SHOOTING DESTINATION MOON

"Why don't they make more science fiction movies?"

The answer to any question starting, "Why don't they—" is almost always, "Money."

I arrived in Hollywood with no knowledge of motion picture production or costs, no experience in writing screen plays, nothing but a yen to write the first Hollywood picture about the first trip to the Moon. LouSchor , an agent who is also a science fiction enthusiast, introduced me to a screen writer, Alford vanRonkel ; between us we turned out a screen play from one of my space travel stories.

So we were in business—Uh , not quite. The greatest single production problem

isto find someone willing to risk the money. People who have spare millions of dollars do not acquire them by playing angel to science fiction writers with wild ideas.

We were fortunate in meeting George Pal of George Pal Productions, who became infected with the same madness. So we had a producer—now we were in business.

Still not quite— Producers and financiers are not the same thing.It was nearly a year from the writing of the screen play until George Pal informed us that he had managed to convince an angel.(How? Hypnosis?Drugs? I'll never know. If! had a million dollars, I would sit on it and shoot the first six science fiction writers who came my way with screen plays.)

Despite those huge Hollywood salaries, money is as hard to get in Hollywood as anywhere. The money men in Hollywood write large checks only when competition leaves them no alternative; they prefer to write smallchecks, or no checks at all. Even though past the big hurdle of getting the picture financed, money trouble remains with one throughout production; if a solution to aspecial-effects problem costs thirty thousand dollars but the budget says five thousand dollars, then you have got to think of an equally good five thousand dollargølution —and that's all there is to it.

.1mention this because there came a steady stream of non-motion-picture folk who were under the impression ~hat thousand-dollar-a-week salaries were waiting for them in a science fiction picture. The budget said, "No!"

The second biggest hurdle to producing an accurate and convincing science fiction picture is the "Hollywood" frame of mind—in this case, people in authority who either don't know or don't care about scientific correctness and plausibility. Ignorance can be coped with; when a man asks "What does a rocket have to push against, out there in space?" it is possible to explain. On the other hand, if his approach is, "Nobody has ever been to the Moon; the audiences won't know the difference," it is impossible to explain anything to him; he does not know and does not want to know.

We had plenty ofbothsorts of trouble.

That the picture did not end up as a piece of fantasy, having only a comic-book relation to real science fiction1 can be attributed almost entirely to the integrity and.:~

goodtaste of IrvingPichel , the director. Mr.Pichel is not a scientist, but he is intelligent and honest. He believed what Mr.Bonestell and I told him and saw to it that what went on the screen was as accurate as budget and ingenuity would permit.

By the time the picture was being shot the entire company—actors, grips, cameramen, office people— became imbued with enthusiasm for producing a picture which would be scientifically acceptable as well as a box office success. Willy Ley's Rockets and Space Travel was read by dozens of people in the company.Bonestell and Ley's Conquest of Space was published about then and enjoyed a brisk sale among us. Waits between takes were filled by discussions of theory and future prospects of interplanetary travel.

As shooting progressed we began to be deluged with visitors of technical background—guided missiles men, astronomers, rocket engineers, aircraft engineers. The company, seeing that their work was being taken seriously by technical specialists, took pride in turning out an authentic job. There were no more remarks of "What difference does it make?"

Which brings us to the third hurdle—the technical difficulties of filming a spaceship picture.

The best way to photograph space flight convincingly would be to raise a few hundred million dollars, get together a scientific and engineering staff of the caliber used to make the A-bomb, take over the facilities of General Electric, White Sands, and Douglas Aircraft, and build a spaceship.

Then go along and photograph what happens.

We had to use the second-best method—which meant that every shot, save for a few before takeoff from Earth, had to involve special effects, trick photography, unheard-of lighting problems. All this is expensive and causes business managers to grow stomach ulcers. In the ordinary motion picture there may be a scene or two

withspecial effects; this picture had to be all special effects, most of them never before tried.

If you have not yet seen the picture, I suggest that you do not read further until after you have seen it; in this case it is more fun to be fooled. Then, if you want toloOk for special effects, you can go back and see the picture again.(Adv.)

The Moon is airless, subject only to one-sixth gravity, bathed in undiluted sunlight, covered with black sky through which shine brilliant stars, undimmed by cloud or smog. It is a place of magnificent distances and towering mountains.

A sound stage is usually about thirty feethigh, and perhaps a hundred and fifty feet long. Gravity is Earth normal. It is filled with cigarette smoke, arc light fog, and dust—not to mention more than a hundred technicians.

Problem: to photographin a sound stage men making a rocket landing on the Moon, exploring its endless vistas, moving and jumping under its light gravity. Do this in Technicolor, which adds a sheaf of new problems, not the least of which is the effect of extra hot lights on men wearing spacesuits.

The quick answer is that it can't be done. -

A second answer is to go on location, pick a likely stretch of desert, remove by hand all trace of vegetation, and shoot the "real" thing. Wait a minute; how about that black and star-studded sky? Fake it—use special effects. Sorry; once blue sky is on Technicolor emulsion it is there to stay. With black-and-white there are ways, but not with color.

So we are back on the sound stage and we have to shoot it there.Vacuum clear atmosphere? No smoking—hardtb enforce—high speed on all blowers, be resigned to throwing away some footage, and leave the big doors open—which lets in noise and ruins the sound track. Very well, we must dub in the sound—and up go the costs—but the air must be clear.

Low gravity and tremendous leaps—piano wire, of

course—but did you ever try to wire a man who is wearing a spacesuit? The wires have to get inside that suit at several points,producingthe effect a nail has on a tire, i.e., a man -wearing a pressurized suit cannot be suspended on wires. So inflation of suits must be replaced by padding; at least during wired shots. But a padded suit does not wrinkle the same way a pressurized suit does and the difference shows. Furthermore, the zippered openings for the wires can be seen. Still worse, if inflation is to be faked with padding, how are we to show them putting on their suits? -

That sobbing in the background comes from the technical adviser—yours truly—who had hoped not only to have authentic pressure suits but had expected to be able to cool the actors under the lights by the expansion of gas from their air bottles. Now they must wear lamb's wool padding and will have no selfcontained source of breathing air, a situation roughly equivalent to doing heavy work at noon in desert summer, in a fur coat while wearing a bucket over your head. Actors are a hardy breed. They did it.

To get around the shortcomings of padded suits we worked in an "establishing scene" in which the suits were shown to be of two parts, an outer chafing suit and an inner pressure suit. This makes sense; deep-sea divers often use chafing suits over their pressure suits, particularly when working around coral. The relationship is that of an automobile tire carcass to the inner tube. The outer part takes the beating and the inner part holds the

-pressure . It is good engineering and we present this new wrinkle in spacesuits without apology.The first men actually to walk the rugged floor of the Moon and to climb its sharp peaks, will, if they are wise, use the same device. - -

So we padded for wire tricks and used air pressure at other times. Try to see when and where we

switched. I couldnça tell—and I saw the scenes being shot.

• Now for that lunar landscape which has to be compressed into a sound stage—I had selected the craterAristarchus .ChesleyBonestell did not likeAristarchus ; it did not have the shape he wanted,nor the height of Crater wall, nor the distance to apparent horizon. Mr.Bonestell knows more about the surface appearance of the Moon than any other living man; he searched around and found one he liked—the craterHarpalus , in high northern latitude, facing the Earth. High latitude was necessary so that the Earth would appear down near the horizon where the camera could see it and still pick up some lunar landscape; northern latitude was preferred so that Earth would appear in the conventional and recognizable schoolroom-globe attitude.

Having selected it, Mr.Bonestell made amodeftf it on his dining room table, using beaverboard, plasticine , tissue paper, paint, anything at hand. He then made a pinhole photograph from its center—Wait; let's list the stages:

1. A Mount Wilson observatory photograph.

2. Bonestell'stabletop model.

3. A pinhole panorama.

4. A large blowup. -

5. ABonestell oil painting, in his exact detail, about twenty feet long and two feet high, in perspective as seen from the exit of the rocket, one hundred fifteen feet above the lunar surface.

6. Ablownup photograph, about three feet high, of this painting.

7. A scenic painting, about four feet high, based on this photograph and matching theBonestell colors, but with the perspective geometrically changed to bring the observer down to the lunar floor.

8. A scenic backing, twenty feet high, to go all around a sound stage, based on the one above, but

withthe perspective distorted to allow for the fact that sound stages are oblong.

9. A floor for the sound stage, curved up to bring the foreground of the scene into correct perspective with the backing. -

10. A second back drop of black velvet and "stars."

The result you see on the cover of this issue. It looks like aBonestell painting becausejt is aBonestell painting—in the same sense that a MichelangelomuraI ~ is still the work of the master even though a dozen of the master's pupils may have wielded the brushes.

Every item went through similar stages. I was amazed at the thoroughness of preliminary study made by the art department—ErnstFegte and JerryPycha —before any item was built to be photographed. Take the control room of the spaceship. This compartment was shaped like thefrustrum of a cone and was located near the nose of spaceship Luna. It contained four acceleration couches, instruments and controls of many sorts, an airplane pilot's seat with controls for landing on Earth, radar screens, portholes, and a hatch to the air lock—an incredibly crowded and complicated set. (To the motion picture business this was merely a "set," a place where actors would be photographed while speaking lines.)

To add to the complications the actors would sometimes read their lines while hanging upside down in midair in this set, or walking up one of its vertical walls. Add that the space was completely enclosed, about as small as an elevator cage, and had to contain a Technicolor sound camera housed in its huge soundproof box—called a "blimp," heaven knows why. -

I made some rough sketches.Chesley.Bonestell translated these into smooth drawings, adding in his own extensive knowledge of spaceships. The miniature shop made a model which was studied by the director, the art

director, and the cameraman, who promptly tore it to bits. It wouldn't do at all; the action could not be photographed, could not even be seen, save by anArcturian Bug-Eyed Monster with eyes arranged around a spherical 3600.

So the miniature shop made another model, to suitphotOgraphic requirements. -

So I tore that one apart. I swore that I wouldn't be found dead around a so-called spaceship control room arranged in any such fashion; what were we making?A comic strip?

So the miniature shop made a third model.

And a fourth.-

- Finally we all were satisfied. The result, as you see it on the screen, is a control room which might very well be used as a pattern for the ship which will actually make the trip some day, provided the ship is intended for a four-man crew. It is a proper piece of economical functional design, which could do what it is meant to do.

But it has the unique virtue that it can be photographed as a motion picture set.

A writer—a fiction writer, I mean; not a screen writer—is never bothered by such considerations. He can play a dramatic scene inside a barrel quite as well a.~in Grand Central Station. His mind's eye looks in any direction, at any distance, with no transition troubles and no jerkiness. He can explain anything which is not clear. But in motion pictures the camera has got to see what is going on and must see it in such a fashion that the audience is not even- aware of thecamera, or the illusion is lost. The camera must see all that it needs to see to achieve a single emotional effect from a single angle, without bobbing back and forth, or indulging in awkward, ill-timed cuts. This problem is always present in motion picture photography; it was simply exceptionally acute in the control room scenes. To solve it all was a real tour deforce ; the director of photography, Lionel Linden,

agedseveral years before we got out of that electronic Iron Maiden.

In addition to arranging the interior for camera angles it was necessary.to get the camera to the selected angles—in this enclosed space. To accomplish this, every panel in the control room was made removable— "wild," they call it—so that the camera could stick in its snout and so that lights could be rigged. Top and bottom and all its sides—it came apart like a piece ofMeccano . This meant building of steel instead of the cheap beaverboard-and-wood frauds usually photographed in Hollywood. The control room was actually stronger and heavier than a real spaceship control room would be. Up went the costs again.

Even with the set entirely "wild" it took much, much longer to shift from one angle to another angle than it does on a normal movie set, as those panels had to be bolted and unbolted, heavy lights had to be rigged and unrigged—andthç costs go sky high. You can figure overhead in a sound stage at about a thousand dollars an hour, so, when in the movie you see the pilot turn his head and speak to -someone, then glance down at his instruments, whereupon the camera also glances down to let you see what he is talking about, remember how much time and planning and money it took to let you glance at the instrument board. This will help to show why motion picture theaters sell popcorn to break even

—and why science fiction pictures are not made every day. Realism is confoundedly expensive.

Nor did the costs and the headaches with the control room stop there.As every reader of Astounding knows, when a rocket ship is not blasting, everything in it floats free—"free fall." Men float around—which meant piano wires inside that claustrophobic little closet. It was necessary at one point to show a man floating out from his acceleration couch and into the center of the room.

Very well;,unbolt a panel to let in the wires.Wups ! While a spaceship in space has no "up" or "down," sound stage three on Las Palmas Avenue in Hollywood certainly does have; supporting wires must run vertically—see Isaac Newton. To float the man out of the tight little space he was in would require the wires to turn a corner. Now we needed a Hindu fakir capable of the Indian rope trick.

The special effects man, LeeZavitz , has been doing impossible tricks for years. He turned the entire set, tons of steel, on its side and pulled the actor out in what would-normally be a horizontal direction. Easy!

So easy that the art department had to design, double gimbals capable of housing the entire set, engineer it, have it built of structural steel, have it assembled inside a sound stage since it was too big to go through the truck doors. Machinery had to be designed and installed to turn the unwieldy thing. Nothing like it had ever been seen in Hollywood, but it did enable a man to float out from a confined space and, later, to walk all around the sides of the control room with "magnetic" boots.

This double gimbals rig, three stories high, put- the control room set high in the air, so the carpenters had to build platforms around it and the camera had to be mounted on a giant boom—one so huge, so fancy, and so expensive that Cecil B. de Mule came over to inspect it. The camera itself had to be mounted in gimbals before it was placed on the boom, so that it might turn with the set—or the other way, for some special effects. This meant removing its soundproof blimp, which meant dubbing the sound track.

("Who cares? It's only money." Don't say that in the presence of the business manager, he's not feeling well.)

This was not the end of the control room tricks. Some of the dodges were obvious, such as making dial needles go around, lights blink on and off, television and radar screens light up—obvious, but tedious and sometimes difficult. Producing the effect of a ship blasting off at six gravities requires something more than sound track of a

rocketblast, as the men each weigh over a thousand pounds during blast. LeeZavitz and his crew built large inflated bladders into each acceleration couch. Whenever the jet was "fired" theseblaaders would be suddenly deflated and the actors would be "crushed" down into their cushions.

A thousand pounds weight compresses the man as well as his mattress, which will show, of course, in his features. The makeup man fitted each actor with a thin membrane, glued to his face, to which a yoke could be rigged back of his neck. From the yoke a lever sequence reaching out of the scene permitted the man's features to be drawn back by the "terrible" acceleration. Part of what you see is acting by some fine actors, Dick Wesson, WarnerAndersOn , Tom Powers, JohnArcher, part was a Rube Goldberg trick.

The air suddenly escaping from the bladders produced a sound like that of a mournful cow, thus requiring more dubbing of soundtr~ck . The air had to be returned to the bladders with equal suddenness when the jet cut off, which required a compressed air system more complicated than that used by a service station.

The sets abounded in compressed air and hydraulic and electrical systems to makevai~ious gadgets work— to cycle the air lock doors, to rig out the exit ladder, to make the instrument board work—all designed byZavitz . LeeZavitz is the man who "burned Atlanta" in GoneWith The Wind, forty acres of real fire, hundreds of actors and not a man hurt. I saw him stumped just once in this film, through no fault of his. He was controlling an explosion following a rocket crash. It was being done full size, out on the Mojave Desert, and the camera angle stretched over miles of real desert. From a jeep back of the cameraZavitz was cuing the special effects by radio. In the middle of the explosions the radio 'decided to blow a tube—and the action stopped, ruining an afternoon's work. We had to come back and do it over the next day, after a sleepless night of rebuilding by the special effects

crew. Such things are why making motion pictures produces stomach ulcers but not boredom.

The greatest single difficulty we encountered in trying to fake realistically theconditions of space flight was in producing the brilliant starry sky of empty space. In the first place nobody knows what stars look like out in space; it is not even known for sure whether twinkling takes place in the eye or in the atmosphere. There is plausible theory each way. In- the second place the eye is incredibly more sensitive than is Technicolor film; the lights had to be brighter than stars to be picked up at all. In the third place, film, whether used at Palomar or in a Technicolor camera, reports a point light source as a circle of light, with diameter dependent on intensity. On that score alone we were whipped as to complete realism; there is no way to avoid the peculiarities inherent in an artificial optical system.

We fiddled around with several dodges and finally settled on automobile headlight bulbs. They can be burned white, if you don'tmipd burning out a few bulbs; theycOme in variousbrightnesses ; and they give as near a point source of light as the emulsions can record— more so, in fact. We used nearly two thousand of them, — strung on seventy thousand feet of wire.

But we got a red halation around the white lights. This resulted from the fact that Technicolor uses

threefihns for the three primary colors. Two of them are back to back at the focal plane, but the red-sensitive emulsion is a gnat's whisker away, by one emulsion thickness. It had.me stumped, but not the head gaffer.He.covered each~ light with a green gelatin screen, a "gel," and the red halation was gone, leaving a satisfactory white light.

The gels melted down oftener than the bulbs burned out; we had to replace them each -day at lunch hour and at "wrap up."

There was another acute problem of lighting on the lunar set. As we all know, sunlight on the Moon is the

harshestof plastic light, of great intensity and all from one direction. There is no blue sky overhead to diffuse the light and fill the shadows. We needed a sound-stage light which-would.be as intense as that sunlight—a single light.

No such light has ever been developed.

During the war, I had a research project which called for the duplication of sunlight; I can state authoritatively that sunlight has not yet been duplicated. An arc light, screened by Pyrex, is the closest thing to it yet known— but the movies already use- arc lights in great numbers, and the largest arc light bulb, the "brute," is not nearly strong enough to light an entire sound stage with sunlight intensity—raw sunlight, beating down on the lunar set would have been equivalent to more than fifteen hundred horse power. There are no such arc lights.

We traced down several rumors of extremely intense lights. In each case we found either that the light was not sufficiently intense for an entire sound stage, or it was monochromatic—worse than useless for Technicolor.

We got around it by using great banks ofbrutes, all oriented the same way and screened to produce approximate parallelism. Even with the rafters loaded with the big lights almost past the safety point, it was necessary to use some cross lighting to fill gaps. The surface of the Moon had some degree of "fill" in the shadows by reflection from cliff walls and the ground; it is probable that we were forced to fill too much. We used the best that contemporary engineering provides—and next time will gladly use an atomic-powered simulation of the Sun's atomic-powered light.

The simulation of raw sunlight was better in the scenes involving men in spacesuits outside the ship in space, as it was not necessary to illuminate an entire sound stage but only two or three human figures; a bank of brutes sufficed and no fill was needed, nor wanted, since there was no surrounding landscape to fill by reflection.

The effect was rather ghostly; the men were lighted as

isthe Moon in half phase, brilliantly on one side, totallyunhighted and indistinguishable from the black sky itself on the other side.

This scene in which men are outside the ship in space involved another special effect—the use of a compressed oxygen bottle as a makeshift rocket motor to rescue a man who has floated free of the ship. The energy stored by compressing gas in a large steel bottle is quite sufficient for the purpose. I checked theory by experiment; opening the valve wide on such a charged bottle gave me a firm shove. The

method is the same as that used to propel a toy boat with a CO2 cartridge froma fizz water bottle—the basic rocket principle.

We had considered using a shotgun, since everyone is familiar with its kick, but we couldn't think of an excuse for taking a shotgun to the Moon. Then we considered using a Very pistol, which has a strong kick and which might well be taken to the Moon for signaling. But it did not look convincing and it involved great fire hazard in a sound stage. So we settled on the oxygen bottle, which looked impressive, would work, and would certainly be available in a spaceship. -

However, since we were still on Las Palmas Avenue and not in space, it had to be a wire trick, with four men on wires, not to mention the oxygen bottle and several safety lines. That adds up to about thirty-six wires for the heavyubjects and dozens of black threads for the safety lines—and all this spaghetti must not show. Each man had to have several "puppeteers" to handle him, by means of heavy welded pipe frames not unlike the cradles used by TonySarg for his marionettes, but strong enough for men, not dolls. These in turn had to be handled by block and tackle and overhead traveling cranes. Underneath all was a safety net just to reassure the actors and to keep LeeZavitz from worrying; our safety factor on each rig was actually in excess of forty, as each wire had a breaking strength of eight hundred

pounds. To top it off each man had to wear a cumbersome, welded iron, articulated harness under his spacesuit for attachment of wires.Thi ~ was about as heavy and uncomfortable as.medieval armor.

The setups seemed to take forever. Actors would have to be up in the air on wires for as long as two hours just to shoot a few seconds of film. For ease in handling, the "oxygen bottle" was built of balsa wood and embedded in it was a small CO2 bottle of the fire extinguisher type. This produced another headache, as, after a few seconds of use, it would begin to produce carbon dioxide "snow," which fell straight down and ruined the illusion. -

But the wires were our real headache. One member of the special effects crew did nothing all day long buttrot around with a thirty-foot pole with a paint-soaked sponge on the end, trying to kill highlights on the wires. Usually he was successful, but we would never know until we saw it on the screen in the daily rushes. When he was not successful, we had to go back and do the whole tedious job over again.

Most of creating the illusion of space travel lay not in such major efforts, but in constant attention to minor details. For example, the crew members are entering the air lock to go outside the ship in free fall. They -are wearing "magnetic" boots, so we don't have to wire them at this point. Everything in the airlock is bolted down, so there is nothing to spoil the illusion of no up-and-down. Very well—"Quiet, everybody! Roll 'em!"

"Speed!" answers the sound man. -

"Action!"

The actors go to thelockers in which their spacesuits are kept, open them—and the suits are hanging straight down, which puts us back on Las Palmas Avenue! "Hold it! Kill it! Where is LeeZavitz ?"

So the suits are hastily looped up with black thread into a satisfactory "floating" appearance, and we start over. - -

Such details are ordinarily the business of the script girl who can always be depended on to see to it that a burning cigarette laid down on Monday the third will be exactly the same length when it is picked up on Wednesday the nineteenth. But it is too much to expect a script

-girl to be a space flight expert. However, by the end of the picture, our script clerk, CoraPalmatier , could pick flaws in the most carefully constructed space yarn. In fact, everybody got into the -act and many flaws were corrected not because I spotted them but through the alertness and helpfulness of others of the hundred-odd persons it takes to shoot a scene. Realism is compounded of minor details, most of them easy to handle if noticed. For example, we used a very simple dodge to simulate a Geiger counter—we used a real one.

A mass of background work went into the flight of the spaceship Luna which appears only indirectly on the screen. Save for the atomic-powered jet, a point which had to be assumed, the rest of the ship and its flight were planned as if the trip actually were to have been made. The mass ratio was correct for the assumed thrust and for what the ship was expected to do. The jet speed was consistent with the mass ratio. The trajectory times and distances were all carefully-plotted, so that it waspossi -ble to refer to charts and tell just what angle the Earth or the Moon would subtend to the camera at any given instant in the story. This was based on a precise orbit— calculated, not by me, but by your old friend, Dr. Robert S. Richardson of Mount Wilson and Palomar Mountain. -

None of these calculations appears on the screen but the results do. The Luna took off from Lucerne Valley in California on June 20th at ten minutes to four, zone eighttime , with a half Moon overhead and the Sun just below the eastern horizon. It blasted for three minutes and fiftysecOnds and cut off at an altitude of eight hundred seven miles, at escape speed in a forty-six-hour

-orbit.Few of these data are given the audience—but what the audience sees out the ports is consistent with

theabove. Thetime at which they pass the speed of sound, the time at which they burst up into sunlight, theBonestell backdrops of LosAngçles County and of the western part of the United States, all these things match up. Later, - in the approach to the Moon, the same care was used.

Since despite all wishful thinking we are still back on LasPahmas Avenue, much of the effect of taking off from Earth, hurtling through space and landing on the Moon had to be done in miniature. George Pal was known for his “Puppetoons” before he started producing feature pictures; his staff is unquestionably the most skilled in the world in producing three-dimensional animation. John Abbott, director of animation, ate, slept, and dreamed the Moon for months to accomplish the few bits of animation necessary to 1111 the gaps in the live action. Abbott’s work is successfuldnly when it isn’t noticed. I’ll warrant that you won’t notice it, save by logical deduction, i.e., since no One has been to the Moon as yet, the shots showing the approach for landing on the Moon must be animation—and they are. Again, in the early part- of the picture you will see the Luna in Lucerne Valley of the Mojave Desert. You know that the ship is full size for you see men-climbing around it, working on it, getting in the elevator of the Gantry crane and entering it—and it is full size; we trucked it in pieces to the desert and set it up there. Then you will see the Gantry crane pull away and the Luna blasts off for space.

That can’t be full -size; no one has ever done it.

Try to find the transition point. Even money says you pick a point either too late or too soon.

The Luna herself is one hundred fifty feet tall; the table top model of her and the miniature Gantry crane are watchmaker's dreams. The miniature floodlights mounted on the crane are the size of my little fingeftip — and they work. - Such animation is done by infinite patience and skill. Twenty-four separate planned and

scaledsetups are required for each second of animation on the screen. Five minutes of animation took longer to photograph than the eighty minutes of live action. -

At one point it seemed that all this planning and effort would come to nothing; the powers-that-be decided that the story was too cold and called in a musical comedy writer to liven it up with—sssh !—sex. For a time we had a version of the script which included dude ranches, cowboys, guitars and hillbilly songs on the Moon, a trio of femalehepsters singing into a mike, interiors of cocktail lounges, and more of the like, combined with pseudoscientific gimmicks which would- have puzzled

-evenFlash Gordon.

It was never shot. That was the wildest detour on the road to the Moon; the fact that the Luna got back into orbit can be attributed to the calm insistence of Irving;Piçhel . But it gives one a chilling notion of what wemayexpect from time to time. -

Somehow, the day came when the last scene had ~ shot and, despite Hollywood detours, we had madeamotion picture of the first trip to the Moon. IrvingPichel ~ said, "Print it!" for the last time, and we adjourned to~ celebrate at a bar the- producer had set up in one end of the stage. I tried to assess my personal account sheet—i1~.had cost me eighteen months' work, my peace of mind,4i and almost all of my remaining hair.

Nevertheless, when I saw the "rough cut" ofth ~

picture, it seemed to have been worth it..