THE PLANETARIAN
Journal of the International Planetarium Society
Vol. 18, No. 4, December 1989

Articles

09 Light for All ................................................................. John Stoke
12 Why Am I an Astronomer? ................................. J. Richard Fisher
16 Archival Project at Hayden Planetarium ................. Sandra Kitt

Features

19 Computer Corner ............................................................ Keith Johnson
21 Dr. Krocter ................................................................. Norm Dean
22 Scriptorium ................................................................. Thomas Hocking
23 Planetarium Usage for Secondary Students ............. Gerald Mallon
27 Secretary's Notepad ....................................................... Gerald Mallon
30 Forum: Conference Activities ............................. Lonny Baker
35 Gibbous Gazette .......................................................... Donna Pierce
39 Regional Roundup ......................................................... Steven Mitch
42 What's New ................................................................. Jim Manning
48 Kodalith Corner .......................................................... Georgia Neff
50 Jane's Corner ............................................................. Jane G. Hastings
A new star is born.
The Zeiss M 1015 Planetarium Projector System.
The ideal modular system for new or replacement installations.
For domes of 8 to 15 meters in diameter (audiences of 50 to 280).
Manual operation or integrated automatic system. Readily expandable with wide range of accessories.
Compact design for optimum viewing and operation.
Basic features of the main projector:
- About 5000 fixed stars, nebulae and star clusters down to a magnitude of 6.0
- Sirius
- Milky Way
- Sun with aureole and reddening
- Moon with surface details, phase change and nodal regression
- Planets: Mercury, Venus, Mars, Jupiter, Saturn
- Equator
- Meridian
- Ecliptic

FIRST TEN Sold Worldwide
3 in U.S.
Parkland College, Champaign, IL
Buehler Planetarium, Fort Lauderdale, FL
Andrus Planetarium, Yonkers, NY

Can we build one for you?

For complete details, contact:
Planetarium Dept. Carl Zeiss
Carl Zeiss
D-7082 Oberkochen
West Germany

For complete details, contact:
Planetarium Dept.
Carl Zeiss
D-7082 Oberkochen
West Germany

Carl Zeiss, Inc.
One Zeiss Drive
Thornwood, NY 10594
914-747-1800

West Germany
The Planetarian (ISSN 0090-3213) is published quarterly by the International Planetarium Society under the auspices of the Publications Committee. ©1989, International Planetarium Society, Inc., all rights reserved. Opinions expressed by authors are personal opinions and are not necessarily the position of the International Planetarium Society, its officers, or agents. The Editor welcomes items for consideration for publication. The Editor reserves the right to edit any solicited or unsolicited manuscripts to suit this publication’s needs.

Executive Editor

John Mosley
Griffith Observatory
2800 E. Observatory Rd.
Los Angeles, Calif. 90027
213-664-1181 day phone
818-988-0353 home phone & fax
CompuServe 74156,473

Associate Editors

Lonny Baker
Forum

Norm Dean
Dr. Krocter

Jane G. Hastings
Jane's Corner

Thomas Hocking
Script Section

Keith Johnson
Computer Corner

Laura Kyro
Book Reviews

Gerald L. Mallon
Secondary Students

Jim Manning
What's New

Steve Mitch
Regional Roundup

Georgia Neff
Kodalith Corner

Donna Pierce
Gibbous Gazette

Mark S. Sonntag
Focus on Education

PUBLICATIONS CHAIRPERSON

Carolyn Collins Petersen
Loch Ness Productions
P.O. Box 3023
Boulder, Colorado 80307

TREASURER AND MEMBERSHIP CHAIRMAN

Mark C. Petersen
Loch Ness Productions
P. O. Box 3023
Boulder, Colorado 80307

ADVERTISING COORDINATOR

Suzanne Gurton
Wallace Fiske Planetarium
University of Colorado
Campus Box 408
Boulder, Colorado 80309
303-492-5002

MEMBERSHIP CATEGORIES

Individual Membership:
U.S. (3rd class bulk mail): $34
Other North America (1st class): $5 postage supplement
Overseas Atlantic (1st class): $5 postage supplement
Overseas Pacific (1st class): $8 postage supplement

Institutional Membership:
$125 first year; $50 annual renewal

Library Subscriptions:
$24 with same postal supplement as above

I. P. S. JOB INFORMATION SERVICE

To receive word of new position openings in the planetarium field, send up to six self-addressed stamped envelopes to:
Donald Hall, Director
Strasenburgh Planetarium
P.O. Box 1480
Rochester, New York 14603

BACK ISSUES OF THE PLANETARIAN

Beginning with Vol. 14, No. 4, individual copies are $6.00 each.
All previous issues are $1.00 each from:
Charlene Oukes, IPS Back Publications Repository
Strasenburgh Planetarium
P.O. Box 1480
Rochester, New York 14603

The Planetarian is designed at the Griffith Observatory.
Printing by Victory Printing and Graphics, Van Nuys, California.
President
Terence Murtagh
The Planetarium Armagh
College Hill, Armagh
Northern Ireland, BT61 9DB, U. K.
0861-524-725

President-Elect
John Pogue
Grand Prairie ISD Planetarium
301 Warrior Trail
Grand Prairie, Texas 75051, USA
214-264-4731 x261

Past-President
Von Del Chamberlain
Hansen Planetarium
15 South State Street
Salt Lake City, Utah 84111 USA
801-538-2104

Executive Secretary
Gerald Mallon, Ed.D.
204 Haws Avenue
Norristown, Pennsylvania 19401 USA
215-631-9403 (office)
215-277-8767 (home and fax)

Treasurer & Membership Chairman
Mark C. Petersen
Loch Ness Productions
P.O. Box 3023
Boulder, Colorado 80307 USA
303-455-0611

1990 Conference Chairman
Lars Broman
Galaxen Convention Center
Jussi Björling's Road 25
S-781 50 Borlänge, Sweden
+46-243 734 27
FAX No. +46 243 734 02

1992 Conference Chairman
Von Del Chamberlain
Hansen Planetarium
15 South State Street
Salt Lake City, Utah 84111 USA
801-538-2104

Historian/Photo-Archivist
John Hare
Bishop Planetarium
201 10th Street West
Bradenton, Florida 33505 USA
813-746-4132

Elections Committee Chairman
Thomas Stec
Central Bucks East High School
Holicong and Anderson Roads
Buckingham, Pennsylvania 18912 USA
215-794-7481

Awards Committee Chair
Phyllis Piluga
The Adler Planetarium
1300 S. Lake Shore Drive
Chicago, Illinois 60605 USA
312-322-0319

IPS Permanent Mailing Address:
International Planetarium Society
c/o Hansen Planetarium
15 South State Street
Salt Lake City, Utah 84111

Please notify the Editor of changes of IPS Officers or Affiliate Representatives.

I. P. S. AFFILIATE REPRESENTATIVES

Association of Mexican Planetariums (AMPAC)
Ignacio Castro Pinal
Museo Tecnológico C.F.E.
Apartado Postal 18-816
CP 11870 Mexico City, D.F.
Mexico
277-5779

British Association of Planetariums (BAP)
Terence Murtagh
The Planetarium Armagh
College Hill, Armagh
Northern Ireland, U.K. BT61 9DB
0861-524-725

European/Mediterranean Planetarium Association (EMPA)
Dennis Simopoulos
Eugenides Planetarium
Syngrou Avenue—Amfithia
Athens, Greece
94-111-81

Great Lakes Planetarium Association (GLPA)
Sheldon Schafer
Lakeview Museum Planetarium
1125 West Lake Avenue
Peoria, Illinois 61614 USA
309-686-6682

Great Plains Planetarium Association (GPPA)
Alinda Wengenroth
Grout Museum of History & Science
503 South Street
Waterloo, Iowa 50701 USA
319-234-6357

Italian Planetaria’s Friends Association (AADP)
Loris Ramponi
c/o Civici Musei de Scienze
Via Orazzati 4
25128 Brescia, Italy

Middle Atlantic Planetarium Society (MAPS)
Thomas Stec
Central Bucks East High School
Holicong and Anderson Roads
Buckingham, Pennsylvania 18912 USA
215-794-7481

Nordic Planetarium Network (NPN)
Lars Broman
Broman Planetarium
Fjällhavren 7
S-424 49 Angered, Sweden
+46-31 30 28 37 (office)
+46-23 101 77 (home)

Pacific Planetarium Association (PPA)
Larry Toy
Chabot College Planetarium
25555 Hesperian Blvd.
Hayward, California 94545 USA
415-786-6881

Planetarium Association of Canada (PAC)
Ian McGregor
McLaughlin Planetarium
100 Queens Park
Toronto, Ontario M5S 2C6 Canada
416-586-5736

Rocky Mountain Planetarium Association (RMAPA)
Mickey Schmidt
Planetarium
U. S. Air Force Academy
50 AT(3/DO(3
Colorado Springs, Colorado 80840
719-472-2779

Southeastern Planetarium Association (SEPA)
Dave Hostetter
Lafayette Nat. History Museum
637 Girard Park Drive
Lafayette, Louisiana 70503 USA
318-268-5544

Southwestern Association of Planetariums (SWAP)
Donna Pierce
Highland Park Ind. School District
4220 Emerson
Dallas, Texas 75205 USA
214-526-4800
Letters to the Editor

Dr. Krocter Under Fire

We are fortunate to work in a field where humor is never far away—some of it's even intentional. We are also fortunate to have a journal which presents the lighter side of the planetarium world as well as discussions of serious issues. Unfortunately, the humor of Dr. Krocter frequently contains a sexual bias which does not belong in our professional journal. In the September 1989 issue, for example, we are treated to a curvaceous, faceless, planetarium ticket-taker named "Bubbles," who is subordinate to several males and takes the chubby nebbish Ralf home for the night, where he saves his announcement of her firing for the next morning—the better, we presume, to win her sexual favors that night. Aaargh!

Francis Biddy
Strasenburgh Planetarium
Rochester, New York 14603

A Reply

Apparently Fran Biddy needs some help reading the comics. He is quick to point out the Bubbles Bandera "is subordinate to several males" but failed to notice that the three males are, in turn, subordinate to a female.

His failure to note the obvious contrast between Bubbles and the quiet, competent, Ms. Plunder, and his apparent assumption that IPS women would identify with the former instead of the latter is revealing.

Dr. Norman Dean
Bel Air, Maryland

Dr. Dean tells me that this is his last Dr. Krocter column. I'd like to thank him for the humor he's brought us, and I personally will miss the adventures at Plunder Planetarium. Incidentally, Dr. George Pitluga, who is mentioned in this month's cartoon, will be celebrating his 80th birthday in 1990. He is doing well, travels a lot, remarried after his wife of many years died, and still teaches an Elder Hostel program in the planetarium in Oswego each summer. He can be reached at 1972 Canal Road, Deltona, Florida 32725.

From the Editor's Keyboard

First, I'd like to affirm that Donna Pierce made an excellent choice in her selection of Planetarian of the Year (page 37). I'd like to add my appreciation for all this person has done—it really has made a difference.

Second, if this issue seems short, it is. Only three articles were in hand at press time, and only one of those was submitted (the other two were solicited). With a conference year coming up I'm afraid that we may see more slim issues in the future. Conference hosts: please think of The Planetarian when reviewing your talks and paper sessions, and let me know of material that might make good articles.

And, for some unexplicable reason, George Reed's Naked i Astronomy, published by the IPS earlier this year, lacks both an index and a real table of contents. I would find it far more useful if it had both. I'll leave the index to someone else, but on the next two pages is a full table of contents. The idea is to photocopy it and slip it inside the book. All current members of the IPS should have received George's book as a benefit of membership.

Best wishes for the New Year!

INDEX OF ADVERTISERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl Zeiss</td>
<td>2</td>
</tr>
<tr>
<td>Conic Instruments</td>
<td>33</td>
</tr>
<tr>
<td>Evans &amp; Sutherland</td>
<td>34</td>
</tr>
<tr>
<td>Laser Images</td>
<td>26</td>
</tr>
<tr>
<td>OMNI Films</td>
<td>18</td>
</tr>
<tr>
<td>Seiler Instruments</td>
<td>38</td>
</tr>
<tr>
<td>Sky-Skan, Inc.</td>
<td>51</td>
</tr>
<tr>
<td>Spitz Inc.</td>
<td>46</td>
</tr>
<tr>
<td>Star Theatre Productions</td>
<td>8</td>
</tr>
<tr>
<td>University of Arkansas</td>
<td>20</td>
</tr>
</tbody>
</table>

CLASSIFIED ADVERTISEMENTS

At the IPS conference in Richmond in July, 1988, it was announced that The Planetarian accepts non-commercial ads at no charge. Forward ads to the Executive Editor.
1. The Celestial Sphere
   - Chinese astronomers read the sky long ago
   - Neanderthal man saw a different winter sky
   - Egyptians' sky goddess a 'Nut'
   - You never see the same sky twice/Solar system flows like river
   - Parts better than whole in celestial sphere model
   - Star names influenced by Western civilization history
   - 'Christianizing' constellations fails
   - View of night sky based on our location in space
   - Fingerprints help identify stars as sun and vice versa
   - Time machine exists in backyard
   - Over (lots of) time the sky changed
   - The stars are heaven-made

2. The Sun
   - Today is the 'green equal night' almost
   - It is time to reveal famous, mysterious circumpolar star
   - Want more sunshine? Go up north
   - Sun is progressing from point to point in the summer sky
   - Tonight is equinox, marking autumn onset
   - Sun is revealed as nuke with good public relations
   - Length of seasons affected by closeness of sun
   - Early scientists used sun in calculations
   - Helium fingerprints on sun

3. The Moon
   - Waxing moon watchers, it's time to get ready to pursue the lunar light
   - The moon always shows us the same face
   - Moon's apparent motion depends on point of view
   - Next full moon is 'once in a blue ...'
   - Full moon theories are full of moon dust, and here's why
   - Is June's moon a honey moon
   - Waxing, waning moon spawns superstition
   - After careful thought the moon is judged 'not guilty'
   - Song spreads awareness of fall moon phenomenon
   - Lunar skygazer sees a different skyscape than us earthlings
   - Looking for moon can reap you unexpected result

4. Eclipses
   - Ho hum visual eclipse can be very exciting to an intellect
   - Stellar eclipse taking place, but it's a mystery to most
   - Disabled astronomer makes a place in history
   - There is a safe way to view total eclipse of the sun
   - Jupiter disappears in sun's glare

5. Time
   - The date of New Year's Day is an arbitrary one
   - Time marches on
   - When the week had 11 days/Reform started riots
   - Moon, equinox set Easter date
   - Islamic calendar starts new year on Wednesday
   - Ramadan depends on careful observation
   - Hanukkah and Christmas on the same day
   - 'Late' Chinese New Year stems from early calendar
   - Saturday is the day to synchronize your sundial with your other clocks
   - Ancient astronomy, astrology name days of the week
   - Sundials reached a zenith in early eighteenth century India
   - Astronomers versus astrologers
91 6—Precession
98 Riddle to the upside down Hercules gets solved
99 Thuban once was North Star

101 7—Planets
109 Astronomer moves from footnote to chapter heading
110 Wandering stars: which one was first discovered?
111 'Nine Pizzas' won't be good today
112 Pay attention, this is a Sirius question
113 Mercury is unusually visible
114 Inferior planets can offer a superior challenge
115 Stargazers living on Venus would need to adjust
116 Venus is the disco planet
117 'Canals' on Mars still a mystery
118 Why not take a tour of Mars?
119 Jupiter is king of the solar system
120 The season for Saturn has begun
121 Suggestion is offered for rebuilding solar system
122 Consider a Saturn trip in your future travel plans
123 Hey, all you chubs, fatties and toads, the earth loves ya

125 8—Celestial Potpourri
132 Time to use more of your crayons
133 Twilight—the Platters may have described it best
134 Everything you wanted to know on 'twinkling'
135 'Shooting star' a space phenomenon
136 Chicken Little was right
137 Comet of 1577 challenged scientists
138 Yesterday's meteorologists were astronomers
139 Some untaught astronomy is often learned from music
140 Sign language may offer more than meets the eye
141 Of galaxies and candy bars

143 9—Star Charts
144 Here's the saga of Orion—Rambo: First Blood
145 Orion the Hunter may also be known as Rocky Rambo
146 Auriga the Charioteer proves history repeats itself
148 Winter has its Triangle
149 Constellation myths may reveal ancient knowledge
150 Evening sky is offering celestial canines as pets
152 Ten steps to success in night sky
153 Crow's deceit leads to high position
154 Belly charts proposed as a better 'mousetrap'
155 Coming of Virgo heralds spring
156 See the universe in a cup of coffee
158 Constellation has a split personality
159 Astrology leaves legacy to physicians
160 Hercules' labor pains
161 Hercules overcome by weak character
162 A stargazing columnist can use some advice, too
164 Summer Triangle: A good start for novice stargazers
165 A born loser captures place in the autumn sky
166 Celestial river still separates lovers
168 Bare braves boil big bear making leaves turn color
169 The Big Dipper isn't a dipper in other nations
170 Watch out for the homonyms at this party
172 Perseus the nerd decides to get ahead
173 Andromeda set for glory
174 Our nerdy hero Perseus uses his head to save the fair Andromeda
A Universe of Opportunity...

At StarTheatre Productions we blend a thorough knowledge of technology with a limitless imagination. This results in the creation of programs that are unique, timely and captivating.

We are continually examining new technological developments with an eye to improve and update our product offerings. This enables us to produce high quality materials at a surprisingly low price.

**StarWares**

*presentation graphic modules*

StarWares is a revolutionary new presentation graphics package from StarTheatre Productions. It brings an exciting world of graphic images to your fingertips.

Imagine hundreds of original illustrations stored on disk for use on a Macintosh computer. These images can be retrieved on command, enhanced, and produced as slide images or laser prints.

And that's not all. With StarWares you can instantly create panoramic views using standard Macintosh applications.

Each StarWares kit comes with a fully illustrated storyboard.

Our film imaging service can transform your digital files into a set of slides for a fraction of the cost of traditional optical camera work.

**StarTrack**

*sound recording modules*

StarTrack is the original sound recording module for all StarTheatre planetarium productions. Each StarTrack module will dazzle your audience with professional narration, rich stereo music and sound effects.

StarTrack modules utilize the latest techniques in multi-track digital and analog recording technology.

StarTrack brings the power of recorded sound to your planetarium. Each show is designed to work independently or in conjunction with StarWares, presentation graphics.

A show transcript and lesson plans are included in each StarTrack kit.

**StarShows**

*planetarium productions*

Explore the future with the StarTheatre's The Greenhouse Effect. Audiences will travel through time to discover what our world could be like 10, 20 or 30 years from now if Global Warming continues at the present rate.

Light up your planetarium with Homer's compelling saga of conquest and exploration. Based on the epic poems The Iliad and The Odyssey, The Journey Home will transform your planetarium into a world of beauty and magic.

StarTrack modules $195.

StarWares modules $98.

Treat yourself and your planetarium to a service that will open up a universe of opportunities... StarTheatre Productions.

We're only a phone call away...

203.236.Star

© 1989 Lancaster Communications Group.

StarCraft, StarTrack and StarWares are trademarks of StarTheatre Productions. Macintosh is a trademark of Apple Computer, Inc.
"Never look a gift laser in the aperture."

Sage advice for the planetarian who wishes to retain employment (to say nothing of eyesight). Thus when The Baltimore Sun, our local newspaper, called to inquire of our interest in accepting a gift exceeding $100,000 to equip the Davis Planetarium with a laser projector, and to fund the production of a light show, we beat back our incredulity and said "sure."

That was December, 1986. As luck would have it we had just completed a survey of laser equipment available from reputable east-coast vendors and had some idea of what we could buy with the $75,000 allocated for hardware. We could have either a super-bright water-cooled Krypton projector or a dimmer, air-cooled Helium-Neon/Argon projector plus a programming system allowing us to generate our own images.

The choice hinged on our intended use for the equipment. It had traditionally been our policy not to present "entertainment" laser shows, and since we enjoyed sufficient attendance to make that policy practical, there seemed no need to abandon it. Our goal became, rather, the integration of laser technology into our regular programming. In this light the overwhelming brilliance of the Krypton projector was a disadvantage. Its expense left no money for programming hardware. Its maintenance costs promised a serious long-term drain. We therefore chose an air-cooled projector and programming system manufactured by Image Engineering Corporation (IEC) of Somerville, Massachusetts.
There was still the question of the show. *The Sun* was celebrating its 150th anniversary and wanted something that would make quite a splash in the community. Our proposal was to produce not a light show per se, but rather a fast-paced exploration of the science and nature of light, one which would utilize the laser to its fullest. With "Light For All" the logo on *The Sun*'s masthead, the proposal was enthusiastically accepted and production was started on a show of the same title.

**Projector Placement**

With our epicentric seating configuration, the logical place to put the projector was behind the audience. But where? The last thing we wanted was some big hulking crate sitting on the floor next to the console. Placement behind the false wall of our projection gallery, where the other projectors hide, seemed natural enough.

There we encountered a snag. The Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration requires that the beam for a Class IIIb laser device emerge no lower than three meters above the floor. Our springline is a mere two meters high. We faced two unpleasant alternatives: stick the thing way up on scaffolding and abandon hope of ever-again presenting an unobstructed view of the whole sky (and despite our emphasis on high-tech we do believe planetariums should be capable of looking like the sky!) or cut one of those awful portholes into the dome and project through it. Both options flew in the face of our conviction that a planetarium should be as technology-transparent as possible.

A meeting was arranged at the Planetarium with two inspectors from the CDRH. Much to our delight they agreed that aesthetic considerations rendered the above options ridiculous, and explained how to obtain a variance from the regulations by erecting barriers to prevent the audience from getting too close to the projector. The "barriers" turned out to be the gallery wall, the console, the seats, and a series of three infrared beams which, when interrupted, close the laser shutter. We were also required to install a "panic button" in the console, enabling the operator to close the shutter should conditions warrant. We put the projector in the gallery behind the console, where it is unseen by the audience.

**Projector Technology**

Image Engineering was very accommodating of our request for a projector with a minimum height profile, and maximum potential for future modification. Assembled on a standard optical plate, the design allows plenty of space for future additions of beam modifiers. As delivered, the projector consists of two lasers (one 40mw helium-neon and one 150mw argon), dichroic beamsplitters to split the green and blue light from the argon beam, acousto-optic modulators to regulate the brightness of each (red, green, blue) beam, and two "turbo" mirror scanners which rapidly position the beam at selected X-Y coordinates. Our persistence of vision makes for the appearance of continuous line graphics from what is simply a moving dot. A separate 19-inch rack contains the electronics to decode the signal and drive the scanners and color modulators.

The images play back directly from a Sony Beta video tape. (In the wake of Beta's demise, IEC now recommends 5-VHS.) An alternate is an audio tape playback system. We selected the video system because it provides higher quality—images are digitally encoded and playback is extremely steady. The audio tape system uses analog FM encoding and requires six tracks of tape. An additional, albeit future, benefit of video encoding is the possibility of interactive laser programming using video disks.

Synchronization of images to the show is accomplished by a crude but effective technique. Since the laser video tape and audio show tape are not interlocked they will drift out of sync. Sync is maintained by briefly pausing the video tape before each laser sequence, using a 1000Hz tone recorded on the video tape itself. A relay pulse from our automation system releases the deck from pause exactly on cue. This works well and we have had no trouble with sequences lasting over five minutes. It is also possible to slave the audio tape to the laser video using a 60 Hz pilotone; for our application this would have constituted the "tail wagging the dog."

Continuously-variable color images cover a wide swatch of the dome, from approximately 20 degrees above the horizon to well beyond zenith. The image intensity on our fifty foot dome is nicely matched to that of our other projectors. Users with substantially larger domes may want to limit the image size to keep the brightness up.

**Image Programming**

The programming equipment resides in our sound studio. We do our programming "off-line." Plan lots of console space if you want to run live. The system consists of an Apple Macintosh II computer with monitor, an Image Engineering Outboard Computer, a Digital Video Encoder and Decoder, a graphics tablet, another Sony Beta deck, and a monochrome XY Vector Monitor for display of laser images.

Several different software programs are available. "Wavemaker" simulates the operation of various oscillators and lets you make lissajous patterns to your heart's content. "Interact" allows the creation and real-time manipulation of both 2-D and 3-D images. The 3-D capability is particularly exciting when objects are
tumbled about. "Script" (not released as of this writing) permits precisely synchronized cue-lists of events to be created and performed. "Rastvect" attempts to create laser vector files from "MacPaint" files, but doesn't work very well. The software is all very new and full of quirks, but Image Engineering seems dedicated to producing a first-class system and has already accommodated many of our suggestions in software revisions.

One thing that cannot be over-emphasized is the need for time in creating complex images. Some sequences lasting mere seconds have taken many hours to create.

Among the 3-D images we've created are:

* Platonic Solids
* Warped spacetime grids
* Big Dipper (rotating to show true stellar distribution)
* Animated optical ray tracings
* Animated "Star Trek" perspective starfields
* Abstract "light show" patterns
* Corporate Logo's for Special Events

Not A Television, Not A Digistar

The mirrors can only move so fast, and attempts to shade or fill images with color will result in unacceptable flicker. In this respect "wireform" laser graphics more closely resemble those of an Evans and Sutherland Digistar projector than a video projector—it's a vector scan rather than a raster scan. There is, however, no comparison between the image sophistication possible on a Digistar and that of our IEC projector. On the Digistar the maximum number of "vectors" in an object is 8000, with a vector defined as either a point or a line segment. In contrast, the IEC laser system allows for a maximum of 1280 "points," and the physical limitations of the color modulators and scanners cause the system to eat points when turning sharp corners, blanking, or even drawing straight lines.

It is important to comprehend these limitations when designing laser graphics for a program. A laser projector is no substitute for ektachrome, special effects, video, kodalith, or a star projector. But taken for what it is—a fount of compellingly pure spectral color—it can add a unique dimension to the visual appeal of a program without drawing unnecessary attention to itself.

The author invites comments and inquiries from interested readers. In addition, a copy of the soundtrack for "Light For All" (which is quite wacky and was a great deal of fun to write!) will be sent upon receipt of a blank 90-minute cassette and return postage.

Behind the wall of the projection gallery are found the projector electronics (foreground), as well as the projector itself. The top of the projector is no higher than the gallery wall, making the hardware invisible from the theater.
**Why Am I an Astronomer?**

**Rick Fisher**

**Rt. 1, Box 29**

**Green Bank, West Virginia 24944**

Fundamental questions are always the most difficult to answer well. A child can stop nearly any scientist dead in her tracks by asking, "What do you do at work?" I've fumbled with this one several times without ever being satisfied with my answer. Maybe it's a sign of age, but I seem to be trying harder and harder to come up with satisfactory responses to this and related questions. I still don't have any very good answers, but let me share a few thoughts with you.

In science, nothing is ever proven absolutely correct. We can only eliminate theories and explanations that do not fit our observations. Even Newton's laws of motion are only approximations. In that spirit, I'll take a slightly negative approach and tell how I have come to find some answers that don't work. Then we will see if there are any tentative conclusions that we can draw. Before doing that, let's set up a few more hard questions. Why study science? How does one do science? What good is basic research?

I have developed a strong dislike for the materialistic answers to the last question. When justifying basic research to politicians we often fall into the simplistic story about it being good for our economic competitiveness, our national security, or the Teflon on our fry pans. Not that these are not worthwhile end products. There just seems to me to be a higher ground from which to defend ourselves. Why get onto the "What have you done for me lately?" treadmill? Wait ... I'm getting ahead of myself.

Some of us like to think that we go through life from one well reasoned action to the next. In fact, we are probably driven much more by the expectations of others than we care to admit. Those of us who show an early talent are very fortunate. From then on we are expected to do well in that area, and we usually try our best to meet those expectations. My dad liked to show off the latest book I was reading or the latest project we were working on, much to my public embarrassment but private delight. That was a very strong driving force. Going on to become an astronomer seemed like the neatest way to continue in the life I enjoyed. Actually, it was a toss-up between astronomy and meteorology.

In a way, I was fortunate to be good at only things academic. To make a career in the arts or sciences you normally have to spend a lot of time at it, starting at a fairly early age. The introverted scientist stereotype has a thread of truth in it. If a student is slow to develop socially, science and mathematics can be comfortable havens for an adolescent.

When I went off to study physics at Penn State I knew that I wanted to be an astronomer, but I had only the vaguest of notions about what it meant to be a scientist. Astronomers need a doctorate to do what they do, so on I went to graduate school at Maryland. I assumed that at some point the mechanics of doing research would be taught to me and that the mysterious aura of being a scientist would appear shortly after getting my degree. I didn't really think about this sort of thing, and I enjoyed working with my thesis advisor very much, but when grad school ended I certainly did not have a clear vision of what to do next.

I enjoy solving practical problems, so I had no trouble getting into projects in my first position at Green Bank. Being near the 300-foot telescope put me in some demand. Brent Tully and I graduated from Maryland at about the same time. He did have a clear idea about what research he wanted to pursue. I enjoyed observing, and he wanted data.

The original intent of our project was to get a much more complete picture of the nearby universe by measuring the 21-cm- wavelength hydrogen line radiation from as many visible galaxies within about 10 megaparsecs (30 million light years) as possible. I have since lost track, but I observed probably about 1500 galaxies in all from lists that kept arriving from wherever Brent was at the time—Canada, France, and finally Hawaii. This took about five years with a total of more than three months of time on the 300-foot, many weeks on the 140-foot for the southern galaxies that the 300-ft could not reach.

---

J. Richard Fisher joined the NRAO scientific staff at Green Bank, WV immediately following graduate school and has held various positions such as Head of the Electronics Division, Site Director, and Project Manager. In 1978 he spent 18 months at CSIRO in Australia and 2 months at the Raman Research Institute in Bangalore, India. His research interests include cosmology, antenna design, and signal processing. He and his wife, Delfa, whom he met in Australia, live in a house of their own design about a mile and a half from the Green Bank Observatory.
and about ten days on the 100-meter telescope near Bonn. The distribution of observing time around the sky was pretty strange. Being in Green Bank, I took whatever I could get. For six weeks, I was the rainy-day backup for summer telescope painting. It didn't rain much that summer.

I believe that we roughly doubled the number of known galaxy redshifts at the time. The science was divided such that I looked at the internal properties of the galaxies, and Brent spent time on their distribution in space. Our first observing trials concentrated on the faintest objects to see whether we could see enough of them to make it worth continuing. To our pleasant surprise, we found that many of the faint galaxies are very bright in the hydrogen line. These little guys have some of the largest ratios of neutral hydrogen to visible star mass of any galaxy. This work got us a little notoriety with my first paper at an American Astronomical Society meeting. As it turned out, the optical brightnesses that we got from the scientific literature were badly underestimated. The ratios are actually lower than we thought, but they are still high, and only a few

quiet people, including ourselves, realized the error much later.

During this time I was up to my ears in punched cards, magnetic tapes, and plotter paper. The observatory computer was 120 miles away in Charlottesville. After each observing day I sent my deck of computer cards with the data tape on the car shuttle, and day or two later the spectrum plots came back. With such a slow turn-around, I got pretty good at getting a computer program to run the first time. All of the velocities and hydrogen masses in our catalogs were measured with a clear 50-cent plastic ruler and an old-time instrument called a planimeter. In retrospect, I'm rather proud of how accurate those measurements have been found to be.

One day in the mail came a letter from Brent containing an exclamation something like "Hold everything, our ship has come in!" This was written on top of the first hydrogen-line-width vs. absolute-magnitude diagram for galaxies, which has come to be closely associated with our names. What Brent discovered was that

The 300-foot telescope at Green Bank, West Virginia. This is the instrument most closely associated with my post-graduate career. It collapsed in November, 1988 after 26 years of science. At an original cost of about $800,000 in 1962 plus several improvements such as a new surface in 1969, it may have been one of the great bargains in science.
the intrinsic brightness of a galaxy is very well correlated with the width of its hydrogen line profile. Hence, we had a way to measure distances to galaxies that appeared to be better than anything that had been tried before. This appeared to be quite a breakthrough.

I did not have as far to travel, so I was the one to present this paper at the next AAS meeting. It gained a lot of attention, partly because the distance scale that we derived was at strong odds with the accepted value at the time. I was even interviewed by the *Los Angeles Times* science reporter. Since then I have occasionally been recognized as the Fisher of the Tully-Fisher diagram.

Out of all of this, I now know that fame is not why science is done. Not for me, at least. This might sound like false modesty, but it's true. I had put my share of the work into the papers that we published, and I felt that my part was well done, but there was something missing.

My first hint at what was missing came when I was working with Jim Lyons, an engineering co-op student at NRAO, sometime around 1981. In the few years before then, after the work with Brent, I had taken on more management and engineering responsibility at the Observatory, and I had spent nearly two years on leave in Australia and India. I was quite tired of data analysis, and I saw instrumentation problems that needed to be solved. Some of them, related to electromagnetics and thermodynamics, were quite challenging.

I had asked Jim to develop some in-house capability for computing antenna reflector patterns, starting with work that had been done at the Jet Propulsion Laboratory. He is the sort who likes to understand the physics behind what he was doing, so he would occasionally come into my office with some particularly tough questions. I was being challenged by someone who understood a conceptually difficult problem about as well as I did, and we were pushing one another along at a pretty good clip. This was enormous fun for me, and I have wondered whether Jim felt the same. Actually, the same thing had happened to me when I was working with my thesis advisor in grad school, but I didn't realize that this was the core of what I was after.

Shortly after I worked with Jim I proposed to the Observatory that we set up a problem-solving group at Green Bank to look into state-of-the-art instrumentation needs. The idea got considerable encouragement but died in a budget cut. In retrospect, I don't think that many people either understood or accepted the purpose of setting up a stimulating working environment. A few supporters seemed to sense what I was after, but I did not convince many others.

You might ask whether an engineering experience applies to science. Yes and no. The problem solving aspect is the same. The definition of the problem usually is not.

In engineering, even at a research university, the problems waiting to be solved are normally pretty obvious. At least, this has been my experience. I have never been at a loss to quickly name a few problems, the solution to which would be of considerable benefit to observers. Science, too, has its share of ready problems to be solved, particularly when one is deep into a specialty. The difference is that answering many of the scientific questions can be a waste of time. In fact, this is a hazard of specialization. Another difference between engineering and science is that, in engineering, we usually know when our solution is correct (the bridge stands or it falls), but we can go for years in science without any check on our solutions. The feelings of accomplishment can be faint and very far apart.

The comments on engineering apply to computer programming, which I have been doing the last few years. Writing software can even be rather seductive, because the time between design and completion of a small project can be so short that the feeling of accomplishment is nearly continuous. A programmer friend calls it the "land of cheap thrills." This may be one reason so many science students become computer analysts. Computers are a wonderful tool for science, but they can be a real trap on the way to a career in science.

Until a couple of years ago, I was quite comfortable developing instrumentation at the Observatory. I'd had a few hints from friends that this was not what I should be doing, but nothing very threatening. Then, at least two things happened to me. First, I was asked to give a talk at the Youth Science Camp near the Observatory. Second, the Observatory began hosting groups of small college and high school science teachers for workshops and institutes. Since I didn't have any recent scientific results to talk about, I tried presenting a philosophical look at science. The outcome was that I found myself encouraging others to be good at and teach something which I had forsaken. That was threatening!

Wouldn't it be terrific to start a career with 17 years of experience and a modest reputation to go with it? Well, that is what I am in the process of doing.

Let's go back to the original fundamental questions and see how we might answer them now.

Why study science? Curiosity is reason enough. Basic science has a closer kinship with the arts than with the engineering disciplines. Music, painting, and drama are usually not associated with economic competitiveness or national security, but we have a very strong attraction to all of them. The desire to satisfy man's curiosity must be at least as strong. Putting a man on the moon
was an engineering feat, but millions of people watched it on television because they were intensely curious. For that reason, alone, it was worth every penny we paid for it. However, the privilege of pursuing one's own curiosity at public expense comes with some strong obligations. Scientists are one of the custodians of man's curiosity. They must not repeat the work of others unnecessarily. They must tell their benefactors what they find and share some of the thrills of the process in terms that can be understood.

How does one do science? Science, in its best form, is a contemplative endeavor. It is not a paper publishing contest or a great database management system for the universe. A well formulated question is often worth a dozen data catalogs. Recognizing the measurements required to differentiate between competing hypotheses is crucial. Until we understand the key gaps in our knowledge, we probably should not run off in search of great discoveries. Serendipity lives on the clear road to another answer.

What good is basic research? The answer to "Why study science?" applies here, too. Material benefits will inevitably result from the discoveries of science, but these are the fruits of applied research (engineering). One might argue that man has a curiosity to aid in his material advancement, but I think that it is the other way around. An Indian friend of mine said that once a person has enough to be free of worry about the necessities of life, that person is no happier because of more possessions. However, a higher standard of living does provide more time to satisfy our appetite for the arts and pure curiosity.

What do you do at work? I read, stare out the window a lot, and sharpen my wits with like-minded colleagues. If you come into my office, I'll see what I can learn from you.

Is there a difference between scientists and science teachers? Only if you think there is. Teachers do not have enough time nor the opportunity to participate in the scientific game, but they should. There needs to be much greater contact between laboratory and classroom scientists beyond university lectures. How else can full-time teachers get the flavor of what it is all about? Students of any level are quite capable of sharpening our wits if we don't worry about maintaining an authority image. Some of my most stimulating moments have come with 6th through 9th grade kids.

There are at least 200 teachers to whom I owe my renewed enthusiasm for research, and I would like to have the opportunity to repay them in kind.

Reprinted with permission from The Earth Scientist, the journal of the National Earth Science Teachers Association.

---

**PLAN NOW FOR 1992**

Arrangements have now been made for the 1992 conference to be held at the Snowbird Ski and Summer Resort located in beautiful Little Cottonwood Canyon in the mountains outside Salt Lake City. The conference facility is one of the finest to be found anywhere. The schedule will include the opportunity of star parties at the top of an 11,000 foot mountain reached by tram. We will have many nice events with lots of change of scene offered by the mountain location.

We suggest that you will want to plan now to include family members and arrange for a long vacation in conjunction with the conference. Salt Lake City is the jumping off point for many wonderful places: Zion Canyon National Park, Bryce Canyon National Park, Grand Canyon National Park, Capitol Reef National Monument, Yellowstone National Park, Arches National Park, Canyonlands National Recreation Area, Glen Canyon National Recreation Area (Lake Powell), Mesa Verde National Historic Park, Chaco Canyon National Historic Park, Canyon de Chelly National Monument, Great Basin National Park, just to name the best known. There are dozens of other, lesser known places to discover. Farther away, but still within a day or so are many other scenic wonderlands: Yosemite National Park, Sequoia National Park, Crater Lake National Park, Glacier National Park, Rocky Mountain National Park—the list goes on and on. We will give you details about these possibilities at the appropriate time. We just want you to think and plan ahead so that you will have the resources to fully enjoy your 1992 summer.

We will provide a high class conference. It is up to you, with our coaching, to plan to get the most out of your time and travel resources. We hope you will mark your calendar plenty early, and begin putting away funds, so that you can make the summer of the Columbian Quincentennial Year your year to explore new horizons within both the planetarium profession and the spectacular mountains, canyons and deserts of western America. So, mark it now: June 24-28, 1992, the year of exploration for all IPS members.

---

The Planetarian, Vol. 18, No. 4, December 1989
An Archival Project at the Hayden Planetarium Library

Sandra Kitt, Librarian
Richard S. Perkin Library
Hayden Planetarium
American Museum of Natural History
Central Park West at 81st St.
New York, New York 10024

Several years ago a space science historian made an appointment to use my library. Since the library at the Hayden Planetarium is considered one of the best astronomy libraries on the East Coast available to the general public, I was confident that this patron would find the resources he needed. When he allured, however, to a three-day symposium held at my institution thirty years ago, I admit that I was thrown into a state of confusion. I was sure that the information on the organization, content and results of the meeting existed, but the question was how to find it among the carton after carton of stored papers dealing with events held at the Hayden Planetarium over the previous forty-five years.

...it is important that all organizations and institutions, no matter how small, keep in mind that their history is unique, and it is worth the effort to preserve and maintain the records and documents which make it unique.

With a little time and extra effort I was able to find the requested information and was rewarded with the profuse thanks of the researcher. As a result of this episode, however, it became clear to me that there was a wealth of research information concerning my organization which was not readily available to me, to other staff, or to the public. Archives are not my speciality, and I knew that a professional archivist was what was needed.

As luck would have it, at this same time I was contacted by a field worker from the New York Historical Resource Center of Cornell University Libraries about the possibility of doing an inventory of the historical documents at the Hayden Planetarium. The ultimate goal of the project was to form a state information network of historical documents linked by OCLC. While the lack of any available records regarding our archival holdings made it impossible for me to participate, the American Museum of Natural History (of which the Hayden is a department) agreed to add the records of its archival holdings to the Resource Center.

But the planetarium archives were not simply forgotten about. A group of Volunteer Office agreed to take on the task of sorting and organizing over twenty transit files of planetarium papers. These dated from 1934, the year the planetarium was built, to 1980, when there was a change in planetarium staff. Ruth Sternfeld, the head of the seven-person team, had been the archivist at the Rockefeller University. When she retired she put her expertise and talents to use as a volunteer at the Museum.

After looking through a basement storeroom which contained the haphazardly stacked files, Mrs. Sternfeld agreed that the job could be done though it would require time (about two years) and know-how. A proposal was submitted to the department chairman who became enthusiastic about the project when it was explained that costs would be minimal—no more that the price of some acid-free folders and document boxes, along with a comfortable and quiet place in which the team could work.

Once the project began it became apparent to me that an archive involves more than just the preservation of the historical records of an institution, and the reasons for forming one go far beyond simply providing historical information to interested researchers. There was the realization that these records might eventually have been lost or destroyed—or simply have disappeared—and the lose would have been significant indeed. We were soon discovering important correspondence from Werner Von Braun, Thomas Mann, and Albert Einstein.

The ravages of years of basement storage were clear. There was evidence of dampness, rodents of course, dust. There were also the effects of the use of non-stainless steel staples, paper clips, carbon inks,
Archivists have a sense of an institution’s documents use and value. The custodian of records in the same custodian of a collection of books matter. The is that the books may duplicated in whole or in specific to a no’ren, collection... stored and maintained the than at Because our project had the supervision of a trained archivist, we could do more than simply re-house documents, weed duplicates and ensure their preservation. An essential step in our project was the preparation of finding aids to reveal the arrangement of records. These were arranged in two notebooks, one of which was an inventory of the collection arranged by provenance, and the second of which was as alphabetical listing off all general correspondence. A set of catalog cards was prepared as an easier guide to the names and subjects in the inventories, and to bring together subjects which appeared in various inventories. They both serve to get one to a shelf location for the actual materials, and provide a brief description of the contents, date(s), and number of folders of information.

From the beginning it was decided that the best place to house the new archive was in the Richard S. Perkin Library at the Hayden. It was also decided that upon completion, copies of the inventory and subject listings should be made and a set given to the main library of the American Museum of Natural History. In this way, as the museum continues to participate in the Cornell project, the now complete archives of the Hayden Planetarium can also be included. The networking project can be worked out so that eventually all historical institutions will have their collections entered and recorded online.

But even if online networking is not your ultimate goal, it is important that all organizations and institutions, no matter how small, keep in mind that their history is unique, and it is worth the effort to preserve and maintain the records and documents which make it unique. If you've given thought to establishing an archive but know that there's no time, money or properly trained staff available, consider using volunteers with a background in archives. Get in touch with local colleges and universities, or ever other librarians who may be able to give you information or provide contacts. And finally, as an impetus to getting your own archival project started, it may help to remember that contrary to popular opinion, history does not repeat itself. When the papers and documents are gone ... they are gone forever.

This article originally appeared under the title “Forty Five Years at the Hayden Planetarium: An Archival Project” in The One-Person Library, a newsletter for librarians and management. Copyright OPL Resources, Ltd., PO Box 948, Murray Hill Sta., New York, NY 10156. Reprinted with permission.

The Quotable Einstein

No amount of experimentation can ever prove me right; a single experiment can prove me wrong.

Imagination is more powerful than knowledge. It enlarges your vision, stretches the mind, challenges the impossible. Without imagination thought comes to a halt.

Out yonder there is a huge world, which exists independent of us human beings and which stands before us like a great, eternal riddle, at least partially accessible to our inspection and thinking. The contemplation of this world beckons us like a liberation.

Einstein was once asked to explain the essence of relativity in a few sentences. He replied: If you will not take the answer too seriously and consider it only as a kind of joke, then I can explain it as follows. It was formerly believed that if all material things disappeared out of the universe, time and space would be left. According to the relativity theory, however, time and space disappear together with the things.
A NEW LOOK AT THE UNIVERSE

Add a new dimension to your facility through the creative use of giant-screen 70mm film. Omni Films International, a world recognized leader in the 70mm market, can supplement your show with films that educate and entertain.

Omni's options are designed to meet your needs:

▲ Install an 870 projection system to project onto your dome.
▲ Let Omni supply a dedicated theater for giant-screen presentations.
▲ Lease films from Omni's extensive library.
▲ Let Omni's award-winning production team produce a custom 870 film to your specifications.

Giant-screen films leave unforgettable impressions that bring customers back again and again. Call Omni for details on how 70mm film can work for you.

P.O. Box 5807
Sarasota, FL 34277-5807 U.S.A.
(813) 924-4239
Telex: 803785
Fax: (813) 924-2643

OMNI FILMS International, Inc.
Eventually we’ll all be networked by way of computers; at least, so claim the PC pundits. NASA has already taken a step in that direction by providing an electronic bulletin board system for teachers. It’s been available since early 1988, so I should have mentioned it earlier, but you know how things pile up ...

NASA’s SpaceLink BBS provides information on services and resources available to teachers. For instance, you can get information about the free videoconferencing system available to schools anywhere in the U.S.A., and beyond, without having to listen to a secretary with laryngitis try to read off the information over the phone. There are sections devoted to the Space Science Student Involvement Program (SSIP), the Lunar Sample Education Project in which many of us have participated in the past, the SEEDS project, and many more. There was current information about the Voyager flyby of Neptune last August.

Operation is simple. Set your modem for 8 bits, no parity, 1 stop bit (8-N-1). This is a very common setting, so you probably won’t have to change anything. You can operate at 300, 1200, or 2400 baud.

Call 205-895-0028. Of course, this will be subject to long-distance toll charges, unless you happen to live in the Huntsville, Alabama area, which probably excludes a fair fraction of the IPS membership.
Choosing any of these items will provide information about that topic. If you have instant memory, you can just read as the words go scrolling up the screen. If you're human, on the other hand, you'll want to save the information in some form. You can elect to capture the text in a buffer, but for error-free transmission, you can choose to download the file using X-modem protocol. If you aren't familiar with X-modem, SpaceLink will even give you a summary of that process.

I've never had trouble getting through. There are eight phone lines, and there is disk storage for 700 megabytes of text, so your limitation on space information access will most likely be your relationship with your long-distance carrier. There is no mail or message center, so you can't exchange messages with other users, but you can leave messages for NASA. Warning: if you don't call for three months, your account will be deactivated, and you'll have to sign up again.

Celestial Computing
Science Software, 7370 South Jay Street, Littleton, CO 80123-4661; phone 303-972-4020.

There have been small-scale attempts to create journals concerned with using microcomputers in astronomy, but Celestial Computing seems like a serious, high-class effort. Editor David Eagle says the quarterly journal will focus on computer applications in celestial mechanics in astronomy, astrometry, and astrodynamics. Primarily he will provide computer methods and programs, but he also plans to include reviews of books and technical publications in the field.

In the first issue, there are articles about symbolic computing and astronomical time calculations; a review of a book/software combination (Fundamentals of Celestial Mechanics, by Danby); computer listings of some routines discussed in the articles; and more.

There is a companion unprotected 5.25-inch disk containing many of the programs in QuickBASIC format, for use on an IBM computer. A subscription to the quarterly disks is available separately from the printed journal. Prices are: journal subscription (four issues), $24.95; disk subscription (four disks), $14.95. There are also separate disks available containing programs on aeronautics, satellites, and astronomy, at prices ranging from $19.95 to $34.95. A demo disk from this set is available for $5.00. The programs are written in QuickBASIC, but you need not have that language to run them.

Celestial Computing is an ambitious offering. The first issue ran to about 32 pages of text, plus about 20 pages of program listings. It is neatly printed on a laser printer (no fancy graphics or page-layouts, though), with even the more sophisticated equations easy to read. It's not intended for beginners; you need to at least understand what is meant by orbital eccentricity and matrix multiplication, whether you can perform the manipulations yourself or not. If you use an IBM, and are involved in celestial mechanics computations, you might give Celestial Computing a try.

In a future column I plan to discuss computational spreadsheets. Many scientists have created spreadsheets that perform astronomical computations that used to be done in FORTRAN, BASIC, or other languages. I've started doing this myself, and it's a fascinating exercise. If you use or have created such spreadsheets, or know of literature that covers that topic, please let me know.

---

**PLANETARIUM DIRECTOR**

University of Arkansas at Little Rock

Minimum of a Master's degree in Astronomy or Physics or a related area; at least three years full-time planetarium experience; experience in observational astronomy and community-planetarium outreach programs; grant-writing and fund raising experience; ability to teach introductory college-level astronomy courses.

Facilities include a 40-foot dome with a Minolta Series IIib star projector, a small solar telescope with H-alpha filter, a 17-inch hollostat, a campus observatory with a 14.5-inch reflecting telescope, and a mobile 24-inch telescope.

Salary and rank in the Department of Physics and Astronomy commensurate with qualifications. Starting 7-1-90 or before. Submit letter of application, curriculum vitae, and five references before 2-1-90 to:

Professor A. Andre Rollefson, Chairman
Department of Physics and Astronomy
University of Arkansas at Little Rock
2801 S. University
Little Rock, AR 72204

Applications will be subject to inspection under the Arkansas Freedom of Information Act.

The University of Arkansas at Little Rock is an affirmative action, equal opportunity employer and actively seeks the candidacy of minorities and women.
**DR. KROCTER OF PLUNDER PLANETARIUM**

**EPISODE II**

by Norm Dean

P.O. Box 669
Bel Air, Md. 21014

"A DAY AT THE BEACH"

MOMMIE, WHY DOES THAT MAN NEVER TAKE HIS SUIT OFF?

HE CAN'T DEAR,

PLANETARIUM DIRECTORS ARE SEWN INTO THEIR CLOTHES.

WHAT ARE YOU READING, BOSS?

IT'S AN ARTICLE BY A TRULY GREAT PIONEER PLANETARIAN, DR. GEORGE PITLUGA, AND IT'S CALLED "BUCK ROGERS, HAIL AND FAREWELL." IT REFERS TO THE COMIC BOOK HERO OF THE 1930'S WHO CRUISED AROUND OUR GALAXY AT LESS THAN RELATIVISTIC SPEEDS IN A SPACE SHIP THAT LOOKED LIKE A GIANT CAST-IRON TEAR DROP.

Buck's writers seldom even mentioned the enormous problems of such long distance travel, which would in fact require many generations. Birth and death would have to occur on the ship.

AND WHAT COULD BE DONE WITH HUMAN WASTE AS HE CRUISED FROM ONE SOLAR SYSTEM TO ANOTHER? HE MIGHT BOIL URINE ON ONE SIDE OF THE SHIP AND CONDENSE IT ON THE OTHER, AS WATER WOULD BE CRUCIAL TO SURVIVAL.

Likewise Buck would have to retrieve the salts and all other "waste" materials. Everything must be recycled.

AND WHAT WOULD YOU DO WHEN PEOPLE DIED ON THE SHIP? YOU CANT' JUST BOOT THEM OUT AN AIR LOCK, NO; THEY TOO WOULD HAVE TO BE RECYCLED.

IT GOES WITHOUT SAYING THAT THE NUMBER OF BIRTHS ON BOARD WOULD HAVE TO BE LIMITED IN SOME WAY.

-CONFLICTS WOULD HAVE TO BE RESOLVED PEACEFULLY, SINCE ANY SERIOUS OUTBREAK OF VIOLENCE COULD MEAN THE END OF LIFE FOR ALL ON BOARD.

THAT WAS PRECISELY DR. PITLUGA'S POINT, RALF.

MOMMIE, THEY'RE MEASURING YOUR NOONTIME SHADOW AGAIN. TRY TO IGNORE THEM, DEAR.

BOSS! I GET IT! THE SPACE SHIP IS EXACTLY ANALOGOUS TO OUR OWN PLANET, THE EARTH ITSELF!
Welcome to the Scriptorium!

Just what is a scriptorium? In the Middle Ages, it was a room found in monasteries where copyists spent hours creating beautifully crafted manuscripts in order to more widely disseminate knowledge. In many ways we who create scripts for planetarium programs have much in common with those artisans: our aim is to create a fine document with which to enlighten those who are exposed to the final product.

The first thing I should say is that I am not an "expert" at scriptwriting. My stewardship of this column confers no expertise, but it is evidence of a certain trust by those who care about this journal. It is my fervent hope that I will continue to merit that trust.

Many writers employ devices in order to make their points. My device shall be the dank and dusty halls of the Scriptorium (I was never one to be content with a mere "corner"). Together we shall explore the nooks and crannies of this edifice; and in so doing, perhaps we shall uncover some of the secrets of the art of crafting a better script. I encourage all and sundry who have ever written, or who have ever thought about writing, a planetarium script to give serious thought to making a contribution to this column. The more of us in our exploration party, the more torches we can carry, and hence, the more shadows we can cast aside. Perhaps you have been in a part of the Scriptorium that the rest of us have avoided. Let's pool our knowledge. I am not the owner of the Scriptorium and all the knowledge contained therein, only the caretaker. Send your contributions to me at the address above.

The Journey Begins

Come on in. I know it's pretty dark and dusty in here, but that should change in a few moments. First I'll turn on the light. Oh, I almost forgot, I've spent the past few months installing electricity in the vestibule. That explains the computer over there in the corner (not to mention the carousel projectors ....). Across the room from the entrance is the door that leads into the interior of the building. Beyond that door my influence ends and I'm no more quick-witted than you go. For the scriptwriter this "seat-of-the-pants" method of navigation won't do at all. As writers, must be aware of where we want to go with our script before we leave! How can we possibly accomplish this tidy bit of relativistic legerdemain? The answer, as you have no doubt guessed, lies with perhaps the most powerful of the writer's tools, the outline.

An outline is a framework upon which to flesh out a script. It is also a reflection of the mindset of the writer and the way that s/he looks at the presentation of an idea. Subtle volumes are spoken by the approach one takes toward a subject and the order that one deals with it. Rather than talking about the outline in the abstract, we shall build one. But where in the universe do we start? The first door in the Scriptorium is labeled...

Brainstorm

Much could be (and has been!) devoted to the notion of the origin of inspiration. Whatever the source—staff meeting, current events, a favorite topic—an idea springs forth. In our case, the topic came about innocently enough. It was suggested by our Executive Editor, John Mosley:

"... Most planetariums will present a show to commemorate the 500th anniversary of the "discovery" of America in the fall of 1992. What topics should we include? What approach should we take? What should the theme be—navigation, cosmology east vs west, age of exploration 15th vs 20th centuries? Should we planetarians somehow get together and come up with a good outline (if not a good script) a year in advance? Will these be of interest to Europeans as well as Americans?"

(Please see Scriptorium on page 25)
Introduction:

The Art of Teaching is not as easy as some non-educators would lead us to believe. The true communication of ideas involves much more than just "saying the words." For example, when trying to present a given topic, it is necessary to assume some level of pre-existing knowledge on the part of the individuals. But the educator must determine exactly what level is possessed by a given group, before making the presentation. If the planet Mars is mentioned as a member of the solar system, most of us would assume that anyone over the age of eight would realize that the object being discussed was an object in space, and not a candy bar from the local store. If however, the teacher ascertains that the only "Mars" that a student knows, is a candy bar by that name, then this discrepancy must be confronted before the rest of the lesson can proceed. This example may seem a little "far-fetched" (I truly hope that there are not many people out there confusing planets and candy bars) but, there are many concepts in the field of astronomy, where a lack of understanding or a mis-understanding is the rule, rather than the exception. The following lesson was developed to help students to explore and overcome a misconception that is common among students of all ages—the interconnection between light and sight.

In presenting lessons on topics as diverse as the phases of the moon or the electromagnetic spectrum, too often the educator assumes that the student already understands how it is that our eyes "see" things, or how radiation travels in space. Yet when students are asked to explain how they were able to see a star, a planet, or the moon, many respond "because it was there," without any understanding at all that our ability to see is directly related to the presence of visible light. An object must either radiate light or reflect light for our eyes to be able to see it. This concept is basic to so many of the topics that are presented in astronomy, that I strongly urge other planetarium educators to carefully examine their students' knowledge, before attempting any presentation requiring this concept, and if necessary, to present an activity to help them gain this understanding. To address this problem, I have successfully used the following activity with sixth and ninth grade students in the Methacton School District and with college astronomy students at West Chester University. I've used it as an introductory lesson for the phases of the moon, for a study of the planets, and as a preliminary activity for college students studying about radiation (and the use of telescopes to collect radiation).

This lesson would be an excellent activity for students studying Physics (the electromagnetic spectrum), Earth & Space Science (the phases of the moon), General Science (radiation and reflection), Art (light, color, and pigment) and many other subjects that involve our ability to see and/or collect radiation. It has been my experience that students of all ages, from elementary through college, have found this activity to be a fun and yet powerful method for examining a difficult and often overlooked concept. Readers are invited to try this lesson with their students and to report on the outcome. If you have any questions or wish to discuss the lesson further, please contact me. Thank you.

NO LIGHT—NO SIGHT!!

A Planetarium Lesson by
Gerald L. Mallon, Ed.D.

Purpose:

The purpose of this lesson is to demonstrate in a concrete yet dramatic manner, the importance of light to our ability to see.

Behavioral Objectives:

By the end of the lesson, students should be able to:

1) demonstrate that in order for our eyes to see something, the object must either radiate light or reflect light.
2) explain that the color that an object appears may be because of the color of light that is radiating from it, or because of its own pigmentation.

3) describe how in the absence of light, our eyes can not see anything, no matter how hard we might try (No light = No sight).

Materials:

* A light placed in the center of the planetarium which can be dimmed.

* A few flashlights (have one with a red filter over the lens, and one with a blue filter, or as an alternative, have filters that can be placed on the flashlight as needed.)

* A few styrofoam balls some of which have been painted different colors (at least one blue and one red).

* A flashlight pointer.

For each student: a styrofoam ball mounted on a stick (or pencil).

Preparation:

Set the planetarium for the current sky. Have the first quarter moon and the planet Mars visible (Mars should be slightly red in color). Have all the materials ready for use. (Check the batteries in the flashlights.) Begin lesson with all projectors turned off, and with the room lights on full.

Presentation:

Engage the students in a discussion about "why we see things." Ask the class if anyone recently saw the moon in the sky? If someone answers that they did, then ask them to explain "how could they have seen it?" Students will usually respond that "it was there and I looked at it." Ask if anyone saw the sun or the stars within the last few days. Some students will respond that they have, but will probably offer answers similar to the first student, if asked how they were able to see them. Explain that the main reason that we can see things is so basic that it is often overlooked by people. To help them better understand why we can see the stars, the moon, the planets, or other objects, you are going to try an activity with them. Ask them to look at their classmates in the room, as well as the other objects around them. Explain that in a moment, even though everything will still be there, and everyone will be trying their best to see, they won't be able to see anything. (Quickly turn off all of the lights plunging the room into darkness.) In order for our eyes to see things, there must be LIGHT. (Turn on a flashlight and shine in on a student.) The students will be quite excited by this experience and you will need to take a moment to regain their attention before continuing. Do not turn on the room lights but instead use only the flashlight for illumination. While you are focusing the students' attention, have them repeat the phrase "No Light—No Sight." (Turn the flashlight off and then on again, to punctuate the phrase.)

Continue the explanation by stating that we can only see things that make their own light (radiate) or are hit by light (reflect). Shine the flashlight on a student, and ask the class if anyone can explain why they are able to see her. Accept the student answers, and reinforce the idea that "Mary" is not shining on her own. She is not making her own light but instead we can see her, because the light leaves the flashlight, hits her, bounces off of her, and then enters our eyes. Without the light, "Mary" would still be there, perhaps making a face at us (turn off the flashlight and quietly ask the student to make a funny face) but we won't be able to see her! (Turn on the light to reveal "Mary" with the funny face.) The younger students particularly like making a funny face for the class and it helps to break the tension of the dark room. (For older students you may not even have to ask them to make a funny face. Some will seize the opportunity and do it on their own!)

Let's look at the sky now and see if we can figure out why we can see some of the objects that are there. (Turn on the stars, the moon and the planet Mars.) Point to a star and ask "Can anyone explain why we can see this star?" For younger students they will probably respond, "because it is making its own light," or "because it is shining." (Note: For older students don't be surprised if someone says, because the machine is projecting the light onto the dome, and it is being reflected back to our eyes. In this case thank the student for being so insightful and ask them to explain how we could see the real stars in the sky.) Next point to the moon and ask them to explain why we can see it in the sky. Student answers may vary from "the moon glows," to "the sun shines on it." To reinforce why we see the moon, distribute the styrofoam balls to the students. Turn on the light in the center of the planetarium and ask the students to look at the balls. Ask them if they can explain why they can see the balls. After a few of them have responded that the light is shining on them, turn off all of the lights in the room while repeating "Remember, No Light—No Sight." Turn the light back on and collect the balls from the students. (Note: This lesson is not designed to teach about the phases of the moon. However, this activity could serve as a precursor for such a lesson at a later date. For more information on activities for teaching about the moon, see the PASS Series Volume 7, "Moons of the Solar System.")

After the balls have been collected, invite the students to look once again at the night sky. Ask them if anyone can notice an object of a different color in the sky. Have
the students point out a few blue and red "stars." Explain that some of the objects that they pointed to may be stars, but some of them may also be planets. Planets are different from stars in that they do not make their own light. We see stars because they are making light and sending it our way, but we see planets because the light from the sun is hitting them, bouncing off of them, and then coming back to our eyes. If we see a star in the sky that appears to be a certain color, it is because that is the color of the light from that star. But if we see a planet in the sky that looks a certain color it is probably because of the color of the planet and not the light that is hitting it. Turn on one of the flashlights with a filter and ask the students to notice the color of the light. Do the same with the other flashlights. State that if the light is shining with a blue light then it will look blue to us when we see it in the sky. Now hold up one of the colored balls. Explain that we are going to pretend that this is one of the planets in our solar system. Turn on the white flashlight and ask the class to identify what part of the solar system the flashlight would represent. (answer: the sun) Shine the light on the colored ball. Ask the class to identify the color of the planet. Explain that in our Solar System, the color that we see when we look at a planet isn’t because of the color of the light that is reaching it from the sun, but because of the color of the planet itself. Mars looks red to us when we see it in the sky because the surface of Mars is red in color. But a star like Betelgeuse looks red to us because the color of light that it is making is actually red.

Collect all of the materials and invite the students to look once again at the night sky. Conclude the lesson by making the following points. "Stars, planets, the moon,—all of these things and more, have revealed themselves to us here on planet earth, because of the wonderful phenomena of light. We have learned so much about the universe by the study of light and today we know that visible light is just part of the radiation that moves through the universe. By studying these other forms radiation, scientists are trying to learn even more about the mysteries of the universe. Without some way of catching this radiation though, we would be left in the dark. Today radio telescopes, optical telescopes, infrared telescopes all scan the skies trying to catch these various forms of "light." I hope you realize from our work today how important light is to our continuing exploration of space and how important these new tools are because they can collect the forms of light that our eyes can’t see. Without these tools we would be very much left in the dark and you know the saying, "No Light—No Sight!"

A CALL FOR LESSONS

Readers are asked to please share their lesson plans for the secondary level (grades 7-12). New submissions will permit the continuation of this column. In submitting lesson plans, please try to use the following format: Title, Purpose, Objectives, Materials, Preparation, and Procedure. (If you have a question about this request, please contact me. Thank you!)

Send materials to:

Dr. Gerald L. Mallon
Arcola Intermediate School
Eagleville Road, RFD #1
Norristown, Pennsylvania 19401 USA
[Phone: 215-631-9403]

(Scriptorium, continued from page 22)

Okay John, we’ll give you an outline. But we won’t stop there. Over the next several installments, the contributors to this column will build an entire planetarium show script.

Let’s start with the three themes which John mentions:

- navigation
- cosmology east vs west
- age of exploration 15th vs 20th centuries.

Admittedly, in a good show we might somehow tie in to all of these, but the next job for us to tackle is that of narrowing our focus. In other words, let’s take one from the list and go on from there, knowing full well that we could always "go back to the drawing board" with either of the other two later, if need be. How do we choose? Since this column is interactive (to a point), I will poll our potentially avid readers and let you decide. Which one do you pick? More importantly—why? Let me hear from you.

Here ends what I hope will be our briefest sojourn in the Scriptorium. Does all this script stuff sound exciting to you? Then be sure to be here when we next go wandering through these halls. After all, we’ve got a show to write!

LASER IMAGES, INC., pioneer of Laser Entertainment, has reasserted its industry leadership with new technology and a new series of shows. True 3-D computer graphics for representational, as well as striking abstract imagery, are now available in LASERIUM® laser shows.

For information on LASERIUM, including programs available and business options, please contact us at Laser Images, Inc., 6971 Hayvenhurst Ave., Van Nuys, California 91406, 818/997-6611

We look forward to hearing from you and the possibility of working with you.
Greetings of the Season and Best Wishes for the New Year! With the new year, comes a new way for you to contact me, your Secretary. You can now fax materials to me using my regular home phone number 215-277-8767. This number has a combination fax and answering machine attached to it, so you can either leave a verbal message or send a fax transmission or both. Hopefully this will help speed communication—particularly for those at a distance.

As promised in my last column, I would like to mention a few of the many projects that are being undertaken by members of IPS for the benefit of the planetarium community. Much work has been accomplished over the last year, for example: committees are working on developing guidelines for those planning or renovating a planetarium, packets for new planetarians have been produced, planetariums are actively involved with communication and "twinning" with planetariums from other parts of the world, publications are being planned and distributed, those using portable planetariums are organizing to share ideas, resources for all of us to use in addressing astrology are being developed. All of these things, and more, are happening within IPS, because of the participation of you, the members. We all benefit from a strong and vibrant organization, and this happens because individual members get involved. Please take this as a personal invitation, if you are not now currently involved with some aspect of the society, please join in! We will all gain from the experience.

Below is a review of some of the projects or areas that could use your participation. At the 1989 Executive Council Meeting, several new committees were formed from the work done by last year's Task Forces. In addition to these new committees, all of the original Standing Committees (example Awards, Publications, etc.) continue their work. Please contact the Committee Chair or Officers listed to volunteer your services. Also, if you would like to propose an area of concern not already listed, please feel free to do so. Contact the President with your idea and use The Planetarian as a vehicle to determine if their are others who share your interest. A letter to the editor or a short article describing your idea will let others know how they can get involved. Thanks.

1. A host is sought for the 1991 meeting of the IPS Council. Last year the Eugenides Foundation Planetarium under the direction of Dennis Simopoulos was gracious enough to host the session. Any affiliate organization, or individual planetarium willing to extend an invitation for the 1991 meeting, should contact President-Elect John Pogue. The decision on the proposed site is slated to be made at this year's Council Meeting in Sweden. (We are really very nice guests.) *

2. The Elections Committee will soon be soliciting nominations for officers of the IPS. Rather than wait to the last minute, consider the members of the society that you know, and contact Elections Committee Chair Tom Stec now with your nominations. Please note that in keeping with my desire to get more people involved with the society, I have decided not to run for re-election. I have happily served two terms as your Executive Secretary and I now look forward to turning over the notepads to someone new—perhaps you? *

3. The Awards Committee is continuing to compile nominations for "Fellows of the International Planetarium Society." At the 1989 Council Meeting the following members were added to the current list of Fellows of IPS: Robert Allen, H. Rich Calvird, David Hoffman, Dr. Mark Sonntag, Donald E. Tuttle, Capt. Thomas J. Winslow, Donald Knapp, and Jon U. Bell. Members are asked to consider other members of the Society who may be worthy of this great honor and send your nominations to Awards Committee Chair Phyllis Pitluga.*

4. The History/Photo-Archive Committee under the direction of John Hare has transferred the files from Paul Engle to John's facility in Bradenton, Florida. John requests that members help solicit slides and other materials for the archives.*

5. The Consumer Affairs/Astrology Committee chaired by Jeanne Bishop is preparing a set of materials that would be helpful to other planetarians in addressing the issue of Astrology. During the coming year, they will attempt to create a summary article which will review past articles that have been published and will then create a resource of materials on this topic. (Contact: Dr. Jeanne Bishop, Parkside Junior High School, 24525 Hilli-
6. The Job Information Service Committee is under the direction of Chair Don Hall. Members seeking jobs and facilities looking for employees have been taking advantage of this IPS service for some years now. Don reports that "From June 1, 1988 through the end of May, 1989, we sent out 24 job announcements (an average of one every 15.2 days) to an average of 25 people." Members are reminded to use this service when necessary. *

7. The Language Committee (Chair Lars Broman) decided that the IPS Membership brochure should be translated into French, German and Spanish. (with the notation that all IPS material is normally printed in English only). These brochures would be distributed to planetarians in the parts of the world where these languages are spoken. IPS members with skill in translation are asked to join the committee. *

8. The Eugenides Foundation Script Contest Committee is chaired by Jordan Marché. The second Biennial Contest will occur during the current year. The second awards ceremony will be held at the IPS conference in Sweden in 1990. Members are urged to submit their scripts to Jordan for review by the committee. (Contact: Jordan D. Marché II, Franklin & Marshall College, North Museum Planetarium, Lancaster, Pennsylvania 17604; phone: 717-291-4315.)

9. The Planetarium Development Group Committee Report is chaired by Ken Wilson. The committee has decided that two publications are needed. The first will be brief and will be aimed at the school, museum, or civic administrator considering a planetarium facility. It will offer definitions and philosophies of planetaria, etc. The second one will be more detailed and will delve into the specific 'nuts and bolts' that would be important for the person delegated to oversee the project. (Contact: Ken Wilson, Ethyl Universe Planetarium, 2500 West Broad Street, Richmond, Virginia 23220; phone: 804-367-0211.)

10. The Planetariums and the Science Crisis Committee was created at the 1989 Council meeting with the directive to draft a document on this topic for council's review at its next meeting. Sam Storch was thanked for his participation in the project to date. Tom Hocking was appointed the Chair of the Committee. (Contact: Tom Hocking, Morehead Planetarium, CB #3480 Morehead Bldg., University North Carolina - Chapel Hill, Chapel Hill, North Carolina 27599-3480; phone: 919-962-1236.)

11. The IPS Committee for the Exchange of Communication and Personnel was created at the 1989 Council Meeting. This committee combines the work of two Task Forces that worked last year. The committee is chaired by April Whitt and will hopefully help to further open the lines of communication within the planetarium community. This might involve written communication or the temporary exchange of personnel. This committee will also help planetariums that are interested in "twinning" with other facilities. (Example: Facilities from Eastern Block countries with those from the West.) (Contact: April Whitt, Adler Planetarium, 1300 S. Lake Shore Drive, Chicago, Illinois 60605; phone: 312-322-0338.)

12. The Portable Planetarium Committee was created and Sue Reynolds was appointed Chair. This committee will help to develop links with those who are interested in the use of portable planetariums. All of those involved in this area are asked to please contact Sue. (Contact: Sue Reynolds, OCM BOCES, Box 4754, Syracuse, New York 13221; phone: 315-433-2671.)

13. The IPS Script Bank Committee was created with Donna Pierce as Chair. The committee is still working on the details of the program but members interested in becoming involved with this project should contact Donna. *

14. The Membership Committee assumed responsibility for the IPS Packets for New Planetariums Task Force. The group proposes that a "packet" of materials be created for distribution to new planetarium personnel. The packet would include book and magazine titles, addresses of vendors, local affiliate reps, etc. Donna Pierce will coordinate this project. *

15. The Curriculum Projects Committee was formed with Elizabeth Wasiluk as Chair. The committee is still reviewing its possible projects and goals and members with expertise in this area are invited to become involved. (Contact: Elizabeth S. Wasiluk, Berkeley County Planetarium, Hedgesville High School, Rt #1, Box 89, Hedgesville, West Virginia 25401; phone: 304-754-3354.)

16. The PSA Task Force is continuing to be coordinated by Kris McCall. A letter appeared in the last issue of The Planetarian calling for members to participate. (Contact: Kris McCall, Sudekum Planetarium, Cumberland Science Museum, 800 Ridley Blvd., Nashville, Tennessee 37203; phone: 615-259-6099.)

17. Miscellaneous Task Forces—Although the vast majority of task forces did an absolutely splendid job over the last year, some projects did appear to sit idle (at least no reports were given on their progress). If you would like to get involved with any of the topics listed below, please contact the President. (If you have done something, then please submit a report to me and The Planetarian.) Slide Bank Task Force, Electronic Bulletin Board Task Force, Standardization Task Force, Planetarium Director's Certification Task Force.
18. Planning continues for the 1990 IPS Conference to be held in Borlange, Sweden July 15-20 1990. All members will shortly be receiving specific information on the event. Invitations to propose papers and posters have already been made and hopefully many of you responded by the deadline. Please plan now on attending this important function, and offer to share your ideas by your active participation as a presenter.

19. IPS Group Travel to IPS '90. As reported in the last issue, the International Planetarium Society is happy to announce that group travel plans have been arranged for members to travel to the IPS '90 Convention in Borlange, Sweden. Updated details of the trip are as follows: Round Trip airfare $726, plus $13 tax, and $40 ground transportation (Note: These prices are based on the current exchange rate for the U.S. dollar. This may fluctuate slightly during the year.) Members will fly Icelandic Air and may depart on either Thursday July 12, or Friday July 13 (limited number of seats per day, and per city). Departure can be from one of two (possibly three) gateway cities. Currently the gateways are Baltimore and New York, with a possibility of Boston. The add-on fares from the members' home cities to the gateways will be based upon the lowest available rates at the time of booking. Direct all inquiries to:

Sigmund Travel Bureau, Inc.
262 S. 12th Street, Suite 206
Philadelphia, Pennsylvania 19107
Phone: (215) 735-0090

20. On the topic of conferences, please note that there are two proposals for the 1994 IPS Conference. During the 1989 Council Meeting, a formal written proposal from the Kendall Planetarium of the Oregon Museum of Science and Industry was submitted to President Murtagh on behalf of the IPS Council. The packet included letters of invitation from the President of the Museum, from city officials, and from the Portland Oregon Visitors Association. The packet described some of the advantages of holding the meeting in Portland during the summer of 1994. Also, Mike Hutton of the Astronaut Memorial Hall of Brevard Community College in Cocoa, Florida formally invited IPS to hold the 1994 Conference at their new facility. Mike distributed materials to the IPS representatives and commented on some of the highlights that a convention in Cocoa might offer to the convention participants. The difficult decision between these two excellent choices will be made at this year's Council Meeting, therefore, please let your representative know your thoughts on this subject before the meeting. If possible, all affiliates are urged to discuss the matter at their annual meetings, or somehow poll their members prior to the Council meeting. (For those of you who are members of the IPS but not members of a local affiliate, please drop me a note and as your secretary and I will attempt to represent your thoughts on the matter.) *

In closing, I wish to thank all of the people who have contributed to the growth of our profession through their work in IPS, especially those mentioned above. And to all those who are considering participation, I urge you again to join in! I look forward to gaining from your involvement!

* These addresses are listed on p. 4 of The Planetarian.

Quotations on Believing

Beware of false knowledge; it is more dangerous than ignorance.
—George Bernard Shaw

Though a good deal is too strange to be believed, nothing is too strange to have happened.
—Thomas Hardy

There can be no security in the conclusions if the premises are not understood.
—Dr. Samuel Johnson

Nothing is so firmly believed as what we least know.
—Montaigne

It is the customary fate of new truths to begin as heresies and to end as superstitions.
—T. H. Huxley

True science teaches, above all, to doubt and to be ignorant.
—Miguel de Unamuno

We certainly are not to deny whatever we cannot account for. A thousand phenomena present themselves daily which we cannot explain, but where facts are suggested, bearing no analogy with the laws of nature as yet known to us, their verity needs proof proportioned to their difficulty. A cautious mind will weigh well the opposition of the phenomenon to everything hitherto observed, the strength of the testimony by which it is supported, and the errors and misconceptions to which even our senses are liable.
—Thomas Jefferson

Skepticism, like chastity, should not be relinquished too readily.
—George Santayana
Lonny Baker  
Morrison Planetarium  
California Academy of Sciences  
Golden Gate Park  
San Francisco, California 94118

A mini-debate has been waged in recent issues of *The Planetarian*, initiated by Donna Pierce in the Gibbous Gazette (March '89), with the opposing view presenting by Ken Wilson in September's Letters to the Editor. Donna expressed concern that the Richmond meeting contained too little astronomy, while Ken referred to a survey he conducted in Tucson which suggested that members attending IPS conferences prefer that more emphasis be placed on the planetarium field and less on astronomy.

The following question was asked of 25 IPS members who have regularly attended past conferences:

«When attending IPS Conferences, what do you consider an appropriate mix of papers, guest speakers, and field trips dealing with the multiple facets of the planetarium field and astronomy?»

If you have additional comments, please submit them to Lonny Baker by January 5 to be included in the March issue of *The Planetarian*.

*****

Regarding the mix of papers, speakers, etc. at IPS conferences, I think we clearly need BOTH. The Pierce-Wilson "disagreement" is largely a reflection of the last two meetings, held at two very different places. At Tucson, an astronomy capital and mecca, it made sense to place more emphasis on that subject than on planetariums per se. This seemed especially important in light of the Challenger accident. At Richmond, however, largely the opposite was true. (How many others, besides myself, traveled to see the Leander McCormick Observatory with its fine Clark refractor?) Considering the density of east-coast planetaria, it was natural to focus more on our own field's problems and progress. So we've had the best of both sides in two successive conferences. Maybe the total balance will be more equal in Sweden. But variety IS nice.

When I go to a planetarium conference, I go to learn new and/or better ways to run my facility. I explore new technologies which may be included in the planetarium we are building in the near future. I also go to talk to other people who have the same problems and interests that I have.

I do not attend a planetarium conference to learn about the latest happenings in the astronomical field. For that information I attend conferences held by the Astronomical Society of the Pacific (ASP) and the American Astronomical Society (AAS), and read current astronomical literature.

The ASP has workshops and conferences aimed at both the amateur astronomer, teachers, and professionals. On the other hand, AAS is very technical, and though involved with public education, that is not their primary concern.

I do not feel there is "an appropriate mix of papers, guest speakers, and field trips" for any conference; in my opinion the subjects will depend on the resources that a locality has upon which to draw. The conferences held in Tucson had different resources to call on than the one held in Richmond.

I want to hear speakers who might not be available in my location, who will talk on astronomy or planetaria. I want to be able to visit other facilities and study how things are done there, to find things I might want to adopt, as well as things to avoid. I like workshops that can give me a hands-on guided approach to technologies I may or may not find useful in my planetarium.

I have never attended a planetarium conference that I did not enjoy or feel was worth every bit of my time, energy and money (and at IPS conferences I am usually paying my own way, as so many of us are).

Rita Fairman  
Akima Planetarium  
East Tennessee Discovery Center  
Knoxville, Tennessee

*****

Over the years, I've attended seven I.P.S. conferences and had many discussions with fellow attendees about them. I've also chaired an I.P.S. conference and been active in several regional meetings. Prior to the 1988 conference in Richmond, we also surveyed the I.P.S. membership concerning their conference preferences.
As I stated in my response to Donna Pierce's Gibbous Gazette item, I believe that the primary focus of an I.P.S. conference should be planetariums. Purely astronomical information is available via many effective existing organs (e.g. Sky & Telescope, Astronomy, Science News, Mercury, Griffith Observer, numerous colleges and universities, and regular meetings of the A.S.P., A.A.S., I.A.U., etc.). Trying to duplicate their efforts is clearly redundant and wasteful. Where I.P.S. bests serves its membership is as a communications conduit that concentrates on the issues, problems, products, services, experiences, discoveries, inventions, research, and so on, directly related to the unique medium of the planetarium. Thus, I feel that a 15 minute paper on 'Computer Generated All-Sky Rooms' is more important than a one hour lecture on 'Beta Pictoris'. The surveys of the I.P.S. membership that we conducted before the 1988 conference showed that most respondents wanted more planetarium oriented presentations and less general astronomy. The surveys also showed a preference for scheduling field trips either at the beginning or the end of the conference so that those with limited time and/or budgets could opt out of the field trips without missing the main program presentations.

Although I feel that the main focus of an I.P.S. conference needs to be planetarium-related, other allied program elements can be very appropriate and welcome. Behind-the-scenes tours of important observatories, tours to archeo-astronomy sites, and events like solar eclipses can offer attendees unique experiences related to their professions. I think the important aspect here is the word 'unique'. They need to be significant experiences that aren't readily available elsewhere. Why travel half-way around the world to hear another lecture on Cygnus X-1 when you could (or have) just as easily read the lecturer's papers on the subject? Indeed, variations in the program mix of I.P.S. conferences are inevitable due to such factors as the proximity of field trip locations of interest, the costs of obtaining invited speakers, the amount of outside sponsorship available for speakers and other program elements, the number of attendees and submitted papers, the capacity and time available in the host planetarium, and so on. Such variety is good, if for no other reason than to give each conference an individual flavor of its own. Just as long as we don't lose sight of the primary focus—PLANETARIUMS.

Let me finish by warning future I.P.S. conference hosts that, no matter what, there's going to be somebody who doesn't like the way you plan and run the conference. All you can do is try to satisfy the majority as best you can with the resources you have available. And to those who have complaints, feedback, desires, needs, new ideas, etc. about I.P.S. conferences, let me strongly urge you to make your opinions known IN ADVANCE to the brave folks who've offered to host upcoming conferences. If you want a workshop on converting your old Motorola 19-inch B&W TV into a do-it-yourself Digistar, ask for it before the conference agenda is set, not after it's over. If you don't tell the planners what you want before hand, you're not likely to get it!

Ken Wilson
The Ethyl Universe Planetarium
Richmond, Virginia

*****

(The response that follows was accompanied by this note: Thanks for the invitation to comment on a topic about which I have a strong opinion. Although my own papers presented at conferences are tech-type on special effects or electronics, I don't want to see a conference dominated by an us-or-them philosophy. Since I knew others who enjoy debate, I networked with a few friends and we have the following opinion. Sincerely, Richard Pirko)

What is an appropriate mix for I.P.S. conferences? We must first define the end to which we are working: the accurate, informative depiction of the universe in which we live. The accuracy challenge was well stated by Jeanne Bishop (IPS 1988 Richmond, March 1989 Planetarium) and widely supported by all who wrote in response.

However, we seem to quickly divide into separate camps of planetariums vs. astronomy, and entertainment vs. education. Encouraged by the mass media, many of us view learning and recreation as exclusive activities. They do not have to be, as shown by the large numbers of amateur astronomers, bird-watchers and wildlife photographers for whom a knowledge of the natural world forms the core of their recreation. Education should never be placed in a separate column from entertainment.

The marvelous technical innovations and hardware of the planetarium field are necessary, but the best equipped planetarium cannot compete with the multi-million dollar effects of Hollywood. We cannot and must not try to make a show run on its effects or a big-name narrator. To do so would make us only a third-rate imitation of the mass media.

The other side of this ugly coin is the lack of modern science and the total avoidance of controversial subjects. Attitudes like "No one will understand or care" serve only to isolate our community and foster scientific elitism. Topics from the mainstream of modern astronomy that are given good coverage in the popular science press are often either badly distorted or altogether ignored in planetarium programming. For example, in the last five years recent advances in cosmology have been featured in Astronomy, Sky and Telescope, the National Geographic and Scientific American as well as

The Planetarian, Vol. 18, No. 4, December 1989

With this in mind we make a plea for the continued inclusion of pure astronomy in conference schedules. We in the planetarium community have a vehicle to combat scientific illiteracy. A working knowledge of basic, up-to-date astronomy is essential for anyone making presentations to audiences who trust us as authorities.

John Beaver
Dept. of Astronomy
Ohio State University

Mike DiMuzio
Dept. of Physics and Astronomy
University of Nebraska, Lincoln, Nebraska

Douglas Fowler
Planetarium
Dept. of Physics and Astronomy
Youngstown State University, Ohio

Susan Peterson
University of Missouri
Kansas City, Missouri

Richard Pirko
Planetarium Dept. of Physics and Astronomy
Youngstown State University, Ohio

****

Once upon a time, visitors to planetarium shows were dazzled by the sight of so many stars, easily awed by phonographic music, the arrow pointer, constellation outlines and a meteor projector. A lot, in fact, was left up to the visitor's imagination. Today's planetarium presentations have become a mix of fast paced multi- visuals that have, in many facilities, become the show. Planetarium conferences in many ways have helped encourage and promote such a direction. It's important that we all benefit from a conference, especially an IPS Conference. "High-tech", all sky and video programming paper sessions are not very helpful for those who return to a facility equipped with a few manually controlled ektagraphics.

It's no easy task presenting the many and diversified facets of the planetarium at IPS Conferences, but there are fundamental common curriculum goals. Planetariums are centers for learning astronomy and we should continue making the subject as attractive, curious and easy as possible. Let's not forget that visuals and the high-tech lend support to the astronomy. Papers are the core of the conference and the majority of them must relate to improving astronomy-related science education in the planetarium, whether for schools or the public.

Not all planetarium directors can afford to, or even wish to, upgrade their facilities, nor do management techniques apply to all planetariums, but every planetarium benefits from the exchange of teaching methods and techniques when it comes to popularizing astronomy. This is basic, and future IPS Conferences should keep the basics in the foreground of planning agendas.

I've always enjoyed listening to guest speakers, sometimes more so than the preceding luncheon or banquet! What is said should be food for thought, but topics ranging from historical aspects of astronomy to space exploration are entertaining enough for everyone.

The 1990 IPS Conference will be different in many respects. For most of us, it will be our first visit to a European planetarium. The planned field trips will play an important role in exposing the sights and sounds of a different culture. Field trips are valuable for this alone. Additional trips to nearby planetariums, observatories, related historical sites and places of interest are enjoyable and broaden our horizons. These trips should be offered at times when all conference members can take part.

Having worked in a European planetarium, I know we have a lot to learn from one another, but that's what these conferences are all about.

Jon Elvert
Lane E. S. D. Planetarium
Eugene, Oregon

****

The Biennial IPS Conference is a valuable opportunity for planetarians to learn and share information about our profession. I think of our profession as that of astronomy and science educators. Many of us are directly involved with students and teachers daily. Some planetarians find their clientele to be primarily the general public. But, in both of these activities, whether academic or entertaining, we are interpreting and conveying information. For us to inform others, it is necessary that we ourselves be informed.

Astronomy is a fascinating area of knowledge. I suspect it is true that, for many planetarians like myself, it is our interest in the subject itself that led us into this profession. There exists a multitude of sources for contemporary astronomical information: books and magazines, professional publications, PBS television programs and series, professional organizations and societies, and conferences.

When I attend an IPS conference, my goal is to learn what other planetarians are doing, discover innovative techniques, and in general, learn what I can do to improve the services and products we provide.
In the past, I have been mostly satisfied with the mix of conference activities. I feel that the majority (approx 95%+) of paper sessions should be related to the planetarium field. Guest speakers from the astronomical community, on the other hand, are a valued addition to our conferences. To listen to what researchers are learning helps all of us to broaden our knowledge and understanding. Even when the speaker introduces jargon or difficult concepts, we can grow by stretching to grasp an idea. Guest speakers also provide a welcome change of pace after attending paper sessions. Here my preference is more toward speakers in the field of astronomy (approx. 85%). Field trips should be informative rather than cultural. I am just as interested in a trip to an observatory or laboratory as I am in seeing how a planetarium has been put together or what special facilities may be present. Pre- or post-conference cultural trips are desirable, but during the conference the primary emphasis should be on our profession.

Kenneth Adams
Schreder Planetarium
Redding, California

Editor's note: Please see Gibbous Gazette for Donna Pierce's response.
DIGISTAR is the world's first and only planetarium and space theater projection system based on sophisticated computer graphics. Instead of mechanical components, DIGISTAR relies on computer graphics to project standard planetarium features, plus special effects that are totally unique to DIGISTAR.

A COMPLETE, EXPANDABLE SYSTEM

DIGISTAR is delivered with all of the hardware and software required to generate images and project them onto a dome. The system features an extensive software package that can be easily updated and expanded. Some of the standard DIGISTAR features include:

- 3-D outlines of 88 constellations
- Travel through space and time, spatially flying through 400 parsecs
- Proper motion of the stars and constellations one million years into the future or past
- Instant positioning from the current sky to any other sky in the past or future
- Alternate skies—Gamma Ray, X-Ray, Radio and Infrared
- Meteors, galaxies and special effects
- Sun, planets and their moons, comets and asteroids with their motions accurately computed using a Keplerian model
- 3-D drawing package to create your own effects
- Extensive users library—free to all DIGISTAR owners

DIGISTAR USERS GROUP

All DIGISTAR owners belong to the DIGISTAR Users Group. This provides an efficient and economical way to share information, and to exchange special effects...at no charge! No other planetarium system can offer this powerful way to expand instrument capabilities and horizons.

Special effects let your planetarium visitors explore more than astronomy. Molecules and chemical designs may be projected on the dome bigger than life; engineering and scientific designs can be displayed, then rotated, panned and zoomed, to study, to educate and to entertain. A variety of other data bases and special effects can be displayed and manipulated, in real time. DIGISTAR is truly unique because what you create and project on the dome of your planetarium is limited only by your imagination. Learn how you can bring a new universe...the DIGISTAR Universe...to your planetarium.

For more information, call Jeri Panek, DIGISTAR sales.

EVANS & SUTHERLAND
580 Arapahoe Drive
Salt Lake City, UT 84108
Telephone: (801) 582-5847

Manned maneuvering unit (MMU) used by NASA astronauts to perform a variety of tasks in space.
And the question is: "When attending IPS conferences, what do you consider an appropriate mix of papers, guest speakers, and field trips dealing with the multiple facets of the planetarium field and astronomy?"

I would like to thank Ken Wilson (Universe Planetarium/Space Theatre, Science Museum of Virginia) for addressing my Where is the Astronomy? in his Letter to the Editor in the September 1989 issue of The Planetarian, and also to associate editor Lonny Baker (Morrison Planetarium, California Academy of Sciences) for making the question the topic for Forum in this issue.

I believe some of "us" cannot see the stars for the special effects. According to the Thordike and Barnhart dictionary, planetarium is defined as: "apparatus that shows the movements of the sun, moon, planets, and stars by projecting lights on the inside of a dome" and astronomy as: "the science that deals with the sun, moon, planets, stars, and other heavenly bodies." Since time began man has strayed off course and sooner or later returns to basic fundamentals. More is not always better and most of us will admit that star shows will be favorites forever and ever and ever! It goes without saying we must remain innovative and open to change and new ideas. I agree with the GPPA Conference theme that "Planetaria should build on the solid foundation of being a source of astronomy education while embracing the new and exciting worlds of technology and entertainment." I think, therefore I (whoops, wrong quotation!). I believe IPS has emphasized too much of the technology and entertainment and not enough of the education. Am I wrong in thinking more of us consider the planetarium to be an educational resource rather than a business? It's the same old story of "education" versus "entertainment", and I plead guilty in not relating my preferences on conference surveys as Ken mentioned in his letter. Therefore, I am asking each of you to join me in answering such surveys with a more dedicated response than just a filling—in—the—blanks assignment! I want more of a balance between astronomy and technology and am trying to provoke the membership into making astronomy the first priority! That's all. It's an old war that needs fighting from time to time.

Kudos:

To Voyager 2! What a thrill it was to be at the Cape as a guest of JPL that day in August of 1977! I wish I could hug you Voyager 2—you have far exceeded our expectations, and we wish you well as you journey into the depths of space we are trying so hard to fathom. Thanks to you and your twin Voyager 1, we planetarians are well equipped to teach the latest on our solar system!

To the International Dark-Sky Association! I am more familiar with what's happening here in Texas because the Texas Astronomical Society charges over $20 per person attending the Texas Star Party each spring for changing out the lighting in the towns of Marfa, Alpine and Fort Davis—those within fifty miles of McDonald Observatory. It also helped that the Board of McDonald was able to get legislation passed requiring the low pressure sodium fixture. John Cotton (Science Place 2 Planetarium) has played a major role in this endeavor, and I fondly recall the night he, Bryan Snow and Bob Kelley (San Antonio College Planetarium) and I were at the Observatory one night jumping up and down watching our shadows by Venus light! It's dark down there.

To Challenger Learning Centers at Howard B. Owens Science Center, Greenbelt, Maryland and to Houston Museum of Natural Science—congratulations on being in full operation!

To all of you who have paid your IPS dues; now go out and get your affiliate friends to do the same! (Mark, you owe me one!)

Castigations:

To Science Museum and Planetarium of Palm Beach County, Inc., Department of Lunarian Affairs, 4801 Dreher Trail North, West Palm Beach, Florida 33405. Also under the name Universal Lunarian Society and Registry, Inc. And we thought the Star Registry was just awful—well wait until you hear this one! Are you ready to own an acre on the Moon. At least there would be no grass to mow. For $50 an acre the Museum keeps $20 as a fund raising mechanism and sends the remaining $30 to the Lunarian Society at the South Florida Science Museum. As Mickey Schmidt (U.S. Air Force Academy Planetarium) so ably points out: "it's poor quality and perhaps fraudulent. The mailing speaks poorly of the planetarium in Florida and reflects on our profession as well. Personally I find this to be an obscene fund raising method. First, the title is, of course, good for nothing but that is never pointed out.
Second, the bulk of the funds do not stay with the local institution. Third, moon settlement is not too far into the future. Some persons may think they might soon have a legitimate claim to lunar real estate. Fourth, most planetarians do not agree with the image and methods of the International Star Registry and because IPS has issued a statement of policy regarding that kind of activity, I do not support the Lunarian Society and urge all other to reject these tactics and practice. I question ethics of "reputable" institutions which would do this and classify them as being of the same ilk as the aforementioned group." Ditto from me, too. John Wharton (St. Louis Science Center) pointed out: "I have major problems with their accuracy. For a sales kit, I would at least hope they could present a consistent spelling for the crater Copernicus ("Capernicus," "Capurnius").

Also, I really liked their promotional art, with an enormous earth (1950's style—North America bias, no weather), and landing strips for approaching Shuttles!!! This is tripe, and makes them—and, by implication, us—look silly. 'nuff said."

I agree and thank both members for bringing this to my attention. For this Castigation I hereby make it a Lifetime Castigation.

Have You Heard?

Rick Greenawald moved last October from Planetarium Curator of the Louisiana Arts and Science Center Planetarium in Baton Rouge to take on the position of Planetarium Curator of the new T.C. Hooper Planetarium/Science Sphere with the Roper Mountain Science Center in Greenville, South Carolina (note: does Mark Petersen have room for all of this??) The new theater will feature the Evans & Sutherland Digistar projection system under a 50-foot tilt dome. They hope to begin operations in the spring of 1990 and Rick invites any of us passing through the area to stop by and see this new facility! .....I stand corrected (again) because Mark and Carolyn Petersen (Loch Ness Productions) were not the only IPS members to be married in a planetarium. Steven Russo (Southern Cayuga Atmospherium Planetarium) reports he and wife Jan (while both were working for the South Florida Museum and Bishop Planetarium) were married under the stars in the Sky Theatre in 1982 with John Hare (Bishop Planetarium) and his wife Linda as attendants—and—laser stars appeared above the couple as they were pronounced man and wife (compliments of our famous Joe Hopkins) .....Wayne Wyrick (Kirkpatrick Planetarium) reports Christina Reeves—Shull will be returning to school and Dayna Bryant will be replacing her as an educational specialist. Good luck to Christina in her studies on astrophysics and welcome aboard to Dayna! .....John Hicks (Marian Blakemore Planetarium) received a lesson in spectroscopy when he was trying to find a rental car after a meeting at the RMPA Conference. Due to the lights in the parking area his "red" car was not red and it did not help that the Air Force van that had been parked next to the car had moved! John said it involved some foot—work in order to locate it! .....That even though Lincoln doesn't have any beaches, ski slopes or mountain vistas Jack Dunn and his staff at the Ralph Muller Planetarium pulled off a fabulous GPPA Conference! .....Jack Horkheimer (Miami Space Transit Planetarium) is still star hustling and if you have not received your Star Hustler Jumping Disc write him for one (or many). .....President Bush, Vice—president Quayle, and NASA Administrator Truly are asking for public involvement in the International Space Year. "The space age requires a global vision to meet new challenges" reports Bush. Space isn't only a place for I.S.Y.—it's also an age that is characterized by a global outlook. The International Space Year in 1992 will be the first year—long worldwide celebration of a new global space age that has relevance for everyone reports ISY Information Service. Looks as if we can certainly help in this global vision area! .....Don't forget to contact Mike Murray (John Young Planetarium) if you want Geoffrey Dick's extensive index to both Astronomy and Sky & Telescope Magazines. This version not only includes feature and topical article listings but also an alphabetical listing of all photographs and drawings for only $20. Many thanks to The Plains Planetaria for this valuable information! .....John O. Williams (Astral Projections) reports the first twelve episodes for Sci-Fi Radio were released last July. This will be aired on public radio under the terms of a grant from the Corporation for Public Broadcasting. To find out when you may hear Sci-Fi Radio, contact your local NPR station. .....Spitz technician Howard Estes got in some good o! home cooking while working in the Dallas—Fort Worth area. Local planetaria presented Howard with his annual Covered—dish Supper at my house in August. Howard may be with Spitz but all the planetaria honor him when he is in the area each year! .....A mountain summit in Colorado was named Challenger Point in memory of the astronauts who perished in the Challenger disaster in 1986. The Department of Interior gave approval to the board on Geographic Names and it is one of the summits of Kit Carson Mountain in the Sangre de Cristo range about 4 miles northeast of Cottonwood, Colorado. .....The High Altitude Observer reminds us about the seven craters on the moon that were named for the Challenger astronauts. The International Astronomical Union chose the seven small craters within the larger crater Apollo. .....Steven Zavalney (Don Harrington Discovery Center) reports the Cinema 360 Conference was a huge success with over twenty attending from the U.S., Norway and Holland! Conference attendees viewed Northern Lights from Norway; a presentation the Discovery Center will be showing this spring. But, it was the Texas Panhandle landscape that was the zenith of the Conference, host Steven says—an early morning cowboy breakfast where the landscape goes on forever and ever! And ever. And ever. .....Tim Kuznjar from Youngstown joined Loch Ness Productions last October, reports Mark C. Peter-
sen. The Petersens and group were working overtime getting the Voyager 2 Neptune show ready! What else is new. .....I visited the Museum of the Rockies while in Montana last August and traveled 80,000 years ago with the dinosaurs, went with Lewis & Clark and the Native Americans and ended up in the Taylor Planetarium seeing some mighty impressive work for such a new planetarium (opening was only last April)! Jim Manning—you have some fine help in students Judith Kirtley and Michael Briggs and staff member David Falk. Now if Digistar could just clean up that star field. .....That Tom Stec (Central Bucks School District Planetarium) gave us all a scare when he collapsed in his driveway (luckily wife Mary Louise was right there!) and spent two days in the hospital enduring tests to find out he was allergic to the medicine he was taking for the inflammation in his back! .....Can you believe all the publicity the Astronomical Society of the Pacific gets—even on the Larry King Show! What’s next?? .....Robert Risch (Jefferson County Public Schools Planetarium) and Elizabeth Wasiluk (Berkeley County Planetarium) attended a feedback meeting (from the NRAD summer workshop) at Buhl Planetarium where Holly Smeltzer delivered a repeat performance of her terrific paper from Richmond on Buhl’s portable planetarium outreach. Elizabeth reports that if you want to find out more about the Green Bank experience you can check out an article by her in the Griffith Observer later this year or early next. .....Jenaworks employs over 85,000 people and is spread out over several locations? .....Ask President—elect John Pogue (Grand Prairie I.S.D. Planetarium) how his Consumer Math class is coming along; on second thought—don’t. It’s truly amazing what the Texas economy is doing to some of our friends in this business. John Hicks has been a bus driver for his district for many years (how else is he going to get them to the planetarium?) Why don’t some of you send in your war stories; we know we are versatile but ....

Art and Space:

Gerhardt Rohner and Harald Schumacher (Galaxy Art Productions) report on a new concept to attract people to space and astronomy by using a unique combination of exhibitions, multimedia performances, movie presentations and planetarium shows. By planning many activities over a four week period in July they were able to cover nearly all facets of spacial subjects throughout Hamburg! Soviet ships and works of artists of the Soviet Union were on display at a shopping mall. At the America House, Grindel Cinema and the Hamburg Planetarium the 20th Anniversary of the first lunar landing was celebrated. Models of the Apollo program, a moonrock sample, and a Lunar Landing Party help to celebrate this historical day. Guests from the United States and the Soviet Union as well as German astronaut Reinhard Furrer, chief engineer of the Saturn V rocket Arthur Rudolf, and guest of honor Jesco von Puttkamer (NASA’s senior strategic planner and former staff member of Verner von Braun) were present! By using art as a medium to interest the people in astronomy Galaxy Art Productions found a successful way to exceed man’s past imaginations by opening new frontiers not only in technology but also with the mind.

Astronomy Day:

Astronomy Day has so many success stories: coordinator Gary Tomlinson (Chaffee Planetarium) reports the Northwest Suburban Astronomers (near Chicago) won the first annual Astronomy Day Award sponsored by Sky Publishing! Runners—up included Bay’s Mountain Amateur Astronomers (Kingsport, TN); The Wilderness Center Astronomy Club (Massillon, OH); American Samoa Astronomical Society (Pago Pago); Charles Hayden Planetarium (Boston); and Penn State Astronomy Club. Besides the standard events, (day and night telescopic observations, mirror grinding demonstrations, special speakers, lectures, library lists of suggested astronomical reading and observatory open houses), some of the more unique and interesting activities included teacher workshops, a lunar gravity simulator, moon rocks, a walking tour of the solar system (scale model), people in costume portraying famous past astronomers, serving space themed food, administering the Astronomy Test of General Knowledge, breaking dark inner balloons while leaving the clear outer balloon intact with focused sunlight, the construction of a special Light Buster poster, astronomical postage stamp displays, door prizes, and—of course, planetarium shows (one planetarium ran a show entitled Dinosaurs in Space), and fund raising for the Ronald McDonald House! St. Louis held an Astronomy Week!

European Meetings on Astronomy and Space:

The French Association for Astronomy held "Le Ciel et l’Espace" last September in Montpellier—Corum—and Aniane Astronomical Observatory. Bernard Pellequer and Danny Mendre (Aniane Observatory) coordinated the meeting with the support of the European Community Commission, the European Spacial Agency and the European Southern Observatory! The aims of the Colloquium were to bring to light the difficulties in European academic education, to explain the status of research and space techniques, to present the repercussions of space research and to expose the various tools with which such fields can be popularized to the general public.

Planetarian of the Year:

And the envelope please ..... To Dr. Gerald L. Mallon (Methacton S.D. Planetarium) for his years of dedication as Executive Secretary for the Society! Who else could

(please see Gibbous on page 41)
From the world's very first planetarium projection machine to the most sophisticated and innovative projectors of today, JENA has been and IS the Hallmark of Quality in the Universe!

- Projectors to fit all sizes and applications
- Complete installation
- Spare parts from Seiler Instrument
- JENA factory trained Seiler technicians at Seiler Instrument

Call Pearl Reilly at 1-800-444-7952 for additional information about JENA projectors and accessory items.
Regional Roundup

Steven Mitch
Benedum Natural Science Theater
Oglebay Park
Wheeling, West Virginia 26003
(304) 242-3000 Ext. 261
CompuServe 72467,2051
Fax (304) 242-7800

Any interesting news, events, activities, etc. from any of the IPS affiliates is greatly appreciated. If you have anything that you would like to share with your colleagues via Regional Roundup, please forward the information to me at the address listed above or via CompuServe Easyplex or fax.

The final deadline for submissions into Regional Roundup for the next issue of The Planetarian is Wednesday January 10, 1990. Please mark your calendars accordingly.

ASSOCIATION OF MEXICAN PLANETARIUMS—AMPAC

AMPAC recently held its 14th national conference. Several items were agreed upon in order to improve compatibility between member institutions, some of which were:

- The sharing of educational materials and programs among similar planetariums.
- The training of technicians.
- AMPAC member institutions should give proper assistance to educators in order to educate the public about proper observation techniques for the upcoming 1991 total solar eclipse.
- A package agreement between the Jenoptic Mexican representative and local technicians is being offered to state authorities to create, repair and equip planetariums through attractive financial arrangements.

Three AMPAC members now have new directors. They are: Juan Campa at Totsasco; Eduardo Zamudio at Morelia; and Pedro Ochoa at Tijuana. Two new members were introduced to the AMPAC representatives during the recent meeting. They were Captain Marco Antonio Baez of the Mazatlan Nautical School and Lieutenant Armando Fernández from the Anton Lizardo H. Military Naval School.

The newly elected officers of AMPAC are listed below. They will begin serving their terms in January 1990.

President: Lic. Alfonso Martinez Serna
Vice President: Ing. Fernando Oviedo Tovar
Council President: Arq. Sergio González de la Mora
Executive Secretary: Prof. Jorge Gabriel Pérez
Treasurer: Ing. Miguel Gil Guzmán
P.R. Secretary: Cap. Francisco Ramírez
Technical Secretary: Ing. Jose de la Herrán
I.P.S. Representative: Ing. Ignacio Castro Pinal

BRITISH ASSOCIATION OF PLANETARIUMS

No report; Terence Murtagh, representative.

EUROPEAN ASSOCIATION OF PLANETARIUMS

No report. Dennis Simopoulos, representative.

GREAT LAKES PLANETARIUM ASSOCIATION—(GLPA)

The 25th annual GLPA Conference was held October 18-21 at the William Staerkel Planetarium in Champaign, Illinois. The host was David Linton. The conference was held at press-time. Details of the conference will be in the next issue.

The Adler Planetarium in Chicago has begun a major expansion project, which will give it more exhibit space and an expansion of its dining facilities. Completion is expected in the fall of 1991.

Tim Kuzniar has left the Ward Beecher Planetarium in Youngstown, Ohio and is now working full-time with Loch Ness Productions in Colorado.

The Northwest Suburban Astronomers, in suburban Chicago, won the first annual Astronomy Day Award sponsored by Sky Publishing Corporation. The five runners-up were from astronomy clubs in Kingsport, TN; Massillon, OH; American Somoa; Boston, MA; and Penn State College, PA.

The Lakeview Museum Planetarium in Peoria, Illinois
recently received a $1,000 grant from the V. M. Slipher Fund of the National Academy of Science for a telescope loan program and teacher workshop. Three Odyssey 10 telescopes are to be purchased. The grant was matched by donations from the Peoria Astronomical Society and the Peoria Area Arts and Sciences Council.

The GLPA nominating committee has selected the following candidates for offices:

President Elect: Garry Beckstrom, Dale Smith, Carl Wenning
Secretary/Treasurer: Art Klinger, David Parker

Daniel Moran has joined the staff of the Koch Planetarium in Evansville, Indiana as a Science Assistant. Dan had formerly been a student assistant at the Davis and Elkins College Planetarium in Elkins, West Virginia.

GREAT PLAINS PLANETARIUM ASSOCIATION—(GPPA)

The 1989 GPPA Conference was recently held at the Ralph Mueller Planetarium in Lincoln, Nebraska on October 13-14. The conference was in progress at press time. Information about the conference will be in the next issue.

ITALIAN PLANETARIA'S FRIENDS ASSOCIATION—(AADP)

Astronomical literature on planetarium usage in Italy is extremely rare. According to Loris Ramponi of the Brescia Planetarium, just a few articles and booklets on planetarium usage have been published in Italian. All of the articles and booklets more or less describe the physical plant or the nature of a planetarium, but not on how to effectively use a planetarium.

One such article was written by Professor Mario Cavedon of the Milan Planetarium and was published as one of the chapters of the encyclopaedia entitled "The Discovery of the Sky." Professor Cavedon's article shows a clear preference for the teaching usage of planetariums but is somewhat puzzled about their use for public programs.

Another publication was written by Albo Abate and Paolo Possiedi and published by the Venice Lido Planetarium. Their article, "The Image of the Sky in History," documents the history of planetariums.

M. Bertolini e P. Luchini of the Vianeggio Nautical Institute Planetarium has written a booklet entitled Introduction to Planetaria which was published for teachers and students with an interest in geographical astronomy. The History of Science Museum Planetarium in Florence, Italy has published a small text of five topics dealing with museum lectures on sky observations, positional astronomy, antique astronomical instruments, introduction to the history of astronomy, and astronomy in Dante's Divina Commedia. The first book to be published dealing with planetarium usage is due out very soon. The book was written by Professor Franco Gabicci, the director of the Ravenna Planetarium in Ravenna.

MIDDLE ATLANTIC PLANETARIUM SOCIETY—(MAPS)

Plans are continuing for the 25th anniversary conference to be held at the Benedum Natural Science Theater in Wheeling, West Virginia May 2-5, 1990. Additional details of the conference will be ready after the first of the year. If you wish further information about the conference, please contact the conference host, Steven Mitch, at the address located at the beginning of the Regional Roundup column.

Spitz, Inc. of Chadds Ford, PA has announced that it has entered into an agreement with the Discovery Place in Charlotte, NC to provide a Space Voyager planetarium for their new Charlotte Observer Omnimax Theater and Kelly Planetarium. Scheduled for completion in early 1991, the new Space Theater will be housed in a 79-foot diameter tilted dome, in combination with an Omnimax film system and a Sonics Associates sound system. Discovery Place will be the site of the fourth Space Voyager. Prior installations include the Cite de Science et de L'Industrie, Paris, France; the Omnimax Planetarium at the Singapore Science Centre, Singapore; and the Armim D. Hummel Planetarium at Eastern Kentucky University, Richmond, Kentucky.

The E. P. Hubble Planetarium, Brooklyn, New York is getting ready to celebrate its 10th anniversary. Director Sam Storch has had about 50,000 people come to study the cosmos at his place during that time. "Sam's Place" is also the home of the Amateur Astronomer Association of New York Library, containing more than 3,000 volumes of astronomical literature.

NORDIC PLANETARIUM NETWORK—(NPN)

Dr. Lars Broman reminds everyone that the 1990 International Planetarium Society Conference will be held July 15-19 at the Futures' Museum in Borlänge, Sweden. Conference planning is continuing at a smooth pace and a good turnout is expected.

Travel plans for the I.P.S. Conference are currently being reviewed and some charter packages seem to be available. Please consult your regional newsletter for travel plans from your area. For additional information on the I.P.S. Conference, contact: Dr. Lars Broman, Chairman, IPS'90, Galaxen Convention Center, Jussi
Björling's Road, 25 S-78150, Borlänge, Sweden.

PACIFIC PLANETARIUM ASSOCIATION—(PPA)

The 1989 fall conference of the Pacific Planetarium Association was held October 19-22 at the Gladwin Planetarium, Santa Barbara Museum of Natural History, Santa Barbara, California, with over 40 members attending. Hosts were Fred and Nancy Marschak. The Astronomical Unit, a SBCC club which supports the activities of the Gladwin Planetarium, also supported the conference. In addition to paper sessions, participants visited Astro Aerospace Corporation, makers of deployable spacecraft booms. Invited speakers included Dr. Alan Hoffman, Santa Barbara Research Corp., who spoke on “The Revolution of Infrared Astronomy” and Steve Matousek, Jet Propulsion Laboratory, on “Voyager II at Neptune: The Discoveries.” A complete report will be published in the PPA’s journal Panorama.

Lonny Baker of the Morrison Planetarium reports that the following Bay Area planetariums sustained no significant damage from the October 17 earthquake: Chabot College (Hayward), Chabot Science Center (Oakland), College of San Mateo, Holt Planetarium (Berkeley), Independence High School (San Jose), Minolta Planetarium (Cupertino), Morrison Planetarium (San Francisco), and San Francisco City College.

PLANETARIUM ASSOCIATION OF CANADA

No report. Ian McGregor, representative.

ROCKY MOUNTAIN PLANETARIUM ASSOCIATION

No report. Mickey Schmidt, representative.

SOUTHEAST PLANETARIUM ASSOCIATION—(SEPA)

The 1990 SEPA conference will be at the Hummel Planetarium of Eastern Kentucky University in June, with Director Jack Fletcher acting as host. Additional information on the conference will be forthcoming.

The 1991 SEPA conference will be hosted by several planetaria in the Atlanta area.

SEPA Southern Skies editor, Linda Hare, is developing a network of state liaisons for input into the newsletter.

Sue Griswold of the Kelly Planetarium in Charlotte, NC, reports plans for a new installation (please see the MAPS regional news).

Baton Rouge planetarian Rick Greenwald has accepted the directorship of the Hooper Planetarium at the Roper Mountain Science Center in Greenville, SC. The Hooper planetarium has a 50-foot, tilted dome and a Digistar instrument. The facility is still under construction.

Mike Hutton, Director of the Brevard Community College Planetarium in Cocoa, Florida will handle the SEPA script bank through the 1990 conference.

SOUTHWEST ASSOCIATION OF PLANETARIUMS—(SWAP)

The Dallas/Fort Worth area planetarians hosted their annual covered-dish supper for Spitz technician Howard Estes. Planetariums represented were: Fort Worth Science and History Museum; Highland Park Independent School District; Garland Independent School District; Mesquite Schools; Richardson Independent School District; Richland College Cosmic Theater; Science Place 2; Tyler Junior College's Hudnall Planetarium and Astral Projections. (August Sanchez of TRAX Instrument Corporation, Albuquerque, NM was a guest. Mr. Sanchez was in the area working on the Hellostat at Richardson I.S.D. Planetarium).

The 1990 SWAP Conference will be held at the Hudnall Planetarium, Tyler Junior College, Tyler, Texas June 5-8. For additional information, contact Bow Walker, Director.

Gibbous, continued from page 37

make such realms of words come out in such concise minutes?; who else could get so many of the membership to commit to untold Task Force Committees?; who else could win the Challenger Seven Fellowship out of a crowd of 100 finalists?; who else could keep such educational articles appearing in The Planetarian year after year? We love you, Jerry, and thank you for all you do for the Society.

Here's to 1990

With a new granddaughter (yes, she's number three grandchild); attending a Council Meeting in of all places Athens, Greece; a week helping McDonald Observatory celebrate its 50th Anniversary on top of Mt. Locke and at Sul Ross in Alpine; two weeks of trout fishing in Montana; new working buddies on the Task Force Committees I chair; all the fabulous members who have written in to Gibbous Gazette; the best job—in—the world with Highland Park I.S.D.; and a husband of 34 years who wants a divorce. Well, seven out of eight makes 1989 livable (see, yours was even better)! Think what 1990 might bring! I wish each of you every happiness in the coming year. See you in Sweden!
One of the most exciting new things lately has been the planet Neptune, newly seen through the camera eyes and sensors of Voyager. If you did as we did, and played the JPL satellite broadcasts for your public to see, you may also have been gratified as we were by the tremendous public interest and response. Those spacey special events can still pack ‘em in, especially when there are new and pretty sights to be seen.

And so this issue’s installment begins with a few sources of Neptunian goodies that may help in taking advantage of the current interest—sources of which you may very well be aware, but for which you may not mind a reminder.

**Views of Neptune**

A set of 20 35mm slides of the Neptunian system (JPL-17 Voyager Mission to Neptune) is available through the Jet Propulsion Laboratory, but the way you get to them is—like Galileo’s trajectory to Jupiter—a bit indirect. Write or call the Teaching Resource Center, JPL, 4800 Oak Grove Drive, Mail Stop CS530, Pasadena, CA 91109, (818) 354-6916 for a Special Pricing Order Form (available only through JPL). Then mail this form with your check to Finley- Holiday Films, 12607 E. Philadelphia St., Whittier, CA 90601. The cost of the slide set is just $6.00 with the special order form. Also available are two Neptune Computer Graphics slide sets (JPL117 and JPL118), taken from pre-encounter computer animation sequences, I’m guessing.

An option would be to check with your region’s NASA center; they may have access to these slides by another route.

Another excellent visuals source is JPL’s 29-minute Neptune Encounter Highlights videotape, which was transmitted for VCR recording over the NASA-Select satellite channel last October 2. There’s little you haven’t already seen if you were religious about watching the JPL satellite transmissions, but the tape takes all of those clever bits and puts them conveniently together in one program. Included are pre-encounter computer animation sequences, the planet rotation sequences, Great Dark Spot “movies,” a sequence of raw images—mostly rings and Triton—received around the day of closest approach, and that neat Triton sequence which pans the surface and then zooms you down for a computer-generated “you are there” view of the Triton horizon.

If you missed the NASA-Select transmission, you can get the tape in a variety of other ways. First, you can order copies of the tape directly from JPL’s contracting video company: The Video Tape Company, 10545 Burbank Blvd., North Hollywood, CA 91601, (818) 985-1666. The cost is $34.40 for the half-inch version, $47.00 for the three-quarter-inch version.

Secondly, you can get a copy of the tape from JPL: send a sealed half-inch VHS tape to Peter McClosky, JPL, Teaching Resource Center, CS-530, 4800 Oak Grove Drive, Pasadena, CA 91109, (818) 354-6919, and he’ll have the Highlights tape copied onto it. Be sure to send your requests on your organization’s stationary, and be advised that duplication is free but can take up to a month for turnaround.

Third, you may want to check with your nearest NASA Teaching Resource Center; they may have the videotape in their library for on-site duplication.

Also available by the time this article appears are two new Voyager shows from Loch Ness Productions. The first is Ness Vignette #3: “Voyager at Neptune,” a 15-20 minute program highlighting Voyager 2’s August discoveries. The second is “The Voyager Encounters,” a 40-minute show recapping the Voyager planetary flybys. I’ve heard excerpts from the Vignette tape, and it sounds good—nice, solid stuff with the dependable Ness quality. And Mark Petersen tells me that the shows have nearly double the number of Neptune visuals of the JPL 20-slide set.

“Voyager 2 at Neptune” sells for $150.00, “The Voyager Encounters,” for $450.00. They contain hassle-free original artwork, graphics, and music, and the show tapes are available in cassette, quarter-track 7.5 ips, and half-track 7.5 ips formats. For more information, contact Loch Ness Productions, P.O. Box 3023, Boulder, CO 80307, (303) 455-0611.

**Other NASA Audiovisuals**

If you send to JPL for the Special Pricing Order Form,
do take a look at the other offerings obtainable through Finley-Holiday Films. They offer a nice selection of videotapes on manned flight and planetary science missions for $25.00 apiece, slide/cassette programs on same for $11.00 each, and a similar variety of 20-slide sets for $6.00.

One of the videos offered (hardly new, but a favorite of mine) is "Universe," a half-hour NASA-produced trek through the cosmos narrated by Captain Kirk, William Shatner. It's been available for years as a 16mm film, and is now conveniently offered in videotape. Made in the post-Viking but pre-Voyager 70's, the program is growing a trifle incomplete in current knowledge of the planets, but otherwise holds up remarkably well. You can regularly see visual snippets of the film in other programs and on the TV news when space scenes are needed. It makes an excellent introduction to the universe for astronomy classes or the general public, and is a good item to stock on your gift shop's video shelf.

One of the slide sets that I particularly like is a set called JPL-16 Future Missions, a breathtaking group of colorful artists' depictions of the Galileo, Magellan, Mars Observer & Rover, Ulysses, Craf/Cassini, Hubble Space Telescope, and other missions. Also included are shots of the real Magellan and Galileo spacecraft in their testing laboratories, with people about for scale. It's a must-have set for telling your public about what's in store in the area of unmanned space exploration.

Another set I can recommend for history buffs is JPL-7 Historical Missions, featuring early unmanned probes like Explorer 1, Ranger, Surveyor, Pioneer, Mariner, and some of the early moon and Mars images obtained from some of them—stuff that I sometimes find a bit hard to find these days. These are good sets to round out the old slide file.

Yet another good way to get NASA audiovisual materials is to snatch them out of the air. We're finding this true since we installed a satellite receiving system at our museum—just in time for Voyager 2's flyby of Neptune—and rediscovered the NASA-Select channel.

For the record, the channel is Transponder 13 on the GE SATCOM F2R satellite (71° W. longitude, 3960 MHz, vertical polarization, C-band), and it really is a gold mine. In addition to the Voyager transmissions and the Neptune Highlights, we've already plucked off some great live footage of October's Atlantis/Galileo mission. If you've got access to a satellite dish and a VCR to record transmissions, you can begin a veritable space video library.

With our new-found satellite link to the outside world from the wilds of Montana, we've also been able to tap into the NASA Education Satellite Videoconference Series on the satellite Westar IV (99° W), Channel 19, originating from Oklahoma State University. The 1989-90 series includes four programs. Two will have run as of this issue's appearance; these programs featured planetary exploration, and flight testing at the NASA Dryden Flight Research Center. The remaining two programs are titled "Space Science in the Classroom," including among other things the Long Duration Exposure Facility and its 12 million tomato seeds (assuming, as of this writing, that LDEF is successfully retrieved from orbit), and "Robotics in Space," featuring activities with robotics and computers. These programs will air January 23 and March 27 respectively.

If the early programs are indications, these will include reports from experts, demonstrations, videotape sequences, classroom activities, and question-and-answer sessions with callers from around the country. The official literature states that these programs "are interactive and designed to be viewed live," but they're also quite good for recording and later playback. And if you register as a "participating site," you also get useful materials to accompany the programs.

To receive site registration materials, write to: Videoconfer­ence Series, Aerospace Education Services Project, Oklahoma State University, 300 North Cordell, Stillwater, OK 74078-0422.

Lastly, I hear by way of Jack Dunn through the GPPA newsletter that another clever videotape based on JPL data is available from Western World Telefilm, 10523 Burbank Blvd., North Hollywood, CA 91601. The half-inch videotape includes "LA: The Movie," "Earth: The Movie," "Mars: The Movie," and "Miranda: The Movie." In these films, JPL takes Landsat and spacecraft images and turns them into computer landscapes through which you fly—it's a great way to wow your audiences if you have a video projector. The tape sells for $29.95. Check also your NASA Teacher Resources Center for copies of the mini-films on the video shelf.

Videotape of the Night Sky

Last issue I mentioned ASP's audio tapes of the night sky; recently, I stumbled across a video tape of the night sky, called "Guide to Backyard Astronomy" and marketed by Crescent Productions, P.O. Box 60612, Sunnyvale, CA 94088.

The 40-minute tape is literately narrated by none other than Tom Gates. The program sensibly emphasizes the use of star charts and binoculars for observing, and includes very good sections on how to use both. Also included are sections on finding the major seasonal star patterns and selected deep sky objects, and necessarily generic sections on the moon and visible planets, with tidbits of information and observing advice interspersed throughout.
I did notice one misstatement (namely, that the moon's orbit is inclined 5 degrees to earth's equator rather than to its orbital plane), and several statements or situations that in my opinion may confuse (for example, showing a crescent moon while mentioning the new moon). But if I had one general quibble, it would be that I was a bit distracted in the constellation section by a lack of consistent visual presentation. For example, in some of the (computer simulated?) starfield images, the constellation patterns were easy to pick out; in others, the background star clutter made it difficult. Sometimes line patterns and sighting lines were superimposed on the starfields, sometimes the scene crossfaded to a similarly-oriented white-on-black star chart line figures, and sometimes the viewer was left to find the patterns on his or her own.

The saving grace, of course, is that you can watch the tape over and over if you miss something—preferably with a star chart or planisphere handy. A folded-up paper star chart is in fact included with the tape. It's one of those circular "full-sky" charts with Polaris in the center and the southernmost star patterns visible at northern mid-latitudes all around the perimeter—serviceable if you know how to interpret it, but looking hand-drawn.

"Guide to Backyard Astronomy" is another potential aid for learning about how to look at the sky, and reviewing what you learn. As always, preview before you stock. As I recall, it retails for about $30.00.

Support Your Special Effects

It we're honest, most of us will likely admit that during our careers we've probably used everything under the sun to shore up special effects—cardboard boxes, coffee cans, the venerable two-by-four in various lengths.

But there are other (if more expensive) ways to support special effects that have to peer over a projection gallery wall, including two mounts whose descriptions follow. These devices were first sniffed out by Richard Cheek of the Staerkel Planetarium, and we also have used them here at the Taylor Planetarium with some success.

The first is a camera mount for small surveillance TV cameras, manufactured by Omnimount Systems, 10850 Vanowen Street, North Hollywood, CA 91605, (818) 766-9000. There are a bunch of models available; we use model #STX-MP-50 C, a svelte black 9 1/2-inch tall number that can support up to 20 pounds. It has a top plate to which you can bolt a projector (or a piece of wood on which is mounted a projector), and which swivels on a ball joint attached to the stand. The stand has a bottom plate that you can bolt it your gallery shelf. It's very sturdy, and works exceedingly well so long as you put the "omnimount" under your special effect's center of gravity.

The omnimount sells for around $30.00 each, not including shipping. Omnimount Systems itself probably won't sell them to you, but they will refer you to a dealer who will.

The second mount is a silver camera mount made by Burle Security Products Division, Lancaster, PA 17601-5688. The distributor we got them from is H&R Corporation, 401 E. Erie Avenue, Philadelphia, PA 19134 (this is a surplus distributor with widely-varying stock, so it can take time to get them).

This mount is of similar height to the first. Its top is a small round plate on a ball-and-socket joint, with a threaded rod for mating to a camera with a tripod mating hol—but you can attach it to special projectors, too. The circular base plate bolts nicely to the gallery shelf. This mount costs about $22, but works not as well as the first. The ball-and-socket is hand-tightened with a knurled ring, and it can be devilish to get it tight enough to hold a projector in a severely-canted position.

At any rate, they're alternatives to the coffee can. Granted, they're more expensive than a two-by-four, but they're also sturdier, neater, cause less clutter, and probably take up less room. If you have your own clever supporting devices or techniques that you'd care to share, let me know, and I'll let everybody else know.

Calendars, Calendars, Calendars

Since we're to last the 1989 calendar now, it's time to look for a new one. Several astronomical possibilities are available.

Hansen Planetarium's 1990 "Wonders of the Universe" is its usual self, with superb-quality and often unusual pictures, and the little calendar date boxes crammed with space anniversaries and useful sky-watching tips. Suggested retail is $8.95 from Hansen Planetarium, Publications Department, 15 South State Street, Salt Lake City, UT 84111.

Astronomy magazine's "Exploring the Universe" also offers its usual mix of colorful space paintings and photographs, with side-bar articles each month highlighting a current event, plus anniversary entries and sky tips. Suggested retail is also $8.95, from Kalmbach Publishing Co., 21027 Crossroads Circle, P.O. Box 1612, Waukesha, WI 53187.

An organization called 21st Century Associates, P.O. Box 65473, Washington, D.C. 20035, is also offering a calendar called "A Grand Tour of the Solar System," with a variety of planetary views and some space anniversaries. It advertises for $10.00, with a 50% discount.
The Secret

Not long ago I received a copy of a poster called "The Amazing Analemma" (subtitled "The Vikings' Secret—A Celestial Navigation Analog")—an expanded version of a small plastic card that was sent to me earlier in the year for review. Both are from Roy T. Maloney, Dropzone Press, P.O. Box 882222, San Francisco, CA 94188.

The card contains the figure eight of the analemma, marking the variations in the sun's noontime position during the year, scaled with the calendar year, the sun's declination, and the Equation of Time (in minutes fast or slow), and containing assorted other references and remarks. The poster adds a flanking earth orbit with zodiac band, with lines connecting certain sun positions in the analemma with positions of the earth in its orbit around the sun. Also added are small representations of the analemmas of the other planets, and other bits of information. The retail price of the card is $2.00 each, with cartons of 100 available for $50.00. I found no information on the price of the poster.

Be careful with these. There is no distinction made between an analemma as traced out in the sky and one that is projected sundial-fashion on the earth, and the manner of presentation may confuse the uninitiated. The pieces are loaded with cryptic or sloppy statements (e.g., "To know the latitude of the sun and the number of degrees from it, you can instantly calculate the latitude of your position."). Inaccurate implications (e.g., "The analemma represents the path of the sun at high noon (zenith) for one year..."—italics mine), and a clutter of references not clearly explained (I'm still stumped by the referral to the cross-over point of the figure eight as the "line of nodes"; unless I'm totally missing the boat, this represents a new definition of the term for me).

Of the two, I think the card is preferable because it's small, plastic, cute, has less to confuse, and if you cut through the clutter, it really can be a rough and ready daily reference for the sun's changing declination and the changing value of the Equation of Time. But these products strike me as being the sort that you can figure out if you already understand the concepts, but not if you don't.

As always, have a look for yourself; I offer only my own personal (if honest) opinion. And if the execution leaves something to be desired, the idea is nonetheless a good one, and perhaps may be recreated in a more comprehensible form. Both pieces refer to a new video titled "A Magnet Called Earth: The Universe Quick and Easy," which is supposed to explain things more. If I see it—and if I learn why the analemma is a Viking secret—I'll let you know.

A Light-Hearted Astronomy Show

The Sudekum Planetarium in Nashville is marketing a new original show called "The Light-Hearted Astronomer," narrated by Ken Fulton, author of the book of the same name advertised in Astronomy. I've heard the tape, and found it to be a folksy, funny, and gentle introduction to the pleasures and pains of becoming an "astronomy enthusiast" intimate with the universe. Using a conversational and low-key approach, the program offers good, solid, realistic advice on how to start, how to observe, what you can see, how to see, and to go slow and avoid the pitfalls of the dreaded "department store telescope."

It's a different, change-of-pace sort of show that cleverly keeps current by providing audio inserts covering some of the major star patterns for each season; you could run it anytime and have your audience know something about what's up tonight. The 35-minute program sells for $550, including script, slides, and soundtrack recorded at your specifications. For information, contact Kris McCall, Sudekum Planetarium, 800 Ridley Blvd., Nashville, TN 37203, (615) 259-6099.

Catalogs, Catalogs, Catalogs

Late last summer, Wess Plastic came out with a new, updated catalog of their slide production products (price is $2.00). That ingenious little hinged slide mount is 25 years old this year, and has multiplied into quite an array of useful products. If you haven't got the new catalog, you can send for one at Wess Plastic, Inc., 50 Schmitt Blvd., Farmingdale, N.Y. 11735-1484.

If you also don't have the 1989-90 Loch Ness catalog, you can get one by contacting Loch Ness Productions, P.O. Box 3023, Boulder, CO 80307, (303) 455-0611. Ness now offers a series of original slides in addition to the shows, music albums, and back-packs. Same copyright arrangements, too.

Recently out is the 1990 Astronomical Society of the Pacific catalog, featuring a variety of video and audio tapes, computer software, posters, calendars, slide kits and sets, video disks, observing aids, and "kid's stuff." Write Astronomical Society of the Pacific, 390 Ashton Avenue, San Francisco, CA 94112 for a copy.

Until "next year" ... what's new?

If there are two or more ways to do something, and one of those ways can result in catastrophe, someone will do it.

Captain Murphy to Major Stapp, 1949; original wording of Murphy's Law.
By Spitz, Inc., originator of the tilted-dome theatre. Supplier of planetariums, projection domes, lighting and multimedia systems since 1945.
IPS ‘90 in Scandinavia

As you all know by now, the next IPS meeting takes place in Borlänge, Sweden, July 15-19 1990. It may still seem far away, but the months go fast. When you read this, the deadline for sending in an abstract is already passed. We have received a considerable number of good abstracts, ensuring interesting sessions for contributed papers during IPS’90.

The Invitation and Preliminary Program will be printed and sent out in January to all who have requested an Invitation. You must request an Invitation to be sent one. Please drop me a note if you haven’t already! The Invitation contains the registration forms both for the Conference and the Post Conference Tour to Finland July 20-23, and these are the deadlines:

- Post Conference Tour Registration deadline: April 1, 1990.

We are planning for a successful meeting and invite you to be part of it!

Lars Broman, IPS ‘90 Conference Chairman
Galaxen Convention Center
Jussi Björling’s Road 25
S-781 50 Borlänge, SWEDEN
Fax No. +46-243 743 02

ASTRONOMY DAY
Taking Astronomy To The People
APRIL 28, 1990

Astronomy clubs, Science Museums, Astronomy departments, Planetariums, etc. wishing to purchase a 120 page handbook of suggestions for hosting local events should send $5.00 plus postage & handling to the address below. Postage is $2.00 in the United States -$3.00 for surface mail outside the United States and $5.00 for Airmail. All funds must be in U.S. dollars. Checks should be made payable to the Astronomical League.

Organizations wishing free rules and entry forms for the Astronomy Day Award (for the organization that hosts the best Astronomy Day Events) without ordering the entire handbook should send a self addressed, stamped legal size envelope to:

Gary E. Tomlinson
Astronomy Day Coordinator
Astronomical League
c/o Chaffee Planetarium
54 Jefferson, S.E.
Grand Rapids, MI 49503
616-456-3985

The Planetarian, Vol. 18, No. 4, December 1989
This month from George Reed of Spitz, Inc., PO Box 198, Rt. 1, Chadds Ford, PA 19317, come some little cartoons he has used for his newspaper columns. His style is lighthearted, but the content is real science. We are sure you will find something you can use. Additional George Reed cartoons appeared in *Naked i Astronomy*, published by the IPS earlier this year.

I am always looking for contributions. If you have some black and white artwork you use in your facility, why not share it with other planetariums? Send drawings or good photocopies to me at the above address. Thanks!
YES! I'M SURE!
THERE IS NO LISTING FOR
OPHIUCHUS
IN THE ASTROLOGY COLUMN!

BIG DIPPER

LITTLE DIPPER

NORTH STAR

SUMMER SUN
HIGH SUN, ENERGY CONCENTRATED

WINTER SUN
LOW SUN, ENERGY SPREADS OUT

WINTER IS FAR AWAY

The Planetarian, Vol. 18, No. 4, December 1989
Everyone has his own personal way of sharing the sky with others. Members of the Richmond Astronomical Society in Richmond, Virginia, for example, sponsor a monthly “Skywatch” on the grounds of the Science Museum of Virginia. As reported in a recent monthly newsletter, they “showed the public the Moon and Saturn, ... but the electricity was out due to a recent storm, so observing deteriorated to viewing the red lights of the radio tower”.

Oh, well. At least people were looking up at the sky. That’s an activity that Jack Horkheimer pushes as “the man who hustles stars”. One of his ways of sharing the sky with others is called “Star Hustler” and is the most successful five-minute program in television history, at one time reaching an estimated five million people a week in more than 350 cities.

And just in case you haven’t been up past 11:00 p.m. or missed the May ’89 Sky and Telescope article about Jack, I must note that he is first and foremost a PLANETARIAN, having been Director of the Miami Space Transit Planetarium since the late ’60’s.

I think that many of us planetarians received Jack’s Press Kit announcing the August 1, 1989 revival of “Star Hustler” after a seven month absence. A special insert requests that planetarians lobby to get SH back on the air in their local area. As Jack says, “Some PBS stations will run planetarium slides at the end of each episode. Try it.”

On the front of the kit we read “This Press Kit converts into a real working sundial”. And inside we find a “Sun Dial Gnomon/Time Indicator” (pencil), which you stick into the hole in the center of the front cover of the press kit folder. Latitude marks on the side of the pencil show you how far in to push the pencil so that the angle formed with the back cover of the kit folder is proper for your location.

The top half of the back cover is a "quiz" with questions like 2) "Are sundial hours the same length of time all year long? If not, why?" 4) "Why won't a sundial work at night?" He goes on: “For answers to above questions send enclosed postage paid card back to Star Hustler. However, if you don’t know the answer to #4, don’t bother.”

A press kit that turns into a sundial? Only Jack Horkheimer could come up with that one. His uncanny advertising genius continues to amaze me ... who else would think of hustling the stars?

Jack remembers when IT happened to him, many years ago. He says: "I heard a rabbi on TV saying, 'There is only one kind of prayer: when you look at something and are stunned by its beauty, when you are stunned by the complexity and genius behind it.' I was looking at the stars, and suddenly I saw them as giant globes sprinkled through space. I was stunned by the universe.”

Thanks, Jack. Now you and everyone else who has a personal way of sharing the sky are keeping the rest of us "Looking Up".

OVERHEARD:

-As reported by Planetarian Jack Horkheimer:

Woman sitting behind Jack on a plane: "Aren’t you on TV ... the Star Hustler?"
Jack: "Yes."
Man sitting beside lady: "Who's that?"
Lady: "That's Jack Horkheimer. He's on TV!"
Man: "Looks like a plain Joe to me."
Man, some time later, as they get off plane: "Are you really on TV?"
Jack: "No."
Man: "You’re not Jack Horkheimer?"
Jack: "No. My name is Joe."
When word gets around that we've sold another large SPICE™ Automation system to a major planetarium, many smaller facilities conclude that the world's most advanced and reliable media control system is beyond their reach.

It may come as a surprise to learn that SPICE was originally conceived as an alternative to those big systems nobody under 50 feet can afford. It just happens that we made our system state-of-the-art, and gave it enormous control capacity.

But you don't have to start big. For $9,748 we'll sell you hardware to automate ten special effects and a half-dozen Ektographics. We'll include complete illuminated manual control/override in a slick little 19" wide rack-mountable chassis. We'll include all the cables; no soldering needed.

We'll include our latest IBM- or Apple-compatible software. We'll warranty the system for a year. If your computer breaks, you'll still be performing shows, because SPICE can run directly from audio tape, to say nothing of manual control.

And since you'll have just purchased the central components of the world's most advanced and reliable media control system, modular upgrades will be even less expensive. (You could start by adding ten more special effects channels for $1,495).

With SPICE, you'll be able to:

- add as many projectors, lamps, motors as you wish, with as much manual control as you desire.
- automate your planetarium instrument with servo precision.
- join the growing video revolution, locking video tape and disks to single-frame, split-second accuracy.
- be empowered to perform sophisticated interactive branching ... for educational programs that uniquely address the needs of each audience.

With SPICE, you'll be:

- SPICE Automation interfaces to everything in your theater.
- SPICE Software is powerful, yet easy to learn.
- SPICE locks to SMPTE time code and permits wireless live lecturer control.
- SPICE is developed, sold, and serviced by a growing company with a twenty year legacy of service to professional planetarians.
- SPICE Cookbook Design Guide is yours for the asking. It includes a demo disk, photos, drawings and all the info you need to know.
- SPICE Automation. We built it because nobody else could. Then we made it affordable.

SKY-SKAN, INC.
51 Lake Street, Nashua, NH 03060-4513, USA
Telephone: 603-880-8500, Fax: 603-882-6522
Telex: 6503362363 MCI UW

The SPICE Automation System for $9,748 includes 1 THYMEL, 1 SUGAR 6 CINNAMONs for III E, 6x2 Manual Panel, 1 Sky-Stepper, 6 cables, software (110v, 60Hz system).