

# FANTASTIC UNIVERSE

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# who rules space

by . . . *Lester del Rey*

**It is time to consider how close we—and others—are to the mastery of space we talk of, and what this means.**

A FEW hours ago, as I write this, the title changed from an abstract question for the future to an immediate problem of the present. The Army, having finally been permitted to make the attempt, has just launched the first U. S. satellite to compete with the Russian ones for mastery of space.

This is obviously welcome, if hardly surprising news. There was never any doubt that we could get into space when we finally decided we wanted to badly enough, and when we were willing to put the right amount of intelligence into the effort. Like the four-minute mile, it was possible long before it was accomplished; but the mind-barrier against it was too great. Once the first four-minute record was established, several other runners also found they could run the mile in that time. And once the first satellite circled the Earth, it was inevitable that we should also come out of our mind-block and achieve similar results.

It might be wise here to take a quick look at the background for the current success. The Army Explorer satellite isn't any late-comer built in a final effort to

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catch up to Russia. Instead, it is the product of the longest planning and the greatest practical experience with rockets in this country—probably in the world. It succeeded because it was adequately designed, had sufficient thrust—at least twice that of Vanguard—and was supervised by a man whose experience with working rockets goes back to the first ones to fly. Both the rocket and the man to use it were available long before the first Sputnik went up; all that was needed was the will to get into space great enough to overcome interservice struggles, red tape and the complicated lethargy that seems to be one of the less happy by-products of any large democracy.

Dr. Wernher von Braun and a number of other scientists worked out the first practical scheme for a minimum satellite several years ago—the original Operation Mouse. This was sidetracked in favor of the Navy's Project Vanguard—not entirely unreasonably, since Vanguard called for somewhat better instrumentation. Then, when we were shoved into making the effort to get into space during the IGY, Project Vanguard was set up, independent of the missile program, and apparently as a minimum effort, since space satellites were now acceptable ideas, but hardly considered of major importance.

Meantime, von Braun was busy working on rockets (when not ad-

vising Hollywood, etc.), but under the greatest restrictions. The Army's missile program had been restricted to flights not to exceed 200 miles—less than the capabilities of the original V-2! Long range missiles were being fought over by other services, and the man who achieved the first great rocket success was seemingly shoved into the background. Nevertheless, the Redstone (Jupiter) missile was perfected and ready.

It was only after the sensational success of Russia—quite a while after, in fact—that the wraps were finally taken off and the Army was permitted to make the spectacularly efficient and unwavering launching of our satellite.

As Dr. von Braun was first to state publicly, this doesn't mean that we've caught up with Russia. We're still far behind, as the different weights of the satellites underscore. But we can catch up—in less time than might be thought—if we'll learn our lessons from the confusion of all this background.

The first lesson we have to learn is to drop all clichés about who or which group in our country shall rule space affairs. It's easy to make wrong snap decisions on this, as we've already done. It's a lot harder to remedy the results of such stereotype thinking.

Science fiction has been as guilty of making such possibly false assumptions as any other group. Most of our "space services" have been based on the Air Force or the

Navy. The temptation to think in such terms is obvious. The Air Force is already in charge of above-ground operations, and space is—supposedly—only a logical extension. Or the Navy is already in control of ships, ship-building and ship-operations. Won't spaceships be just more ships—at least no more dissimilar than submarines?

Maybe either of these assumptions is correct. I have no wish to sneer at either service or its abilities. I'll even admit that Project Vanguard might well have succeeded if it had been given anything like the chance it should have had. But let's not decide that any one group shall rule until we know more.

The Army has been "being made" obsolete for some 2000 years now—by everything from the catapult to the guided missile. But it won't lie down and die. As I wrote some time ago (*It's Your Atomic Age*, Abelard Press, 1951), "No method of eliminating the foot-soldier has done more than increase the number of foot-soldiers per battle. Perhaps space travel and combat in space will eliminate the infantry—but it seems more probable that some Army genius will invent a new race of infantrymen capable of breathing in a pure vacuum and walking around comfortably on nothing!"

As long as the Army is still faced with the fundamental job of controlling the land, it must be able to check any form of invasion

and retaliate against such invasion; in an age of intercontinental missiles, that means it must deal with them. It was entirely natural then that the Army should have leaped into the research work on rocketry more rapidly than other services; its duty demanded that. And it might also be remembered that such massive land operations as the building, supplying and launching of a ship from land to space (over ocean and through air, but not necessarily more than in passing) ties in very neatly to Army skills. To rule the Army out of space without prolonged study is hardly wise.

On the other hand, space itself offers very little immediate advantage to any Armed Service beyond observation. Rockets are tied in with missiles now—but it's just as valid to tie motor cars in with tanks. Space is fundamentally most important to science—and the men who must develop the systems to put us there are mostly scientists and engineers.

It's not too early to begin considering what group must finally control our space effort. But the study must be a thorough one. Whether the Army, Navy, Air Force or some civilian group (in keeping with our basic traditions) gains ultimate control, we need some responsible, capable and flexible group who can take over and see that the job of getting into space is done and done properly. We've had enough of flying off in all directions with more attention to

the arguments about *who* than the thought of *where*.

Until we get that, it hardly seems that there's much chance of bringing all ideas and all the best brains together, though this is surely the best way for us to catch up with Russia. After all, that country made its first success by putting the best minds on the subject together (under their Academy of Sciences, which is itself naturally a branch of the government) and giving them full-speed-ahead orders.

And once we're ready to put our own house in order, perhaps we can turn to the extremely urgent job of deciding on the rule of space among the various nations which will be going out into space.

At the moment, by a streak of remarkably good luck, this has been temporarily cared for. The International Geophysical Year is organized internationally in fact as well as in title. Since both Russia and the United States are nominally sending up satellites as an official part of this program, all space activities fall within this international jurisdiction. The fifty-odd cooperating countries have waived all matters of space law for the moment, and the satellites are cruising over boundaries without any argument. But this is only a temporary situation. The IGY comes to an official end in the middle of 1958.

Of course, the ideal solution might be to have the IGY simply declare an extension of their program—letting everything but the

space studies lapse, but continuing at least nominal control there. Then, as the decades passed under such an extension of the Year—semantically not any more confusing than many other historical cases—the precedent already established would eventually become firmly set, and there would be the IGY as a truly international governing body for all space. It would be both the easiest and the most nearly ideal solution.

But history indicates that simple solutions are seldom chosen, perhaps because they offer so little chance for the palaver and the chest-beating that mankind has an instinct for, along with other anthropoids. Probably the IGY will run to its end and stop, leaving everything in chaos. What then?

Well, there is no clear legal definition of how high the boundaries of a country reach. We know that they do reach upwards, since air rights over a country are matters of established custom. If a plane crosses a boundary into another country without permission, it can be shot down at once. The air belongs to the nation under it. So far, this ownership has been construed to reach as high as any plane flying over it may go, but we have no clear limit.

Nor do we have any rule that says rights stop at the end of the atmosphere. There is nothing to prevent any country from claiming rights out to infinity and acting upon that claim by bombing any-

thing out of its skies. For that matter, it's impossible to say exactly where the atmosphere ends; the aurora is an atmospheric phenomenon, and it reaches to a height of some six hundred miles! Above that, there must be a few molecules drifting about. There is no boundary, but only a gradual change.

Suppose we simply drift along into the future. We have space stations (which can be confined to one country only when put into an orbit 22,000 miles out, where circum-rotation once each 24 hours matches the Earth's own rotation). Let's say Russia has a station some 500 miles up, manned with a group of scientists. Now, a medium-sized country we'll call Hyborea is having a tiff with Russia at the UN about something. Meantime, a tiny country we'll call Graustark is screaming at all those satellites passing overhead—mostly because Graustark can't even build rockets on her budget. Well, Hyborea has a fine supply of United States super-range, atomic-warhead missiles, as part of a defense alliance with us. So Hyborea makes a sub-rosa suggestion to Graustark.

Graustark signs a trade-agreement with Hyborea, which somehow just happens to include a mutual defense pact under which Graustark will be given training by Hyborean-hired technicians. Hyborea gets the right to conduct maneuvers on Graustark territory.

While conducting such maneuvers, Graustark suddenly finds that

the Russian space station is going to be directly over her territory in three days. She issues an ultimatum to Russia demanding that Russia not invade her territory—the space over her—at the risk of any invading craft being shot down. (There might be a hint that passage right could be bought, of course.) Anyhow, Russia can't turn the station, and pays little attention to it all. So Graustark appeals under the mutual defense pact to Hyborea—who happily is conducting missile tests on Graustark at the time—and Hyborea solemnly agrees to keep its word. At the proper time, as the station "invades" the space over Graustark, a U. S.-made missile is launched from Graustark by Hyborea, using hired French technicians. It hits the space station, causing an explosion there that slows the station into a falling orbit. The station comes down out of control, only partly burning up. It lands in the middle of Manhattan, kills 713 people, does a billion-plus dollars damage, etc.

What are the legal penalties? Well, Graustark was acting legally—she was clearly invaded. Hyborea was only living up to her pact with Graustark. The United States and France were not responsible for what was done with their missiles and technicians. Who is at fault, anyhow?

Simple. Russia is. She's responsible for the damage to the United States and should pay for it. Or she can even be accused of invad-

ing the United States if one man of military status is somehow still alive on the wrecked station before it lands.

That is a very highly simplified example of what might happen. In real life, things have many more sub-currents. Any one of these could result in almost any country involved declaring war and the others being in such a muddled mix-up that they couldn't back down. In the first launching of war missiles, a lot of other countries would be crossed by the missiles and could logically decide to avenge this insult to their national honor!

These complications arising from space flight were foreseen long before the first successful satellite. I have before me a paper dated 1953, entitled *Air Law and Space* by Prince Welf Heinrich of Hanover—a thesis for his doctorate of laws. Another, *Space Law—The Development of Jurisdictional Concepts*, by Andrew G. Haley, General Council of the American Rocket Society, was presented in 1957 at the 8th Annual Congress of the International Astronautical Federation in Barcelona. And finally, a late one by Andrew G. Haley and John Cobb Cooper, is revealingly entitled *The Russian Satellite*. In these (the last two published by the American Rocket Society), there is an extensive list of references to papers delivered over a great many years on the subject of space law.

The subject has been discussed

before Disarmament Conferences, before the United Nations, and wherever possible. Many very capable men have been aware of the coming age of space and have tried to resolve some of the problems in advance.

*Space Law*, by Haley, sets forth the basic proposal that seemed most logical before the flight of Sputnik. Very briefly, this suggests that the "air space" above nations be limited to a zone of about 300 miles in height, known as contiguous space. This, it was felt, was the minimum height at which a true satellite could operate, since below that air would retard its speed; while this height would offer the maximum height for all craft which gained lift or support from the air, such as airplanes. Contiguous space would fall into the rule of national sovereignty, with legal rules similar to those pertaining to the flight of normal aircraft. Beyond that, true space would be international, with no country having the right to restrict passage through it.

Interestingly enough this paper also proposes what I consider a remarkable law for problems that may arise from our future contact with other non-human races, where what we like may not apply. In this version of the Golden Rule, Dr. Haley suggests that we must do unto others as *they* would have done unto *them*. Science fiction writers and readers obviously have no monopoly on mental flexibility

and awareness of the future! I think he has proposed the best possible rule here.

But getting back to space law—the whole concept received a severe jolt from the flight of Sputnik, since the first satellite's flight indicated that space craft could operate well below the proposed 300 mile level. At the moment, it's a little hard to set up even a satisfactory arbitrary zone of demarcation between true space and contiguous space.

Nevertheless, there is a body of theory well enough worked out that it should be entirely possible for some agency to formulate a satisfactory law to govern space. While the exact height of the "contiguous space" may be in some doubt (probably soon to be settled by further satellite work), most of the other details have been settled in theory. Such things as the right of passage through contiguous space by a peaceful launching or return of a spaceship have been taken care of, for instance.

All that would seem necessary is for a conference at which the nations could agree, perhaps making the exact height tentative, to be subject to later revision. This would have seemed easier to do before any satellite was up, when no nation had any vested interest in space. But nothing was done.

We have a precedent for that, too. International law as applied to the oceans was developed long after men first began building

powerful navies and merchant fleets that could go anywhere.

But this is a precedent that must not hold good. *Laissez faire* won't work, even when backed up by a strong nation. There are no strong nations today, when defensive power is compared to offensive; and in the near future, the situation may well get worse. There must be some working arrangement made before anything can get badly out of hand.

This, of course, relates primarily to satellites. In the case of true spaceships, making passage to the moon or to other planets, the legal situation seems just as unsatisfactory, but the actuality is simplified by another factor. Effectively, it's a pretty good rule that anything is international which cannot be policed by any nation. This is not a matter of legal concern, but of common sense. It does no good to post a "Keep Off" sign unless you can make sure there are enough men around with power to back it up. It's useless to claim sovereignty over anything which you can't get out to protect.

There's a man in Chicago, for instance, who staked out a claim on space. He went through some elaborate rigmarole about it to make it legal—at least in his eyes. So when Sputnik went up, he cabled a strong protest to Russia. So far as I know, he never got a satisfactory reply. But the claim would have had some kind of validity if he'd been in a position to send his



troops up and knock Sputnik aside, or build a pound out in space in which to hold Laika from Sputnik II. At least, in that case, his efforts would have received very serious consideration.

Without power to implement claim, possession is merely obsession. The power may be your own, or it may be loaned to you by your government, but it *has* to be there.

Up to a certain distance—the distance at which land-based missiles from below are effective, probably—space will be only as international as tight agreements can make it. Beyond that limit, it will automatically become international.

Any government can stake out the whole moon on the first trip. But no government can adequately police every square mile of it to prevent others from setting up bases. If any government could—assuming cheap and common rockets which we won't have until this has all been settled—it still would not pay. Who can hope to get enough out of any planet in its early development to pay for 1% of the manpower it would require to protect it from invasion?

So we can assume that up to some limited height—from twenty to three hundred miles—the air-space is national; again, beyond a certain distance where national control can be exercised, space will necessarily be international.

But that still leaves us a zone of uncertainty, where anything might happen. Here is where we will put

our observation satellites to study the world below by television and our manned space stations for work, for spying perhaps, and conceivably for an attempt to build up a space arsenal of missiles. It's this zone of uncertainty that needs some fast and decisive agreement among nations to prevent what might be a sordid mess, indeed! Before we put any manned satellites up, at least, some working arrangement had better be made. And that doesn't leave us much time!

It's also in this narrow zone that the hopes and fears of many people have been placed. It's about this small zone that most of the shallow thinking in science fiction and out of it seems to center. Here, suddenly, rule no longer means to establish an order of rules, but rather to control.

"Who rules space, rules the Earth!"

How often have you heard this? It has been used to justify nearly everything. And the pattern can be stated fairly simply, since it has been used so often.

Basically, the idea is that any nation which gets a satellite up capable of holding a few people and a lot of missiles will be able to lay down the law to the whole world. It will prevent any other nation from building a space station, will ground all the rest of Earth, and will sit up there spying out any hostile movement, ready to enforce a Pax Vacuo below. We can have dictators like none before,

or we can have a wonderful world where (before Sputnik, as the stories went) the U. N. will enforce the millennium of happiness on all, and no little backward nation will even resent it!

Since Sputnik, the picture is a little grimmer, it seems; and many who don't like grim pictures are not really talking about it now—just shuddering quietly. It now might be possible for Russia to get that first working station up, and what would poor us-uns do then, poor things?

The whole idea is an easy fallacy to accept. I swallowed it myself, at first. Sure, who rules space rules the Earth. Simple, obvious—and damned nonsense. It's one of the purely mechanistic ideas that completely overlooks all factors but one, and that one is incomplete.

Granted, bombs could be put up there. With hydrogen warheads in space missiles, based in a space platform that could observe the Earth and fire at the first sign of trouble, there could be enough rapid striking power to annihilate all opponents and to wreck any other station before it could be assembled to the point of usefulness.

That's the mechanical part of it all that makes a convincing picture. As I indicated, it isn't even mechanically complete. It also leaves out all the other factors that govern mankind's living together.

Because of these human elements, the fact that the station

could prevent any other station being built has no real meaning. In theory, once we had the A-bomb, we could have prevented any other country getting one, too. All we had to do was to go out at once in high-flying planes from whatever base we could use and bomb the big cities of every other country. It would have disorganized things too much for any other program of atomic bomb building for quite a while.

Of course, it wouldn't have worked, because we'd have gotten hurt trying it. (I don't know whether ethics would have prevented our doing so, and don't care. Ethics have a habit of somehow relating to practicality in the long run.) We'd have had to face the united fury of the world, and without bombs to help them, they still could have hurt us too much. We couldn't wantonly declare war on the world.

Neither can we do so from a space station. Whether space is international or not, the station can safely be considered to be property of the nation building it. To attack it with missiles—after warning or not—will constitute a clear act of aggression as viewed by the rest of the world. (We would have to be given the world's consent to sole ownership of space to have the right to blast others out, and we won't get that.) Even our closest allies would never stand for that—because they couldn't risk letting any single nation achieve that **much**

control. The wrecking of another station would only be done if we were ready to go ahead and wipe out the entire nation that tried to build it—and probably many others as well. We can't afford it—enough H-bombs to do it might wipe us out through contamination, if we could even hope to achieve such destruction.

This will be clearly apparent to other nations. And since they'll know we won't blast away stations they may try to build, there will be other stations put up. Once there are several, there is no longer any more chance of using stations to rule than there now is of using H-bombs here below to rule.

Even mechanically, the picture isn't as simple as it seems. We completely overlook the fact that the station itself must be vulnerable. It cannot carry as much power as the whole Earth below. And it must operate on a fixed orbit, easily predicted in advance. It can attack the Earth—but at the first sign of attack, it will itself be blasted out of existence. If the first bomb does not get it—and it's going to be a pushover, lacking any heavy armor—the next ones will. The moment it fires at Earth, it is doomed—and it may never even be able to guess what nation decided to pick it off at the first excuse.

After all, when the day comes that we can build ships to carry up the parts to build such a station, then the day will have arrived when it's simple to build hydrogen-

warhead rockets to reach the station.

It's hard to find how a stock of missiles aboard a space station can have any military value at all. And the expense of getting them into space and maintaining them, the task of building rockets to move them, etc., are all so much greater than building them for a ground take-off that they would be only expensive, useless toys. Aside from some rather silly idea of shaking a big stick for the first few months after the station is built—at the risk of a lot of bad will and no results—it would be pointless to put military missiles into space.

It seems possible—though human beings in specialized professions of any sort being what they are, not necessarily probable—that we'll never bother building a space arsenal. If we do try it, or if any other nation tries it, it will be only a tiny added bit of hell that can menace us along with the horrors of ICBM's beyond what we now dream. The Earth must fear rockets, but only rockets from Earth itself.

Of course, there remains the missile that is from a fixed base on Earth, and which penetrates space briefly on its way to the enemy. This, however, has nothing to do with the true rule of space. It's like saying that who rules the air rules Earth when we mean that anyone who can fire enough arrows can rule.

Space power—in the sense of military power based in space,

rather than simply passing briefly through it—is a meaningless noise. For the amount of results it can achieve, it will remain hundreds of times as expensive as any other means. And any practical military man is going to recognize this and use his appropriations to increase his effective power to strike where he can get the most for it.

It is probably the basic awareness of this which has created some of the official lethargy about space. The Services are busy with their guided missiles, but they've given comparatively little attention to true space flight. It isn't practical, even when achieved, from their point of view. Russia has devoted more work to it, because of its tremendous propaganda value in proving that she is forging ahead. She got her money's worth, but we could not have done as much; there would have been no shock value had we been first, as there was when she beat us. (Of course, in the long run, our loss in propaganda was tremendous; but this is a negative, not a positive, value, and harder to anticipate and spend for.) A few civilians, like Dr. von Braun, have retained a wider vision than military power—but that isn't the business of the Services; we're lucky for the few effective space pioneers we have.

Of course, a space station would have some military value—as a spy. From such a platform in space, we could locate hostile movements, lo-

cate valuable striking places, etc. We could ship this news down to the ground where it could be used, if necessary. Since this would be done before hostilities, bombing the station for such spying would be a tipoff, and hence useless.

But in the long run, this will lessen the likelihood of any future decisive military blows, and act to some extent as a deterrent to war. Rather than acting as a means of gaining control or rule of the world, it will make it harder—and also less necessary—for any nation to try to achieve rule. Let us consider that maybe who rules space will reduce the thoughts of ruling Earth.

Or, perhaps in one sense, the idea of the rule of space being synonymous with the rule of Earth makes some sense. No nation will rule space—beyond the limited area of airspace, or contiguous space, where rule will become less valuable anyhow. But an abstraction will rule it. Science is the only thing that can logically gain any immediate great value, or any long range lasting power, from space. Science—the use of organized knowledge to gain more knowledge—not scientists. To get there, to stay there, and to utilize what is found in space, science must rule.

Perhaps through the increase and added value of such science, the influence of science on Earth will increase and deepen. Perhaps we'll learn to think in terms suitable to the age, and to some extent to rule

ourselves below in keeping with the international abstraction of science above.

I suspect that the first few years of the space age are going to be rough ones for all of us, from internal and external stresses. But in the long run, space will create its

own answers. I believe those answers are going to be good ones.

Who rules space, after the first trying years, doesn't really matter. In this case, and against all military tradition, it is far more important to occupy the territory than to rule it!