# Journal of the International Planetarium Society

## PLANETARIAN

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Vol. 13, No. 4

Fourth Quarter, 1984
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Introduction

I am greatly honored to present this lecture among friends here in the very friendly city of Monterrey. As we have gone back and forth to events this week, we have enjoyed being together and our hosts have been especially kind to us. Certainly one of the special things about this conference has been the beauty of the place we meet in. The mountains surrounding us are most impressive. I have wondered if you, like me, have looked up at them with the urge to get up there where you could look down here.

High places have always been very significant to me as they probably are to most people. Lately, I have thought a lot about the importance of high places. Perhaps you have shared my thoughts and emotions while standing on a mountain peak and looking over the world below. "I don't ever want to go back down," you might think. But it doesn't take very long to realize that you can't do anything up there. Your life is in the valley where everything happens. Before long, you are going down the trail a slightly different person, with renewed determination to do something of value.

Today, most of us fly to many places. Coming here, for example, I thought how significant it is that we have seen clouds from both sides, and that we can now look down through the eyes of astronauts—through the cameras they carry—and even through robot eyes passing planets in distant parts of the solar system. I think of a paraphrase from Socrates:

Man must rise above the earth,
To the top of the atmosphere and beyond,
For only then will he truly understand
The world in which he lives.

The best perspective comes from multiple views. Think of the multitude of views we can have almost simultaneously: We can see the whole Earth from orbit while we view its smallest grains with powerful microscopes. Consider the significance of such combined perceptions.

There are many kinds of high places. The top end of a microscope is a high place and so is the bottom end of a telescope. We are reminded of the words of our host in opening this meeting, "Those who dare to watch the stars will never be the same."

Isn't it true that the Earth itself is a high place? It carries us through our part of the universe and from it, we look outward into great depths. It is the view of the universe from Earth which means so much to us as Planetarians and it is this view which we want so much to help others to enjoy.

We all find various types of high places in our own lives and in our work. Recall that Isaac Newton said that if he had seen farther than other men, it was because he had stood on the shoulders of giants. The pinnacles each of us stand on are usually reached by climbing slopes built by others.

Armand Spitz stood in a high place. He looked out and saw opportunity. He had been a planetarium teacher and this gave him a concept which caused him to do something. As a result of his actions, many of us have our professions. Because of him, we enjoy trying to elevate others to higher perspectives.

I was privileged to know Armand Spitz, but unfortunately not when he was in his prime. His mind was agile, but his body limited his activity. To the end, he continued his creative work through the hands of his beloved companion and friend, Grace. I thought you might like to listen to his voice from the past; to hear his greeting given to us fourteen years ago just prior to the "zeroth" meeting of our society.*

There is one thing that I shall always remember from talking to Armand about planetariums. He said that it is not any particular kind of equipment that exists in any planetarium that is most significant (Keep in mind that this was the inventor of the American planetarium instrument, the man who brought the planetarium into the mainstream of science education, who was talking). "The most important thing in any planetarium," he said, "is the teacher." I am sure we all agree.

*Editor's Note: For a complete transcription of Armand Spitz's message, delivered to the 1970 CAPE meeting in East Lansing, Michigan, only part of which was played in Mr. Chamberlain's lecture, see the Planetarian, vol. 1, no. 1.
What do people want most to know?

Accepting the importance of the teacher in planetariums, how do we establish our thinking and philosophy concerning what we do as planetarium teachers? If we could select a few concepts that we could get across to people who enter our theaters, what would they be? In order to approach an answer, I would like to share with you three experiences which have been important in establishing my own perspective.

My first planetarium job was at the Robert T. Longway Planetarium in Flint, Michigan. While there, I frequently taught courses for the community education system operated through the Mott Foundation.

An interesting thing happened during the first class period of one of the evening courses. The first part of the session had been held in a classroom. At intermission, we made our way from the classroom to the planetarium. On route, one of the students, whom I learned was an elementary teacher, approached me in an almost militant fashion and told me that he refused to teach astronomy to his students. He said that there are far more important topics to occupy his time and the time of his students. He said that there are far more important topics to occupy his time and the time of his students. He asked, “Why study things which can not be touched and which have so little importance in our everyday lives?” I did my best to answer his question and I have always wondered whether or not he changed his opinion during the course. I hope that he did.

I have encountered the same attitude a number of times since then, and thinking about this has helped me sort out the parts of astronomical knowledge which I would like to have as many people as possible understand.

Experience number two occurred at a meeting of the American Association for the Advancement of Science held in Chicago, years ago. At that meeting, the American Astronomical Society presented a day long symposium on teaching astronomy to non-science students and to the general public. As part of the symposium, there was a panel consisting of university professors of astronomy and students who had been enrolled in at least one semester of astronomy for non-science majors.

After the professors had spent some time discussing the subject, a member of the audience suggested that we hear from the students. As I recall, one student, whose name I do not remember, came all the way from the west coast to be on the panel, began expressing her feelings about what might be left out of the course, in view of the vast amount of material to choose from. She started to explain why she thought that the topic on binary stars might be omitted from the course. She would have been interrupted by one of the professors who listed all of the reasons why binary stars must be included. Perhaps he was correct. What interested me most was that nothing more was heard from the student. Some times we are so busy arguing our own point of view that we are unable to listen to those we are there to serve.

The symposium continued to its conclusion. I did not feel that a very good job was done in addressing the question of what we should select from astronomy to teach to those who would not work in science. But since that day, I have wondered about the question and I have attempted to build my own list. What are those few things you would share with everyone on Earth, if you could? My list would probably not be very similar to yours, and that is not so important. Indeed, our lists might change as time goes on. What is important is that we take the time to make such lists and that our lists should be part of our philosophy of planetarium instruction and program production.

The third item I wish to cite comes from an article I read in the American Journal of Physics before I ever thought about planetarium work. The author of the article was a physics professor who had become concerned about teaching physics to non-science students. The source of his concern was his observation of two extreme attitudes expressed by students graduating from the university.

“I think we would all agree...that people are constantly searching for better models of themselves in the world.”

At one end of the spectrum was the student who would say, “I am confused. The physical scientist presents the world in one way; the engineer in a slightly different way; the social scientist looks at things still differently. I am confused.”

At the other end of the continuum, the student might say, “I begin to see a beautiful picture of myself in the universe. Physical science has helped me understand basic material things; social science has given me insight into my human side and my relationships to others; philosophy has helped me integrate other things into my life. I begin to see unity and I want to learn more.”

The physicist decided that the difference between these extreme attitudes must be because some students were wise enough to find time, amid study, to sit back and put learning into context with life. Some other students were so busy memorizing answers to expected questions on examinations that they failed to see important relationships.
The physics professor thought a great deal about what he might do to help students appreciate relationships between disciplines. One of the things he did was to invite three of his colleagues to lecture, about the relationships of physics to their own fields of study, on the first three days of class with a new group of students.

The first day, a biologist greeted the new class and began his lecture, “Biology is the study of Man in his environment.” He then went on to explore a few exciting biophysical ideas.

The second day of class, a psychologist stood before the group and said, “Psychology is the study of Man in his environment;” and then filled the hour with interesting links between physics, chemistry and the human brain.

On the third day, a philosopher stood up and began his lecture on the philosophy of physical reality by saying “Philosophy is the study of Man in his environment.”

The groundwork had been laid. The physicist met his student on the fourth day with, “Physics is the study of Man in his environment;” and he spent the rest of the semester proving that statement.

So what is astronomy? What is the planetarium really all about? What are the things that everyone, studying anything, wants to know most about? What do we most seek when we study any particular discipline, whether it be in the classroom, in the planetarium, or in the field?

I think we would all agree, when we really think about it, that all people are constantly searching for better models of themselves in the world. Consider the words of Henri Poincare, “The scientist does not study nature because it is useful; he studies it because it is beautiful. If nature were not beautiful, it would not be worth knowing, and if nature were not worth knowing, life would not be worth living.”

We all seek a better understanding, a better feeling, a better comprehension of ourselves in the world around us. If that is true, it makes a difference what we select to teach and how we present information in our star theaters.

Changing world views

Let us briefly diverge to review some of the things, relating to our own profession, which have changed our world views. We start with selections from the main line which developed into the science we teach about.

Long ago, people stood under the stars, looking out, wondering, asking questions. They proceeded to find answers. At first, they invented the answers resulting in many mythological explanations: celestial spheres; the Goddess Nut arching her starry body overhead with the Sun, Moon and planets moving along her; starry serpents surrounding elephants on the backs of turtles swimming in an ocean; Helios driving his fiery chariot up out of the auroral dawn; or the Scarab Beetle pushing the Sun across the sky.

Eventually, there were models based more on thought and observation. It is said that Archimedes developed a device that could be said to be the first planetarium. We know that celestial globes preceded terrestrial ones. Eventually, celestial globes were made bigger and better; even so big that people could go inside of them and the globes could be turned to simulate the movement of constellations—the apparent workings of the universe.

"In all periods of time, we have been interpreters. We will always interpret the universe around us. Our interpretations will reflect our cultures, our traditions, our beliefs, our arts and sciences. They will differ and they will continue to be refined."

Jumping ahead to modern times, it is said that in about 1920, a huge star globe was considered for construction in Jena, but, as we all know, Walther Bauersfeld had a new idea. The modern planetarium resulted, reflecting changes in our models of the dynamic universe. Cosmological changes continued to be introduced into the marvelous theaters of the stars, right up to the present time where we attempt, in the grandest style, to expound upon our continually changing concepts. Today, we begin to use computer graphic machines capable of showing distant views and of being updated with new information.

In addition to world views which led to science, there continued to be those which did not. Workers in archaeoastronomy find cultural perspective in study of these models. Following this conference, many of you will visit places where we find evidences that people cared about the stars and created their own interpretations of them. We see beautiful renderings which suggest some of their concepts. We even find an “observatory;” one of the two symbols of our IPS Monterey meeting.

We hear of discoveries on places like Fajada Butte in New Mexico. We see figures carved and drawn on rock which suggest thinking about the Sun, Moon and stars. Some of these are abstract and beautiful. Some sky symbols are constructed of delicate materials, feathers for example. Others are painted on leather shields or teepees. We find calendars kept by Plains Indians; winter counts
which record remembrance of a brilliant fireball seen on a portion of the American Plains in 1821 or 22 and the famous 1833 Leonid meteor blizzard.

We find astronomical models as part of religion. The Skidi Band of Pawnee Indians, for example, lived in earth lodges filled with much symbolism relating to the sky. The four main support posts symbolized certain stars and certain related concepts on earth and in the sky. The fireplace in the center of the lodge was symbolic of the Sun. An altar at the back (west) side of the lodge symbolized life and the renewal of life each year. The posts around the edge were symbolic of stars. The smokehole overhead represented a group of stars which passed nearly through the zenith and represented chiefs in council. The house was a microcosm of the world outside. The lodge even served as a primitive observatory. Evidences suggest that the priests knew where to sit to make observations through the two openings of the lodge, which helped them know when it was time to plant, harvest and perform ceremonies.

The Skidi people had their own constellations and it was believed that the ancestors of the people had been placed on earth by certain stars in the sky. At least in concept, the villages of the Band were organized on earth in patterns reflecting the relative positions of the most important stars in the sky. The famous Pawnee chart of the heavens capsulizes much of this very interesting astrotheology.

In other parts of America, we find carved masks of the Sun and Moon and carvings of Raven placing the Sun in the sky.

We find many other reminders of the numerous ways people have interpreted their environment including the phenomena of the sky. In all periods of time, we have been interpreters. We still are. We will always interpret the universe around us. Our interpretations will reflect our cultures, our traditions, our beliefs, our arts and sciences. They will differ and they will continue to be refined.

One of my favorite views is found on Kitt Peak where we see many domes housing telescopes of the type used to look out in an attempt to observe the edge of the universe. Across the mountains, we see a dome-shaped peak, Boboquivari, said by the Papagos to be the center of the universe.

I recall another example, a television commercial, which illustrates how differently people interpret things. A group of American Indians were being conducted around a TRW space facility. At the end of the tour, the TRW guide handed the tribal leader a color photograph, indicating that it was a picture of the Indian's reservation seen from space. The Indian laughed and handed the TRW guide a gift saying, "and here is a picture of space seen from our reservation." It was a rendering of a sandpainting of Father Sky.

Both the models which have led to modern science and those which did not are interpretations. When we speak of white dwarfs, neutron stars, black holes, quasars or galaxies, aren't we presenting models of the universe—interpretations of what we see? Interpretations are what people come to planetariums for. They are interested in interpretations of the past as well as the most up-to-date scientific interpretations. We should never forget that the most fundamental thing they seek is better comprehension of themselves as part of the universe. With that fact to guide us, we can make wise choices of what to present and how to present it.

"As teachers, the most important elements in planetariums, let us make our sky theaters high places where people can go to more clearly see themselves as significant parts of the universe."

Planetariums are High Places

When we present, in our sky theaters, the astronomies of many cultures, including our own scientific view, we are bringing into focus a spectrum of human perspectives. We help people understand themselves and others living in a vast environment. We take people into high places and focus on great concepts extending back toward our origins and forward toward our potentials.

We should recognize that people everywhere are constantly interpreting themselves in the world as they perceive it. We can help them perceive it better.

We are professional interpreters, as Armand Spitz indicated. We interpret Man in his environment. We use some of the world's most highly developed technologies to interpret some of the greatest human discoveries. In order to sharpen our communication skills, we should learn to sit in high places and sort out concepts which result in the grandest perspectives.

I hope that we will all go back to our homes, following these few days spent among the people from the Royal Mountains, elevated to new heights from which we can more effectively influence others by concentrating our efforts upon our own lists of great concepts which we want people coming into our star theaters to comprehend. As teachers, the most important elements in planetariums, let us make our sky theaters high places where people can go to more clearly see themselves as significant parts of the universe.
I have attended all of the meetings since the Society started and feel that this is one of the most outstanding meetings we have ever had. Each meeting has had its unique features, but I consider the Monterrey meeting to be hard to beat. Our hosts were very cordial, friendly, and sincere. And I would like to express our deepest gratitude and thanks.

Paul R. Engle
University of Arkansas
at Little Rock Planetarium

The IPS Conference in Monterrey, Mexico was an elegant and royal experience for all who attended. The gracious hospitality, the wonderful cultural events, and the friendliness of all who hosted us will live in our memories.

The conference balanced high quality presentations and papers with marvelous entertainment and camaraderie. All IPS members lift their hats—and glasses—in a toast to the Planetarios a la AMPAC, and especially the Centro Cultural Alfa and its Director, Guillermo Schmidhuber.

Edna De Vore
Independence High School
Planetarium

My most striking memory of the conference is the dedication, warmth and hospitality that Guillermo and his fine staff offered to all of us. All the words of praise that were said really cannot begin to tell those folks just how great they really were! The renewal of past friendships, the making of new friendships and the sharing of philosophies and ideas also stand out as an invaluable aspect of the conference.

I'm proud to be associated with such a fine and exciting organization as IPS. After the 1982 Vancouver conference and this past conference in Monterrey, IPS has truly become a proud symbol of international brotherhood.

Steven R. Mitch
Benedum Natural Science Theater

I was fortunate to be able to attend the 1984 conference of the International Planetarium Society in Monterrey, Mexico. I did so with a little bit of fear and trepidation, because of my perceived lack of information prior to the conference. But just as my bewilderment concerning why, in the dark of night—during a thunderstorm, my plane was first turning one way and then the other, prior to landing in Monterrey] cleared up in the light of day, so were my other feelings about the Conference. Just as the mountains around the Monterrey airport are obstacles that the pilot had to deal with, so are massive budget cutbacks that the Alfa Cultural Center had to contend with. In light of this, it is amazing that the conference came off at all—and such an elegant conference at that!

During my brief stay in Mexico, I was impressed by the warm hospitality displayed. The staff of the Alfa Cultural Center made me feel quite important. Minor details were well thought out and any problems that arose were quickly solved, making this the most elegant convention I have ever attended.

Highlights of the conference are impossible to separate because there are so many. The beautiful mountain setting, the inspiring Alfa Cultural Center with its marvelous facilities, the well organized program, the hospitable staff, and the crowning glory, the trip to Mayaland following the conference; all of these are highlights of the 1984 IPS Conference. But the most memorable outcome for me was the attainment of true international status for IPS through the efforts of Guillermo and his "helpers." We have, in truth, entered a new dimension.

Eloise W. Koonce
Richardson Independent School District Planetarium

Our hosts were incredibly gracious: the warmth of their welcome will always color my impressions of Mexico. The highlight of my trip came during a moment at Chichen Itza when, away from the crowds, I stood alone with my back to the jungle gazing at the Temple of The Warriors. As the warm rain fell, the emotional impact descended on me to underline my earlier intellectual interest.

Fran Biddy
Strasenburgh Planetarium
I left with a warm feeling in my heart, along with a sadness, that I could not stay longer. The meals were excellent and the price of registration was very reasonable. All I know is that I would hate to be hosting the next conference. It would be extremely difficult to match the hospitality displayed in Mexico.

Gary E. Tomlinson
Roger B. Chaffee Planetarium

In my memory, the three attendee contributions that I enjoyed most included the showing of the hour long Greek film on the production of a planetarium program starring Dennis “Chain Smoker” Simopoulous, Norm Sperling’s “The Four Great Questions of Astronomy,” and the arrival of Tom Stec’s suitcase four days after the arrival of Tom Stec. The most valuable part of the conference was the opportunity to meet with past friends from different parts of the country and from other IPS meetings. And, of course there was the opportunity to make new friends and to share and exchange things of common interest.

One of the most nervous moments in my life occurred when I presented Jack Spoehr, now with IMAX and formerly associated with Spitz Space Systems, the MAPS Distinguished Service Award. The award was given in recognition of his 23 years of service to the profession as a planetarium salesman. Jack played a significant role in the development of the teaching planetarium, the Spitz Summer Institute and the Spitz Planetarium Director’s Handbook. Jack’s “foot in the door” provided more than 300 institutions with planetarium instruments and domes. I think my nervousness came from the long and close association Jack and I have had.

George Reed
West Chester University
Planetarium

In addition to the mariachi band marching down into a delighted crowd of feasting planetarians, the big surprise from the 1984 IPS conference was the crowd itself. Many were expecting to see only a modest number of delegates from the “well-to-do” institutions; instead, there was a very good crowd of folks representing even the tiniest of domes.

The friendliness of the Mexican people and the immense beauty of the country (and, of course, the strength of the American dollar) made Monterrey the ideal conference location. If there was any disappointment at all in the event, it was the shortage of technical sessions and demonstrations. What did take place was certainly very good—it just wasn’t abundant enough.

But, oh, those parties! They were certainly abundant! And it was just not possible not to enjoy them. I’m wondering if, to this day, bus drivers in Monterrey are sporting spoons on their noses (held there by molecular adhesion, of course).

Sam S. Mims
Louisiana Arts and Science Center Planetarium
Scientists predict that civilian passengers won’t regularly be riding the Space Shuttle until sometime in the next decade. There is, however, no reason to wait—thanks to an exciting new wrap-around motion picture that has been described by Shuttle Astronaut Ron McNair as “the next best thing to being there!”

The Space Shuttle: An American Adventure, produced by the Cinema 360 Corporation and the Russell C. Davis Planetarium, is becoming the first non-NASA in-space documentary. Its purpose, says Producer/Director Richard Knapp, is to provide earthbound viewers with “what only astronauts have been able to experience before—the sensation of space flight in 360 degrees.” In addition, says Knapp, “we want to capture something that goes beyond space flight—the enormous enthusiasm and commitment of the people behind the scenes—from the scientists, assembly workers, and technicians, to the reactions of the crowds that gather on the beach to watch launches firsthand.”

Perhaps the most unique features of this film project are the two specially modified Arriflex III motion picture cameras carried aboard the Shuttle this year. To capture the majestic panorama of space, each was fitted with an 8mm f/2.8 ultra-wideangle Nikon fisheye lens capable of seeing an area 180° wide by 360° around. Each lens was also equipped with a variable exposure ring to enable the use of the full range of f/stops from 2.8 through 22.

One camera was stored in the Shuttle’s crew compartment during the first flight (41B), and was handheld by astronauts to record such activities as flight operations, experiments, meals, and exercising. It was “safed” to 24 frames per second constant speed, and used five 400-foot magazines of Kodak 5294 color negative film.

A second camera was sealed inside a forged aluminum “Get-Away Special” canister within the payload bay. This camera’s f/stops ring had been modified to be driven by a stepping motor from the crew compartment of the Shuttle. It also could accept commands to operate at either 12 or 18 fps. This camera used one 1000-foot magazine of Kodak 5247 color film. When the payload bay doors were opened, the camera was offered a commanding 360° view of such activities as the use of the remote manipulator arm, the launching and retrieval of satellites, the astronauts’ activities during EVAs, and some exciting views of Earth below.

Though hemispheric cinematography has been done successfully on land and in helicopters for nearly two decades, the extension of the medium into the harsh environment of space posed new problems for technicians. Extreme temperature ranges, weightlessness, airlessness, and tremendous forces made putting a camera into space no simple matter.

One of the first steps was to clean and relubricate both cameras with special space-compatible lubricants which cling to surfaces, rather than form into little balls of liquid that float away in zero-g.

The most severe conditions, however, were faced by the payload bay camera. During liftoff, this camera was expected to experience forces of up to 4 g’s from acceleration, and up to 10 g’s from acoustical vibration. Without protection, this camera would never have made it into space. “Normal mounting systems such as are used in these cameras won’t hold up to the stresses of launch,” said Monty Moncrief, a NASA technician. “If you don’t tie all the elements together in the unit, you’ll end up with a thousand pieces in the bottom of the can!” Therefore, this camera was packed tightly in Solamide, a special space-age vibration insulating material. The entire 340 pound canister was then bolted tightly onto the fuselage of the orbiter.

Temperature was another problem that could have spelled disaster. In addition to being wrapped in Solamide (which is also a good thermal insulator), thin, flat strip heaters were glued to the camera, film magazine, and lens to counteract the -250°F they would face much of the time.

Still another problem to overcome was the rapid deterioration of the film in the vacuum of space. To prevent this, the canister was filled with 7½ pounds of nitrogen gas and sealed. But because the fisheye lens was required to protrude from the canister lid to see its entire field of view, the lens was covered with an 80mm diameter, optically perfect quartz hemisphere. This protected not only the lens but the one-half atmospheric pressure inside the canister as well.

Despite the thousands of man-hours of attention to these and countless other details, no one was sure if this cinematic “first” could even be pulled off. “We were all so concerned about the camera surviving the liftoff during the first mission,” said Knapp, “that we asked for special TV coverage of the opening of our camera lens cover. We were very anxious to see it open on command. When it did, there was a great cheer of rejoicing in the Mission Control Center!”

Thus began the first non-NASA in-space documentary film project. On February 3, 1984, Dr. Ron McNair, Shuttle Mission Specialist, became history’s first “zero-g cinematographer.” With extremely impressive credentials in laser
physics, McNair had no prior cinematography background at all. He learned quickly, however, for filming conditions aboard the Shuttle were often less than ideal.

Compromises were necessary in order to keep the costs down and get the cameras aboard the Shuttle this year. One was to forego feedback from the payload bay camera to the crews and ground control. Questions like: what is the camera seeing; how many feet of film have been exposed; and is the camera even running; could not be answered in real time. “It’s a real seat of the pants proposition right now in taking these pictures and logging them,” said Knapp.

One challenge was trying to judge the harsh light levels in space. “It’s difficult to get any kind of optimum exposure with fisheye photography, and it’s especially so in space,” said Knapp. “Since we don’t really like to have the Sun in the field of view, we went to a great deal of trouble to chart for the crews what the optimum Sun angles would be.” But these are things that one cannot train for on Earth, and Astronaut McNair was forced into some quick aesthetic and technical decisions to get the shots right.

“The actual orbit operation—while there were no major surprises—got to be pretty tricky,” said McNair. “The big problem was trying to get the appropriate lighting and action to happen at the same time. Either the action would happen at night, or with the Sun angle wrong, or when I couldn’t get to the camera,” he said. “It really took some fast maneuvering—things like operating the remote arm and another movie camera while reaching over and hitting the right button to get the Cinema 360 going, setting f/stops and frame rates, and things like that. And all that was guesswork because there wasn’t enough time to look the information up. It was either do it that way or not at all!”

A particularly anxious moment came while Astronaut Bruce McCandless was testing a foot restraint in the open payload bay—about three feet from the camera. “While the camera was rolling,” Knapp recalls, “a tote bag he was carrying was bobbing all over the place. At one point, it bobbed right toward the lens. He reached out with a wrench and knocked it away because he was afraid it was going to smash the lens. The engineers watching on a TV in Houston were afraid of that also. As they saw that thing coming toward the glass, they were on the verge of heart attacks!”

But even with an occasional tense moment and some uncertainties, the crew managed to remain loose during the filming. “Just for fun, I took up a director’s hat, dark glasses, and a nametag that said ‘Cecil B. McNair’ on it,” recalls Dr. McNair. “And I had a sound-synchronization slate with my name as Director, and would use it as a gag when it was time to shoot some of the C-360 footage. I’d go down and get my hat and glasses, and start yelling commands, and go for the whole Hollywood bit. We took that footage during some very serious periods, but my job was to pull it off. I just had a little fun in the process!”

After three flights of the C-360 cameras, some of the most dramatic footage ever filmed had been obtained—the launch of a commercial satellite, the use of the Remote Manipulator Arm, astronauts’ activities outside the craft with the Manned Maneuvering (“Buck Rogers”) Units, the retrieval and repair of the ailing Solar Max Satellite, and unfurling an array of solar panels.

For the magnificent effort on the part of all the astronaut/cinematographers in getting the job done came lavish praise. “The expression of having gone 110 percent for us just doesn’t cut it,” said Knapp. “They went 200 percent! They really did so much more than we had asked for and expected. Out of 5000 feet of film they shot, about eighty percent is totally usable, delightful, and exciting footage!” And in September, both Ron McNair and Bruce McCandless were to be inducted as Honorary Members of the American Society of Cinematographers for their outstanding work on this project.

The full impact of this footage is felt only when it is viewed projected on the interior of a three-dimensional domed screen, producing a remarkable true-to-life perspective. Upon seeing the first projected images, everyone was completely spellbound. “Our expectations were, if anything, conservative,” said Knapp. “We underestimated what a powerful effect this was going to be. We were more than pleased with what we got—we were astonished!”

Even those who had flown on the Shuttle were astounded. “It brought back the memory of being there so vividly,” recalls McNair. “It was almost like being in the cockpit again! And the view from the payload bay was one I had never seen before. I suppose even though you aren’t weightless, and you can’t float, you can probably watch that movie and think you can! And I’m sure the effect will be magnified for someone who has not been in space and actually seen the real thing!”

But, as spectacular as the in-space footage will be, it will only be a fraction of the finished picture. Producers are now editing and incorporating footage shot inside the Engine Test Facility in Mississippi, the Solid Rocket Booster Facility in Utah, and inside the Johnson Space Center in Houston. In addition, there is some spectacular footage of the Shuttle Orbiter being hoisted and mated with its External Tank and SRBs, and some unprecedented views inside the Firing Room during the last few hours and minutes before Shuttle liftoff.

**Continued on page 15**
This is not an easy question to answer, primarily since star theaters vary, not only in size, but in ownership as well as philosophy of operation. Basically, all planetariums can be fit into one of the following categories:

(1) A planetarium which is its own entity (precious few of those around.)
(2) A planetarium which is incorporated with a museum or other center.
(3) A planetarium under the control and operation of a college or university.
(4) A planetarium which is in a school or controlled by a school system.

There are, of course, variations and combinations of these assignments (i.e. — a star theater located in a public museum but which has staff members who are school system employees).

It is probably safe to say with conviction, that regardless of size or type, the principal reason that a theater may be threatened with closure is one of a financial nature. The chances are fairly good with this assumption that the governing body responsible for providing the finances has suddenly realized that the planetarium under question has been or continues to be a liability. The chances are just as good that their opinion was formed WITHOUT much consideration of the educational, cultural or entertainment value in an aesthetic sense.

Least threatened by this prospect is the planetarium which sits in a college, has no staff, and remains idle save for the few times during the year a professor brings an astronomy class in for a session on celestial navigation, etc. In short, a theater which costs little to operate may sit there woefully unused, but may be around for some time to come.

Most threatened by the prospect of being shut down are two types of operations:

(a) School system planetariums which generate no revenue at all, and
(b) Other star theaters which depend to some degree on gate receipts to help defray operating expenses, and yet, for one reason or another, continue to operate at a deficit.

To expand on a discussion of possible alternatives and courses of action to aid endangered planetariums, this report will consider each operation separately, since the possible solutions may not be applicable to both.

**CLOSURE OF A SCHOOL SYSTEM PLANETARIUM**

A realistic observation of the financial status most school systems are in cannot exclude what is happening at the Federal level. Public education is receiving less and less assistance from Washington. This may be considered to be a highly biased political statement. However, the truth of the matter is that Federal entitlement programs are slowly being replaced with the non-monetary urgings for school prayer. Where once this country (via Title III and NSF grants) built many school star theaters, the memory of the glory days of assistance to science education has been replaced in Washington with insistence of more school discipline. (Discipline costs for a paddle are much less than the expense of science [and planetarium] equipment and supplies.)

One might suggest that the above observation is unfair and, moreover, unrelated. Yet, there is a connection. A few years back, many school systems employed instructors who spent their entire day working in federal Title I and migrant programs. The salaries for these instructors were reimbursed, for the most part, by the government in Washington. Now there exists a situation where severe cutbacks in entitlement programs is a reality AND several of those teachers have now earned some form of tenure in their district. The money for their salaries must come from somewhere else.

The financial crunch in some districts may be compounded if that district suffers an erosion of its tax base whether from population movement, (in the case of rural communities) from agricultural disaster, or (in urban locales) from the shutdown of industry.

To add insult to injury, there are some districts who must pay for court settlements in cases of employment discrimination.

To make matters even worse, many school systems around the country are moving towards school-based management. Principals of schools are being given more
authority as to how monies allocated to their campus are to be spent. Where once a county may have set aside transportation monies to pay for buses used in a field trip to the planetarium, now these monies are school centered. (And even if the principal opts to place ANY of his money in a transportation account, the planetarium instructor now faces competition from a teacher who would rather send her class to Uncle Joe’s Friendly Alligator Farm instead.)

Any school system which faces a combination of two or more of the above is in financial trouble. It may very well be that such an administration may look upon its planetarium as a luxury it can no longer financially afford. Could the school system planetarium, as a collective group, be in trouble? It already is.

The question now is what, if anything, can be done to counter the threat of closure?

If the predicament is imminent, there is one ploy which experience has proven to be effective. Public pressure.

Most planetarians are well known in their communities. Even the smallest theaters on occasion run some public service programs. Do not hesitate to ask members who attend your programs for help. Request that they write letters to individual school board members or make phone calls. Expand your list of prospective supporters to include teachers who are supportive of your efforts, professional associates in the community, important leaders whom you might know, personal friends and relatives. Don’t forget to ask for letters of support from members within your regional planetarium group and others you know from association at IPS conferences.

School board members, as a group, are notorious for reacting to public pressure. More than one board has backtracked from closing a planetarium when besieged with phone calls and letters from all corners of the continental United States.

A note of caution, however. This method may work only once. If a star theater avoids shutdown one year because of voiced support, and is threatened a few years later with the same confrontation, the powers that be may not react with as much surprise and may be better armed to thwart a second resurgence of opinion.

It is felt that the role IPS and its governing body should assume is one of support. Members of the Executive Council, when asked, should be willing to write letters to governing bodies of beleaguered institutions. These letters should stress an opinion of the educational benefit of a star theater to the school system and the community.

There is, unfortunately, no guarantee that letters, even from IPS Executive Council members, will have the desired effect. Attacked planetariums should weigh the possibility that such letters from a wide span of individuals could generate an atmosphere of resentment that outsiders are trying to determine local action. There is a possibility that such support could do more harm than good.

For those theaters that do not feel the pressure of being under the gun, vigilance is still necessary. It is recommended that a school system planetarian offers his/her services to the broadest spectrum of students possible.

Examine the program structure that your theater is offering. Is it dated? Has a given presentation been around too long and are teachers beginning to tire of it? There may be a direct proportion between disgruntled teachers and the number of trips to Uncle Joe’s Farm!

Make yourself visible and available to the schools which you serve. Do you publish a brochure/calender of all your offerings during the year? Does that calendar include some neat artwork or cartoon? (Remember that a piece of paper with a drawing on it will tend to be read as opposed to one of straight typing.)

Do you have programs which you can take out to the schools as a guest lecturer in the classroom? Having students compute Bode’s Law can be an exciting experience; have students construct a simple sundial corrected to your latitude and start a discussion of why the sundial is reading the “wrong” time; or pace off a scale model of the solar system outside with the sun shrunk to the size of a golf ball. All of this can be and is meaningful and exciting to everyone.

If you can afford the time to do these experiences away from the theater, and make the time you spend in the classroom an exciting venture for both the students AND the teacher, they will be chomping at the bit to come to your programs.

In summary, do as much as you can to make you and your programs as appealing as possible. A planetarium instructor who is in demand both in and out of the theater may very well be the one who is deemed by the administration to be INDISPENSABLE when the financial finger of doom begins its sweep.

**REVENUE-GENERATING STAR THEATERS**

The problem of closure for public, college or museum-centered planetariums is more complex, especially if these theaters are expected to generate funds from gate receipts to help offset expenses. A governing board may look upon this type of operation simply from the financial end of things, and could consider abandoning the planetarium if gate receipts start dropping radically.

The planetarium that faces such a reality must start asking some serious questions about the theater operation.
(1) Has the planetarium taken advantage of local media to advertise its programming? Press releases to newspapers cost nothing in advertising expense, especially if done in the format the papers wish to see. Don't forget radio and television. These stations would probably be willing to air your spot IF YOU PRODUCE THE TAPE AND SLIDES.

(2) Examine the times when you are offering public presentations. Opening the theater on a weekday for a show at 1:00 P.M. may draw in the retirees, but will abandon the working families. Also watch out for your choice of evening presentations. Is your only public show offered on a night when a number of religious denominations hold services?

(3) What kind of programming are you offering to the public? (Here you may have to take a hard look at some personal prejudices you may have, regarding star shows.) If you are of the notion that planetarium presentations should be live lectures concentrating on what the star machine is capable of projecting, you might be in danger of alienating your audience against a return trip. You might be fascinated talking endlessly about Betelgeuse; however, is your audience willing to come back next month to hear the same treatise? Probably not!

Also, how long does a particular program remain in the theater? Someone who attends your program and knows that nothing new will be offered for another four months won't bother to return until then. (This is not to say that a planetarium should offer something new every week. Considering how long it takes to produce anything of quality, such is not realistic. Yet, a theater should strive to offer variety as frequently as possible.)

Have you considered offering something in the realm of cosmic concerts? If the thought of rock music blaring in your hallowed chamber turns the stomach, perhaps there is someone on your staff who would jump at the chance, if offered the responsibility of production. Remember, there is a potential audience of youths who would be willing to lay down hard cash for such a presentation. Who knows? An audience who appreciates a contemporary music program may very well return for a traditional star program. (More than one planetarium is the U.S. has been able to boast of black ink in the ledger as a consequence of this type of programming.)

[There is a caution which should be noted here. Light shows for many of us are nothing new. It is sincerely hoped that no star theater becomes so engrossed with their lasers and capability of approaching the threshold of pain with the music that the traditional star show falls by the wayside. Light shows could have their place as a method of generating revenue, but with time they could also reach a point of saturation. Let us never forget the reason why the planetarium was erected in the first place.]

(4) Have you, in an effort to hold down your expenses, drawn upon as much volunteer help as possible? Your community may have a wealth of retired people, mechanically inclined, who would love nothing better than to help put some special effect together for you. The same thing may be true for the teenager who might be tired of the usual offerings on television and is waiting for someone to offer him or her a challenge. There is a wealth of talent out there. Your task is to find it.

(5) What is your relationship with the administration which controls the financial strings? If you consider the board of directors as your enemy, there might be an excellent chance that the feeling is mutual. When was the last time that you offered the powers that be a special showing of some new presentation BEFORE it was opened to the public . . . even if such a premire is at a time inconvenient to you? Remember that everyone likes to be considered special, even board members. Showing consideration to the bosses could very well result in reciprocal action.

(6) Have you considered offering something unique like a subscription-based science fiction film festival during the summer? Many of the older sci-fi films are available for rental in 16 mm format at reasonable rates. Advertising and showing a different film each week could be a profitable venture.

Perhaps you have tried all of the above steps as suggested, but find the threat of closure still looming in the not-so-distant future. What can be done? For this, there is no simple answer.

Perhaps letters of support from IPS officers and other installations could be beneficial. However, beware of the possibility of backfire as noted in the school section of this article.

There are circumstances which could be beyond anyone's help. Example: A theater constructed as a consequence of a grant or will from some benefactor (who wished to remain in someway immortal), grandiose in size, expensive to maintain and (most importantly) situated where these simply is not a population large enough to support its operation. If such is the case, the theater probably should not have been built in the first place. This is probably a losing cause and the people employed there might best start looking for jobs elsewhere.

One final suggestion. (This one has the potential of rubbing against egos.) If every positive effort has been made to save the theater from extinction, but to no avail, it might be worth asking the administration to consider the advice of experts in the field who have a known track record of turning around a money-losing proposition into the opposite. It could very well be that a board of directors would want to have alternative suggestions presented to them and would be willing to look at the advice of an outsider. ☐
In the summer of 1983, IPS initiated a project with Evans & Sutherland Computer Corporation which was hoped to be of benefit to planetaria everywhere. This project was to produce a videotape of significant astronomical topics using the E & S “Digistar” Projection System. A copy of the videotape was to be made available to all members of IPS for reproduction in any format they felt was most useful to their operations. This tape is now completed.

I first approached Jeri Panek of E & S about this project. It turns out that she was already pursuing the taping of several astronomical subjects for an E & S videotape on Digistar. The project was approved by both E & S and the IPS Council. This fortuitous timing has resulted in the IPS version of the tape being produced at essentially no cost to us (except for the cost of duplicate blank tapes).

The concepts presented on this tape were solicited from IPS membership. They include:

1. Earth-Centered Orrery
2. Sun-Centered Orrery
3. Pluto-Neptune Orbits
4. Trip to Aldebaran
5. Walk Around Orion
6. Proper Motion of Stars

These guidelines govern the use of the tape: it may be used for any educational purposes. These include: illustrations for classroom lectures; film or video projection incorporated into planetarium shows; and public displays of astronomical principles. Note that these are all “in-house” uses. The tape may not be used in any advertising. (After all, if you don’t have a Digistar, these visuals in your TV spot would represent capabilities you don’t have—thus false advertising.) You cannot use its visuals in a show you are planning to sell to other planetaria. And, you cannot use it in a film or video production outside the planetarium without obtaining prior permission. Not much in the way of restrictions, but they are logical.

So, here it is: a project of modest proportions, but one I hope will prove very useful. We don’t even care if you are not an IPS member. As a planetarian, you may borrow the tape from your IPS regional representative and copy it. It is our hope that you will note that IPS is working for you. And perhaps you might even be motivated to check out the value of sharing ideas, techniques and concerns through such an international organization.

Please note—the IPS videotape has been produced in “U-matic” ¾-inch format. You may, of course, copy it to any ⅛-inch format recorder, or to 16 mm film, if you wish.

AMERICA RIDES THE SHUTTLE!
...continued from page 11

When completed this Fall, the 28-minute film will be released in hemispheric format to the handful of U.S. planetaria presently capable of showing it. Producers and astronauts expect it will have no trouble drawing huge crowds. “Space has been an awesome, interesting and exciting area for people for many years,” said McNair. “They have gotten back photographic accounts of it in the past. But now, this is an opportunity for people to experience it as best I know how without actually being there. And when the producers get it all edited and put the sound to it, it’s going to be one spectacular film!”

In the meantime, America, fasten your seatbelts! The countdown has begun!

NOTICES

Copies of the 1984 I.P.S. Directory are available to non-I.P.S. members at the cost of $25.00 (postpaid). Checks should be made payable to I.P.S., and sent to the Treasurer of the Society.

Nominations for the I.P.S. Special Award (to be presented at the 1986 Tucson Conference) must be submitted to the Awards Committee Chairman Bruce Dietrich by January 15, 1985. Additional nominations may be presented at any time. A description of the service and merit should also be included. Bruce’s address:

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And our regular columns highlight the things your visitors are interested in: viewing tips for amateur astronomers, a look at future Solar System exploration, and beginning in March, regular updates on Halley’s Comet. We’ll explore its history, its origins, its composition and the fleet of spacecraft poised to intercept it.

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President’s Message

JEANNE E. BISHOP

The last two years have gone by very quickly for me. Soon I will pass the office of IPS President into Alan Friedman’s capable hands. (In fact, we plan a ceremonial call at 0h U.T., January 1, 1985.) I have very much enjoyed working for IPS. I hope that I have succeeded in a major goal, that of promoting communication and dialogue both within the Executive Council and between Council and members. I am aware that I was privileged to serve IPS during the excellent, precedent-setting conference last summer in Monterrey, Mexico. I just sent my next-to-last newsletter to the Executive Council, and this is my last report to you.

Soon you will receive a dues renewal notice for 1985. Although Walt Tenschert will soon turn over the duties of Treasurer to a newly-elected person (not yet determined), he will continue to serve as IPS Membership Chairperson. He will work with the new Treasurer this year. Dues for 1985 will remain the same, both individual and institutional categories. Upon receipt of your dues, immediately you will be sent a copy of the just-published IPS Special Report, Cosmic Artoons, by George Reed (well-known astronomy artist, as well as current MAPS President). We are delighted that George has shared his artwork with the planetarium community, ready for use in many possible activities—camera-ready artwork for slides, printed programs, publicity, etc. Be sure to get your copy by renewing your IPS membership. And please spread the word of this benefit among planetarium colleagues, thereby helping both them and IPS.

Very soon, all known planetarians should be receiving a very long survey, sponsored by IPS. Please take the necessary time to complete it carefully. Information from this survey will be used in at least two ways: (1) for a new, more comprehensive Directory and (2) for survey reports that will be published in the Planetarian, useful for future conference agenda planning, decision of topics for future IPS Special Reports, marketing by producers for planetariums, and for those preparing dissertations and other in-depth studies concerning the planetarium community. Therefore, this survey deserves extra special attention. It will come from the project’s chairman, Dr. Charles Hagar, Planetarium Institute, San Francisco State University. Charles has worked closely with the Executive Council, members of PPA, Mark C. Petersen (who maintains the official address file for IPS) and Ron Grant of Spitz (Spitz pledges a grant of up to $4300 to IPS for this project, so that IPS will not be using regular funds for it).

Thank you in advance for your cooperation in a high rate of return of questionnaires, helping to make the survey project a success.

For the first time in over ten years, you should find advertising in this issue of the Planetarian. Carolyn Collins Petersen, working with Editor Jordan Marché, has created guidelines for attractive advertising at reasonable rates. Council is not expecting a great deal of income from this source; IPS will pay income tax on all but a small amount, as the Society is classified as a “business league.” However, now there is the opportunity for companies to relay information about products in our journal, a service both to the companies and to IPS members. Tasteful advertising is a natural activity for IPS, which has a constitutionally stated goal of promoting the circulation of information related to our profession.

Another first is the preparation of a Planetarian Index, from the first issue to the present, by John Mosley. John offered this excellent index, with listings by title, author, and subject, as a special report to IPS. However, we have decided on John’s alternative suggestion of his supplying constantly updated copies to members on request at cost ($6.00 bound; $3.00 unbound). John’s efforts represent a very valuable individualized service to IPS members. See the announcement about the index elsewhere in this issue.

IPS Awards Chairperson Bruce Dietrich will present nominations with recommendations for the IPS Special Award at next summer’s off-year Council meeting. Nominations to be considered at this time by Council must be sent to Bruce soon, by January 15, 1985. Those selected by Council next summer will receive their Special Awards at the next IPS Conference in 1986.

Flandrau Planetarium in Tucson is enthusiastically preparing for the 1986 Conference. Acting Director Dick Norton and Conference Hostess Lonny Baker are lining up many talks and tours, focusing on ASTRONOMY. The conference is planned for very early in July, 1986. Early rather than late summer is essential for weather reasons, as in the case of the Monterrey conference.

The IPS/NASA video film project has been tabled until a number of additional people contribute to it. Video tapes, films, and slides could all be used. Chairperson Bill Gutsch has fewer than ten usable items, which does not allow proper representation of the planetarium community. Bill appealed for material at several affiliate conferences and in writing in the Planetarian, as I did. Lynn Bondurant at NASA Lewis, who would sponsor the project, plans some additional appeal. Please continue to consider what you could send, now to Lynn, which could be used in a half hour video film covering the nature of planetariums and their offerings. Should material be forthcoming, we can go forward.
The latest IPS Directory (1983 on the cover, but mailed by Editor John Wharton within the last few months) has an item that people of Zeiss-Oberkochen say needs clarification. A court judgment permits the name of Zeiss in the United States only for the Oberkochen firm. The Jena firm must be called something else in the United States; one name they have used in publicity is "Jenoptik." We are asked to correct this in our Directories for the future and be aware of the situation.

I want to thank so many people who have worked with me over the past two years. The 1983 and 1984 Executive Council members have done a fine job for IPS, and I have enjoyed serving with them. I particularly want to thank Walt Tenschert, who did double duty, as he has for many years, both as Treasurer and Membership Chairperson. Walt played an unusually large role in the mailing and registration details for the Monterrey conference, and he is assisting in the publication of the IPS Special Report by George Reed. Walt has been of inestimable help to me in making plans for IPS. Walt is leaving the Treasurer's position, after about 10 years of uninterrupted service. We are very glad that he will continue as Membership Chairperson. Thanks, Walt! Also, a very special thanks to Jack Dunn, who is always searching for ways to further the service and image of IPS, and who continues as IPS Executive Secretary. Planetarian Editor Jordan Marché has had much to do with my smooth term, as he has kept the journal on time, always with a high-quality appearance. There was no lapse in service, even when he changed positions from Nevada to Pennsylvania. Happily, we can look forward to many future issues with Jordan as Editor. Thanks, Jordan! I would again like to thank all members of AMP and SWAP, particularly John Pogue, for their work and other support of the Monterrey Conference, 1984. Thank you to Larry Toy, who is completing a very thorough, excellent job as Elections Chairperson. I appreciate all the suggestions and reactions from the entire membership, as well as from Council, during the last two years. Mark C. Petersen and Carolyn Collins Petersen have consistently responded with ideas and offers of assistance, which have been especially helpful. Thanks to Volker Roehrs, Thomas Hocking, Mike Ryan, Lee Ann Hennig, Bill Peters, Edna DeVore, George Reed, John Wharton, Bill Gutsch, John Mosley, Doris Forror, and Gabriel Munoz for efforts on special projects. I look forward to assisting our new IPS President, Alan Friedman. Please help me.

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This installment of "Gibbous Gazette" begins with a letter I received on October 23 from the University of Colorado's Fiske Planetarium:

"The enclosed information we hope will be published in the next issue of the Planetarian as it will correct the impression that Fiske is closed. Although planetarium activities have been restricted, we hope to expand once again in the future. Sincerely, Robert N. Stoller, Technical Director . . .

"Responding to the item in the Planetarian's third quarter 1984 Gibbous Gazette section, the Fiske Planetarium staff report the following:

"On September 1, 1984, responsibility for operating the planetarium was transferred to the University of Colorado Laboratory for Atmospheric and Space Physics (LASP). Fiske had not presented star shows, movies, or laser shows to the general public since May. Under the new management, astronomy classes for University students and star shows for school students continue (over 10,000 students participated in these programs last year), a new monthly science lecture series (free and open to the public) has begun, and plans are now in formulation for providing regular planetarium shows for the public. A program in providing science education classes for children will continue this fall at the planetarium, but is being transferred to a new University location for the Spring. Fiske will continue to support this program with its special facilities, especially in the planetarium theater.

"LASP will move a major space research operation, including a modern computer, into available space at the planetarium. Operations will be visible to students and the public as they pass through the facility. Some new lobby exhibits explaining University of Colorado space research will appear. It is hoped that the incorporation of Fiske into a large, effective organization will provide stability for continued operations and the development of quality planetarium programs.

"The former director, David Aguilar, is now working in publicity for Ball Aerospace Corp. in Boulder. Gene Ammarell has been restored to full time as of September 1. Carol McLaren, director of the children's science education "After School" program, is now a regular university employee at LASP while that program is being transferred to a new University location. In the May shake-up, we lost our secretary, who is now replaced by a half-time receptionist. Bob Stoller continues as Facilities Manager. With the help of student assistants, the planetarium is healthy and continues to function."

(Bob, for what it's worth, I sincerely hope the changes instituted at Fiske don't turn out to be just another "quick fix" by the University of Colorado, and that my gloomy forecast of Fiske's future turns out to be proven wrong. Good luck!)

"ONE OF THESE DAYS ALICE — POW! RIGHT TO THE MOON!"

With a declaration by President Reagan late this past summer, the "Teacher In Space Sweepstakes" is on; the first truly civilian Shuttle passenger will be a U.S. elementary or secondary teacher, flying perhaps by late 1986. At the time of this writing, NASA will have released an Announcement of Opportunity, containing selection criteria and other pertinent information. The requesting of application packets is the next step for would-be teacher astronauts. To apply, a person must be a U.S. citizen teaching full-time in a public or private school in the U.S., Puerto Rico, Guam, or other U.S. territories. The applicant also must be able to show by qualifications — such as working in a planetarium — that he or she is the ideal candidate. If you answered correctly to all of the above points, and haven't received the Announcement of Opportunity yet, then write to NASA, Mail Code ME, Washington, D.C. 20546. To get a recorded message on the status of the process, call (202) 453-8644.

"HEY! MIKEY LIKES IT! ("STARS OVER CHINA" REVISITED)

In the First Quarter '84 Planetarian's "Gibbous Gazette", we reported the musings of McLaughlin Planetarium's Tom Clark over their concerns on running/having to run a historical show, "Stars Over China". To see if their concerns were warranted, the McLaughlin staff conducted a survey of visitors (before they attended the show) to learn of audience preferences for show topics. Now, as reported in the winter '84 issue of PAC's NORTHi STAR, Tom has — as promised — released the results of a survey "made of those who attended the historical show inflicted on them":

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<table>
<thead>
<tr>
<th>Number of First Choice Selections</th>
<th>Show Sample</th>
<th>Previous Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life in Space</td>
<td>29.3%</td>
<td>34.9%</td>
</tr>
<tr>
<td>Recent Discoveries</td>
<td>24.9%</td>
<td>23.3%</td>
</tr>
<tr>
<td>Planetary Exploration</td>
<td>21.4%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Constellations/Star Lore</td>
<td>14.0%</td>
<td>19.4%</td>
</tr>
<tr>
<td>History of Astronomy</td>
<td>10.5%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

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With regard to specific reaction to "Stars Over China," Tom reported a positive response, with eight out of ten people saying the show lived up to their expectations and rating the "enjoyment level" as good or excellent. "Obviously," Tom said, "the audience liked the show and we did a good job with the historical topic." He added, "What one sees is a three-fold increase in the first choice of a historical topic. However, it remains a choice of a clear minority of visitors . . . Few were converted and the predominant view of our audiences, whether they attend historical shows or not, is that the planetarium is a place for presentations on what is current in astronomy. Of course, we probably knew that instinctively. What we may not have realized is that any audience appreciates a good show, even if it is not their first choice of topics. The trick may be to get them to come in and try it."

**DOES THE PROJECTOR GET UNION SCALE?**

Another planetarium has gone Hollywood, so to speak. The U.S. television network ABC is producing a made-for-TV movie about teen-age suicide, with Oklahoma City as the setting. During on-location filming, the producers wanted the central character (played by the actor who portrayed Elliot in "E.T.") to have a planetarium projector in his room. So, they called OKC's Kirkpatrick Planetarium to see if they could get some assistance. Wayne Wyrick, Kirkpatrick's director, couldn't exactly let them have the facility's Minolta Series IIB, but he was able to offer an alternative — and at a much more manageable size. The star projector for Kirkpatrick's Apollo portable planetarium was sent off on its screen test. No word yet as to whether or not the projector's scenes made the film or ended up on the cutting room floor, but interested planetarians are advised to begin watching their TV Guides for "Survivors," starring Ellen Burstyn and Marsha Mason. (Also due out in 1985 on U.S. television is the TV mini-series adaptation of James Michener's Space. It remains to be seen if the mini-series will follow astronaut John Pope into retirement as the State University of Fremont's planetarium director. Stay tuned.) **Trivia question:** Can you name the three films, two television series episodes, and one made-for-TV movie which featured planetariums? (Answers near the end of this column.)

**"EARN BIG MONEY IN YOUR SPARE TIME . . ."**

... And make a contribution to the field, by submitting an article for Griffith Observatory's 13th Annual Awards for Popular Articles in Astronomy. Sponsored by Hughes Aircraft, the awards will go to those with articles "which best communicate to the average reader material of current historical interest in astronomy, astrophysics, and space science." Cash amounts of the awards are: 1st prize—$650, 2nd prize—$300, 3rd prize—$200, 4th prize—$150, honorable mention—$50 each. The deadline for submissions is March 1, with awards to be made on May 1. The winning articles will appear in the Griffith Observer. For more information, and criteria for entries, contact: Griffith Observatory, 2800 East Observatory Road, Los Angeles, California 90027.

**ASTRONOMY NEWSLETTER FOR TEACHERS DEBUTS IN U.S.**

A quarterly newsletter for teachers and librarians in grades 3 through 12 is now available from the Astronomical Society of the Pacific. Sponsored by ASP and the American Astronomical Society, the newsletter is aimed at those with little or no background in astronomy. According to Andrew Fraknoi, ASP's Executive Officer, "the newsletter will include short nontechnical articles on new developments in our exploration of the universe, practical classroom activities for teaching astronomy, and specific suggestions for the best written and audio-visual resources on astronomical topics." To receive the newsletter, at no charge, interested teachers or librarians should write—on school stationery, and identifying their pertinent grade levels—to: Astronomical Society of the Pacific, Teachers' Newsletter, 1290 24th Avenue, San Francisco, California 94122.

**VACATION SPOT FOR DOBSONIANS**

With a grant from the James Smithson Society, the Whipple Observatory has given amateur astronomers a chance to view under the same skies as the "big boys and girls." On the eastern slope of Mount Hopkins, at an elevation of about 1,500 meters, the Observatory has constructed an "amateur astronomy vista." The two-acre site, just off the access road to the Observatory, features half a dozen concrete pads for amateur telescope setup. Mount Hopkins is about 60 km south of Tucson, Arizona.

**IF ONLY THE MAJOR POWERS WOULD STOCKPILE LUMILINES . . .**

... But, since they don't, planetarians have to worry about trying to find them. In dealing with this rare commodity, some planetarians have turned to some resourceful ways of keeping their domes illuminated. Bob Wollman of the King High School Planetarium in Corpus Christi, Texas has found an alternative to trying to bag colored lumilines. As he reports, "Fluorescent bulb manufacturers are making a safety sleeve for their bulbs, to contain the glass, mercury vapor and phosphorus when the tube breaks. These sleeves come in colors! The sleeves are made for the larger diameter fluorescent tubes, which are about 40mm, while the lumilines are about 25mm in diameter. This means they don't fit very well, but up in
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the cove, who cares? I have simply cut the four-foot sections of sleeve to fit the frosted-white lumiline. The color is slightly more golden, but of equal intensity.” For the L40/1F lumilines Bob has, he uses four-foot sections of “Safety Sleeve Tube Guards” (no stock number), at $4.13 each in cases of 12. Good idea, Bob!

TORONTO TO HOST SPRING MEETING OF PAC

In a break with tradition, the Planetarium Association of Canada will hold its biennial conference this spring, at the McLaughlin Planetarium in Toronto, Ontario. Among the reasons cited by PAC president Robert Ballantyne for the spring meeting date is the possibility of joint sessions with the Canadian Astronomical Society, which will be holding their annual meeting in Toronto at the same time the PAC conference is scheduled (May 25–29). The theme of the conference will be “Telling the Story,” covering such topics as program content, operations philosophy, and a review of new Canadian facilities. For more information, contact: Chris Sasaki, Conference Registrar, McLaughlin Planetarium, 100 Queen’s Park Crescent, Toronto, Ontario M5S 2C6.

ASTRONOMY DAY 1985 ANNOUNCED

The Astronomical League has designated April 27, 1985 as “Astronomy Day,” according to Gary Tomlinson, Astronomy Day Coordinator. For more information on this 12th-annual observance, contact Gary at Chaffee Planetarium, 54 Jefferson S.E., Grand Rapids, Michigan 49503 (616) 456-3985.

RESOURCE ROUNDUP

Some comet-related items of interest: David Chandler, the designer of “The Night Sky” planisphere and author of “Exploring the Night Sky with Binoculars,” has come up with a nifty 3-dimensional cardboard Model of Comet Halley. It comes in three pieces—one a base, one for the plane of the earth’s orbit depicting positions through the second half of ’85 and the first half of ’86, and the third section showing the inclined path of the Comet, with its positions for the same period of time. Anyone who can replace a star lamp can assemble the model, which is available in a box of 50 for $37.50. To order, contact: David Chandler, P.O. Box 309, La Verne, California 91750 . . . Another company is offering Comet Halley T-shirts. Productions Limited is offering four
different styles of art on T-shirts in a variety of colors. For
bulk-order information, contact: Metco Productions
Limited, P.O. Box 0385, New Orleans, Louisiana 70174
... A host of various Comet Halley materials, such as
T-shirts, bumper stickers, posters, books and even a com-
memorative medal, are available from: Halley's Comet
Watch, Box 188, Vincentown, New Jersey 08088 ... 
Annual subscriptions are available to the Comet News
Service, a semi-technical quarterly on comets with
emphasis during the coming year on Comet Halley. One-
year subscription rates (U.S. dollars) are $5.00 for the U.S.
and Canada, and $7.50 for all other countries. To sub-
scribe, contact: CNS, P.O. Box TDR, No. 92, Truckee,
California 95734.

Other items of interest: The New York Hayden Planetary
nium has entered the ranks of planetariums offering show
kits for sale to other facilities. Hayden's first show kit is
"Star-Quest", narrated by Leonard Nimoy, at a complete
cost of $1,770. Available in February will be 'The Violent
Universe', narrated by Vincent Price. The Hayden has
also released a slide catalog of original artwork (pans,
dissolves, etc.) and spacecraft models. For more informa-
tion, contact: Dr. William A. Gutsch, Jr., Chairman,
American Museum—Hayden Planetarium, 81st Street at
Central Park West, New York, New York 10024. ... Two
astronomy sound filmstrip sets are now available from
the National Geographic Society. Set One consists of five
sound filmstrips, "The Sun and the Solar System", "The
Inner Planets", "The Outer Planets", and "Asteroids,
Meteoroids, and Comets", under the collective title of
"The Solar System". Set Two — "Deep Space and the
Mysteries of the Cosmos" — consists of three sound film-
strips, "Stars", "Galaxies and the Expanding Universe",
and "Life in the Cosmos". The average running time for
each is about 17 minutes. Set One has a cost of $129.50;
Set Two runs for $188.50. For more information: National
Geographic Educational Services, Washington D.C.
20036 ... The 1985 Astronomical Society of the Pacific
Selectory catalog of such materials as slides, prints, maps,
posters, books, tapes, and novelty items, is now available.
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STAR TRAILS

Longtime planetarian and small-dome special effects
wizard Charlie Walker is retiring from his Hartford (Con-
necticut) facility and (sadly) the planetarium field. He'll
be exercising his creativity on the pipe organ at the Austin
Organ Company ... Jan Paul Dabrowski is the new direc-
tor of the Kendall Planetarium at the Oregon Museum
of Science and Industry in Portland. Prior to joining the
staff at OMSI, he was director of the Fayetteville (North
Carolina) State University Planetarium ... The Gengras
Planetarium in West Hartford, Connecticut also has a new
head: Francine Jackson (formerly with the New York
Hayden) is now Curator ... Steve Russo is the new direc-
tor of the Southern Cayuga High School Atmospherium–
Planetarium in Poplar Ridge, New York ... Judy Irwin
has departed as senior staff member of Edmonton, Alberta's
Mobile Planetarium, to pursue a Ph.D. in astronomy at
the University of Toronto. Judy is replaced by Janet
Couch, formerly the school programmer at the Queen
Elizabeth Planetarium in Edmonton. (The Mobile Astron­
omy Project has also moved, from the Natural Resources
Science Centre to: Provincial Museum of Alberta, 12845-102 Avenue, Edmonton, Alberta) ... Kirk Brocker
has become acting director of the Museum of Science
and Industry in Des Moines, Iowa; replacing Kirk as Plan­
etarium Director is Larry Kellogg, formerly the Museum's
health educator ... Another planetarian has become a
museum director: Eugene Jenneman has left the Jesse
Besser Museum in Alpena, Michigan to take the position
of Executive Director of the Erie (Pennsylvania) Historical
Museum and Planetarium ... Ken Adams is the new
director of the Schroeder Planetarium (Shasta County
Schools) in Redding, California ... Kirkpatrick Planeto­
rium in Oklahoma City has a new producer: Lynn
Dodson, formerly with KCSC radio at Central State
University in Edmond, Oklahoma ... Jack Horkheimer,
Executive Director of the Miami Space Transit Planetari­
um, will follow in Carl Sagan's footsteps on January 1 as
his "Star Hustler" TV show graduates from Florida public
Television to the United States' PBS network ... Deborah
Byrd, writer and producer of the University of Texas' "Star­
date" syndicated radio program, has received the 1984
Klumpke-Roberts Award from the Astronomical Society
of the Pacific. The award goes annually to "an
individual or group making outstanding contributions to
the public understanding of astronomy." Previous recipi­
ents include Carl Sagan, Isaac Asimov, and Fred Hoyle
... NOVA NEWS: Welcome to our skies John Karl
Mosley, born August 20 to Tina and John (Program Super-
visor at the Griffith Observatory in Los Angeles), and
Matthew Michael Donovan, born September 18 to Louisa
and Hal (Producer for the McDonnell Star Theater in
St. Louis).

ANSWERS TO TRIVIA QUESTIONS

Films: "Rebel Without A Cause" (1957), starring
James Dean as a troubled teenager who can't get enough
of the Griffith Observatory; the Zeiss was on screen longer
than many of the film's actors — it was also more con-
vincing than many of the film's actors. "Mars Needs
Women" (1964), judged one of the worst sci-fi movies
of all time; who could forget the scene during the
featured planetarium's show on Mars, when the tape
breaks and the disguised Martian in the audience takes over the narration? “Local Hero” (1982), featuring Burt Lancaster as an eccentric oil tycoon who has a Goto (?) on elevator to rise up into his office for impromptu constellation shows.

TV Series Episodes: “Searching For Home” from “The Night Stalker” (1973), with star Darin McGavin as paranormal reporter Ernie Kolchak pursuing an invisible alien force into (what was supposed to be) the Adler Planetarium, only to find the poor thing’s lost and is just consulting a road map. “Les’s Groupie” from “WKRP In Cincinnati” (1979), with the radio station’s news director and farm reporter Les Nessman finally getting a date, and showing the woman a “good time” by taking her (off camera) to the Natural History Museum’s Planetarium.

Made-for-TV Movie: “Search For The Gods” (1975), with a post-Walt Disney Kurt Russell heading a group of wild college students who get their kicks by searching for ancient astronauts; they bone upon the subject by visiting the (unknown) campus’ planetarium. (The facility was supposed to be in Florida, and it wasn’t a Spitz — somebody ‘fess up!)

THE 1984 “CASEY” AWARDS

To mark the close of the year, the usual “Kudos & Castigations” give way to the first annual “Casey” awards, celebrating some high and low distinctions of 1984. (“K & C” will return next issue.) And now, the envelope please ...

The Best Civic Gesture Award to the City of Vancouver, for compensating the MacMillan Planetarium some $202,000 in lost gate receipts, when the facility had to close down to remove asbestos insulation.

The Shakiest Civic Planning Award to the organizers of EXPO ’86 in Vancouver, for (1) assuming that a 550-seat OMNIMAX theater could, when the world’s fair concludes, be converted into a planetarium with little or no cost (David Hurd and Ian McLennan have since estimated some $7 million in conversion costs); and (2) for thinking that Vancouver needed a second major planetarium.

The Galileo Award for the Most Dubious Observing Technique to 15 year-old Kristen Rowlands of Racine, Wisconsin, who partially lost her sight after staring for an hour at the May 30 solar eclipse. According to an AP wire service story, she said she was unaware of the dangers of staring at the sun.

The Tackiest Space Application Award to McDonald’s restaurants, who met with NASA officials to request that their 50 billionth hamburger be taken up on an upcoming Shuttle mission, released for one orbital pass, and then retrieved for posterity. Runners-up: Coca-Cola and Pepsi Cola — they want to install dispensers on the Shuttle. (As reported by Space News)

The Going Out In A Blaze Of Glory Award to Dorothy Beetle, recently-retired director of the Patterson Planetarium in Columbus, Georgia; she spent her final days on the job trying to remove a layer of ammonium phosphate from her facility’s instrument, console, seats, and some 5200 slides, after a projector caught fire (just prior to a show) and ushered in the local fire department.

The Forget-Me-Not Award to the Muscogee County (Georgia) school board, who forgot Dorothy Beetle’s planetarium when they voted to equip certain school areas with Halon fire extinguishers.

The Gold Mesh Mailbag Award to the public information office of NASA’s Jet Propulsion Laboratory, for anticipating the needs and desires of planetarians by producing a first-rate level of resource material.

The Most Convincing Special Effect Award (tie) — When a poorly-designed drainage system allowed water to seep into the heating ducts above the dome of the Schuele Planetarium in Bay Village, Ohio, manager Doris Forror ended up with a very convincing three-day rain effect. In Vancouver, the opening scene of MacMillan Planetarium’s “Powering the Future” show called for early man to discover fire, and the campfire effect looked good; the effect was even more convincing when the campfire projector began emitting smoke and flames.

The Space-Magazine-Most-Likely-To-Be-Read-By-Survivalists Award to Military Space — For $297 (25 issues a year) the publishers promise “You’ll stay informed of the high-voltage battle of ideas and policy under way in Washington ... Military Space will give you the inside information you need to set your targets.” (The publishers point out, by the way, that theirs is a “no-risk” subscription.)

The Space Cowboy Award to U.S. Senator Jake Garn (R-Utah), who will ride the Shuttle long before one of us—perhaps because he’s been requesting a jump seat from NASA for years, but, more likely, because Sen. Garn chairs a subcommittee that reviews space agency budgets.

The Least Significant Contribution To Astronomy Education Through P.C.s Award to the Universal Press Syndicate and its “personal computers” columnist Peter McWilliams, for a review by McWilliams of an astrology program (Deluxe Astroscope) in which he praised the program for its ability to produce accurate horoscopes.

Here’s just one example why the Reagan Administration should receive the Good Ol’ Basics Award: In a recent Gallup Poll of high school students in the U.S., 55 percent said they believe in astrology (up from 40 percent six years ago). It looks as if we are going back to the “good old ways.”

Continued on page 36
Theatre of the Mind...

COMPLETE

Planetarium Show Packages!

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Original music by TIM CLARK
PAUL NELSON

Original artwork by CAROL CARLSON

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ALL PLANETARIUM SHOW PACKAGES INCLUDE: ANNOTATED SCRIPT: with show production hints and instructions for special effects. SLIDES: one step from the Master Set. With diagrams; pin registered sequences. SOUND TRACK FORMAT: select cassette or reel to reel [½ or ¼ track, 7½ or 15 ips]. LOW COST: $378 per show + shipping. (Discounts for multiple purchases and cash sales). NO COPYRIGHT HASSLES: All shows ©, © Copyright 1983 by Stasiuk Enterprises.

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#3. STELLAR EVOLUTION ---> A 17½ minute production, includes: Script, slides, metal cassette sound track............... $75.00
#4. COSMIC PERSPECTIVES ---> A 16 minute cosmic zoom, includes: Script, slides, metal cassette sound track............... $75.00
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Regional Roundup

JACK DUNN

Beginning with the Summer, 1985 issue (submission deadline March 21), Kathleen Hedges will become the new Regional Roundup Coordinator. Please send all affiliate-related news items to her at:

Clyde Tombaugh Space Instruction Center
PO. Box 533
Alamogordo, NM 88311

The I.P.S. Historian (Dr. Paul Engle) has restated the need for additional affiliate materials in our archives. Specifically, photographs of regional meetings and I.P.S. members (past and present) are being sought. Send all related items to him at:

University of Arkansas at Little Rock
33rd and University Avenue
Little Rock, AR 72204

Since John Wharton has been known in his column to pass out compliments and castigations, I thought I might begin with a comment of my own.

In July, some 130 planetarians assembled in Monterrey, Mexico, for the 1984 I.P.S. conference. As the only GPPA member (or at least the only one from the GPPA’s territory) to make it to this conference, I had the interesting task of describing this meeting to my colleagues who missed it. Let me first say that I heard many comments both before and after this conference such as “I couldn’t afford it,” or “I didn’t have the time,” or “I couldn’t find out any details on the meeting,” or “It’s too far to travel.” In fact, I have to admit that I shared some doubts with other planetarians. Would this conference really be worth the effort to visit a non-English speaking nation (even though it is a nearby neighbor)? There were problems in communication between Monterrey and U.S. planetarians. The IPS Council had heard a very convincing report at their 1983 meeting, but we found it difficult to convey the spirit, the enthusiasm which we felt from Robert Ortiz and Gabriel Munoz (representing the Association of Mexican Planetariums).

Once I reached Monterrey, these doubts were all evaporated in an instant. The sights and sounds of those six days will live with me forever. Never have I found such hospitality and genuine warmth. The conference was extremely well organized. This was a small gathering compared to some others, yet that worked to our advantage. There was a feeling of family and it was a family of nations—all bound together in the spirit of the planetarium profession. We exchanged ideas and debated concepts against a setting of beauty and downright grandeur.

Our hosts in the Mexican Planetarium Association and the Alfa Cultural Center were extremely accommodating. Did you need a secretary for typing or copying? One would be provided. Did you need equipment, help with travel arrangements, shopping, translating? There was someone ready to take care of your every wish. Families were also treated excellently. There were special tours for spouses and classes for the children. Almost all meals were paid by registration or sponsor. The AMP showed us respect and encouragement for our profession and the professionals who make up IPS. They can be extremely proud of the 1984 conference. And I will try to let you know, through this column, of their continued success.

The Society is healthy and buoyed by the spirit of the Monterrey Conference. As I have said, it was a once in a lifetime event. The folk ballet, the concerts and the Mariachi Orchestra playing for us in the Cultural Center during our farewell dinner are all memories which I shall cherish. But most of all, it is the friendship and warmth of some tremendous people. As Keith Goering recently said in our GPPA newsletter—“Planetarium people are the nicest in the world.” I wish you all could have been there.

GPPA met in Waterloo, Iowa, on October 18–20, 1984. Alinda Campbell hosted the conference at the Grout Museum and Planetarium. She offered a good and inexpensive meeting with paper sessions and demonstrations.

MAPS members participated in an extensive watch during the recent annular eclipse. Their enthusiasm was not dampened by the variable weather reported along the path. Meanwhile, the 1985 MAPS meeting will be held at the Hayden Planetarium in New York, May 1–4, 1985.

GLPA met this fall at the Wauwatosa West High School Planetarium, Wauwatosa, Wisconsin. The Spitz Memorial Lecture was given by George Reed.

PPA will hold its spring convention April 11–13, 1985, in Yosemite, California. What a place for a conference. There’s no roof but they do have half a dome! (And what a star projector.) Michael Chriss of the College of San Mateo, 1700 West Hillsdale Road, San Mateo, California, 94402, has details.

SWAP—In August, I visited the Dallas-Fort Worth area and found the school planetaria gearing up for the annual invasion of students. I would especially like to mention John Pogue at Grand Prairie and Donna Pierce at Highland Park for bringing me up to date on SWAP doings. The 11 area planetaria get together regularly for “local group” meetings. When I passed through, they had just had one of these dinners (planetarians, I note, do consume mass quantities of food and drink) at Bill Dexter’s (Richland College Planetarium).
Providing science instruction for the lower elementary grades has always had its problems. With the children's natural curiosity and enthusiasm comes a short attention span. The available textbooks may be two years ahead of grade level in reading difficulty (1), (2). Some teachers suffer from science anxiety (3). And often there is not enough money for supplies and equipment. More recently, the politically popular "back to basics" movement has resulted in downgrading or outright elimination of elementary science instruction in many schools (4), (5), (6). Development of skills in thinking, in discriminating fact from fantasy, and in observing and predicting are being sacrificed to the improvement of a few narrowly specialized skills in reading and computation. Ironically, investigations have shown that science experiences help significantly with developing language and reading skills (7), (8).

We have been experimenting with a way to keep science in the curriculum by integrating it with reading instruction. Not by having children "read about science" but by using basic science lessons as a part of learning to read. A natural way of doing this is with the Language Experience Approach (LEA), an approach that combines the children's experiences with their own language patterns. Studies have shown that children instructed this way perform better on measures of reading achievement, creativity, creative writing, and spelling than do children instructed in other reading programs (9), (10), (11). The Language Experience Approach is based on the assumptions that: what you think, you can say; what you say, you can write, what you can write, you can read (12). Of course, not all thoughts can be put into words, but the great many that can be verbalized are the sort we use. The instruction proceeds in steps:

Step 1. The teacher provides students with an idea in as concrete a form as possible.
Step 2. The students dictate a story based on the idea and the teacher writes it down.
Step 3. The students read the story with the teacher until they become fluent.
Step 4. Follow-up skills work is done on the selection.

Science lessons are an excellent source of concrete ideas for stories for LEA reading instruction. LEA can be used for expanding concepts and vocabulary in science, building sight vocabulary, learning words in context, and for reading sentences as units. The approach can be used with or without a text.

In this type of instruction, the teacher first plays an active part, providing a stimulus through a science lesson, drawing out words and phrases. Then the teacher records the children's stories without making corrections. Finally the teacher guides the children through the skills work, clarifying content, editing for sequencing, spelling, and punctuation.

**LEA READING UNIT FOR CLASSROOM INSTRUCTION**

The LEA reading unit reported here is based on an astronomy lesson, "The Moon," in a form adaptable to grades 1, 2, 3. As part of this unit, we developed a planetarium lesson to supplement the class instruction. We were encouraged to do this by the results of an earlier test of an LEA science-based unit on dinosaurs.

"The Moon" was tested on two first grade classes of 22 students each. Both teachers were experienced professionals, knowledgeable in the astronomical content of the unit, and imaginative in their handling of new teaching material. Both were free to modify the LEA outline we provided as long as they retained these objectives:
The student will be able to:
1. Tell what the moon is and how it moves.
2. Explain how we see the moon.
3. Explain when we can see the moon.
4. Draw the moon in its sequence of phases.

The instruction was to emphasize: that the moon always keeps the same face toward the earth; that the moon is always the same shape but appears to change shape because the lighting changes during the month; that the motion of the moon, and thereby the changing of phases, is regular and predictable.

One teacher kept strictly to the subject of the moon. The other treated the moon as part of a unit on space. Each class had a browsing table of books on astronomy. Art work in the classroom centered on the unit theme. Students made drawings of the moon in its different phases. They also kept an illustrated and dated moon diary through a month of phase changes.

The planetarium unit was designed to coordinate as closely as possible with classroom reading instruction. The core of the unit was on tape with two live segments offered where flexibility was needed. An essential feature of the planetarium lesson was the appearance on the dome of key words and phrases along with the narration and slides illustrating the reading lesson of the classroom.

The instruction was to emphasize: that the moon always keeps the same face toward the earth; that the moon is always the same shape but appears to change shape because the lighting changes during the month; that the motion of the moon, and thereby the changing of phases, is regular and predictable.

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The key word and phrase captions were in manuscript writing presented to resemble the writing on the classroom chalkboard (Figure 3). Standard practices of reading instruction and the astronomical content of the unit determined most of this material. However, by scheduling a few days' lead time, we arranged a surprise for the children. Slides of their own drawings and selections from their own stories appeared in the planetarium sky (Figure 4). The result was a spontaneous oral reading session. After the program, the children gathered around and read their stories from the flip chart. Scores on a test given a week later indicated they had achieved a reasonable mastery of the essentials of the moon lesson: 89% for the class that worked exclusively on the moon and 83% for the class that studied the moon as part of a space unit.

TRY IT YOURSELF

With a little imagination, you can design science-based LEA reading units. But you may wonder if it would be
realistic to expect a planetarium or museum to provide matching programs coordinated as closely as the one we have described. Indeed it would. The scientific content of almost any unit you can dream up will very likely be part of the stock-in-trade of most public science education institutions. They all have facilities for quick production of slides and transparencies. And the people who do this work are forever on the lookout for new ideas to try.

ACKNOWLEDGEMENTS

The superb classroom preparation provided by Betty Karnes and Alma Cook, first grade teachers, Central School, Baxter Springs, Kansas, made it a pleasure to test this unit. And, of course, the test would not have been possible without the support of their principal, William Green.

BOOKS

LEARNING KITS

16mm FILMS

REFERENCES
THE PLANETS BY GUSTAV HOLST
A Planetarium Lesson by Dr. Gerald L. Mallon

PREFACE:
Programs on Gustav Holst’s *The Planets* can be found in most planetariums’ repertoires. This musical selection easily lends itself to a review of the planets and demonstrates the interconnections between astronomy and music. However, the following lesson plan describes a different approach to the usual presentation of the subject. In this version, the planetarium director and the music teacher “team teach” the concepts to the students, and actively involve them in their study. The students gather information about astronomy as well as music during the course of the lesson, and do so as full participants, not just as observers.

PURPOSE:
To examine the astronomy of the planets in our solar system and to explore the internal workings of the musical suite, *The Planets* by Gustav Holst.

MATERIALS:
Worksheets, overhead transparency of worksheet, overhead projector, slides showing facts and myths about the planets, records: *The Planets* and *Have You Seen the Stars Tonight?* (by Jefferson Airplane).

PREPARATION:
Set the planetarium instrument for current latitude and date. Set planets for proper position in the sky. Have slides, worksheets, etc. ready to use.

BEHAVIORAL OBJECTIVES:
By the end of the lesson, students should be able to:
1. List at least one major factual characteristic of each of the planets, (e.g. size, orbital velocity, etc.)
2. List at least one major mythological characteristic of each of the planets, (e.g. Mercury the messenger of the gods, Mars the god of war, etc.).
4. Verbally explain the musical elements that were chosen to represent the planet in the suite.

This plan has been successfully used in the Methacton School District Planetarium for the last four years. Although it is designed to be team-taught, it is offered here in a manner that would allow other planetarium directors, if necessary, to present the topic as the sole instructor.

Your comments on this lesson, as well as your submissions of other lesson plans for the secondary level (grades 7-12), are greatly encouraged. If submitting lesson plans, please remember to use the following format: Title, Purpose, Objectives, Materials, Preparation, Procedure. Thank you.

PROCEDURE:
[Introduction] People have been captivated by the mystery of the universe for all of time. They have watched and wondered about it for centuries. Aside from the actual scientific investigations into the make-up of the universe, people have been fascinated by its beauty and majesty. They have spoken about it in poetry and literature; they have represented it in art; and they have used it as a theme in musical selections—everything from “Fly Me to the Moon,” to the “Age of Aquarius,” to “Have You Seen the Stars Tonight?”, which you heard as you were coming into the planetarium.

Today we are going to be closely examining a piece of music written to depict some of the planets in our solar system. The suite is called *The Planets* and it was written by Gustav Holst in 1919. It contains seven movements, one for each of the planets seen in the night sky. If this is so, why are there only seven movements? (The Earth is not included because we live on it and thus don’t see it in the sky, while Pluto is not included because it was not discovered until 1930).

For our work today, we will first take a look at each of the planets to explore some of their physical characteristics and also some of the mythological ideas that have been connected with them. Next, you will hear a short part of each of the movements and try to determine which planet Holst is trying to represent in his music. During this section your music teacher will help you to understand why Holst chose the various instruments and musical patterns that he did to try to depict each planet.
The Astronomy of the Planets: Before we begin our review, please keep in mind that we are going to be using current information about the planets, but there are still a lot of things that we simply don’t know about them yet. Therefore, don’t be surprised if, in years to come, you hear something new about our solar system. A good example of this concerns the “ringed planets.” For the longest while, the only planet that was known to have rings was Saturn. Now we know that at least two more are ringed planets. Does anyone know which two these are? (Uranus and Jupiter)

As well as some facts about the planets, I will also be mentioning some of the mythological ideas associated with them. To people long ago, the planets were very special because they could do something that no human could; they could move among the stars. This is why we call them “planets.” That word means “wandering star” in the ancient Greek language. Because of their ability to move in the sky, people long ago thought of them as gods and attributed certain magical powers to them. (Use overhead to demonstrate) For each planet, then, I want you to list on your worksheet at least 1 fact about the planet and 1 mythological belief. (Distribute worksheets.) The closest planet to the sun is Mercury. . . (Proceed through each planet briefly mentioning some of the current facts known about the planet and some of the mythology behind them.)

The Music of the Planets: The music we are now going to hear will try to represent each of the planets. Music that is written to represent something is called “Program Music.” This is different from “Absolute Music,” which is written just for the sake of the music itself; that is, for the sound of it, not to try to describe something.

Listen now to the first movement and see if you can determine which planet Holst is trying to represent. Pay careful attention to the instruments used, the tempo, the dynamics, etc. (A short segment of the movement for Mars should be played. If the class cooperates, go from late afternoon to early night, bringing the lights back up for the next series of questions.)

Please raise your hands now and vote for which planet you think the music was trying to represent. Was it Mercury, Mars, or Saturn? How many for Mercury? . . . for Mars? . . . for Saturn?

The correct choice is Mars. Can anyone describe what instruments made the music sound like this planet’s mythological character? (Student responses: loud, Timpani Drums sound like cannons, trumpets sound like a charge into battle, steady rhythm—like marching.)

Now listen to the second movement. (Play a short segment of Venus, the Bringer of Peace. Slowly fade down the white and yellow lights, leaving the blue cove and then slowly fade down to night.)

Please vote now for your choice. Vote between Jupiter, Neptune, and Venus. How many for Jupiter? . . . Neptune? . . . Venus? The correct choice is Venus. Can anyone describe what instruments were used and for what effects? (Student responses: Quiet, slow music, violins, flutes, harp, French horn.)

Listen now to the third movement. (Play a short segment of Mercury, the Messenger of Gods. If the class is cooperative, use a fast display of daily motion to reinforce the notion of motion as portrayed in the music.)

Please vote between the following planets, Saturn, Mercury, or Neptune. How many for Saturn? . . . Mercury? . . . Neptune? Can anyone describe the reason for your choice? (Student responses) The correct choice is Mercury. What made it sound like this planet? (Student Responses: fast moving, light sounding, etc.) Can anyone tell what kind of notes were used? (Student response: probably 16th notes.)

Now listen to the fourth movement. (Play a short segment of Jupiter, the Bringer of Jollity. Bring the lights down in a dramatic manner to match the mood of the music.)

Everyone, please look at the planets left on your paper. Which planet do you think this movement was written to represent? (Student response: Jupiter) Can anyone pick out elements of the music that help it to represent Jupiter? (Student response: Royal sounding, trumpets fanfare, full orchestra, tuba sounds like laughing.)

Listen now to the next movement. (Play a short segment of Saturn, Bringer of Old Age. Fade the lights to night and use daily motion to slowly march the stars across the sky. Proceed to sunrise and end with the sun methodically moving across the dome.)

Please vote between the remaining three planets on your paper. How many for Saturn? . . . Uranus? . . . Neptune? The correct choice is Saturn. Can anyone describe why the music represents Saturn? (Student response: Slow; time seems to be ticking away, the sound of two chords being repeated sounds like a pendulum clock swinging back and forth.)

Now you will hear a short section of each of the remaining two movements, Uranus and Neptune. Try to put them into the correct order, and pick out the elements that make each sound like that planet. (Play a short segment from the two remaining movements. During Uranus, bring the lights down in an unexpected manner to match the mood of the music. Activate daily motion in a similar way to reinforce the concept of the magician. During Neptune, simply use a very slow daily motion and a very dark sky. The visuals should reinforce the music and not overpower them.)
THE ASTRONOMY OF THE PLANETS: In the space below, list the name of each planet in the Solar System and at least 1 physical and 1 mythological characteristic of each planet.

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THE MUSIC OF THE PLANETS: In the space below, list the planet depicted by each movement in the suite, and explain how the music suggests the planet.

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When operating any type of multi-image presentation, there is nothing more frustrating than having a projector lamp fail. Precautions to avoid this type of occurrence should be an important consideration for any theater operator. There is a simple method of constructing a lamp failure detection system which can be used by facilities unable to afford scheduled lamp replacement mechanisms.

HOW IT WORKS

The detector system consists of a power supply, an LED display panel, and a string of CdS photo-electric cells. The power supply converts 110VAC into 5VDC. A line is run from the power supply to each of the photocells which are mounted in the lamphouse of each projector and on to an LED on the display panel. (See Figure #1).

When a projector lamp fails to light, its photocell will not allow current to pass and its corresponding LED will remain unlit.

MATERIALS NEEDED

A 5-6VDC power supply, a metal chassis box (if no space is available on the console), and ribbon or multi-conductor cable are needed. For each projector a 10 mA LED, 220 ohm resistor, and VT-341 CdS photocell are needed.

SYSTEM ASSEMBLY

1. The first step consists of mounting the photocells in the projectors to be monitored. If the projectors are rack mounted, the easiest solution is often to cement the cell on the steel pan beneath the projector.
Be sure that the cell will be illuminated by the lamp. Most Ektagraphic projectors have a small rectangular opening in the bottom of the chassis directly below the changing mechanism which is perfect for this situation. A carefully drilled $\frac{1}{2}$ inch hole will solve the problem in other cases.

If the projectors are not rack mounted, the cells should be attached so that the projector can be easily removed for maintenance; for example, with a magnetic cell (See Figure #2).

![Figure #2]

2. The second step is to construct the LED display panel. Solder a resistor to the positive lead (the lead extending out of the rounded side of the lamp) of each LED. Then solder a wire from the negative leads (the lead extending out the flat side of the lamp) to the negative side of the 5 VDC power supply.

Next, mount the LED display. If there is room on the control console, mount it directly into the console itself. Otherwise, it can be mounted in a metal chassis box located elsewhere. Mounting the LEDs is simply a matter of drilling a series of holes the diameter of the LED and cementing the lamps in place.

3. Next, the LEDs must be connected with the respective photocells. Begin by connecting one of the wires in the multi-conductor or ribbon cable to the positive lead of the power supply. Then run this wire to the positive lead of each photocell, stopping at the last one. Next, solder each of the remaining wires in the cable from the negative lead of a photocell to an individual resistor (one wire per resistor). Each cell should be thus connected to a separate LED. The LEDs and projectors can then be labeled with corresponding numbers to help locate a specific faulty lamp.

CHECKING THE SYSTEM

The system should now be fully operational and ready to test. To begin the test, plug in the power supply and check the LED panel. If all of the projectors are off, none of the LEDs should be lit. Next, turn on all of the projector lamps. All of the LEDs on the panel should now be lit. If one is not, check to see that its corresponding projector is operating. If all of the projectors are operating properly, but the display is not indicating it, recheck all connections and photocell positions.

NORMAL OPERATION

Now that the system is operating properly, it's time to integrate it into specific programs. If dark slides are inserted into the starting tray positions, none of these checks will be visible to the audience.

If all projector operations are normally controlled manually through the console, the first command before running a show should be to turn on all projector lamps for approximately five seconds. The operator should check the LED display at this time to be sure that all lamps are operating. If one fails to illuminate, the operator can stop the show long enough to replace the lamp.

If an automated programmer is used, a cue should be inserted prior to the beginning of each different show to illuminate all of the projectors for approximately five seconds. If one of the LEDs fails to light, the program should be stopped and the corresponding bulb replaced.

After completing a successful test with either type of system, all projectors must be advanced by one position to remove the dark slides from their gates. Now you can start the show with an extra amount of security.
When computers were being invented some years ago, we all knew that if we ever got one, we'd use it for astronomical calculations and keeping track of inventory and expenses. We probably didn't realize their future popularity in games or their importance in word processing or to control planetarium special effects projectors. One of their real strengths, however, is still coming into its own, and that is to transmit information.

With a modem, we can tie our microcomputers into the telephone lines and talk to other microcomputers. A modem allows us to transmit standardized text in a form that other microcomputers can read, and breaks the language barrier between brands and formats. Of course, there are other ways to transmit information too—by telephone and mail—and each has its place. Short nontechnical messages directed to a single person go best as a telephone call, and the mail is great for sending books, photographs, and complex drawings, but electronic mail is not just a duplication of these two. With a modem, you can transmit lengthy text (like the contents of this column) immediately to an editor who need not have a modem, you can transmit lengthy text (like the contents of this column) immediately to an editor who need not have his computer waiting to receive as you send, and that requires coordination. A way around this problem is that to send text to someone, that person has to have his computer waiting to receive as you send, and that requires coordination. A way around it is for both parties to join a service that sells the equivalent of post office boxes: to send a message you transmit to the other person's box (or post it on a public message board), and he reads it at his leisure.

One possible use for electronic mail that could benefit the I.P.S. is to maintain a directory of members and information on planetariums—their staff, operating hours, current shows, special events, etc. This information would, of course, be kept as up-to-date as a recorded phone message. A person wanting to know who is who or what is happening at planetariums in Virginia, for example, would call up the service, select Virginia, and read or print the data stored there. Compared to typesetting, printing, and mailing in bulk, such an electronic data service would be cheap and efficient. At present, too few people have microcomputers and modems for such a service to be really useful. But similar directories do exist today and within a few years, they will be common.

The modem's strength is in transmitting detailed text and numbers quickly and accurately to a great number of people, and this clearly has a use in astronomy. How often have we heard about the discovery of a new comet and wished we could immediately get precise information on it? We could, of course, call the Smithsonian Astrophysical Observatory and ask Brian Marsden to read the orbital elements or coordinates to us over the phone, but his patience and time are limited. The information will eventually come via the I.A.U. Announcement Cards if we have a subscription—but not for several days. The microcomputer now provides a fast and accurate path to the information. This year, the Central Bureau for Astronomical Telegrams initiated a service that lets us read and print the telegrams as soon as they are prepared, selecting them from an index by date and topic. To use the service, you must establish an account and pay a monthly fee. Contact the Bureau at 617/495-7030 for details.

Another great service is offered by the U.S. Naval Observatory in Washington (the "USNO Remote Data Access System"). There are quite a few options available (such as the status of numerous navigational satellites) that few of us will use, but others could be very useful. You are allowed to tap into their computers and programs and calculate sunrise, sunset, and twilight times for any location. You can also find the sidereal time or the standard time for any location on earth. Programs already exist for microcomputers that will do most of this, but it's comforting to have the authority of the Naval Observatory behind the numbers if it's important to be accurate. Call 202/653-1079 or FTS 653-1079 and be sure to set for even parity, seven bits, and note that the system is fussy and will throw you off immediately if you give an inaccurate command or wait too long to respond!

Several astronomical societies have begun to exchange information via microcomputer and more will certainly join in the months to come. Those already operating are run by the Houston Museum of Natural Science
(713/526-5671), the Central Florida Astronomical Society (305/268-8576), and the Kalamazoo Astronomical Society in Michigan (616/342-4062). All are free (except for the cost of the phone call) and open to anyone. A common feature is the posting of news of interest to the general group (as upcoming society or museum activities and lists of local clubs and officers), and upcoming astronomical events. Each service allows users to leave messages for each other and post notices, questions, and ideas on public bulletin boards—the real attraction of electronic services for most people. There may be listings of astronomy programs that can be downloaded. The Houston board, the most ambitious of the lot, even allows callers to play astronomical games. One hint—phone rates are cheaper after 11 p.m.

A national astronomy bulletin board is hosted by CompuServe, one of the largest commercial information exchanges. You must subscribe to CompuServe to use it, but the rates are only $6 per hour with no initial membership fee, and you access CompuServe through the closest of hundreds of phone numbers scattered across the country. If you live in a metropolitan area, this means only a local (i.e., free) call, but if you live in a rural area, you may have to dial a number in a nearby city. Once connected, you can choose to participate in the Space Special Interest Group, an "interactive online forum for people interested in all aspects of . . . outer space." Here, you can exchange information with people all over the country. In typical messages, someone will ask for assistance in selecting a telescope, another will ask for information on Halley's Comet, someone else will post a news item of general interest, and there will be an astrophotography question. Before last May's annular eclipse, the board was flooded with requests for information on observing sites and filter combinations. And, of course, you can read the replies (unless they are private) or jump in and add your own two cents' worth. A separate section allows you to contribute or download astronomy programs in BASIC.

Although the logic of the operating instructions still escapes me, it's all wonderfully interactive and, with a few dozen regular participants, including some professional astronomers and planetarians, it's growing to where it will soon be an important source of assistance and place to post messages. See you there—I'm #74156,473!

Both Sky and Telescope and Astronomy magazines use CompuServe to disperse the computer programs they review. You browse through the Public Access Area of CompuServe's Information Services until you find a program you like, and download it error-free to your computer. Sky and Telescope also provides a limited news bulletin service of astronomical events.

When telephones were new, people who owned one had the problem of too few people to talk to. We are in a similar situation with microcomputers and modems today, but the benefits of exchanging information electronically are so great that progress is swift, and in a few years, people who aren't linked in will find themselves on the outside.

The feature article in the October issue of the Griffith Observer is a lengthy review of astronomical software for microcomputers, written by yours truly. If you are not a subscriber and would like a single copy, send $1 to Griffith Observer, 2800 East Observatory Road, Los Angeles, CA 90027.

John Mosley has compiled and printed an index of major articles that have appeared in the Planetarian since Vol. 1, No. 1, and is making copies available for the cost of printing and postage. If you would like a bound copy, send $5.00 to John at the Griffith Observatory, 2800 East Observatory Road, Los Angeles, CA 90027. John will update his index periodically, and is also offering a Planetarian reprint service.
Regional Roundup
... continued from page 25

SEPA has also finished another successful conference. In fact, staff members of the Bishop Planetarium are probably still recovering from a meeting which even produced its own T-shirt. One of the highlights was an address by Von Del Chamberlain (new director of Hansen Planetarium) on “Through the Eyes of the Comet.” SEPA has given over much of its latest journal to historical references to the comet in poetry and advertising. This newsletter continues to stand as a most professional publication. Congratulations on keeping up the journal go to Thomas Hocking of St. Charles Parish Planetarium in Luling, Louisiana.

Two more comments and I will be done. The Astronomical Society of the Pacific also continues their fine publication “Mercury.” If you are not a member, I urge you to check it out. Recent issues have included tributes to the late George Abell and Bart Bok—both longtime ASP members and supporters of planetaria. Their book reviews are also an excellent guide to references in astronomy, science, and pseudoscience.

Lastly, if you have news of your region that should be in this column, send it to me. I cannot let the planetarium community know of your conference, your activities, etc., if I don’t have the information. There are still several newsletters not reaching my hands.

Gibbous Gazette
... continued from page 23

The Days of Future Past Award to Jim Eshleman of Macon, Georgia, who was the subject of an October ’84 Keyboard magazine profile, “Jim Eshleman Probes the Expanding Universe of Planetarium Music.” The article described Eshleman as a “newcomer who has been lining up a lot of planetarium gigs throughout the Southeastern states.” As Eshleman is quoted in the story, “The people at the Mark Smith Planetarium in Macon heard me... so I started doing original music for them. They wanted to explore new avenues for their shows, so they asked if I would do some live programs... Since then, I’ve been working with the Southeastern Planetarium Association, and they’ve set up a tour for me next year.” This was news to the folks of SEPA, who—aside from Ken Guyton at the Mark Smith Planetarium—had never heard of Eshleman. The “planetarium synthesist” has done a six-week run of a live concert at the Macon facility, and may, according to Ken, do some soundtrack work for them in the future. Eshleman’s reportedly planning to contact some SEPA facilities about possible future concert engagements. But, as of now, there is no tour set up for “gigs” on the SEPA “circuit.”

Finally, one last award, most serious and heartfelt: Planetarian Of The Year—Walt Tenschert. For a decade, Walt has been the common thread running through I.P.S. In ten years, as our Treasurer, he’s volunteered his time and talent for the professional betterment of us all. Now, Walt is stepping down from his leadership role, as he prepares to retire from the field. It’s hoped he’ll take with him a deep sense of personal satisfaction for all he’s done. It’s certain he has our gratitude and best wishes for the future.

Planetarium Usage for Secondary Students
... continued from page 30

Who thinks that they know the proper order? (Student response: Uranus and then Neptune.) Can anyone explain why? (Student response: Uranus—the music was both loud and soft, surprising changes, the unexpected changes in meter; Neptune—the music was soft, spooky sounding, no “home” tone.)

Conclusion: Thank the class for their cooperation and participation. Reiterate the mystery and fascination of the sky and redemonstrate the current positions of the planets and how to find them in the sky.
The first thing that I want to bring to your attention is the fact that I have moved. Please note my new address here: Lot 31, Woodland Trailer Court, Clarion, PA 16214.

The second thing I need to correct is an oversight on my part. I would like to add the authors’ names to my previous report on the second printing of “A Field Guide to the Stars and Planets” by Houghton Mifflin Company. Both Donald H. Menzel and Jay M. Pasachoff have done a fine job of producing this second edition. You may order directly from the address given in the previous column, or call TOLL-FREE (800) 225-3362.

Carl Zeiss, West Germany, a leading producer of precision optics, has introduced the M 1518, a new, all-astronomical planetarium projector system for mid-sized domes from 15 to 18 meters (49 to 60 ft.) diameter. The same size as their M 1015 projector, the new instrument closes a gap in the Zeiss line of planetaria, which now accommodates any dome from 8 to 25 m (26 to 82 ft.).

The new, compact Zeiss is of modular design and is available as a manually operated instrument or with an integrated, fully automated system.

Complete details on the new M 1518 planetarium for campus or civic installations can be obtained by writing to Anthony Jenzano, Planetarium Counselor, 37 Oakwood Drive, Chapel Hill, NC 27514 or by calling (919) 967-2543.

AstroMedia announces three products: “The Light-Hearted Astronomer,” a book by Ken Fulton; “Man Flies Free,” a new poster; and “The Cambridge Deep-Sky Album.” “The Light-Hearted Astronomer” includes chapters such as: Amateur Astronomers—A Strange Breed; Astronomy’s Jungle; The Ads; The Telescopes; What Accessories Do You Really Need?; Seeing What You Observe, Observing What You See; Living with a Non-Astronomer Spouse; and Is the Universe a Harsh Mistress? In his distinctive and humorous style, Fulton tackles these topics and many more. This new book offers something never yet published: a “survival manual” for amateur astronomers that tells it like it really is! The 128-page paperback is priced at $6.95.

Man Flies Free is a beautiful new poster featuring breathtaking photographs of astronauts Bruce McCandless and Robert Stewart on their first historic free-flying “space walk.” It is printed on high quality stock in brilliant color and measures 21" x 30". The cost is $4.95.

The Cambridge Deep-Sky Album, by Jack Newton and Philip Teece, is a 126-page authoritative text. Imagine having a powerful telescope at your command, sweeping the skies for distant galaxies and nebulae, searching out the secrets of the heavens. Through the magic of modern astrophotography, The Cambridge Deep-Sky Album brings you all of this and more. You’ll observe the delicate blue in the arms of the spiral galaxies, the stunning deep red of glowing hydrogen nebulae, and the silvery glitter of star clusters strewn across the sky. The Cambridge Deep-Sky Album is co-published by the Cambridge University Press and AstroMedia Corp. The cost of this book is $19.95 and can be purchased through Cambridge University Press or the AstroMedia Order Dept., 625 E. St. Paul Ave., PO. Box 92788, Milwaukee, WI 53202.

New from Theodore Stalec of the Physics Department at Kansas State University is a Planetarium Program for the Hearing Impaired. So, what’s new about this, you say? Just that it is for Apple-compatible computers! This disk is the first in a series of programs which will allow planetariums to be used by those with hearing problems, a computer, at least one disk drive and a monitor.

The program STARS is designed to introduce the planetarium sky, “to get them in the doors and wanting more.” Two longer programs are on the drawing board and Ted hopes others will follow. For programming buffs, he has also included an expanded version of the program. However, there are so many remark (REM) statements that the program will not run as it is written (but hopefully it can explain how the program works).

Anyone wanting a copy should send Ted a blank disk and a self-addressed stamped disk mailer for him to make you a copy. You may reach Ted at Cardwell Hall, Kansas State University, Manhattan, Kansas 66502.
JANE'S CORNER

JANE P. GEOHEGAN

We planetarians have been struggling with it for 50 years. I don't know why we got saddled with "planetarium" as the name for the place we work, but we should be satisfied that we've finally made the general public aware of what goes on in "that dark room."

But no! We got fancy. Some of us decided that maybe "planetarium" didn't really fit what was happening, so we decided to play around with the name where we work. First came "Space Theater", an attempt to describe the "feeling" of the place, the audio-visual superiority of the place, or some other perverse convoluted whim of the mind.

"Star Chambers" sprang up where "Planetariums" had been. I mean, really; 50 years of educating the public down the drain? "Atmospheriums" became the rage. Wanna go with me tonight to the "Hyperhemisphere"? Here's the latest: an "Explanetorium" in Three Rivers, Quebec and the "Infinium" north of Tokyo, Japan. I have no idea what goes on there; do you?

[Sigh.] Maybe I should give in. After all, it saves a lot of explaining if the name of your "domatory" kinda fits what goes on there. Hey, as a matter of fact, that's not such a bad idea; 'domatory': a place where a planetarian spends most of his/her life. It works! I think I've got the hang of it now . . .

Later. Planetarians Jon Bell of Peninsula Planetarium, Newport News, Virginia, (newly converted) Jane Geohegan and Francine Jackson of Gengras Planetarium in West Hartford, Connecticut wish to announce a new era in planetariumism: A N T S or Appropriately Named Theaters of Space! Here's what we suggest:

Astronauseum—A facility which specializes in simulated space sickness.

Laziarium—A planetarium which never opens.

Flatularium—A facility which simulates the methane gas and other gases in the atmosphere of Jupiter, Saturn and other gas giants.

Armageddome—Planetarium whose programming specialty is the demise of exploding stars, universes, etc., or the ultimate end of the Universe.

Pulsarium—Facility which utilizes energy from nearby neutron stars to activate stunning visual special effects.

Sparse Transit Planetarium—Older model of the Space Transit Planetarium whose star ball has been clogged up with dust so that the stars are barely visible.

Vacuurama—Facility which provides a breath-taking realistic outer space experience for school groups.

Solarium—Think of it! Be the first in your district to have a greenhouse by day and a star theater by night! The star projector projects only one star, but with an apparent magnitude of -26!

Soularium—Specializes in teaching break dancing under the stars.

Ennuisphere*—A place where only dull planetarium shows are presented (Editor's Note: It has been observed that most sky show scholars feel that "Ennuisphere" and "Planetarium" are synonymous.)

Pubesarium—A dark, domed environment in which 8th graders learn about stars, planets, and other bodies.

Humdrome—A combination beehive and planetarium. This honey of a facility studies the stellar orientation of stinging insects to the Praesepe star cluster.

Hertzsprung-Russelarium—Finally! A theater devoted to the use of every single technical diagram ever used in an astronomy textbook. (See also "Ennuisphere").

Recyclotron—Not a planetarium, but a facility that exists to enable planetarians to exchange one unwanted special effect projector for another.

Diarthearama—A theatre for long-running sky shows.

Spitzarium—Any facility whose star projector says its name when you turn it on.

Planhairium—Every seat has a hair dryer! To work in this fabulous facility, one must have a degree in cosmetology.

Anachrodome—Any currently existing planetarium that started out as something else; e.g. hockey arena, stairwell, library.

Hubba Bubbasphere—A national repository for all the gum scraped off planetarium floors each year.

Alternatarium—A planetarium which was later converted to something more profitable; e.g. hockey arena, stairwell, library.

Here's to ANTS! I hope you can see your way clearly to write me and suggest ones we may have missed in your district.

*See also "Boritorium," "Tedium," and "Dulldome."