Satellite Scout

Bill wondered what would happen when the four moons of Jupiter and the planet lined up with the sun. He found out • By ROBERT A. HEINLEIN

BEGIN STORY HERE

A CALIFORNIA Scout, Bill, his father, stepmother and sister, are emigrants on the huge spaceship Mayflower en route to a new colony on the planet Ganymede, a satellite of Jupiter. During the journey Bill organizes a Scout Troop, planning to carry Scouting to the new planet. Disappointment awaits everyone, however, when they land on frigid, rocky, almost airless Ganymede. The Colony is not prepared for so many immigrants. There is no place to live; Peggy, Bill's stepsister, cannot adjust to the low-pressure air, his father has to take a job instead of being able to homestead a farm as planned. It looks as if Bill had smuggled his Scout uniform in uselessly, for he will have to return to Earth. Then Bill makes his decision. He will undertake alone the tough job of pioneering the farm from the rock and frost of Ganymede.

PART THREE

AND THAT'S THE way it was, though Dad hemmed and hawed some. When I saw the piece of land we drew in the lottery I felt like backing out of my decision to pioneer the farm by myself so dad could keep his job, but it was too late. You never saw so much dead waste of boulders and rock.

But Papa Schultz said that I would make a fine farm of it.

I'm getting ahead of my story. Papa Schultz was a Scout Commissioner. Would you believe it, Ganymede had Scouts all along! We just hadn't heard about it. It caused some hard feeling and jealousy that we had called ourselves "The Boy Scouts of Ganymede," not to mention the fact that the Leda Troop used the city hall as a meeting place and now we immigrants had crowded them out through using it as barracks.

But our Scout Leaders got it straightened out and the *Mayflower* Scouts were taken into the local organization—ratings confirmed on probations, where they differed, and all Patrol Leaders to come from the Leda Scouts. That was fair enough; how could I be a Patrol Leader when I was so green I didn't know northwest from next week?

What it really meant to me was that I had to pass Merit Badges in engineering agronomy and planetary ecology—which is a fancy way of saying Ganymede farming—or I would stop being an Eagle Scout by default.

Hank Jones and I transferred over to the Auslanders, one of the Leda Patrols. It meant we caught a certain amount of hazing but we learned a lot faster, too. Sergei Roskov was Patrol Leader and he didn't let them do too much to us. Besides, the Schultz boys were in the Auslanders.

Papa Schultz was just the man from whom to learn Ganymedean farming. The Schultzes had the farm next to us and Papa Schultz came down and introduced himself the day we went out to see our land. He invited us back to his house for coffee cake and to meet his family. Next thing I knew he had suggested to George that I come work for him until we got our chance at rock crushing machinery.

Papa Schultz needed another farm hand as much as a snake needs pockets, but it was too good a chance for me to miss. I moved in with them.

Papa Schultz was a big man with a booming voice and a wiry red beard spread out over his chest. Johann Schultz was his real name, but everybody called him "Papa" or else "Appleseed Johnny," because he was forever giving away appleseeds and telling people to plant them. He gave me some the first time I met him. He had the only tree on the whole of Ganymede, a grafted apple tree that he had imported from Earth.

He had the best house in the colony, too—rock, like all the others, but bigger, for his big family. It had a real fireplace, only nothing had ever been burnt in it because there was nothing to burn. They got their heat from the power antenna on their roof, like everybody else.

MAMA SCHULTZ WAS as big as he was but shorter and wider. She made a career out of stuffing people with her good cooking; I gained twenty mass pounds while I was with them. The oldest girl was about my age and was named Gretchen. She took after Papa—red-headed and tall and an awful tease. Then there were the twins, Kathy and Anne, and the baby.

The oldest boy, Johann Junior—"Yo" they called him—worked in town. Vic Schultz and the next boy, Sam, worked the farm with Papa. They were Explorers like me. Then there were Hugo and Peter, both Cubs.

Everybody worked around there. You could bet on it that the baby would start helping with the dishes when she learned to walk. Me, I worked too, and learned about corn and pigs and chickens and that you always milk a cow from the right and how to hand-pollenate plants. Everything was stoop labor—plenty of power but no power machinery. I learned not to sneer at a wheelbarrow; under Ganymede's low gravity you could move a mighty hefty load with a wheelbarrow.

We had fun, too; I've never met a family that laughed so much. After supper we would sit around and I would play my old squeeze box and everybody would sing, with Papa braying along in his own key, not caring.

I don't know when I've been so happy.

When the time came to crush our land I was almost sorry, but by then I could till a row of corn or caponize a rooster and there was no excuse not to start making a farm.

THE ROCK CRUSHER came down the road from town and stopped where the road ended at a lava flow, just a piece short of where our land started. The driver lowered the big spade, started his vibro-cutter, the spade moved in and chewed that lava rock like so much peanut brittle. The crusher moved forward about at a walk, leaving a nice smooth road behind it.

About noon it reached our land and moved up on it. Dad and I had dynamited all the boulders more than six feet thick. What was left the crusher just chewed up and spit out. By midnight I had a farm—covered with loose rock, but level.

I rated a cud chewer for the next week. A cud chewer is a baby rock crusher; it turns the crushed rock into rock flour, ready to be worked up into soil. It was light phase

"No good," he answered, "We've got to get Peg to the hopsital."

"Peggy, Peggy! Can you hear me." No answer—He hit the door hard with his shoulder

for the next two days and we kept the cud chewer going all the time, with George spelling me off shift (and getting practically no sleep) and the Schultz boys helping out.

MAYBE I SHOULD explain about "light phase." Ganymede takes an Earth week to go around Jupiter and turns on its axis in the same time, just like Luna, so we had it light for the first three and a half days of each week, starting Sunday night and ending Thursday noon; then we would have half a week of darkness, ending the following Sunday midnight, with nothing but Jupiter light outside . . . though Jupiter light is not to be sneezed at. Jupiter spreads across about two hundred and fifty times as much sky as Luna does from Earth. You can read print by it. Since Ganymede always faces toward Jupiter, like Luna does toward the Earth ("tide-locked" the astronomers call it), Jupiter is always hanging there overhead, ruddy and grand and unmoving. The Sun moves, the stars move, all the other satellites of Jupiter move—but not good old Jove!

By the end of dark phase five acres of our land was ready to work. Monday morning the colony ecological department delivered to me the one load I was allowed of "pay dirt"—real Earth soil, split six ways and developed in the hydroponics sheds and infected with Earth bacteria and worms and everything else needed to turn rock into living soil. I got up early to receive it and was just studying how I had best use it when I saw something moving down the road . . . six men, pushing wheelbarrows.

They came closer and I saw that it was all the male Schultzes, each with a load of garbage mulch *and all for me!*

I didn't know how to thank them.

Papa Schultz shouldered me aside and took charge. He folded the garbage into the pay dirt with a pitchfork as carefully as Mama Schultz handling beaten egg, then he had us till it into the rock flour in long strips. Then we planted a mutated grass to hold the soil through the coming winter. Winter comes every six months on Ganymede—five months of summer, then one month of winter, turned on and off at the power house. They do it by lifting the heat trap during light phase. Winter we had to have to leach the soil and to cause some of the crops to fruit, but my new soil had to be tied down with roots before they turned on winter. This meant plenty of hard work.

Without the Schultzes to help I doubt if Dad and I could have gotten it to seed and take hold in time. Pioneers need good neighbors.

My next job was to get a house up. I spent nearly two weeks cutting rock, using a vibro-saw rented from the colony. A vibro-saw makes quick work of stone dressing; it cuts like a hot knife in butter, but you have to be awfully careful not to get your fingers into the field.

Just what sort of a house was a problem. I would like to have had a big one like the Schultzes, and earthquake proof like theirs, but we didn't have the time, nor the money for that big a patent roof. We had quakes all the time, little ones from the shifting and readjusting of the crust that resulted from melting off Ganymede's ice cap—but they never amounted to anything and most of the colonials didn't go in for the added expense of making a rock house quakeproof.

WE COMPROMISED. One room had to be quakeproof, because it had to be sealed and pressurized, for Peggy. The rest of the house would be dry-wall fitted stone.

I had my stone cut and dressed and was planning to send out invi- (*To page* 60)

ILLUSTRATED BY REYNOLD BROWN

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(Continued from page 21)

tations to a house raising when I saw a Patrol of Scouts swinging down the road toward our place. Presently I made out Sergei Roskov and Sam Schultz and knew it was my own Patrol, though I hadn't known they were planning a hike. My own fault, I told myself; I hadn't been to a meeting in a long time—I'd been so busy.

Instead of sliding on past, they turned in. Sergei halted them near me and turned to me. "Bill," he said fiercely, "are your Scout dues paid up?"

"You know darn well they are," I answered.

"Then you can help. But keep out of our way." Suddenly he grinned and I knew I had been hoaxed. He turned back to the Patrol. "House raising drill!" he shouted. "Fall out and fall to!"

It was like those old TV comedies where everything is speeded up. You should have seen those fellows work. The house started to grow right under my eyes.

Dad showed up presently and so did Papa Schultz, so I knew everybody was in on the joke but me. I didn't care—except for one thing. I got Dad aside and said, "George, how in the world am I going to feed them?"

"Quit worrying," he said.

"But I *have* to worry! Everybody knows it's the owner's business to supply the picnic at a house raising."

Dad just walked off. After a bit I knew why. Here came Gretchen, Molly, Mama Schultz, and the twins, carrying baskets on shoulder yokes. It was supposed to have been Molly's doing, but I know Mama's cooking.

After lunch Sergei had a little trouble getting them back to work. One of Mama's meals has that effect.

By eighteen o'clock we had a house and a pint-sized barn as well, though the door of the house had not been hung and the power antenna was not rigged. But we had a house.

It doesn't take uniforms to make Scouts.

BY MY DIARY IT was the first day of spring when we all moved into the house. I had been there during the winter month, getting in a crop of ice and storing it in the gully, fixing up the inside of the house, and nursing my little apple saplings along. But come the first warm day we arranged for a tractor to bring Peggy out and we all moved in. Dad had rigged a stretcher for Peggy, with a plastic glass bubble over it and fitted with a gas impeller unit salvaged from an old space suit.

It not only let us get her out from town; it enabled us to take her outdoors from time to time. She would climb in the stretcher and shut herself in; then we would bleed off the pressure in her room, open both doors of the air lock, and carry her out for some sunlight. She would lie there, looking down at Laguna Serenidad below us or staring up at the peaks of the Big Rock Candy Mountains—or, like as not, just watching Dad and me working in the fields.

Once she got out of the stretcher and moved around outdoors. She didn't even get a bloody nose from it—but she was plenty glad to get back in in about ten minutes and let us raise the pressure.

Still, it had let her do what she wanted to do, which was to pet Mabel, our cow. At first we had gotten milk for Peggy from the Schultzes, but about midsummer I had had a chance to get a fresh two-year-old on tick, so I did and Peggy named her Mabel.

We had started out the summer with a pair of rabbits and one old broody hen and a clutch of fertile eggs. With the addition of Mabel we were getting somewhere, although I was heavily in debt at the colony exchange. Still, next summer I hoped to get a sow, if all went well.

DAD AND I WORKED all the time. He kept his job in town, but he would hoof it out nine miles after work and put in another full shift on the farm. We were all working ourselves to a frazzle, but we were making progress and we all felt happy and close together.

"He was chasing his tail when all of a sudden . . ."

I was too busy to fret, right up to the following winter. At first winter seemed like a good rest. I was tired out and cranky and didn't know it; Molly was just patiently exhausted. She wasn't used to farm life.

Dad didn't complain, but his face had deep lines which his beard didn't cover. But it was mostly Peggy.

THE FACT WAS she wasn't adjusting. It wasn't only the pressure; something else was wrong. She didn't *belong* here and she wouldn't *grow* here. She belonged back on Earth.

We weren't bad off, but there is a whale of a difference between being a rich farmer, like Papa Schultz, with heaps of manure in your barnyard and hams hanging in your cellar and every modern convenience, even running water, and being poor farmers, like us, scratching for a toe hold and in debt to the Commission. That winter we had time to brood about it.

We were gathered in Peggy's room after lunch one Thursday. Dark phase had just started and Dad was due back into town; we always gave him a send-off. Molly was darning and Peg and George were playing cribbage. I got out my accordion and knocked out some tunes. After a bit I found I was playing *The Green Hills of Earth*. I hadn't played it in a long time.

I brayed through that fortissimo part about *"Out ride the sons of Terra; Far drives the thundering jet—"* and was thinking that jets didn't thunder any more. I went into the last chorus, the one you play very softly: *"We pray for one last landing on the globe that gave us birth—"*

I looked up and there were tears running down Molly's cheeks.

I could have kicked myself. I put my accordion down with a squawk and got up. Dad said, "What's the matter, Bill?"

I muttered something about having to take a look at Mabel.

I went outside, but didn't go near the barn. It had been snowing and was almost pitch dark, though the Sun hadn't been down but a couple of hours. The snow had stopped but it was cloudy and you couldn't see Jupiter, or anything else.

The clouds had broken due west and let the sunset glow come through. After my eyes adjusted, I could see—the mountains, snow to their bases, disappearing in the clouds, the lake, just a sheet of snow-covered ice, the boulders making weird shapes in the snow. It looked like the place where you might be sent for having lived a sinful life.

I wondered what I was doing there.

The clouds in the west shifted and I saw a single bright green star, just above where the Sun had set.

It was Earth.

Presently somebody put a hand on my shoulder and I jumped. It was Dad, bundled up for a nine-mile tramp through dark and snow.

"What's the matter, Son?"

I choked up and couldn't talk. Finally I blurted, "Dad, why did we come here!"

"Mmmm . . . you wanted to come."

"I know," I admitted.

"Still, the real reason was to keep your grandchildren from starving. Earth is overcrowded, Bill."

I LOOKED BACK at Earth. Finally I said, "Dad, I've made a discovery. There's more to life than three square meals a day. Don't plan on any grandchildren; I know when I've made a mistake."

"You're wrong, Bill. *Your* kids will like this place, just the way Eskimos like where they live."

"I doubt it like mischief."

"The ancestors of Eskimos weren't Eskimos; they were immigrants, too. If you send your kids back to Earth for school, they'll be homesick. They'll *hate* Earth. They'll weigh too much, they won't like the air, nor the climate, nor the people."

"Hmm—look, George, do you like it here?"

At last Dad said, "I'm worried about Peggy, Bill."

"But how about yourself—and Molly?"

"Women, well sometimes things get rugged." He shook himself and said, "I'm late. Go inside and have Molly fix you a cup of tea." He hunched his shoulders and set off down toward the road.

Suddenly it was spring and everything was all right.

Even winter seemed like a good idea; freezing and thawing was necessary to develop the ground and many crops won't fruit without cold weather. Anyway, anybody can live through four weeks of winter.

Dad laid off his job and we pitched in and got our fields planted. Then there was the back-breaking chore of preparing the gully for our apple seedlings. Dad was interested, not just for fruit trees, but for lumber. George had visions of the Big Rock Candy Mountains covered with tall straight pines . . . someday, someday.

When we were ready to plant our six little trees, Papa Schultz came over and pronounced a benediction.

IT WAS THREE WEEKS later that the moons lined up—Ganymede, Callisto, Io, and Europa, all perfectly in line and all on the same side of Jupiter. They come close to lining up every seven hundred and two days, but the fractions don't work out exactly.

This line up was with the Sun, too; it had been calculated that such a perfect one would not occur again for more than two hundred thousand years. You can bet we were all waiting to see it.

Having the Sun in the line-up meant that we would be able to see it. The shadows of Ganymede and Callisto would be centered on Jupiter just as Io and Europa reached mid transit.

Full phase is at six o'clock Saturday morning; we were all outside by five. George and I carried Peggy out in her bubble stretcher. It was a fine, clear summer night, with old Jupiter blazing overhead like a balloon on fire. Io had just kissed the eastern edge of Jupiter—"first contact." Europa was already inside the eastern edge and I had to look sharp to see it. Well inside, but still in the eastern half were the shadows of Ganymede and Callisto. I could not have told them apart if I hadn't known that the one farther east had to be Ganymede's.

WE FELT A SLIGHT quake but we were used to quakes. Besides that, about then Io "kissed" Europa. Throughout the rest of the show, Io gradually slid behind Europa.

They crawled across Jupiter; the moons fairly fast, the shadows in a slow creep. When we had been outside about half an hour the two shadows started to merge. Io slid halfway under Europa and looked like a tumor on its side. They were halfway to center and the shadows were even closer.

Just before six o'clock Europa—you could no longer see Io; Europa covered it—as I was saying, Europa kissed the shadow, which by now was round, just one shadow.

Five minutes later the shadow had crawled on top of Europa—and I was

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seeing the most extraordinary sight I would ever see in my life, Sun, Jupiter, and the four biggest moons perfectly lined up.

I let out a deep breath, "Gee Whiz!" was all I could say.

"I agree, Bill," Dad answered. "Molly, let's get Peggy inside."

"I'm going down to the lake," I said. The biggest tide of record was expected and I had made a mark the day before.

I had gotten maybe a quarter of a mile beyond the road when it hit.

It knocked me flat, the heaviest shake I ever felt. I've been in heavy quakes in California; but they weren't a patch on this. I lay face down for a long moment, digging into rock with my nails and trying to get it to *hold still.*

The seasick roll kept up and kept up and kept up, and with it the noise—a bass rumble, deeper than thunder and more terrifying.

A rock rolled against me and nipped my side. I got to my feet and managed to stay there. The ground was still swaying and the rumble kept on. I headed for the house, running—like dancing over shifting ice. I fell down twice and got up again.

The front of the house was caved in. The roof slanted down at a crazy angle. "George!" I yelled. "Molly! Where are you?"

I spotted George beyond the collapsed roof and rushed around to him. "You all right?" I demanded.

"Get Molly out—" he gasped.

I found later that George had gone out to the barn, but we didn't have time to talk; we dug—moving slabs that had taken four Scouts together to lay. George kept crying, "Molly! Where are you?"

She was lying beside her stone stove, penned in by the roof. We heaved it off her; George scrambled over the rubble. "Molly! Molly darling!"

She opened her eyes. "George! What happened?"

"Are you hurt?"

She sat up said, "I think—George! *Where's Peggy?*"

Peggy's room still stood; but the outer door of the lock was burst from its gaskets and stood open, the wrong way. It was dark inside; I pushed on the inner door; it wouldn't give. "Can't budge it," I told Dad.

"Probably held by air pressure. Call out to Peggy to get in the stretcher."

"I need a light," I yelled.

Dad hauled his out and shined it in. "It looks bad," he said softly. "Explosive decompression." There was a gap between door and frame; it wasn't pressure held, it was jammed.

Dad shouted, "Peggy! Peggy darling—can you hear me?"

No answer. "Take the light, Bill—and stand aside." He hit the door hard with his shoulder; it flew open, spilling him.

Peggy lay half out of bed. Blood was dripping from her mouth.

WE GOT HER INTO the stretcher and Dad brought the pressure up. She was alive; she choked and bled some more. She seemed to go to sleep—or maybe fainted—after we got her into the bubble.

Molly was crying quietly. Dad wiped his face and said, "Grab on, Bill. We've got to get her into town."

We picked our way over the wreckage and got outside.

I glanced up at Jupiter; Io and Europa had not yet reached the western edge. But that wasn't what held my attention; the stars were too bright. "George," I said, "what's happened to the sky?"

"No time—" he started to say, then said slowly, "Great Scott!"

"What?" asked Molly. "What's the matter?"

"Back to the house! We've got to dig out all the clothes we can. And blankets!"

"Why?"

"The heat trap is gone! The quake must have wrecked the power house."

So we dug again. The blankets were for the stretcher; Dad wrapped them around and tied them. "Okay, Bill," he said. "Quick march!"

It was then that I heard Mabel bawl. Dad stopped. "We can't leave her to freeze; come, Bill!"

We put the stretcher down, ran to the barn, and dragged the roof off her. She wasn't hurt but she looked at us indignantly.

MOLLY LED MABEL and carried the light. The night, too bright a few moments before, was now overcast. Shortly you couldn't see anything. The road was wet with dew; it was getting colder.

Then it rained. Presently there was wet snow. Molly dropped back. "George," she asked, "have we come as far as the Schultzes?"

"No good," he answered. "We've got to get Peg into the hospital."

"But oughtn't I to warn them?"

"Their house is sound."

"But the cold?"

"Oh." With the heat trap and the power house gone, every house would be like an ice box. It was going to get colder and colder and colder. . . .

And colder. . . .

But we never found the turn off. The snow was driving into our faces and we missed it. It was a dry snow now, that burned our faces.

I started pacing when we left the lava that marked the new road. We had come about five miles when Molly stopped. "What's the matter?" yelled Dad.

"I've lost the road."

Dad took the torch and looked at his watch. "We've come about six miles," he announced.

"Then we're about to that stretch where the road is flush with the fields," he said. "Bill, take the light and search both ways. And for heaven's sake retrace your steps—or you'll lose us."

To the right was no good; but on the twenty-third step to the left I found the road—falling flat. I got up and walked back.

"Good!" said Dad. "Slip your neck through this."

"This" was a yoke he had made by retying the blankets to get free line. With it I could carry the weight on my shoulders. Not that it was heavy, but our hands were stiff with cold. "Good!" I said, "look, George, let Molly take your end."

"Nonsense!"

"It isn't nonsense. You know this road; you've tramped it enough times in the dark."

"Bill is right, dear," Molly agreed. "Here—take Mabel."

Dad gave in. I don't know how he kept the road but he did. We had slogged on another hour when Molly stumbled, and went down.

I stopped and sat down, too; I just wanted to stay there and let it snow.

Dad came back and comforted her and told her to lead Mabel; she couldn't get lost now. She insisted that she could still carry, but he lifted the yoke off her shoulders. We started up again and slogged on, endlessly, one foot after the other and the cold getting worse. I couldn't feel my feet any longer.

Dad stopped. "Listen!" he said.

I heard a dull rumble. "Quake?"

"Keep quiet!" Then he said, "Off the road, everybody!"

Concluded in BOYS' LIFE *for November*

How "Doc" Peters helped Sam stop a murderer

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