Satellite Scout

Even before the spaceship reached Ganymede Bill decided it was important to have a Scout Troop on the new planet and it sure was

By ROBERT A. HEINLEIN

BEGIN THE STORY HERE

BILL, A CALIFORNIA Scout, and his dad are emigrants on the spaceship *Mayflower* en route to a new colony on the planet Ganymede, a satellite of Jupiter. With them are Bill's stepmother and half-sister, to whom he is not entirely reconciled. After blast-off passengers are permitted to unstrap from their safety couches but not to move from their rooms. All the boys in Bill's bunkroom obey except Noisy Edwards, who knows more than the captain. Noisy is returned to the room and strapped down for discipline. Just as Bill is deciding that Noisy will be a nuisance, the loud speaker announces that spin will be placed on the ship. He stops wondering about Noisy and awaits with suspense the real beginning of the long trip through space.

Part Two

SLOWLY WE DRIFTED to the outer wall of the ship. That made that wall the floor; gradually we got heavier. Noisy was still strapped in; he yelled for us to help him down. We were discussing it when the same aide came in, unstrapped Noisy, and told us all to follow him.

That's how I happened to attend Captain's mast.

"Captain's mast" is a court, with the Captain as judge. The aide, a Dr. Archibald, told about finding Noisy wandering around during acceleration and the Captain asked Noisy if he had heard the order? Noisy had to admit it.

Captain Harkness said, "You are an undisciplined lunk," then added, "You did this because you were hungry?"

Noisy nodded.

"Ten days bread and water," said the Captain. "Next case."

Noisy looked shocked silly.

The next case was the same, but a woman. She had had a row with her aide and had stomped off to tell the Captain—during acceleration.

Captain Harkness cut her short. "Madam," he said, "have you ever washed dishes?"

"Why, no!"

"Well, you are going to—for the next four hundred million miles."

I looked up Dad afterwards; he and Molly had a stateroom. Peggy was there, but visiting—all the kids over eight were in dormitories. Dad was shifting their couches to what was now the floor. I told him about mast; he nodded. "We saw it in the screen."

"George, the skipper of a ship is an absolute monarch, isn't he?"

Dad said, "No, he's a constitutional monarch. But he's a monarch."

"You mean we have to bow and say, 'Your Majesty'?" Peggy demanded.

Molly said, "I don't advise that, Peg."

"Why not? It would be fun."

"The Captain would probably paddle you."

I looked down into the bottom of the universe

"Oh, he wouldn't dare!"

I wasn't sure. I remembered four hundred million miles of dirty dishes.

Captain Harkness didn't act like a monarch; he had us elect a ship's council. You know the first thing that council did? They decided we had to go to school!

School wasn't too bad. We started with a tour of the ship, which took all day—"day" by ship's time. The *Mayflower* was top shaped. The point of the top was her jet—Chief Engineer Ortega, who showed us around, called it her "torch." The round end housed the control room, the Captain's cabin, and officers' staterooms. The power plant was shut off from the rest of the shop by a radiation shield that ran right through the ship. From there to the control room was a cylindrical hold a hundred feet across. We were carrying stuff to the colony—machinery, soil concentrates, instruments—I don't know what.

Wrapped around this cylinder were the living decks; "A" deck was the skin of the ship, then "B" and "C" decks. The artificial gravity from spinning the ship made directions confusing—anywhere you stood seemed level, but if you walked far enough you came back to where you started.

Spinning the ship had another odd effect; all around us was "down." Mr. Ortega took us into a view gallery which had a big quartz plate in the floor, surrounded by a guard rail. The first few backed away quick and girls squealed. I pushed forward and looked down and was staring into the bottom of the universe, a million, trillion miles below.

Stars were reeling across the hole, which made it worse. The Big Dipper passed under me, slid out—and a few seconds later was back. I said, "This is where I came in," and backed away.

We went through the hydroponics room—just plants growing to replace the oxygen we breathed. Then the Chief led us into a mess room, and told us about the power plant. He said there had been three types of ships; first was the chemical-fuel ship like the German rockets used in World War II, except that they were step rockets. "They were big and inefficient. The next development was the atom-powered rocket.

"THE LATEST IS THIS—the mass-conversion ship. We accelerated at one gravity for four hours and twenty minutes; that brought us up to more than ninety miles a second. If we *held* that drive for a trifle less than a year, we would approach the speed of light. The *Mayflower* has power to do just that. At ideal efficiency, she would use only one percent of her mass as energy and another one percent as reaction mass."

A kid spoke up. "Mister Chief Engineer, suppose we *passed* the speed of light?"

Mr. Ortega shook his head. "It can't be done."

I know they say a speed faster than light is meaningless, because it involves the square root of minus one—but scientists change theories the way a snake changes his skin. I stuck up my hand.

"Mr. Ortega, what *would* happen if we got up close to the speed of light—and then stepped up the drive and held it?"

"Why, it would— No, let's put it this way—" He broke off and grinned. "Kid, don't ask me. I'm an engineer with hairy ears, not a mathematical physicist."

"All right," he went on, "what does 'E equals MC squared' mean?"

An older boy said, "It means mass can be converted into energy."

"RIGHT!" MR. ORTEGA agreed. "The first demonstration was the atom bomb. Then came uranium power plants, but until recently we hadn't any idea of *how* to do efficiently what Dr. Einstein's equation said, clear back in 1905. Does anyone know how much you get when you convert matter into energy?"

Nobody knew. "It's in that one equation," he said. "One gram gives nine times ten to the twentieth power ergs." He wrote it down:

900,000,000,000,000,000,000 ergs.

"Nine hundred thousand million billion ergs. A pound of feathers equals more than fifteen billion horsepower-hours. Does that tell anyone why the *Mayflower* was assembled in space and will never land?"

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"Too hot," somebody said quickly.

"'Too hot' indeed! If we had blasted off from Mojave, Southern California would have been reduced to lava."

A space ship is a dull place, once the excitement wears off. There's nothing to do, and no room to do it.

Take "B" deck—two thousand emigrants slept there. It was 15 feet across, not quite 500 feet around. "A" deck was larger and "C" smaller. Each of us had room for his bunk and about that much over to stand on. To get the best use from the galley and mess rooms, the council put "A" deck on Greenwich time, "B" deck on Pacific Coast time, and "C" deck drew zone minus-eight or Philippine time. At that we were crowded and time hung heavy.

I used to kill time with Hank Jones, a boy I had known at Scout camp. He came in one morning while I was folding my Scout uniform into my bunk and said, "Why do you keep that?"

"Maybe we'll have Scouting on Ganymede."

"Not that I ever heard of."

That gave us an idea. Why not start up Scouting again right now?"

WE CALLED A meeting for fifteen-thirty. Greenwich time, that is. It was seven-thirty in the morning for the "B" deck boys and a half hour before midnight for "C" deck. By fifteen-forty we had them spilling into corridors, even though we used the biggest mess room. I warmed them up with a couple of tunes on my squeeze box, then Hank called them to order and made a speech. He said that we had enjoyed the benefits of

ILLUSTRATED BY REYNOLD BROWN

Scouting on Earth and it seemed a shame not to continue. Scouting was the tradition of the explorer and pioneer and there could be no more fitting place for it than on a new planet.

He slipped me the wink. I got up and proposed a resolution. It read: Be it resolved —we the undersigned, desiring to extend the Scouting trail out to the stars, do organize as the Boy Scouts of Ganymede in accordance with the principles of Scouting and, in so doing, reaffirm the Scout law.

Hank said, "Is there a second?"

There were seconds all over.

Somebody pointed out that Ganymede wasn't a star. Hank told him that was poetic license. The worst objection was from a weary runt called Millimetre Muntz. He said, "Mr. Chairman, you haven't authority to set up a new Scouting jurisdiction. As a member of Troop Ninety-Six, Gradell, New Jersey, I object."

Hank asked him what authority Troop Ninety-Six, Gradell, New Jersey, had in space? Somebody yelled, "Throw him out!"

Hank banged on the table. "Just ignore him. Are you ready to vote?"

It passed with a yell; Hank was elected organizational chairman, and appointed a flock of committees. There were several men present. One of them, Dr. Archibald, our sector aide, spoke up.

"Mr. Chairman, I was a Scoutmaster in Nebraska. I volunteer my services."

Hank looked him in the eye. "Thank you, sir. Your application will be considered."

Dr. Archibald looked startled, but Hank went smoothly on, "We need you older Scouts. Liaison committee will take names of any willing to serve."

It was decided to have a Troop for each deck and I was tagged as acting Senior Patrol Leader for "A" deck. At first they were just "A", "B" and "C" Troops, but I wanted a name for mine. We settled on the "Baden-Powell Troop," which tied in with the English time zone our deck used.

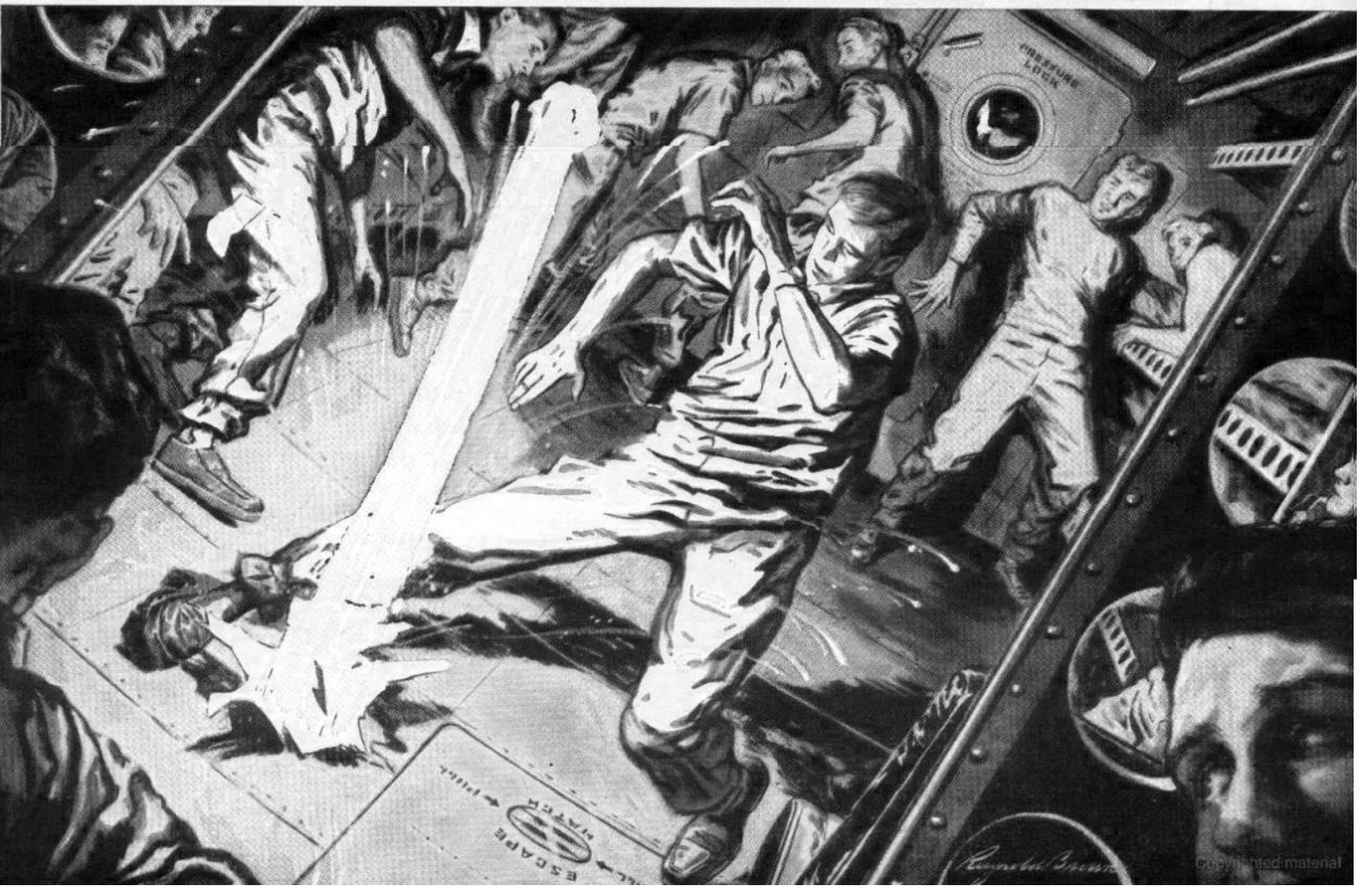
The time-zone idea took hold; "C" deck picked "Aguinaldo," and "A" deck called themselves the "Junipero Serra Troop." Dad says there is a lot in a name.

WE CONFIRMED whatever permanent ranks and badges a boy had held before, but working out new tests and badges was complicated. We could set up a Merit Badge in hydroponics and give tests right in the ship. Mr. Ortega set up another in spaceship engineering and Captain Harkness did the same for ballistics and astrogation. Soon we had enough tests to let a boy go up for Eagle Scout, once we had a Court of Honor. That came last, as Hank kept putting off the final report of the liaison committee. I asked why; he said I would see.

I did see, eventually. At last we had a meeting of all Troops to install Scoutmasters and dedicate the Court of Honor. From then on the adults ran things. Oh, well—it was fun while it lasted.

We were fifty-three days out then and a week to go; Jupiter was already a tiny, ruddy-orange disc. We couldn't see Mars; it was on the far side of the Sun. We didn't even see any asteroids because Captain Harkness had lifted us north of the ecliptic (*To page* 50)

It sounded like a rifle going off by my ear, like a steel door being slammed, like a giant tearing yards of cloth.



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Great granddaddy of 'em all! Wait till the gang hears how you hooked him, the tremendous fight he put up, how he almost got away, and then...

How you rode home with him—along that old path through the woods, down Sugar Loaf hill, across the bridge and back to Route 26—practically flying all the way, thanks to that slick New Departure Safety Brake.

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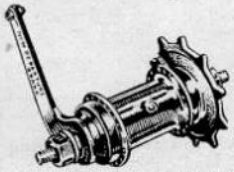

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BOYS' LIFE
DANIEL BOONE TARGET SHOOT ENTRY FORM

(Please print or type below)

Shooter's Name _____ Age _____

Street Address _____

City _____ Zone _____ State _____

Scout Unit or National Rifle Association Affiliation _____

Division Entered — Target Rifle ☐ Sporting Rifle ☐

Witness' Name _____

Street Address _____

City _____ Zone _____ State _____

Score

(Enter scores of any 10 bulls—five shots on each bull—made in one day.)

Total

"I hereby certify that, I am the Shooter's parent or guardian, Scoutmaster, Assistant Scoutmaster, Camp Rifle Instructor or Junior Rifle Club Instructor (Underline one) and after acquainting myself with the rules governing the 1950 BOYS' LIFE—DANIEL BOONE TARGET SHOOT, I personally witnessed the firing of the scores listed above. Those scores were fired by the shooter specified and in full compliance with all rules."

Signature of Witness _____

Signature of Shooter _____

Rifle Used:

Manufacturer _____ Model No. or Name _____

The good woman was quite upset, so much so that she rolled over on the floor and then went merrily bumping down the stairs, completely at the mercy of gravity.

AT THE VERY MOMENT of her downfall Alfred's collar broke, the dress sleeve gave way. The Mudhen spun off balance and dog and boy joined the lady on the downward path. Their combined descent formed a flying ball of feet, elbows, petticoats, fur, displaced balustrade, yells, screams and growls. Even when the mass came to rest among the rubber plants several moments passed before its individual elements could be identified.

The Mudhen broke away first and stood half-crouching as he tried to get his feet under him amid the tangle of his skirt. Alfred came next, fast. The Mudhen leaped for the piano, but the dress stayed with the bulldog. Cheese, always calm in a crisis, snatched up a rug and enveloped Alfred, a byproduct of the maneuver being an upset chair that landed on Froggie's shin. Rip came around right end to help Cheese, but met the Bumble Bee instead. The older gentleman skidded on the bare floor and slid under a corner whatnot, which collapsed, crowning him with a framed picture of Uncle Eben Beeman. Cheese, Rip and Froggie converged on rug-wrapped Alfred, carried him to the door and threw him out.

Even when he was gone the sitting-room was not what it used to be. The furniture was scattered like wind felled trees. Mr. Beeman sat on the floor surrounded by the whatnot and its cargo of bric-a-brac, and on top of the piano stood The Mudhen wearing only his B.V.D.s. Suddenly Mrs. Stebbins, who had been temporarily mislaid, rose from the wreck of the rubber plants, pointed a condeming finger at the late Myrtle Tewksbury and screeched, "She's a man!" She took a horrified backward step, swayed and sat down in the washtub of water.

Everything had happened that could happen, so eventually the shouting and the tumult died. Standing in the midst of the wreckage, the Bumble Bee glared at the shivering Mudhen.

"Crane," he said sternly, "I demand an explanation of this prank."

"Prank!" The Mudhen made a hopeless gesture. "I was only trying to perfect my art, Mr. Beeman."

"Your—art?"

"My acting. I was given a feminine part in the school play." He paused, then laid it on thick. "I thought if I could deceive a person of your keen intelligence I would be able to act convincingly on the stage. It was an experiment for art's sake."

Whatever Mr. Beeman may have thought, he was good enough sport to only say resignedly, "Very well, Crane. But in the future please experiment in a circus ring or some other place that is suited to the exercise of your talent."

"Yes, sir." The Mudhen answered humbly. THE END

Satellite Scout

(*Continued from page* 29)

to avoid the asteroid belt. Anybody knows that meteors are no real hazard unless a pilot does stupid things like driving into the head of a comet. On the other hand the asteroid belt has a lion's share of sky junk. The older ships drove straight through, and none was ever hit to speak of. But Captain Harkness, having power to spare, played safe. By avoiding the belt there wasn't a chance in a blue moon that the *Mayflower* would be hit.

Well, it was a "blue moon." We were hit.

It was reveille, "A" deck time, and I was folding my uniform to put it under my pillow. Suddenly I heard the goldarndest noise I ever heard in my life. It sounded like a rifle going off by my ear, like a steel door being slammed, like a giant tearing yards of cloth.

Then I couldn't hear anything and I was dazed. I shook my head and looked down—and I was staring at a raw hole almost between my feet and as big as my fist. Through the hole was blackness—then a star whipped past and I realized that I was staring out into space.

There was a hissing noise.

I DON'T REMEMBER thinking. I wadded up my uniform and stuffed it in the hole. It seemed as if the suction would pull it on through, then it jammed. But we were still losing air.

Noisy was yelling and alarms were ringing. The airtight door to our compartment closed automatically and locked us in.

That scared me silly.

Sure, it's better to kill a few than to let a whole ship die—but it was *my* neck.

The pressure was sucking away at the plug but I was afraid to stuff it in harder, for fear it would pull through and leave us chewing vacuum. Noisy Edwards was beating on the door and screaming, *"Let me out!"* and the loudspeaker was shouting, "H-twelve! Can you hear me?"

I yelled *"QUIET!"*

One of my Cubs was staring at me. "What happened, Billy?"

I said, "Grab a pillow! Put it on top of my hands!"

He gulped and did it.

It was an ordinary foam-rubber pillow. I snatched one hand out and then the other, and pressed it down. It dimpled in and I was scared. But it held.

The loudspeaker was still shouting for compartment H-12 to report. I yelled *"Quiet!"* and added, "Slug Noisy!"

Somebody poked him and they swarmed over him. "Now *everybody* keep quiet," I gasped and shouted, "H-twelve reporting!"

The Captain answered, "What is the situation?"

"There is a hole in the ship but it's corked up."

"How? How big a hole?"

I told him and that is about all there was to it. First they had to isolate that corridor, then two men in space suits opened our door and chased out everybody but me. "You can get up now, kid," one said, his voice hollow through his helmet. The other took over holding the pillow.

They sent me out: the corridor was empty but I banged on the air-tight door at the end and they let me through. Then we waited and finally we were allowed to go back to our bunk room. There was a plate welded over the hole.

THAT WAS WHY I went to Captain's mast again. George was there and Molly and Peggy, and my Scoutmaster, Dr. Archibald, and my roommates and the ship's officers.

The First Officer shouted, "Captain's mast for punishments and rewards!" as Captain Harkness came out. Dad

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shoved me forward.

The Captain looked at me. "William Lermer?"

I said, "Yes, sir."

He said, "I read from yesterday's log: 'On twenty one August at oh-seven-oh-four Greenwich, the ship was broached by a meteorite. Interlocks isolated the punctured compartment, H-twelve, with no serious pressure drop elsewhere.

" 'A passenger, William J. Lermer, contrived a patch and succeeded in holding pressure for breathing until a repair party took over.

" 'His alertness saved the lives of all persons in compartment H-twelve.' "

The Captain added, "A copy will be sent to Interplanetary Red Cross. I have no way to reward you but you have my heartfelt gratitude. I speak for all hands and most especially for the parents of your bunk mates."

He went on in a low voice, "A good job, that. You were on your toes."

I said I had been lucky.

He said, "Luck comes to the man who is prepared for it."

We left, George and I together, Molly and Peggy following. I heard Peggy saying, "That's *my* brother."

Molly said, "Hush, Peggy. Don't point."

A couple of days later I ran into Noisy by himself. "I want to talk to you," he said.

"What's on your mind?"

"You think you're smart!"

I didn't like his tone. I said, "I don't *think* so; I *am*."

"Pretty cocky! You think I ought to be kissing your hand for saving my life?"

I said, "Skip it; it wasn't for you."

"I know," he answered, "and I'm not grateful, see?"

"Fine," I told him. "I wouldn't want gratitude from a guy like you."

He was breathing hard. "That's enough from you," he said. Then I caught a mouthful of knuckles.

I got up cautiously, trying to surprise him. It was no good; he knocked me down again. I tried to kick him but he danced out of my way.

The third time I stayed down. When I quit seeing stars he was gone—and I hadn't laid a finger on him. I lay awake that night trying to figure out ways to fix him, but they weren't any good.

On the twenty-fourth Captain Harkness started bringing us in. We decelerated and as we passed Jupiter Io came out of eclipse. First black sky, then a dark blood-red disc, and then it was a brilliant orange. It popped up like magic.

Callisto was behind us; Europa was off to the right; Ganymede was almost straight ahead—and here was a funny thing; Callisto was silvery, Io and Europa were orange; Ganymede was downright dull!

I asked George; he said, "Ganymede used to be as bright as Io and Europa, it's the greenhouse effect—the heat trap."

I knew about the greenhouse effect; it is the biggest part of the atmosphere project. When the 1985 expedition landed Ganymede was a couple of hundred degrees below zero—cold enough to freeze a ghost!

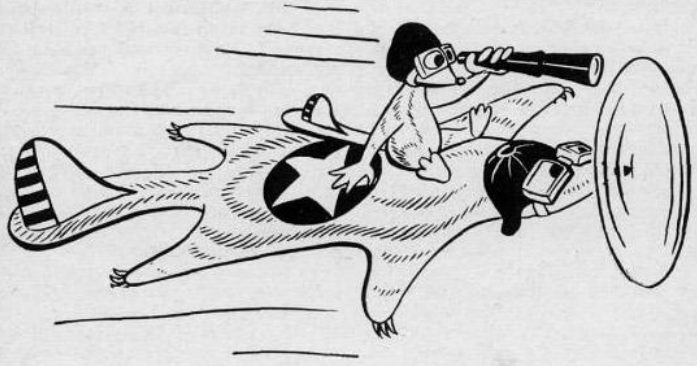
"Look, George," I objected, "I know, but why is it so dark?"

"Light is heat; heat is light," he answered. "Light goes in and doesn't come out—and a good thing, too."

Captain Harkness put her in a circular orbit about a thousand miles up from Ganymede. We had arrived—as soon as somebody came and got us.

The trip down to Ganymede made me suspect that being a colonist wasn't all glamor. There was just one shuttle ship, the *Jitterbug*, and she could carry only ninety at a time. At last it came our turn; the *Jitterbug* was terrible, stale air and dirt. There weren't any couches—just pads which we covered shoulder to shoulder. The skipper was an old female called "Captain Hattie." She drove away so hard that I blacked out, then we dropped for twenty minutes; she gunned her again, and we landed, with a terrible bump. And Captain Hattie was shouting, "Out you come, ground hogs!"

The *Jitterbug* carried straight oxygen at ten pounds; now Captain Hattie spilled pressure to adjust to Ganymede's three pounds. Three pounds of oxygen is enough to live on,



SO YOU THINK... *That Squirrels Fly*

WELL, they don't, at least not the way their name "flying squirrels" would have you believe. These creatures have a membrane stretched between their fore and hind legs. When they jump from a tree they spread their feet. The membrane is stretched and becomes tightened.

The squirrels drop and then swoop down at about a forty-five degree angle to their landing spot. At no time during this "flight" do they flap in any sense of the word. At the end of their rapid glide they use their tails as elevators and by the momentum of their body can lift themselves slightly to a landing position on the branch of a tree. Now you know.

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but such a sudden drop makes you gasp. Peggy got a nose bleed.

We had to climb down a rope ladder, the wind was howling, and shaking it. There was snow on the ground except where the jet had melted it. I could hardly see, but a man grabbed me and shouted, "Over that way!"

I headed the way he pointed and found a path, trampled to slush. I could see people disappearing in the snow ahead and I trotted after.

It was half a mile to the shelter and cold all the way. I was chilled through by the time we got inside.

The shelter was a big shed, not much warmer and jammed with people. The colonial men were bearded and some of them had long hair as well. I finally found George & Co., you could see that Peg's nose had been bleeding and there were tears and dirt on her face. George looked gloomy. I came up and said, "Hi, folks!"

George looked around. "Well, Bill! How is it going?"

I answered, "It's a shambles."

I had understated it. Just how bad a shambles we had still to find out. The colony wasn't ready for us. They had been moseying along, getting about five hundred immigrants a year, which was all the old-type ships could deliver—when suddenly the Colonial Commission dumped six thousand people on them.

They did the best they could for us; they turned their town hall into a barracks and set up a kitchen to feed us, but we were almost as crowded and uncomfortable as we had been in the *Mayflower,* and families were split up—all the men and boys on one side, all the women and girls on the other. That made Dad pretty sore.

THEY HADN'T BUILT more buildings for us because they couldn't. Except for a few buildings made from sheet metal brought out from Earth, like the receiving station and the town hall and the hydroponics sheds, all the buildings in the town of Leda and all the farmhouses were cut from country rock. No wood, no glass, no plastics, no hardware—Ganymede had been just a ball of rock and ice before the atmosphere project was started. Putting up new buildings on it wasn't easy.

The worst of it was that there was no telling when we would get land of our own. We had come out there on the promise of free land, expecting to farm. The land was there, millions of acres, but it was just bare, dead rock. The rock had to be crushed, foot by foot, and worked into living soil, using cultures and soil concentrates from Earth. But that takes power machinery—rock crushers and soil chewers—and the colony didn't have enough machinery. It might be two to four Earth years until it came our turn to crush our land.

We had been cheated.

There was an awful rumpus about it, with the immigrants getting mad and the colonials getting sore back at them and mass meetings and protests and proposals and counter-proposals. Finally the captain of the *Mayflower* had to agree to take some of us back to Earth, on authority of the immigration representative at Leda. The rest swallowed their disappointment and stayed.

It made a family crisis for us—go back, or stay?

George and Molly and I held a powwow in Peggy's room in the hospital. The plain fact was that Peggy had not adjusted to Ganymede's low air pressure. Worse than just nose bleeds—she would faint and could not eat, until the doctors put her in a sealed room. Dad managed to get us a cramped little apartment of our own by taking an engineering job with the colony government—government employees got government quarters—but that still didn't bring us all together as Peggy had to stay in the hospital. Worse still, it meant he wouldn't be free to prove a farm even when it came our turn for the machinery.

I CAME TO THE FAMILY conference feeling grim and ready to go back to Earth. In addition to everything else that was wrong I had just had a run in with a couple of colonial boys—some of them delighted in hazing us newcomers. I felt that I would give my right arm for a sight of San Diego Borough, sprawling over the hills, short rations or no short rations.

Do you know what changed my mind? That pressurized room of Peggy's. I had gotten used to low pressure and straight oxygen. I couldn't breathe; it felt like swimming in warm soup.

We discussed it back and forth, me not committing myself. Finally Dad said, "There's no help for it, Molly. We've got to go back." He turned to me and said, "That doesn't apply to you, Bill. If you want to stay, I'll arrange it."

I said I guessed I would stay.

Molly said, "No, George."

Dad said, "Dear, it's got to be. Peggy isn't getting well; we've got to take her back."

Molly squared her shoulders. "I know Peggy has to go back. But that doesn't mean we all have to go back. I—"

"No, Molly!" Dad interrupted, "I didn't marry you to split up. You—"

"Nor did I! Peggy has to go; she can go with the Hamiltons and my sister Phoebe will meet her at the other end." She reached out and took Dad's hand. "If women turned back at the first trouble, there would be no pioneers."

PEGGY HAD BEEN following the talk with big eyes, like a little lemur. Now she let out a wail. "I don't want to live with Aunt Phoebe! I *won't* go back." She turned to me. "I'm a pioneer, too. Tell them so, Billy!"

I don't know what got into me. The brat had been nothing but a nuisance. But I found myself patting her hand and saying, "Don't worry, kid. If you have to go back, I'll go with you."

Dad said sharply, "Bill didn't stop to think, Baby. He didn't mean it."

Peggy turned to me again. "You did so mean it—didn't you, Billy? But it doesn't matter; I'm going to stay and be a pioneer."

I swallowed and told her that I had meant it.

Dad looked at Molly. She shrugged and said, "The children seem to have taken matters in their own hands."

Dad said doubtfully, "I suppose I could seal off one room in our apartment."

Peggy squealed. "You mean I could come home?"

Molly said, "That doesn't solve anything. That would just tie you down to your job—permanently."

" 'What can't be cured must be endured.' "

"But, George!"

I stood up. "George. Molly."

"Eh?"

"I'm pretty near as tall as you are, George. I'm strong and handy."

"What are you driving at, Son?"

"You keep your job for now and take care of Molly and the kid. I'll make us a farm."

To be continued in BOYS' LIFE *for October*

Football is Tackling

(*Concluded from page* 21)

an adequate head guard. Practically all serious injuries stem from the lack of sufficient protection of the head. I have a rule that seems rather cruel at times which I always enforce: Each player wears his head gear from the moment he arrives on the field until practice is over. When a coach is lecturing or time is out, we allow the players to remove their head gears, but they must have them in their hands. The safety value of this rule is inestimable.

We do not believe that tackling should ever be practiced full speed. Many prospective young football players have had their confidence shaken by full speed tackling drills before they ever had a chance to develop the proper technique.

We have our players count off by twos, and have the ones face the twos about five yards apart. First, we have the ones tackling the twos, who simulate ball carriers. The ball carrier does not try to dodge or make the tackler miss him. He jogs slowly toward the tackler and allows himself to be tackled. Later on we put a little more "zip" into this drill but never do we have it full speed.

Stance and Approach

The proper stance is then taught and demonstrated by the coach. The feet are well spread about the width of your shoulders. The weight is well forward on your toes. The knees are slightly bent so as to throw the body in a crouched, yet comfortable, running position. The body above the waist is slightly forward and the head is up.

The approach to the ball carrier is made from this position with short digging steps. Try to keep yourself in perfect balance and under control. Keep your eyes fixed on the waist of the ball carrier. Never watch his eyes because a smart runner will fake you completely out of position. Also never watch his knees or feet as they are moving rapidly and present a very difficult target. We feel that the hips and waist are the most stable parts of a runner's body and by fixing the eyes on this point you can maintain the proper balance which is so necessary in executing a tackle. The head is always up. I cannot emphasize this particular point too much. Practically all of the injuries occurring in tackling can be laid to the fact that the tackler had his head down. In this way he may get a hard blow on his head from the runner's knees or feet or he may suffer a neck injury. Each time a player of mine makes a tackle, I shout, "Head up." Aside from the possible physical risk, it is very poor form. A football player cannot hope to become a good tackler until he learns to keep his eyes open and his head up.

High and Safe

When the would-be tackler is about a yard from the ball carrier, he should make a quick dip of his knees and coil his body for the shock of the contact. He should aim his shoulder (either shoulder) at what I describe as the soft part of the under belly of the ball carrier. This is the easiest and safest point to contact. In the old days they used what they called "shoe string tackling." They attempted to hit the runner above the shoe tops and trip him. Of course, when they missed, and they did miss often, there were a lot of bloody noses and lacerated faces as they plowed the ground with their noses, or caught cleats from the runner's shoes in their face. For years a football player was considered "yellow" if he tackled high. Practically every coach in modern football feels that tackling should be high and safe.

As the player drives his shoulder into the waist of the ball carrier he slips his head to the opposite side and attempts to pocket the runner as close as possible to the base of the neck. At the moment of contact, he uncoils and drives up and through the ball carrier with his feet digging like pistons. The arms instantaneously encircle the runner's legs and are locked by grasping the other hand or wrist at a position back of his knees. Pressure is exerted at this point by squeezing the arms as tight as possible and lifting him completely off the ground. The hard digging of the legs should never cease until he has been deposited flat on his back. Never let up in your efforts until the whistle blows. Many games have been lost by a tackler's assuming that he had stopped the ball carrier and then having him break loose for a long run and a touchdown.

There are varied methods of teaching tackling and many different types of tackling. Some coaches use a tackling dummy to practice on, but I feel that this does not give a player the true feel. We have each of our players take three tackles with the right shoulder and three with the left shoulder using the method that I describe each day. We feel that with this one fundamental drill and form to work on they will be further advanced when the time comes for a full speed scrimmage or the opening game than they would have been by practicing several different methods.

Often in close line play it is impossible for a player to make a clean form tackle as I have described, because he is partially blocked. He should be taught in a situation like this to grasp the ball carrier with either hand on his jersey, pants or any place he can possibly get hold of him and try to drag him down.

In going down under punts or in making other open field tackles, the player should be more cautious. Make the runner "show" first, unless you can hit him just as he catches the ball, slow down about three yards from him, get set with your legs wide apart and feet moving and let him become the aggressor. Let him make a few extra yards in a situation like this.

Good Tacklers Are Made

Remember this: You do not have to have a lot of ability to become a good tackler. Some players are born runners, but to become a good tackler, all you need is to practice hard and to have the desire.

With the advent of the two platoon system in football with one team for the offense and another team for the defense, any boy can become a valuable member of a football squad if he can tackle.

Eleven good tacklers are seldom defeated, and if they ever are, they hold the respect and admiration of their opponents. There is something good for one's character in making himself a fine tackler.

Football is tackling.

THE END

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