

*They lived in spaceborne bubbles
and feared the Earth — but not
as much as old Earth feared them!*

BY FRITZ LEIBER

THE BEAT CLUSTER

Illustrated by DICK FRANCIS

WHEN the eviction order arrived, Fats Jordan was hanging in the center of the Big Glass Balloon, hugging his guitar to his massive black belly above his purple shorts.

The Big Igloo, as the large living-Globe was more often called, was not really made of glass. It was sealingsilk, a cheap flexible material almost as transparent as fused silica and ten thousand

times tougher — quite tough enough to hold a breathable pressure of air in the hard vacuum of space.

Beyond the spherical wall loomed the other and somewhat smaller balloons of the Beat Cluster, connected to each other and to the Big Igloo by three-foot-diameter cylindrical tunnels of triple-strength tinted sealingsilk. In them floated or swam about an assemblage of persons of both sexes in informal dress and undress and engaged in activities suitable to freefall: sleeping, sunbathing, algae tending ("rocking") spongy cradles of water, fertilizer and the green scummy "guk"), yeast culture (a rather similar business), reading, studying, arguing, stargazing, meditation, space-squash (played inside the globular court of a stripped balloon), dancing, artistic creation in numerous media and the production of sweet sound (few musical instruments except the piano depend in any way on gravity).

Attached to the Beat Cluster by two somewhat larger sealingsilk tunnels and blocking off a good eighth of the inky, star-speckled sky, was the vast trim aluminum bulk of Research Satellite One, dazzling now in the untempered sunlight.

It was mostly this sunlight reflected by the parent satellite, however, that now illuminated

Fats Jordan and the other "floaters" of the Beat Cluster. A huge sun-quilt was untidily spread (staying approximately where it was put, like all objects in freefall) against most of the inside of the Big Igloo away from the satellite. The sun-quilt was a patchwork of colors and materials on the inward side, but silvered on the outward side, as turned-over edges and corners showed. Similar "Hollywood Blankets" protected the other igloos from the undesirable heating effects of too much sunlight and, of course, blocked off the sun's disk from view.

Fats, acting as Big Daddy of the Space Beats, received the eviction order with thoughtful sadness.

"So we all of us gotta go down there?"

HE jerked a thumb at the Earth, which looked about as big as a basketball held at arms-length, poised midway between the different silvers of the sun-quilt margin and the satellite. Dirty old Terra was in half phase: wavery blues and browns toward the sun, black away from it except for the tiny nebulous glows of a few big cities.

"That is correct," the proctor of the new Resident Civilian Administrator replied through thin lips. The new proctor was a lean

man in silvery gray blouse, Bermuda shorts and sockassins. His hair was precision clipped — a quarter-inch blond lawn. He looked almost unbearably neat and hygienic contrasted with the sloppy long-haired floaters around him. He almost added, "and high time, too," but he remembered that the Administrator had enjoined him to be tactful—"firm, but tactful." He did not take this suggestion as including his nose, which had been wrinkled ever since he had entered the igloos. It was all he could do not to hold it shut with his fingers. Between the overcrowding and the loathsome Chinese gardening, the Beat Cluster stank.

And it was dirty. Even the satellite's precipitrons, working over the air withdrawn from the Beat Cluster via the exhaust tunnel, couldn't keep pace with the new dust. Here and there a film of dirt on the sealingsilk blurred the starfields. And once the proctor thought he saw the film crawl.

Furthermore, at the moment Fats Jordan was upside-down to the proctor, which added to the latter's sense of the unfitness of things. Really, he thought, these beat types were the curse of space. The sooner they were out of it the better.

"Man," Fats said mournfully, "I never thought they were going to enforce those old orders."

"The new Administrator has made it his first official act," the proctor said, smiling leanly. He went on, "The supply rocket was due to make the down-jump empty this morning, but the Administrator is holding it. There is room for fifty of your people. We will expect that first contingent at the boarding tube an hour before nightfall."

Fats shook his head mournfully and said, "Gonna be a pang, leavin' space."

His remark was taken up and echoed by various individuals spotted about in the Big Igloo.

“IT'S going to be a dark time,” said Knave Grayson, merchant spaceman and sun-worshipper. Red beard and sheath-knife at his belt made him look like a pirate. “Do you realize the nights average twelve hours down there instead of two? And there are days when you never see Sol?”

“Gravity yoga will be a trial after freefall yoga,” Guru Ishpingham opined, shifting from padmasana to a position that put his knees behind his ears in a fashion that made the proctor look away. The tall, though presently much folded and intertwined, Briton was as thin as Fats Jordan was stout. (In space the number of thins and fats tends to increase sharply, as neither overweight nor under-musculature carries the

penalties it does on the surface of a planet.)

"And mobiles will be trivial after space stables," Erica James threw under her shoulder. The husky sculptress had just put the finishing touches to one of her three-dimensional free montages—an arrangement of gold, blue and red balls—and was snapping a stereophoto of it. "What really hurts," she added, "is that our kids will have to try to comprehend Newton's Three Laws of Motion in an environment limited by a gravity field. Elementary physics should never be taught anywhere except in freefall."

"No more space diving, no more water sculpture, no more vacuum chemistry," chanted the Brain, fourteen-year-old fugitive from a brilliant but much broken home down below.

"No more space pong, no more space pool," chimed in the Brainless, his sister. (Space pool, and likewise billiards, is played on the inner surface of a stripped balloon. The balls, when properly cued, follow it by reason of their slight centrifugal force.)

"Ah well, we all knew this bubble would someday burst," Gussy Friml summed up, pinwheeling lazily in her black leotards. (There is something particularly beautiful about girls in space, where gravity doesn't tug at their curves. Even fat folk don't sag in

freefall. Luscious curves become truly remarkable.)

"Yes!" Knave Grayson agreed savagely. He'd seemed lost in brooding since his first remarks. Now as if he'd abruptly reached conclusions, he whipped out his knife and drove it through the taut sealingsilk at his elbow.

The proctor knew he shouldn't have winced so convulsively. There was only the briefest whistle of escaping air before the edge-tension in the sealingsilk closed the hole with an audible snap.

KNAVE smiled wickedly at the proctor. "Just testing," he explained. "I knew a roustabout who lost a foot stepping through sealingsilk. Edge-tension cut it off clean at the ankle. The foot's still orbiting around the satellite, in a brown boot with needle-sharp hobnails. This is one spot where a boy's got to remember not to put his finger in the dike."

At that moment Fats Jordan, who'd seemed lost in brooding too, struck a chilling but authoritative chord on his guitar.

"Gonna be a pang

"Leavin' space," (he sang)

"Gonna be a pang!"

The proctor couldn't help wincing again. "That's all very well," he said sharply, "and I'm glad you're taking this realistically.

But hadn't you better be getting a move on?"

Fats Jordan paused with his hand above the strings. "How do you mean, Mister Proctor?" he asked.

"I mean getting your first fifty ready for the down jump!"

"Oh, that," Fats said and paused reflectively. "Well, now, Mr. Proctor, that's going to take a little time."

The proctor snorted. "Two hours!" he said sharply and, grabbing at the nylon line he'd had the foresight to trail into the Beat Cluster behind him (rather like Theseus venturing into the Minotaur's probably equally smelly labyrinth), he swiftly made his way out of the Big Igloo, hand over hand, by way of the green tunnel.

The Brainless giggled. Fats frowned at her solemnly. The giggling was cut off. To cover her embarrassment the Brainless began to hum the tune to one of her semi-private songs:

"Eskimos of space are we
"In our igloos falling free.
"We are space's Esquimaux,
"Fearless vacuum-chewing
hawks."

Fats tossed Gussy his guitar, which set him spinning very slowly. As he rotated, precessing a little, he ticked off points to his

comrades on his stubby, ripe-banana-clustered fingers.

"Somebody gonna have to tell the research boys we're callin' off the art show an' the ballet an' terminatin' jazz Fridays. Likewise the Great Books course an' Saturday poker. Might as well inform our friends of Edison and Con-vair at the same time that they're gonna have to hold the 3D chess and 3D go tournaments at their place, unless they can get the new Administrator to donate them our quarters when we leave — which I doubt. I imagine he'll tote the Cluster off a ways and use the igloos for target practice. With the self-sealin' they should hold shape a long time.

"But don't exactly tell the research boys when we're goin' or why. Play it misterioso.

"Meanwhile the gals gotta start sewin' us some ground clothes. Warm and decent. And we all gotta get our papers ready for the customs men, though I'm afraid most of us ain't kept nothin' but Davis passports. Heck, some of you are probably here on Nansen passports.

"An' we better pool our credits to buy wheelchairs and dollies groundside for such of us as are gonna need 'em." Fats looked back and forth dolefully from Guru Ishpingham's interwoven emaciation to his own hyper-portliness.

MEANWHILE a space-diver had approached the Big Igloo from the direction of the satellite, entered the folds of a limp blister, zipped it shut behind him and unzipped the slit leading inside. The blister filled with a dull pop and the diver pushed inside through the lips. With a sharp effort he zipped them shut behind him, then threw back his helmet.

"Condition Red!" he cried. "The new Administrator's planning to ship us all groundside! I got it straight from the Police Chief. The new A's taking those old deportation orders seriously and he's holding the —"

"We know all about that, Trace Davis," Fats interrupted him. "The new A's proctor's been here."

"Well, what are you going to do about it?" the other demanded.

"Nothin'," Fats serenely informed the flushed and shock-headed diver. "We're complyin'. You, Trace —" he pointed a finger — "get out of that suit. We're auctionin' it off 'long with all the rest of our unworldly goods. The research boys'll be eager to bid on it. For fun-diving our space-suits are the pinnacle."

A carrot-topped head thrust out of the blue tunnel. "Hey, Fats, we're broadcasting," its freckled owner called accusingly. "You're on in thirty seconds!"

"Baby, I clean forgot," Fats said. He sighed and shrugged. "Guess I gotta tell our downside fans the inglorious news. Remember all my special instructions, chillun. Share 'em out among you." He grabbed Gussy Friml's black ankle as it swung past him and shoved off on it, coasting toward the blue tunnel at about one fifth the velocity with which Gussy receded from him in the opposite direction.

"Hey, Fats," Gussy called to him as she bounced gently off the sun-quit, "you got any general message for us?"

"Yeah," Fats replied, still rotating as he coasted and smiling as he rotated. "Make more guk, chillun. Yeah," he repeated as he disappeared into the blue tunnel, "take off the growth checks an' make mo' guk."

SEVEN seconds later he was floating beside the spherical mike of the Beat Cluster's short-wave station. The bright instruments and heads of the Small Jazz Ensemble were all clustered in, sounding a last chord, while their foreshortened feet waved around the periphery. The half dozen of them, counting Fats, were like friendly fish nosing up to the single black olive of the mike. Fats had his eyes on the Earth, a little more than half night now and about as big as

the snare drum standing out from the percussion rack Jerdy had his legs scissored around. It was good, Fats thought, to see who you were talking to.

"Greetings, groundsiders," he said softly when the last echo had come back from the sealing-silk and died in the sun-quilt. "This is that ever-hateful voice from outer space, the voice of your old tormentor Fats Jordan, advertising no pickle juice." Fats actually said "advertising," not "advertisin'"—his diction always improved when he was on vacuum.

"And for a change, folks, I'm going to take this space to tell you something about us. No jokes this time, just tedious talk. I got a reason, a real serious reason, but I ain't saying what it is for a minute."

He continued, "You look mighty cozy down there, mighty cozy from where we're floating. Because we're way out here, you know. Out of this world, to quote the man. A good twenty thousand miles out, Captain Nemo.

"Or we're up here, if it sounds better to you that way. Way over your head. Up here with the stars and the flaming sun and the hot-cold vacuum, orbiting around Earth in our crazy balloons that look like a cluster of dingy glass grapes."

The band had begun to blow

softly again, weaving a cool background to Fat's lazy phrases.

"Yes, the boys and girls are in space now, groundsiders. We've found the cheap way here, the back door. The wild ones who yesterday would have headed for the Village or the Quarter or Big Sur, the Left Bank or North Beach, or just packed up their Zen Buddhism and hit the road, are out here now, digging cool sounds as they fall round and round Dear Old Dirty. And folks, ain't you just a little glad we're gone?"

THE band coasted into a phrase that was like the lazy swing of a hammock.

"Our cold-water flats have climbed. Our lofts have gone aloft. We've cut our pads loose from the cities and floated them above the stratosphere. It was a stiff drag for our motorcycles, Dad, but we made it. And ain't you a mite delighted to be rid of us? I know we're not all up here. But the worst of us are.

"You know, people once pictured the conquest of space entirely in terms of military outposts and machine precision." Here Burr's trumpet blew a crooked little battle cry. "They didn't leave any room in their pictures for the drifters and dreamers, the rebels and no-goods (like me, folks!) who are up here



right now, orbiting with a few pounds of oxygen and a couple of gobs of guk (and a few cockroaches, sure, and maybe even a few mice, though we keep a cat) inside a cluster of smelly old balloons.

"That's a laugh in itself: the antique vehicle that first took man off the ground also being the first to give him cheap living quarters outside the atmosphere. Primitive balloons floated free in the grip of the wind; we fall free in the clutch of gravity. A balloon's a symbol, you know, folks. A symbol of dreams and hopes and easily-punctured illusions. Because a balloon's a kind of bubble, But bubbles can be tough."

Led by Jordy's drums, the band worked into the Blue Ox theme from the Paul Bunyan Suite.

"Tough the same way the hemlock tents and sod huts of the American settlers were tough. We got out into space, a lot of us did, the same way the Irish and Finns got west. They built the long railroads. We built the big satellites."

Here the band shifted to the Axe theme:

"I was a welder myself. I came into space with a bunch of other galoots to help stitch together Research Satellite One. I didn't like the barracks they put us in, so I made myself a little private home of scalingalk, a material which was used only for storing



liquids and gases—nobody'd even thought of it for human habitation. I started to meditate there in my bubble and I came to grips with a few half-ultimates and I got to like it real well in space. Same thing happened to a few of the other galoots. You know, folks, a guy who's wacky enough to wrestle sheet aluminum in vacuum in a spider suit may very well be wacky enough to get to really like stars and weightlessness and all the rest of it.

"When the construction job was done and the big research outfits moved in, we balloon men stayed on. It took some wangling but we managed. We weren't costing the Government much. And it was mighty convenient for them to have us around for odd jobs.

“**T**HAT was the nucleus of our squatter cluster. The space roustabouts and roughnecks came first. The artists and oddballs, who have a different kind of toughness, followed. They got wind of what our life was like and they bought, bummed or conned their way up here. Some got space research jobs and shifted over to us at the ends of their stints. Others came up on awards trips and managed to get lost from their parties and accidentally find us. They brought their tapes and instruments with them, their sketchbooks and typers; some even smuggled up their

own balloons. Most of them learned to do some sort of space work — it's good insurance on staying aloft. But don't get me wrong. We're none of us work-crazy. Actually we're the laziest cats in the cosmos: the ones who couldn't bear the thought of carrying their own weight around every day of their lives! We mostly only toil when we have to have money for extras or when there's a job that's just got to be done. We're the dreamers and funsters, the singers and studiers. We leave the 'to the stars by hard ways' business to our friends the space marines. When we use the 'ad astra per aspera' motto (was it your high school's too?) we change the last word to asparagus — maybe partly to honor the green guk we grow to get us oxygen (so we won't be chiseling too much gas from the Government) and to commemorate the food-yeasts and the other stuff we grow from our garbage.

"What sort of life do we have up here? How can we stand it cooped up in a lot of stinking balloons? Man, we're free out here, really free for the first time. We're floating, literally. Gravity can't bow our backs or break our arches or tame our ideas. You know, it's only out here that stupid people like us can really think. The weightlessness gets our thoughts and we can sort them.

Ideas grow out here like nowhere else — it's the right environment for them.

"Anybody can get into space if he wants to hard enough. The ticket is a dream.

"That's our story, folks. We took the space road because it was the only frontier left. We had to come out, just because space was here, like the man who climbed the mountain, like the first man who skin-dove into the green deeps. Like the first man who envied a bird or a shooting star."

The music had softly soared with Fat's words. Now it died with them and when he spoke again it was without accompaniment, just a flat lonely voice.

"But that isn't quite the end of the story, folks. I told you I had something serious to impart — serious to us anyway. It looks like we're not going to be able to stay in space, folks. We've been told to get out. Because we're the wrong sort of people. Because we don't have the legal right to stay here, only the right that's conveyed by a dream.

"Maybe there's real justice in it. Maybe we've sat too long in the starbird seat. Maybe the best generation doesn't belong in space. Maybe space belongs to soldiers and the civil service, with a slice of it for the research boys. Maybe there's somebody who

wants to be in space more than we do. Maybe we deserve our comedownance. I wouldn't know.

"So get ready for a jolt, folks. We're coming back! If you don't want to see us, or if you think we ought to be kept safely cooped up here for any reason, you just might let the President know.

"This is the Best Cluster, folks, signing off."

AS FATS and the band pushed away from each other, Fats saw that the little local audience in the sending balloon had grown and that not all new arrivals were fellow floaters.

"Fats, what's this nonsense about you people privatizing your activities and excluding research personnel?" a grizzle-haired stringbean demanded. "You can't cut off recreation that way. I depend on the Cluster to keep my electron bugs happily abnormal. We even mention it downside in recruiting personnel—though we don't put it in print."

"I'm sorry, Mr. Thoms," Fats said. "No offense meant to you or to General Electric. But I got no time to explain. Ask somebody else."

"Whatdya mean, no offense?" the other demanded, grabbing at the purple shorts. "What are you trying to do, segregate the squares in space? What's wrong

with research? Aren't we good enough for you?"

"Yes," put in Rupleman of Convair, "and while you're doing that would you kindly throw some light on this directive we just received from the new A—that the Cluster's off-bounds to us and that all dating between research personnel and Cluster girls must stop? Did you put the new A up to that, Fats?"

"Not exactly," Fats said. "Look, boys, let up on me. I got work to do."

"Work!" Rupleman snorted.

"Don't think you're going to get away with it," Thoms warned Fats. "We're going to protest. Why, the Old Man is frantic about the 3D chess tournament. He says the Brain's the only real competition he has up here." (The Old Man was Hubert Willis, guiding genius of the open bevatron on the other side of the satellite.)

"The other research outfits are kicking up a fuss too," Trace Davis put in. "We spread the news like you said, and they say we can't walk out on them this way."

"Allied Microbiotics," Gussy Frimal said, "wants to know who's going to take over the experiments on unshielded guk societies in freefall that we've been running for them in the Cluster."

Two of the newcomers had

slightly more confidential messages for Fats.

Allison of Convair said, "I wouldn't tell you, except I think you've guessed, that I've been using the Beat Cluster as a pilot study in the psychology of anarchic human societies in freefall. If you cut yourself off from us, I'm in a hole."

"It's mighty friendly of you to feel that way," Fats said, "but right now I got to rush."

SPACE Marines Sergeant Gombert, satellite police chief, drew Fats aside and said, "I don't know why you're giving research a false impression of what's happening, but they'll find out the truth soon enough and I suppose you have your own sweet insidious reasons. Meanwhile I'm here to tell you that I can't spare the men to police your exodus. As you know, you old corner-cutter, this place is run more like a national park than a military post, in spite of its theoretical high security status. I'm going to have to ask you to handle the show yourself, using your best judgment."

"We'll certainly work hard at it, Chief," Fats said. "Hey, everybody, get cracking!"

"Understand," Gombert continued, his expression very fierce, "I'm wholly on the side of officialdom. I'll be officially overjoyed to see the last of you floaters. It

just so happens that at the moment I'm short-handed."

"I understand," Fats said softly, then bellowed, "On the jump, everybody!"

But at sunset the new A's proctor was again facing him, right-side-up this time, in the Big Igloo.

"Your first fifty were due at the boarding tube an hour ago," the proctor began ominously.

"That's right," Fats assured him. "It just turns out we're going to need a little more time."

"What's holding you up?"

"We're getting ready, Mr. Proctor," Fats said. "See how busy everybody is?"

A half dozen figures were rhythmically diving around the Big Igloo, folding the sun-quilt. The sun's disk had dipped behind the Earth and only its wild corona showed, pale hair streaming across the star-fields. The Earth had gone into its dark phase, except for the faint unbalanced halo of sunlight bent by the atmosphere and for the faint dot-dot-dot of glows that were the Los Angeles-Chicago-New York line. Soft yellow lights sprang up here and there in the Cluster as it prepared for its short night. The transparent balloons seemed to vanish, leaving a band of people camped among the stars.

The proctor said, "We know you've been getting some unof-

ficial sympathy from research and even the MPs. Don't depend on it. The new Administrator can create special deputies to enforce the deportation orders."

"He certainly can," Fats agreed earnestly, "but he don't need to. We're going ahead with it all, Mr. Proctor, as fast as we're able. For instance, our groundclothes ain't sewed yet. You wouldn't want us arriving downside half naked an' givin' the sat' a bad reputation. So just let us work an' don't joggle our elbow."

The proctor snorted. He said, "Let's not waste each other's time. You know, if you force us to do it, we can cut off your oxygen."

THERE was a moment's silence. Then from the side Trace Davis said loudly, "Listen to that! Listen to a man who'd solve the groundside housing problem by cutting off the water to the slums!"

But Fats frowned at Trace and said quietly only, "If Mr. Proctor shut down on our air, he'd only be doing the satellite a disservice. Right now our algae are producing a shade more oxy than we burn. We've upped the guk production. If you don't believe me, Mr. Proctor, you can ask the atmosphere boys to check."

"Even if you do have enough oxygen," the proctor retorted,

"you need our forced ventilation to keep your air moving. Lacking gravity convection, you'd suffocate in your own exhaled breath."

"We got our fans ready, battery driven," Fats told him.

"You've got no place to mount them, no rigid framework," the proctor objected.

"They'll mount on harnesses near each tunnel mouth," Fats said imperturbably. "Without gravity they'll climb away from the tunnel mouths and ride the taut harness. Besides, we're not above hand labor if it's necessary. We could use punkaha."

"Air's not the only problem," the proctor interjected. "We can cut off your food. You've been living on handouts."

"Right now," Fats said softly, "we're living half on yeasts grown from our own personal garbage. Living well, as you can see by a look at me. And if necessary we can do as much better than half as we have to. We're farmers, man."

"We can seal off the Cluster," the proctor snapped back, "and set you adrift. The orders allow it."

Fats replied, "Why not? It would make a very interesting day-to-day drama for the ground-side public and for the food chemists—seeing just how long we can maintain a flourishing ecology."

The proctor grabbed at his nylon line. "I'm going to report your attitude to the new Administrator as hostile," he sputtered. "You'll hear from us again shortly."

"Give him our greetings when you do," Fats said. "We haven't had opportunity to offer them. And there's one other thing," he called after the proctor, "I notice you hold your nose mighty rigid in here. It's a waste of energy. If you'd just steel yourself and take three deep breaths you'd never notice our stink again."

THE proctor bumped into the tunnel side in his haste to be gone. Nobody laughed, which doubled the embarrassment. If they'd have laughed he could have cursed. Now he had to bottle up his indignation until he could discharge it in his report to the new Administrator.

But even this outlet was denied him.

"Don't tell me a word," the new Administrator snapped at his proctor as the latter zipped into the aluminum office. "The deportation is canceled. I'll tell you about it, but if you tell anybody else I'll down-jump you. In the last twenty minutes I've had messages direct from the Space Marshal and the President. We must not disturb the Beat Cluster because of public opinion and

because, although they don't know it, they're a pilot experiment in the free migration of people into space." ("Where else, Joel," the President had said, "do you think we're going to get people to go willingly off the Earth and achieve a balanced existence, using their own waste products? Besides, they're a floating labor pool for the satellites. And Joel, do you realize Jordan's broadcast is getting as much attention as the Russian landings on Ganymede?") The new Administrator groaned softly and asked the Unseen, "Why don't they tell a new man these things before he makes a fool of himself?"

Back in the Best Cluster, Fats struck the last chord of "Glow Little Glow Worm." Slowly the full moon rose over the satellite,

dimming the soft yellow lights that seemed to float in free space. The immemorial white globe of Luna was a little bit bigger than when viewed from Earth and its surface markings were more sharply etched. The craters of Tycho and Copernicus stood out by reason of the bright ray systems shooting out from them and the little dark smudge of the Mare Crisium looked like a curled black kitten. Fats led those around him into a new song:

"Gonna be a pang
"Leavin' space,
"Gonna be a pang!
"Gonna be a pang
"Leavin' space,
"So we won't go!"

—FRITZ LEIBER

★ ★ ★ ★ ★

FORECAST

The big news for December is Paul Anderson, beginning a major science-fiction novel that we're proud to present, uncut, as a two-part serial: *The Day After Doomsday*. It's Anderson's latest, and not far from being his best ever — which, as every science-fiction reader well knows, is very good indeed.

But there's more. Three fine novelettes, including Algis Budrys with *Wall of Crystal*, *Eye of Night* and *Margaret St. Clair* with a classification-defying exercise in wit and whimsy, *An Old Fashioned Bird Christmas*. Plus *Willy Ley* . . . plus the usual lineup of shorts . . . plus (we hope; if the type will stretch to hold it) an unusual article. It's going to be a memorable issue, and that's a promise. So, isn't this a good time to subscribe?



GALAXY'S 5-★ SHELF

YURI GAGARIN proved yet again that there is no substitute for scientific knowhow, hence this column devoted entirely to Junior Education:

THE ASTRONAUTS by Martin Caidin. E. P. Dutton & Co., Inc.

The limited payloads of our rockets have necessitated the Mercury Project approach to our first spaceflight. Despite safeguards and fail-safe devices, our attempts are marginal.

Caidin's copiously illustrated book fills in the information gap

about America's seven astronauts, the men who hold the key to our chances. They are so remarkably able that the results of the tests awed the medical and technical testers. "Some of them actually kept up with (the tests) and they aren't designed to be kept up with!"

SPACE VOLUNTEERS by Terence Kay. Harper & Brothers.

Behind each invention or achievement are countless hours of tedious preparation. Newton "stood on the shoulders of giants."

Einstein theorized about data observed by others.

Our seven astronauts will go into space armed with equipment and knowledge garnered by hundreds of "space volunteers" like Col. Stapp of rocket sled fame; Capt. Simons of the 20-mile-high balloon flight and scores of anonymous test pilots, centrifuge riders, ejection seat testers, etc., etc.

Kay's informative book is about unsung men who make the headlines possible.

NINETY SECONDS TO SPACE by Jules Bergman. Hanover House.

The book, an extravagantly illustrated account of the X-15 and its predecessors, refers in title to the total powered flight time of the rocket craft. It is also the story of the men who fly in (and occasionally die in) these barrier-shattering flying laboratories. As an inspirational story of hard work, research, experimentation and pure bravery, this book is tough to beat.

COUNTDOWN by William Roy Shelton. Little, Brown & Co.

"The story of Cape Canaveral," reads the subtitle of this book which chronicles the growth of America's prime rocket-launch area from a snake's paradise to

the most exciting piece of real-estate in the western hemisphere. It is also the life story of many rockets — accident-prone Vanguard, reliable Jupiter, Thor, Atlas, Titan, Polaris. The *Life* and *Time* author, witness to almost all of the shoots, has written a breezy, interest-sustaining story.

THE MAN WHO RODE THE THUNDER by W. H. Rankin. Prentice Hall, Inc.

Marine Lt. Col. Rankin made headlines when he bailed out of a supersonic jet ten miles up without a pressure suit and then descended through a thunderstorm. The return to earth took forty minutes instead of ten, but a frail human being survived the unbelievable violence of the thunder, lightning and deluge.

This thrilling true adventure makes one speculate upon what extremes of physical anguish the new breed of spacemen will have to endure.

POLARIS! by James Baar and William E. Howard. Harcourt, Brace & Co.

Firing a rocket 1200 miles from a submerged nuclear submarine to a pinpointed target seems a near-impossibility. So it is — but it only took the Navy 4½ years to accomplish the im-

possible. Of prime importance was a shrewd decision to switch in midstream from the liquid fuel Army Jupiter missile to the solid fuel Polarix.

The authors present a segment of missile history that should serve as inspiration to all good damn-the-red-taper-ers.

THE FASCINATING WORLD OF ASTRONOMY by R. S. Richardson. McGraw Hill Book Co., Inc.

Dr. Richardson, formerly of Palomar and Mt. Wilson, employing the question-and-answer technique, poses questions that laymen ask most:

"What makes the sun shine?"

"What created the planets?"

"What is the farthest the eye can see?"

The good doctor has written an eminently readable and informative book.

THE BOOK OF THE ATOM by Leonard de Vries. The Macmillan Co.

Author de Vries's bated-breath treatment of his subject enhances its already enormous appeal. These chapter headings convey the tone: "A Horrible Suspicion;" "The Greatest Race of All Time;" "Leviathan in Chains;" "A Cracker Full of Surprises."

CAREERS AND OPPORTUNITIES IN SCIENCE by Phillip Pollack. E. P. Dutton & Co., Inc.

The stupendous strides of technology have made necessary this revision of a 1945 career guide. Industries and products undreamt of 15 years ago have opened up job opportunities equally new. Pollack's fine book details opportunities each field offers, some background fill-in, necessary training and remunerative averages. One message comes in loud and clear — *advanced study, to and including Ph.D., pays off!*

SATURDAY SCIENCE edited by Andrew Bluemle. E. P. Dutton & Co.

Westinghouse sponsors the annual Science Talent Search. It also offers a program for all honor high school students in the Pittsburgh area, a series of lectures by members of the Westinghouse Research Labs which were adapted for this excellent, provocative book. The biographical vignettes heading each chapter should also serve as inspiration for aspiration and emulation.

FROM CELL TO TEST TUBE by R. W. Chambers and A. S. Payne. Chas. Scribner's Sons.

Biochemistry, the chemistry of living things, is a young science.

Why? Because man had to get over the fever of discovery of the vast new world of micro-organisms before he could begin to ask for answers to: Why and how do the chemical compounds called Life react and reproduce?

The book is a fine combination of provocative subject and intelligent presentation.

THE ROMANCE OF WEIGHTS AND MEASURES by Keith Gordon Irwin. The Viking Press.

Irwin's special interest is the English system; its origins, changes and present complexity. He presents the beautiful simplicity of decimal-system measurement in Anglo-Saxon England a millenium ago and the succeeding chaos created by Norman conquest and foreign trade.

In his fascinating book, Irwin, like Asimov, proves that the subject of weights and measures can be as engrossing as any facet of human development.

THE LIFE AND TIMES OF TARQUIN THE ETRUSCAN by C. M. Franzero. The John Day Co., Inc.

That the Etruscans are a people of mystery is peculiar because Etruria, even more than Greece, is the cornerstone of Roman civilization. Rome took

over intact the Etruscan system of government, army organization, civil engineering. The founder of the Tarquinian dynasty of Roman kings was Etruscan.

However, the infamous "Rape of Lucrece" touched off the destruction, in repugnance, by the Romans of every available Etruscan relic.

Franzero's minutely detailed book makes the utmost of myth and conjecture.

THE LOST PHARAOKHS by Leonard Cottrell. Holt, Rinehart and Winston.

Archeology being scientific detection raised to the heights, it is hardly surprising that Cottrell's exciting book reads like a detective story. Instead of tracking down culprits, however, Egyptologists uncover cadavers buried for millenia. In one fantastic discovery, over *thirty* Pharaohs were found in a common tomb where they had been hastily reburied more than 3000 years ago to save them from the ravages of tomb robbers!

SEVEN MILES DOWN by Jacques Piccard and Robert S. Dietz. G. P. Putnam's Sons.

Auguste Piccard, inventor of the bathyscaph, wrote phlegmatically in *Earth, Sea and Sky* of

his adventures in stratosphere and abyss. His son, Jacques, pilot on the deep dives undertaken by the bathyscaphs *FNRS-2* and *Trieste*, is much more demonstrative in his account, particularly of touchdown in the deepest hole on earth, 35,800 feet down in Challenger Deep. Adventure lies in Inner as well as Outer Space.

EDISON EXPERIMENTS YOU CAN DO. Harper & Bros.

Methodical Tom Edison made notes on every experiment he ever conducted. During his lifetime, he filled 3400 notebooks of 200 pages each!

In this fascinating book prepared by the Edison Foundation, the reader can follow the footsteps of the great man, in some cases from actual facsimiles of the original notes, and using simple materials.

SCIENCE PUZZLERS by Martin Gardner. The Viking Press.

First impression is that Gardner has written an ordinary book of stunts. However, each puzzler is just that; it makes the reader ponder even though no special experimental equipment is needed.

Chemistry, astronomy, topology, psychology, etc. are contributors to the mind-teasers.

THE WILD ROCKET by Peggy Hoffman. Westminster Press.

An indisputably fit subject for a science-fiction juvenile is the planning, building and firing of a home-made, six-foot, solid-propellant rocket by an untutored backwoods boy. These basic facts are mere background however, for Mrs. Hoffman's warm, tender story of the guts and sheer determination of the orphaned, loveless youth and the understanding he encounters.

Rating (12-15): ****½

DANNY DUNN ON THE OCEAN FLOOR by Jay Williams and Raymond Ahrashkin. Whitteley House.

Danny's adventures are always based on a solid science foundation, once the authors' usually wild main premise is digested. Currently Danny, in cooking a plastic mixture of Professor Bullfinch's, employer of Danny's widowed mother, achieves a transparent plastic of super-strength — but through the sheer neglect of his duties.

In short order, jovial Prof. Bullfinch, acidulous Dr. Grimes, Danny and friends Irene and Joe are off to explore the ocean bottom in a transparent, super-strength bathyscaph.

Rating (8-12) ****½

— FLOYD C. GALE