

Cryptonomicon Study Guide

Cryptonomicon by Neal Stephenson

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Plot Summary

Cryptonomicon by Neal Stephenson is a hilarious and informative book about code breaking and cryptology. The novel is concerned with several generations of math geniuses and computer whizzes, who are all tied together through the gold the Axis powers buried in the Philippines near the end of World War II.

There were three students at Princeton before the war, Lawrence Waterhouse, Alan Turing and Rudy von Hacklheber. All were math geniuses. Turing returned to England and von Hacklheber to Germany when they finished their academic work. During the war, von Hacklheber was a top cryptologist for Germany, and Turing and Waterhouse were the top cryptologists for the Allies. Waterhouse was with the supersecret Detachment 2702 to which Bobby Shaftoe was assigned. He was a friend of the Japanese Goto Dengo, who designed a huge vault in the Philippines where gold from various countries was hidden.

Many years later, their children and grandchildren come together and meet some of the World War II survivors. Doug Shaftoe and his daughter Amy run a marine salvage company in the Philippines. They enter into a contract with Epiphyte Corporation, for whom Randy Waterhouse works. They are creating a big data haven in the Sultanate of Kinakuta and are laying undersea cable for the Internet and Telecommunications. They have a plan to create an electronic currency that is backed by gold that will function through the Crypt, which is what the data haven is called.

The Shaftoe's salvage operations result in the finding of a briefcase on a sunken U-boat. The encrypted sheets are in the handwriting of Rudy von Hacklheber, and the race is on to decrypt them and learn the location of Golgotha, the gold storage vault. This results in Randy being set up on a drug charge until he breaks the Arethusa code so somebody else can learn the location.

The action of the novel takes place around the world as the character move around, both during wartime and in modern times. The reader can watch the action taking place in these locations, ranging from a college library to a German U-boat. Hacking is also a specialty of the modern-day main characters, and the reader watches as they move messages and information around the Internet in ways that can't be traced.

Don't let the size of the book, more than nine hundred pages, scare you. The book is fast reading and the reader does not need knowledge of the math used to explain cryptology to enjoy the book. It is interesting to learn how the codes were broken in World War II and how modern day hackers operate.



Pgs. 1-62

Pgs. 1-62 Summary

Cryptonomicon by Neal Stephenson is a hilarious and informative book about code breaking and cryptology. The novel is concerned with several generations of math geniuses and computer whizzes who are all tied together through gold the Axis powers buried in the Philippines near the end of World War II.

The book opens with Corporal Bobby Shaftoe, Private Wiley and other Marines driving a truck full of Alpha Station's code books and files through the streets of Shanghai, China.

In America, Lawrence Pritchard Waterhouse is growing up, spending his freshman year at Iowa State University and his sophomore year at Princeton. He is very interested in mathematics. He befriends two men, Alan and Rudy, who are also interested in mathematics and building various machines based on mathematics. Alan wants to build a Universal Turing Machine so he can beat Rudy at chess. The three men have long discussions about mathematics and how to use symbols.

Lawrence returns to Iowa State for his third year but does poorly grade wise. He drops out and enters the Navy. Lawrence writes a paper that his professors have published in a mathematical journal and learns of this just as his ship, the U.S.S. Nevada, sails for Pearl Harbor.

Avi and Randy are at the Tokyo Airport, boarding a plane for Manila. On the plane, Randy uses his laptop to use Ordo, a cryptographic software program to read other messages that Avi said were written for him. His passport identifies him as Randall Lawrence Waterhouse and he works at the Three Siblings Computer Center.

As the Marines march out of Shanghai, Bobby marches to the ship in formation with the others. He remembers an incident that occurred when he finished the Last Patrol. It was an incident with the Nipponese over seaweed and poetry where he met Goto Dengo, from whom he learned judo. In return, he had helped Goto Dengo with his baseball skills. Shaftoe's ship arrives in Manila several days later on December 7, 1941. He visits an old girlfriend named Glory Pascual.

Randy arrives at the Manila hotel. Meanwhile, back at the Three Siblings, there are computer security problems and Randy is not there to take care of them. He and Avi use Ordo to communicate with because it is almost unbreakable, and they are discussing Epiphyte, which involves information that they want to keep private. Ordo is slow but is considered the best in the world.

When Randy was at the University of Seattle, he was a member of a fantasy game group, which is how he met Avi. During the course of his work at the library, he met Andrew Loeb. While helping Andrew with his studies, he used the information to write a

fantasy game program which Avi's employer purchased. This resulted in a legal quagmire involving Andrew's father's law firm and the University legal department.

Pgs. 1-62 Analysis

The book opens by introducing some of the main characters. Bobby Shaftoe is a corporal in the United States Marines during World War II and stationed in Shanghai, China. He and his group are driving a truck full of equipment, files and code books through the banking district. It is Friday, the day notes are exchanged into silver, and the streets are crowded, but their orders are not to stop for anything. A gun blast from their ship send the coolies scattering so they can drive through the crowd.

In America, Lawrence Pritchard Waterhouse is growing up and attending college. He is in his second year at Princeton and is fascinated by mathematics. He and his friends, Alan and Randy, spend hours discussing the subject.

Many years later Avi meets Randy, who is Randall Lawrence Waterhouse, in Tokyo and escorts him to his plane going to Manila, where Avi has made arrangements for his lodging. They work for the Three Siblings Computer Center and are interested in cryptology. This is the linked computer center of three colleges in California where a big conference is beginning. Randy works in computer security and there are problems in his absence. His girlfriend, Charlene, talked him into providing computer support for the conference.

Randy and Avi met at a fantasy game group to which they both belonged. Each was interested in the design of fantasy games, and Avi went to work for a Minneapolis fantasy game publisher after graduation. Randy, who was working in the library, was helping Andrew Loeb with his research and used the information to write a fantasy game program using Charlene's computer account. When Avi's employer bought the program, there were lawyers for Andrew and the University, both wanting a share of the profits. It was a trying period for Randy.



Pgs. 63-125

Pgs. 63-125 Summary

Lawrence Waterhouse is on the deck of the U.S.S. Nevada when the attack on Pearl Harbor begins. His ship is berthed next to the Arizona and he at first thinks that something has gone wrong with a training exercise. He is assigned to cryptography, a field in which he is extremely talented. He is soon shown how to use Indigo, a cryptology machine. Eventually his security clearance puts him on a level with Commander Schoen and he is reassigned to London.

After Charlene completed her Ph.D., she obtains a job at one of the Three Siblings Schools, and she and Randy move there. Randy works on his master's degrees in Astronomy but spends most of his time writing programs since he is known as a UNIX expert and now becomes an expert at networks. He goes to work for Avi's San Francisco company producing fantasy games. They try to work with Hollywood but eventually the troubled company is sold to the Japanese. Since then they've worked at the Three siblings running the computer system.

Randy's trip to Manila was for business. He walked around the city taking GPS coordinates which he sent to Avi for the Epiphyte database. Randy opens an office in Manila for Epiphyte Corporation. Avi and Randy have a meeting with the government officials and others involved in the information industry. They show a video presentation about their company.

Randy meets Amy Shaftoe on one of his walks around the city. He explains the purpose of Epiphyte Corporation to her and what their plans are for the business, which is aimed at corporate communications.

Bobby Shaftoe is viewed as a war hero and films a public relations spot with Lieutenant Ronald Regan. When he is released from the hospital, he is given a special assignment in North Africa.

Lawrence Waterhouse arrives in London and reports to Westminster, where they ask about Commander Shoen. He has a very high rating with the British because of his work with Schoen and the Indigo machine. The British ask him about his school days with Turing, and they explain how they intercept and decode German messages. His assignment is to help develop a system of randomness that will fool Dr. Rudy von Hackleheber, the top German cryptologist.

Pgs. 63-125 Analysis

After the attack on Pearl Harbor, which Lawrence Waterhouse survives on the U.S.S. Nevada, he is assigned to cryptology. His fascination with numbers, going back to the days he helped the math teacher fix the organ, now finds a useful outlet. He moves up



through the ranks of security clearances until he is on a level with Commander Shoen and one of the two people authorized to decode high level messages. As a result of his unique talent, he is reassigned to London.

More insight is gained into Randy's character. He moved to the Three Siblings when Charlene gained a teaching position there. He is a UNIX expert by that time and learned about networks when he was in graduate school there. He joined Avi's fantasy game company in San Francisco and then returned to run the Three Siblings computer center after the company was sold to the Japanese. At a faculty party, he had a discussion with an Internet specialist and strongly objected to being labeled a techocrat.

Avi and Randy run the Epiphyte Corporation and are building the data base, which is why Randy is in Manila collecting GPS coordinates. He opens an office for the corporation.

Lawrence Waterhouse's assignment to London involves helping to develop a system of randomness to keep Dr. Rudy von Hacklhebner and other German cryptologists from breaking Allied codes. He will be working with Alan Turing. Lawrence knew them both at Princeton.



Pgs. 125-192

Pgs. 125-192 Summary

Randy is sailing on Amy's junk. They are going to be doing business together and she is explaining her company's operation and showing him some of the sights. Her company will be doing the cable installation for Epiphyte. At the end of the voyage, Randy spots the Rui Faleio, a yacht owned by the billionaire Dr. Kepler, known as The Dentist in the technology industry. Avi and Randy attend a party on the Rui Faleio and meet Amy's father. Shaftoe proposes a business deal to Randy, who says he must consult with Avi first.

Waterhouse is briefed about the situation in the various theaters of operation. The Allies know the Germans have a new cypher machine called Triton, which the Allies call Shark. It has four wheels instead of the three that the Enigma machine had. There is also a four-wheel Enigma machine. They have to find a way to break the code, which means they have to figure out how the machines function. Lawrence and Alan figure that Rudy knows they have broken the Enigma code.

Bobby Shaftoe and his unit are in a plane. As far as he can tell, they are flying across Tunisia. He knows how Rommel's supply line works and tries to obtain information from the pilots but is unsuccessful. As he rides in the plane, he thinks of his experiences on Guadalcanal. The pilot tells him that they have to be spotted by a German convoy, which they eventually are. They dump the dead soldier's body in the sea and proceed to Malta.

Avi and Randy are working with a laptop computer presentation. They look at different files and pictures tracking undersea cables in various parts of the world. There are few going into the Philippines. Avi wants to wire the Philippines into the Net via the Taiwan link which they already have. They want to make the Philippines an information center. Big companies are already laying cable in certain areas and Avi explains, they don't have to worry about that. Each of the men at the meeting is an expert in his own area, and Avi feels they can make a viable business entity. He points at the island nation of Kinakuta as the place to construct a data haven.

Pgs. 125-192 Analysis

Amy's company, Semper Marine Services, has been retained by Epiphyte to lay their cable. While sailing around the area on Amy's junk, Randy learns about Amy's company and some of the history of the area. They see the yacht of billionaire Dr. Kepler, who is known as The Dentist in the world of technology, and learns some of his background from Avi, who cautions Randy against having any business dealings with him.

Lawrence Waterhouse is introduced to Bletchley Park and his superiors there. He is reunited with Alan Turing, and they work on figuring how the four wheel German cypher



machines work so they can break the new code. They wonder if Rudy knows that the Enigma code has been broken.

Bobby Shaftoe is stationed in North Africa, where they will eventually battle Rommel.

Avi and Randy hold a business meeting in Manila. The attendees are all experts in their own area and soon learn of Avi's plan. There is an island nation called Kinakuta that is wiring for the Internet and telecommunications. Avi wants to build a data haven there, since the Sultan has already begun the work. The attendees are interested.



Pgs. 192-253

Pgs. 192-253 Summary

Lawrence is given a pass to Bletchley Park and walks around looking at the sites. He knows that Y Service intercepts German radio messages. He comes upon a man carrying a box of carrier pigeons. Lawrence peeks through the windows to see what is taking place in the various buildings and sees a machine that is reading a tape so fast that the tape burns. He remembers his school-day discussions of the Turing Machine.

Randy flies to Kinakuta. He finds Kinakuta City to be very modern, since it has been rebuilt since the end of World War II. The Sultan is building a Technology City. He walks around the city taking in the sights.

At a meeting with Lord Woadmire, the Duke of Qwghlm, Lawrence explains the meaning of the term HFDF, High Frequency Direction Finding and how the Allies plan to use it to find German transmitters. They want to mount the antennas on his castle.

At the airport, Randy has a chance meeting with Ferdinand Goto, the Vice President of Special Projects at Goto Engineering. They have a meeting the next day. Randy hires a taxi to take him to Technology City where Epiphyte Corporation has consulting contracts for systems integration. He goes to the site and the Epiphyte trailer where the staff shows him around the future site of the Ministry of Information and the future data haven. On the ride to the hotel, he reads the history of the area. He spends the rest of the day studying the Epiphyte's Business Plan.

Bobby Shaftoe's assignment takes him to Italy. He doesn't understand the assignment and just goes where he is ordered. His unit, Detachment 2702, is to stay until they are attacked by the Germans, then they will be picked up. The men in the unit carry cyanide pills.

Randy Waterhouse finishes reading the Epiphyte business plan. He checks email and finds a message from someone in Leipzig telling him that Epiphyte needs a network of data havens, not just one. What if the Sultan decides to shut it down? Randy tries to find out who sent the message. He finds himself locked out of Ordo and has to find John Cantrell to reinstate his key. They sit in the bar and talk business.

Pgs. 192-253 Analysis

While walking around the grounds at Bletchley Park, Lawrence sees a machine reading a paper tape so quickly that the tape burned. He remembers his discussions at Princeton with Turing about his ideas for a Turing Machine, which was a form of a computer, which hadn't been invented yet.



He meets with Lord Woadmire and explains the importance of HFDF and how it is needed to find German transmitters. He explains the importance to the war effort of the HFDF and the need to break German codes. The military wants to place antennas on the roof of the duke's castle and the duke gives his consent.

Randy arrives in Kinakuta City and goes to the construction site of the future Ministry of Information. Since Epiphyte has the consulting contracts on systems integration, there is an Epiphyte trailer and staff there. Tom Howard shows him around the site of the future data haven. This is the data haven that Avi wants Epiphyte to join.

Bobby Shaftoe and his Detachment 2702 are moved around to different places. They are to stay in Italy until they are attacked. Their purpose seems to be to do nothing but attract attention. Their Detachment number, 2702, is the product of two prime numbers, and it is conceivable that their purpose is to attract the attention of Rudy von Hacklhebner.



Pgs. 253 - 327

Pgs. 253 - 327 Summary

The HFDF for Huff Duff antenna is mounted on the roof of the castle. Detachment 2702 has not arrived at the castle and Lawrence spends his time rotating the antenna for appearance sake. Bletchley Park has broken the Shark code and now is easily decoding the German codes, which is how they found out that the Germans have broken their own code. He is at the castle to find a German spy, and thinks he has found the spy in the person of the cook named Margaret.

Bobby Shaftoe and Detachment 2702 are on their way to Norway and from there to Sweden. The merchant ship they are on has a hold full of weapons, and they are supposed to make it look like they became stranded in Norway and are trying to flee to Sweden. They are picked up and promptly sent on another assignment aboard a freighter. When they are waiting for the Germans to arrive, the men in the Detachment have a heated discussion over whether or not to destroy the codebooks and are told that the codebooks are supposed to be taken by the Germans. They accuse one of the men, Lieutenant Monkberg of being a German spy as they move to their rendezvous point in Sweden.

Epiphyte Corporation is holding a shareholder's meeting. Those in Attendance are Avi, Randy, Tom Howard, Eberhard Fohr, John Cantrell and Beryl Hagen. Avi points out that Kinakuta is ideally situated for the placement of big routers. Randy and Eberhard have a private discussion about the value of not putting documents in writing so there can't be any legal consequences. The group discusses whether there is any way of terminating their deal with The Dentist and discuss the legal ramifications. The Dentist is a minor shareholder in Epiphyte and his partners are financing the Philippines project.

Bobby Shaftoe wants to blow the safe on the U-boat, but Lawrence Waterhouse wants it shipped to the experts in London. Waterhouse finally opens the safe and finds a stack of onionskip papers weighted by a gold bar. The papers contain non-Enigma encrypted messages.

Randy, Avi and other from Epiphyte attend meetings at the office of the Sultan. The grand wazir enters with a group of Chinese businessmen. The Sultan arrives and says he demands freedom of information. His government will not monitor or snoop in any way.

Pgs. 253 - 327 Analysis

Lawrence is at the castle as the HFDF antenna is raised. He tells the people of the need for the antenna to find U-boats so they can sink them. His purpose at the castle is really to find an information leak or a German spy. When the cook is replaced and the replacement, Margaret, has a sexual encounter with him, he thinks he has found his



spy. Lawrence wants to keep the affair going to see what information he can learn from her.

Bobby Shaftoe and Detachment 2702 are now on assignment in Norway where they are again waiting until the Germans notice them, and then they are evacuated. This mission follows the typical pattern of their earlier mission, but this time they are supposed to leave the codebooks for the Germans.

The four Epiphyte major shareholders meet with Avi and Randy. They discuss their involvement with The Dentist, who is a minor shareholder. It is his partners who are financing the Philippine project, and the group discusses the possibilities of ending their deal with him.

Detachment 2702 and Waterhouse are sent to examine an abandoned U-boat. In the safe they find a stack of encrypted messages, which Waterhouse takes back to Qwghlm to decode them, even though he feels certain that Bletchley Park has already broken the codes.

At a meeting with the Sultan and his staff, Randy, Avi and the others learn that the Sultan believes in complete freedom of information. He tells them that his government will not interfere with the data flow in any way.



Pgs. 327-387

Pgs. 327-387 Summary

The meeting with the Sultan's people and Dr. Pragasu, a relative of the Sultan, continues. He wants to form big money contracts with them. They show the group the software on Randy's laptop and how it will communicate with the data haven called the Crypt, from anywhere in the world and how access is protect by the use of biometrics. The people at the meeting try the software during the lunch break and even Kepler is impressed.

That evening, Kepler visits Randy in his hotel room. Kepler thinks that Epiphyte has more in mind than just telecommunications. Randy doesn't want a candid conversation with The Dentist.

Lawrence Waterhouse is on a train headed to Bletchley. He is thinking about the codes from the U-boat, U-353 because he is still baffled by them and wants to talk to the people at Bletchley about them. He meets Alan Turing at the Crown Inn. They talk about the U-353 codes that Bletchely Park couldn't figure out either. They discuss the possibility of it being a one-time pad or an entirely new encryption scheme. Randy shows Alan the pages taken from the U-353, and Alan tells him that the pages were written by Rudy von Hacklhebner. In the coming days, they both work on Rudy's codes in their spare time.

After Kepler leaves Randy's room, John Cantrell comes to tell him that Pekka, an acquaintance of theirs, is in his room. Pekka, known as The Finn, shows them his Van Eck phreaking and how they can read the information on Tom Howard's screen in the next room.

Shaftoe and Detachment 2702 are on another assignment. They are to impersonate Negroes and find a U-boat. The steamer broadcasts her locations as it send out an SOS, thus giving the location of the U-boat. The men on the steamer evacuate before the Germans torpedo the boat. While they wait for orders about the survivors in the water, a Royal Navy submarine arrives and picks up the survivors. The Germans torpedo the British submarine. The Germans capture two survivors, Lieutenant Enoch Root and Sergeant Bobby Shaftoe.

The Epiphyte people go to the Ministry of Information building site where Prag and many others are. Randy is still carrying on his email conversation with someone he can't identify and is thinking of it while the Epiphyte group tries to attract Prag's attention. Randy selects this time to ask Avi if they really want to be involved with the kind of people with whom they are becoming involved. Randy is having his doubts, and Avi tells him to make up his own mind. The group will buy back the stock of anyone who wants to pullout.



Prag leads the tour through the site. There are many different people from different nations. After the tour, Avi leads the Epiphyte people away for a meeting. It seems their San Francisco lawyer has received notice that The Dentist is about to sue Epiphyte for not informing him of their Kanakuta venture. This negates the value of Epiphyte Corporation.

Pgs. 327-387 Analysis

As the meeting with Sultan's people continues, Epiphyte reveals its new software based on biometrics. They discuss the security aspects. Later that evening, Kepler, who was at the meeting appears in Randy's hotel room wanting to talk candidly, which Randy doesn't want to do. He implies that Epiphyte has more in mind than just improved telecommunications.

Lawrence Waterhouse travels to Bletchley Park for meetings taking the codes for the U-353 with him. He shows them to Alan Turing who recognizes the handwriting of Rudy von Hacklheber. They both work on the sheets in their spare time. Alan raises some questions on Rudy's position in the German military. Perhaps he isn't as highly ranked as they thought.

John Cantrell comes to Randy's room to tell him that an old acquaintance of theirs, Pekka the Finn, is in his room. Randy goes there to see his demonstration of Van Eck phreaking (a type of hacking), where he taps in on Tom Howard's computer in the next room.

Shaftoe and Lieutenant Enoch Root are captured by the Germans, who sink a British submarine. The Germans know they will be tracked by the Allies.

The Epiphyte group attends a tour of the Ministry of Information site led by Prag. After the tour, Avi leads his group off for a meeting. They are being sued by Kepler for not informing him of their Kanakuta deal, as per their agreement with him. This destroys the value of the business. Randy is also having doubts about Epiphyte and the kind of people with whom they are involved. Avi tells him that he and any of the other shareholders can sell their stocks back to the corporation any time they want out.



Pgs. 389 - 451

Pgs. 389 - 451 Summary

Lawrence is summoned to a meeting at Bletchley Park. He reads a file on messages from U-691 while waiting for the others to arrive. When they do, they discuss the U-691 capture of Bobby Shaftoe and Enoch Root. They discuss the possibility of playing radio games with the Germans since they can impersonate the fist of U-691. They believe the Allies can destroy the sub before it reaches Germany.

Avi and Randy are talking and Avi tells Randy that he knows Randy would rather be working on the Crypt, but they need him to handle the Philippines cable project. Randy tells him about his discussion with Doug Shaftoe and using Semper Marine Services to do future cable lays in exchange for a share of the profits on their sunken treasure business. Doug wants The Dentist kept out of the deal.

The Germans are interrogating Shaftoe and Root aboard U-691. Shaftoe is being questioned on whether or not the Allies have broken the Enigma code. Shaftoe took a bottle of morphine from the abandoned U-353, and the German have it and have traced the numbers. Shaftoe says he knows about the gold on U-353 and describes what he saw on the ship. In exchange for the information, they give him morphine. The Germans receive a message that was sent to the entire German military that U-691 has been boarded and taken over by the Allies. It must not be allowed to reach Germany. The order is withdrawn when the U-boat captain Bischoff sends a message saying he knew about the gold in U-353.

Amy Shaftoe is diving in the South China Sea. Randy and Doug are also on board. They have found a sunken boat and are looking for treasures. Doug explains the equipment and what it is used for to Randy. Randy explains some of Epiphyte's problems with the Dentist and the fact that he owns ten percent of Epiphyte stock. They had to let him in to prevent the lawsuit and must now provide explanations of what they are doing. They are currently scanning a wreck on the bottom of the sea.

Lawrence Waterhouse is back in the United States. Having spent a week with his family, he is now in California. The war's action has now shifted to the Pacific.

Goto Dengo and his surviving comrades are still wandering through the jungles of New Guinea and find a Japanese camp.

Pgs. 389 - 451 Analysis

The meeting at Bletchely Park, which Lawrence Waterhouse attends, concerns a German submarine, U-691, which has captured Bobby Shaftoe and Enoch Root. They decide to deceive the German with Funkspiel, or false radio transmissions



ostentatiously from U-691 so the Allies can sink the U-boat. If it doesn't surface and surrender, Shaftoe and Root will die.

Randy tells Avi about the business proposition from Doug Shaftoe. If Epiphyte hires Semper Marine Services to do their surveys and future cable lays, they will cut them in for a percentage of the profits on the sunken treasure business, since they will find them from the surveys. Avi is interested but Doug has a condition that they don't tell the Dentist.

U-691 has Shaftoe and Root aboard and is interrogating them when they receive the full impact of the Allied Funkspiel. There was a message that U-691 had been captured and taken over by the Allies, and it was to be prevented from reaching Germany. The crew of U-691 learned from Shaftoe of the gold aboard U-353 and the U-boat commander, Bischoff, uses this information to have the order withdrawn to sink U-691. The U-boat must now find a way to reach a port and avoid Allied ships and planes while navigating. Shaftoe tells Bischoff about the town in Sweden where they can safely go.

Randy is on the Glory IV with Amy and Doug, viewing a shipwreck on the bottom of the sea. They have gone ahead with their deal with Semper, and Epiphyte prevented the lawsuit from The Dentist. Epiphyte must keep him informed of their activities. Randy has told The Dentist's people that they are scanning for laying cable. Randy knows that Epiphyte is trying to defraud the Dentist.

The war in Europe slows down and the action shifts to the Pacific. Lawrence Waterhouse is on leave in the United States and knows he will be assigned to the Pacific.

Japanese soldier Gotto Dengo has been lost in the jungles of New Guinea. He and his surviving comrades finally find a Japanese camp there.



Pgs. 451-529

Pgs. 451-529 Summary

Bobby Shaftoe has been in Sweden for six months and is having an affair with a woman named Julieta.

Randy wants to dive to see the shipwreck. He is beginning to take a romantic interest in Amy. The divers previously brought up an aluminum briefcase that they found on the sunken U-boat. It contains gold rimmed spectacles, a fountain pen and a lot of soggy paper. Doug says they think it belonged to Rudolph von Hacklheber. There is an envelope with the words "Waterhouse Lavender Rose."

Lawrence Waterhouse is in Brisbane and reports to the assigned place. An Army major tells him that they are worried about the Japanese changing their codes. The Japanese don't know their codes have been broken.

Shaftoe's drinking partner in Sweden is Gunter Bischoff. Bischoff's family in Germany is sending him money. Bischoff did not return to Germany with the rest of the men from U-691. The men write him and want him to come home to Germany. Gunter Bischoff tells Shaftoe how certain German officers are rewarded with items of huge financial worth, like gold and other things of value. The items are shipped in U-boats. They try to find the remnants of a downed plane and find Julieta and Otto and eventually Enoch Root.

Randy is back in his room watching a video on dancing. Doug had mentioned that Amy likes ballroom dancing. He is meeting Amy and Doug later and decides to check his email. There is a message from the palimony lawyer he retained to handle the problems in his split with Charlene. He finds he will have to make a trip to California. He goes to meet the Shaftoes and does not recognize Amy in a dress. Randy tells Doug what he has learned about von Hacklheber. He was at Princeton at the same time as Randy's grandfather and was a mathematician. He doesn't know what he did during the war.

Lawrence Waterhouse begins to meet some of the people he will be working with in Brisbane. He breaks some of the Japanese codes.

Rudy von Hacklheber comes to Sweden to meet with Bischoff, Shaftoe and Root. He explains the structuring of German intelligence and explains the positions he has held in cryptology. He tells them how he tracked Waterhouse in transmissions from Qwghlm around the world to Detachment 2702. He had figured the role of Detachment 2702 was to make the Germans think their Enigma code was intact. Due to his treatment by Goring, he never reported his suspicions. Rudy and his friend Angelo, a test-pilot, are put on a special train with Goring and then told what Goring wants. Goring wants him to devise the best crypto system in the world, which he did but he partially paralyzed the machine before delivering it. U-353 was one of Goring's ships. He learned by intercepted message that Bischoff, Root and Shaftoe were in Norrisbruck, Sweden and



decided he and Angelo would escape and hide there. Angelo was killed trying to escape. Rudy's plan is that they should go to Manila and steal the Nazi gold. He explains his plan, which involves Root's Societas Eruditorium.

Randy is flying out of Manila and uses his laptop to read and answer his email. He sends a long email to the Epiphyte people concerning his travels to the Luzon region and the wealth of gold bars he saw. The only way to obtain the gold is to pay for it in Philippine pesos. His conclusion is that there are a lot of people with money to spend that are looking for a way to spend it. Epiphyte can provide the way through the Crypt.

Pgs. 451-529 Analysis

Randy is out on the South China Sea with Amy and Doug. He would like to dive to personally to see the shipwreck, but Doug advises against it. Doug shows them what they have found - an aluminum briefcase with gold rimmed glasses, a fountain pen, soggy paper and an envelop with the words "Waterhouse Lavender Rose." Randy wonders if his grandfather knew the man.

Bobby Shaftoe has been in Sweden for six months with his drinking buddy, Gunter Bischoff. Bischoff sent all his men from U-691 back to Germany and he remained in Sweden. He tells Shaftoe his theory of how Hitler rewards some officers and others with items of value, like gold, that are shipped in U-boats.

Randy finds out some information about Rudolph von Hacklheber and tells Doug that the man was at Princeton at the same time as his grandfather. Von Hacklheber is from a wealthy family in Leipez, but Randy doesn't know what he did during the war. He doesn't know for sure but he thinks his grandfather had something to do with crypto during the war.

Surprisingly, Rudy von Hacklheber arrives in Sweden to meet with Bischoff, Root and Shaftoe. He explains the structure of German intelligence and talks of the fact that he felt that the Enigma code had been broken and mentions the name of the people he felt were capable of breaking the code. Turing and Waterhouse were included in that group. It was Rudy who sent Margaret to Qwghlm to spy on Lawrence Waterhouse. He had tracked Waterhouse's transmission to a mysterious unit that moved around the world. He used on time pads to communicate with Detachment 2702. Rudy figured out that the purpose of Detachment 2702 was to make the Germans think their Enigma code was safe. He never reported any of this because he was under suspicion by Goring. He no longer feels any loyalty to the Reich and learns from intercepted messages, that Bischoff, Shaftoe and Root are hiding in Sweden and decides it's a good place to go. His plan is for them to go to Manila and steal some of the Nazi gold.

Randy is flying out of Manila and sends a very long email to his Epiphyte colleagues discussing the wealth of gold he saw in Luzon. His point is that there are a lot of people involved looking for a way to spend money. He sees Epiphyte providing this way through the Crypt



Pgs. 529 - 590

Pgs. 529 - 590 Summary

A German U-boat arrives in Norrsbruck. Bischoff grabs his gear and heads for the pier and Shaftoe helps him carry his gear. This is all part of the plan devised by Rudy, Bobby, Enoch and Gunter. The U-boat departs. There is a general delivery envelop for Bobby from Bischoff full of German naval intelligence documents. Root tells Bobby that he has to leave because Julieta's friend Otto betrayed him to the Germans, and they will come for him. They assemble a Russian gun to be prepared. A car full of Germans arrive and Bobby and Enoch open fire. Root is shot in the exchange of fire. Root marries Julieta before going to surgery. He does not survive. Bobby leaves for Manila.

Lawrence Waterhouse is still in Brisbane and is becoming infatuated with Mary Smith, the woman at his boarding house. He discovers that she is from Qwghlm. He wants to talk to her but there are other men around her. Rod, his roommate, is a relative of Mary's and says he will talk to her.

Goto Dengo has been in a hospital for six weeks and wonders why he hasn't been killed or sent back to Japan. A priest is beside his bed praying. One day he is taken to the veranda in a wheelchair where he meets other Japanese men. Goto had been evacuated from New Guinea by submarine and the priest at the hospital, Father Ferdinand, belongs to Societas Eruditorum. When Goto is discharged he is flown to Manila and the Japanese Army.

Randy arrives at the San Francisco Airport where Avi meets him. Avi has read the long email sent by Randy and they discuss the situation as they drive to Avi's house. Randy will visit his family to see what he can find out about the envelop with the words Waterhouse Lavender Rose.

Lawrence Waterhouse attends church with Rod since he is still trying to attract the attention of Mary. He helps fix the church organ.

Goto Dengo is briefed on his new assignment. He will work at what appears to be a special prison camp where they will build a big storage facility.

Pgs. 529 - 590 Analysis

The plan to steal the Nazi gold is put into action. Bischoff returns to Germany by U-boat. Otto betrays Bobby to the Germans, and Root is injured helping Bobby avoid capture. Root marries Julieta before dying in surgery. Bobby leaves for Manila, as part of their plan.

Lawrence Waterhouse finds that a new variable has entered his life—a woman named Mary Smith who is a relative of his roommate, Rod. He is shy and doesn't know how to

approach her. He attends a dance and tries to approach her, but there are too many men around her. Rod agrees to talk to Mary for Lawrence.

Goto Dengo was evacuated from New Guinea and has been in a hospital for six weeks. He is suspicious at being treated so well and thinks the priest is trying to convert him. The priest, Father Ferdinand, belongs to Societas Eruditorum and tells Goto anyone can join. When Goto is discharged, he returns to the Japanese Army in Manila.

Randy flies back to San Francisco to settle his affairs with Charlene. He tells Avi about the envelope with the words "Waterhouse Lavender Rose" and says he is going to visit his family to see what he can discover. He thinks his grandfather was involved in cryptology during the war and remembers a trunk full of papers and other war items in his grandmother's attic.

Goto Dengo's new assignment is secret. He is assigned to what appears to be a special prison camp where he will build a big storage facility. That is all he is told.



Pgs. 590-655

Pgs. 590-655 Summary

Lawrence Waterhouse is at a meeting, which includes Lieutenant Colonel Earl Comstock of the Electrical Till Corporation. They discuss the Japanese crypt systems called Azure and Arethusa. They know there is something going on with gold in the Philippines. They haven't yet broken the codes, but they have used HuffDuff to locate some of the transmitters. Waterhouse has been monitoring radio transmissions and performing statistical analysis on the machine he designed. He explains how the machine works.

Amy is traveling with Randy on the West Coast. The Shaftoe boys, Robin and Marcus Aurelios from Tennessee, travel with them. They are traveling in two different cars. Amy and Randy discuss the gold deal and how to create a currency based on the gold that can only be spent on the Net. The currency will be electronic currency and will be protected by crypto and is untraceable.

Bobby Shaftoe eventually makes it back to the United States when the military sent him home. He travels to the South Pacific any way he can and eventually arrives in Brisbane where he presents himself as reporting for duty. He still has to reach Manila to meet the others.

Randy arrives at his grandmother's house where the family is dividing her belongings. When it comes to grandma's china, Randy finds it is Royal Albert Lavender Rose.

Goto Dengo is at his project in the Philippines jungle. They are surveying the area, which is known as Bundok. Goto is a good worker which is noted by his superiors.

Randy's family doesn't know much about what Lawrence Waterhouse did during the war. Grandmother is Mary Smith or Mary cCmndfh, the woman Lawrence Waterhouse married. Randy and Amy piece together the events surrounding the china pattern and the sunken U-boat. They have a photo of people from a picture with Amy's grandfather in Manila in 1945 and compare the spectacles they found on the sunken boat to the picture. They think one of the men is Alan Turing. Randy finds his old friend, Chester, who is still playing fantasy games. They begin to analyze the information from Randy's grandfather.

Pgs. 590-655 Analysis

Lawrence Waterhouse appears at a meeting and announces that he performed a statistical analysis of Japanese radio transmissions using a machine that he designed. He shows them how the computer functions and performs statistical computations. He also announces that he is engaged to be married.



Amy is traveling with Randy on the West Coast. They discuss the gold project and the plan to create an electronic currency based on gold. The currency can only be spent on the Net and will be untraceable. This plan is the result of Randy's visit to Luzon and the long email he sent to Epiphyte staff. When Randy arrives in Whitman, he finds that his grandmother's china is Royal Albert Lavender Rose.

Goto Dengo is working at the site known as Bundok. He is sent on a digging mission and impresses his superiors with his good work.

Amy and Randy begin to piece together some of the pieces of what was found in the sunken U-boat, with a picture of some people with Amy's grandfather in 1945 Manila, and the information they learned at Randy's grandmother's house. They think one of the men in the picture is Alan Turing. Randy takes all of the notebooks and they find to his friend Chester, from his fantasy game club days and they begin to analyze the information from Lawrence Waterhouse's notes.



Pgs. 655 - 710

Pgs. 655 - 710 Summary

Goto Dengo is digging tunnels at Bundok. They are creating a lake from the damn on the Yamamoto River. Dengo shows his superiors the vault they have built and how they plan to conceal the opening. He also explains how it is booby trapped if a thief enters.

Randy and Avi are walking along the beach talking. Avi tells Randy that Andrew Loeb has filed a lawsuit against Epiphyte. Andrew works for Dr. Kepler, who suspects that Semper Marine has found sunken treasure. Andrew claims that Epiphyte's contract with Semper Marine is too vague and doesn't cover the possibility of sonar scans locating sunken treasures. He wants a majority interest in Epiphyte. In order to prevent damages, they have to get the Shaftoe's to suspend their salvage operations. They also discuss the fact that all their data files are in California and subject to subpoena. Even though it is encrypted, Andrew could subpoena the key. Randy says he is returning to Kinakuta.

Goto Dengo is still working at the vault, which they call Golgotha. He is supervising a worker named Wing who is digging a ventilation shaft and tells him that other Filipino prisoner workers will be arriving after the ventilation shafts are completed. The day comes when trucks arrive and unload crates into the vault. The crates contain gold bars.

Randy drives back to the Silicone Valley area where the Ordo offices are located. The parking lot is full of people, including the police and the media. Randy watches the action from the roof of his car, parked across the street. Using a secure anonymous service, he logs into the Crypt in Kanakuta and uses it to log into Tombstone, the machine at the Ordo office. Randy spots someone he knows and calls him over, looking for information on what is happening. The rumor is that Ordo is being raided by the Feds and he recognizes Andrew Loeb as one of the men at the doorway yelling at Avi. Randy finds and overwrites the incriminating files on Tombstone just as the police enter the building. Then his screen goes blank. The people in the van parked next to him created an electromagnetic pulse which destroys every computer chip in the area. It does not affect the data on hard drives.

Goto Dengo watches as gold and other priceless items are brought to the vault. Most of the gold bars carry central bank stamps. Since the workers know about the gold, it means that there is no chance of escape.

Randy is at the airport waiting for the Air Kanakuta flight to board. He doesn't know if he successfully wiped the hard drive of Tombstone. He sees Avi's wife and children heading for an El Al flight. Randy calls Doug from the plane. After he hangs up, the phone rings and he has a conversation with an unknown person who tells him that he knows that Randy is trying to crack Arethusa. The man tells Randy that he spent ten years trying to break that code and he tells Randy the story.



Pgs. 655 - 710 Analysis

The vault that Goto Dengo is building is progressing. He gives some of his superiors a tour and explains the various booby traps they installed in case thieves try to access the vault. The superiors are impressed with his work.

Avi tells Randy that Epiphyte is being sued by Andrew Loeb who works for Dr. Kepler. The suit claims that the contract between Epiphyte and Semper Marine is too vague and doesn't cover the possibility of sunken treasure being uncovered by the sonar scans. They want a majority share in Epiphyte. Avi and Randy consider different options. All their data, even though it is encrypted, is located in the State of California and, along with the key, is subject to subpoena. They could go to prison if they don't honor the subpoena.

The work proceeds on Golgotha to the point where trucks arrive and crates are unloaded into the vault. Goto Dengo finds out that the crates contain gold bars.

Randy is outside the Ordo building when a raid is taking place. Andrew Loeb is there with the police to seize their computer, Tombstone. Randy is sitting on the roof of his car, using his laptop routed through the Crypt in Kinakuta, overwriting incriminating files on Tombstone, before the van parked next to him, created an electromagnetic pulse that destroys every chip in the area.

During World War II, many countries shipped their gold to other places to keep it from falling into the hands of the Nazis. Much of it ended up in the vault. Since much of the gold was from Japan, Goto Dengo surmised that the Japanese command knew they would lose the war. The workers at the vault know that they will die there because they know about the gold. The vault will be sealed to keep it from being found by the Allies. Goto Dengo wonders if he will survive.

Randy returns to Kinakuta. On the plane he receives an anonymous phone call from a man who won't identify himself, but provides him with information about Arethusa, the code he learned about from his grandfather's papers.



Pgs. 710 - 764

Pgs. 710 - 764 Summary

Shaftoe is working with a man named Pedro in the Philippines. They are told to meet the submarine, Tarpon, where they pick-up a transmitter. Bobby travels to Concepcion on his own and finds the others with the transmitter did not survive the trip, having been caught and executed by the Japanese. He hides with Glory's relatives and finds that she gave birth to a boy named Douglas MacArthur Shaftoe on September 13, 1942. He eventually reaches Manila.

Randy arrives on Kinakuta City and is met by John Cantrell. They talk about what has happened at the Crypt and at Ordo. Randy writes notes to Cantrell about his phone conversation on the plane. They drive to Tom Howard's house where they meet with Tom and Doug Shaftoe. They discuss the lawsuit by The Dentist against Epiphyte. There is also talk about a recent international government meeting held in Brussels and that there might be an international clamp down on crypto and digital money. Randy says that they cannot beat The Dentist in court so they begin to discuss other alternatives. They tell Doug to get the gold out and bring it to Howard's house, and they'll deposit it in a bank vault and receive electronic cash from the Crypt.

Randy next tells them about the anonymous phone call on the plane and Arethusa. Doug ties the code to the gold in the hills and says there is talk that the primary gold vault has yet to be found.

Goto Dengo is crawling through the tunnel at the vault as he was ordered to do. They activate the detonation of the main tunnel. He and his men, Wing, Rodolfo and Bong have their own plan of escape. Goto designed the vault in a way that would allow them to escape. He designed a bubble where they have stored food and water. The flooding of the vault begins and they have to wait several days before they can leave or they will be killed by the Japanese. Two days later they dynamite a hole and begin their escape. Three of the four men reach Lake Yamamoto.

Randy has what he thinks are the real Arethusa messages and begins to work on decoding them. He works on this while on a Malaysian Air flight. Amy is there to meet him but he must clear customs, but they find a ziplock bag of white powder in his bag.

Bobby Shaftoe is still in shock over Glory being a leper. They are on the outskirts of Manila which has been torched by the Japanese. Bobby wants to find his son but has to stay with his unit, which fights its way into Manila. As they fight their way through the city, Bobby looks for Glory's family and his son.

Randy is being held in prison and meets with Attorney Alejandro. Drug smuggling carries the death penalty. The attorney says that his rich friend Chester has called to



see if he could help. Someone else's money brought Randy a clean private cell where he could use his laptop. He is allowed to see Amy.

Pgs. 710 - 764 Analysis

Shaftoe learns from Glory's relatives that she had a son, Douglas MacArthur Shaftoe and that she is somewhat famous in her efforts against the Japanese. Bobby wants to see her. He is advised to go to Manila where his son is.

Randy, Tom Howard, John Cantrell and Doug Shaftoe discuss the significance of Kepler's lawsuit against Epiphyte. They want Doug to remove the gold from the sunken ship and bring it to Howard's home. From there they will deposit it at the Central Bank of Kanakuta and receive electronic currency from the Crypt. They go on to talk of Arethusa and the anonymous phone call Randy received on the plane. Doug thinks Arethusa is tied to the hidden gold from World War II when he hears the story. Randy doesn't think his grandfather had the same files that the government spent ten years trying to break.

Goto Dengo designed the vault with the idea of escape in mind. He had correctly anticipated the intent of his superiors. The men who knew about the vault and the gold would be buried alive with it. Goto, with Wing, Rodolfo and Bong had planned for their escape at the proper time. Only Rodolfo didn't make it to the surface of Lake Yamamoto.

Randy begins to work on the Arethusa messages while he is on a Malaysian Air flight. Amy is waiting at the airport for him but he is detained at Customs when they find a bag with white powder in his luggage. He has been set up by someone, as his attorney says.



Pgs. 764 - 814

Pgs. 764 - 814 Summary

Bobby Shaftoe and his group are still moving through Manila, in fierce fighting with the Japanese. MacArthur's troops are also attacking. Shaftoe is injured by a Japanese grenade, but he reaches the baseball diamond and finds Goto Dengo. They lock themselves in the women's bathroom and talk. Goto tells him where the children are since he is looking for his son. A man, a General, enters and recognizes Bobby, who has been missing since Concepcion. Bobby introduces Goto to Douglas MacArthur, who, with his staff, were using the men's room, and says he has converted to Christianity. Goto is embraced by MacArthur. They fight their way to the cathedral where Goto is baptized. Afterwards, Bobby finds his son, and MacArthur says he has a mission for Bobby.

Randy remembers having his wisdom teeth extracted, as he is being driven to his new jail cell by the police. A German man is put into the cell next to Randy and introduces himself as Enoch Root. They begin to play bridge.

Bobby Shaftoe's mission has him parachuting out of an airplane. He looks at all of the antennas and ascertains that the building is a Japanese intelligence headquarters. He lands in the antennas and is injured. He begins to follow the order of his assignment.

Randy turns on his computer. He figures the whole situation was set up by someone who knows he has some kind of information on this hard drive. He doesn't know if it is The Dentist or his friends in the Bolobolo syndicate or someone else. They know he has Arethusa. The only way they can get the information is through Randy, because of all of the encryption. Randy can defeat the Van Eck phreaking by not calling files to his screen, but he can still work with the files. Enoch interrupts to tell him that his dinner has arrived and then tells him the story of the hidden gold and how people have spent years digging for it. A Mr. Wing from China tried to obtain much of the land in the area. Enoch was arrested for trying to prevent Wing from digging. Enoch is the man who called Randy on the plane, as Randy correctly guesses. After this conversation, Randy returns to his work on his computer. He decides he needs some of the documents stored at Chester's house and asks to see his attorney.

Pgs. 764 - 814 Analysis

Bobby Shaftoe and Goto Dengo meet during the fighting in Manila and talk. They have been friends for years. Bobby tries to talk Goto into surrendering, but he says it isn't honorable. When Goto puts a gun to his own head, Bobby pulls it away. MacArthur arrives and Bobby introduces Goto, who basically becomes one with the Americans. Bobby finds his son and is told MacArthur has an assignment for him.



Randy is placed in a cell in another location where he can use his laptop. The only place where the cord reaches is to a locked file cabinet which Randy fantasizes is full of electronic equipment to monitor the computer. A man is put into the next cell and introduces himself as Enoch Root. They begin to play bridge. Enoch was involved with the original plan to steal the Nazi gold, which Randy doesn't know about.

Bobby Shaftoe's parachuting mission has him landing on a building with a rooftop full of antennas. He is injured in the landing and figures that the building is a Japanese Intelligence Headquarters.

Randy figures out a way to work on his files while keeping the contents hidden from Van Eck phreaking. He decides to put his plan into effect on a gradual basis. Enoch Root tells him the story of rumors of gold hidden in the hills by the Japanese and how a Mr. Wing from China is digging in the area. Protesting the digging is what led to Enoch's arrest. He also tells Randy that he correctly guessed that Enoch was the anonymous caller on the plan.



Pgs. 815 - 859

Pgs. 815 - 859 Summary

Randy has Attorney Alejandro send Chester a note requesting him to send information on zeta functions. He also sends a note to Avi to find out if Wing is a client of The Crypt. There is nothing he can do with the code until the information on the zeta-functions arrives. He and Enoch Root talk only around meal times, and Randy learns that Root thinks the Japanese stole the gold to use it for backing a future currency for a Greater East Asia. They talk about how they would spend a kiloton of gold. Avi comes to visit and tells him that Wing is a Crypt client. Kepler also visits Randy and says he had nothing to do with Randy's arrest. They talk about who might have framed him. After Kepler departs, an emissary from Chester arrives. Randy reads the documents sent by Chester. Randy figures that Wing is causing his problems because he wants the Arethusa intercepts broken so he can find the Primary. He figures he will not be released until this happens, but he doesn't tell this to his attorney. Randy breaks the Arethusa code without ever putting any information on his screen. He uses a subliminal channel to hide the information he wants to look at in other information. He learns the coordinates of Golgotha.

In the 1945 world of Lawrence Waterhouse, anyone whose job it was to perform mathematical calculations was known as a computer, and he found a room full of dead computers. The identified bodies were all Chinese and all were experts at using the abacus. He learned what numbers corresponded to the positions on the abaci in the room, and he knows there were logarithm tables at the desks. After studying the situation, he concludes they were using zeta functions. Using the computers in Brisbane, he figures the inputs to the zeta function and comes up with the numbers that were on the abaci. He has broken the Azure/Pufferfish code.

Randy is released and flies to Tokyo. He takes his laptop to the hotel lobby where he meets Avi. They walk around and end up strolling through a market as they talk about governments like China laying submarine cables. Avi tells him that the governments have an agreement and that The Dentist is a part of it. They talk about Golgotha and Avi says they have a meeting with Goto Furundenendu to discuss digging.

Alan Turing and Lawrence Waterhouse talk on the phone when Alan is in London and Lawrence in Manila. They are using a phonograph record as a one time pad. The machine is known as Project X. Alan began work on a more advanced machine for voice recognition called Delilah but has a problem with generating random noise. Lawrence suggests the use of zeta functions and then tells about the abaci and Arethusa and that he thinks it has something to do with gold.

Bischoff arrives by U-boat to meet Rudy. Otto asks about Bobby Shaftoe and is told he is dead. Enoch Root has arrived safely in the Philippines. They will unload the boat and sink it.



Randy and Avi meet with Goto DFengo and his son Furudenendu. The Gotos are not too eager to talk about digging in the Philippines. Randy and Avi finally figure out that Goto Dengo is one of the people involved in burying the gold. They tell him that General Wing is close to finding the vault and Goto Dengo says they will dig it up first.

Pgs. 815 - 859 Analysis

Randy asks Chester to send the information from his grandfather's files, which he uses to break the Arethusa code. He programs his computer in such a way that none of the information shows up on his screen but comes through as a Morse code from the LED displays. He learns the location of Golgotha. He has had several visitors that have brought him information, and he learns that General Wing obtained the information that Randy wants, since Wing is already digging in the area. Randy's computer gives a false set of coordinates on the screen for the location of Golgotha.

Lawrence Waterhouse learned much information from a roomful of dead slaves who were used as parts of a human computer. He learned the numbers corresponding to the position of the abaci and noticed the existence of logarithm tables and concluded the slaves were working with zeta functions. He correctly deduces the zeta function inputs and arrives at the numbers on the abaci. This is how he broke the Azure/Pufferfish code.

After Randy is released he meets with Avi in Tokyo where they have a meeting with the Goto organization to discuss digging. Avi is also interested in Golgotha.

Turing and Lawrence Waterhouse are both working on various kinds of code machines. They have a discussion and Lawrence tells Turing about a Japanese code that he is trying to break. It is called Arethusa and he thinks it has something to do with gold. They also talk of Rudy's role in Azure/Pufferfish, which was based on zeta functions.

Avi and Randy's meeting with the Gotos goes well. They find that he is a survivor from building Golgotha. They want a joint venture with Goto who isn't interested until he learns General Wing is close to finding Golgotha.



Pgs. 859 - 910

Pgs. 859 - 910 Summary

Near the end of the war, Enoch Root finds Goto Dengo and asks about his digging assignment. He tries to get Goto to talk about the gold and tells him that there are men who want that gold.

The gold from the sunken boat is brought to Tom Howard's house. Avi and Randy are both there to supervise; Doug Shaftoe and others are patrolling with armed weapons. Goto Dengo is there along with the Epiphyte people. Afterwards, Randy travels by pambot to Luzon to find the Golgotha site. Amy appears and so does Enoch Root and Doug Shaftoe, among others. Randy learns that Goto Dengo and Avi, who flew, have immigration problems and had to leave the Philippines. Randy says it should be a two day hike to the Golgotha site. He tells Enoch that they are on a fact-finding mission, and Enoch tells him that Goto Dengo told him the location years ago.

Goto Dengo is a name Lawrence Waterhouse is familiar with from dozens of intercepted messages. Root is looking for people who attended Bobby Shaftoe's funeral and is watched by Waterhouse. Lawrence knows that Rudy, Bischoff, Shaftoe and Root were all in Sweden together. He thinks that the men Root is talking to may be Gunter and Rudy. If that is true, then there is a conspiracy, which he is picking up on from the Arethusa messages. He now watches the men meet with Goto Dengo. He is eventually spotted by Rudy who figures Lawrence found them by decrypting the messages. Rudy asks how he broke the code and Lawrence explains how and that he hasn't told anyone but he left a sealed letter in case he didn't return. Rudy asks if Lawrence wants to join them, and Lawrence tells him to endow a chair at the college where he will be teaching. Rudy writes down the name of the china pattern so he can send a wedding gift. They say their goodbyes.

Doug explains how to navigate through the mine field. They make it part way through the mine field when Amy is shot by an arrow. Randy, very emotionally, says he loves her and wants to marry her. Randy thinks the shooter is Andrew Loeb, who then emerges from the water with part of his leg blown off and a big knife with which he tries to attack Randy. Loeb is shot by Enoch.

Lawrence Waterhouse rigs the Arethusa code with the seed Comstock so that it will never be broken. He figures it will keep Comstock and the NSA busy for years.

Rudy and Gunter are submerged in the U-boat. The boat, being tracked by the Allies, is hit, just as it surfaces. The boat settles on the sea floor. Gunter escapes but Rudy stays in the boat.



The group with Randy are blockaded in a compound for a week by General Wing's people. The Goto Engineering people arrive with a lot of equipment and begin digging. Golgotha is uncovered.

Pgs. 859 - 910 Analysis

The Epiphyte group and Shaftoe and some hired help move the salvaged gold from the shipwreck to Tom Howard's house vault, for transport to the Central Bank of Karakuta, as per their plan. Afterwards, Randy travels to Luzon by pambuat. A driver named Matthew is to take him to the site. Amy meets him, along with Doug Shaftoe and Enoch Root. Root tells Randy that Goto Dengo told him the location of the Golgotha many years ago.

Doug informs Randy that Avi and Goto Dengo, who fled to the Philippines, has immigration problems and had to leave the country. This might have been taken as a warning of possible future problems, but it wasn't.

Lawrence Waterhouse locates his old Princeton friend, Rudy von Hacklheber by breaking the Arethusa code of where they were to meet for Bobby Shaftoe's funeral. He declines Rudy's offer to join in the gold conspiracy and asks for an endowed chair where he will be teaching. It seems his real purpose was to talk to Rudy and tell him how he broke the Arethusa code.

The group is led by Doug as they cross a minefield. A crazed Andrew Loeb appears and shoots Amy with an arrow. When he tries to attack Randy, he is killed. Both Enoch Root and Amy had guns aimed at Andrew.

Earl Comstock tells Lawrence Waterhouse of the post-war plans for the National Security Agency, but Waterhouse declines, saying he wants to get married and teach. He says he has not yet broken Arethusa. Comstock thinks Rudy is a communist homo and engaged in espionage for the Russians. He says the transmissions are coming from Luzon. Waterhouse doesn't say anything because he knows who is there and sending those transmissions.



Characters

Randall Lawrence Waterhouse

Randy is an employee of the Three Siblings Computer Center at the opening of the book. Randy and Avi have founded a number of high tech companies which have gone bankrupt. Randy graduated from the University of Washington in Seattle with a degree in astronomy. He was a fantasy game player which is where he met Avi. He used his girlfriend Charlene's university computer account to write his first fantasy game program, which took a year to complete. Avi's employer bought the program.

Randy had moved to the Three Siblings area when Charlene began to teach there. He became known as a UNIX expert and then perfected his knowledge of networks. He went to work for Avi's San Francisco based fantasy game company, but it eventually failed. He forms the Epiphyte Corporation with Avi and goes to Manila to gather data and to promote the company.

Randy has some doubts about Epiphyte but stays with Epiphyte. He works with Shaftoe and Semper to find sunken treasures and finds out about the wealth of gold certain individuals are holding and proposes the Crypt as a way of helping them spend their money.

Randy learns of the gold in the Philippines jungle and uses his grandfather's notes to break the Arethusa code to find the location of the gold vault. His grandfather was Lawrence Waterhouse. He and Avi enter into a deal with Goto Dengo to retrieve the gold before General Wing does. Randy proposes to Amy right before the gold is found.

Bobby Shaftoe

Bobby Shaftoe is a corporal in the United States Marines and is stationed at Station Alpha when the book opens during World War II. He is from Oconomowoc, Wisconsin, though many of his family are from Tennessee. He was in Manila with his girlfriend Glory when Pearl Harbor was attacked. He was eventually shot in the arm and discharged and opened an export business. He married a Spanish woman and had a son named Jack and two daughters. The daughters eventually moved to Tennessee while Jack stayed in Manila.

Shaftoe is part of Detachment 2702 which is used by the Allies to attract the attention of the Germans. They are moved from place to place and remain until the Germans notice them at which point, they are evacuated., Eventually Shaftoe and Enoch Root are captured by the Germans; after their capture, Bischoff eventually hides with them in Sweden where they are joined by Rudy von Hecklheber, who has a plan for them to go to Manila and steal Nazi gold.



When Bobby arrives in the Philippines, he finds that Glory has leprosy and that he has a son. He meets his friend Goto Dengo during fighting in Manila and Goto switches to the American side.

Lawrence Pritchard Waterhouse

Lawrence is the son of Godfrey and Alice Waterhouse. He taught himself enough piano at the age of five to take organ lessons. When the organ breaks, when he was twelve, he helped the math teacher repair it and became interested in math. He attended college at Iowa State University where he was a member of the Naval ROTC. He spent his sophomore year at Princeton, where he met Alan Turing and Rudy von Hacklheber. In the Navy, he is assigned to cryptology and after Pearl Harbor is sent to London to work at Bletchley Park, the center of the British cryptology effort. He will work with his old school friend Alan Turing. Eventually he comes to head Detachment 2702 and tries to plug an information leak. When the German U-boat activity is subdued, he is reassigned to the Pacific and goes to Brisbane. He finds out about the code Arethusa and that it has something to do with gold. He breaks the code and doesn't tell anyone but Rudy, who he finds in the Philippines through intercepted messages. After the war, he marries Mary and teaches at a small school in Whitman, Washington. He is Randy's grandfather.

Goto Dengo

Goto Dengo was a Japanese soldier in World War II. He was stranded in New Guinea for several months before being evacuated and hospitalized in Luzon where he meets a priest, Father Ferdinand, who belongs to Societas Eriditorum. Goto is flown to Manila when he is discharged from the hospital and the Japanese Army gives him a new assignment. He is assigned to a digging project at a prison near Bundok where he is to build a vault, called Golgotha. He finds that trucks come and unload crates full of gold bars into the vault when it is completed. Goto knew that anyone who knew about the gold would not survive, so he designed the vault with escape in mind. When the time came, he manages to escape with two other men.

Years later, Goto and his son are visited by Randy and Avi. He agrees to a joint venture with them to keep General Wing from getting the gold.

Avi Halaky

Avi is a Jew whose father's family was from Central Europe and whose mother's family was from New Mexico. Avi met Randy at a fantasy game group to which they both belonged. Avi was a graduate student in history at the time. After graduation from the University of Washington in Seattle, he moved to Minneapolis and went to work for a publisher of fantasy games. His company bought Randy's fantasy game. Avi eventually begins his own fantasy game company in San Francisco, which Randy joins but it is



sold to the Japanese. Avi and Randy work for the Epiphyte Corporation and open an office in Manila where they go to promote the company.

Avi is married to Devorah and has several children. He is interested in the gold buried in the Philippines and arranges a meeting with Goto Dengo's firm in Tokyo to discuss the digging project, not knowing that Dengo designed the vault.

Rudolf von Hacklheber

Rudy meets Lawrence and Alan when all are students at Princeton. He is also interested in mathematics and machinery and returns to Germany when he completes his studies. He becomes a top cryptologist for the Germans in World War II. He loses faith in the Reich and when asked to build a new code machine for Goring, he partially disables it so it doesn't function properly. Rudy never told the Reich that he had figured out the purpose of Detachment 2702. He escapes to Sweden where Bischoff, Root and Shaftoe are hiding and has a plan for them to go to Manila and steal Nazi gold, even though he himself is from a wealthy family. He dies in the submarine off the coast of the Philippines. This is the shipwreck that the Shaftoe's found.

America Shaftoe

America Shaftoe, Amy, lives in Manila. She runs a fleet of junks and the Semper Marine Services and meets Randy in Manila. Her company is supposed to be a low level contract for Epiphyte Corporation. Her father was an ex-Navy Seal named Douglas MacArthur Shaftoe. Semper works with Epiphyte on laying cable and also salvages sunken treasure at the same time, giving Epiphyte a share of the profits. They have retrieved a briefcase with codes they believe are in Rudy von Hacklheber's handwriting and have a picture of Amy's grandfather with some people in 1945 Manila, and identify one as Alan Turing. She becomes romantically involved with Randy and is at the Golgotha site when the gold is found.

Enoch Root

Enoch Root was a lieutenant and the chaplain assigned to Detachment 2702. He hides out in Sweden with Gunter and Bobby and when Rudy arrives, becomes part of the plot to steal Nazi gold. He is injured when the Germans come to capture Bobby. He marries Julieta before being taken to surgery but does not survive. Root appears as a missionary in Manila and anonymously calls Randy on the phone. Enoch occupies the prison cell next to Randy. Enoch is part of the group present when Golgotha is found.

Gunter Bischoff

Gunter Bischoff was the captain of U-691, the U-boat that picked up Shaftoe and Root. He needed a safe haven to stop at, and Bischoff suggests the place in Sweden where



he and Detachment 2702 had a mission. Bischoff sent his men back to Germany and remains in hiding in Sweden with Shaftoe and Root until Rudy appears with a plan to steal the Nazi gold in Manila. As part of the plan, Gunter returns to Germany and then goes to Manila where he meets the others.

Alan Mathison Turing

Alan becomes friends with Lawrence when both are attending Princeton. He also is interested in mathematics and machinery. Alan completes his Ph.D. and returns to England. He and Lawrence exchange letters. Turing works for the British military in World War II and eventually works on the same project as Lawrence. It is Turing who recognizes Rudy's handwriting on the papers that Lawrence retrieved for U-353. Turing becomes more interested in the computer machinery when the war ends in Europe.

Godfrey Waterhouse IV

Godfrey Waterhouse IV is a minister who was born in Murdo, South Dakota. He moved from town to town every year or two, preaching for his church. He was educated at Fargo Congregational College and obtained a Ph.D. in Classics from a school in Ohio. He had taught Greek and Latin at Bolger Christian College in Virginia. He married Alice Pritchard and they had a son named Lawrence Pritchard Waterhouse. After Alice's death, he and Lawrence moved to Moorhead, Minnesota.

Wing

Wing was one of the workers under Goto Dengo who helped build Golgotha. He was one of the men who escaped with Goto Dengo. The other was Bong. Wing settled in China and returned to the Philippines as General Wing and began to dig for the gold. Randy believes it was Wing who framed him with drugs.

Hubert Kepler

Hubert Kepler is a dentist and a billionaire. He owns the yacht Rui Faleio. He is a minor investor in Epiphyte and it is his partners who are financing the Philippines project. He threatens to sue Epiphyte for not keeping him informed of their activities.

Dr. Mohammed Progasu

Dr. Mohammed Progasu, or Prag, is a second cousin of the Sultan's and the Kinakutan Minister of Information. He was educated at Berkeley and Stanford and is known to Randy and Avi from his Silicon Valley days.



John Cantrell

Cantrell is one of the people involved in the founding of Epiphyte Corporation.

Ferdinand Goto

Ferdinand Goto is Vice President of Special Projects at Goto Engineering.

Tom Howard

Tom Howard is a shareholder of Epiphyte Corporation.

Eberhard Fohr

Eberhard Fohr is a shareholder of Epiphyte Corporation.

Beryl Hagen

Beryl Hagen is a shareholder of Epiphyte Corporation.



Objects/Places

Shanghai

Shanghai is a province in China where Station Alpha is located.

Princeton, New Jersey

Princeton is the site of Princeton University where Lawrence Pritchard Waterhouse spends his sophomore year.

Manila

Manila is the capital of the Philippines.

Three Siblings Computer Center

The Three Siblings are three colleges in California whose computer centers are linked.

Station Hypo

Station Hypo is the location of the cryptology units in Hawaii.

San Francisco

San Francisco, California is the location of Avi's fantasy game company.

London, England

London, the capital of England is where Lawrence Waterhouse is assigned by the United States military.

Bletchley Park

Bletchley Park is near London and the site of the British cryptology operations.

North Africa

The North African countries were a theater of operations during World War II.



Kinakuta

Kinakuta is an island nation ruled by a Sultan that is located near the Philippines and Borneo.

Sydney, Australia

Sydney Harbor in Australia is where the Allies are unloading a lot of equipment.

Qwghlm

Qwghlm is where a castle is used as the headquarters for Detachment 2702.

New Guinea

New Guinea is a nation in the South Pacific that is populated by headhunters.

Sweden

Sweden is a country in Scandinavia that was neutral in World War II.

Brisbane, Australia

Brisbane is a city in Australia where the Allies had their center for breaking Japanese codes.

Whitman, Washington

Whitman is a small town in Washington where Randy's grandmother lives.

Golgotha

Golgotha is an underground vault near Luzon in the Philippines where the Axis buried gold.

Themes

Fascination with Numbers

A fascination with numbers is an underlying theme throughout the book. Those working in cryptanalysis must be good at math in order to develop and break codes.

Throughout the book, the various characters are playing numbers games. As a child, the young Lawrence Waterhouse became fascinated with math when he helped the math teacher fix the church organ. At Princeton, Lawrence, Alan and Rudy spent hours discussing math and how to use it to build Alan's Turing Machine, which was a computer. They looked at how organs and bicycles worked in mathematical ways and then used this information to break codes and build early code machines and computers.

Throughout the book, Stephenson shows how math relates to cryptology and computers as Randy Waterhouse, the grandson of Lawrence, uses math in his computer hacking and to break the Arethusa code to find the location of the buried gold. Many of the characters also play math games with one another and use it to communicate as Randy and Enoch Root did while in prison. In spite of all of the math throughout the book, a knowledge of mathematics is not necessary to understanding the book. Those who are knowledgeable of mathematics may probably view the book in a different way since they will be prone to spending time playing with the math.

Paranoia

Another underlying theme of the book is paranoia, or a deep suspicion of being intercepted on the radio or Internet. During the World War II era, this was an occupational hazard as each side tried to protect its codes while breaking the codes of the other side. In the modern era, this deep suspicion was a part of the lives of Avi and Randy as they were always looking to develop better security programs to keep outsiders from reading their messages or tracking them through the Internet. At several points in the book, Randy comments on Avi's paranoia about their messages being read by an outsider. They were always looking for better encryption programs or using ways of routing so they couldn't be easily traced although this was necessary when Randy wiped incriminating files from Tombstone, their computer at Ordo.

A lot of their paranoia stems from the fact that they understand computers and hacking and know what other people are capable of, as when Pekka the Finn gives Randy a demonstration of Van Eck phreaking. Randy is very aware of this methodology when he is in prison and goes to extraordinary lengths to defeat the technique. They might not have been so paranoid about being monitored if they were not so computer savvy.



Search for Treasure

The search for treasure is another theme of the book although this motive can be considered a part of the desire to make money and be rich. Businesses exist as for profit organizations and their purpose is to make money, and Epiphyte was no different in this respect. The Epiphyte people became interested in searching for treasure through Semper Marine Services who they had hired to lay undersea cable. When Doug explained that one of the by-products of undersea sonar scans was finding shipwrecks and sunken treasure, they became interested in treasure hunting. The gold could be used to back an electronic currency they would create for users of the Crypt, which was their purpose for being in the Philippines and Kinakuta. When their salvage operations brought up a briefcase with encrypted papers, Randy went to work on breaking the German's Arethusa code to learn the location of the rumored gold vaults. When they discussed a joint venture with Goto Engineering to dig for the gold, they found that Goto Dengo had designed the gold vault. The search for the gold becomes the primary goal of Randy, who seems to view it in business terms from the point of view of the Crypt.



Style

Point of View

The book is written from the third person point of view, which is good for a novel of this kind. This point of view allows the reader to get to know the various characters and allows the characters to express their opinions. There is much dialogue between the various characters, which is one way in which the story is told. The author functions as the narrator and provides the information necessary to keep the reader informed about places and events.

The third person is broader than the first person point of view. The first person uses a character to tell the story which limits the readers' knowledge to events that occur in the presence of the narrator. The use of third person avoids this problem and allows the reader to learn of events that take place without the presence of the main character.

The author does not really take a direct moral position concerning the hacking, the government attitude toward encryption or toward the buried gold, but he does so indirectly. The situation surrounding the raid at Ordo is presented in a very humorous way with the electromagnetic pulse destroying all the computer chips in the area while Randy is trying to destroy the data on the hard drive. Goto Dengo presents the moral view on leaving the gold in the vault and says the answer lies in business and development and not gold.

Setting

There are many different locations that are settings for the action of this novel as the different characters move around the world in both war time and modern times. There are scenes in Shanghai, China during the War, where Bobby Shaftoe was stationed. Princeton University in New Jersey is the setting where Lawrence, Rudy and Alan are students. Randy and Avi live in California so there are many scenes there and at the Three Siblings Computer Center where Randy worked. There are also some scenes in Washington where Randy grew up and attended the University of Washington at Seattle. Randy and Amy travel to his grandmother's house in Whitman, Washington where Randy retrieves the information of his grandfather's time in World War II.

There are many settings in Europe during World War II. Turing works at Bletchley Park, which is the center of the Allies cryptoanalysis in the war in Europe. Lawrence Waterhouse travels around to Qwghlm, Brisbane, Manila and other places on official duty, as does Bobby Shaftoe who is assigned to places like China, North Africa, Norway, Sweden and the Philippines. Goto Dengo spends a large part of the war in the jungles of New Guinea.

The modern day group also travels around. Much of the actions of the novel surrounding the modern time characters takes place in the Philippines and Kinakuta,



where a data haven is being constructed. There are also scenes on planes, boats, and other vehicles as the characters move around.

Language and Meaning

The language of the novel is easy-to-read, everyday English. The meaning of most sentences is easy to understand but there are many words the reader may want to look up. Even though the length of the book is over nine hundred pages, it is fast reading.

There is a lot of technical jargon in the novel. The modern-day characters are computer experts and hackers and they used a lot of technical terms and jargon, most of which Stephenson explains during the course of the novel. The same is true for the sections on cryptology, which are full of mathematical formula and jargon. The reader can still enjoy the story of the novel without understanding the mathematics although the book probably has a different meaning for those who do. It is the skill of the author to write the book in such a way that it can be enjoyed on different levels by different people. The mathematician will probably spend more time with the book playing with the math.

The fact that the novel is fast reading means that the reader does not get bogged down in the math and the jargon unless the reader chooses to do so.

Structure

The book is divided into titled chapters. This makes it a little difficult to work with due to the length of the novel. The divisions are based on what a particular character is doing and each chapter provides the necessary information.

The overall story structure is chronological in that the gold is found in the end, but the book jumps around from war time to modern time as the story is told. There are places where there is some confusion about which Waterhouse is active in a scene. The reader must piecemeal the story together until the very end. From this point of view, the structure is a little weak because the reader spends a lot of time trying to figure out how various character and events fit together. But at the same time, this adds to the experience of reading the novel, and one wonders if there is another structure that the author could have chosen. Still, it is somewhat confusing for the reader at times.

There is also quite a bit of jumping around time wise within each chapter. Characters like Bobby Shaftoe and Goto Dengo have flashbacks that occur throughout the novel, and this also makes it somewhat difficult to follow at times.

Quotes

"Yeah, okay, well - if you had a machine like that, then any given preset could be represented by a number - a string of symbols. And the tape that you would feed into it to start the calculation would contain another string of symbols. So it's Godel's proof all over again - if any possible combination of machine and data can be represented by a string of numbers, then you can just arrange all of the possible strings of numbers into a big table, and then it turns into a Cantor diagonal type of argument, and the answer is that there must be some numbers that cannot be computed." (pg. 20)

"Ultra and Magic are more symmetrical than not. In each case, a belligerent Power has developed a machine cypher which it considers to be perfectly unbreakable. In each case, an allied Power has in fact broken that cypher. In America, Dr. Schoen and his team broke Indigo and devised the Magic machine. Here, it was Dr. Knox's team that broke Enigma and devised the Bombe. The leading light here seems to have been Dr. Turing. The leading light with you chaps was Dr. Schoen, who is, as you said, under the weather. But he holds you up as comparable to Turing, Commander Waterhouse." (pg. 122)

"The three-wheel Enigma is just that type of system (i.e., periodic polyalphabetic). Its wheels, like the drive train of Turing's bicycle, embody cycles within cycles. Its period is 17,576, which means that the substitution alphabet that enciphers the first letter of a message will not be used again until the 17577th letter is reached. But with Shark the Germans have added a fourth wheel, bumping the period up to 456,976. The wheels are set in a different, randomly chosen starting position at the beginning of each message. Since the Germans' messages are never as long as 450,000 characters, the Enigma never reuses the same substitution alphabet in the course of a given message, which is why the Germans think it's so good." (pg. 169)

"The sun will be down soon; it is already down in Berlin, as in most of the hellish empire that Hitler has built from Calais to the Volga. Time for the radio operators to begin their work. Radio does not, in general, go around corners. This can be a real pain when you are conquering the world, which is inconveniently round, placing all of your most active military units over the horizon. But if you use shortwave, then you can bounce the information off the ionosphere. This works a good deal better when the sun is not in the sky, sluicing the atmosphere with wideband noise. So radio telegraphers, and the people who eavesdrop on them (what the Brits call the Y Service) are alike, nocturnal beings." (pg. 193)

"The format of the messages makes it clear that they were not encrypted with an Enigma machine. Enigma messages always begin with two groups of three letters each, which tell the receiving clerk how to set the wheels on his machine. Those groups are missing on all of these sheets, so some other cipher system must have been used. Like every other modern nation, the Germans have a plethora of different cipher systems, some based on books and some on machines. Bletchley Park has broken most of them." (pg. 308)



"Usually, he is above such cheating. But the messages from u-353 have him completely baffled. They were not produced on an Enigma machine, but they are at least that difficult to decrypt. He does not even know, yet, what kind of cipher he is dealing with. Normally, one begins by figuring out, based on certain patterns in the ciphertext, whether it is, for example, a substitution or a transposition system, and then further classifying it into, say, an aperiodic transposition cipher in which keying units of constant length encipher plaintext groups of variable length, or vice versa. Once you have classified the algorithm, you know how to go about breaking the code." (pg. 339)

"The generator starts instantly, with a nearly inaudible purr. It is good stuff, part of the capital improvements that Semper Marine made as part of its contract with Ephiphyte and Filitel. Now they are using it, effectively, to defraud the Dentist." (pgs. 433-434)

"Sinkov provides Waterhouse with a desk in the whorehouse and begins to feed him the messages that Central Bureau hasn't been able to decrypt. There are still dozens of minor Nipponese codes that remain to be broken. Maybe, by breaking one or two, and teaching the ETC machines to read them, Waterhouse can shorten the war by a single day, or save a single life. This is a noble calling that he undertakes willingly, but in essence it is no different from being an Army butcher who saves lives by keeping his knives clean, or a lifeboat inspector in the Navy." (pgs. 488-489)

"'Assertions,' Waterhouse says. 'Assertion number one is that Pufferfish and Azure are different names for the same cryptosystem. Assertion number two is that Pufferfish/Azure is a cousin of Arethusa. Three: all of these cryptosystems are related to gold. Four: mining. Five: Phillipines.'" (pg. 593)

"'The Dentist can have any company he wants,' says Avi, 'but he wants Epiphyte. Why? Because we are badass, Randy. We have got the Crypt contract. We have got the talent. The prospect of running the world's first proper digital currency, is fantastically exciting.'" (pg. 668)

"The fact that Randy has logged on has now been recorded by the system in several locations on the hard drive. He has, in other words, just slapped big greasy fingerprints all over a weapon that the police are moments away from seizing as evidence. If Tombstone is shut down and grabbed by the cops before Randy can erase those traces, they will know he has logged on at the very moment that Tombstone was confiscated, and will put him in prison for tampering with evidence. He very much wishes that Douglas MacArthur Shaftoe could somehow be made aware of what a ballsy thing he is doing here. But then Doug has probably done all kinds of ballsy things of which Randy will never be aware, and Randy respects him anyway because of his bearing. Maybe the way to get that kind of bearing is to go around doing ballsy things in secret that somehow percolate up to the surface of your personality." (pg. 691)

"Randy doesn't know what to make of the Wing business. It puts him in mind of Doug Shaftoe's yarns. Maybe Wing is looking for the Primary, and maybe Enoch Root is too, and maybe the Primary is what Old Man Comstock was trying to find by decrypting the



Arethusa messages. Maybe, in other words, the location of the Primary is sitting on Randy's hard drive right now, and Root's worried that Randy, like an idiot, is going to give it away." (pg. 798)

"If you want to understand, look out the window!" says the patriarch, and sweeps his cane around in an arc that encompasses half of Tokyo. 'Fifty years ago, it was flames. Now it is lights! Do you understand? The leaders of Nippon were stupid. They took all of the gold out of Tokyo and buried it in holes in the ground in the Philippines! Because they thought that The General would march into Tokyo and steal it. But The General didn't care about the gold. He understood that the real gold is here -' he points to his head - 'in the intelligence of the people, and here' - he holds out his hands - 'in the work that they do. Getting rid of our gold was the best think that ever happened to Nippon. It made us rich. Receiving that gold was the worst thing that happened to the Philippines. It made them poor.'" (pg. 858)

"All Randy can do for a while is fume. Doug Shaftoe's laughing. Amy just looks distracted. Enoch broods for a few moments, and finally says: 'Originally the plan was to buy this land with a smaller cache of gold that was dug up and loaded aboard a certain submarine. We would then wait for the right moment and then dig up the rest. But the submarine sank, and the gold sank with it. I sat on the knowledge for many years. But then people started buying up land around here - people who were obviously hoping to find the Primary. If I'd had the money, I would have bought this land myself. But I didn't. So I saw to it that the Church bought it.'" (pg. 874)

"For a long time there is really nothing to be seen except steam; but after Golgotha's been burning for an hour or two, it becomes possible to see that underneath the shallow water, spreading down the valley floor, indeed right around the isolated boulder where Randy's perched, is a bright, thick river of gold." (pg. 910)



Topics for Discussion

Explain the relationship between mathematics and cryptology.

Lawrence Waterhouse, Rudy von Hacklheber and Alan Turing all meet during Lawrence's sophomore year at Princeton. Describe what paths their careers took and how they all came together again.

Why was Detachment 2702 sent on missions to attract the attention of the Germans?

What is The Crypt and why is it significant?

How are the items Amy and Doug found on the sunken U-boat tied to Waterhouse, Turing, and von Hacklheber?

Why is Epiphyte Corporation threatened with lawsuits from Dr. Kepler and Andrew Loeb?

What was the purpose of the Vault known as Golgotha? How did Goto Dengo survive?

Why was Epiphyte Corporation interested in the gold? What were their plans for the gold?