The OBSERVER

The Newsletter of the Twin City Amateur Astronomers, Inc.

January 2001 Volume 26, Number 1

In This Issue:

The New Guy in the Dome

—Michael P. Rogers

ALTHOUGH a visual inspection would not indicate the fact, less than two months ago, the ISU Planetarium underwent a dramatic change. For the first time, it has a full time Assistant Planetarium Director, Mr. Thomas Willmitch. I caught up with Tom last Friday, as he was busily preparing for the next planetarium show, Aurora (January 19-May 5).

Thomas Willmitch, in the "office"

As you might imagine, behind every planetarium show are untold hours of hard work. On the day I met Tom, the work was made even more difficult thanks to the planetarium's somewhat antiquated equipment: slide projectors malevolently burned up or out, diskette drives refused to read disks, etc. Still, Tom was good humored about it all, and willing to talk to me about his life and his plans for the planetarium.

Although Tom has had an abiding interest in astronomy from the time he was a youngster, his original career goals were quite different: he received a degree in Photography from the Art Institute of Pittsburgh, and worked as a commercial photographer for several years. During that time, he joined the

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Public Meeting Jan 18th @ the BPL: The 2001 Skywatcher's Almanac

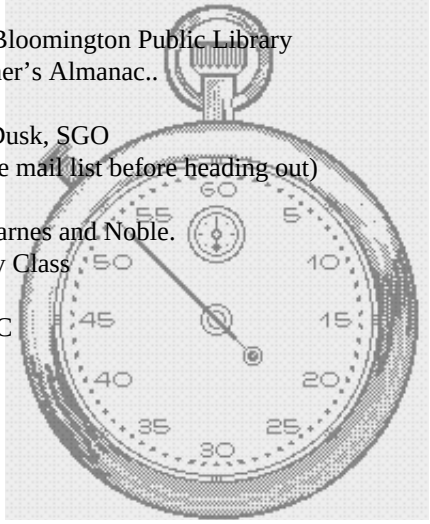
TCAA Calendar

Thursday, 18 January, 2001, 7:00-8:00 PM, Bloomington Public Library
TCAA Meeting. Topic: The 2001 Skywatcher's Almanac..

Friday & Saturday, 19 & 20 January, 2001, Dusk, SGO
Members-Only Observer's Session (check the mail list before heading out)

Monday, 5 February, 2001, 7:30-9:00 PM, Barnes and Noble.
TCAA Reading Group/Beginning Astronomy Class

Saturday, 10 February, 2001, 5:00 PM, SGNC
TCAA Annual Banquet (see p. 3 for details)



The Observer
The Newsletter of the TCAA, Inc.

The Observer is a monthly publication of the Twin City Amateur Astronomers, Inc., a non-profit organization of amateur astronomers interested in studying astronomy and sharing their hobby with the public.

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Articles, ads, etc., are due by the 1st weekend of each month. Items may be e-mailed to: mprogers@mail.millikin.edu, or jmemken@ilstu.edu

Dues

$25.00 per household, per year
$15.00 for members over 60
$12.00 for newsletter only
$ 1.25 for a single newsletter copy

Etc., Etc., Etc.

—Michael P. Rogers

HOPEFULLY everybody survived the new year, and took to heart at least some of the new year's resolutions that appeared in the newsletter last month. As the author of those resolutions I am slightly biased, but at least one other person has told me that they were "well done". True, that other person is co-editor and married to me, so she might also be accused of bias — let's just say that I have had absolutely **no** complaints about that article.

January Meeting: Remember that on the 18th of January we have our first meeting/presentation of the year at the Bloomington Public Library. Several members will be making a presentation entitled "The 2001 Skywatcher's Almanac", detailing astronomical events for the upcoming year. There will be time to talk about club business, so please try and attend.

TCAA Annual Banquet: Speaking of attending, the TCAA annual banquet is next month. As the article at right attests, we have a really excellent speaker, so I hope that everybody can make it. Weather permitting, we will have a first light ceremony for the observatory, so if you want to get be associated with this bit of club history, you know what you have to do (or, in case you don't, the answer is "SHOW UP!!!").

Mail List: The best way to keep track of club activities is via our e-mail list. The traffic varies widely — sometimes as many as 5-10 messages a day — but it does provide a way for members to get together virtually, and complain about the weather :-) :-) For those of you who are on the internet, please, please consider joining the list. You can sign up really easily, by going to:

http://www.egroups.com/group/tcaa

and clicking on Register. If you need help, send e-mail to Al Timke, our mail list manager, (atimke@earthlink.net).

TCAARG/BAC: I suppose that these acronyms need deciphering. The TCAARG, the TCAA Reading Group, meetings on the first Monday of each month at the Barnes and Noble Cafe from 7:30-9:00 PM, to talk about astronomy. Lately, we created a Basic Astronomy Class, and have been working through , and nearly finished, Astronomy: A Self-Teaching Guide, by Dinah Moche. Since we are almost finished, the question is, what should we do next? I have some ideas, but hopefully others do, too: join us at the next meeting to talk about it, and bring any books that look good. (My own idea is to work through the Hands On Astrophysics book from the AAVSO, but it would be really easy to convince me that this is a Bad Idea).

Eclipse: If you missed the eclipse on December 25th, 2000, too bad; but some hardy observers were out there. In particular, Mark Cabaj ventured forth with camera to record the event for posterity. You can see some of his work on p. 6 in this issue. Thanks, Mark, for sharing them!

February 10, 2001, A TCAA Odyssey

Annual Banquet and SGO Open House

— Michael P. Rogers

YES, it's that time of year again, time to start contemplating the TCAA Annual Banquet, when members gather to reminisce about the year past, dream about the year to come, and talk about all things astronomical.

This year, in order to celebrate the completion of our observatory, we will be holding it at the **Sugar Grove Nature Center**, southwest of Bloomington, on **Saturday, February 10th**, following the schedule below:

Social Hour/Open House:	5:00-6:00 PM
Dinner:	6:00-7:00 PM
Keynote:	7:15-8:00 PM
State-of-the-Club Address:	8:10-8:20 PM
Awards/Elections:	8:20-9:00 PM
SGO First Light Ceremony*:	9:00-9:15 PM

**weather permitting*

Keynote:

We have been privileged, in recent years, to have some terrific speakers at our banquets, and I am delighted to report that the tradition continues: Dr. James Brown, Professor of Astronomy at Millikin University, will be our featured speaker this year.

Jim is a remarkable person, a dedicated scholar, an inspiring teacher, and an avid amateur astronomer. His research interests are nuclear structure and astrophysics, and his lengthy list of publications, in some of the most prestigious physics journals on the planet, is simply amazing.

Jim's introductory astronomy course is always filled to overflowing, a testimony to his well-deserved reputation. Jim manages a small armada of LX-200 telescopes, with which his students observe and do CCD imaging.

Our keynote speaker, Dr. James Brown

In addition to his publications and coursework, Jim is currently coordinating the construction of a new observatory at Millikin, and has already managed to spend $90,000 just on the telescope and mount!

Obviously Jim will have a lot of interesting things to say, and hopefully everybody can make it to his talk.

SGO Open House:

As TCAA members know (perhaps too well!), it has been an arduous journey to this point, but we now have our own observatory! Since most of our members have not seen the Sugar Grove Observatory, we will have an Open House from 5-6. After the banquet, we will have a brief "First Light Ceremony", weather (and member interest) permitting.

Board of Director Elections:

According to the bylaws, the Twin City Amateur Astronomers is run by a board of 5 members, elected annually at the February banquet. Especially in recent years it has become somewhat difficult to get members to volunteer, but perhaps this year will be different. The main qualification is **not,** let me repeat, **not**, expertise in either observational or theoretical astronomy. Certainly it helps to be interested in the two, but since you are reading this, that probably is a given. No, the only prerequisite is an interest in helping the club to grow and prosper in its mission to educate and promote astronomy among its members and in the community as a whole.

If you are interested, all you need to do is come to the meeting and declare yourself when the time comes. We promise no hanging chads at this election :-)

State-of-the-Club Address:

The State-of-the-Club address gives the President an opportunity to reflect back on his year of leadership. In this case, our president has certainly a lot to be proud of, but we are going to *try* and keep him to 10 minutes :-)

Food & Drink:

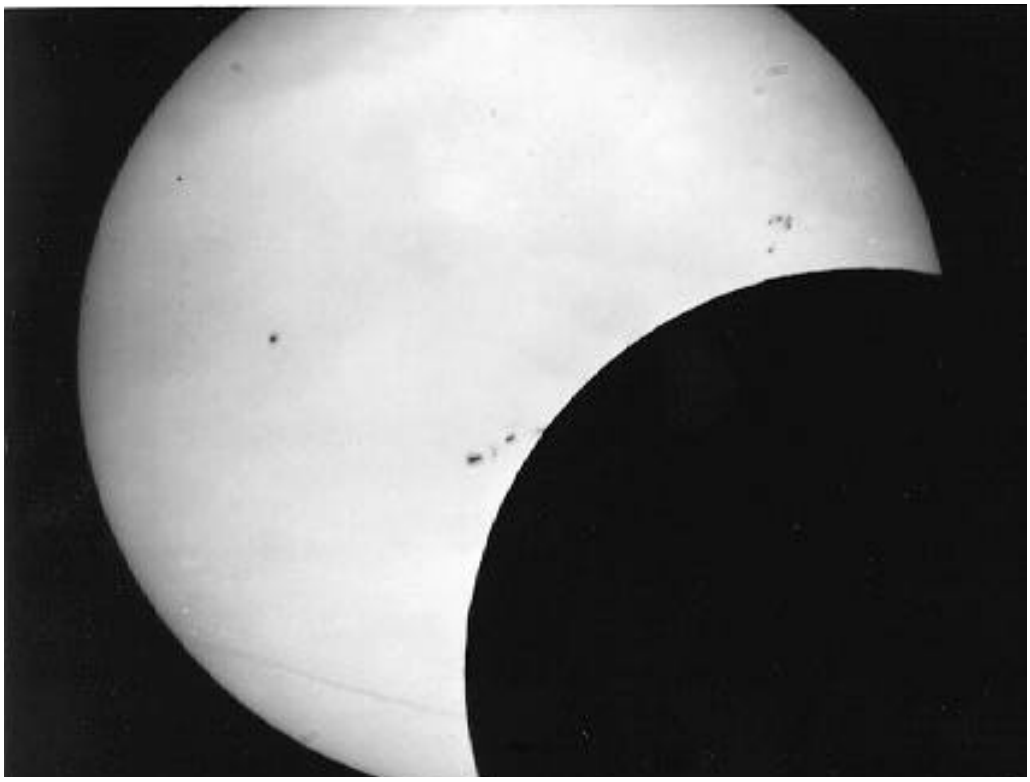
As this issue is going to press, the plan was for the club to dip into the treasury for the main course (pizza or subs) and have members bring desserts and drinks and other munchables. A donation of $5 per family towards the meal would be nice, but is optional.

Eclipse Photographs

— Mark Cabaj

Without doubt Mark Cabaj is one of the best astrophotographers around: he has won national awards for his efforts, and it's easy to see why (or not, depending on how Kinko's handles these; be sure and visit the web site to see the pdf version of this newsletter, or better yet come to one of the meetings and examine the photographs for yourself).

All photographs were prime focus (i.e., with the camera replacing the eyepiece) through Mark's Celestron C-8 telescope.



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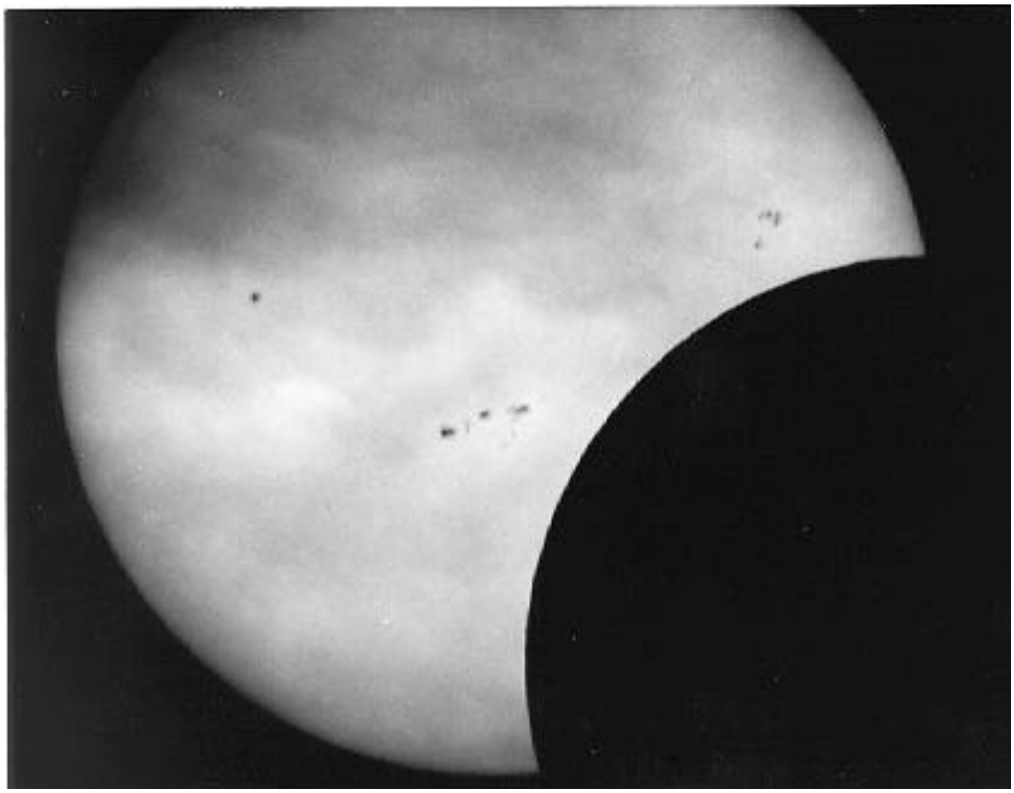

25/12/00; T-Max 100 1/125 second; solar + yellow filter f/10

Royal Observatory: an Amateur Astronomer's Delight

— Jean Memken

OVER the holidays, my family and I had the opportunity to do some traveling. This year we wended our way back to the British Isles and spent a glorious two weeks traveling through Great Britain and Scotland. One place we had always wanted to visit on our trips abroad, but had never quite worked it into the itinerary was the Royal Observatory in Greenwich which is in the eastern sector of London proper. This year, we put it on the top of our list of things to see and do in London. Am I ever glad we did! We had a wonderful day learning all about time and space there, and everyone in the family found something of interest in Greenwich.

The author and child at the Royal Observatory

The Royal Observatory is the home of the Prime Meridian of the world and of Greenwich Mean Time. All time and space is measured relative to Longitude Zero which is defined by the crosshairs of the great Transit Circle telescope in the Meridian Building of the Observatory. Greenwich Mean Time, or GMT, is the basis for the international Time Zone System. So a visit to the Royal Observatory is like visiting the beginning of time and space in many ways. One of the first things we did after ascending the hill where the Royal Observatory is located is stand in the obligatory pose straddling the Prime Meridian, so we could be in two places (the eastern and western hemisphere) at the same time. At the end of the meridian line is the digital clock that measures Greenwich Mean Time, the standard time for all the world. The clock is actually housed in a small museum which intersects the Prime Meridian. There are many clocks in the museum, as well as a number of historic telescopes which were fascinating to see. They tell the story of time and the role the stars played in establishing Greenwich Mean Time as well as how the astronomers at the observatory sought to develop a systems of measurements that would help ships navigate the globe (see next article).

Author et. al. in the obligatory "two-hemisphere" pose

The actual observatory, called the Great Equatorial Building, was originally built in 1857 and it housed a large 12.8 inch equatorial refracting telescope. Eventually, the building was remodeled and a new onion shaped dome was constructed to encompass the swing of a newly constructed 28-inch refracting telescope. The scope was quite a spectacle. It is the largest telescope I have ever seen, and even the hardware that is used to support the scope and maneuver it around the dome is quite impressive.

Another part of the Royal Observatory which was a delight to see was the Octagon Room and the Astronomer's Apartment. Being the royal astronomer in the 1700s was not a fun job. The observatory at that time was isolated on top of a hill outside of the city limits, and the job

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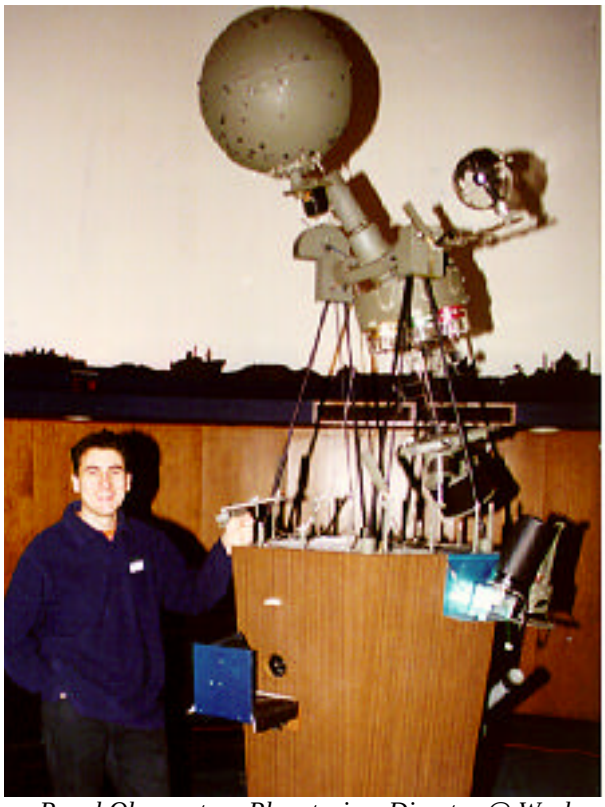
requirements forced the astronomer to work all night and sleep days. It was a lonely existence. The apartment reflects the hardships the initial royal astronomers' faced. However, a rather famous architect and amateur astronomer, Christopher Wren, designed the Royal Observatory, and came up with a rather pleasant alternative for the royal astronomer in the form of the Octagon Room. The room, as it name implies, has eight sides, four of which have huge windows. The room itself is beautifully designed, and the windows were developed for indoor observing and accommodate a variety of long telescopes. During the day, the room is filled with natural sunlight, making it an extremely pleasant place to be. So the room exhibits function and beauty, both important attributes of good interior design. Little did I think I would find something at the Royal Observatory applicable to share with my design classes, but you can bet I will be showing them pictures of the Octagon room.

The Royal Observatory

A final treat we experienced at the Royal Observatory was getting to see a planetarium show at the adjacent Royal Planetarium. The planetarium is located on the upper level a a gorgeous red sandstone Victorian building. Just to see the building was an experience. The show was just a primer about looking at the night sky, but our whole family found it highly entertaining. The planetarium director, Anton Verplough, was an engaging character, who enthusiastically described the night sky for the audience. Since most of the visitors to the planetarium live in London proper and never really get to see the stars, descriptions of the night sky, especially the constellations, were enough to get any novice hooked on stargazing. I especially enjoyed Anton's description of Ursa Major. In Britain, our Big Dipper is called "The Plough", but Anton told us that the French called it "Le Saucepot", and proceeded to use his pointer to fill it with beans for the French. All the audience found that quite humorous, and laughed even more when Anton started zigzagging his pointer over the constellation and said he had put Le Saucepot in the microwave! I thought he probably had a great time with school groups, and no doubt has inspired more than one Brit to wander out to the countryside to take a look at the night sky.



Royal Observatory Planetarium Director @ Work

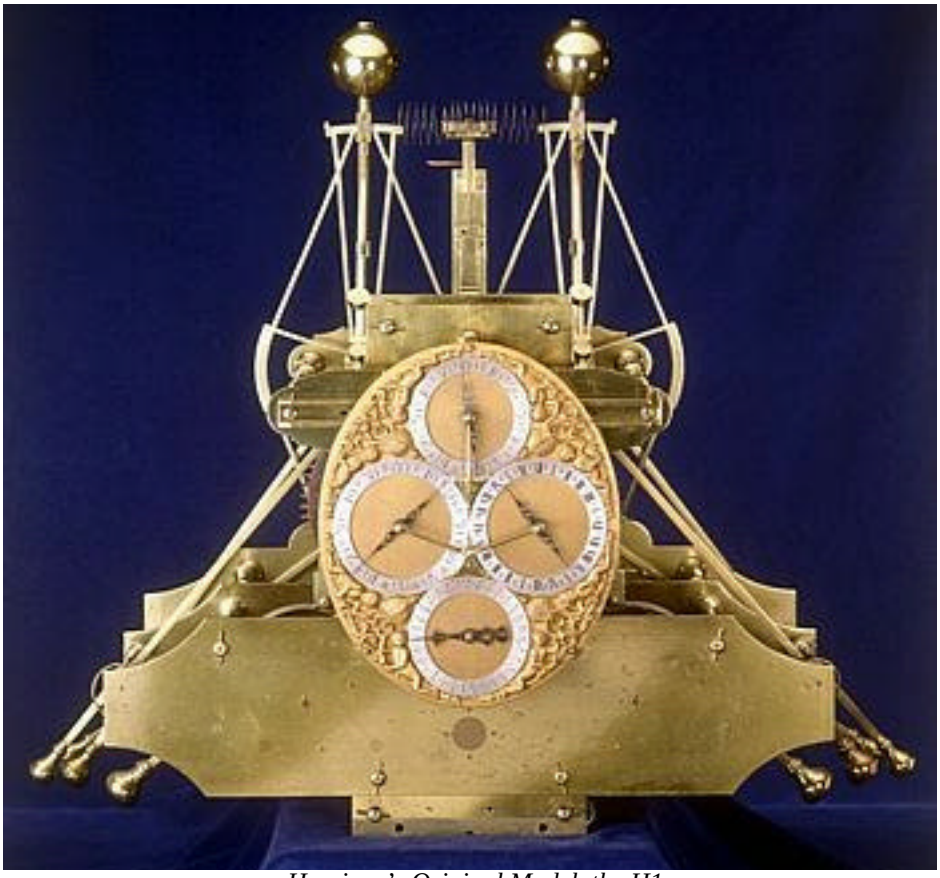
Although there are thousands of other things to do and see in London, I would highly recommend going to see the Royal Observatory. It is an easy trip on the underground (subway) and overland train, and it is an experience you will remember for a long time. If you are interested in finding out more about the Royal Observatory, check out their web site at http://www.rog.nmm.ac.uk.

The Great Contest to Discover Longitude

— Jean Memken

THE idea of dividing the planet into sectors using longitude and latitude lines is something we moderns take for granted, but those lines on our globes and maps were not always there. A series of maritime disasters prompted the British Government in 1714 to offer a public award to anyone who could discover a way to determine longitude at sea. The prize was 20,000 pounds if the method could determine longitude to within half a degree. The size of the prize prompted much scientific, as well as, not so scientific, response. One of the more bizarre solutions to the problem was a mysterious substance developed by one person who called it the "powder of sympathy." When the powder was sprinkled on a knife which had inflicted a wound on someone, the action would cause that person to re-experience the original pain. The suggestion was made that if a number of dogs were all wounded with the same knife, they could then be placed on the different ships in His Majesty's fleet. Everyday at noon (Greenwich time), someone at Greenwich could plunge the knife into the Powder of Sympathy and all the dogs would yelp at the same time, regardless of where they were. By knowing it was noon in Greenwich, navigators had one essential ingredient towards being able to calculate their longitude at sea! The judges were not too impressed with this idea, hoping instead someone could use the stars in some fashion to pinpoint longitude lines at sea.

Scientists had long realized that the ideal solution to the Longitude Problem was some mechanism which would allow you to know how far you were from a zero point (like the prime meridian in Greenwich) in terms of time, because longitude is a co-efficient of time. Since the 360 degree circumference of the Earth completes one full rotation every 24 hours, each hour's worth of time equals 15 degree worth of rotation, or 15 degrees difference in longitude.



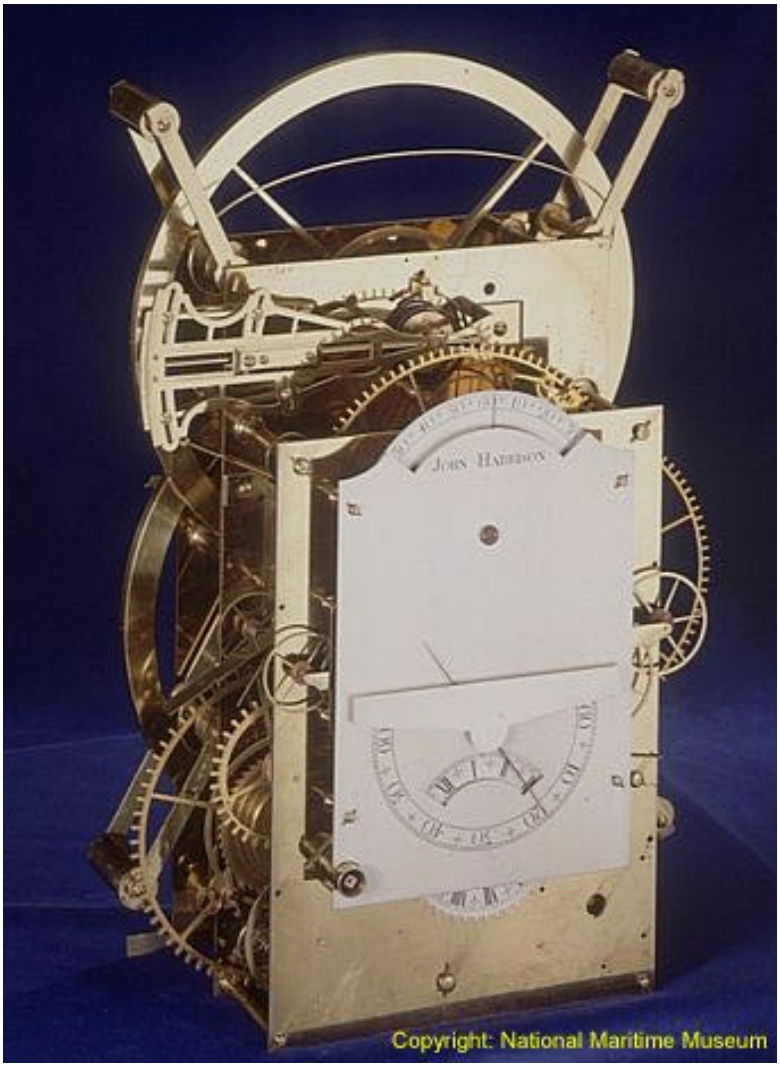
Harrison's Original Model, the H1

Although the British government officials were putting their hopes on astronomers to solve this problem, it was actually a clockmaker, John Harrison, who came up with the solution. In 1730, after 4 years of careful thought and study, Harrison developed plans for a large sea-going clock. He showed his designs to Sir Edmund Halley, the Astronomer Royal at the time, who enthusiastically embraced Harrison's ideas and introduced him to George Graham, one of the greatest clockmakers of the day. Graham built Harrison's design, known as the H1, and it was immediately embraced by the scientific community as one of the great marvels of the modern age. However, Harrison thought he could do better and developed an H2 and eventually an H3 model of this sea-going clock, called a chronometer. However, all of the models had some deficiencies in design that limited their ability to measure longitude. A breakthrough finally came in 1753, when Harrison commissioned a friend to make a small pocket-watch for him, which he could use to test the accuracy of his large timekeepers. As soon as he saw the watch, he realized he had been tackling the problem in the wrong way. A small timepiece, with a high-frequency oscillator, could be fashioned into a much more stable timekeeper than a huge portable sea-clock would ever be. Hence, the H4 was developed. It failed miserably on its first trial, but on its second trial, the performance was three times better than the performance rates stipulated by the original Longitude Act. Eventually, H5 was invented by Harrison and it performed admirably - losing only about one third of a second a day.

continued on next page

With the invention of H5, Harrison demanded the prize from Britain's Longitude Board, but they had lost patience with him after he invented his H3 model. Finally, Harrison was awarded his money after taking the matter to King George III who tested the H5 model himself at his private observatory in Kew. However, the final prize amount turned out to be only about 8,750 pounds since the Longitude Board had been financing Harrison's various models with the prize money. So, technically, Harrison never really won the Longitude Prize, though the world now recognizes him as the man who discovered longitude.

The Winning Model (the H4)



Harrison's H3

John Harrison

Treasurer's Report — December, 2000

— Duane A. Yockey, Treasurer

OPERATING FUND BALANCE – November 30, 2000 - $ 1,032.50

Income

Allan Timke (dues renewal & postage) -	$ 29.08
Robert & Mary Enzweiler (dues) -	$ 25.00
Duane Yockey (dues renewal) -	$ 25.00
Sharon MacDonald (dues renewal) -	$25.00
Aaron Vercimak (dues)	$25.00

Expenses

None!!!

OPERATING FUND BALANCE – December 31, 2000 - $ 1,161.58

OBSERVATORY FUND BALANCE – November 30, 2000 - $598.79

Income

Interest - $ 2.66

Expenses

None!!!

OBSERVATORY FUND BALANCE – December 31, 2000 - $601.45

TOTAL TCAA FUNDS $1,763.03

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Mahoning Valley Astronomical Society (http://www.mvobservatory.com/), a club formed in 1939 and still going strong! He rose through the ranks to become secretary and then president.

Tom gave me a brief history of the MVAS, and that in itself was fascinating. The club was founded by Jack Draper, a superb amateur telescope maker whose works have been compared with such luminaries in the ATM world as Fecker, Brashear, Mogey, and Clark (look them up :-). Draper made a 16-1/4" Cassegrain, that serves to this day in the MVAS's observatory, the Mahoning Valley Observatory, or MVO. To make it easy to access the eyepiece, the MVO has what is surely a rarity among club observatories: the floor can be elevated or lowered, while the scope, physically isolated from the floor (fortunately!) remains in position.

Inspired by his experience in the MVAS, Tom abandoned photography to pursue astronomy professionally. He enrolled at Youngstown State University, where he earned a Bachelor's of Science in Physics and Astronomy.

During his time at YSU, Tom had the good fortune to work at the Ward Beecher Planetarium, a 40 foot dome that seats 120 (in contrast to ISU's Planetarium, a 30 foot dome seating 110). At the Ward Beecher Planetarium, Tom's mentor was Tim Kuzniar, a man adept at putting together planetarium shows and one from whom Tom learned much.

Based on the (absolutely correct) notion that you should not do undergraduate and graduate work at the same institution, Tom went on to do his graduate work at Vanderbilt University. He served as Research Assistant at the Arthur J Dyer Observatory, located in a state park south of town. The Dyer Observatory is equipped with a 24" Cassegrain, and a C-14 (so we're in good company!).

Tom did his graduate work under Frank Fekel (now at Tennessee State University), studying spectroscopy of multiple star systems): we're *definitely* going to have get him to give a talk or two on the subject (suitably dumbed-down, of course!).

Dr. Frank Fekel

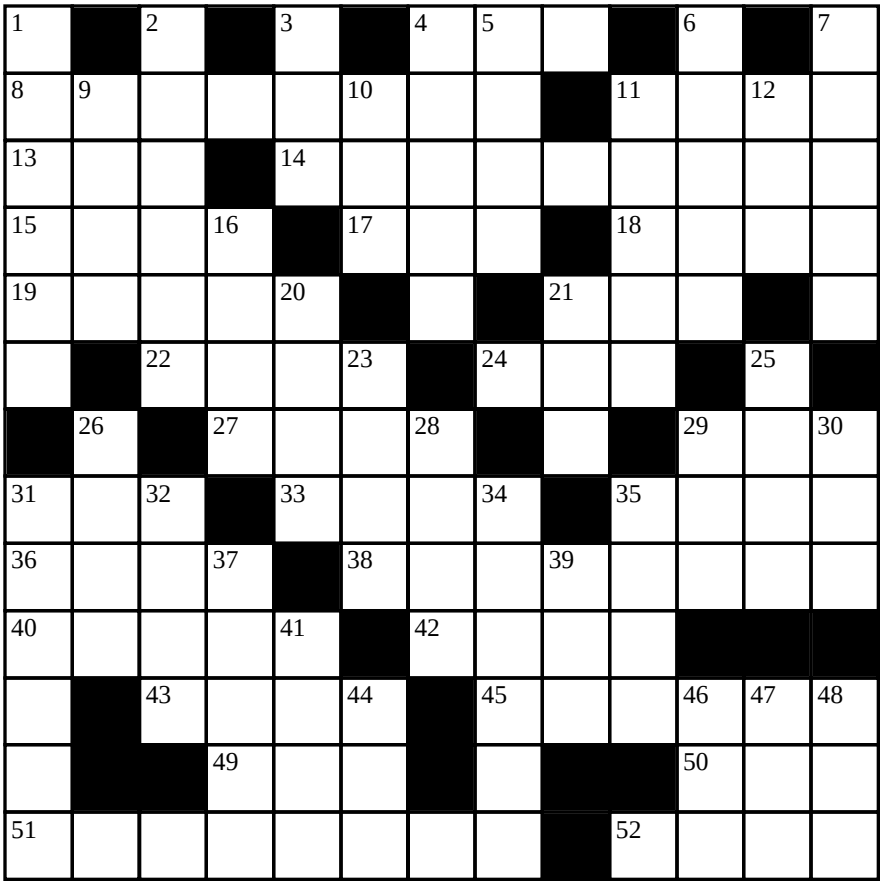
Since graduating from Vanderbilt, Tom has worked at the Arlington Planetarium, not only running the planetarium but also creating his own in-house productions — something that had not been attempted in years. He has also worked at the Talcott Mountain Science Center, a science teacher resource center with a "Hypospherium" — that's a planetarium with a dome area greater than a hemisphere, but less than an entire sphere (your trivia fact for the day). The TMSC is associated with the University of Hartford, and during his 3 year stay there, Tom taught astronomy courses and worked at the Hypospherium.

Alan J. Dyer Observatory, Under Construction

Now Tom is bringing his considerable expertise and experience to the ISU Planetarium. Although Carl Wenning is still director, Carl's interests — most notably Physics Education and bees — means that Tom will be the de-factor Director.

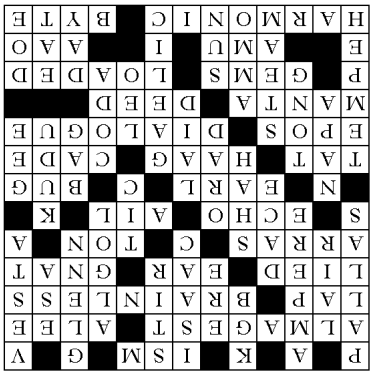
The Observer Crossword

—Observer Staff



ACROSS
4 Doctrine
8 The star catalog of Ptolemy
11 On sheltered side
13 One circuit
14 Lacking intelligence
15 Told an untruth
17 Organ of hearing
18 Midge
19 A rich tapestry
21 Unit of weight
22 Reflected sound
24 To be unwell
27 British nobleman
29 Insect
31 Make lace
33 Dutch name of The Hague
35 Juniper
36 Epic poetry
38 Interlocution
40 Devilfish
42 Feat
43 Precious stones
45 Full
49 Atomic mass unit
50 Anglo-Australian Observatory, for short
51 A pendulum moves with simple .... motion
52 Unit of computer memory

DOWN
1 Second largest asteroid
2 The unit of electrical current
3 Soviet secret police
4 British scientist ... Newton
5 Agitate
6 First American to orbit the earth - John ...
7 Third largest asteroid
9 Den
10 Before
11 Alternative name for Beta Persei
12 Ariane's developer (abbr)
16 Fresh-water fish
20 Sovereign
21 Involuntary muscular contraction
23 Toward the mouth
25 African antelope
26 Soft lambskin leather
28 Put down
29 Purse
30 Command to a horse
31 Fermented soybean cake
32 Chinese secret society
34 Pertaining to the Gaels
35 Conclusion
37 Water vapour
39 Constellation : The lion
41 Ammunition
44 Hub of the solar system
46 On Jupiter, this is about 10 hours long
47 Consume
48 Female deer



The Welcome Mat

Another family joins the merry throng this month. A warm January welcome to our newest members...

Robert & Mary Enzweiler
Bloomington, IL

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Michael Rogers & Jean Memken, Editors
2206 Case Drive
Bloomington, IL 61701

Dues Due? ☐

The Dues Blues

If you see a check in the box above, it means **your dues are due.** To retain membership -- and with a new observatory, why quit now??? -- please send $25 to our esteemed treasurer:

Duane Yockey
508 Normal Avenue
Normal, IL, 61761

As always, thank you for your support!!