with a contact number to activate Project Wildfire in case of emergency. The card states, "IN CASE OF FIRE -- Notify Division 87 -- *Emergencies Only*." He recalls from the Defense Department briefing that the phone number is supposed to be the binary of 87. He

figures the binary code; it is 1-110-1010. Once he's added the dashes, the number resembles a perfectly legitimate phone number. He dials it.

Part 1 Analysis

The author, Michael Crichton, grabs the reader's attention right away. His narrative is jacketed with a cover page indicating that "THIS FILE IS CLASSIFIED TOP SECRET." He also warns that unauthorized readers may be subject to imprisonment up to twenty years and fined up to $20,000. Immediately, the reader feels the illicit thrill of reading a top secret file. The story is presented as if it were historical fact, and the presence of a historical narrator lends a sense of academic authority to the tale. The author grips the reader with a sense of urgency to discover the facts through his convincing reporting style.

The narrative is similar to the true crime story genre of books written by the likes of Ann Rule. Just as true crime novels document the human story behind a crime statistic, the "facts" of *The Andromeda Strain* are fleshed out and revealed chronologically, from a human perspective. The author's conceit is so convincing that one finds oneself utterly suspending disbelief and plunging into the story with credulity. To further convince the reader of the document's authenticity, Crichton provides an Acknowledgements page which thanks the individuals who helped him research the facts surrounding *The Andromeda Strain*. The now thoroughly convinced reader can flip to the back of the book and find the main characters' names listed in the Bibliography, along with the names of their published works.

Part 1 documents the events of Day 1 of the Andromeda crisis. The author establishes context and tone through the narrator, who gives thoughtful, analytical, and supposedly, historical commentary regarding the crisis. The narrator, ostensibly the author himself, provides a historical context supported by research references. Michael Crichton blends this reporting style with classic novel structure.

The author states his theme that crises are made up of human personalities, and then introduces his characters with an eye towards exploring that theme. Their resumes are elucidated, and details of their backgrounds are reviewed for the reader's benefit. The narrator drops dark hints that the make-up of these men contains some fatal flaws, which will escalate the crisis. However, he sticks to his linear narrative and does not reveal any events beyond the scope of Day 1 at this juncture. Now that the author has established a foundation upon which to construct his plot, he ends Day 1 with a classic turning point. Major Manchek calls for help from the Wildfire team to set the events of the novel in motion.

Already, the reader can tell this is a technical narrative. Yet, the author has a gift for revealing technical details as if they were puzzle pieces. Crichton explains the logic behind the various scientific instruments used, so that laymen can understand the options scientists and engineers have in terms of tool choice. The technology is cutting

edge for the year 1969, but even all these years later, the novel does not feel out of date.

Crichton's explanations as to why scientists needed and developed certain tools is still relevant today, and one can imagine that all of the tools have been refined over the years through a similar process of scientific trial and error. The author's gift for making technology accessible to the reader helps to pull the reader more deeply into the story. It allows one to enjoy each discovery and moment of scientific enlightenment as if the discovery were one's own. Michael Crichton brings his reader into the scientific process and allows the reader, for a brief span of pages at least, to think like a Nobel Prize winning scientist.

Part 2

Part 2 Summary

Chapter 5: The infrastructure for Project Wildfire has been available and lying dormant for two years. It needed only Manchek's call to set things in motion. Upon dialing the number, Manchek hears the tell-tale humming and clicking which indicates he is on a secure, scrambled trunk line. A recorded voice answers his call and instructs him to state his name and his message. Manchek leaves a message indicating he has "confirmatory visual data" (page 29) of a Wildfire. Even as he speaks, Manchek doubts his own words. Despite the alarming Scavenger camera evidence, he finds the possibility of an alien life form brought back to earth by the Scoop satellite to be unbelievable. He waits by his phone for the myriad of telephone calls he expects to receive in response to his Wildfire alert, but Manchek receives no calls at all. He doesn't realize the entire process of activating Wildfire has been automated. An automatic top-secret cable is issued in response to his call, informing other maximum-security military units of the Wildfire Alert and the possible need for a directive 7-12. A second top secret cable is issued moments later naming the scientists on the Wildfire team. They are Jeremy Stone, Peter Leavitt, Charles Barton, Christian Kirke and Mark Hall.

At the Stone residence, Allison Stone is desperately trying to usher her guests out the door. The fifteen couples invited to the Stone's for dinner have overstayed their welcome by one in the morning. Allison is surprised when the doorbell rings and two military officers are standing at her front door. They request to see her husband, Dr. Jeremy Stone, chairman of the Stanford bacteriology department. Stone comes to the door in his dinner-party tuxedo, and the officers inform Dr. Stone that there is a fire. To Allison's surprise, her husband acts as if he were expecting this news. He tells her he will be gone for an indefinite number of weeks. He leaves immediately with the officers, not even bothering to change out of his tuxedo or pack a bag. In the car, the officers hand Stone a file titled "PROJECT SUMMARY: SCOOP." Stone is unfamiliar with Project Scoop, but his thoughts drift back to the conference some years before, which began the chain of events leading up to this night.

In the summer of 1962, an English biophysicist named J.J. Merrick presented a paper at a biological symposium. It discussed the probabilities of first contact with an alien species. Merrick theorized that since most life forms on earth are simple organisms, like bacteria, it would be likely that the first alien species encountered by man would be a bacterium. Merrick was concerned with the possibility of plague resulting from such an encounter. His ideas are not taken seriously by many people, but the bacteriologist, Stone, takes them very seriously.

Stone is a Nobel Prize winning scientist, and his views on the subject are taken more seriously than Merrick's. Stone acts as an advocate for research into this possibility, and for government funded construction of a laboratory equipped to handle dangerous alien bacteria. His petition to the President results in project funding from the Defense

Department's Advance Research Projects List. The Defense Department allocates $22 million for construction of a special, isolated laboratory in Flatrock, Nevada. The Wildfire Laboratory consists of five underground levels connected by a central core. Each level is more sterile than the level above it, and lab personnel are required to undergo stringent decontamination and quarantine procedures before accessing the top secret Level V. The successful completion of this laboratory two years ago left Stone satisfied that his country now had "the capability to deal with an unknown biologic agent." (page 43)

What Stone does not know is that Washington's willingness to allocate funds for the Wildfire Project is directly related to the top-secret government Project Scoop. On an empty Boeing 727, which the military uses to transport Stone to the Wildfire lab, Stone is given the Project Scoop file. He discovers that Project Scoop, funded by NASA, is a military initiative designed to send small satellites into space with the hope of obtaining samples of alien bacterial life. Scoop is the government's attempt to engage in germ warfare by finding and utilizing alien bacteria against which America's enemies would have no defense. The Scoop satellite, which landed in Piedmont, is the seventh such satellite to be sent into space under Project Scoop. It is the first to offer promising results for bacteria and germ warfare.

During the flight, Stone's reading is interrupted by a telephone call. He is informed that the other members of the Wildfire team have also been alerted. Everyone, with the exception of Professor Kirke, who is currently hospitalized, will be joining Stone at the Wildfire laboratory. Stone thinks about the other members of the team. He has confidence in all of them, except Dr. Mark Hall. Defense Department officials who believe in The Odd Man Hypothesis have chosen Hall, against Stone's better judgment.

Mark Hall is called to Project Wildfire moments before he begins surgery on an already anesthetized patient. Peter Leavitt, the chief of bacteriology at the hospital where Dr. Hall works, is also a member of Project Wildfire. It is Leavitt who informs Dr. Hall that he must drop everything and go the Wildfire lab. Leavitt assures Hall that a back-up surgeon is already en route to handle the patient's procedure. To Leavitt's annoyance, Hall has never taken his commitment to Wildfire seriously. Hall had believed the whole project was theoretical and never expected to actually be called. Now, Hall regrets having turned down Leavitt's previous attempts to keep him up to date on the project status.

Leavitt, on the other hand, has long been fascinated with Wildfire and is excited to be leaving his normal hospital routine to work on such an exciting and important project. Impatiently, Leavitt instructs Hall to read the project file before arriving at Wildfire. Hall asks about the other team members, and Leavitt informs him that Kirke is in the hospital, but that Jeremy Stone and Charles Burton are at this moment in a helicopter above Piedmont, Arizona, already at work containing the wildfire. As Leavitt and Hall get into the Army sedan waiting to take them to the airport, Hall notices that Leavitt turns his head away from the flashing lights on top of the sedan.

Chapter 6: The K-4 jet helicopter, containing two scientists and a pilot, lifts off from a maximum-security hangar at Vandenberg. All three men wear environmental suits looking like puffy space suits. One of the scientists is Dr. Charles Burton, professor at Baylor Medical School and consultant to NASA's Manned Spaceflight Center in Houston. Burton's specialty is the effects of bacteria on human tissues. Burton is a pioneer in his field. Due to the apparent effectiveness of penicillin, most scientists had avoided studying the mechanisms of action of common bacteria like *Staphylococcus aureus*. However, when the first strains of penicillin resistant bacteria began to surface, Burton's work suddenly took on major importance. Burton looks the part of the absent-minded professor with his sloppy clothes and untidy hair.

Sitting across from Burton in the helicopter, Dr. Jeremy Stone tries to conceal his distaste for Burton's careless appearance. Underneath his environmental suit, Stone still wears his tuxedo from the dinner party. They discuss the fifty bodies awaiting them at Piedmont. Their working hypothesis is that the deadly virus, or whatever it is, must have transmitted itself through the air. They study maps of wind direction and population density as they consider how far this airborne organism may have spread. As they fly over the town, the scientists notice buzzards on the ground, eating the bodies. They order the pilot to drop gas canisters, and he does so, killing hundreds of birds. As Stone looks down on the dead birds, something nags at him. He thinks these birds are providing him with some clue, but he cannot figure it out yet.

Chapter 7: The helicopter delivers Burton and Stone to Piedmont approximately twelve hours after the deaths of the reconnaissance men, Shawn and Crane. The men notice that the town is completely cloaked in silence. "They knew, in fact, only two things. First, that the trouble apparently began with the landing of Scoop VII. Secondly, that death had overtaken the people of the town with astonishing rapidity. If it was a disease from the satellite, then it was like no other in the history of medicine." (page 65) They observe that the dead townspeople had, for some reason, come out into the middle of the street in their pajamas to die. Many of them died while clutching their chests, which would indicate a heart attack; however none of the bodies wear the pained expression that usually accompanies death by sudden heart attack. It is as if death came even too suddenly for pain; the corpses wear looks of surprise.

The two scientists deduce, given the lack of pain, that the corpses were clutching their chests because they couldn't breathe. Yet this makes no sense, either, because none of the dead people made any attempt to loosen their ties or constrictive clothing, the typical instinctive response when one's breathing becomes difficult. When they find Shawn and Crane's bodies, they notice another irregularity. Shawn's body had pitched forward at the time of death, causing him to cut his face deeply. However, there is no blood around the wound. Suddenly they realize that none of the bodies have bled, not even the corpses partially chewed by the vultures.

Stone and Burton remove the dead bodies from the reconnaissance van and gas up the vehicle. They switch on the satellite sensors and drive toward the signal. The signal leads them to a building that is both residence and office for the small town doctor, Alan Benedict. They find Dr. Benedict's corpse in his study, where he had apparently pried

open the Scoop satellite with pliers and a chisel. They slip the small satellite into a sealed container and move to examine Benedict's body. Undressing the corpse, they notice a complete lack of post-mortem lividity. Lividity is the phenomenon of blood accumulation in the tissues caused by gravity after death. Normally, for example, someone who dies on his back develops livid purple skin on his backside where the blood pools up after the heart stops pumping. Dr. Benedict had died sitting up, and should show lividity in his buttocks and thighs, yet his skin is completely pale. Burton cuts into Benedicts blood vessels with a scalpel. Inside them they find that the blood has completely coagulated; no longer liquid, it resembles a red sponge.

The men carry the satellite with them, as they search the other homes in Piedmont. In most of the homes, they find people cut down in the middle of everyday activities. However, they also find several suicides, which indicate to them that not everyone died instantaneously after all. The suicides are all unusual in nature, and suggest that those who survived the initial exposure had gone stark raving mad. To their surprise, they find a squalling infant in one of the houses. The men return to rendezvous with the helicopter carrying the infant and the satellite.

Burton ascends the ladder to the helicopter first. An old man wearing a white nightgown accosts Stone, still on the ground. The man identifies himself as Peter Jackson and begs Stone not to kill him. They realize he must be the man captured on film by the Scavenger plane cameras. Jackson vomits blood and passes out; they use a power winch to hoist the unconscious man aboard the helicopter. The pilot establishes radio contact with Major Manchek to report successful retrieval of the Scoop satellite and to request that Manchek order up a directive 7-12.

Chapter 8: Directive 7-12 is part of the Wildfire emergency protocol. The directive calls for a limited thermo-nuclear strike to sanitize an area contaminated by exogenous organisms. The function of the bomb is to cauterize the infection and prevent its spread. The President has taken a great deal of convincing to accept directive 7-12 and insists that final authorization rest with him. The four scenarios which could lead to directive 7-12 are: 1, a contaminated American spacecraft lands in an unpopulated area of the United States; 2, a contaminated American spacecraft lands in a major American city; 3, a contaminated American spacecraft lands outside the United States but in a neutral country; and 4, a contaminated American spacecraft lands outside the United States in an enemy country, like the Soviet Union.

Protocol calls for the Russian government to be informed in the first three scenarios. Russian notification has been considered for scenario four, in order to allow Russia to cauterize its own territory with their own nuclear weapons. Ultimately, for political reasons, it is decided that if a contaminated American spacecraft ever lands in Russia, the Russian government will not be informed. All of the experts project that scenario number four will lead directly to nuclear war with Russia; therefore it's best not to notify them, even if thousands of Russians might be killed by the alien bacteria.

Now that Major Manchek has called for a directive 7-12 over Piedmont, Arizona, the scenarios are no longer theoretical; they have become very real. The President of the

United States decides to postpone Manchek's request for forty-eight hours. Instead of authorizing directive 7-12 immediately, the President orders the National Guard to cordon off the area until further information about the nature of the infection can be gathered.

Chapter 9: Dr. Mark Hall sits in the cramped rear of an F-104 fighter jet that takes him to the Wildfire lab. He struggles to read the top secret Wildfire file; there's barely room to open the file in the tiny confines of the F-104. The file is 274 pages long and consists of mostly unintelligible military speak. Mark Hall is able to make out the general specifications of the lab construction. He then reads about the time-consuming progressive decontamination process, which he and the other scientists will have to undergo in order to descend from Level I to Level V. He also learns that the facility is equipped with a nuclear self-destruct device. Something called the Odd Man Hypothesis is referenced, but the page that describes it has been deleted from Mark's copy of the file.

Chapter 10: Dr. Hall lands in Flatrock, Nevada shortly after noon. Leavitt meets him with a light blue sedan and drives him down a desolate dirt road towards the Wildfire facility. En route, Hall asks about the nuclear self-destruct device, and Leavitt confirms its existence. However, when Hall asks about the Odd Man Hypothesis, Leavitt postpones answering him. They pull up to the entrance, which is marked only by a weather-beaten sign that says, "GOVERNMENT PROPERTY KEEP OFF." (page 91) Leavitt informs him that there are high security measures protecting the installation; however, they are well-hidden to avoid arousing public suspicion. The Wildfire lab, on first approach, looks like a wooden utility building surrounded by a field of corn and enclosed by a barbed wire fence. The corn, Leavitt explains, is part of an agricultural study. Wildfire is designed to look like a desert reclamation test station, and it actually does function as an agricultural station. Experiments are underway to develop strains of corn which will grow in inhospitable soils like the surrounding desert. The entrance to the Wildfire lab is hidden inside a storage closet.

When Leavitt and Hall step inside the storage closet, Hall realizes the closet is actually an elevator. The elevator descends into the ground. When they exit, Leavitt instructs Hall to place his hands on a glowing green glass podium. The machine scans his fingerprints and allows him access. Leavitt and Hall enter a locker room where they leave behind their civilian clothes and put on loose fitting, one-piece pink uniforms. As they move down the hallway, an alarm sounds, and a white light flashes. Hall notices that Leavitt, again, looks away from a flashing light. Leavitt realizes that Hall has not removed all of his civilian items; his wristwatch has triggered the alarm. Hall removes his watch and this time the men are allowed to enter through a doorway that opens automatically.

Inside Level I, Leavitt explains that each Level is color-coded. The walls in Level I are red. A door leads them into the Immunization Control room where Hall is subjected to an automated, full body computer scan. The computer asks him questions regarding his medical history, and scans him for everything from fungus to warts. Hall speaks flippantly to the computerized voice and the computer admonishes him for wasting

valuable time. Subdued, Hall allows himself to be immunized by a pneumatic gun that snakes out of the wall, attached to a thick cable. The computer instructs him to dress and exit the room.

In the hallway, Hall meets up again with Leavitt, who has just completed his own computerized immunization. Leavitt explains to him that the machine he just encountered is an electronic body analyzer developed by the government. Eventually, the government intends to replace the human physician with this automated diagnostic machine; however, there will be certain difficulties for both doctor and patient in adjusting to this new technology. They pass other people wearing pink uniforms in the hallway, but Leavitt and Hall don't see their own team members until they enter the conference room. Stone and Burton await them inside. Stone hands Hall a red key and tells him to wear it around his neck.

When Hall expresses confusion as to the purpose of the key, Leavitt admits to Stone that Hall has not yet been informed about the Odd Man Hypothesis. In response, Stone takes out a silver key and inserts it into a console. He advises Hall that he has just armed the atomic self-destruct device. Stone further explains that Hall's red key is the only thing which can prevent the device from going off in case of emergency. If the extraterrestrial pathogen escapes its containment field and contaminates the lab, the self-destruct sequence will automatically initiate. Dr. Hall will have exactly three minutes to insert his key and stop the lab from self-destructing.

Hall asks why this power has been granted to him. Stone gives him the page about the Odd Man Hypothesis, which had been removed from Hall's copy of the Wildfire file. Hall scans it and discovers that a series of government tests supports the theory that single males perform better under pressure in making life or death decisions than married males or married/unmarried females. Hall discovers that he, himself, had been tested for such effectiveness when first recruited for the Wildfire Project. He had scored highest among the team members in effective life or death decision-making. Hall is the only single male on the Wildfire team, and as such, has been given the responsibility of aborting a nuclear self-destruct.

Chapter 11: In the conference room, Stone begins the formal briefing. He explains that they are on the top level of a five level underground structure. It will take the scientists nearly twenty-four hours to undergo the contamination procedures required to descend all the way to Level V. He turns on a television monitor and shows the men that the Scoop satellite is already on its way down to Level V through the central core of the building connecting to each level. Stone tells them about Peter Jackson and the infant, who survived the deaths at Piedmont. Both survivors await them in a clinic on Level V. Stone tells them that a directive 7-12 has been called, and by now the town of Piedmont will have been destroyed by a nuclear blast.

The men leave the conference room and proceed through a door marked "TO LEVEL II." (page 108) Inside the door, they strip off their pink uniforms and drop them in an incinerator. Hall notices that the door they just passed through contains a sign indicating that return to Level I is not possible through that door. The men move through a series

of steam and shower rooms that bathe them in unknown disinfectant chemicals. Leavitt discusses the planning problems inherent in disinfecting "the human body - one of the dirtiest things in the known universe - without killing the person at the same time." (page 110) In the final room through which they pass, the men put on yellow uniforms before entering yellow Level II.

On Level II, the men face a similar decontamination procedure, but even more stringent. Their uniforms are again incinerated, and the men must swim through an underground total-immersion chemical pool to reach the long-wave radiation bathroom. On Level III, four nurses await them. They are each escorted to an examination room to be quite thoroughly checked out by a physician. Hall's physician is so cold and detached, that he thinks he would prefer another machine. On Level IV they face four total-immersion baths, ultraviolet and infrared light showers, and ultrasonic vibration decontamination.

The final challenge is an ultraflash skin burn, which turns the outer skin layers into ash; Hall is protected through this process only by a helmet that covers his head. When they exit the Level IV decontamination, the men find green uniforms to match the color of the walls. Hall begins to feel disoriented as he is subjected to another thorough round of physical examinations and tests. Stone informs the men they must wait six hours before proceeding to Level V. He schedules a conference in five hours time and suggests they get some sleep in the meantime.

Hall quickly falls asleep in his room. Burton lies awake on his bed, considering the implications of the total blood clotting he and Stone found in the Piedmont victims. His complex, technical train of thought eventually fatigues his mind into sleep.

Meanwhile, Leavitt also lies awake reviewing the protocols he personally put into place for Wildfire. The first goal of Wildfire is to isolate and identify the causative organism. The steps he designed to accomplish this involve examining the capsule closely and taking lab cultures from it. The cultures are grown in the lab and experimented upon to find out the organism's mechanism of action. It appears at this early stage that the organism kills by clotting the blood; "if that turns out to be the case, they had a good start, but if not, they might waste valuable time following it up." (page 115)

Leavitt thinks about cholera. Long ago, doctors knew that severe diarrhea was a symptom of cholera, and they knew cholera was a fatal disease. They didn't know, however, how cholera caused death. Much money and time was wasted trying to find a cure for cholera. Eventually, scientists realized that the symptom, diarrhea, was also the cause of death. The extreme dehydration, which accompanies the violent diarrhea, killed the patients. It was simply lack of water. Modern doctors know giving a cholera patient plenty of water enables the patient to survive the infection. "Cure the symptoms, cure the disease." (page 115) Leavitt wonders if they can cure the Scoop organism disease by treating the blood-clotting symptom. Or, perhaps the clotting is only a secondary symptom and not the mechanism of death. In another room, Dr. Stone lies abed wondering how the others will react to the news of the meteorite.

Meanwhile, in Delta sector on Level I, a man sits before a giant communications console. His job is to monitor all incoming communications and inform the Wildfire team of any important developments. He is notified each time a new communication comes in by a bell on the teleprinter. If the computer malfunctions, he is to report that as well. The communications computer appears to be functioning perfectly. According to the self-checks, it performs every twelve minutes. The man has no reason to imagine anything is the matter.

Part 2 Analysis

Humanity meets technology on Day 2 of this adventure, as the main character, Mark Hall, is subjected to increasing indignities against his person in the name of science. The theme explored in this section relates to the rising fear in the mid-twentieth century that mankind would become slaves to technology. Science was developed with the ideal of putting technology to work for mankind, but the clinical, sterile, even hostile nature of many early scientific experiments caused societal alarm. Many feared then, and continue to fear now, that the human touch may be lost under the stranglehold of technology. Certainly, science has the potential to empower or to enslave humanity, but the choice is up to society. Current controversies; such as debate over fetal stem cell research, echo the concern which Michael Crichton voices in *The Andromeda Strain*. Fortunately, as the author will eventually conclude in his novel, the human spirit will not be denied.

Technology in service of humanity is the most likely outcome of scientific advance, because ultimately human beings drive the technological advances by their power of choice. Especially in the United States, consumers decide what technology is worthy of purchase. Crichton illustrates this point in Chapter 10, when Hall and Leavitt discuss the machine invented to provide computerized physical exams. The machine is designed to replace doctors, and is even capable of making diagnoses on the basis of test results. Yet, it has not been put into practice out of deference to likely objections from patients who would much prefer to be examined by a human being.

Crichton underscores the public's darkest fears when his narrator informs the reader that the government plans to gradually introduce the machine to the public. This attempt to remove the element of choice from society mirrors the fears many people in the late '60s that powerful corporations or governments could misuse the power of technology. Many thoughtful novel and film writers voiced their concerns over the technological assimilation of society, and continue to do so today. From Stanley Kubrik's sterile vision of 2001 to Star Trek's evil Borg machines, science fiction writers have addressed the consequences of scientific hubris for decades. Some frightening technologies have indeed been developed over the years, as well as plenty of useful ones, but technology is neither inherently good nor evil. The men and women who put it to use drive it. This is what occupies Michael Crichton. Who are the men behind the Andromeda crisis? What can society learn from their mistakes?

Crichton makes Mark Hall his protagonist, because Hall is the most human of the four team members. Hall reacts to the Wildfire environment with a skeptical lack of trust that anyone might feel while being poked and prodded by computers, which do not bother to explain why or what they are doing. He does not care for the Big Brother-like anonymity of the computer voices, and insists on speaking like a real person rather than spitting out the pre-programmed yes or no answers the computer expects to hear.

The process of "decontaminating" the body is almost inherently self-hating. It is as if Jeremy Stone, who designed the Wildfire decontamination process, believes human bodies are loathsome and dirty. In order to enter his pristine biological environment on Level V, the men must coat themselves with toxic chemicals and even burn off the outer layer of their skin. The process was not designed with human comfort in mind; in fact, Stone's design rather treats human beings as if they were an unwanted infestation in his laboratory. Later in the book, Crichton will discuss Jeremy Stone's self-hatred; for now, it is visible in the nature of his creation, the Wildfire lab. Dr. Hall, for all of his human faults, is a breath of fresh air in this otherwise sterile environment, an environment completely hostile to the needs of mankind.

Part 3

Part 3 Summary

Chapter 12: A seductive, female voice wakes Mark Hall from his sleep. He asks who is speaking, and the sensual voice repeats its message: "Time to wake up, sir." (page 121) He looks around the room, but he is alone. He asks the woman her name, and she again repeats her message. He notices a blinking light on his nightstand and pushes the button next to it; this time when he speaks, the voice does not respond.

Hall wonders how the system works; it is obviously interactive since the message repeats in response to his voice. To test his belief that there is a human being on the other end of this wake up service, he pushes the button on his nightstand again. The woman's voice asks him if he needs anything. He asks her to tell him his name. Moments later, a man's voice addresses him. He introduces himself as the answering service supervisor, and tells Dr. Hall that he ought to take this project more seriously. Hall laughs and apologizes, explaining he was only curious how the system works, and to whom that luscious female voice belongs. The supervisor dryly explains that the voice has been pre-recorded by a sixty-three year old woman who lives in Omaha, named Gladys Stevens.

Disappointed, Hall leaves his room and heads to the cafeteria, where he finds Leavitt. The two of them drink a glass of dark brown juice, which tastes like orange juice but contains all the nutrients needed to sustain a man for eighteen hours. He and Leavitt finish off their meal with a couple of vitamin pills and black coffee; not even sugar is allowed on Level V, because it might provide a growth medium for bacteria. Before they head to the conference room, Leavitt hands Hall a suppository designed to sterilize the GI tract.

In the conference room, Stone talks about a man named Rudolph Karp. A Hungarian-born scientist, Karp came to the United States in 1951. He worked quietly for several years before publishing the results of his studies on meteorites. His goal was to determine, indisputably, whether bacteria and other tiny life forms discovered on meteorites came from outer space, or if earth organisms had simply contaminated the meteorites. There was a great deal of scientific prejudice at the time against the idea of life forms from outer space. Karp's publication came out about the same time that several other scientists were publishing on similar subjects, and the academic community met all of them with ridicule. However, a handful of scientists from various countries were intrigued by Karp's careful work. Jeremy Stone and Peter Leavitt were two of these interested men.

Stone and Leavitt are aware that prejudice and preference within the scientific community can cause scientists to reject valid ideas out of hand. Leavitt himself had developed the Rule of 48, which he states as "All Scientists Are Blind." (page 125) He coined the phrase based on science's once irrevocable conclusion that the human body

contains forty-eight chromosomes. Studies were made and pictures taken which confirmed that the body has forty-eight chromosomes. Several years later, it was discovered that the body only has forty-six chromosomes. Scientists took new pictures confirming this discovery, and when they went back to those earlier pictures, they realized that the early pictures only showed forty-six chromosomes all along. Hence Leavitt's Rule of 48 signifies his belief in keeping an open mind to ideas like Rudolph Karp's.

Leavitt and Stone had designed the Vector 3 Wildlife Protocol with this same openness to new ideas. In the past, the argument was whether organisms found in meteorites came from alien life in outer space or from the earthmen who found the meteorites. Leavitt and Stone conjecture that there is a third possibility, one that is more likely than the first two. The organisms find their way onto the meteorite in outer space, but that does not make them alien life forms. They could just as easily be earth organisms that have made their way into space. Leavitt and Stone believe that any such earth organisms will have adapted in space, away from earth and its environs, into totally unfamiliar organisms, for which earthmen will have no natural defenses. Yet, ironically, despite this theory and their commitment to remaining open-minded, the entire Wildfire team rejects the possibility of mutated bacteria being the source of the Scoop contamination. They all believe, to a man, that the mystery organism they have come to investigate is an alien life form.

Stone hands the team members a file containing a transcript of the Scoop VII launch. Shortly after settling into its orbit, ground control systems showed that the satellite's orbit had suddenly decayed. It had fallen out of the sky for no apparent reason. The only logical conclusion was that the satellite had hit something in its path that knocked it out of orbit. Mission control showed no American satellites in the vicinity. Therefore, the satellite had either hit a Russian satellite, or it had collided with a space meteor of some sort. Leavitt interjects the possibility that Scoop had collided with an alien vehicle or alien space debris. The men acknowledge the possibility, but they believe a meteor is the most likely source for the collision. A gong sounds and the pre-recorded voice of Gladys Stevens tells the men it is time to proceed to Level V.

Chapter 13: Level V is blue. Like the other levels, it is circular and surrounds the central core of the underground structure. They will live and work on this level until their mission is completed. Burton gives Hall the tour and explains that the laboratories and equipment rooms that they will be using for their work are sealed away inside the central core. From outside the sealed perimeter, the men will access the isolated core where the contaminated satellite is kept through the use of glove boxes. The men will insert their hands into gloves, which reach into the rooms.

There are also mechanical hands in some of the rooms, which the men can manipulate from an external control room. Most unusual is the full body "glove box," which Hall will use to examine the two living survivors. Both Peter Jackson and the baby are being kept inside the central core, in a hospital-type room. The room contains four standing space suits. Each suit has a tunnel leading back out to the sealed off external ring of rooms where the men live and work. The tunnels look like fat tails, and allow the men to

crawl into the space suits so they can stand and work in the examination room without exposing themselves to the air inside it.

The four men join up at Central Control, a glass-walled room filled with equipment. Through the glass, the men can see the Scoop satellite inside the central core. Hall is surprised at how small the satellite is; it resembles a metal football of a yard long. Stone uses a set of controls, which look like brass knuckles, to manipulate the metallic hands inside the sealed room with the satellite. He opens up the satellite, then, at Leavitt's suggestion, uses the metallic hands to place a black Norway lab rat into the room with the satellite. The metal hands select the appropriate animal cage from behind a sealed glass wall of cages with individual doors; the concept reminds Hall of a vending machine.

The narrator digresses into a discussion of the suitability of various animals for scientific experimentation. Black Norway rats have been bred over the years into homogenous, white-furred specimens not subject to inter-species differentiation. In other words, all black Norway rats are physically alike. A scientist in Europe will get the same results from his rat as a scientist in the United States or Russia. Scientists thus prefer to use this species because it makes it easier for other scientists to reproduce their work and achieve the exact same results. Monkeys are preferred animals, too, because of their similarity to human biology, especially the chimpanzee, which is the closest genetically to man. Hamsters, however, respond more like humans when it comes to immune system and cancer studies. Pigs react most like man does to heart and cardiovascular studies.

Stone deposits the lab rat into the room, and it is dead within seconds. They repeat the experiment with a rhesus monkey, but this time they set up a tracer scan to record the monkey's biological functions in milliseconds. The monkey flings a hand to its chest and dies with a startled expression, just like the residents in Piedmont. Burton volunteers to do the autopsies on the animals. With the push of a button, the dead animals are moved along a conveyor belt towards the autopsy room in another part of the building, but still within the central core. Burton leaves. Stone and Leavitt decide to perform a microscopic scan of the satellite capsule, and Hall heads off to examine the two surviving patients.

Chapter 14: Hall enters a room marked "MISCELLANEOUS." It is set up for contingencies and now houses the survivors. He finds himself in a room much like Central Control with a glass wall, but this room is smaller and looks into a central room that contains two beds and hospital equipment. Karen Anson, Hall's new assistant, is already in the small control room. She explains how the computer works, and Hall uses it to order fifteen or twenty lab tests for the patients. The computer screen advises him how much blood and urine are needed from the patients in order to perform the tests. Karen shows Hall how to crawl through the tunnels into the space suits inside the central room.

Working inside her space suit, Karen draws the requisite blood from the infant and Peter Jackson, who appears to be comatose. Hall crawls into a space suit and turns his

attention to Mr. Jackson. The old man is pale and thin; Hall figures he is probably anemic and has some kind of chronic condition as well. Hall tests the old man's reflexes, and Jackson responds physically. Thinking the old man might not be unconscious after all, Hall shouts his name several times. After a moment, Jackson opens his eyes and tells Hall to go away. He lapses back into an unresponsive state. Hall performs a physical exam on him and discovers blood in his stool. He tells Karen that Jackson has some gastrointestinal bleeding, and orders her to give him a whole blood and plasma infusion right away. Next, he examines the infant. It is a difficult half hour, because the baby squalls and screams and is generally uncooperative. The baby's exam and lab results all come back in the normal range. There is nothing at all wrong with the child.

Chapter 15: In the Central Control room, Stone and Leavitt conduct a painstaking examination of the satellite capsule using a mechanically manipulated microscope. Each time they raise the magnification, they must wait patiently while a black box moves slowly above the surface of the capsule, transmitting images. It is an extremely time-consuming process, and both men are needed to watch the magnified video feed because one man alone could easily get tired and miss something. They are looking for a trace of the meteorite which they think hit the capsule, and they are looking for the organism itself, any kind of bacterial growth which they might find on the capsule.

Their search of the capsule's exterior produces nothing. However, when they scan the interior, they find "a tiny black fleck of jagged material no larger than a grain of sand." (page 153) They see bits of green mixed in with the black fleck. Realizing they may have just discovered alien life, the men react calmly and professionally, although on the inside, they are both astounded. They patiently continue their scan and find two other areas of green. At a higher resolution, the men are able to see that the black fleck is a piece of rock. They believe it is the meteor that hit the capsule, but they cannot be sure. One of the rock's edges is perfectly straight, like an artificial or man-made surface.

The green flecks prove to be more exciting under high resolution. The patches are hexagonal and notched. The notches make them look exactly like little green gears. To the men's shock, the green spots turn purple and grow a bit larger, then turn green again as they watch. Quickly the men use the metal hands to swab cultures of the green and black flecks. They place the cultures into petri dishes containing a variety of growth media. The computer then assigns the petri dishes to different growing environments; each dish receives a different combination of light, atmospheric pressure, and temperature settings. Leavitt and Stone must now wait twenty-four to forty-eight hours to view the results of the growth cultures.

Chapter 16: In the autopsy room, Burton works on the dead lab animals. Unfortunately, his tension and nerves, resulting from his gruesome trip to Piedmont, cause him to make several errors. Before he performs the autopsies, he is asked to carry out some vector experiments to determine how the mysterious disease is transmitted. To accomplish this, Burton lines up several animal cages. The cages are designed to provide a separate air supply to each test animal, but Burton has the ability to

interconnect their air supply as needed. The corpse of the dead Norway rat is placed in a cage next to the cage of a living rat.

Burton connects their air supplies, and the living rat immediately dies. He puts another live rat into a cage alongside the dead Norway, but this time before connecting their air supplies, he installs a Millipore filter between them. The filter has tiny perforations that will allow something no bigger than a small virus to pass through it. He connects the air supplies and the living rat remains alive. Burton changes out the filters using filters with progressively larger perforations until the living rat finally dies. The filter that allows the unknown killer to pass through it contains openings about the size of a small cell. With these vector tests, Burton is able to determine that disease transmission is airborne, but he also rules out the possibility that it is a gas, a virus, or a chemical molecule. Based on the air filter size, the agent could only be a larger molecule like a bacterial cell.

Next, Burton purges the air from the dead Norway's cage, then, connects the air supply between it and another live animal. Nothing happens. This tells Burton that the dead bodies themselves are not contagious, only the air surrounding them transmits the disease. His next step is to determine the entry point of the disease into the body. He infuses a rhesus monkey with radioactively tagged blood proteins before exposing it to the virus in order to track where the blood clotting begins. The resulting scans tell him that the clotting begins in the lungs then progresses to the brain; therefore, the disease must be inhaled. Burton then gives some live rats an anti-coagulant to prevent blood clotting. The rats live longer, but still succumb to the disease. He makes a crucial mistake by neglecting to autopsy the rats given the anti-coagulant; Burton does not realize his mistake for another forty-eight hours. He autopsies only the first two animals killed and learns nothing new.

Chapter 17: Mark Hall examines the lab results from Peter Jackson and the baby. The baby is within normal limits for every test. Peter Jackson, however, has several medical issues. His anemia is a result of on-going blood loss from his GI tract. His bloodwork shows continued improvement as Hall continues to give him whole blood transfusions. Hall believes Mr. Jackson is comatose, but the computer informs him otherwise. An EEG shows alpha waves consistent with regular sleep patterns. Hall crawls back through the tunnel into his space suit and wakes up Mr. Jackson. Jackson is not surprised to find himself in a hospital; he informs Dr. Hall that twice before he has passed out and wound up hospitalized with an ulcer, which he has had for two years. Mr. Jackson has ignored his doctor's dietary restrictions and has refused to allow the surgeons to operate on his ulcer. Jackson tells Hall that he has his own home remedy for the ulcer that works better for the pain than anything the doctors have suggested. Jackson takes nearly a bottle of aspirin a day and sips from a can of Sterno that cuts the pain. Dr. Hall warns him that the Sterno is dangerous, and that large amounts of aspirin can actually exacerbate the stomach bleeding. Both of these home remedies combined explain the lab results that show Jackson to be suffering from acidosis, or excess acidity in the body. Hall allows Jackson to drift back to sleep, then joins the others in the conference room.

In delta sector on Level I, Captain Morris checks for computer malfunctions. He is suspicious, because the bell has not rung for some time to signal an incoming communication. It seems unlikely that no messages have been sent to Wildfire in the last nine hours. However, the computer system checks out and Morris leaves, satisfied. He fails to notice the problem with the printer paper. A jam has lodged in between the bell and the striker, physically preventing any incoming messages from being printed.

Chapter 18: The conferences are held every twelve hours, as mandated by protocol, in a room off the cafeteria allowing the scientists to save time by eating and talking simultaneously. Their meal consists of a glass of nutrient fortified liquid and three pills. Burton speaks first, advising the others that the size of the lethal agent is one micron in diameter. He also explains that the agent is airborne, that coagulation begins in the lungs, and that anti-coagulant drugs were ineffective against it. Hall speaks next, piquing everyone's interest, when he tells them he was able to talk with Peter Jackson. When he explains about the aspirin and Sterno, the other men realize Jackson must be highly acidotic. They wonder if the high acid levels in his body protected him from death. However they are stymied when Hall reports that the infant's acid levels are perfectly normal. The team members decide that Hall must figure out what the old man and the infant have in common which protected them both from death.

Stone and Leavitt lead the others into the Morphology room and show them the petri dishes containing the black rock and the green substance. They explain that the rock is the meteor, and that the green substance was found growing upon it. They project the green substance through a microscope lens and the others watch in fascination as it turns purple and grows right before their eyes. Everyone notices the hexagonal shape; they wonder if it represents a single unit of the organism or if the six-sided shape only appears when many units link together. They decide to perform microsurgery and divide the already tiny green pieces into tinier units for study.

Chapter 19: Major Arthur Manchek receives a disturbing telephone call at his home. A pilot on a training flight has crashed after going off course and flying through Area WF. Area WF is the code name which refers to the cordoned off area surrounding the town of Piedmont. Manchek agrees to meet the accident investigation team right away. After hanging up the phone, he thinks furiously to himself that Piedmont should have been destroyed by a nuclear bomb two days ago as Stone and Leavitt had requested. Manchek has no official position to contest the President's decision to delay directive 7-12. He has been counting on the Wildfire scientists to offer a vigorous protest, but the scientists have made absolutely no response to the top-secret message informing them of the delay.

On the flight from Vandenberg to the scene of the crash, Manchek hears the recorded transmissions from the final seconds of the training pilot's life. The pilot reports that everything made of rubber in his cockpit is dissolving. Manchek asks if Wildfire has been informed, and is assured that a priority message was sent an hour ago. Manchek is stunned that they haven't responded yet. It occurs to him that the scientists are for some reason not checking their messages. At the wreck site, Manchek surveys the twisted, burnt remnants of the plane. He finds a human bone amidst the wreckage.

Disturbingly, there is no skin on the bone, but the bone is smooth and white, not charred as if the skin had been burned off. A member of the investigation team informs him that, ironically, despite the pilot's final message, there was nothing made of rubber in the cockpit. Every rubber-like object on the Phantom airplane had actually been composed of a new synthetic plastic polymer. The polymer is very flexible and shares many similar characteristics to human skin.

Chapter 20: Burton mans the spectrometer on Level V. It consists of a vaporizer, a prism and recording screen. Burton places a chip from the black meteor rock into the vaporizer. The light spectrum it gives off when it burns up is shown by the prism and tracked on the recording screen. Since different chemical elements give off different wavelengths of light when they burn, the spectrometer will allow Burton to determine the chemical composition of the rock. Next, he drops in a piece of the green substance and vaporizes it. Burton must now wait two hours for the computer to report the results.

Meanwhile, in another room, Leavitt feeds similar chips into an amino-acid analyzer. Amino acids are the building blocks of protein. These protein chains form all of human life by forming DNA strands. The amino-acid analyzer will not provide the order of the amino acids on the protein chains, but it does report an overall percentage of amino acid composition. Life on earth requires protein. Proteins also form enzymes, which allow for chemicals to react with one another. Without chemical reaction, there is no life. Or is there? Leavitt wonders if the alien life form requires protein to survive. Leavitt reflects on the definition of life. Scientists have long struggled to come up with a workable definition that fits all life forms. To date, they have failed.

Meanwhile, Jeremy Stone works to embed fragments of the green material in a plastic capsule the size of a small pill. Once the plastic hardens, he will be able to shave away a thin enough piece of the green matter to observe it under an electron microscope. As Stone works on producing this tiny sliver, he feels grateful for the fact that he has all the time in the world to complete his experiments. With Piedmont nuked out of existence and the Wildfire lab safely contained, there is no immediate danger to humanity from the alien killer.

On a related note, Mark Hall, The Odd Man, walks the hallways trying to memorize the locations of the atomic detonator substations. There are five of them on Level V. In order to deactivate the atomic self-destruct device, Hall will have to reach one of these substations and insert his key. The steel key he wears around his neck is conductive, and all five locks into which it can be inserted contain a system to measure the capacitance of the person holding the key. It can measure body size, weight, and the salt content of sweat. The locks are specifically designed to operate only if Mark Hall himself inserts the key. Hall takes this responsibility very seriously, and is chagrined to learn that during construction, three substations were left off in error. If the auto-destruct is initiated, all eight sections of Level V are sealed off to prevent contamination spread. Since only five of the sections have a substation, there is a chance Mark could be sealed off in a section without a substation and unable to stop the nuclear detonation.

Leavitt wakes up from a dream, excited. He dreamt of a house inside of a city. In the house, a man lives and works, moving about between home and the city during his daily routines. Then, in the dream, the city vanishes, leaving only the house. The man in his house is now cut off from the things the city formerly provided: water, plumbing, electricity, supermarkets, schools, drugstores, employment. Without the city, the house becomes a different organism altogether, isolated.

Leavitt makes a connection between his dream and the Wildfire organism. He dresses in a hurry, intent on informing Stone of his new inspiration. Before he can leave his room, however, Leavitt suffers a mild seizure and loses ten minutes of time. Distressed, Leavitt knows he should inform Stone of his medical condition, but Leavitt knows if it comes out, he will lose his job and will no longer be able to drive a car. He decides to continue to hide his condition. As long as Leavitt avoids looking at blinking lights, he tells himself, he will be all right. Leavitt finishes dressing, his dream forgotten. Meanwhile, Stone paces and thinks in his room. He feels like he is overlooking something important about Piedmont. Something Hall said during the conference reminded Stone of the birds in Piedmont, but he can't put his finger on what's bothering him.

Chapter 21: At midnight, the Wildfire team meets for another conference. Stone looks at the others in the room and realizes that none of them are getting enough sleep. He tells them that tired men make mistakes, and recommends everyone get at least six hours of sleep in a twenty-four hour period. As the meeting commences, Leavitt suggests they file for a code name now that they know they have discovered a new organism. They look to the scrambler typewriter in the corner of the room. It sends and receives messages, but until now the men have ignored it completely.

A long curl of paper streams from the machine, representing incoming messages. Had any of the messages been important, a bell would have rung on Level I, and the Level I technician would have alerted them to the important message. The men have received no such alerts, and so have ignored the routine transmissions coming regularly through the machine. Now, as Stone types out and sends a request for a code name, Burton glances over the scroll of previously received messages. Stone's reply comes back swiftly. The alien organism has been code named Andromeda. Burton's eyes go wide as one of the previously received messages grabs his attention. He shows it to the others. It is the notification about the President's decision to delay directive 7-12.

Horrified, the men call upstairs to Captain Morris in delta sector. The equally horrified Morris connects them to the head of the President's Science Advisory Committee, Mr. Robertson. A heated discussion follows as Stone reiterates that Piedmont and the Wildfire lab are the only two potential sources of contamination, and that Piedmont, unlike the lab, has no method for containment. Directive 7-12 is the only solution. Robertson sympathizes, but cannot overrule the President's decision. Stone tells Robertson that since they foolishly stationed National Guard troops around Piedmont, Stone wants to know when the first man dies, and where. Before they end the call, Robertson asks Stone what he thinks about the Phantom plane crash. The Wildfire team realizes they have missed yet another important transmission. Stone asks for

details as soon as the crash investigation team has them. The phone call ends, and the men leave the conference room. They do not notice yet another important message in the long scroll of paper. The missed message concerns the death of an Arizona highway patrol officer.

Part 3 Analysis

Part 3 moves from science fiction to the mystery story genre, as the scientists attempt to piece together the puzzle of Andromeda. The author explains the logical steps they must take, and provides the readers with enough clues to keep up with the scientist's deductions. Crichton ratchets up the tension by dropping ominous hints throughout the narrative. The narrator points out mistakes made by the scientists, but the reader can only guess at where those mistakes might lead. The fact that directive 7-12 was not carried out makes time a critical factor, yet the scientists work slowly and methodically, believing they have all the time in the world.

Other portentous facts are divulged, such as that several of the rooms on Level V do not provide access to a nuclear substation in the event Mark Hall has to use his key. The folly of trusting automated processing above human supervision is first shown by the printer jam, which cuts off the Wildfire team from important communications. As the book progresses, the reader will learn more about Jeremy Stone, and come to better understand why he would foolishly put his trust in automation rather than human judgment. Interestingly, both human judgment and computer automation prove to be fallible in this section. Stone's biggest mistake, then, was in believing he could create an infallible system in the first place.

The fundamental inhumanity of the Wildfire project is revealed through the treatment of both the human patients and the laboratory animals. Imagine Peter Jackson's reaction upon waking up to discover a government-issue doctor bending over him wearing a space suit. Dr. Hall tells Jackson only that he is in a government facility in Nevada. Apparently, it is not deemed important for Mr. Jackson to be made aware of his fate or his medical status. As the most human of all the characters, it is particularly chilling to the reader to witness Mark Hall's disregard for his patient, which is demonstrated by Hall's condescending arrogance when speaking to or about Peter Jackson.

Similarly, nobody bothers to administer care to the squalling infant. Hall is irritated by the baby's uncooperativeness when he examines the little boy, yet never spares a thought for the fact that the baby must be crying for its dead parents. Although both the baby and Jackson are administered nutrients and medical care, neither of them receives any human kindness. The laboratory animals are treated as objects, too. While it may certainly be necessary to use lab animals to study the life-threatening Andromeda, none of the doctors feel even a momentary twinge of guilt before killing the animals. All in all, the Wildfire Project seems quite out of touch with the needs of humanity.

The scientists involved in supposedly saving humanity from the Andromeda strain seem more interested in solving the puzzle for other motivations. Some of the men work out of sheer intellectual curiosity, and others, like Leavitt and Stone, for personal aggrandizement and career advancement. In any case, humanity's fate rests in the hands of men who have their own personal agendas, which they believe, are more important. Neither Michael Crichton nor his narrator explicitly verbalizes any indictment of the men's motivations; the author allows the reader to judge for him or herself. However, the picture painted by Crichton is not at all flattering to the institutions of science or government. The reader can hardly miss the irony that the government spent $22 million building a laboratory designed to protect humanity against the very biological weapons the government spent even more money importing from outer space. The existence of Project Scoop reveals the government's dishonest intentions for funding the Wildfire Project. The U.S. Army merely wants to use Wildfire to create and contain biological weapons of war. What's most striking about this revelation is that none of the scientists protest Project Scoop when they learn about it. The morality of cultivating biological weapons capable of killing thousands of people instantly is not accorded even one line of dialogue. The scientists are too busy trying to figure out how it works to waste time wondering why or if Project Scoop should have been sent into space to bring back lethal agents like Andromeda.

Yet, the scientists are not inherently bad men; in fact, their flaws are very human. They are heedless of many things because they are distracted by their curiosity and a passion for their work, traits which even the least scientifically minded reader cannot help but share as the crisis unfolds. The reader, caught up in the action, must root for the scientists and follow each new discovery with fascination. The pure joy of triumphing over one's environment is a pleasure long felt by human beings. As the dominant form of life on the planet, taming the world around him has long been mankind's special provenance. Medical science has achieved great gains for humanity, and in this section, it appears the Wildfire team will succeed in controlling Andromeda. Their calm, rational procedures work just as they planned, and the pieces of the puzzle begin to fall into place. The author has planted all his clues, and the solution seems to be on the tip of everyone's brain. Unfortunately, this optimism will ultimately prove to be short-lived.

Part 4

Part 4 Summary

Chapter 22: Now that they know directive 7-12 was not invoked, the men are under extreme pressure to come up with a cure for Andromeda. They rush to check the now available results from the spectrometer chemical analysis and the amino-acid analyzer. The spectrometer shows that the black rock contains hydrogen, carbon, oxygen, sulfur, silicon and selenium, with traces of other elements. This tells the team that it is not a rock at all. It resembles earthly organic life, and is also similar to the composition of plastic. The green spot contains hydrogen, carbon, nitrogen and oxygen in roughly the same proportions as 99% of earth life organisms. This is encouraging to the men, as it makes Andromeda seem rather similar to earth life in composition.

However, the amino-acid analysis tells a very different story. Neither the rock nor the green matter contains any amino acids whatsoever. Life on earth is predicated on amino acids. If this new Andromeda life form has none, the men are at a complete loss to explain how it works. Finding a cure, therefore, will take much, much longer.

Back in the Morphology room, Jeremy Stone slices a thin piece of the green material for viewing under the electron microscope. The electron scope allows much higher magnification than any other type of microscope, because it uses magnetic fields rather than light rays to view and enlarge objects. The down side to the electron scope is that it can only view material slices a few molecules thick. Because the viewing material is so thin, it is extremely difficult to "guess the shape and function of the full structure." (page 220) When Stone turns on the scope, he is amazed to see a perfect six-sided hexagon, interlocked with other equally perfect hexagons on each side. Andromeda looks like a crystal. Stone calls Leavitt in to consult. Leavitt believes that the crystalline hexagonal structure serves to separate the various life functions within the organism. Suddenly, he recalls his dream of the house and the city. He tells Stone about it, and the two men consider that they might be looking at a tiny piece of a much larger organism.

This brings to mind The Messenger Theory. A communications engineer named John R. Samuels had devised a theory of how intelligent life forms from other galaxies might realistically communicate with Earth. Both radio and TV signals are too weak to travel far and still retain their integrity. Samuels theorized that an alien species might instead send out live, self-replicating organisms to other planets. If the organisms made contact with other intelligent life, they would begin to grow into a complete life form capable of communicating directly with its new friends on Earth. Many scientists laugh at The Messenger Theory, but the Wildfire team cannot afford to do so. They decide to check the samples being cultivated in the petri dishes to see how much they've grown. Stone also orders an x-ray crystallography test. Given the crystalline structure of Andromeda, this test will be excellent for computing the probable structure of the complete organism from one tiny segment.

Meanwhile, Dr. Hall speaks to Mr. Jackson again. The patient is feeling a little better, but hesitates to discuss the tragedy at Piedmont. Jackson tells Hall he has lived in Piedmont all his life. When he finds out the baby survived, he tells Hall that the baby's name is Jamie Ritter. According to Jackson, there is nothing unusual about baby Jamie apart from the fact that he cries constantly. Jackson recalls him squalling on the night of the tragedy. Jackson recounts the events of that night. The whole town had noticed a glowing object fall from the sky. A local man named Charley Thomas had retrieved the object and brought it into town. They couldn't tell if it was an Earth-made object or alien, so they decided to take it to the most educated man in town, old Doc Benedict. Benedict promises to check it out, make a few phone calls, and let everyone know in a few hours. It was dinnertime, and the townspeople went home to eat, leaving the satellite with Benedict.

Hall interrupts to ask Jackson if he'd been drinking his Sterno that day. Jackson tells him he had taken some around six. About eight-thirty that night, the trouble started. The man Jackson had been chatting with, Al, suddenly jumps up and shouts, "Oh God, my head!." (page 228) Then Al runs outside and falls down dead in the street. Before Jackson could react, all the other townspeople came running into the street; without a word, they all grabbed their chests and died. Jackson had been terrified; he thought everybody was dead. Then, he heard the baby crying and saw another man, Peter Arnold, still alive. Several others were alive, too, but acting completely crazy. They started to kill themselves one by one.

Jackson had been so unnerved he told himself he was either dreaming or had too much to drink. He'd gone home and lay down in his bed. He intended to stay there till morning, but around ten o'clock he heard a car drive through town. He'd gone outside and found Lieutenant Shawn and Private Crane, dead in their vehicle. It was the first car Jackson had seen since officer Willis of the highway patrol had driven through town just moments before the mysterious deaths started.

Chapter 23: Major Manchek clutches his coffee cup and watches as the investigation team reconstructs the wreck of the Phantom plane in a large room built for that purpose. A technician brings him results from a lab test on a piece of the plastic polymer from the air hose on the Phantom. The technician informs him the polymer has been depolymerized, or in other words, the long string of polymers holding together the plastic has come undone. The technician says it must have been caused by a chemical reaction. The source of the reaction could be extreme heat, acid or a microorganism. Manchek immediately writes out a message to Wildfire and gives it to the technician to transmit.

In the Wildfire lab, Hall and Burton talk about Jackson's account of the Piedmont tragedy. Hall asks Burton what he thinks could have caused the mass insanity amongst those at Piedmont who didn't die instantly. Hall mentions the man who died after saying, "Oh, God, my head." (page 233) Burton and Hall think that a brain hemorrhage might have caused the insanity, and it would explain the man's final words. Simultaneously, Burton and Hall realize the solution. They know Andromeda kills by clotting the blood. They realize that blood-clotting in the body is usually initiated by a tear or leak in a blood

vessel wall. The body clots the blood to dam up the leak. What if Andromeda attacks the blood vessel walls directly? If it spreads quickly through the bloodstream, attacking all the vessel walls as it goes, this would explain the massive clotting throughout the body.

However, if an individual were incapable of normal blood clotting, then Andromeda would still continue to attack the blood vessels, causing major leaks, and eventually, a lethal hemorrhage. Since Burton has previously established that Andromeda attacks the brain after entering through the lungs, the hemorrhage would likely be a brain hemorrhage. Brain hemorrhages are capable of causing insanity as well as death. Suddenly Burton remembers the animals he forgot to autopsy, the ones to which he had given the anti-coagulant drugs. He retrieves one of the bodies and slices into its head. Blood spurts out of the incision. When he exposes the brain, he finds a large hemorrhage over the brain surface.

Excited, Burton sums up their findings: "If the animal is normal, it dies from coagulation, beginning at the lungs. If coagulation is prevented, then the organism erodes through the vessels of the brain, and hemorrhage occurs. 'And insanity." (pages 235-236) Burton thinks of a dozen ways coagulation might be prevented in a human being, including impaired liver function or vitamin K malabsorption. To Burton's dismay, Hall reports that Peter Jackson has none of those conditions, nor does the baby. However, Hall is not dismayed. He believes he and Burton are on the right track. Jackson and the baby survived, according to Hall, because for some reason they never inhaled the Andromeda strain into their lungs in the first place.

Chapter 24: The narrator reminds the reader of a pertinent quote from Montaigne: "Men under stress are fools, and fool themselves." (page 237) They made major mistakes, which Stone later expressed this way: "We were problem-oriented. Everything we did and thought was directed toward finding a solution, a cure to Andromeda. And, of course, we were fixed on the events that had occurred at Piedmont. We felt that if we did not find a solution, no solution would be forthcoming, and the whole world would ultimately wind up like Piedmont. We were very slow to think otherwise." (pages 237-238)

The men veer further down the wrong path in their analysis of the growth cultures. Andromeda proves to grow well in any growth media, e.g., sugar, blood, chocolate, plain agar, or just the glass of the petri dish with nothing added. Oxygen inhibits its growth, but any type of light causes it to grow well. When they check to see what waste products the growing organism excretes, they find none. It is a pure conversion system, meaning it converts 100% of the energy it absorbs into growth; it wastes nothing. This is a sensible adaptation for an organism that lives in outer space and cannot afford to waste what few resources are available to it.

Suddenly, the men have a horrifying realization. If the organism directly converts energy to matter with absolutely no waste, then it is functioning like a highly efficient atomic reactor. They get Robertson on the line immediately and explain to him that a nuclear detonation in Piedmont will provide Andromeda with a limitless supply of energy, causing Andromeda to grow at an uncontrollable rate. Uncontrolled bacterial growth is a

frightening concept, explains the narrator, because bacteria multiply geometrically. Under ideal circumstances, bacterial cells divide in two every twenty minutes, thus "one becomes two, two become four, four become eight, and so on. In this way, it can be shown that in a single day, one cell of *E. coli* could produce a supercolony equal in size and weight to the entire planet earth.

This never happens, for a perfectly simple reason: growth cannot continue indefinitely under 'ideal circumstances.' Food runs out. Oxygen runs out." (page 241) However, since Andromeda uses energy as its food, a nuclear blast would give it an unending food supply, and it would grow exponentially. It could engulf the entire planet within hours. Luckily, Robertson assures them that Directive 7-12 has not been carried out, and promises that it will not be done. He tells them the President will be glad to know he made the right decision.

Before ending the call, Robertson informs them of the Phantom crash team's discovery of the depolymerized polymer and the fleshless bone. The Wildfire team cannot think how that relates to Andromeda's mechanism of action, so they table discussion of the plane crash for now. After they hang up, Stone suggests they check the new growth cultures to make sure the new growth is as deadly and potent as the original substance. If the men had performed this check, they would have realized right then that their thinking had gone astray. Unfortunately, before they can do so, they are interrupted by the television monitor. A man appears on the screen and informs them that Leavitt's brain scan had come back showing a problem. The man assumes the scan is in error, but needs Leavitt to repeat the test as soon as possible. Leavitt says he's too busy, and Stone arranges for him to delay the re-test until later. Before the men can get back to checking the growth cultures for potency, the computer informs them that the results of the x-ray crystallography are ready. They all rush off to check them.

Chapter 25: The x-ray crystallography results are extremely puzzling. They show that Andromeda is not formed like a typical cell with a nucleus, mitochondria, and ribosomes. In fact, it contains no subunits or smaller particles inside the hexagons whatsoever. Every bit of the structure is composed of the exact same substance. Given these facts, it would appear to be a completely inert structure. It cannot be alive by earth standards, and yet it is alive. Leavitt and Stone complain aloud that they should have brought a physical chemist onto the team. The unspoken thought they both share is, "instead of Hall." (page 247)

Meanwhile, Hall examines the long rolls of paper coming from the teleprinter. Most of the messages are in code and meaningless to him. Then he notices the message about the death of Arizona highway patrol officer, Martin Willis. Willis had apparently gone insane. He walked into a diner that he frequented regularly complaining of a severe headache. Then he had gotten suspicious and paranoid and pulled out his revolver, shooting each customer in the diner before turning the gun on himself.

Hall remembers that Officer Willis had driven through Piedmont moments before the deaths had begun. He contacts the girl at the switchboard and requests to be connected to the Chief Medical Officer for the Arizona highway patrol. A Dr. Smithson comes on the

line. He is hesitant to discuss the matter with Hall, until Hall threatens him with a twelve-year jail sentence for obstructing a government investigation. Smithson relents and answer's Hall's questions. It turns out Willis was diabetic, and was lax about taking his insulin shots.

Smithson asks if his death is related to the government test being held in Piedmont. Hall lies and says no, but he's sure Smithson doesn't believe him. To be safe, Hall asks the operator if he has the authority to arrest someone. She explains he does under certain circumstances; Hall arranges to have Smithson detained for forty-eight hours to prevent him from spreading rumors. Just then, the emergency alarm sounds in the laboratory, accompanied by a bright-yellow flashing light.

Chapter 26: Hall sprints down the corridor as a soothing female voice announces that the seal has been broken in the Autopsy room. Hall's assistant, Karen, joins him in his sprint down the hallway; Hall tells her the infection must have spread in the autopsy room, meaning Burton is likely dead. Leavitt races down the hallway towards them, but suddenly stops in his tracks. Hall doubles back and notices that Leavitt appears to be in a trance, staring at the blinking lights. Hall instructs his assistant to cover Leavitt's eyes. Leavitt suddenly sinks to the ground and his whole body begins to shake. Hall protects his head with his toes as it hammers against the floor. Leavitt has gone into full seizure, and Hall orders Karen to get some medicine from the lab. He administers it when she returns, and asks her to stay with Leavitt.

Hall races on towards the autopsy lab. The autopsy lab is sealed off, so Hall goes to Central Control, where he finds Stone watching a terrified Burton through the control room glass. Stone speaks soothingly to Burton, who is somehow still alive. He tells him they're pumping oxygen into the autopsy room to inhibit the spread of Andromeda. Turning to Hall, Stone asks what took him so long. When Hall explains that Leavitt is suffering from epilepsy, Stone remarks that Leavitt must not have known about his condition. Hall says he knew all right, for Hall had witnessed Leavitt avoiding bright flashing lights.

Returning to the matter at hand, Stone privately tells Hall that it will take several minutes to get the oxygen pumped into the autopsy room. He only told Burton it was already being pumped in to calm Burton down. Hall asks for a status check, and Stone explains that Andromeda has been contained within the autopsy room, so the rest of the lab is safe. The leak in the autopsy room occurred four minutes ago. Both men realize that Burton should be dead by now. Stone comments that the oxygen will slow down Burton's breathing, which is rapid at the moment because Burton is "scared to death." (page 261) That phrase tips Hall off to something. He walks away, explaining to Stone that he needs to think over the idea of being scared to death.

Chapter 27: Hall returns to his lab and stares at Peter Jackson through the glass. The idea of being scared to death is somehow the answer. Hall considers Jackson with his Sterno, and Officer Willis with his diabetes. Both men were in acidosis, which somehow prevented them from contracting Andromeda. Hall stares at the infant, wondering what could have caused acidosis in the healthy baby. He thinks about acidosis. The body

must maintain a ph balance within a certain range. Extreme variations from that range can cause death. However, the body can compensate for excessive acidosis by breathing rapidly, which blows out a lot of carbon dioxide. Since carbon dioxide forms acid in the bloodstream, rapid exhalation of carbon dioxide reduces acidity levels.

Then, Hall realizes that the extremely quick action of Andromeda means that Andromeda must reproduce in the bloodstream, because no one could breathe in enough Andromeda organisms to explain the rapid coagulation. It occurs to him that excessive acid in the bloodstream might prevent Andromeda from growing inside the body. Someone with acidosis has a body with a hostile environment in which Andromeda cannot grow. That would explain Jackson and Willis; but what about the baby? Suddenly, he realizes: the baby survived for the same reason the birds had survived in Piedmont. The reason was their rapid breathing. The baby's crying caused it to breathe rapidly; birds naturally breathe very rapidly. Inspired, he asks the computer to report Andromeda growth results based on pH levels. As he suspected, Andromeda grows within a narrow range of pH. Not only acidosis, but its opposite, alkalosis, would inhibit the spread of Andromeda within the body.

Chapter 28: Hall races back to Central Control and orders Stone to stop the oxygen infusion, which has finally begun to pump into the autopsy room. Hall looks at Burton through the glass and sees that the oxygen has begun to slow his breathing. Rapidly, he explains to Burton that Andromeda works within a narrow pH range, and that if Burton can continue to breathe fast, the resulting respiratory alkalosis should stop the disease in its tracks. Hall tells Stone to pump extra carbon dioxide into the room. Stone objects that Andromeda flourishes in carbon dioxide environments, but Hall explains that it doesn't matter what the air is like if the environment in the blood has an unfavorable acid balance.

Suddenly, Stone understands what Hall has figured out. Aware that Burton cannot breathe rapidly indefinitely, Hall asks him to check around the room for something to counteract the alkalinity of his blood if it gets beyond a tolerable range with the breathing; something like bicarbonate of soda, ascorbic acid, or vinegar. They look around the contaminated autopsy room, but find nothing. There was nothing there, except a live lab rat breathing calmly in its cage. It should be dead, and yet it lives.

Before they can react to the rat, the computer announces a new emergency. The gasket seals in three other sections have failed. Andromeda is escaping into the entire building. Yet, Stone and Hall are alive, as is Burton and the lab rat. Another inspiration strikes Hall. Hall makes a connection between the baby and the airplane. He tells Stone that the baby could not have cried for the entire twelve hours it was in Piedmont with Andromeda before the men found it. It should have died the moment it stopped crying.

Hall realizes that leaves two possibilities. Either the Andromeda strain was gone by the time the baby stopped crying, or it had mutated into another form. Hall suggests that the Phantom airplane crash was a result of the mutated Andromeda. The mutated form is only dangerous to rubber gaskets, not to people. Burton has been exposed to a now harmless strain of Andromeda. Just as the men realize Andromeda is harmless, the

computer announces that all of the other gaskets have lost integrity. The self-destruct sequence begins. Stone yells at Hall to get out of the room right away before Hall gets sealed off from the substations that will allow him to stop the nuclear bomb from exploding. Hall heads for the door, but too late. He is sealed in, away from the substations. The computer tells them they have three minutes to atomic self-destruct.

Chapter 29: Hall clutches his red key and asks Stone if there is any way to get to a substation. Stone informs him he is sealed off from every substation on Level V. Hall thinks of the central core, which runs through the middle of every level. If he could climb up into the central core, he could reach a substation on another level. However, Stone warns him that the core is protected by ligamine sensors to prevent potentially contaminated lab animals from escaping through the central core to another level. The sensors track movement in the core, and shoot ligamine darts at any moving target. Hall asks what his chances are of getting past the sensors; Stone says zero. Hall breaks the glass and enters the core anyway.

Stone calls out hopefully that the ligamine darts are designed to paralyze smaller animals, so Hall might be able to take a few dart hits before the ligamine stops his breathing. With the seconds ticking away, Hall climbs up the core. Stone warns him that the sensors are tracking him. Hall takes one dart, then two, then three. With ninety seconds to self-destruct, he reaches the opening to Level IV, but just as the ligamine begins to paralyze his body. Slowly, too slowly, he moves down the hall. Somehow he finds himself turning his key in the lock of the substation. The final thing he hears before slipping into darkness is the voice of Gladys Stevens advising him the self-destruct has been cancelled.

Part 4 Analysis

"Men under stress are fools, and fool themselves." (page 237) With this quote from Montaigne, Michael Crichton establishes the major theme of *The Andromeda Strain*. The climax towards which his story has been leading, the solution to the Andromeda puzzle, winds up being an anti-climax instead. Andromeda has already mutated into a non-lethal form long before Mark Hall comes up with his great inspiration about acidity levels in the body. In fact, the only Andromeda-related crises that exist are the man-made contingency plans calling for "cautery" of the infection. Jeremy Stone is revealed as a scientist who hates his own human fallibility, and by extension, his self-hatred becomes a hatred of mankind. Stone creates the nuclear bomb contingencies because he is willing to sacrifice part of the earth and quite a few of its people to keep the planet *pure* and *uncontaminated*. Through Stone's character, Michael Crichton evokes the same type of selfishness and self-hatred embodied by Stanley Kubrik's famous Dr. Strangelove. Although, Jeremy Stone is written more realistically than the caricaturized Strangelove.

Crichton's theme of scientific hubris is revealed as the moral of his story by the fact that Andromeda mutates into a harmless organism. The scientists in the story conceive of the possibility of bacterial contamination from outer space, and then put everyone's lives

at risk to save humanity from what turns out to be a harmless life form. They have, in effect, manufactured the crisis themselves. Throughout the novel, Mark Hall has represented the human point of view, while Jeremy Stone represents the supposed perfection of scientific automation. Interestingly enough, it is Mark Hall, with all his human flaws, who saves the day. The irony is not lost on the reader that Mark Hall is the only member of the team who Stone feels is superfluous. Nor is the failure of Stone's automated perfection lost on Mark Hall.

Hall's final thoughts before shutting down the reactor are anger at the inhumanity of man: "'Forty-five seconds to self-destruct,'" the voice said, and then he was angry because the voice was female, and seductive, and recorded, because someone had planned it this way, had written out a series of inexorable statements, like a script, which was now being followed by the computers, together with all the polished, perfect machinery of the laboratory." (page 278)

Part 5

Part 5 Summary

Chapter 30: Hall comes to and finds a concerned female staring down at him. She tells him he had gone about forty seconds without breathing before they were able to intubate him and put him on a respirator. That was fifteen minutes ago. The ligamine has now worn off. She tells him that according to predictions, the Andromeda strain is over Los Angeles by now. Later, Stone tells him that Andromeda has spread around the globe, but it is having absolutely no effect on anyone. Stone tells him he turned the key with about thirty-four seconds to spare. Hall says, "Plenty of time. Hardly even exciting." (page 282) But Stone informs him that from Stone's perspective it was quite exciting, because the air supply on Level V gets evacuated when the countdown reaches thirty seconds. Hall saved them all with four seconds to spare. Stone smiles and tells him they now have all the time in the world to study the harmless Andromeda strain. What is most important, says Stone, is that they learn to understand it.

Epilogue: Officially, the Andros V manned spacecraft that burned up on re-entry was classified an accident based on mechanical failure. The tungsten-and-plastic laminate heat shield was said to have been burned away on re-entry. No public mention is made of Andromeda or its plastic-eating properties. In a NASA press conference, official spokesman Jack Marriott announces the indefinite postponement of all further space flights. The reporter asks him if NASA's decision is related to the recent Russian decision to halt their own space program. Marriott declines to comment. When asked how long the delay might be, Marriott answers that the decision is "out of our hands." (page 285)

Part 5 Analysis

Michael Crichton adds one final ironic twist to underscore the futility of the Wildfire Project. In the final chapter, Jeremy Stone reassures the men that they now have all the time in the world to study Andromeda at leisure. Yet the Epilogue reveals that the Andromeda strain has continued to mutate and is now eating away at American and Russian spacecraft. The author has left another ominous loose end, which the reader might recall at this juncture. Earlier in the story, Major Manchek finds a human bone, picked clean of all skin at the Phantom crash site. The Phantom technicians inform him that the rubber that dissolved on the Phantom is actually a polymer, which bears similarity to human skin. The possibility exists that Andromeda has mutated into a flesh-eating bacteria and now inhabits outer space, preventing people and spacecraft from leaving the earth.

Based on what the reader has already learned about Andromeda, it is clear that no amount of scientific study will ever catch up with the disease's mutations. Human involvement has both created and exacerbated the problem. Had the scientists not

interfered with the balance of nature in the first place, none of the events surrounding Andromeda would ever have occurred. Crichton ends his book with the statement that some things are "out of our hands." (page 285) In fact, Michael Crichton suggests that Nature herself will eventually correct her own balance, assuming humanity declines to interfere.

Characters

Dr. Mark Hall

None of the other scientists really want Mark Hall on their team. In large part this is due to the fact that Mark Hall is the only practicing surgeon amongst them. Although every team member is a medical doctor, the others' careers are more focused on research and development. Thus, initially, the others take Dr. Hall less seriously. To compound this problem, Mark refuses to take the Wildfire Project very seriously. When Dr. Leavitt first recruits him, Mark refuses to take an interest in the periodic updates Leavitt offers him about the project's status. Mark is a practical man who does not believe the earth will ever be invaded by any alien life forms. He finds the Wildfire Project amusing, which irritates his sponsor, Dr. Leavitt. Perhaps for this reason, Leavitt does not bother to explain The Odd Man Hypothesis to Mark. When Mark Hall is ultimately called upon to join the project, he finds himself completely unprepared for the experience, and for the depth of responsibility accorded him as the Odd Man.

Yet, what the others find most irritating about Mark is precisely what makes him endearing to the reader. Mark Hall brings a breath of humanity into the clinical, sterile environment of the Wildfire Lab. He jokes with the computer and finds himself aroused by the seductive, feminine voice that conveys pre-recorded messages to the scientific team. The author chooses to make Mark Hall the primary protagonist, most likely to provide a human perspective to the enigma that is Wildfire. Every other team member accepts the cold, sterile environment as a necessity, but Mark finds it difficult to accept, and this makes his character most accessible to the reader.

Unfortunately, Mark's sense of humor falls flat with the Wildfire technicians, who all take themselves and the project rather too seriously. Yet in the end, the others finally realize Mark's value. His brilliant deductions ultimately solve the Andromeda puzzle. Plus, from the moment he realizes that he is the Odd Man, the man charged with the responsibility of overriding the nuclear self-destruct mechanism, Mark takes that responsibility very seriously. His humanity and courage save the lives of everyone in the building when he risks his own life to stop the self-destruction sequence from completing its deadly mission.

Dr. Jeremy Stone

Dr. Jeremy Stone is the leader of Project Wildfire. Imperious and conceited, he is nonetheless brilliant, and a man of conscience. Stone's career has been a testament to both his brilliance and his ambition. As a twenty-six year old law student, he performed the experiments on bacterial mutation, which eventually won him the Nobel Prize. In the years prior to being awarded the Nobel, the up and coming medical research star performed several cutting-edge experiments, which brought him international recognition from his scientific peers. Over the years, Stone has managed to parlay his

research accomplishments and legal training into a respected position as a top government advisor. His marriage to a senator's daughter has also provided him with additional contacts and clout. In fact, given that this is his fourth marriage, one is led to wonder whether he courted his wife, Allison, out of love or out of ambition. In either case, the pair has become a power couple, and they top the social pecking order at Stanford, where Stone retains a position as chairman of the bacteriology department.

Project Wildfire is Dr. Stone's baby. Theoretically, Stone initiated Wildfire out of concern for humanity. As a bacteriologist, he became concerned over the possibility that the American space program could encounter an alien bacterium and inadvertently bring it back to earth, contaminating the entire planet with a life form which mankind's immune system would be ill prepared to deal with. Thus, on the surface, he does appear to be attempting to do good for humanity by petitioning the President for funds to construct the Wildfire Lab.

However, even the nature of the petition letter he sends betrays his inflated self-image. Stone drafted the letter after the same fashion in which Einstein famously petitioned President Roosevelt to fund the atomic bomb project. Stone definitely sees himself on a level with Einstein, and has a tendency to treat his Wildfire colleagues as his intellectual inferiors. Stone withholds information from them at various times, and one can only imagine that he does this out of a need to feel superior, and in the know. The design of the Wildfire Lab, although a technological marvel, is inherently cold and inhuman. The reader cannot help but feel that the lab reflects the soul of its creator, Dr. Jeremy Stone.

Dr. Peter Leavitt

Dr. Peter Leavitt is Chief of Bacteriology at the same hospital where Dr. Mark Hall is a practicing surgeon. Despite the fact that they are colleagues, the two men could not be more different. While Hall feels fulfilled by his successful surgical career, Leavitt considers hospital work to be dull and unrewarding.

Leavitt is an adventure hound. As a young man, he traveled widely, researching parasites in third world countries. He found the work to be exciting as well as professionally rewarding, but Leavitt was forced to give up the adventurous life as he grew older and it began to take a toll on his health. He is fond of saying that public health research is a young man's game, and that one should give it up after one's fifth case of intestinal amebiasis. Leavitt developed his fifth case of intestinal parasites in 1955 and was forced to take a soft, comfortable desk job at a hospital in the United States. Yet, like an old general wishing for one last taste of battle, Leavitt desires nothing more than to have one more adventure in his career.

Hence, the Wildfire Project attracts him immensely. Instead of worrying that an alien bacterial life form might someday wipe out the planet earth, Leavitt seems to wish for the possibility. He wants a chance to play the hero, and the Andromeda strain provides him that opportunity.

Unfortunately, Leavitt's health is not really up to the task. He hides his epilepsy from his team members, because he is so desperate to be included in the Wildfire adventure. This decision puts the others at risk, and yet one cannot blame Leavitt for wishing to participate in such an exciting scheme. However, on a darker note, Leavitt's desire for adventure and heroism represents the hidden motivation behind Project Wildfire. The Wildfire team essentially creates a large-scale crisis out of thin air. Twenty-two billion government dollars are wasted on a project which exists largely to benefit the self-aggrandizing egos of the project team members.

Dr. Charles Burton

Dr. Burton is a fifty-four year old pathologist who holds a professorship at the medical school at Baylor University in Houston. Additionally, he serves as a consultant to NASA's Manned Spaceflight Center in Houston. His specialty is the effect of bacteria on human tissues. These credentials land him a coveted spot on the Wildfire Project team. Burton is the absent-minded professor type. His mind is so preoccupied with lofty thoughts that he pays little attention to his manner of dress or even the ground in front of him, and is apt to trip and fall if lost in thought. He is nicknamed "the Stumbler" by his colleagues, not only because of his propensity to stumble and fall, but also because of his immense genius, which allows him to stumble upon complex solutions seemingly by accident.

Of all the scientists, Burton is the only one to accord Dr. Mark Hall the respect he deserves, and in the end, when Hall deduces the truth about Andromeda, Burton is with him every step of the way. Yet Burton gets little respect from the team leader, Dr. Jeremy Stone, largely because Burton fails to care about appearances. He is more interested in his thoughts than in dressing to impress. However, even Stone recognizes the value of Burton's brilliant mind, and appreciates his contribution to the Wildfire team.

Peter Jackson

Mr. Jackson is the only adult survivor of the tragedy in Piedmont, Arizona. A life-long resident of the tiny town, Jackson is devastated by the deaths of his friends and neighbors. He wakes up to find himself quarantined in a top-secret government facility, but he reacts with surprising equanimity to his situation. Mr. Jackson is being held and examined without his consent by a doctor more interested in stopping the spread of Andromeda than in Mr. Jackson's welfare. Jackson willingly shares his medical history with Dr. Hall.

When Hall learns that Jackson has been ignoring doctors' orders regarding his diet and self-treating his ulcer with Sterno and aspirin, Hall unfairly judges Mr. Jackson. With the condescending attitude so common amongst doctors at the time in which the book is set, Hall presumes to dismiss Jackson as a crotchety old man who doesn't have enough sense to listen to his doctors. Ironically, Peter Jackson has the last laugh. It is actually

his home remedies that raise the acidity levels in his body enough to protect him from the deadly Andromeda strain.

Karen Anson

Although there are several female technicians working inside the Wildfire laboratory, Karen Anson is the only one introduced by name. She is the nurse assigned to assist Dr. Mark Hall in his duties. The author spends very few words discussing or describing Karen's character. Her lack of characterization serves to underscore the male-dominated environment of the scientific field, particularly in the 1960's, during which the book is set.

Miss Gladys Stevens

Gladys Stevens is the owner of the seductive feminine voice, which Mark Hall hears over the intercom on Level V. In the antiseptic, clinical environment of the Wildfire lab, Hall is thrilled to hear such a feminine, human voice. He speaks to the voice, hoping to learn that it is a live woman hidden somewhere in the building. To his disappointment, Hall learns that not only is her voice a recording, but that the recording is made by a sixty-three year old lady in Omaha, who makes a living taping messages for voice-reminder systems.

Major Arthur Manchek

Major Manchek, an engineer by trade, has the dubious fortune of being the Chief Duty Officer and man in charge of all Scoop Project activities during the month of February, when the Andromeda crisis occurs. Fortunately, he is a man prepared to handle crises, and wastes no time denying or minimizing the evidence that something has gone very wrong with the Scoop Project. Manchek's typical reaction to any crisis is to slow down his reactions. While others around him are losing their heads, Manchek takes his time and very deliberately thinks through the situation. It is his decision to call in the Wildfire scientists that sets the events of the book in motion.

Lieutenant Edgar Comroe

The cardiovascular physiologist on duty at Scoop Mission Control the night the bodies are discovered in Piedmont. Unlike Major Manchek, Lieutenant Comroe is not psychologically prepared to deal with the Andromeda crisis. On the night the tragedy unfolds, Comroe is only interested in catching up on his reading, and finds himself irritated by the disruption to his routine caused by Andromeda.

Lieutenant Roger Shawn

The leader of the two-man reconnaissance team initially sent to retrieve the downed Scoop capsule. Lieutenant Shawn's character is not well developed, for he dies in the very first chapter. However, he is a significant character because his final report to headquarters, followed by his sudden death, are the catalysts that prompt the launch of Project Wildfire.

Objects/Places

The Andromeda Strain

The code name given to the microscopic, yet deadly, alien life form brought back to earth by the Scoop satellite. Crystalline in nature, the Andromeda strain resembles no earthly life form. The Wildfire scientists, for lack of a more accurate understanding, refer it to as a strain of bacteria.

The Atomic Substations

Located throughout each level of the Wildfire Laboratory, the atomic substations contain an override feature that only Mark Hall can activate. In the event of emergency, a nuclear self-destruct sequence is automatically triggered. Mark Hall has exactly three minutes to reach a substation to stop the laboratory from self-destructing. Due to an unfortunate planning error, there are several sectors within the laboratory that do not contain atomic substations. When Mark Hall becomes trapped in a sector on Level V which doesn't contain a substation, he must risk his life to climb through the dangerous central core of the laboratory in order to access a substation on Level IV.

Directive 7-12

Directive 7-12 is the top-secret code name for the Wildfire contingency plan that calls for a nuclear "cauterization" of the Andromeda infection. When directive 7-12 is conceived, the Wildfire scientists firmly believe that a nuclear explosion would kill any alien bacterial life form which threatens the earth. Initially, when the President belays the order to drop a nuclear bomb over the site of the Andromeda contamination, the Wildfire team fears the deadly disease will spread unchecked. They lobby heavily for the enforcement of directive 7-12 until the scientists realize, to their horror that Andromeda feeds upon energetic reactions. Had directive 7-12 been carried out, the resulting atomic bomb blast would have provided the Andromeda strain with an unlimited supply of energy for growth. The nuclear blast would have allowed Andromeda to grow exponentially and blanket the entire planet with its deadly disease in a matter of hours.

Level V

The bottom level of the five-story Wildfire Laboratory is the green Level V. It takes twenty-four hours to descend through the rigorous decontamination process on the upper levels. Level V is designed to be as sterile an atmosphere as humanly possible. When on Level V, the scientists subsist on synthetic nutrients alone; natural foodstuffs are prohibited because they provide potential growth media for bacteria.

Ligamine

Ligamine is a water-soluble curare derivative that causes complete paralysis. Although the effects of ligamine wear off quickly, the ligamine-induced paralysis includes paralysis of the lungs; therefore ligamine leads to death unless medical intervention can be obtained. The Wildfire Laboratory has sensors in its internal core designed to spot mammals attempting to escape from one level to another. Once the sensors have locked onto the animal, darts full of ligamine are shot at the escaping mammal. The system was designed to prevent contaminated animals from spreading Andromeda between levels. However, in the climax of the novel, the mammal targeted by the ligamine darts is Dr. Mark Hall.

The Red Key

A red metallic key is provided to Mark Hall. The key is designed to respond only to Mark Hall's touch, and can be used to override the automatic self-destruct sequence in the Wildfire Laboratory.

The Scavenger

Flown by Samuel "Gunner" Wilson, this intermediate-range reconnaissance jet aircraft is fully equipped for day or night intelligence flights. Fitted with two side-slung 16mm cameras, it can film both the visible spectrum as well as low-frequency radiation. Additionally, it contains a center-mount Homans infrared multispex camera, along with electronic and radio-detection gear. The Scavenger is sensitive enough to map a city during a blackout; it can follow individual cars and trucks from a distance of eight thousand feet; it can detect a submarine two-hundred feet below the surface; and, it can pin-point the location of a factory from the building's residual heat even four hours after the factory has shut down for the night. All images picked up by the Scavenger's cameras and detection equipment are processed automatically in-flight, and are thus available for immediate viewing as soon as the aircraft returns to base.

The Scoop VII Satellite

The yard-long, cylindrical satellite is the seventh in the series of American Scoop satellites designed to search the cosmos for microscopic alien life forms. Scoop VII is the first to succeed in its mission. It returns to earth bearing the Andromeda strain. When the satellite is pried open by the curious inhabitants of Piedmont, Arizona, a massive, deadly outbreak is triggered and the Wildfire scientists are called in to clean up the mess.

The Spectrometer

The spectrometer on Level V of the Wildfire laboratory is a standard K-5 Whittington model. Its purpose is to analyze the chemical components of whatever object or organism is being tested. It consists of a vaporizer, a prism, and a recording screen. The object or organism is vaporized. When it burns up, it emits light which gets passed through the prism. The colors are recorded for analysis. Since every chemical element gives off a different wavelength of light when it is burned, it's possible to determine the chemical makeup of the test object or organism by analyzing the light spectrum it produces when burned.

The Wildfire Laboratory

The Wildfire Lab is a top secret, twenty-two million dollar government installation in the middle of the Nevada desert. The laboratory is disguised as a benign agricultural research station, which, on the surface level, it is indeed. However, the real Wildfire is hidden five stories below ground. It is a fully automated laboratory geared towards purifying, sterilizing, and containing deadly bacteria, viruses and unknown disease-causing agents like Andromeda. It provides a starkly sterile backdrop to the events of the book. The Wildfire Lab was built for efficiency and sterility. It represents, on a symbolic scale, the epitome of the once-popular scientific belief that reason and orderly logic are superior to the weaknesses of emotional human judgment. In the end, of course, the automated logic of the computer proves to be the true failure, and Mark Hall's humanity saves the day.

Social Sensitivity

Science fiction serves a social function by extrapolating from the realities of the present to the possibilities of the future. Part of the effectiveness of the genre depends upon the realistic assessment of what might happen if certain trends, ideas, or circumstances were extended to a logical, albeit perhaps unlikely, final conclusion. At the base of The Andromeda Strain, essentially a science-fiction thriller, Michael Crichton deals with two social concerns. The first, which is clearly stated early in the novel, has to do with the political or social overtones of new discoveries—overtones that may not concern or occur to the discoverers. The consequences of the contamination of an experiment such as Project Scoop were not seriously considered by the scientific community at large, and most of the military minds that were responsible for the satellite dismissed the inherent ramifications as less pertinent than what the discovery itself might provide—the means to wage biological warfare.

The second concern is more philosophical and metaphysical in nature. In trying to identify the cause of the deaths in Piedmont, Arizona, the members of the Wildfire team necessarily must also consider the possible ramifications of their own actions, and this involves the potential redefinition of certain basic concepts that underlie western civilization. By extension, their definitions apply as well to life and the variety of cultures on this planet as to any other life that might exist in the universe. Human reaction to alien life forms may well be predicted by reactions to human foreigners, and to members of other cultures and subcultures. Thus, Peter Leavitt demonstrates that the terms by which twentieth-century America defines life, intelligence, and humanity are predetermined by biases that grow out of Americans' methods of perception and their point of view. This leads to the realization that there are basic concepts and applications of those concepts that need to be redefined before realistic identifications are even possible.

Techniques

Crichton, more than any other popular novelist, is a child of the age of film. He describes things cinematicalry, as though he is looking through a camera's eye. This is a familiar point of view for his audience; it permits the use of specific accepted visual and narrative conventions to be combined in interesting, acceptable, and effective ways, and it produces prose that is easily translated to the screen.

The most important element in Crichton's style is a realistic tone, a sense that the events being portrayed actually happened and that the author is merely reporting what took place. "I found," he has said, "you could make something more believable if you pretended not that it might happen or was happening, but that it had happened." Technological details and factual correctness, therefore, assume a paramount position in his approach to his material. As a result, he creates novels in which figures and scientific concepts are detailed but characterization is minimalized so that it does not intrude on the quantifiable aspects of the tale. This is true from the very beginning, as illustrated by the title page, which is presented as though it is the cover of a top secret file. Crichton thus sets the tone of the book and indicates that his subject matter is technologically oriented with military overtones.

The day-by-day format builds tension and emphasizes the authenticity of the account. The authenticity, the sense of realism, is reenforced by the "Acknowledgments" section and by the references at the end of the book, for the acknowledgments are written as though the events have, indeed, transpired, and the references are concrete confirmation of the possibility that such an event could occur. The constant use of quotations from major writers in many disparate fields likewise confirms the author's authority, as do the innumerable careful delineations of technology. The inclusion of segments of transcripts, interviews, and reports, maps, pictures, computer print-outs, and technical discussions (such as the "Summary of Odd Man Hypothesis" and the detailed plans describing the five sterilization stages at the research center in the "Day 2" section) are further examples of how Crichton creates a sense of validity. There are few excess adjectives in the descriptions, the writer's style being clean, fairly simple, and straightforward in keeping with the controlling fiction that the work is an objective report of an occurrence, although precise details are incorporated occasionally for effect. The coldness of Lt. Shawn's metal binoculars in the opening scene, for instance, impresses one as being realistic and allows for easy identification with the character's situation.

Having established a realistic tone, Crichton builds tension in several ways. If the account is authentic, as he has gone to great trouble to establish, then the serious nature of the problem is enough in itself to create tension, for the characters are faced with a situation that could lead to the destruction of all life on Earth. The tension is not that of a great work of art, which derives from the conflict between characters or is a result of a character's internal conflict; rather it is simply a matter of mechanically attacking a problem and the tension arises from the question of whether the answer will

be obtained in time. The resultant novel is entertaining, but it does not address major philosophical questions because the emphasis is on the process, not the people.

The flashback device (writing as though the event has already taken place) is especially effective in the third-person narrator's voice employed by Crichton, again underscoring the factual tone that he fashions and with which his audience is familiar from exposure to it in documentaries—which lends further credence to the story. Two other devices work well within this context: foreshadowing and parallel plotting. Often Crichton expands the tension by referring to something in the future. He talks about Lt. Shawn's concerns, for instance, then adds, "before his death." Stone's preoccupation with the buzzards feeding safely in Piedmont is another example of how the author uses this technique. The logical explanations provided as the narrative proceeds (as in relating Burton's mistake in failing to autopsy all of the exposed animals) similarly are effective because they are expressed in the third-person voice.

The parallel plotting permits Crichton to develop several thematic and plot lines simultaneously. Thus, he can underscore the theme of scientific interaction and at the same time he can advance the plot. A prime example of this technique is seen in the gathering of the Wildfire team members. Each member is introduced individually, with the man's characteristics and unique background being presented so that it is clear what his strengths and weaknesses are and how he will fit into the team. By examining the members separately, Crichton concurrently develops the concept of a scientific community that works in concert. The entire sequence in the research center is developed in the same manner.

Themes

Themes

To a large extent, the themes of The Andromeda Strain derive from a combination of the social concerns, the nature of the characters, and the context in which the characters find themselves. Crichton's novel demonstrates the humanity of people who have "moments of great brilliance, and moments of unaccountable stupidity." This leads to questions about the survival value of human intelligence.

It also leads to a dissertation on the nature of crises and a discussion of the retrospective predictability of most human crises. Furthermore, throughout the novel there is a subtext that implies that much of what happens in the universe is accidental and beyond human control.

Although not obviously the focus of Crichton's novel, an interesting theme that develops, and at least through implication is to be considered, is that of the usefulness of technology in solving problems, as evidenced in the fly-by of Piedmont. Still, there are numerous instances when technology breaks down; there is a computer error during the assembling of the team, and the bell that signals the arrival of incoming messages at the research center malfunctions, for example.

Another malfunction of technology is part of a larger theme, too. Crichton clearly presents an admiring picture of science at work throughout the book, and he explains the scientific approach to problem solving in considerable detail.

Countering this, however, is the realization that science can be misused (as in the military applications), and that scientists are human and therefore, liable to blindness to things beyond their experience or that run contrary to established ways of thinking.

Scientific Hubris

The scientists in *The Andromeda Strain* engage in an exercise in futility. Their quest to save the world from global destruction is a crisis invented by the very men who seek to resolve it. Jeremy Stone is the personification of scientific hubris in the story. As the creator of the Wildfire Project, his vision guides the project from its initial conception through final construction of the top-secret underground laboratory. His goal for the Wildfire Project is nothing less than to save humanity from mass destruction. Stone conceives of a theory that man's first contact with alien life will be with an alien bacterium. As a bacteriologist, he is aware that most life on earth is bacterial life, and supposes that the same must be true throughout the universe. This theory leads to the logical fear that such an alien bacterium might destroy earth's population upon first contact because mankind will not have developed defenses for unknown bacteria. With the NASA space program launching more and more objects into space, Jeremy Stone

figures it is only a matter of time before one of the returning spacecraft infects the earth with deadly alien bacteria.

Stone's concern is so great he convinces the government to spend $22 million building a research laboratory with facilities to isolate and contain such alien life forms. Once the Wildfire Lab is complete, Stone can breathe easier knowing that, thanks to his efforts, mankind is prepared to survive a lethal attack from outer space. Thus with a great deal of arrogance, Stone has arranged to make himself the protector of all mankind from a cosmic evil so grand and insidious that no one else, besides Stone, had been capable of envisioning it.

Yet, the even grander irony is that Stone's vision, rather than being too grandiose, turns out to be far too narrow in scope. Not once did Stone consider the vast scope and power of Nature. Having figured out that contamination of the earth from an alien virus or bacteria is a likely possibility, it never occurs to Stone that Nature may have already accounted for this possibility. In the end, natural defense mechanisms cause Andromeda to mutate into a benign life form that can no longer harm humanity. The only danger to humanity is posed by Stone's nuclear "defense" contingencies. He is willing to nuke his own countrymen, his own planet, and even himself to save humanity from a non-existent danger.

Stone's alarmism results from his lack of trust in natural processes. Stone believes that only science can save humanity. He enjoys casting himself in the role of savior, even if he has to make up a non-existent enemy to save mankind from. His hubris is such that he nearly destroys the world in his attempt to be a global hero. The theme of scientific hubris which Michael Crichton addresses through Stone's character serves as a caution for modern society. Mankind has developed great power through science. Literary themes dealing with scientific hubris attempt to caution humanity to use that power wisely, and to avoid the corruption and arrogance that often accompany such power.

Global Destruction

In *The Andromeda Strain*, the spectre of global destruction hangs over humanity like a Damocles sword. Throughout human history, mankind's ability to organize and carry out plans on a large scale has altered the earth's environment. Many of the changes brought about by human beings have been beneficial, like indoor plumbing and water filtration. Other visible planetary changes have been at worst, neutral, such as landscaping, the construction of great monuments, or the development of show dog breeds. Yet many of mankind's experimentations with nature have been more alarming. Time and again, we have demonstrated to ourselves our capacity for causing damage on a global scale. Ironically, the point Michael Crichton makes in *The Andromeda Strain* is that the destruction mankind wreaks on the earth does not result from overly ambitious designs, but the very opposite, by the fact that human design is not grand enough. Mankind's vision, no matter how grand, cannot encompass the scope of nature.

Modern day Biology classes teach students the potential folly of tampering with an ecological system we do not fully understand. There are historical examples of scientific attempts to eliminate a specific predator bug from crops, which only succeeded in disturbing the delicate ecologic balance that had formerly kept an even uglier predator at bay. Attempts to correct such problems have resulted in even worse predators manifesting in the area, so that what was once a simple bug problem becomes a poisonous snake infestation, or something even worse. The scientific attempt to control the Andromeda strain produces a similar fiasco in the atmosphere surrounding the planet earth. Its killing mechanism, which the scientists work so hard to discover and understand, has already mutated by the time the scientists solve the puzzle.

"Life finds a way," as Michael Crichton states in *Jurassic Park*, a book he published many years after *The Andromeda Strain,* but similar in its warning about tampering with the biological environment. The Andromeda life form finds a way to escape its glass and steel prison in the Wildfire laboratory. Instead of attacking human blood vessels, it begins to attack the rubber gaskets that seal it inside the laboratory. This mutation implies a sort of cosmic intelligence that the characters in the book grossly underestimate. Such cautionary tales, as Michael Crichton writes, document frightening worst-case scenarios. However, Crichton writes with an eye toward preventing such destruction. *The Andromeda Strain* is a thoughtful commentary on the power which technology grants mankind. Such power should be regarded with awe, warns Crichton, in order to avoid the worst-case scenario of global destruction.

Man vs. Machine

Dr. Jeremy Stone develops his Wildfire Laboratory into a completely automated system. Computer scripts are written out and pre-recorded to anticipate every potential human question or command. Security is automated as well, designed to detect and react instantaneously to any leakage of the Andromeda strain by sealing off each of the rooms on Level V. If the computer detects an emergency, it will automatically initiate an atomic self-destruct device. Only the Odd Man has the key to override the self-destruction, but even this manual override process contains an element of automation because the lock is designed to accept the key only if Mark Hall himself holds the key. The computer automatically determines his identify by measuring his body weight, mass, and his specific salinity levels. The Wildfire Lab is a monument to the power of machinery. Jeremy Stone is all too aware of the fallibility of human beings, but he puts his trust in computer automation to get the job done. Stone has thought out every possible contingency, and is certain nothing can go wrong.

Yet, cracks in this automated perfection are visible from the moment man starts to interact with the machinery. Mark Hall responds to the computer voice by asking questions that Stone never anticipated. The pre-recorded messages are designed to be functional, and cannot properly respond to Hall's social overtures. Another flaw in the automated machinery develops when a simple printer jam blocks all incoming communications. The machinery, designed to monitor itself for software trouble, is unable to detect the paper jam, and thus the scientists miss several important incoming

messages. These minor flaws, seen early in the story, foreshadow the coming showdown between man and machine. The machinery at Wildfire is heavily armed with nuclear weapons, laser tracking devices, and poisonous darts, plus it has the ability to trap the scientists behind heavy, sealed doors. In this context, the minor mechanical glitches appear quite ominous. The reader is hardly surprised when the inevitable confrontation develops between Mark Hall and the Wildfire Lab. The safeguards Stone builds into his automated system turn into dangerous weapons when the computer decides to use them to prevent Hall from ending the self-destruct sequence. In the end, Hall must use every ounce of his human ingenuity, courage, and perseverance to outwit the heavily armed computer.

Style

Point of View

A historical narrator, ostensibly the author himself, tells *The Andromeda Strain*. The narrator describes the events in the story as if they were historical fact. The scientific details are technically accurate and heavily researched, which lends the book the feel of a scholarly publication. As, too, does the discussion of the related social philosophies and scientific theories, supported by quotes and concepts from leading scholars. The novel appears to be a painstakingly researched retelling of true events, much like a true crime story. The pseudo-journalistic, pseudo-scientific reporting style of the narrative lends credence to the author's conceit that one is reading a top secret report. The narrator states his intention to flesh out the human factor behind the Andromeda crisis, and presents his characters through this conceit, much as an FBI profiler might present the pertinent character traits of a crime suspect. However, the narrator does not give the impression the scientists are on trial for their actions. He portrays the scientists as human beings with brilliant yet fallible minds reacting to intense pressure and an artificial environment. The author most certainly intends *The Andromeda Strain* to be a cautionary tale, but he allows his readers to draw their own conclusions based on the facts of the case.

The Andromeda Strain is related so factually that readers can completely suspend their disbelief and slip into the point of view Michael Crichton so deftly portrays. Since the story is related as historical documentation, it contains no first person narrative whatsoever. Any time the story delves into the thoughts of one of the characters, it is understood that the narrator learned these thoughts through a series of interviews the narrator held with the novel's protagonists. Michael Crichton goes so far as to mention these interviews in his Acknowledgements section at the outset of the novel. The author doesn't miss a trick in convincing the reader that one is actually reading a top-secret case history about one of the largest biological crises in recorded history.

Setting

The Andromeda Strain is set in the artificial environment of the underground Wildfire Laboratory. Ironically, this manmade environment is inhospitable to man. The character of Dr. Jeremy Stone has designed the high-tech Wildfire Lab to isolate and control microscopic biological life forms in the event of an outbreak. Chillingly, it has a similar effect on human beings. The clinical, sterile environment has the effect of isolating and controlling the human scientists who reside within the lab during the Andromeda crisis. Dr. Mark Hall, the most human of the characters, becomes meek and submissive to computer suggestions after the automated decontamination process disorients and weakens him. The decontamination procedures that define the environment at Wildfire seem like an attempt to purify man of his humanity. As the scientists descend through the five levels of this subterranean laboratory, they are exterminated, inoculated, and

ex-foliated until Jeremy Stone deems them clean enough to enter the top-secret, ultra-sensitive heart of his operation, Level V.

Blue Level V is where the majority of the action is set. The core of the building is an amazing glass and steel contraption that seals Andromeda, the Scoop Satellite, and the contaminated survivors of Piedmont away from the scientists. The scientific team members work in a ring of rooms surrounding the central core. Each room has a glass window which looks into the core. All instruments are operated remotely by the scientists, using metallic hands and glove boxes to avoid exposure to Andromeda. In the physical examination room inside the core, four space suits stand ready for occupation by the scientists, who can crawl through a tunnel into the suit and thereby enter the core without breathing the air. In the event of emergency, the scientists would be sealed in the suits, unable to return to the decontaminated outer perimeter. Emergency doors are poised to seal off every section in case of an outbreak, and the climactic scene is driven by Mark Hall's need to reach a fail-safe button in a sealed-off section. The Wildfire Laboratory embodies the author's vision of mankind enslaved by technology, and provides an eerie, sterile, and inhuman backdrop to the events of the story.

Language and Meaning

The language in *The Andromeda Strain* brings the reader into the world of high-tech, biological science. To his credit, author Michael Crichton does a tremendous job of explaining the jargon and scientific vocabulary he uses. His explanations are most often directly presented, but on occasion he provides a contextual explanation instead, by sharing enough supporting information so that the reader can accurately guess at the meaning of a given term. The reader will not only learn what Millipore filters and angstroms are, but the reader will also become conversant with what they do. At no time does the author present an experiment without explaining its purpose. In plain, concise language, Crichton brings the reader up to date on the latest technology available to the scientists, and even goes so far as to explain the thought process involved in solving the Andromeda puzzle. Crichton uses terms like isolation and identification to describe the goals of the Andromeda team. Transmission and mechanism of death are two of the variables the scientists hope to identify. The vector tests designed to identify these variables involve calibration and the use of magnesium isotopes. By the time the Wildfire scientists realize that acidosis or its opposite, alkalosis, can prevent death by coagulation, the reader feels comfortable with this terminology. Michael Crichton was a scientist before he became an author, and *The Andromeda Strain* demonstrates his knowledge and skill in both professions. His skill at communicating complex concepts in an engaging manner allows the reader to feel like a part of the Wildfire team. Crichton's ability to make the reader comfortable with complex technological language makes *The Andromeda Strain* a pleasure to read for scientists and laymen alike.

Structure

The Andromeda Strain is divided into five parts, where each part represents one day of the five-day crisis. Thus, the narration is wholly linear in nature. Each day progresses hour by hour, and the narrator is careful not to divulge facts before they would occur chronologically. This strict linear structure aids the author in building suspense, because the reader must wait in breathless anticipation for the test results, just as the scientists must do. If a lab test takes five hours to deliver results, the reader will not be apprised of the test results until the appropriate time has elapsed. The author makes good use of foreshadowing techniques to increase the reader's anticipation during these wait times. Despite the delays in revealing information, the action and pacing never slows down. During the long waits for results, the scientists multi-task by working on other tests. Developments occur concurrently as the author shifts back and forth from one Wildfire team member to another, each furiously working on their own piece of the puzzle.

The book is designed to resemble a top-secret file. The author includes an Acknowledgements page at the beginning as well as a Bibliography at the end to heighten the sense that one is reading a classified, scientific document. Graphs, charts and transcripts are also included in this "file" as visual aids and supplemental information. The author arranges all of this information into one comprehensive report documenting the supposed Andromeda crisis. The chronological linear structure of the report is mirrored by the linear structure of the Wildfire laboratory protocols. The scientists must progress step-by-step through the stringent decontamination procedures. They begin on Level I and gradually work their way down to Level V, where the heart of the novel takes place. On Level V, the scientists continue to work in a linear fashion as they perform their experiments in logical sequence. This linear structure does not prevent the author from providing back story on his characters, however. As opposed to the traditional flashback method, Michael Crichton uses a historical narrator to assist with his exposition. The background stories are presented by the narrator who has ostensibly interviewed all the main characters regarding their experiences at the Wildfire Lab. Thus the book's structure is completely consistent with the structure of a classified document; at no time does the author vary from this conceit. This inspired structure makes *The Andromeda Strain* feel compellingly realistic.

Quotes

"According to Lewis Bornheim, a crisis is a situation in which a previously tolerable set of circumstances is suddenly, by the addition of another factor, rendered wholly intolerable. Whether the additional factor is political, economic, or scientific hardly matters: the death of a national hero, the instability of prices, or a technological discovery can all set events in motion. In this sense, Gladstone was right: all crises are the same." Part 1, Chapter 3, page 12

"As the plane came down into a flat second run, he tried not to look at the ground. But he did, and again saw the bodies. The phosphorus flares were burning low, the lighting was darker, more sinister and subdued. But the bodies were still there: he had not been imagining it.

'Jesus,' he said again. 'Sweet Jesus.'" Part 1, Chapter 3, page 19

"'Captain Morton,' the man said. He did not offer to shake hands. 'There's a fire, sir.'

'All right,' Stone said. He looked down at his dinner jacket. 'Do I have time to change?'"

'I'm afraid not, sir.'

To her astonishment, Allison saw her husband nod quietly. 'All right.'

He turned to her and said, 'I've got to leave.' His face was blank and expressionless, and it seemed to her like a nightmare, his face like that, while he spoke." Part 2, Chapter 5, page 34

"Colleagues referred to Burton as 'the Stumbler,' partly because of his tendency to trip over his untied shoelaces and baggy trouser cuffs and partly because of his talent for tumbling by error into one important discovery after another." Part 2, Chapter 5, page 48

"'What the hell do you mean, it can't wait?'

Leavitt remained calm. 'You'll have to break scrub. This is an emergency.'

'Look, Peter, I've got a patient here. Anesthetized. Ready to go. I can't just walk - '

'Kelly will take over for you.'" Part 2, Chapter 5, page 51

"As he grew older, however, Leavitt had stopped traveling. Public health, he was fond of saying, was a young man's game; when you got your fifth case of intestinal amebiasis, it was time to quit." Part 2, Chapter 5, page 53

"He was being paid to take a risk. He had volunteered for the job. And he knew that high above, circling at twenty thousand feet, was an Air Force jet with air-to-air missiles. It

was the job of the jet to shoot down the helicopter should the pilot suffer a last-minute loss of nerve and fail to go directly to Wildfire." Part 2, Chapter 6, page 63

"He cut deeper. There was still no bleeding from the incision. Suddenly, abruptly, he struck a vessel. Crumbling red-black material fell out onto the floor.

'I'll be damned,' Stone said again.

'Clotted solid,' Burton said.

'No wonder the people didn't bleed.'" Part 2, Chapter 7, page 70

"'Nobody told you that a major factor in your selection to the team was your single status?'

'What does that have to do - '

'The fact of the matter is,' Stone said, 'that you are the Odd Man. You are the key to all this. Quite literally.'" Part 2, Chapter 10, page 102

"For years it was stated that men had forty-eight chromosomes in their cells; there were pictures to prove it, and any number of careful studies. In 1953, a group of American researchers announced to the world that the human chromosome number was forty-six. Once more, there were pictures to prove it, and studies to confirm it. But these researchers also went back to reexamine the old pictures, and the old studies - and found only forty-six chromosomes, not forty-eight.

Leavitt's Rule of 48 said simply, 'All Scientists Are Blind.'" Part 3, Chapter 12, page 125

"And then, as they watched, the spot turned purple and remained purple. The notches disappeared; the spot had enlarged slightly, filling in the V-shaped gaps. It was now a complete circle. It became green once more.

'It's growing,' Stone [said.] Part 3, Chapter 15, page 156

"The lab was contaminated. He went on to main control, and found Stone looking at Burton through the closed-circuit TV monitors.

Burton was terrified. His face was white and he was breathing in rapid, shallow gasps, and he could not speak. He looked exactly like what he was: a man waiting for death to strike him." Part 4, Chapter 26, page 256

"It was then that he realized that he, too, was scared. Scared to death. The words came back to him.

Scared to death.

Somehow, that was the answer." Part 4, Chapter 27, page 262

"'Forty-five seconds to self-destruct,' the voice said, and then he was angry because the voice was female, and seductive, and recorded, because someone had planned it this way, had written out a series of inexorable statements, like a script, which was now being followed by the computers, together with all the polished, perfect machinery of the laboratory. It was as if this was his fate, planned from the beginning." Part 4, Chapter 29, page 278

Adaptations

Ironically, while The Andromeda Strain was unmistakably written with a cinematic eye, the translation of the novel to celluloid was only moderately effective. The 1971 film, directed by Robert Wise and starring Arthur Hill and David Wayne, is too drawn out to effectively capture the tense atmosphere that was developed in the original version.

Key Questions

The Andromeda Strain is the archetypal modern technological thriller, the ancestor of Tom Clancy, William Gibson, Robin Cook, and a host of others. As such, it makes for a good subject for discussion. Can we identify those elements in the novel that resonated so well with its audience that it sold millions of copies and still sells well? Why do these elements touch so many people? The novel is an excellent example of Crichton's ability to identify a latent fear in modern culture and nurture it into full blown terror. How does he do this? Does The Andromeda Strain offer any clues?

The novel is also good for discussion because of the elements of our culture that Crichton chooses for setting, theme, and characterization. It may be significant that Kirke, the Church, is excluded from the new source of religious faith—science—which works its wonders apart from him. It is very hard to escape the reach of modern technology—even very poor people have radios, and in most of the world, ownership of a television is no longer a sign of wealth. Yet, the workings of the technological devices that surround and infiltrate modern life remain by and large mysteries to all save those specially educated or trained in their mysteries. And even for those so educated, much remains mysterious: The mechanic that repairs an automobile's electrical system may have little idea of how an aircraft flies, and a computer engineer may be lost when it comes to understanding how a washing machine's rinse cycle works. Crichton works with the anxiety people are likely to feel when confronted with a big unknown, and in The Andromeda Strain he focuses on a big unknown in technology—something that could be on our doorsteps, fallen from the sky, brought in by the wind, or delivered with the mail carrier's unseasonable cough. A successful discussion might well begin with the big fears of everyday life in the modern world and on how Crichton uncovers those fears, exposes them for us, and invites us to join his scientists as they strive to put those fears to rest. Such a discussion could expand into the novel's general subject matter: the merits of the scientific method, the advantages and disadvantages of the human element in a technological crisis, and whether safety in a technological society lies in knowing the technology and taming it. The discussion could then broaden further: What are the fears Crichton identifies in his novel?

How prevalent are they in our society?

What can be done to allay those fears, or are those fears justified?

1. What is Project Scoop? Who is responsible for it? Is it a plausible endeavor within the scope of modern technology?

2. What does The Andromeda Strain suggest are the American biases toward life that need to be revised? Is it possible for Americans to changes these biases? Is it desirable?

3. Why are some of the characters brilliant much of the time and sometimes unaccountably stupid? Who are examples of this?

4. What are the ways in which technology is limited in The Andromeda Strain?

Will these limitations always be in effect, no matter how far technology advances?

Is advanced technology always inherently risky?

5. Is Crichton's portrait of the American military fair and accurate, or is it biased by the era in which the novel was published?

6. What ethical issues arise during the narrative? How do the characters deal with these issues? Do they recognize any of them as ethical issues?

7. What is the novel's vision of how scientists work to solve a problem? What is the procedure, step-by-step, depicted in the novel? How realistic is the depiction?

8. How does Crichton make the scientific method exciting and suspenseful?

9. What kinds of details does Crichton choose for setting convey in times and places for events? How effective are these details?

10. What special skill or skills does each Wildfire team member bring to the scientific investigation? Is the logical for choosing each one sound? What does this mixture contribute to the narrative?

11. Some of the characters are changed in the motion picture version of The Andromeda Strain. What might be the reasons for these changes?

12. While some readers would classify The Andromeda Strain. as science fiction, others insist that is a thriller wearing the garments of science fiction. What are the characteristics of science fiction? Of modern thrillers? Which of these traits are typical of The Andromeda Strain?

Topics for Discussion

Discuss your views on the Odd Man Hypothesis. Do you believe the theory that single men make the best decisions when under stress is an accurate one? Why or why not?

Do you think Michael Crichton's choice to include technical details in his narrative enhances or detracts from the story? Why?

Both Peter Jackson and Officer Willis exasperate their physicians by taking risks with their health and refusing to follow doctors' orders. Yet this refusal to comply with doctors' orders allows them to survive their initial exposure to Andromeda. Under the circumstances, would you say their choices were wise or foolish? Explain your position.

The Wildfire scientists initially join the project to protect the planet against harmful biological species from outer space. Why do you suppose none of the scientists protest when they find out Andromeda is meant to be used as a biological weapon of war?

Given the virulent nature of the Andromeda strain, the scientists seem to have no other choice than to sacrifice laboratory animals to save human lives. Do you believe these sacrifices are warranted under the circumstances? Why or why not?

In *Philosophical Problems of Quantum Physics*, physicist Werner Heisenberg states that "all our journeying can only bring us back to our starting point." (Pantheon Books, 1952; page 23) Explain how this statement relates to the moral of the story in *The Andromeda Strain.*

The polished human bone discovered in the wreckage of the Phantom aircraft is never addressed by the scientists. What implication does the author make by leaving this ominous loose end untied?

Of all the scientific theories and technical equipment descriptions detailed in the book, which did you find most interesting, and why?

Literary Precedents

In writing The Andromeda Strain, Crichton was influenced by four very different sources. First of all, his purpose was to emulate Charles Dickens and Robert Louis Stevenson by telling a "good story." Second, his favorite authors are Edgar Allan Poe and Sir Arthur Conan Doyle, so he was well grounded in mystery writing before he ever began writing himself. An important element was added to this background when he read and was greatly impressed by The Ipcress File (1962; see separate entry), Len Deighton's novel about a British secret agent. Crichton is also a great fan of the movies of Alfred Hitchcock, and it is easy to see that the roots of his plotting and characterization developed out of these elements, particularly when combined with the atmosphere and science-fiction themes of H. G. Wells's classic The War of the Worlds (1898; see separate entry), the fourth major influence on his novel. The kinds of characters and the circumstances in which they find themselves, the themes, the resultant tensions, and even some of the techniques that run through these acknowledged literary precedents appear in The Andromeda Strain.

Related Titles

In The Terminal Man (1972), Crichton deals with another science-fiction theme, behavior modification through psychosurgery. Many of the same questions about the nature of technology and the capabilities and limitations of scientific specialists are raised in this tale about Harry Benson. Benson is injured in an automobile accident and surgeons implant electrodes in his brain in an attempt to prevent epileptic attacks that have been triggered due to the accident. Predictably, the mechanism fails, Benson goes berserk, and a team of scientists is faced with the task of tracking him down and rewiring or destroying him. Referring to Mary Shelley's Gothic novel, Crichton has stated that "I've always wanted to rewrite Frankenstein, and this is it." In his updating of the nineteenth-century novel about the consequences of misused science, the author includes many of the same techniques that appeared in The Andromeda Strain; the day-by-day structure, the use of graphics (charts, computer print-outs), and the like, are all devoted to replicating an atmosphere of scientific verisimilitude and designed to develop maximum tension. As in The Andromeda Strain, Crichton's medical background is evident as he uses his narrative to popularize scientific concepts.

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