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Editor's Message

This issue marks the end of two years that I have held the job of Executive Editor. This issue is late in coming to you due to a delay for which I am totally responsible. I think that this is inexcusable. I am resigning my position.

When I accepted this position, I did so thinking that I could provide a service to the Publications Committee and to I.S.P.E. Now I find the position is simply more than I can handle. The job requires a certain kind of knowledge that I do not have, talents that I do not possess and an ability to handle situations that I cannot.

I feel that the Executive Editor should not allow personal matters to interfere with the work that must be done for the journal. He should not accept commitments in his job, church, community and family to reach the point where he simply does not have the time to devote to the journal that it requires. I have allowed this to happen too often. For the welfare of the journal, I feel that I must bow out and allow someone else, more capable than I, to provide the needed leadership.

I will preserve "my" eight issues of the Planetarian always. I enjoyed doing them. Thank you for the privilege.

Bill Fagan

Notes

Bill is a bit hard on himself. Two years ago, when we needed an Editor, Bill was willing to jump in with both feet and try to help ISPE. He did the best he could within his own circumstances, and we could not ask more than that. We owe him a great deal of thanks - he put himself on the firing line and helped us rebuild our journal. The PLANETARIAN will carry on, thanks in part to Bill's efforts at a crucial time.

John L. Cotton, Jr.
Publications Chairman

Readers are advised that there will be no interruption of The Planetarian. Until a new Executive Editor is selected, send all material for publication to Ronald N. Hartman, Dept. of Mathematics-Astronomy, Mt. San Antonio College, 1100 N. Grand Avenue, Walnut, California 91789. Telephone: (714) 598-2811 Extension 258, or leave message with the Secretary at Extension 361.

SURVEY results and conclusions will appear in the March, 1978 issue of The Planetarian. To date, 54% of 400 survey forms have been returned. We thank those of you who took time to respond. We appreciate it. -RNH
1978 CONFERENCE INFORMATION

The Washington meeting of the International Planetarium Society is scheduled in August for three main reasons: convention rates are lower in Washington in the summer, Washington is a good place to combine a vacation with the conference, and the Smithsonian museums are open until 9:00 p.m. Professional activities will occur during the business day and participants will be urged to enjoy the museums in the early evenings.

In addition to paper and business sessions the agenda will include a number of lectures. Dr. David Morrison of the Lunar and Planetary Sciences program of NASA will discuss exploration of the solar system. Dr. Phillip Morrison of MIT will bring us up to date on high energy astronomy just prior to the launch of the second High Energy Astronomy Observatory. Dr. George Field, Director of the Harvard-Smithsonian Center for Astrophysics, will conclude the session with an overview of astronomy from space.
On Monday evening, as the National Air and Space Museum closes to the public, delegates will gather in the Museum's IMAX theater. Michael Collins, Director of NASM, will welcome IPS members and introduce Dr. Owen Gingerich, who will present a lecture on "Great Conjunctions in History."

On Tuesday evening another lecture will be held after museum hours in the National Museum of Natural History. Dr. John A. Wood from the Center for Astrophysics will speak on "Rocks from Space." Delegates will be encouraged to visit the meteorite and lunar sample galleries prior to this lecture.

Wednesday sessions will be held at the Maryland Academy of Science in Baltimore. That evening an open house will be held at the U.S. Naval Observatory.

Three more lectures are planned. Vincent Di Fate, noted science fiction illustrator, will speak on "Out-of-This-World Illustration." Alfred Bester, science fiction author and TV writer, will discuss writing for audio-visual productions. Finally, Don Hall will have some special remarks as he approaches the end of his tenure as President of IPS.

These events are intended to add interest to the meeting and help expand our professional abilities. The most important part of the meeting, however, will be the dialogue between IPS members through paper presentation and informal discussions. Your participation will help make the 1978 IPS conference successful.

INTERNATIONAL PLANETARIUM SOCIETY

1978 Conference
August 6-10, 1978
Washington, D.C.

REQUEST FOR PAPERS

All participants wishing to present papers should complete the following form and return it by May 1, 1978. (We can supply additional forms if needed or you may copy this form.) Late submissions may not be accepted.

Papers must be brief, concise and professional, and may be presented only by persons registered at the conference. Because of the number of presentations expected and the amount of available time, we may not be able to accept all papers. Notification of acceptance will be made by June 15, 1978.

Papers shall not be done for commercial or advertisement purposes. We reserve the right to request submission of entire papers before final acceptance is made.

Dennis Mammana
February 6, 1978
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ABSTRACT (150 word maximum, typed and single spaced)

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SUBMISSION DEADLINE: MAY 1, 1978. Please send to:

Dennis Mammana 3365 NASM Smithsonian Institution Washington, D.C. 20560
Phone: (202) 381-4193

Date received by NASM __________
DEVELOPMENT OF THE PLANETARIUM PROFESSION

Robert C. Tate

Many planetarium people who are associated with schools and school systems will be quite familiar with the movement within education to make teaching a "profession". In fact, there seems to exist a trend to make many occupations into professions, or to add an air of professionalism to the jobs that people do. It is not unusual that people who have devoted their lives to working under the planetarium dome would also be interested in the professionalism associated with their work. At a number of conferences during the past few years, discussions have occurred, usually on an informal basis, concerning just what is considered professional conduct on the part of planetarium people as they deal with each other, the public, and their administrators.

A number of members of SEPA feel that it is time for these discussions to become a formal part of SEPA activities, and the purpose of this article is to open discussion within the society to try to develop guidelines for the development of professionalism in the planetarium community. It is hoped that the discussions will continue for some time, and it is imagined that they will, for there is little agreement now as to just what constitutes a real "pro" in the planetarium. In addition, there are planetariums with decidedly different philosophical functions, and there may be little common ground as to how our business is conducted. We may find common agreement in one area, however, and that deals with our relations with administrators. This is at the heart of many of the problems of the planetarian, and it is here that discussions and guidelines on professionalism may have their greatest value.

WHAT IS A PROFESSION?

It may seem odd to have to ask this question, but everyone has a different idea of just what a profession actually is. There is general agreement that doctors, lawyers, and ministers are professionals, but then we also refer to an expert brick mason as a real "pro", and prostitution is still considered the oldest profession. Naturally the word "professional" can take on a number of meanings. It is probably good to settle on a sociological model of a profession so there will be some common grounds to make our discussions meaningful. The following model is taken from a number of sources, and seems to fit our needs.

As each point of the model is listed and explained, evaluate a number of occupations on a scale of one to ten to see how each rates. Try to evaluate planetarium work as one of these occupations to see where we now stand as professionals.
1. THE PROFESSION IS BUILT ON A SYSTEM OF KNOWLEDGE, FOUND IN PUBLISHED LITERATURE. THIS KNOWLEDGE IS BOTH OF THEORY AND TECHNIQUE.

The profession deals with information which is found in a system of knowledge which is published. This knowledge should be more or less accessible in a free society. Any good library will have shelf after shelf of books on law. These books and publications preserve the knowledge necessary for lawyers to function. Some of the books will be on the philosophical basis of law, origins and history of law, collections of the laws of various governments, and the techniques used by good lawyers in their everyday practice (note that word practice, which is what professionals do). When new techniques and knowledge are developed, they are added to this published body of knowledge.

We in the planetarium profession are just now beginning to record our body of knowledge. While the theory of our primary subject, astronomy, is well preserved in print, the techniques of planetarium operation are yet to be adequately documented. It is not enough to know about the size scale of the universe; we must be able to develop within the planetarium visitor an appreciation and understanding for the scale of the universe, and we must do it in a dramatic, entertaining way with sensory experiences which we must know how to produce. We must know how to produce a total sensory experience for the visitor which will leave him with the feeling that he has had an emotional encounter with the universe. It is this type of technique which must be methodically recorded within the body of knowledge of planetarium operation to fulfill this requirement of the true profession.

2. THE PROFESSION EXISTS TO MEET A NEED OF SOCIETY.

Within society there is a fundamental need to cross rivers and stay dry; there is a need to move mountains to get at the minerals beneath; and there is a need to build tall buildings which do not fall in on people; thus the civil engineer is a member of a profession since he is capable of meeting these needs of society. Many of the needs of society are concerned with public safety, health, or peace of mind, and many are economic. The planetarium meets a very specialized need of society to know about the universe. While it is not a life or death situation, if one does not have an understanding of the universe, there may come a time in the future when such knowledge may be necessary for survival.

3. MEMBERS EXPERIENCE EXTENSIVE TRAINING BEFORE ENTERING THE PROFESSION. THIS TRAINING IS UNDER THE CONTROL OF THE PROFESSION.

All professions have extensive training periods. This keeps the public from accomplishing for themselves those tasks commonly performed by the professional. It takes more than an anatomy book and a couple of razor blades to remove an appendix, thus the doctor has had about nine years of training before he attempts it. The planetarian generally has a number of years of training before he is in a position to produce competent planetarium programs. Much of this training is in fields foreign to the planetarium.
The technique is usually picked up as an apprentice under the watchful eye of an experienced planetarium director. More formalized instruction and standardization of experiences might aid the profession.

4. **MOTIVATION TO SERVE IS THE REASON MEMBERS ENTER THE PROFESSION.**

The primary motivation of the professional is the desire to serve. Clergymen are not paid for services rendered, but are paid so their basic needs may be met, thus allowing them to better serve. When asked to list the benefits of their jobs, true professionals put money far down on the list. In this respect there are already many very professional planetarium people who could easily be making more money elsewhere, but who are dedicated to their work.

5. **THE PROFESSION IS SELF-REGULATING.**

The recent stand of the bar associations concerning whether lawyers can advertise their services shows the strength of the professional organization in regulating the profession. Often this self-regulation carries the backing of law. Medical schools are regulated more by the American Medical Association than by the government, but doctors are still licensed by the government. This licensing is a result of pressure by the medical profession in an attempt to keep unqualified people out of the profession. Thus pressure from the strong professions often produces legal recognition for the organization. Planetariums are not now self-regulating. Regulation is a volatile point since there is so much diversification among planetariums.

6. **THE MEMBERS HAVE A COMMITMENT TO THE PROFESSION.**

Professionals seldom change occupations. This is a result not only of dedication, but also the long training period needed to enter. It is now easy to enter the planetarium field, and many people seem to move in and out of it. Part of this trend is a result of the fact that there are so few planetariums, particularly in any given geographic region. Often whether a person remains in the planetarium field depends on many outside factors, seemingly beyond the control of the individual, such as salary, availability of positions, whether a home must be sold and a move made to a new area, etc.

7. **THE MEMBERS HAVE A SENSE OF COMMUNITY.**

Doctors mingle with doctors. Most members of a profession are in the same social class as other members of that profession and have similar goals and interests. There exists a very strong sense of community within the planetarium profession as evidenced by the large attendance at planetarium conferences in proportion to the number of people engaged in planetarium work.

8. **THE MEMBERS LIVE BY A STATED CODE OF ETHICS.**

Once firmly developed, the profession produces a stated code of ethics governing actions of members. Should a planetarian cast horoscopes on the side for pay? Or should he allow obviously erroneous material into a
planetarium program? How does he deal with the public and his superiors? These questions can be answered with reference to the code of ethics. The development of the code of ethics is a long and cautious process, with items often derived from need in response to specific situations.

Now that we are able to see what is involved in identifying a profession, we may list occupations generally considered professions by sociologists. They are as follows:

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The list is not complete and can be changed from time to time. It is interesting to note that school teaching, to which we often relate in our planetarium work, is considered a near-profession. Self-regulation is supplanted here by government regulation since education is now primarily a governmental function in our society. Planetarium work is sufficiently different from school teaching to justify the development of separate professions in the view of the author.

HOW PROFESSIONS DEVELOP

It is interesting to note that professions seem to develop along similar lines. Again sociologists tend to agree on the nature of this developmental process. It goes like this.

1. A NUMBER OF PEOPLE START PERFORMING A NEEDED SERVICE.

This happened as soon as the first planetarium was built. Often teachers find themselves entering the planetarium profession when the principal finds this new strange contraption at the end of the newly constructed wing of the school and, meeting the unsuspecting teacher in the hall, says, "You're it". Thus another person starts to perform the needed service and becomes a planetarian.

2. A TRAINING SCHOOL IS ESTABLISHED.

Once a number of people see that the need exists, and start to fill it, a training school is established. This may be a formal school or just an apprenticeship. Eventually some standards are established for the education of those entering the profession and a formal school established.
3. THE PROFESSIONAL ASSOCIATION IS FORMED.

This may happen before the training school is established. There are now a number of planetarium associations which were not in existence ten years ago.

4. THE PROFESSIONAL ORGANIZATION AGITATES FOR SUPPORT OF LAW FOR THE PROTECTION OF THE GROUP.

This has not happened in the planetarium profession. Presumably it would take the form of teaching certificates issued by state teacher certification boards for those operating planetariums in school systems. It could also occur if government grants are issued to planetariums. In this case the society might feel inclined to certify planetariums and only certified planetariums could be eligible for grants. This would be an example of governmental recognition and protection of the profession and has occurred with a noted museum organization.

5. THE PROFESSION GENERATES ITS CODE OF ETHICS.

Often also included in this sociological description of the process of professionalization is a change in name of the occupation to give it more class. Undertakers now want to be called morticians or practitioners of mortuary science, and school teachers are now educators. Likewise, garbage men are sanitation engineers, and the people who work in planetariums are planetarians!

WHY DEVELOP PROFESSIONALISM?

Developing ourselves into a profession, while an offensive idea to some, does have some definite benefits.

a. By becoming more professional, better service can be rendered to the public. Training schools, professional organizations, preservation and distribution of knowledge, and a code of ethics are all things which can benefit both members and clients. If we know how to produce better programs and lessons in the planetarium, it makes our service of greater value to those who give up their time to participate in the planetarium experience. Naturally some planetarium experiences will always be better than others, but the professional activity can only raise the level of quality of all planetarium offerings. No one ever died or lost his civil rights by seeing a bad planetarium program, though many have had bad experiences, and even these reflect upon us all.

b. Developing a set of educational standards for those entering the profession is a necessary task. What classes should an aspiring planetarian take in college? What classes should a well-rounded planetarian have had? What classes should a planetarium institute of master's level program offer? Having these guidelines on paper would be of service both to people who want to enter the profession, and to administrators who want to hire competent planetarium people.
c. Certification of training schools and programs for the training of those entering the profession.

d. Development of support for programs of research in planetarium education, techniques, and technology. What are the best planetarium techniques for facilitating learning? We cannot judge the value of the planetarium as a teaching tool as judged against the traditional classroom teaching methods until we know the best planetarium techniques. Research here has started, but more is urgently needed. The profession should support this work.

e. Develop an expanded planetarium market. Most of us owe our jobs to the Spitz planetarium salesman who knocked on administrators' doors trying to sell a most unusual product. Little of the work in establishing new planetariums has been done by planetarians. This situation should change if our profession is to grow. Our organizations should be aggressive in seeking out new potential locations for planetariums and do everything possible to aid in the design, financing, and establishment of new planetariums. This, in the long run, is good for us all.

f. Develop a code of ethics. Much discussion of a basic philosophical nature is needed here which is beyond the scope of this paper or its author.

We must plan for future accreditation of planetarium facilities, programs and personnel. The time will come when planetarium teachers will be certified by state boards of education. Most planetarium teachers in school systems are already certified, though probably not in planetarium education. Georgia, for instance, requires a planetarium instructor to hold valid teaching certificates in physics or math at the high school level, even though the lion's share of time is spent teaching elementary students. When asked, our societies should be able to outline certification requirements which fit the needs of the job. If we do not do this, it will be done for us. It may even be to our advantage at some future time to lobby for special certification of planetarium teachers. Likewise, it may become necessary to certify planetarium programs and facilities, though there seems to be no agreement on how or even if this should be done.

Developing the profession can protect members. Becoming professional in our activities helps to preserve our jobs, guarantees that those entering the field are competent, and that members will have planetariums properly equipped and designed. Horror stories abound concerning the treatment of planetarians by administrators who feel they need answer to no one for the way they treat their employees. A strong professional society can exert pressures directly or indirectly which lend support to the distressed planetarian. While this smacks of union activity, it is not. The professional organization may sanction a school system which has unjustly removed a competent planetarian, thus putting on notice to prospective replacements the nature of the job situation. The society can also act as arbitrator in situations of genuine honest disagreement between planetarian and administrator.
These services can be important in protecting those who work in a facility which is commonly considered a step-child of the museum, or ignored in the school system which considers the facility not as a vital part of the operations, but more of a public relations device to show how progressive the system is.

Finally, the name of the profession and all those within it is affected when one planetarian falls into disgrace. Providing the baseline set by a code of ethics protects all the members from the thoughtless actions of the incompetent.

RECOMMENDATIONS

The following recommendations are offered for consideration, refutation, modification, or just to get discussion going on who and what we are. Your thoughts on them are invited.

1. Change the stated purpose of all planetarium organizations to encourage the development of the profession. This is particularly true of ISPE which in purpose exists only to develop communication within the network of affiliates. ISPE is the logical vehicle to develop the profession.

2. Strengthen communication within the professional organizations. Our knowledge must be preserved in readily available publications. How many meetings of planetarians have occurred since 1974 when ISPE met in Atlanta? How many of these meetings bothered to publish their proceedings as was suggested as a valuable professional service by the author in his editor's notes in the ISPE Special Report #6, Proceedings of the 1974 Conference of ISPE? How much knowledge has been lost by the careless approach of program committees to this need within the profession? Preserving our knowledge is probably our most important job at this point in time.

3. Discussion, most productively within committees of our planetarium societies, must occur on the following topics. The list is not complete.

   a. The nature of the profession needs defining. What is considered a planetarium and what is not? What or who should be included in the profession?

ARE YOU BECOMING MORE PROFESSIONAL?

Where do you stand as a professional? Below are some indicators of professional appearance. You will never be professional unless you start to think like a professional. Doing these things will not make you a professional, but may help you to think like one.

1. Do you have a business card to introduce yourself as a professional planetarian?

2. Are your certificates, diplomas, etc. proudly displayed so others can see your pride in your professional accomplishments and growth?
3. What do you put in that little blank on your income tax form when it asks for "occupation"? Do you put "teacher", "astronomer", or "planetarian", or do you just scribble something illegible there?

4. Do you contribute articles to planetarium journals to preserve your knowledge? Do you attend planetarium meetings?

5. Do you operate according to some set of occupational or performance goals, or do you just drift along with the tide?

6. Does your instruction or programming display some theory of learning to which you adhere?

Where we go from here in becoming more professional will depend on the interest of those in our societies who feel a need to carry on the discussion started in this article. All contributions are welcome, all ideas of value.

References


... and you WILL like my program ...
TIPS FOR THE NEW PLANETARIAN—Part II

Edited by
William F. Rush

Part I, appearing in the Autumn, 1977 issue included the following sections:

I. INTRODUCTION
II. WHAT MAKES A GOOD PLANETARIAN
III. GETTING STARTED
IV. DESIGNING A PLANETARIUM

PART II

V. WRITING SCRIPTS

Jeff Hunt has several suggestions for preparing scripts:

"Script writing could be the most difficult job the new planetarian must undertake. It is very hard to keep the whole program within a reasonable time limit. One tends to ramble when writing instead of producing a clean, crisp program. It is best to keep your complete show within forty minutes; the shorter, the better. It will take several hours of diligent writing to produce a script to fit into the time limit.

There are a few ways in which you can develop a script for your program. The first and hardest way is to develop everything from scratch. Make a detailed outline on your subject and fill in between the lines as you research.

After generating an outline, there is a simpler path to follow. Find the appropriate material in books and magazines and modify the author's work to fit your ideas. Many college students have been failed for not giving credit to authors for their work. If you use another author's work, have the courtesy to write to the publisher and ask his permission to use the material. There should not be any problem if you do not charge admission to your planetarium.

You can exchange your work with others who are willing. The Great Lakes Planetarium Association Education Committee is presently developing a script library. To get full details about the library write to Jeanne Bishop, 1721 Canterbury Rd., Westlake, OH 44145."
These scripts are available at very nominal cost--usually the duplication cost. Scripts are often available at local and regional planetarium meetings, again at a low price. Occasionally an entire program can be had for free. Sources of such programs are the Hansen Planetarium in Salt Lake City and NASA.

Yet another possibility to consider is the purchase of programs from a larger planetarium. Although this may seem expensive at a few hundred dollars, the quality is usually high and it would probably be impossible to produce a comparable program, working alone, for twice the purchase price. While the purchase of a complete program may be out of reach to small planetariums, it should be considered carefully by medium size installations. I personally feel that planetarians waste much of their time needlessly duplicating each other's efforts.

VI. SPECIAL EFFECTS

Although a thorough discussion of special effects is more appropriate in another publication, the beginning planetarian ought to give this area some consideration at the start. Jeanne Bishop remarks:

"Generally, few special effects come with the planetarium instrument. Many planetarians consider the construction and use of auxiliaries a major part of their work. Others are philosophically disposed to think a limited number, with good teaching techniques, will adequately serve the purposes of good programming."

I fall into the former group, feeling that there are essentially two types of special effects. The first type is what I think of as an "observational effect" which reproduces some astronomical event (such as a lunar eclipse or meteor shower) as realistically as possible so that the audience can see the phenomenon as it actually looks. The second type of special effect can be thought of as an "explanatory effect" in which the physical cause of some observed phenomenon is demonstrated (such as a projector which shows an image of the moon moving into the shadow of the earth and disappearing). Ideally, seeing an observational effect should make the audience think "so that's what it looks like" and the ideal explanatory effect should make the audience think "so that's why it happens". Such an ideal effect is so clear that to see the effect is to understand the phenomenon with no need for verbal explanation. I always strive for at least one and usually two special effects of high visual impact in each of my programs.

However, one must be careful to avoid the tendency to make the planetarium special effect (particularly the "observational effects") so spectacular that realism is lost. This is pointed out by Jeff Hunt:

"Special effects can make or break your program. You must remember that you are trying to reproduce mother nature as accurately as possible. Make a sunset look like a sunset not an electrical blackout. Let the eyes of the viewers become adjusted to the darkness; it makes the effect of a sunset more realistic."
Whirling star balls tend to make some people nauseated. If you are going to produce some daily motion, start the movement very slowly to let the audience know what is happening. Then you can increase the speed of the motion, a little.

Many times, the intensity of the special effects are too bright permitting stray light to flood the planetarium dome. Keep the intensity of the projectors at a very low level. Your effects do not have to be bright to be spectacular.

Many planetarium directors feel that it is easy to overemphasize and overuse such special effects. Jeanne Bishop, after an interview with Dan Snow writes:

"Dan also feels strongly about special visual effects: 'A slide should not appear unless it adds something to the presentation. It's impressive to see a panoramic landscape of Venus, but what really does it contribute? A planetarium is for astronomy. I recently saw such a landscape in a multi-media production. Yes, it dazzled, but the stars portrayed were for the wrong season! This situation is pretty grim.' Dan said he thinks much of the spectacular and non-astronomical has appeared as the result of the thinking that the planetarium is a theater which must pay its way."

As the spectrum of opinions indicates, there is no "right answer" as to how many and what type of special effects should be in a program.

Assuming that you have decided that you need one or more special effects, the first question arises is whether to build or buy what you want. The answer depends on your particular situation, as summarized by Jeanne Bishop.

"With sufficient budget, you can order a good number of commercial projectors. With talent and time you can construct projectors which will produce the same effects at a fraction of the cost. The GLPA Instructional Materials Committee and various planetarium periodicals can offer suggestions. I think you must be aware of your planetarium programming objectives, your initial and operating budgets, and your own interests, talents, and time limitations when you decide if and what auxiliary effects to obtain. A word of caution: Do not spend an inordinate amount of time on auxiliary-effect preparation at the expense of effective total program preparation and presentation and important administrative duties (such as vigorous, positive public relations). Try to maximize the benefits of your planetarium for the population you serve."

Each planetarium director has his or her own particular favorite special effect projector and you must decide for yourself what you want and can afford. Jeanne Bishop has passed along her suggestions as to what she has found most useful:

"Special effects which I have found most useful in a variety of program situations (public adult and mixed groups, school science students, and multi-disciplinary school classes) and which may be
commercially purchased are: lunar and solar eclipses, comet, aurora, and evolution-of-a-star. Although a meteor shower is a useful effect, I have not yet seen a commercial projector which conveys the correct idea— that even in the heaviest annual showers, one or two detectable streaks per minute (not one hundred or so!) are normal. Moreover, an occasional arm movement with your projection arrow can suffice to give this idea. You will want at least one carousel slide projector, and if money is available, four to eight would be useful. Also acquire as many small single-frame slide projectors without fans as possible, for you will find that they have endless uses. Install rheostats on projector light (not fan) sources, for best effect in use. If you will not have panorama skyline projection, make a silhouette with buildings, trees, and other skyline objects of heavy, black construction paper (available on rolls) for your dome. Remember to keep the scale small to keep the impression of 'vastness.'

VII. MUSIC

Jeff Hunt offers several suggestions on music.

"Selecting music to accompany your script can be made effortless, if you select a theme for your program.

If you go the the cinema frequently, you may find a good idea for a program by listening closely to the music soundtrack. It may take more than one viewing of a movie to discover its musical score.

Many times music is overused in planetarium shows. I like to introduce a new idea with ten or fifteen seconds of music fading it down to a level that suitably mixes with my voice. I let the music play for about two more minutes at this level and then fade it away. When another new idea is introduced, I do the same thing. Once in a while, I let the music play through the whole idea that I am presenting. When that section of the script is completed, I immediately stop the music and start the next piece of music. This is a good 'attention getter.' Never use music with singing in it because it can draw attention away from your words and to the singing."

Suggestions on specific selections as well as more thorough discussions of the philosophy of music selection, I suggest reading the articles in The Planetarian of March 21 and June 21, 1973 by David Solzman.

VIII. TAPE OR LIVE

Perhaps no single question has generated as much debate among planetarium directors as whether or not programs should be taped. Virtually all planetarians feel that the best shows are those given by a live speaker. Unfortunately, a slip of the tongue, a series of closely spaced programs or a stubborn cold can result in a less than satisfactory presentation. The question of whether to tape or not is a question of balance between the closer audience
contact of a live lecture and the greater convenience of a taped program. Jeff Hunt describes some of the relevant considerations.

"How are you going to present your show? You can either tape it, or do it live, but which is best? There have been many discussions about the best way to present a planetarium program, but your experience will eventually tell you what is best for your style. Before you decide the method of presentation, you may want to ask yourself these questions. How many times will the program be used? Will there be several presentations within a short period of time? Will the program be used again sometime in the future? If the program is going to be used several times, you will probably want to tape it. That way you have an option when it comes time for your show.

Another point to consider is the amount of special effects you have in your program. If you decided on a large number of effects that take an enormous amount of concentration to operate, you will want to tape the program. Operating special effects and talking is not like walking and chewing gum at the same time; it is a difficult situation. When in doubt, tape your program. You may find that the operation of the special effects may not be as difficult as you first thought."

Jeanne Bishop, in interviewing Dan Snow, gives us a reaction of one planetarian who dislikes taped programs:

"Dan is totally against a completely taped program for any audience. He believes that it is an insult to one's audience if a live presenter is not there. He likes taped music at the beginning and end of programs, however. His preference is for quiet, mysterious passages to introduce the stars, which he has termed the 'darkness falls on the wings of night' approach. For sunrise he uses music which contributes an uplifting mood (He likes to let stars gradually fade to such music with no voice). He also uses various sound effects, such as bird calls. But he cautions to use special care lest the birds depicted are not in season! In this age when so many public--and even some school--planetarium programs are completely taped, this philosophy probably seems unusual. Dan believes the value of the live presenter has been overlooked."

IX. GIVING A SHOW

The diversity of programs and individual styles makes it difficult to give any rules for presenting a program, but Ruth Howard has a few general tips:

"Start the pointer at the zenith and call the attention of the audience to the direction in which it is going to move.

Move the pointer slowly and as steadily as possible. It is very easy for the audience to lose the arrow, especially if that audience is unacquainted with the sky."
Turn on rheostated switches slowly. You will see any error in switching before it becomes apparent to the audience and can make a correction without their ever knowing it occurred.

Although some "purists" may object to a slightly oval sun, I have found that by projecting the orrery onto the curving portion of the dome, rather than directly overhead, you can create the illusion of elliptical orbits and illustrate Kepler's first law more effectively. Few of the audience will be aware that the sun is not round! The orbit of Mercury, in particular, will show this effect.

Despite the fact that many planetariums do not allow children under 6 or so, we have found that the pre-schoolers--4-year olds, especially--respond well to a 20-minute program entitled, 'What Happens at Night.' This works best when the group leader has prepared them for the dark before they come to the planetarium. This program is a good introductory program for kindergartners, too.

Keep within the time limits you have publicized for each program, especially for public programs, as many in the audience may have timed their parking meters to correspond. They will become fidgety if they feel trapped and know that their meters are running out!

X. ANOTHER ROUTE

Although most planetarium directors have learned the planetarium aspects of their profession by trial and error and informal conversations with more experienced planetarians, there has been an increasing trend toward more formal training. Frank Jettner published a list of institutions offering coursework in planetarium education in The Planetarian, June 21, 1973, p. 78.

Internships are becoming more common, also. The experiences of new planetarium intern, Kenneth Wilson, provide insight into the operations of such a program:

"Beginning with the 1976-77 internships, funding has come from the National Museum Act. Initially, each intern received a stipend of $5000 for a period of up to one year. This stipend has now been increased to $6000 for one year.

Perhaps the best description of the internship can be found in the one page information sheet mailed to prospective applicants. It states:

[The internship is] a 12-month period of 'learning by working.' There is no formal program, but the successful candidate will be able to pursue personal interests along with regular staff assignments in a variety of planetarium specialty areas. These include script preparation, public speaking, show operation, program
production, sound track recording, photography, visual design and special effects projector construction.

Prospective applicants of the Strassenburgh Internship should be advised that preference is given to candidates with a bachelor's degree and some planetarium experience, either paid or voluntary. In past years, the average number of applicants each year has been about 30.

There have been five Strassenburgh Interns before me. All have been placed in the planetarium field with such institutions as the Fels Planetarium, the Ruben R. Fleet Space Theater and the planetarium of the Smithsonian Air and Space Museum...I find the staff very professional, friendly and most helpful.

Finally, I would recommend that any new planetarian considering a full time career in the field, look into the Strassenburgh Planetarium Internship."  For further information write to:

Strassenburgh Planetarium
663 East Ave.
Rochester, N. Y. 14603

XI. SOME FINAL REMARKS

These few pages can never hope to provide answers to all of the many questions which can arise as you start your career as a planetarian. I hope that they have given you some feel for the spectrum of providing opinion among experienced planetarium directors, but the most important thing to remember is that you can only learn what works best in your situation by experimentation.

Virtually all planetarians are helpful and willing to share whatever materials and ideas they have. Make an effort to meet the nearest planetarians and do not hesitate to ask for help. We all wish you the best of luck!

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(as quoted in an interview with Jeanne Bishop, September, 1976)
Armand Spitz, as quoted by Dr. Harry E. Crull in the Second Annual
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The big news in our school system this month is "TESTING". Not only the big news, virtually the only news. Tests and surveys at every grade level are trying to determine a) vocational interests, b) math and reading skills, c) aptitudes, and d) a whole bunch of other stuff.

Most of the tests are in a multiple-choice format. I picked up one this week and glanced at one of the questions: "Entropy is a) a measure of the unavailable energy of a system, b) an ultimate state of inert uniformity, c) an award, usually in the form of a statue with engraved plaque, given at the close of a sports season to outstanding athletes, d) all of the above, e) none of the above."

H-m-m-m. Pretty tough stuff. There was also something wrong. The real answer, "f) the subject of a popular planetarium show called 'The Last Question'", wasn't among the choices! I became fearful and suspicious. Perhaps being a planetarian had creeped into my life more than I knew. After all, the process of becoming a planetarian may be irreversible; it began to bug me, so I examined one of the tests more closely and sneaked a peek at the answers.

It was devastating. I was hopelessly lost to the real world forever. The part of the test dealing with word definitions really wiped me out. None of the answers were right!

I'll show you what I mean: here are some words with the definitions that were chosen as correct...........

"slew - a large number, as a slew of people"

"light leak - a not-very-serious plumbing problem"

"ghost - a scary Hallowe'en creature"

"star field - arena used for Super Bowl Sunday"

"canned - adjective describing a food-preserving process"

"Spitz - famous American swimmer"

"zoom - to move with a loud but low hum"

(on second thought, that may be correct)

"relay - a type of running race"

"star ball - a gala event in Hollywood"

"brute force - applied by a strong person to a weak adversary"

"pointer - a large gun dog of a lean smooth-haired breed originating in Spain"
"arrow - the missile weapon used with a bow"

dissolve - to separate into component parts"

"Goto - little-known Japanese general in WW II"

"the planets - nine celestial bodies which revolve around the sun"
   (See what I mean? Everyone knows "the planets" is an obscure symphonic composition by Gustav Holst)

"cove - a small sheltered inlet, creek, or bay"

"console - to soothe in distress or depression" (Don't "they" know anything? It's no wonder that John Ryor, President of National Education Association, claims that tests are to blame for low scores, not the kids. Right on, John!)

"home - one's native land or place"
   (Close! But they left out the part about the unique spherical nature of "home")

Perhaps I'm OK. There's hope that there are more of me somewhere. If you're out there, help!

P.S. What are the only three words in the English language that end in "...cion"? Clue: A star freak should know one of them.
Panorama Techniques

Pat McGee

This information will enable one to produce a 360 degree planetarium panorama from photographic prints.

MATERIALS:

You will need access to a 35mm SLR camera (lens polarizer desirable), tripod, cable release, 1 roll 20 exp. color daylight print film, 1 roll 36 exp. color slide film (balanced for copy stand lights), copy stand (polarized lighting desirable), photographic gray card, two (index card size) pieces of flat black cardboard, exacto knife, color felt pen set, flat black paint and brush, straightedge, scotch tape, tape measure, see-through plastic ruler with mm scale, slide opaque and brush, slide masking tape, light table, glass-plastic slide mounts. (airbrush and Grumbacher gamma black paint are optional)

1. Load your camera with the print film and photograph a 360° scene. Overlap your shots to ensure total coverage. Use a tripod for longer night exposures. It’s best to use a high vantage point with no objects so close as to be cut off at the top of the picture. Print the resulting photos (3 by 5 size is fine, 5 by 7 size is better) on any non-glossy paper.

2. Assemble the prints in order and cut the ends with the straightedge and exacto knife so that the prints can be assembled with no scene overlap. Make your cuts in the least conspicuous spot so that the print ends don't butt together in the middle of a flagpole, for example. Tape the print backs together and measure the length \( l \) of the resulting mosaic. You may wish to color the edges of the prints with the magic markers before assembly to ensure that no white seams are visible in the mosaic. Paint black any areas you don't want projected (i.e., sky). If you encounter gradual transitions from light to dark, (for example, a light against a dark sky) you may need an airbrush to effect a proper transition. If most of your horizon lines are abrupt, you may choose to produce Kodachrome masks. I have found that the combination of black paint on the mosaic, hand opaque on the resulting slides, and a double mount yields sufficient density for satisfactory use in most panorama systems. Tape the two ends of the mosaic together so that you have a loop with the pictures on the inside. Divide \( l \) by \( n \), the number of pan projectors, and mark off this length on the loop, thus dividing it into \( n \) equal sections.
3. Cut off a piece of the mm. scale on the plastic ruler and mount it horizontally in a glass-plastic slide mount. Divide your dome circumference ($\pi d$) by the number of panorama projectors, $n$, in your system. Mark off this length along the dome horizon with black tape. Both tape markers should be placed within the projected format of one of the panorama projectors. Install and project the mm. scale in the projector and determine how many mm. units fall within the two dome markers. This is a direct measure of $i$, the desired image size, in millimeters, on the slides used in the panorama system.

4. Load your copy camera with slide film and mount on a copy stand. Note the focal length of the camera lens, $f$. You can now calculate $s$, the distance from the camera film plane to the section of the mosaic being copied. Be sure all your units cancel. (In my case, I have a 30-foot dome, 8 pan projectors $n=8$ each with a 2-inch lens, $f=50\text{mm.}$, $i=29\text{mm.}$, $l=1283\text{mm.}$, which gives $s=485\text{mm.}$) Set up the film-mosaic distance $s$, focus the camera lens, and place the two black cardboard pieces between the camera and mosaic so that they are out of focus and allow you to see $1/n$th of the mosaic. Use a gray card to set your exposure. Cross polarizers (light-lens) help to reduce glare. Tilt the mosaic about $15^\circ$ (as in diagram) if you have a keystone problem. Shoot the mosaic sections, remembering to take two shots of each (both 1 stop overexposed) if you plan to double-mount the results. You may feel safer if you bracket the shots as well - photograph at the $s$ distance and at $s\pm 0.05s$. Mount the slides that result and check the "fit" when projected in your pan system. If satisfactory, you can then do the hand opaque application and double mount, or make Kodalith masks for the horizon edge of the slide image.
You can produce very nice cross-fade, day to night scenes with this technique. I use a two projector twilight effect that fits above the town horizon and the result is smashing. To accomplish this, I have hand opaqued part of the pan horizon silhouette on the cloud slides, allowing you to fit the projections together like a puzzle.

If I can be of any help, please feel free to give a call.

Pat McGee, Director
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