

Goodwin Harold Leland

# **The Flaming Mountain: A Rick Brant Science-Adventure Story**



Harold Goodwin

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# **Goodwin Harold L. Harold Leland**

## **The Flaming Mountain: A Rick Brant Science-Adventure Story**

### **THE FLAMING MOUNTAIN**

Rock, melting like butter on a hot stove! It is hard to believe, but that is what happens on San Luz, a small island off the coast of South America. When Rick Brant and his pal Dan Scott fly to the famous resort island to join Rick's father, head of the Spindrift Scientific Foundation, a seemingly inactive volcano is about to explode in an eruption which could easily blow San Luz off the map.

The immediate threat is to a small town at the foot of the volcano, where the air reeks with the fumes of hydrogen sulfide and sulfur dioxide, and it is here that Rick and Scotty help Dr. Brant and his scientist associates set up headquarters, in the hope of finding a way of controlling an eruption that is growing into a certainty with fantastic speed.

But their efforts to save the island town are hindered by the superior forces of nature, the superstitious fatalism of the people – and sabotage!

With the earth opening up all around them, Rick, Scotty, and the scientists have little hope of preventing a catastrophe, until a decision is made to unleash the awesome power of atomic energy in a desperate last attempt to fight the volcanic eruption.

Jam-packed with excitement and swift, tense action, *The Flaming Mountain* has all the elements that have made the Rick Brant Science Adventure series a favorite with boys all over the world.

## CHAPTER I

### Vulcan's Hammer

The entire staff of the world-famed Spindrift Scientific Foundation gathered in the conference room of the big gray laboratory building on the southeast corner of Spindrift Island. It was unusual for the whole staff to be called to a meeting. Even more unusual – not a single member knew what the meeting was about.

Rick Brant, son of the Spindrift Foundation's director, Dr. Hartson Brant, was perhaps even more mystified than the professional scientists. His father had phoned from Florida with brief instructions. "Rick, I want you and Scotty to make a scale model of San Luz Island. It's off the coast of Venezuela. You'll find it on the sailing chart of the area, and there are references in the library. Be as complete and detailed as possible, and have the model ready by Saturday. Pick me up at Newark Airport Saturday noon. I'll have a guest. Ask Hobart Zircon to call a full staff meeting for two o'clock Saturday."

Rick and his pal Don Scott had completed the model, which was now resting on a table at the front of the lab conference room. One hour ago he had flown with Scotty in his plane, the Sky Wagon, to Newark Airport where he had picked up his father and a short, white-haired elderly man by the name of Dr. Esteben Balgos.

Rick, a teen-aged version of his long-legged, athletic father, was consumed with curiosity. He could tell that the scientist was deeply concerned over something. It seemed likely Dr. Balgos was at least involved in that concern, if not the actual cause. But Rick still knew of nothing that would relate Spindrift Island off the coast of New Jersey to San Luz, an island off the coast of northern South America.

The Spindrift scientists were gathering, pausing to examine the model on the table before they took their seats. Hobart Zircon, the huge, bearded senior physicist and associate director of the Foundation, looked at the model in company with Tony Briotti, the youthful staff archaeologist. Dr. Howard Shannon, chief biologist, came in with Julius Weiss, the famous mathematical physicist.

A slender, attractive dark-haired girl, Rick's own age, moved through the crowd to his side. He gave her a smile of welcome. Jan Miller was the daughter of one of the staff physicists, Dr. Walter Miller.

"What's all this about, Rick?" Jan asked. "And where are Barby and Scotty?"

"I wish I knew what it's all about," Rick replied. "Barby and Scotty are at the house with Dad's guest, a Dr. Esteben Balgos. We picked Dad and Balgos up at Newark an hour ago. They'll be over in a few minutes." Rick had come to the lab ahead of the others to be sure there were sufficient chairs set up and that the model was in position on the table.

"You must have some idea," the girl insisted. "You and Scotty made the model."

"Sure we did. But we don't know why. Dad called from the University of Florida and gave instructions, and I didn't have a chance to ask any questions."

"It must be important," Jan commented. "The whole staff hasn't been together since Christmas."

Rick nodded. That had been a social occasion, not business, and on the day after Christmas he, Scotty, and Dr. Parnell Winston had taken off for Cairo where they had become involved in intrigue and a major scientific mystery. The episode was now referred to as *The Egyptian Cat Mystery*. The boy wondered if this meeting was a beginning of something exciting, too, and in the same instant he was sure that it was.

"Here comes Barby," Jan said suddenly. "Excuse me, Rick."

Barby Brant, Rick's pretty blond sister, paused in the doorway until she saw Jan hurrying to meet her. The two girls conferred briefly, then hurried to take seats in the exact center of the front row.

It was the custom at Spindrift to include the island's young people in staff activities, and Rick had been a part of the various projects and discussions since he could remember. But not until Jan Miller's arrival on the island, during the adventure of *The Electronic Mind Reader*, had Barby bothered to attend the scientific discussions. Jan, as bright as she was attractive, had succeeded in persuading Rick's sister that science was not only exciting, but understandable.

The buzz of talk in the room stopped as Hartson Brant and his guest entered, followed by Scotty. The husky, dark-haired ex-Marine at once joined Rick. The two had been close friends and constant companions since the day Scotty joined the staff during *The Rocket's Shadow* project. An orphan, Scotty was now a permanent member of the Spindrift family.

Hartson Brant did not need to rap for attention. There was an expectant hush as he began immediately. "Our guest today is Dr. Esteben Balgos, of whom many of you have heard. Until his retirement a few years ago, he was considered by his colleagues as the dean of South American geophysicists. His primary field of interest was – and still is – volcanology."

Rick leaned forward. Volcanology, study of volcanoes. The mountain that formed the backbone of San Luz had once been a volcano, but it had been dead or inactive since prehistoric times. El Viejo – the Old One – was its name. Rick wondered if it might not be the connecting link between San Luz and Spindrift, but he couldn't yet see how.

"Dr. Balgos reached me at Florida University while I was lecturing there. We talked, and I agreed that we would examine his problem. It is so unusual and challenging that I wanted all of you to hear what he has to say. Rick and Scotty have built a scale model of the island to help Dr. Balgos describe the problem to us."

"So that's why we built it," Scotty whispered. "I've been wondering."

Rick grinned. So had he.

Dr. Balgos acknowledged Hartson Brant's introduction, took a moment to wipe his horn-rimmed spectacles, and got down to business, using a pencil as a pointer. He spoke perfect English with a soft, musical Spanish accent which Rick found pleasant.

"This, young ladies and colleagues, is San Luz. I retired to this island from my native Peru a few years ago, so it is now my home. Its relationship to South America is the same as that of Bermuda to the east coast of your country. In other words, it is an island vacation resort. There are about 32,000 people on San Luz, engaged in caring for tourists, in fishing, in farming bananas and cacao, and in digging and exporting pumice."

Rick knew this from his research. He hoped Dr. Balgos wouldn't linger too long over descriptions.

"The tourist facilities are along the south coast, which is one continuous beach, starting at the main town of Calor, and running to Redondo, a fishing village at the northern tip of the island. There are several excellent hotels and guest homes."

Dr. Balgos pointed with his pencil to a cluster of buildings at the base of the mountain. "The location of this hotel is an exception. It is called the Hot Springs Hotel, and it is one of our biggest. It is named for the hot springs at the base of the mountain. You will see at once that El Viejo – this mountain – is clearly a volcano. The presence of hot springs at its base indicates that it is not entirely dead."

Now they were getting somewhere, Rick thought.

"Starting a few months ago, earthquakes in the vicinity began to increase in frequency. Since we are on the edge of a major geological fault, earthquakes are not at all unusual, and the increase attracted little attention. However, I have corresponded with seismologists throughout the area, and it is clear that the increase is due to activity directly under our island."

The Peruvian scientist held up his pencil, like a teacher addressing a class. "I see that you consider this significant. So do I. There is one other bit of information that is also significant. The flow from the hot springs has changed in character. There is an occasional outpouring of hydrogen sulfide and sulfur dioxide. Also, the average temperature of the springs has gone up several degrees."

The area must smell pretty bad, Rick thought. Hydrogen sulfide was what gave the characteristic aroma to rotten eggs, and sulfur dioxide wasn't exactly perfume. He wasn't surprised when Dr. Balgos added that the hotel had been virtually abandoned.

"My data is not sufficient for any conclusion, but the general one that some kind of volcanic activity is increasing. However, I'm sure most of you depend, as I do, on intuition as well as on data. This intuition is simply the result of years of experience. Mine tells me that El Viejo is about to become active again."

There was a murmur from the scientists.

"I am aware," Balgos went on, "that this is a conclusion which cannot yet be supported. But I am certain in my own mind that such is the case. I do not believe the present mild activity causing the earthquakes will subside. But more than that, I believe the activity will grow in a particularly disastrous way."

The scientist pointed to the volcano. "I have examined this cone. It is ancient, covered with jungle growth. It is clearly stable. The crater is filled in with compacted, weathered lava. If there should be a normal eruption, it would have to vent through the hot springs, which is the only active channel. Notice that the town of Calor would then be right in line with the eruption."

Rick could see it clearly. The contours of the terrain were such that a lava flow of any magnitude would engulf the little city.

"I believe the volcano will vent through the hot springs," Balgos went on. "But my examination of the volcano leads me to expect that it will vent with fantastic violence. The hot-springs channel is purely seepage. There is no open vent. This means the mountain will resist the growing forces under it until it is forced to give with great suddenness. To be as concise as possible, what I see here is another Krakatoa."

There was a concerted gasp from the assembled group. Rick felt his scalp prickle. He had expected nothing like this. Krakatoa, he knew from his reading, had been the greatest cataclysm in recorded history. The volcano, in the East Indies, had blown up with enormous violence. The island on which it was located had been literally blasted to bits; nothing was left. Nearby islands were blazed clean. No one knew how many people had perished instantly. The blast was felt completely around the world, and the dust of Krakatoa had so filled the world's skies that the weather was changed. Winters came earlier and stayed longer, until the dust settled at last.

"This is our problem," Balgos said simply. "It is made more difficult by two things, our people and our politics. The people are superstitious fatalists. I know them too well to expect that they will move from the island. And where would they move? San Luz is claimed by three countries: England, Colombia, and Venezuela. But we consider ourselves independent. We have our own legislature. We cannot go to any one country for help without acknowledging its sovereignty over us. We cannot go to all three at once, because the diplomatic difficulties of getting three nations together would take too much time. Besides, I do not know what any nation could do. And so, I come to you, on behalf of our governor, and of myself."

There was silence when Balgos finished. Then big Hobart Zircon boomed, "If we assume your conclusions are correct, what can be done? There is no way of stopping a volcanic eruption, much less an explosion. Man is helpless before such natural forces. It would be easier to stop a hurricane than another Krakatoa."

Balgos shrugged. "I agree. Yet, can we stand by and wait without even making an attempt?"



"Certainly not," Hartson Brant replied. "First, we must develop more data. Dr. Balgos had said that his conclusions are based on intuition, and not facts. I, for one, trust his intuition. But we must know the exact situation before we can even begin to study the possibilities of doing something."

Tony Briotti objected. "Even with a study, what can be done? I'm not a physical scientist, so this is outside of my field. But I've never heard of anyone even attempting to change the direction of a lava flow, much less control an eruption."

Dr. Balgos spread his hands expressively. "In mythology, Vulcan was the blacksmith, the god of fire and volcanoes. We have grown too wise to believe in myths, but we do believe in the scientific method. I come to you, as some of its most famous practitioners. If anything can be done – and I do not know if it can – then you are the scientific team that can do it. If you can do nothing, then San Luz will die, violently, under Vulcan's hammer!"

## CHAPTER II

### San Luz

Rick Brant awoke slowly. For a moment he lay with eyes closed while he tried to identify the strange odor that smote his nostrils. It was a noxious combination of medicine, burned matches, and ancient eggs. Then he remembered, and sat bolt upright in bed.

San Luz! The smell of the hot springs burned his nose even through the air-conditioning system. It must be awful outside, he thought. It had been bad enough last night.

He looked over to the other bed in the luxurious room and saw Scotty, wrapped like a cocoon in sheet and blanket. For a moment he was tempted to heave a pillow at the ex-Marine, then reconsidered. Scotty needed sleep. Let him wake up naturally.

Rick lay back on his pillow and closed his eyes. He could do with a little more shut-eye himself. So much had happened in the past few days that he was still spinning from the speed of it.

The arrival of Dr. Esteben Balgos had upset Spindrift more thoroughly than anything else Rick could remember. He and Scotty had sat through hours of argument and heated debate. Jan and Barby had given up when the scientific arguments got far beyond their ability to understand. Rick hadn't understood much either, but he had stuck it out to the end.

The conclusion was that probably nothing could be done. There was simply no way to check the eruption of a volcano. If El Viejo was going to blow its top, well.. that was that. But the Spindrift Scientific Foundation was not known for its eagerness to drop seemingly insoluble problems, so the staff had agreed that a study should be made, at the very least.

Hartson Brant had chosen Hobart Zircon and Julius Weiss to work with him, then he had persuaded an old friend, Dr. Jeffrey Williams, to drop his work for a short time and join the party. Dr. Williams was a noted seismologist. From the U. S. Geological Survey, Hartson Brant had borrowed Dr. David Riddle, a geologist with considerable experience in volcanology.

The scientific team departed at once for San Luz, leaving Rick and Scotty to bring up the rear. The boys loaded scientific equipment into the Sky Wagon and took off for San Luz. It took three days for the little plane to make the trip, the longest flight of Rick's flying career. Only once before had he flown so far over water, and then only to the Virgin Islands. The plane had made it easily, but he and Scotty had sweated it out.

Ordinarily, Hartson Brant would have taken the boys by commercial air, but he wanted Rick's plane on hand. Since the senior scientist did not know what difficulties the scientists might encounter, he wanted a way of making aerial surveys and photographs, plus ready communication with the mainland and nearby islands.

The boys had arrived early the evening before, only to be whisked to the Executive Mansion where the governor of San Luz, the Honorable Luis Montoya, was holding a reception for the visiting scientists.

The governor, a charming little man who looked like Rick's idea of a Spanish grandee, knew why the scientists were there, of course. But the secret was confined to the governor himself and to Balgos. Even Jaime Guevara, the lieutenant governor, did not know.

The agreement was that the scientific group would seem to be interested only in the hot springs. The purpose of their visit, the governor had announced to the local press and radio, was to investigate the change in the springs that had ruined a principal San Luz resort hotel.

By ten o'clock, when the reception ended, the boys were exhausted. But the end was not yet. They were riding in Zircon's jeep – five jeeps had been assigned to the party by the governor – and Zircon had to meet the last member of the party, Bradley Connel, a geologist borrowed from an oil company in Caracas, Venezuela, by Dr. Balgos.

It was nearly midnight before the boys got to sleep, after nearly three days with minimum rest. So, both were tired. In the middle of thinking how tired he was, Rick dropped off to sleep again.

He awoke with Scotty's voice in his ears. "Come on, old buddy. Dad's calling a staff meeting in fifteen minutes."

Rick sat up. "How do you know?"

"Didn't you hear the phone ring? Boy, you must be tired! Let's go. Time for a quick shower and coffee. I've had mine."

Rick saw that a breakfast tray was on a bedside table. He had slept through Scotty's arising, shower, and delivery of breakfast. He shook his head, still groggy.

A quick shower woke him up. He sipped coffee and ate toast while getting into his clothes, then the two hurried down the corridor of the luxury hotel to the conference room Hartson Brant had taken over as headquarters.

The scientists were already there, taking seats around the room as the boys walked in.

Rick looked at the new faces. It was the first time he had seen them in daylight. Dr. Jeffrey Williams was a plump, round-faced man with a shock of pure-white hair. Dr. David Riddle was tall, dark, lean, and heavily tanned. He looked like a mining engineer, or perhaps a forest ranger. Bradley Connel was short, heavy set, with straw-colored hair and the kind of complexion that is always sunburned and peeling so long as the days are hot – which meant always, this close to the equator.

"Let's get to work," Hartson Brant said. "It's obvious that visual inspection is not going to tell us much. We'll have to get tracings before we have any real idea of what's going on under us. Dave, have you found anything of importance?"

David Riddle shook his head. "It's a typical formation. Nothing unusual about it at all. El Viejo is simply a dead volcano, its cone filled in, and plenty of jungle on the slopes. The hot springs are just a seepage point, as Dr. Balgos knows. So far as I can tell, they're the weakest point, so if the mountain lets go, that is where the blowoff will come. Of course, this could be wrong and there may be weaker channels we don't suspect. We'll know when we start shooting."

Hartson Brant looked at Dr. Williams. "Anything to add, Jeff?"

"Not much. I've gone over the seismic data Esteben got from the seismologists in the area, and it's clear that the epicenter of most recent earthquakes in the area is right under us. Something is happening down in the earth under the mountain, but I can't say what it is. It may be volcanism or it may be a fault shifting."

Rick knew that a fault was like a great crack in the earth's structure, but he had thought the scientists had agreed that the earthquakes were caused by volcanic action. He asked, "Sir, doesn't the change in the springs mean something?"

"Perhaps, Rick," Dr. Williams answered. "We don't really know. Dr. Balgos thinks they mean a great deal, and I have respect for his opinions. But I'm only a seismologist. I have to depend on traces from earthquakes, and the traces tell us nothing but the single fact that something is going on far below."

Hartson Brant nodded. "The answer will depend on more data, so today we'll start to collect it. Rick and Scotty brought apparatus, and the governor has supplied us with dynamite and two experienced helpers, Ruiz and Honorario."

"How do we split up?" Julius Weiss asked.

"Into firing and recording teams. Since we have only two recorders, we can have only two teams for data collection. But we can have three firing parties. Dave Riddle will work with Honorario, Brad Connel with Ruiz, and Hobart Zircon with Rick and Scotty. Julius, you and I will form one recording party, and Esteben and Jeff will form the other. Each team will have a jeep. Now, if you'll all gather around this model the boys made, we'll pick approximate locations for stations."

The boys had brought the model with them. Now the group gathered around and discussed the best locations for both firing and recording parties.

Dave Riddle was assigned a station on the slope of El Viejo near the town of Redondo on the north end of the island. Brad Connel was given a location on the northwestern slope, and Zircon and the boys were shown a position on the west near the place where pumice, a foamy volcanic rock, was mined. Hartson Brant and Julius Weiss were to place one recording station on the eastern slope of the mountain, while Dr. Williams and Dr. Balgos were assigned a station on the northern coast.

Hartson Brant handed a wrist chronometer to each team leader. Each team was also to have a transit, with which to take bearings for the purpose of locating the stations with precision.

"The hotel restaurant has packed lunches for us," Hartson Brant stated. "If we get under way at once, we can start shooting at one o'clock. Let's try for three shots each this afternoon. Each firing team will move one mile in a clockwise direction between shots, and we'll need to space the shots fifteen minutes apart. Hobart, you'll start shooting at 1:00, Brad at 1:15, Dave at 1:30. At 2:00, we'll start the cycle over again. That should bring us all back to the hotel by suppertime."

Big Hobart Zircon clapped the boys on the shoulder. "Let's get going. Scotty, you pick up our lunches. Rick, we'll load equipment."

The five jeeps were lined up outside. Rick carried out a transit, the tripod slung over his shoulder, and found the two local helpers waiting. Ruiz was a short, swarthy man with gleaming white teeth and a Mexican-style sombrero. Honorario was only slightly taller, and so thin a strong breeze would blow him away. The two San Luzians greeted him courteously. "*Buenos días, señor.*"

Rick knew enough Spanish to be equally polite. "*Buenos días, señores. Cómo están ustedes?*"

The two switched to English. Rick hoped it wasn't a reflection on his Spanish accent, acquired at Whiteside High School the year before. "We are well, señor," Ruiz answered, and Honorario added, "We hope you will enjoy San Luz, señor."

Rick said that he expected to enjoy it very much indeed. He wondered if the two knew that their mountain was getting ready to blow its top. He asked, "Do you have the dynamite, *amigos?*"

"In the shed, señor. Also the caps and the detonators. If you will come, I will show you." Ruiz gestured toward a concrete shed that stood some distance away.

"What was the shed used for?" Rick asked as they walked toward it.

"It is a shed for a pump, señor. The pump is for the hotel's water, which must be brought up the hill from Calor."

In a moment Rick saw for himself. The pump was operating noisily. Along one wall were shelves, one of which contained two cases of dynamite and boxes of caps. On another shelf were three detonators. He selected one, then picked out six sticks of dynamite. He handled the stuff gingerly, even though he knew it was safe as so much soap. Dynamite, for all its explosive power, is stable stuff, and difficult to set off by accident.

The dynamite caps were much less safe, however. Each was packed carefully in its own protective wrapping, but Rick took no chances. He put each one in a different pocket. Then, feeling like a keg of gunpowder with a sputtering fuse, he walked back to the jeep.

Hobart Zircon and Scotty came out of the hotel as he approached.

"Stand back," Rick said grimly. "I may go off like the Black Tom explosion if you touch me."

Big Hobart Zircon chuckled. "Don't worry, Rick. If you do, we'll go off with you. Would it make you happier if I carried the explosives?"

Rick considered. "It doesn't matter," he said. "If the stuff goes off, we'll all go into orbit at the same time and the jeep will go with us. Let's go."

Scotty looked at him curiously. "Where are the caps?"

Rick patted his pockets one at a time. "One in each breast pocket and one in my watch pocket. Don't push me around, buddy. I'm loaded."

Scotty grinned. "I'll keep my distance."

The rest of the party was loading jeeps now, too. Scotty hoisted the equipment and lunches into the back of the jeep and got in with them. Rick climbed gingerly into the front passenger seat and

Zircon got ready to drive. He handed Rick a map. "You navigate. Our first destination is marked with a cross. We start out on the road leading west from the hotel. That will take us to the pumice works."

"Okay," Rick began, but he never finished. The jeep began to rock under him. For an insane instant he thought it must have a perfectly silent motor, then he realized Zircon had not yet turned on the ignition switch. Sudden dizziness made him clutch at the seat, and instinctively he clapped an arm across his chest to protect the dynamite caps.

He was vaguely conscious of yells from around him, and he struggled to sit up straight. His stomach was churning and he felt nauseated. Zircon let out a bellow like a wounded steer.

From inside the hotel Rick heard the sudden crash of shattering glass and gripped the jeep seat tighter with his free hand.

Then, as suddenly as it had come, it was over. He straightened up, dizzy. "Wh-what happened?" he asked shakily.

He heard Dr. Balgos. "A warning, my friends. The most serious one yet." He pointed up to where the peak of El Viejo loomed. "The Old One must be working faster than I thought."

"But what was it?" Rick asked again and at the same time was afraid that he knew.

"Earthquake," Zircon boomed. He pointed.

Rick stared. In a zigzag line across the hotel parking lot was a fissure, one that hadn't been there a minute before. The concrete gaped in widths varying from a crack to a few inches.

The earth had opened up!

## CHAPTER III

### Firing Parties

It was a shaken group of scientists that moved off in their jeeps to the preselected stations. Most of the adults had experienced earthquakes before, but none had seen the earth split almost at their feet. To Rick, the sensation had been as upsetting as any he had ever experienced.

"The one thing we learn to depend on," Zircon said, "is that the earth under our feet is solid and dependable. When it shakes like a jelly, it causes a kind of emotional shock, apart from any physical damage it may do."

"It certainly did with me," Rick agreed.

"Ditto," Scotty added.

Zircon put the jeep in gear and moved away from the hotel. He drove slowly over the narrow part of the crack in the parking lot, then picked up speed. Rick looked around. Bradley Connel and Ruiz were following in their own vehicle.

Zircon took a blacktop road to the west, close to the base of the mountain. Fortunately for Rick's peace of mind, the road was fairly smooth. He had never carried dynamite caps before, but he knew they contained fulminate of mercury, which is one of the most unstable and violent chemical substances, pound for pound, ever created.

The big scientist sensed his uneasiness. "Relax, Rick. Those caps won't go off without a substantial knock against something. Enjoy the scenery."

Rick grinned. "I'll try."

The scenery was tropical. Once away from the hotel grounds, there was heavy growth, vines, creepers, and broad-leafed plants. He saw palmetto and wild banana interspersed with Judas palms and other typical vegetation. The growth clung to the side of El Viejo like a thick green carpet. Now and then the jeep passed an open space in the vegetation and he saw the plains stretching away to the sea on his left.

The jeep climbed gradually and Rick realized that their direction had changed. They were now heading on the more northerly course. The vegetation was thinner, too, and he guessed it was because they were higher up the mountainside. At a rough estimate, the jeep had climbed nearly a thousand feet.

"Pumice quarry ahead," Zircon announced.

Rick saw ramshackle wooden buildings, then piles of grayish rock. A hundred yards farther on he saw an open pit. This was where the San Luzians mined pumice for export.

"Is there much of a market for it?" Scotty asked.

"Not as much as there was years ago," Zircon replied. "Pumice, as you probably know, is volcanic rock. But not an ordinary one. It's a kind of foamy lava honeycombed with gas bubbles. It's used as an abrasive. Modern industrial products have replaced it in general use, but apparently there's still enough demand so that the San Luzians are able to export a little. Our firing station is about a mile from here."

Rick looked at the rough terrain. "Think we can get through?"

"Easily. According to the map, we have an unpaved road part of the way."

The unpaved road turned out to be a pair of wagon tracks. But at least there were no trees in the way. Rick held on tight as Zircon shifted into four-wheel drive and forged ahead.

The big scientist kept an eye on his odometer, or mileage counter, while the boys watched for a clearing. It was slightly over a mile before they found one, and Zircon pulled off the road to let Brad Connel and Ruiz go by.

The jeep stopped as the two came abreast and the geologist called, "Want to trade stations?"

"We like this one," Zircon replied with a grin.

"Don't blame you. I have another three miles through this stuff. Well, so long."

The jeep started off and was soon lost as the path curved slightly.

Zircon looked at his watch. "Plenty of time, but we might as well get ready."

A few minutes search disclosed a spot far enough away from the clearing for safety, with no trees to be uprooted by the blast. Zircon took two of the dynamite sticks Rick carried and one of the caps. He placed the cap over one stick and used a special tool, like a jar opener, to crimp it into place.

"This is the only really delicate part of the operation," he said. "If the crimpers slip, they could set off the cap and the dynamite. So be careful when you do it. Keep the crimpers low on the flange of the cap."

He found a rubber band in his pocket and used it to hold the two sticks together. A coil of wire was produced next, and the connection made to the dynamite cap. Zircon dug a shallow hole with his heel and put the dynamite sticks in, then backed off unwinding wire as he went.

The detonator had been left in the jeep. Rick got it and carried it to where Zircon waited with the pair of wires.

"How does this thing work?" Scotty asked.

"It's a dynamo," Zircon replied. "When the handle is pushed down it engages gears that spin a flywheel, which operates the dynamo long enough to send an electrical charge through the wires."

"So don't sit on the handle," Rick joked.

"And don't kick it," Scotty added.

Zircon connected the wires to a pair of terminals on top of the detonator, then looked at his watch. "Plenty of time. We might as well take it easy. Anyone hungry?"

No one was. It was too soon after breakfast. Instead, Rick took the opportunity to ask questions.

"I can understand the general principle of what we're doing, but can you tell us exactly what happens?"

"Sure. When the dynamite charge goes off, it sends shock waves through the earth in all directions. Whenever a shock wave strikes something of different density, its direction and velocity change. For instance, if there is denser rock a few hundred feet down, that will cause a change of both velocity and direction. With me so far?"

"I think so," Scotty said. "The denser the stuff the wave strikes, the faster it moves. Like sound waves. I mean, sound moves faster in water than in air, and faster in a steel rail than in water. Is it the same?"

"Just about," Zircon agreed. "The shock waves radiate away from us, through the earth, and eventually reach the recorders on the other side of the mountain. You can see what happens, I think. Waves will arrive at different times, depending on the path they took and the kind of material they went through."

Rick nodded. "So if there's molten rock, or magma somewhere in the way, the shock wave that goes through it will slow down and arrive at the recorder later?"

"That's it. The tracings we get can be analyzed to give us a kind of cross-sectional look at the mountain. You see, we know how fast the waves travel through different kinds of earth structure. Also, we will know the point of the explosion and the location of the recorder for each shot. Which reminds me. We'd better get out the equipment and locate ourselves precisely."

"How?" Rick asked. "What will we use for landmarks?"

"The top of the mountain, for one, and if you'll look carefully to a point slightly south of east between those two banana palms, you'll see the top of the control tower at the airport."

Rick shook his head. "Good thing you're with us. I completely forgot to watch for landmarks."

"That was the first thing I had in mind in looking for a spot," Zircon told him.

The transit gave a precise angle between the two landmarks. Zircon drew a line on the map connecting the southern tip of the mountain and the airport tower. Then, with that as his base line,

it was easy to draw two lines at the correct angles from each of the points. The transit's position was where the two lines intersected.

By the time the scientist had finished, it was nearly one o'clock. The three walked to the detonator. "Pull the handle up," Zircon directed. Rick did so. "I'll count down from ten seconds. Push down on zero."

It was like the countdown for a rocket firing, Rick thought. Zircon called out the time starting at one minute, then called off the last ten seconds. As he reached zero, Rick pushed the handle home.

The dynamite went off with a roar that sent leaves and dirt flying, and Rick felt the shock wave slam against his ears with stunning force.

"Open your mouth next time," Zircon said. "I forgot to warn you." He was already reeling in the wire. "Let's get going. One mile farther on for the next shot."

At the next station the same procedure was repeated, but before it was time, there was a far-off explosion. Zircon looked at his watch. "Brad Connel. Right on time." In another fifteen minutes there was an even more distant sound as David Riddle's first shot went off. They ate their lunch and listened to the echo off the mountain.

Zircon and the boys were ready when their time came. Location this time had been made on sightings toward the mountain, and a flagpole at Cape San Souci on the western side of the island.

The road petered out and they were forced to go cross-country to reach the third shot station. Fortunately, Brad Connel had left a path of crushed vegetation, so it was only necessary to follow where he had led.

After the third shot, the three collected their equipment and drove back to the hotel.

They were the first back. All three were sticky from the heat, and somewhat insect bitten. By unanimous consent they headed for the showers.

Rick dressed except for his shoes, then stretched out on his bed. He wondered what the day's work would show. The memory of the earthquake was still fresh, and he was anxious to see if it had come from rising magma far below, or from some other source. He had a mental image of white-hot rock rising sluggishly, melting a path to the surface. Now and then the magma struck water, or gas-producing minerals, and then there was a tightly held explosion that made the earth shudder.

Well, it was probably like that, from what he had read about volcanic action. Anyway, he could do without earthquakes. They were unnerving.

Scotty finished dressing, and Rick slipped on his shoes. It was time for the others to be back. Connel should have arrived only a few minutes behind them, but it would take longer for the others because they had gone around the mountain in the other direction.

The boys walked to the staff conference room and found Hartson Brant and Julius Weiss. The two were busy unrolling long strips of paper covered with blue shadings.

"Find anything yet?" Rick asked his father.

"No. We're just getting ready to take a look. How did it go?"

"No trouble. Zircon must still be in the shower. Probably Connel is, too. He must have been right behind us."

The scientists started poring over the traces.

"Here's your first shot," Hartson Brant said. He pointed to where a series of squiggles began. Rick could see nothing of interest. All the pen marks looked about the same to him. It would take expert analysis to make anything out of them.

The boys left the scientists to their work and wandered out into the parking lot. "I want to take a closer look at that crack," Rick said.

"Same here. Suppose it goes to China?"

Rick grinned at his pal. "That's a myth. If you drilled a hole straight down through the center of the earth from here you wouldn't come out anywhere near China. You'd be in the Southern Hemisphere."



"Don't get technical on me, boy."

The crack, however, went down only about three feet, gradually narrowing until it was closed. Even so, it was impressive. Rick knew that the actual break must continue down into the earth for some distance, perhaps for hundreds of feet. The force it took to shake the earth like that was awesome. Again he was reminded sharply of the kind of forces against which the Spindrift group was trying to contend, and he felt for the first time that the job was completely hopeless. What could mere men do?

A horn honking wildly brought him to quick attention. He turned and saw a jeep coming along the western road into the parking lot. Brad Connel! But where was Ruiz? Then, as the jeep neared, Rick saw. The San Luzian was lashed to an improvised stretcher lying across the back of the jeep!

The geologist drew to a stop, his face chalky.

"Get a doctor!" he shouted. "Quickly! Ruiz got caught in the last explosion. I think he's dead!"

## CHAPTER IV

### Seismic Tracings

Ruiz, the short, friendly San Luzian, was not dead, but he was only barely alive. Within a half hour he was on his way to the hospital at Calor, crushed and unconscious.

Brad Connel was badly shaken. "I thought he was behind me," the geologist explained. "But he had gone back to check the cap connection. At least, that's what he must have gone back for. I fired, then turned around, and he wasn't there. He was blown fifty feet at least. If only I had checked! But he was there with me, and I just kept my eye on the chronometer. He didn't say anything. He just walked off."

There was nothing much to be said. It was the kind of accident that seems absolutely senseless. Both Connel and Ruiz were old hands with explosives, yet the San Luzian apparently had wandered back to the charge just as it went off.

Rick and Scotty walked toward the hot springs behind the hotel and talked it over.

"Pretty stupid thing for anyone to do," Scotty said soberly.

Rick agreed. "Especially an old hand. Ruiz was supposed to be experienced, but I can't imagine how a veteran could pull a stunt like that."

It made absolutely no sense. Ruiz spoke English. Rick knew that from his conversation with the San Luzian. So he must have known Connel was counting down, getting ready to push the plunger home. Why would he walk into the blast, unless he was tired of living? But he didn't believe Ruiz would try to get himself killed deliberately. The little San Luzian had seemed like a sane, happy individual.

Rick gave up. Maybe when Connel calmed down a little he could shed more light on the accident. "The smell from the springs is getting pretty strong," Scotty remarked.

It certainly was. The wind had been from the hotel toward the hot springs most of the day, and the odor hadn't been bad. Now, in the vicinity of the springs, it was making Rick's eyes water and his nose smart.

"Think we can get close enough for a look?" Rick asked.

"We can try. There's the building ahead."

A cement walk led from the hotel to the springs, rising up a gradual incline that was not too steep for wheel chairs, or for the elderly. The boys had heard that many invalids had come here, to bathe in the hot springs, to drink the mineral water, and to soak in warm mud.

"How'd you like a nice hot mud bath?" Rick asked.

Scotty grinned. "Can't say it appeals to me, but there must be something to it. There are mud baths and hot springs in Europe, too. With plenty of customers."

Rick took out his handkerchief and dried eyes that were watering from the fumes. He doubted that the gases were good for them, but he was curious. He wanted to see where the volcano would blow its top, if it was going to.

In spite of the irritating fumes, they persisted and got a quick look at the former health area. There was a series of pools for bathers, ranging from big ones for large groups to individual tublike affairs, all nicely tiled. There was one area of mud baths. Rick had an impression of two areas, one of bubbling mud, the other of steaming water. It was enough. The boys turned and got out of there.

Back at the hotel, the scientists were working. All were present, except for Brad Connel, who had asked to be excused. He was in his room, apparently still badly upset over the accident.

Dr. Jeffrey Williams had obtained a large sheet of paper and had sketched an outline of the volcano and the earth under it as seen in cross section. As Hartson Brant read off data from the day's

tracings, Dr. Williams plotted points far underground. Now and then he connected points, or put in a light line.

Rick and Scotty watched with interest. The tracings meant nothing to them; analysis was a job for trained scientists. But Dr. Williams was slowly producing a picture on the paper.

"That's all," Hartson Brant said finally. "How does it look, Jeff?"

The seismologist shook his head. "Not good." He held his pencil almost flat to the paper and began shading in an area bounded by the points he had made. "According to what we have, this is the shape of a magma front." He drew in other lines, rising vertically through the earth into the volcano. "Apparently these discontinuities indicate old channels, now filled in. Notice that the magma is not following the original channels. This seems to confirm what Esteben has been telling us."

The volcanologist nodded. "It seems to. Jeff, do you have any doubt about this area being magma?"

"I'm afraid not. The data fits. Of course it's still pretty far below the surface."

Rick could see that the ominous shading was nearly twice as far underground as the top of the volcano was above sea level.

Julius Weiss spoke up. "The next step is to find out how fast the magma is rising."

"A series of shots every day for the next few days should tell us that," Hartson Brant agreed. "Hobart, you've been pretty quiet. Any comments?"

"None of any importance," the big physicist boomed. "Only this: what can we possibly do about a situation like this?"

Hartson Brant shrugged. "I don't know. At least we can keep track of the magma."

David Riddle, the geologist, added, "It will allow time to warn the population. I can see no other means of saving them except to get them off the island."

Rick had reached the same conclusion. It didn't take a scientist to realize the gravity of the situation. El Viejo was getting ready for something big, unless the magma subsided. Since no one was really sure about the physics of volcanology, no one had a good guess why the volcanic action had begun again. No one could be sure it would not decrease, either.

"This picture is pretty rough," Dr. Williams said. "I'll refine it a little after dinner, Hartson. It will give us a better basis for plotting tomorrow's results."

"Good idea," Hartson Brant agreed. "And speaking of dinner, it's about time. Let's wash up and meet in the dining room in a half hour."

"Better call Brad Connel," Zircon said. "I know how upset he must be, but it will be better if he joins us and eats something."

Rick and Scotty returned to their room and washed for dinner. Both were quiet. The appearance of the magma under them, almost like a mushroom cloud in shape, was pretty ominous. Like sitting on a volcano, Rick thought. It was the most appropriate expression he could think of. No wonder the earth had split.

Scotty mused aloud. "Rock. Melting like butter on a stove. Thousands of tons of it. Makes you appreciate natural forces, doesn't it?"

"Even hydrogen bombs are pretty feeble by comparison," Rick agreed. "It makes me uneasy to think of all that stuff boiling up under us."

"I caught myself looking down a couple of times," Scotty said with a grin. "I wouldn't be surprised to see steam coming up through the rug."

Rick consulted his watch. "Maybe food will make us feel better. Come on. It's about time."

The scientific party was alone in the hotel, except for a reduced staff. The governor had made arrangements for the hotel to operate so that the visitors could have service. Rick almost wished they had stayed at a beach hotel with other people around them. The huge resort was like an abandoned city, with a few ghosts left in it.

They walked through the conference room on their way into dinner and found Connel looking over the sketch Williams had made. He looked up as they entered and greeted them casually.

"Hello, Rick, Scotty. I see we do have magma below us."

"That's what Dr. Williams said," Rick agreed. "How do you feel, Mr. Connel?"

The geologist shrugged. "How can I feel? Ruiz was – is – a nice little guy. I still don't know what happened, why he should walk back to the charge. I was concentrating on getting the charge off on time, and there was no reason for him to go back."

"You said he went to check the cap connection," Scotty reminded.

"It's the only reason I can think of, and it isn't a very good one. He made the connection himself. Maybe he wanted another quick look."

The geologist transferred his attention back to the sketch. "The stuff is still pretty far down. Good thing, too. That will give time for evacuating the island. We've probably got several months yet."

The subject wasn't brought up during dinner, but over coffee Esteben Balgos commented, "We must keep the governor informed. Jeff, if you will lend me your sketch, I'll take it to the Executive Mansion first thing in the morning and bring it back before we begin shooting. I think the governor will want to start planning for evacuation, if he has not yet done so."

Williams nodded. "Help yourself, Esteben. I'll probably have the sketch in my room. Knock on the door in the morning if you want it."

The talk turned to heat-transfer mechanisms in the earth, and from there to the whole problem of solar-energy input and outflow. The subject was not one in which Rick had any background, and it wasn't long before he lost interest. Besides, he was still tired from the trip, and the day's events had added their own burden of fatigue.

Scotty yawned, and Rick took the opportunity to suggest, "Let's go to bed."

"I'm with you."

The boys excused themselves and in a short time were settled down for the night. Rick fell asleep almost instantly.

He awoke with Scotty shouting in his ear. "Let's go, Rick! Trouble!"

Rick was on his feet, into trousers and shoes before he was fully awake. Scotty had already dashed into the corridor. Rick joined him and the rest of the scientists, who were standing in a group in front of Jeffrey Williams' room. The white-haired scientist was holding a handkerchief to a bloody bruise on his head. Rick hurried up just in time to hear him tell the group:

"I don't know what happened. My door wasn't locked, so anyone could have come in. I didn't see a soul. I must have dozed off."

"What's going on?" Rick demanded.

His father answered. "Someone came into Jeff's room and slugged him, apparently while he was dozing over the tracings. Both the tracings and the sketch are gone!"

## CHAPTER V

### Dynamite Missing

"There's only one reason I can think of why anyone would want to steal the tracings," Rick said. He held on for a moment as Zircon steered the jeep over a bump in the trail. "If word has leaked out about why we're really here, maybe someone in the tourist business would steal the evidence to keep business from being ruined."

Scotty spoke up from the rear seat. "There's one big fat flaw in that argument, boy. Would anyone care so much about business that he'd want to stay and be blown up? Who thinks more of business than he does of his own skin?"

Zircon chuckled. "There may be such people, but I suspect they're scarce."

Rick had to agree. He stared through the windshield at the tail of Brad Connel's jeep. The geologist was leading the way to the firing area, and he was alone. Hartson Brant had tried to assign one of the boys as a helper, but Connel had balked. He insisted that he did not need a helper, that he was used to handling charges alone, that he did not want to take the risk of an accident like that of yesterday.

"Connel was pretty determined to go it alone," Rick remarked.

"He's upset over the accident to Ruiz," Zircon pointed out. "He probably feels bad because he couldn't see Ruiz when he visited the hospital."

Connel had gone into town with Dr. Balgos, and had paid a call at the Executive Mansion. While Balgos talked with Governor Montoya, recreating the stolen sketch from memory, Connel had been taken to the hospital by Lieutenant Governor Jaime Guevara. The hospital reported that Ruiz was on the danger list, his condition unchanged. He could have no visitors. Apparently both Guevara and Governor Montoya had tried to assure Connel that he should not be so depressed over what was obviously a freak accident.

The trio stopped at their first station, and Connel waved, then continued on his way. Rick watched him out of sight, then turned to go to work. He remembered what the geologist had said the night before.

"Connel figures we have months before the volcano blows," he remembered.

"What?" Zircon looked up sharply. "How did he arrive at that conclusion?"

"From Dr. Williams' sketch."

"Hmmm." The big scientist checked the detonator thoughtfully. "He must have figured on a straight upward flow of the magma. But from the shape of the magma front, I think it's highly unlikely that it will progress in any such regular fashion. Instead, the front probably will increase erratically, but in a kind of progression. It may double its frontage at approximately regular periods."

Scotty scratched his chin. "Double its frontage, huh? What does that mean?"

"Maybe four hundred square feet today, eight hundred tomorrow, and sixteen hundred the day after. We won't know the rate of growth, or the time scale, until we've watched it for a while. But I talked with Balgos and Hartson last night at some length, and their opinion is that we probably have a couple of weeks, maybe even three or four. But not months."

Rick whistled. "That fast? When will we be sure?"

Zircon shrugged. "Can't tell. We'll keep shooting on a daily schedule, and perhaps in three or four days we'll see enough growth in the front to make an estimate. But even that can be misleading. If the magma strikes a softer area, it can grow even more rapidly. Our best bet will be to keep a daily watch from now on."

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