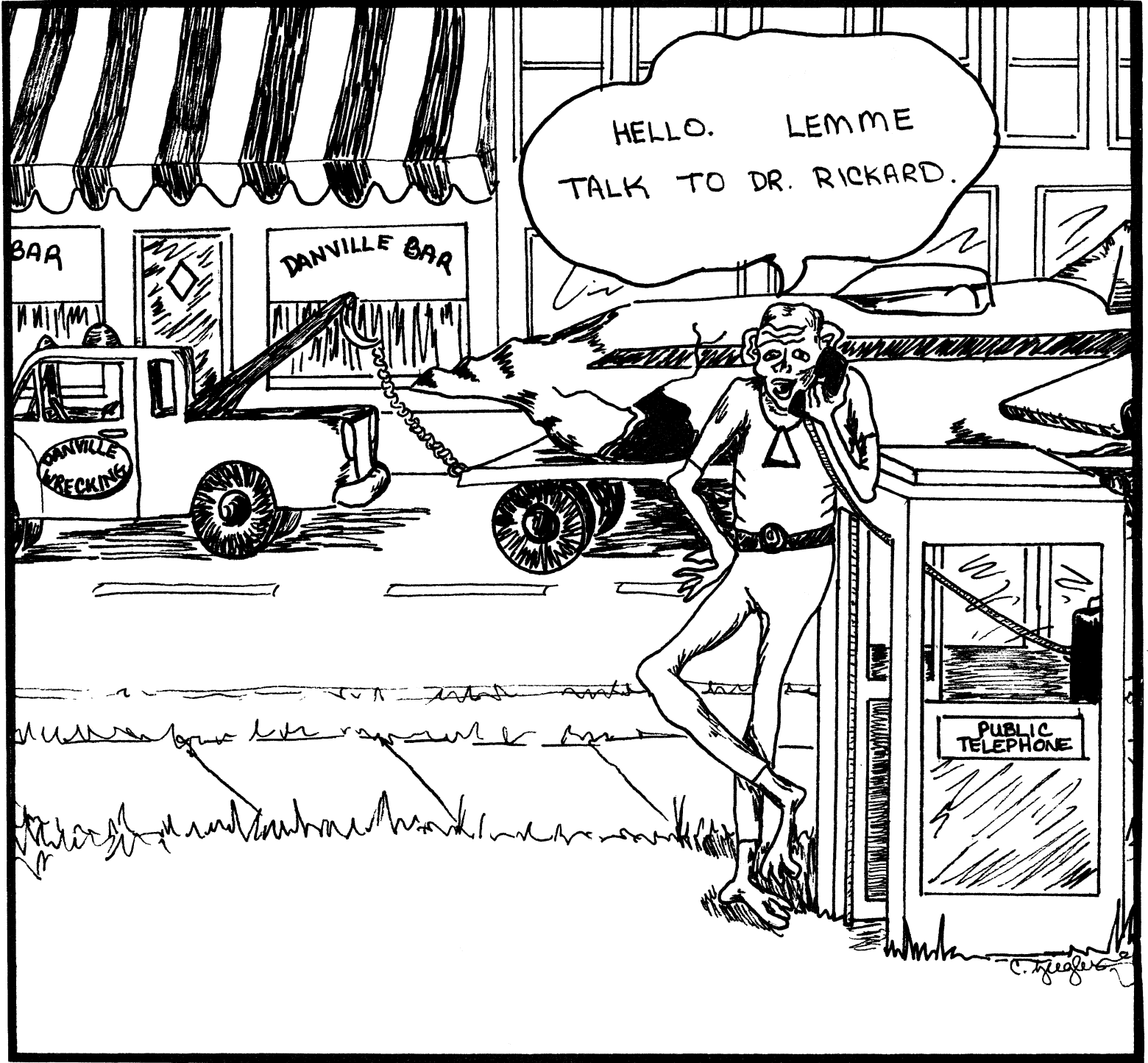


THE OBSERVER

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PAGE 1



----OF SPACE SHIPS AND THE NATIONAL ENQUIRER-----
STORY ON PAGE 3

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A special thanks to all the people who con-
tributed articles and who helped with the
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ROBERT J. HAVLEN
NEW ASSISTANT TO THE DIRECTOR

The June, 1979 *Observer* Personnel Update had a picture of Robert J. Havlen, newly appointed Assistant to the Director. The question has arisen: who is this guy?

Bob Havlen is already well known to the Charlottesville scientists. From 1977 to 1979, he was a lecturer in astronomy at the University of Virginia, interacting with many staffers on matters of extragalactic research. Actually, he should also be dimly familiar to people in Green Bank, having been an NRAO summer student in 1964. It was there that he developed an appreciation of the virtues of radio astronomy. Curiously, when he finished his undergraduate work at the University of Rochester, he went to the University of Arizona to become an optical astronomer.

Dr. Havlen finished his Ph. D. thesis in 1970, and went to the European Southern Observatory in Chile, which offered a clear view of Puppis. In his seven years there, he pursued a number of projects involving young star-formation regions and galactic structure (especially as seen in Puppis). He has also done a number of optical studies on clusters of galaxies.

As Assistant to the Director, his duties are wide-ranging. He has been seen simultaneously collating contributions to the Annual Report to the AAS, locating office space for new staff members, and debating the Library Committee's request for a subscription to *Playboy*.

We wish him well in his endeavors.

* * * * *

NOT REASON'S MOONS

Lee J. Rickard

Some people are born to celebrity. Some attain it. And some people leave their legs sticking out in the aisle and accidentally trip celebrity as it passes by. In the last course, one should not be surprised if the encounter is a rude one. I do know something of these matters. In experiences best left untold, I have interrupted Arthur Godfrey's lunch, and have shared an elevator with Pearl

Bailey and two dozen shoe salesmen. But educational though those encounters were, they were poor preparation for my recent brush with media stardom.

The affair began with a brief phone message left on my desk. Someone named Pablo had called, on the recommendation of Pat Palmer (my thesis advisor), and had left a toll-free number to call. I noted that the receptionist had checked the box marked "You are destined to return the call". Clearly, there were big doings in the offing. I returned the call, but was told by a gentleman with a very thick Irish accent that Pablo was gone for the day. Not surprising at 9 pm. I decided not to risk any dumb questions. For all I knew, Palmer had put me in touch with a Spanish branch of the Ulster Defense League. Best to play it cool until I reached my contact.

With Pablo's return call the next day, my fantasies veered from Hemingway to Harold Robbins. Pablo represented America's most popular newspaper (by its own admission), the National Enquirer. He was trying to work up a story on an article in Icarus about orbiting meteors. He had not read the article himself, but had seen it referenced in a Russian article. For lack of a well-stocked library, he had called Palmer, whom he had interviewed on SETI some months before. Palmer, knowing of my vast archives, steered him to me. And now he was offering me the chance to appear in grocery store check-out lines all across the nation.

From a consideration of the experiences of other scientists who have been interviewed for tabloids, I have formulated two rules. The first rule is: never answer a question without first rephrasing it. The Enquirer pays well; it can afford writers with the skill to turn a few yes or no answers into an admission of complicity in the CIA plot to clone Margaret Trudeau. The second rule is: be nice to the reporter. The Enquirer pays well; it can afford lawyers with the skill to convince all but the foolhardy of the uselessness of a libel suit. So if the reporter feels insulted, he can write out the most incredibly wierd sentence imaginable, enclose it in quotes, append the phrase "asserted Dr. Rickard", and go home blissfully avenged.

So I did not hang up. Instead, I did my best to answer Pablo's questions.

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Fortunately, his call had reached me in the library, so it took only a few trips to the stacks to collect the facts. What emerged was the tawdry tale of Bagby's moon.

John Bagby works for the Hughes Aircraft Company, in the Research and Development Division. He has a bit of an idée fixe about the possibility that the Earth has other natural satellites besides the much-travelled Moon. This is not a crazy idea. It is generally believed that gravitational interactions with the Moon have thoroughly swept from near space the primordial gravel that may have been left after the formation of the Earth-Moon system. But newcomers are not unimaginable. For example, R. M. L. Baker, Jr., showed in 1958 that meteorites on a "near-miss" trajectory could be slowed by atmospheric drag and go into temporary orbits. (The resulting altitudes, though, would be too low to resist further drag, and eventually these orbiting meteors would complete their fall to Earth.) The probabilities are low; Baker estimates that only 0.2% of all stony meteors would even have a chance of orbiting, and that ignoring all debilitating effects other than vaporization by heating. But considering how many meteors hit the Earth every day, even a million-to-one shot has a chance of coming true.

There is a smattering of evidence that some meteors do come to Earth on nearly horizontal trajectories. W. A. Cassidy and friends have argued that the Campo del Cielo meteorite field must have been formed by such an object. Bagby often cites the case of the Great Meteoric Procession of 1913, which was a 3 to 5 minute train of several groups of fireballs appearing to travel a 5000 mile path from western Saskatchewan to Brazil. A number of people, most notably C. A. Chant, believed that this must have been the break-up of an orbiting meteor. There is, however, much disagreement about this. C. C. Wylie, in particular, has argued very persuasively that the various observers were only seeing different meteors in a typical meteor shower, none travelling more than 100 miles, none moving in a particularly horizontal path.

In any case, Bagby's problem isn't that he believes orbiting meteors are possible. His problem is that he sees them. Lots of them. From time to time, he turns up in some journal

reporting visual observations of mysterious lights in the sky. He reports few details of the observations themselves. Instead, he reminds his reader that such things are at least possible, tabulates some measured positions and angular velocities (some with large errors, some with no errors at all), fits an orbit or two, and submerges again.

But no one other than Bagby and his friends ever sees these things. They certainly ought to. Jean Meeus, a Belgian geophysicist, has used Bagby's own measurements and calculated orbits to show that, at their closest approach to the Earth, these objects should outshine the brightest stars. Every night, billions of people look up at the sky and don't say "Hey! What's that?" -- effectively rejecting Bagby's claims.

Given such a refutation, it may be unseemly to consider other complaints, but I will anyway. Bagby cites as confirming evidence certain propagation anomalies observed at an 18 kHz radio station in the Canal Zone. We pause to note that his objects ever penetrate the ionosphere, and thus remain forever out of touch with 18 kHz radio stations. He cites as confirming evidence certain anomalies in the orbits of artificial satellites. We pause to note that Meeus has shown these anomalies to be typographical and computational errors made in the preparation of the orbit tables. And finally, one of Bagby's most dramatic claims is that one object broke up on or about December 18, 1955. But most of his observations were made during the time that Clyde Tombaugh (the discoverer of Pluto) was conducting a systematic search specifically looking for natural satellites of the Earth. Tombaugh didn't see them.

Of course, I didn't have all this information at the time of my fateful interview, but I had enough to be pretty discouraging. Pablo was polite, but I thought I sensed disappointment at my devastating criticism. Personally, I would have been quite happy if, for want of excitement, he decided to kill the story. Media stardom is one thing; the revulsion of one's peers is another. I was not absolutely confident that my two rules would keep me from becoming another Enquirer loony.

Rule number three: rules one and two do
--continued, next page--

work, but not well enough. Several weeks later, I encountered the July 17 Enquirer in a drugstore. The headline was, "Crippled UFO Orbiting Earth". Gasp. I turned to page 33 with trembling hand. There was a familiar name in the text. Mine.

What I didn't know when Pablo and I were talking was that the Russian paper citing Bagby's article was the real subject of the story. It was a claim by one Sergei Petrovich Bozhich (of whom I, for one, have never heard) that Bagby's exploding moon was really a wrecked spacecraft. Rules one and two had worked, sure. I was quoted quite correctly - for example, asserting that orbiting meteors had never actually been observed. But in the context of the Russian report, I seemed to be ruling out the natural explanation in favor of the supernatural one. If it ain't a meteor, it must be a spaceship. Dr. Rickard says so.

So now I have the pleasure of seeing myself referred to in print as "a top American scientist". It is hard to enjoy it in the company of Prof. Aleksandr Kazantsev, "a noted Russian astrophysics researcher" (and science fiction writer by profession), and Prof. Aleksei Zolotov, "a top Soviet explosion expert" (and an oil drilling engineer with an established reputation as a crank). Palmer tells me that about 18 million people read the Enquirer; on the average, each individual article is read by half the readers. Since my article was a headline story, we may safely assume that some 10 million people think I believe in little green persons. (Well, not necessarily little: Zolotov says they could be as much as nine feet tall.) Worse, most of them respect me for it.

I've received surprisingly few letters. Five people wrote asking if the story was true; and if so, didn't it make the Air Force look stupid? One person wrote that he didn't care what I thought, because he was actually an extraterrestrial himself and was anxious to go home. That one is going in the Guinness Book of World Records under "Letter, Strangest One Ever Written". I also got a phone call from a drunk in a bar in Danville, Florida, whose friend had a piece of a flying saucer that he wanted to send to Charlottesville. I gave him the address of the U. Va. Astronomy Department.

One interesting bit of fallout was some support for one of my pet theories. Within days after the article appeared, I got a call from a stringer for NBC. I've always suspected they have an intimate connection with the Enquirer, especially considering how many paranormal documentaries they show. I had a nice chat, but I don't think I'll get to meet John Chancellor.

* * * * *

AYSO

Richard Fleming

American Youth Soccer Organization (AYSO) is a national youth organization formed to promote soccer for children of ages 7-18. "Everyone plays" is the motto of AYSO and is the key to the success of this youth soccer organization. Simply stated, this means that every registered player that comes to the game will play at least half of the game. In youth soccer the game is divided into quarters and coaches are allowed to substitute players in order to satisfy the "everyone plays" requirement.

We registered 14 teams of 15 players each for the summer season. The teams were in age groups that correspond with the various divisions of youth soccer. Division one was made up of boys and girls ages 14-18, Division two, ages 11-13, Division 3, ages 9-10 and Division 4, ages 7-8. There were teams in each division from Green Bank, Hillsboro and Marlinton.

At the end of the season a picnic and awards ceremony was held and awards were presented to the division champions, most valuable players, all stars and other players specially recognized by the referees and coaches.

This year was the first for youth soccer in Pocahontas County, West Virginia. The response from the children and adults indicate that it will be even bigger next year.

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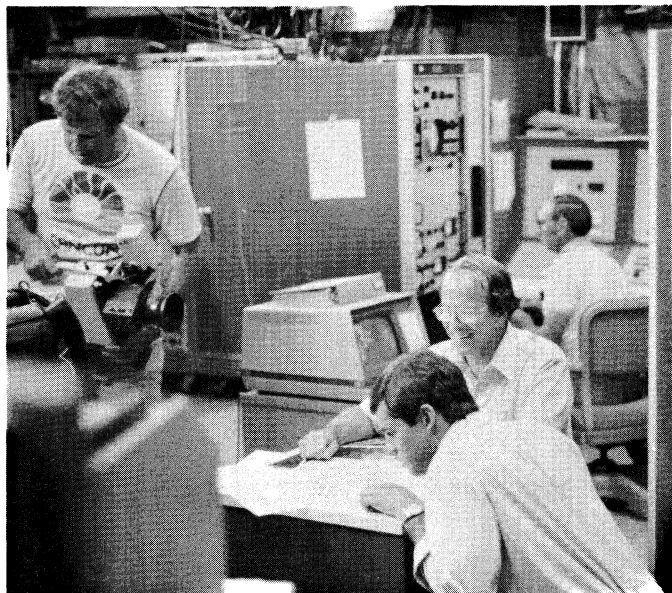
GOING PLACES

Wally Oref

Part of a new show that may premier on CBS this fall was shot on location at Green Bank this summer. A crew of six spent a day and a half in mid-July filming NRAO in general and radio telescopes in particular. Of the many hours of film shot, only about five minutes worth will be used in a possible new show called "Going Places".

"Going Places" features Jim Stewart, a young traveler who tours around the United States in a customized, white van visiting interesting places. The format of "Going Places" reminds one of the Charles Kuralt's "On the Road" show except Stewart's program is targeted for a younger audience.

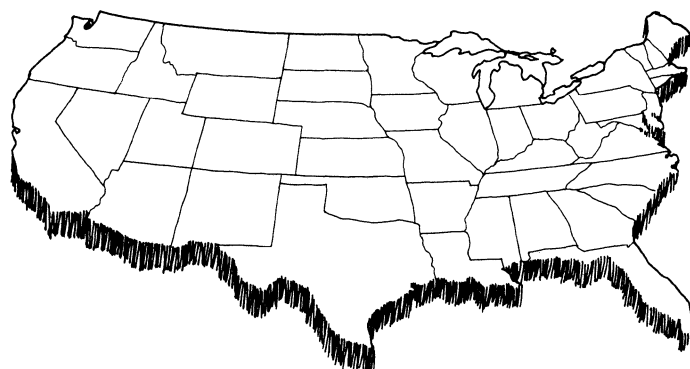
The camera crew spent a lot of time filming Jim Stewart and radio astronomer, Dave Shaffer outside, inside and on the deck of the 140-foot telescope. Dave Shaffer stars as the young scientist interviewed by Stewart. Those of us who were present during this portion of the filming were impressed with Dave's easy to understand answers to questions relating to radio astronomy.



Dave Shaffer explains to Jim Stewart what is done with telescope data while Harold Crist gathers more data.

The CBS people (a few of the crew were free lancers) were somewhat closed mouthed about details concerning the show. Apparently many new shows are proposed every fall TV season but only a few become network shows. "Going Places" probably is such a candidate. Nevertheless, they told us to watch for "Going Places" around November 2nd.

* * * * *



A FAMILIAR RING?

"There is one obstacle to further advance.... The increasing price of fuels necessary to work machinery. Coal and oil are going up and we are strictly limited in quantity We are spendthrifts in the matter of fuel and are using our capital for our running expenses.

"In relation to coal and oil, the world's annual consumption has become so enormous that we are now actually within measurable distance of the end of the supply. What shall we do when we have no more coal or oil?

"Alcohol makes a beautifully clean and efficient fuel... we can make alcohol from sawdust, the waste product of our mills... from cornstalks and in fact from almost any vegetable matter capable of fermentation. Our growing crops and even weeds can be used. The waste products of our farms are available for this purpose, and even the garbage from our cities."

—Alexander Graham Bell, before the District of Columbia's McKinley Manual Training School graduation, February 1, 1917.

CHICKEN LITTLE SUMMER

by Sarah Martin

Before the memory of the summer of '79's big fiasco, namely Skylab, fades completely, I thought we should recap some of the more exciting by-products of its demise for posterity. Whether it was the heat, the gas line frustration, a certain fatalism borne of cynicism at the state of the world, or whatever, groups around the world exhibited varying degrees of community craziness as the time of demise approached. My records are incomplete because I only started collecting them a few days before crashdown, not realizing until then that I was witness to a real attack of global lunacy, but sparse though they are, the clippings certainly give a flavor of what was going on.

We begin with the first Skylab-related injury (and as far as I can tell, the last), reportedly suffered by a woman in Salt Lake City, who in watching Skylab race across the evening sky from her front porch, fell off said porch and broke her left arm and right leg. Then, there are the groups of people who felt sure that Skylab would land near (or on) them. A man in Richmond sold tickets at \$5.00 a throw for spectators, who in addition to ringside comfy seats, could have all the beer they wanted while they watched Skylab crash into his back yard. Other reports of Skylab parties came from Spokane, Washington, where the Skylab Self Defense Society sold T-shirts with large red bulls-eyes; Cincinnati, where a bulls-eye on City Hall was proposed; northern Canada, Spivey's Corner, North Carolina and Cape Canaveral, where residents built a giant baseball glove to catch Skylab debris. In Park Forest South, Illinois they were throwing a welcome home party with fireworks to guide Skylab to their location.

Defenses against Skylab ranged from hard hats with spikes (an early warning device) being sold in Kansas City, to an offer from the operator of Meramac Caverns to let people hide out underground until after the fall. A man in Grand Rapids, Michigan (not Gerald Ford) brought suit against NASA to prevent the fall. A radio station in Richmond insured nearby residents against injury with a half-million dollar policy through Lloyds of London.

Residents of the West Virginia-sized island of Sri Lanka seemed especially hard hit by Skylab fever. They offered human skulls and chickens as sacrifices after being counseled to do so by local astrologers, as well as buying "Skylab oil" to prevent injury (the way the oil was supposed to work was not explained but it must have been successful since there were no reported injuries of Sri Lankans).

Chicken Little lotteries were popular around the world, from Australia to NRAO Charlottesville (Susan Neff won locally) to Las Vegas. Lotteries in the District of Columbia were called off after a local bar was raided by police since such things are illegal (the newspaper account did not specify whether it was lotteries per se that are illegal, or whether the illegality involved was making fun of a government organization without prior permission from Senator Proxmire).

Russell Baker, tongue firmly in cheek, published several contingency letters that NASA allegedly had prepared to cover everything from a close relative being "smushed" ("Please accept our sincere regrets for the bereavement your family has sustained during the recent loss of one of our space stations...") to the loss of famous monuments ("Dear India: We know you feel like making a fuss about the hole in the Taj Majal, but we've got some fancy new epoxy patching compounds, developed for quick-fix jobs in space, that can probably seal it up so that it's hardly noticeable...").

Evidently, although NASA has been short on cash in recent years, the agency had a large stockpile of luck. The 77 tons of debris harmed little more than a few fish and grasshoppers according to all published reports. Other than losing a little face, the biggest NASA concern to date following Skylab's untimely fall is a littering citation from the Esperance (Australia) county council.

* * * * *

"Lord, when we are wrong, make us willing to change. And when we are right, make us easy to live with."

--Peter Marshall

PLANETS AROUND OTHER STARS

In our galaxy, a giant pinwheel containing hundreds of billions of stars, we know for certain of only one star that has planets. That star is our own sun, and the planets are those in our solar system.

Even with powerful telescopes, no one has ever seen a planet orbiting another star. It's very likely that other planets do exist. But the search for them is difficult because planets are relatively small and faint. As seen from Earth, even large planets would be drowned in the fiery light of the stars around which they move.

But, aside from simply looking, there are other ways to check on the existence of planets orbiting other stars. A new way has been suggested by a University of Texas astronomer, Dr. Myron Smith. He believes that the rate of the sun's rotation gives a clue to the presence or absence of alien planets.

The sun's rotation has been well known for centuries. It makes one complete turn in about 27 days.

Less well known is the rotation rate for other stars. Smith's study, made possible with a new high-resolution spectroscopic light-detector called a Reticon used at the McDonald Observatory 107 inch telescope, involved a careful look at 17 stars. Although most of these stars are about the same age and temperature as the sun, Smith found that they generally rotate much faster than the sun.

"The sun is rotating two and one-half times more slowly than you'd expect for stars of its type and age. Statistically speaking, it's in the lower four to ten per cent for speed of its rotation", said Smith. He added that only one of the 17 stars he observed rotates more slowly than the sun, and that star is apparently older.

Stars are born with rapid spin. The connection between the sun's rotation and the question of alien planets lies in the fact that the sun's planets were almost certainly necessary to slow its early rate of spin.

"Most of the angular momentum in the solar system is locked up in the planets," said Smith. Angular momentum is a measure of a body's rotational motion. In other

words, if the sun didn't have planets, it would spin much faster.

Thus, Smith suggested, the rapid rotations of other stars may indicate that the stars don't have planets, or at least not big ones. "There may be a comparative lack of Jupiter-sized planets orbiting these stars," he said.

Another aspect of Smith's study may indicate that, in some cases where planets are present, the planets could have trouble supporting life.

"Rapidly rotating stars tend to have stronger magnetic fields and greater chromospheric activity", he said, adding that the chromosphere is a hot upper layer in a star's atmosphere. "For example, the nearest star to the sun is Alpha Centauri. We know a great deal about it because it's close. It has been shown that it's rotating more rapidly than the sun and yet has stronger chromospheric activity for its age."

Smith believes that this stronger activity in rapidly rotating stars may affect the development of life.

"More active stars would produce more high-energy radiation. It's possible that on some planets orbiting these more active stars life couldn't have gotten firmly started. The reason is that the bombardment of high-energy radiation from the stars might have been lethal to early forms of life because of rampant mutations that would not allow a stable species to develop."

"But," he was careful to add, "it's also possible that moderate radiation would have caused mutations allowing biological evolution to proceed faster or along much different lines on other planets than it has around a relatively peaceful star like the sun."

"It's important to caution that we don't know the ideal rate of mutation, or whether that phrase even has any meaning to the biologist," he said. "But this connection is a new factor to consider in trying to estimate the prevalence and forms of life elsewhere in the galaxy."

The University of Texas
McDonald Observatory at
Mount Locke

LETTER TO NRAO

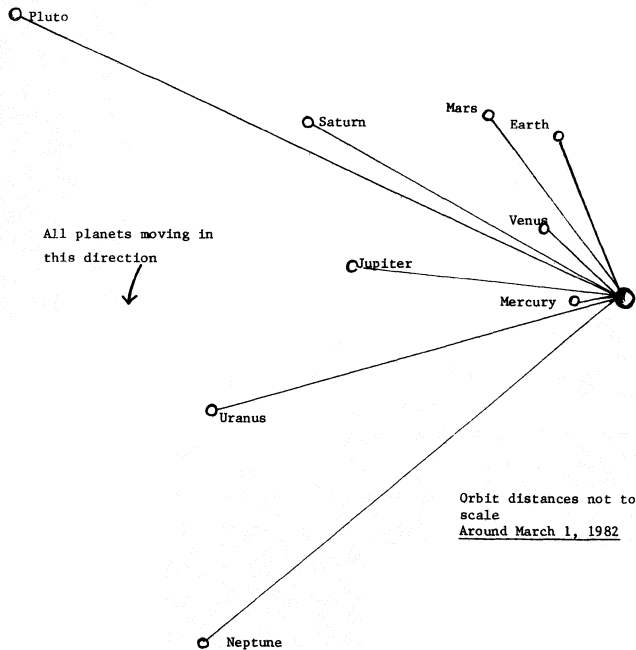
Dear Sirs:

I'm in a Bible prophecy study and have heard that in 1982, all the planets will be in conjunction on the same side of the sun. Could you please send me a confirmation of this and/or any projections as to what effects this will have?

If there is a cost involved as to this information or more needed for postage, please advise.

Dear Ms. _____ :

Thank you for your letter concerning the position of the planets in 1982. Indeed, around March 1st of that year all of the planets will be on the same side of the sun although the alignment is not perfect. The direction to the planets from the sun will cover an arc of a little over 100° as illustrated in the sketch.



Since the gravitational effects of the other planets on the Earth are quite small it is very unlikely that this alignment will have any noticeable effect on the Earth. A few scientists have speculated on the possibility of planetary gravitation triggering earth-

quakes later in the 1980's but there is very little agreement in the scientific community about the validity of this argument. In any case it is hardly anything to be overly concerned about. Earthquakes will certainly continue to be with us in the future, but it is doubtful that their frequency will increase due to planetary conjunctions. The alignment you refer to is interesting, nevertheless, and can be enjoyed in much the same way as watching an odometer turn over all its digits every 10,000 miles.

Sincerely,
Rick Fisher
Radio Astronomer

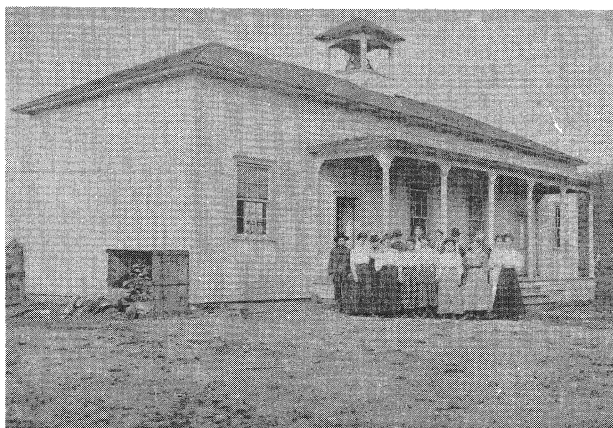


MY SEARCH FOR GREEN BANK ACADEMY

Leona Brown

Green Bank, Virginia, boasted an academy.

In Green Bank, West Virginia, there is a two-story, white frame building known as the "lodge hall". Odd Fellows and Rebekahs hold meetings on the second floor, the lower floor houses the Upper Pocahontas County Clothing Center. This building is often pointed out to tourists and newcomers to the community as "the old academy". This information is almost, but not quite, correct.



This white frame building is now the Green Bank Odd Fellows Lodge

I have had a marvelous time this summer searching out the connection between the "lodge hall" and the "academy". The enjoyment has come from the contacts I have made with descendants and relatives of the academy founders and people connected with the schools which followed the old academy. They have been willing to share with me old pictures, documents, memories and stories. I have learned enough to fill a book including many interesting things about Green Bank I never knew before. (Did you know there was once an oil well at Green Bank?)

A history book refers to northwest Virginia, in "late antebellum days," as a "land of academies". The distance of this area from the capital at Richmond, and the fact that the wealthier landowners of the Tidewater area had more political clout, resulted in the

neglect of this area by the Virginia legislature when it came to distributing educational funds. (This, even more than the salvery issue, probably contributed to the eventual separation of the two states.) The residents of this area had to compensate by establishing their own academies to provide an education for their young people beyond that available in the "common" or "old fields" schools, which taught only the basic skills. Pocahontas County, Virginia, had three of these academies. Callahan's Semi-Centennial History of West Virginia lists only one as determined from the census of 1850. Whether it was the one at Green Bank is rather doubtful. The West Virginia Historical Almanac, states, "The Green Bank Academy was incorporated at Green Bank, Pocahontas County" and gives the date March 26, 1842. However, since the deed for the land was made in 1853, the date of the actual building is uncertain.

Most of the factual history of the Green Bank Academy was furnished to me by James Wooddell, great-great grandson of the James Wooddell who, with his wife, Jane, deeded the land for the academy, on July 4, 1853, to the academy trustees. The trustees were: David W. Kerr, W. J. Wooddell, Isaac Moore, Jr., Benjamin J. Arbogast, Ben Talman, Daniel McLaughlin, William Dunkum, William Nottingham, Adam Nottingham, Paul McNeil, Patrick Bruffey, H. A. Mathews, Jacob Mathews, and James Wooddell. Today's James Wooddell, as a retirement hobby, is engaged in mapping the family cemeteries of Upper Pocahontas County. Much of his time is spent researching local history and genealogies. He was kind enough to lend me a copy of the original deed, as well as part of a community history written by Roscoe Brown in 1935. He also loaned me a copy of an 1851 court order establishing a commission to "view the way for an alteration in the public road from a signpost at Brown and Wooddell's store to the creek opposite the site of the contemplated academy". Although Roscoe Brown's history says that the academy was, perhaps, built in 1844, this suggests that it was not built until later.

However, I was anxious to talk to people who might be able to share with me some personal recollections of family history connected with the academy. This is what makes history "come alive" for me.

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Early in my search, I ran into some confusion. Some told me that the lodge hall was not the original academy building. Some said the original building was across from the lodge hall, where the house formerly known as the Arbogast house and lately as the home of Jack and Virginia Irvine now stands. Old pictures of graduating classes standing on the steps of this house seemed to bear this out. Roscoe Brown's history says that the academy building was built of bricks which were moulded and burned on the lands of William Arbogast, near the Cranberry Swamp. (Lynn Kerr told me that this swamp was behind the house where Jesse Fisher now lives, the old Moomau place.) I thought that the old brick building might have been incorporated into the Arbogast house.

Janet Crist has a lovely, perfectly preserved picture of some beautiful young ladies in white graduation dresses, standing on the steps of Virginia Irvine's house. One of these young ladies was Wilma Beard, now Mrs. Harper, who is 86 years old and lives in Elkins. I called Mrs. Harper, and learned from her that she is a relative of the Benjamin Arbogast named in the deed as one of the trustees of the academy. The academy building, she told me, was brick, but it was not on the site of the house where the picture was taken. She recalled that in 1913, on the evening before the picture was taken, she and the other young ladies had attended a graduation party at a home across Deer Creek from the academy. There was a flood and the girls all had to be taken home the long way around by Arbovale, to put on their graduation dresses, and then back to Green Bank to have the picture taken.

Other people in Mrs. Crist's graduation picture include Anna Conrad (now Brill, still living), Amy Burns, Mabel Woods (Nelson), Stella Brown, Coda Whitecotton, Faye Wooddell, Fronia Flynn (now Williams, living in Durbin) and Mabel Gillispie (Conrad, Betty Ruth Crist's mother). The teacher of this class was Berlin Simmons, who appears in the picture of the white frame building.

Mrs. Harper also gave me the stern admonition that the local family name, Wooddell, is to be pronounced with the accent on the first

syllable. "If you are going to say Wooddell," she said, "then you must also say Cassell. It's Wooddell." I stand corrected.

Since Roscoe Brown's history mentioned that the last teacher in the school built on the site of the old academy was Mr. C. E. Flynn, I talked to Evelyn Sutton, his daughter, who is now the Arbovale postmistress. She shared with me the picture on page 12 and directed me to the home of Edward Sutton and his sister Ruth. From them, I learned the end of the academy story and the beginning of a new one.

The Sutton home is across Deer Creek from the lodge hall, but almost in sight of it. Mr. Sutton told me that he attended his first year of school, 1906-1907, in the old brick academy building. That same year, the building was torn down by his father, Martin Sutton, and Walter Ralston. He pointed out to me the chimneys on his house, which were built with the bricks taken from the old academy building.

The one-story, white frame building pictured earlier was then erected, perhaps on the same foundation as the old brick building. It served as the Green Bank School building until 1917, when the building which now houses Green Bank Middle School was built. Then it was sold to the Odd Fellows Lodge, and the second floor was added.

The picture on page 10 was made from a post card sent to Dortha Arbogast, later Mrs. Markwood Gum, in 1909. It is probably the first picture made of this building. Two of the ladies in it, Flora Gillispie and Flossie Conrad, were aunts of Betty Ruth Crist. Mabel Woods, also in the picture, was Harold Crist's aunt. Markwood Gum, who loaned the picture, believes the group may have been a "Teacher's Institute", since the man in the bowler, Berlin Simmons, came from Shepherd College to train teachers. In those days, when one finished whatever local school was available, one could attend an "Institute" for about six weeks take an examination, and be certified to teach. Many of the people pictured did later teach school.

Grade school classes were also held in the building. Fannie Kane remembers riding on

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horseback behind Dortha Arbogast from her home on North Fork Road to attend fourth grade there. Markwood Gum also went to this school after finishing at the Bruffey school on North Fork Road. The man on the left, in the flat hat, was Brown Varner, the teacher for the lower grades. Lynn Kerr remembers learning her ABC's from him.



Probably the last class to graduate from the school on the old academy site.

Rear row, left to right: Henry Copen, Kermit Arbogast, Dewey Beard, Watson Echols. Second Row, left to right: Eula Moore, Ethel Echols, Ruth Sutton, Third Row, left to right: Lila Orndorff, Mary Orndorff. Teacher: C. E. Flynn

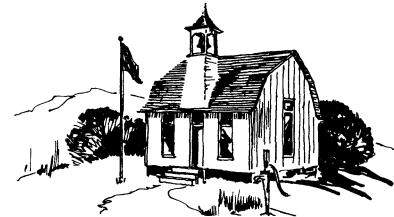
This picture, probably taken at the end of the school year 1916-1917, is probably of the last class to graduate from the school on the old academy site. The principal, standing at the left, was C. E. Flynn, father of Evelyn Sutton and Ruth Riley. He later served as superintendent of schools from 1927-1937.

Second from left in the back row of students is J. K. Arbogast, who served as assistant superintendent of schools from 1955-1967. The young lady on the right in the second row is Ruth Sutton, sister of Edward Sutton, who still lives at their home across Deer Creek. The young lady in the white dress on the left in the front row is Lila Orndorff, who taught at the new Green Bank school until her retirement.

The legacy of education bequeathed to us by the founders of Green Bank Academy has come down through the Green Bank School, which followed it, and Green Bank High School, which has been supplanted by Pocahontas County High School. We may soon have the opportunity to pass it on to our posterity through a new or renovated Green Bank Middle School.

Why were the graduation pictures taken in front of the Irvine house? Because the light was better over there, and the house made a pretty background.

* * * * *



A BLIND PITCH

The Window Shade News Bureau in New York City, a trade organization, reports that one-fourth of the energy used in the United States for heating and cooling is squandered through windows; that from 40 cents to \$1.40 is added to fuel and utility bills annually for each square foot of single pane glass in a typical home. Ordinary window shades, the Bureau says, can save up to 21 cents per cooling dollar for a typical home in a moderate climate. The Bureau claims up to ten times more summer heat passes through window glass than through the wall around the window.

* * * * *

NRAO ROUNDUP

*Reprinted from the NRAO Quarterly Report
for April 1, 1979 - June 30, 1979*

ELECTRONICS DIVISIONGreen Bank

The development of a dual-channel upconverter-maser system to cover 5-26 GHz is progressing well. The first channel of this receiver should be installed on the 140-foot telescope by the beginning of 1980.

The 300-1000 MHz receiver is still progressing slowly. AIL has been unable to supply cooled FET amplifiers meeting the noise temperature specification. It is expected that the Charlottesville laboratory will be able to build a suitable amplifier in the near future.

A single-stage 40-50 GHz maser is now ready for testing. An initial cool-down indicated a magnet problem. However, it is expected that this will soon be remedied.

A 22-GHz focal plane measuring receiver for making antenna surface measurements of the 140-foot telescope is being developed. This receiver should be available for testing by the end of the year.

The IF interface for the Model IV autocorrelator is progressing well, and interfacing with the digital section and installation at the telescope should occur by the end of the year.

Charlottesville

Millimeter-mixer development has continued by further use and understanding of an equivalent-circuit measuring technique. Five new 70-115 GHz mounts have been fabricated and will be evaluated next quarter. Cryogenically-cooled mixers which have a SSB mixer noise temperature of 400 K at 150 GHz have been completed and shipped to Tucson.

Investigations of millimeter-wave frequency doublers have begun. A unit with 10% efficiency and 3 mW output power has been used to adequately pump a room-temperature mixer at 208 GHz. Double mounts for the 110-170 GHz range are being constructed and also high-breakdown voltage diodes are being fabricated at the University of Virginia.

A 4.5 GHz FET amplifier has been fabricated and 6 different types of FET's have been evaluated in the amplifier at temperatures from 300 K to 20 K.

Expansion of the VLBI Mark II processor and construction of the Model IV autocorrelator are continuing.

Tucson

During this quarter the cooled 2-mm receiver has been completed. The noise temperature is less than 1000 K SSB at 150 GHz, which we expect to improve somewhat in the future. Klystrons in the frequency range 130-170 GHz continue to be a big problem; this may be alleviated somewhat in the future by use of backward wave oscillators.

Construction on the He³ bolometer system has started. Dr. P. Ade of Queen Mary College in London will be working on this system for use this summer. We plan to have the bolometer installed in the refrigerator with a good set of measurements by the end of September. The He³ system will need a more rapidly switching subreflector than our present design and work has started on the procurement of a carbon fibre subreflector that will be far lighter than our existing aluminum design. A breadboard switching mechanism has been built that switches satisfactorily at 30 Hz.

Work continues on the power supply for the 190-230 GHz carcinotron. We plan tests on this tube in the next three months. Design has started on a cooled mixer receiver for this frequency range.

ENGINEERING DIVISION

Fabrication of the 300-foot traveling feed structural support, traveling feed drive system, and traveling feed mock up for testing continued, and final details and changes in the design were completed. Further studies on the behavior of the 140-foot structure and feed support system were carried out. Modifications to the 140-foot Cassegrain house were designed. Some of the modifications were made, including removal of the L-band feed horn. Modifications were made to the deformable subreflector for the

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140-foot telescope. Conceptual design for a future 25-meter millimeter wavelength telescope and its proposed site continued on a limited basis. Limited inspection assistance was given the VLA project. Routing engineering assistance was provided operations and maintenance in Charlottesville, Green Bank, and Tucson.

COMPUTER DIVISION

VLBI

The retarded baseline correction has been incorporated into the processor software and is undergoing final tests. When released, it will enable users of the NRAO VLBI processor to do phase closure on three station processing.

Video cassette tape recorders are being tested to determine their feasibility for VLBI use.

VLA

The image processing effort in Charlottesville has been placed under the direction of Ed Fomalont. Two image processing systems are being developed: (1) A Modcomp based system to remain in Charlottesville, and (2) a DEC/VAX system which will be moved to the VLA site upon completion.

The Modcomp IV/25 CPU (96 kbytes) has been replaced with a Modcomp Classic 78/60 (572 kbytes). An I²S image display unit has been added to this system. The DEC-VAX 11/780 (512 kbytes) has been ordered.

Green Bank 300-foot Telescope

An additional terminal and disk have been purchased for the Modcomp system so that a previous user of either the 300-foot or 140-foot telescope may be accommodated along with the scheduled 300-foot user.

IBM 360/65

The model 1051 Calcomp drum plotter has been delivered and installed. Software is presently being developed so that it can replace the existing plotter.

Tucson 36-foot Telescope

A two-port disk has been purchased for the 36-foot telescope. This will eventually be placed on Kitt Peak Mountain and will act

as an interface between the control computer and a separate data processing computer.

VERY LARGE ARRAY PROGRAM

The array was scheduled for observations and tests an average of 50% of the time during the second quarter of 1979. First fringes were obtained on antenna 20 during May. Seventeen antennas are currently operational on the 18-km baseline. Twenty antennas are outfitted with electronics.

Antenna 25 was accepted from the sub-contractor on June 28, which is six days behind the schedule adopted in June 1976.

During the quarter circular polarizers were installed on all L-band feeds. Initial astronomical tests indicate acceptable performance with respect to on-axis instrumental polarization. A major development during the quarter was the first use of two antennas in true spectral line mode.

The Versatec hard-copy peripheral for the new graphic terminal on the DEC-10 has been received. The terminal itself should arrive early in July. The work on on-line software for the spectral-line system is progressing.

Phase IV construction work was 85% complete by the end of the quarter. Phase V work was estimated 6% complete. The New Mexico Gross Receipts Tax case was heard and a final judgment in favor of the U. S. Government (VLA) was issued on April 19, 1979. The State filed an appeal of the judgment on June 15, 1979.

* * * * *

ELECTRIC 'PUMPS'

Electric Transportation Management of Troy, Michigan, plans to market coin-operated electric auto charge units this year. The firm also plans to have available re-charge units that rely on wind-powered generators. Both "pumps" are designed to be installed at existing gasoline stations.

* * * * *

WHAT'S COOKING?HONEY-GLAZED SWEET ROLLS*from the kitchen of Bette del Giudice**

- 3 3/4 cups all purpose flour
- 1 pkg. active dry yeast
- 1 cup milk
- 1/4 cup butter or margarine
- 1 tsp. salt
- 2 T. sugar
- 2 T. honey
- 1 egg
- 2 T. butter or margarine
- 1/2 cup packed brown sugar
- 2 tsp. ground cinnamon
- 1/2 cup honey
- 1 T. butter or margarine
- 1/2 cup currants (raisins or blueberries)
- 1/2 cup maraschino cherries or
chopped nuts

In mixing bowl combine flour and yeast. In saucepan, heat milk, 1/4 cup warm water, the 1/4 cup butter, sugar, the 2 T. honey and salt, stirring constantly just until butter melts (115° - 120°). Add to flour in mixing bowl. Add egg. Stir till well combined (dough will be soft). Cover. Let rise in warm place about one hour or until double. Stir dough down; divide in half.

On well-floured surface roll out one half the dough to a 9" X 8" rectangle. Brush with half of the softened butter. Combine brown sugar and cinnamon; sprinkle half over the dough. Roll jelly-roll fashion, starting at long side; seal edges. Cut in one inch slices.

Repeat with remaining dough, butter, and sugar mixture. Combine the 1/2 cup honey and the melted butter. Drizzle in bottom of 2 greased 9 inch round baking pans. Sprinkle currants, nuts, etc. in bottom of pans.

Place rolls, cut side down. Cover, let rise about 45 minutes or until nearly double. Bake in 350° oven for 25-30 minutes. Let stand 5 minutes. Invert onto dish or waxed paper. Makes 18 rolls.

**Bette would like to have your favorite recipes using honey.*

STEAK PICADO

OR

"Southern Cal's Special"*from Emilio Vallez*

For each portion:

- 6 oz. sirloin or other tender meat,
cut in bite-size pieces
- 1/4 tsp. fresh garlic mashed in 1/4
tsp. salt
- 3/4 cup onion, coarsely cut
- 3/4 cup bell pepper, coarsely cut
(or green hot peppers)

Saute meat in oil and garlic salt until lightly browned over very hot fire. Add onions and peppers. Toss lightly and turn fire down to medium. Gently toss frequently until vegetables have become limp (about 4 to 5 minutes).

For each portion add:

- 1/4 tsp. cuminos, ground
- 1/4 tsp. black pepper, ground
- 1/4 cup tomato (fresh), chopped
- 1 tsp. water

Toss a few times until tomatoes are warmed through. Serve immediately.



PERSONNEL UPDATE

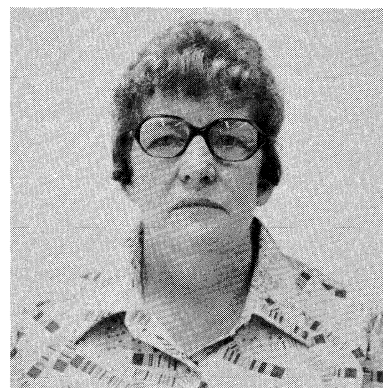
NEW EMPLOYEES



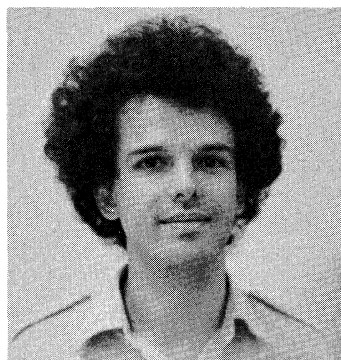
Janice Mole
Sr. Secretary
Electronics - CV



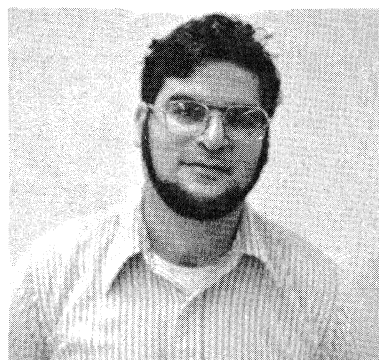
Linda A. Crelling
Secretary A
Business Management - CV



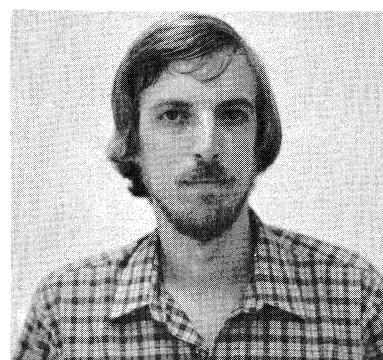
Irene B. Morris
Technical Trainee
VLA Construction - CV



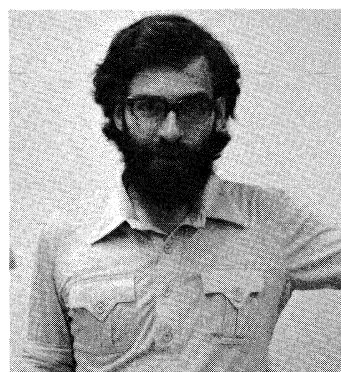
G. Dick van Albada
Research Associate
Basic Research - CV



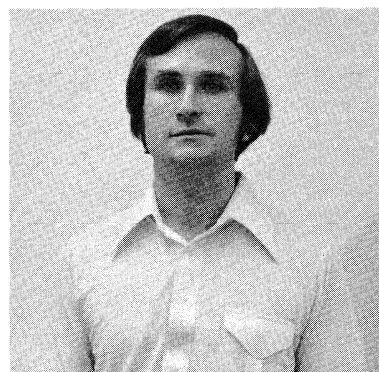
David Burstein
Research Associate
Basic Research - CV



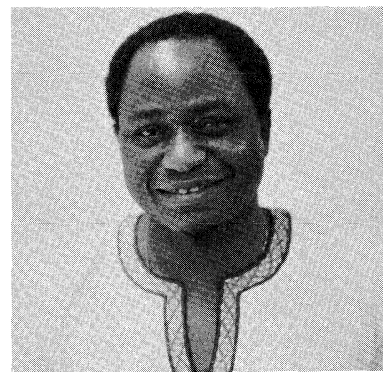
Allan D. Tubbs
Research Associate
Basic Research - CV



B. Murray Lewis
Visiting Associate Scientist
Basic Research - CV



James J. Condon
Visiting Associate Scientist
Basic Research - CV



Samuel E. Okoye
Visiting Associate Scientist
Basic Research - CV

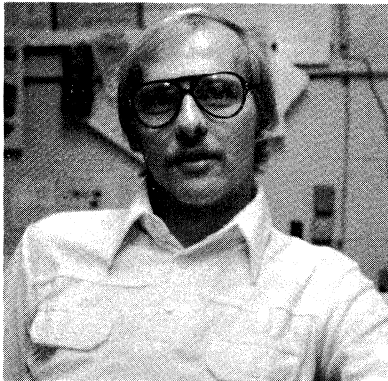
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NEW EMPLOYEES (Continued)

Donald Rayburn
Visiting Assistant Scientist
Basic Research - CV



Susan E. Delap
Technical Specialist III
Telescope Operations - GB



Michael D. Crist
Technical Specialist III
Telescope Operations - GB



Carol J. Ziegler
Secretary B
Administrative Services - GB

OTHER NEW EMPLOYEES - PHOTOS NOT AVAILABLE

Peter A. Ade	Electronics Engineer I	Electronics - Tucson
John P. Basart	Systems Scientist	VLA Scientific Services - NM
Marcello Felli	Visiting Associate Scientist	Basic Research - NM
Delia M. Figueroa	Janitor - Custodian	Tucson Operations - Tucson
Reubin H. Hill	Intermediate Technician	Electronics - Tucson
Malcolm L. Peralta	Antenna Mechanic	VLA Antenna - NM
Robert J. Peralta	Maintenance Trainee	VLA Project Management - NM
Margaret C. Perley	Technical Specialist II	VLA Array Operations - NM
Eric D. Russell	Scientific Programming Analyst II	VLA Computer Division - NM
Craig Sarazin	Visiting Associate Scientist	Basic Research - CV
Stanley R. Sullivan	Technical Specialist II	Tucson Operations - Tucson

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REHIRE

Arnoldus H. Rots

Systems Scientist

VLA Scientific Services - NM

TRANSFERS

John W. Archer

to Electronics - CV

Catherine F. Burgess

to Computer Division - CV

Edward Fomalont

to Computer Division - CV

David E. Hogg

to Basic Research - CV

John P. Lagoyda

to Business Management - CV

LEAVE OF ABSENCE

Rick Bearfield

RETURN FROM LEAVE OF ABSENCE

Sandra Treppa-Richards

Lawrence Rudnick

TERMINATIONS

Rosalina K. Armijo

Richard Groseclose

Silena K. Morris

Greg Brubaker

Edward N. Haigh

Marian W. Pospieszalski

Larry O. Carlisle

Phillip E. Hardee

Mark J. Reid

Mary Rose Chavez

David Haynes

Robert S. Runyon

Wayne A. Christiansen

Mike Hogan

Lawrence Rudnick

Melinda Crist

Feliz M. Landavazo

Craig Sarazin

Nathalie Dolan

Jerry Long

David Shaffer

Harry Fox

Paul Mehle

Rosalie Slaven

Steve Gillispie

Jimmy D. Whipkey

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CREF UNIT VALUES - 1979

January	- \$40.90	May	- 40.59
February	- 39.47	June	- 42.13
March	- 41.60	July	- 42.58
April	- 41.61	August	- 44.50

RUSSIAN ASTRONOMERS VISIT

Bob Havlen

During the recent hub-bub at JFK in New York over the departure of a Soviet visitor to the U.S., NRAO hosted a pair of amiable Soviet scientists in a working visit lasting more than two weeks at Charlottesville, Green Bank, and Socorro. Drs. L. Matveyenko and V. Kostenko, from the Moscow Institute for Space Research, had visited Charlottesville on prior occasions. Dr. Matveyenko has been here many times as part of a continuing series of VLBI experiment collaborations between the Crimea Astrophysical Observatory and other telescopes in the VLBI network.

The occasion which brought these two distinguished visitors to the U.S. was a jointly sponsored visit by NRAO and SAO/MIT. During their visit about half of their time was spent at NRAO facilities. While in the Boston area their hosts were Drs. B. Burke and J. Moran. Most of their time at NRAO was spent using the VLBI processor in Charlottesville. They did find time to visit Green Bank and carry on many technical discussions both in Charlottesville and Green Bank related to the operation of their Crimean facility. Of special interest to them, of course, was their three day visit to Socorro and the Plains of St. Augustin to witness the development and operation of the VLA. On their way back east through Washington they were graciously hosted briefly by Bill Howard of the NSF and Ken Johnston at NRL.

Their reductions on the Charlottesville processor primarily involved data obtained between Crimea and Onsala, Sweden of water vapor sources in the Orion star-forming complex. A good deal of interest is centered around the exact relationship to each other as well as to other star-formation signposts in the region, such as infrared sources and ionization fronts. They were, indeed, quite excited over the results that were coming out of their processing efforts.

The Charlottesville scientific community was also fortunate enough to hear about additional recent work being carried on at the visitor's home institute. Dr. Matveyenko presented a colloquium on August 28, on the "Nuclear Structure of the Seyfert Galaxy NGC

1275", based on the milliarcsecond resolution that VLBI experiments allow.

* * * * *

NOTES ON MY CHINA VISIT

Woon-Yin Wong

This a a mixture of reports, thoughts and anecdotes collected during my visit to the old country. The visit ran from the middle of May til the end of June. I worked for four weeks in the Purple Mountain Observatory of Nanking, then proceeded to visit the observatories in Peking and Shanghai. I concluded the visit with a week of vacation with my family in Hangchow and my home town, Canton.

The Organization

The headquarters of the Chinese Academy of Science is located in the capital, Peking. It is an organization equivalent to the U.S. NSF and AUI combined. This organization supervises all research institutions in the country and has many separate divisions. The second of these supervises the areas of physics and astronomy. The division head is a young energetic and bright lady in her thirties, named Deng Hsu-wei. Miss Deng got her degree in mathematics from the University of Kho-che in 1963.

Under the new program of modernization in the field of science, all research institutes are encouraged to plan ahead on their programs. In astronomy, the Purple Mountain Observatory engaged itself to develop in high frequency (up to 115 GHz) radio astronomy while the Shanghai Observatory has expanded its array and also plans to add a 2-meter reflector in 1980. All observatories are administratively independent. It is always very competitive between observatories, particularly in the matter of funding. There is a general understanding that not all major new projects will be funded.

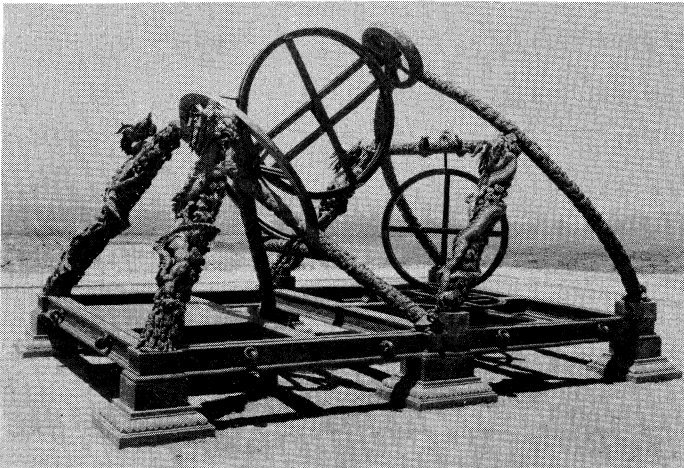
In parallel to the Academy of Science is the Department of Advanced Studies, whose duty it is to supervise all universities. Its yearly budget is quite low in comparison with that of the Academy of Science, but it nevertheless

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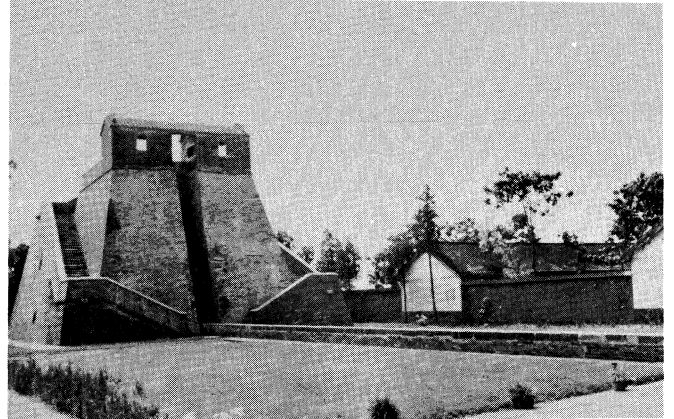
has programs of its own. One example is the possible acquisition of a 25-meter radio telescope for the University of Nanking. The precision of this telescope would be similar to that of the VLA antennas with observing capabilities up to 23 GHz. This would serve as a research facility for the various faculties and as an educational tool for students.

The Aftermath

During the stormy radical movements in the sixties, the fanatics wanted, among other things to tear down whatever could serve as a reminder of the past. Destruction was not total, but its mark could certainly be felt everywhere. Some landmarks were lucky enough to survive this onslaught and are now open to visitors, but hundreds of historically or archeologically important artifacts were destroyed. In Hangchow, one Buddhist temple dating back to the T'ang Dynasty (618-906 A.D.) survived only after the late premier Chou En-lai personally ordered the army to be stationed around the perimeter of a temporary wall. Slogans left behind from the Cultural Revolution still can be seen, even on the walls of Peking's Forbidden City, the Imperial Palace. The new paint still can not cover up entirely those over-sized characters.



The Abridged Armilla is an ancient Chinese astronomical instrument that dates back to 1437 A.D., the Ming Dynasty. It was used to determine the position of important circles of celestial spheres.



The Tower of Chou Kung, built about 1100 B.C., for the measurement of the sun's solstitial shadow lengths. In its present form the structure is a Ming (1368-1644 A.D.) renovation, situated at Teng-feng County, Honan Province.

From the Western World

If one confined his traveling only to large cities in China, he would invariably come across the imprint of some old western colonialism. Foreign powers had their own enclaves in big cities like Canton and Shanghai, those areas were policed by their own jurisdictions. Of course these phenomena vanished soon after the revolution in 1949. When we were in Shanghai we stayed in a hotel converted from a French apartment house, located in the old French section. The French section has one distinct characteristic: the streets are lined with maple trees. These trees were originally from Southern France, around the region of Lyon, I was told.

The place I stayed in Nanking was the complete second floor of a three-story house and it used to be in a British compound. Soon my wife joined me, she said that the house reminded her very much of that of her grandfather, by its appearance and the fixtures inside. A short walking distance through the back alley, one could reach the Ding-Shan Hotel from my place. Over there stood two

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houses with steep orange tile roofs and well-proportioned chimneys. They used to be part of the Dutch Embassy and would have fitted perfectly well along the canals of Amsterdam.

On Farming

Usually it is not the rainy season in May when farmers start to harvest their wheat, but this year it rained a little more often than normal and everybody was talking about the weather out of genuine concern. Almost all able bodies participate in farming one way or another, all on a volunteer basis. In general, each person will spend one day a month in the field. Some might do so due to peer pressure, but the majority welcome this kind of work as a break from the daily routine. We do this in our front yard, which is not at all productive.

On Clothing

The modernization program is overdone at times. One incident concerns a story about Pierre Cardin being invited to China in an attempt to introduce a new fashion to the people. To me it is a pretty silly thing. What difference does it make that everybody wears Mao's jacket or Pierre Cardin's jacket?

A Deal Between the East and the West

A couple from Belgium were traveling with a group and staying in the same hotel in Nanking that I did. They had been around to every gift shop in the city and were particularly fascinated by an ivory sculpture on sale everywhere. In one shop, however, it was offered at a price of 625 yen, considerably cheaper than the 1250 yen asked in all the other places. After three days of repeated checking they bought the lower-priced sculpture.

It was one of the highest priced transactions in recent months and the salesgirl was proud of it. Later in the day she told this to her supervisor, but the supervisor pointed out to her that the price of the sculpture should have been 1250 yen. They checked and found that by mistake the salesgirl had misplaced the price tag. They went to this couple and tried to explain their mistake, hoping that they would either return the sculpture or pay the difference. The Belgian couple refused. The girl cried. Her salary is 36 yen a month.

The Crowded Corridors

The Peking-Shanghai-Hangchow-Canton route is especially crowded with visitors and it is likely that you will meet either someone you know or some distinguished person that everybody recognizes.

During the visit of the Chinese delegation of astronomy to Green Bank in the autumn of 1976, the state department sent, along with two nervous secret service agents, a liaison officer named Holsey Beemer to accompany the group. His special duty is to serve as a connection between the department and the Chinese and we met in Green Bank. Almost three years had passed but in the middle of the lobby of the Peking Hotel stood Mr. Beemer. We were happy to see each other and for the next two weeks, we repeatedly met in Hangchow and even shared the same flight to Canton.

The Pavilion for Listening to Orioles in the summer palace is a nice place to dine, and we were fortunate enough to be the guests of Mr. Yu of the Academy. The palace is very large and opulent. In order to reach the pavilion one must walk from the main gate, through long corridors, past the Hall of Happiness in Longevity, the Garden of Harmonious Interest, and the Hall that Dispels Clouds.

There were lots of tourists but we were early enough to take a leisurely tour. There was one big attraction that drew large crowds. We were curious and surprised to see Bob Hope singing, dancing and doing Gilbert and Sullivan's, "H.M.S. Pinafore" on the Marble Barge.

We took the train from Shanghai to Hangchow. It was a three hour ride, and was reasonably comfortable. All visitors were obviously assigned to one railroad car which was not full. There I noticed the famous American violinist, Isaac Stern, traveling with his family and an entourage of eight to ten people. By evening, when we strolled along the West Lake after a sumptuous meal, we could hear crisp but frequently interrupted melodies from one of the remote pavilions across the lake. The evening was dark and still. The air was hot.

Mary lives in Charlottesville. By leading tours, she goes to China three or four times a year. An article written by Horace Sutton in one March issue of "Saturday Review" this year mentioned, "Mary, the tiny tour

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leader, surely the descendant of ancient China traveling under the unlikely surname of Israel". Mary and her husband John are acquaintances of ours. On a hot July day at the Harbour of Whampoa where we took our leave of China by hovercraft on the way to Hong Kong, we were happy to see Mary and John.

Science vs. Business

The array in Mi-yun, 160 km northeast of Peking, was finished in 1967. It is over one kilometer long, and consisted originally of 16 telescopes, each of 6-meter diameter. In 1978, it was extended to include 23 elements. Soon after the array was modified and tests had started, a mysterious interference signal began to occur persistently. It took the observatory many months of detective work to pinpoint the source. It was from the spark plugs that belong to the new fleet of taxis in Peking. There is no use fighting the budding Tourist Industry. The observatory is quietly changing the frequency of its front ends.

A Few Words on the Life in China

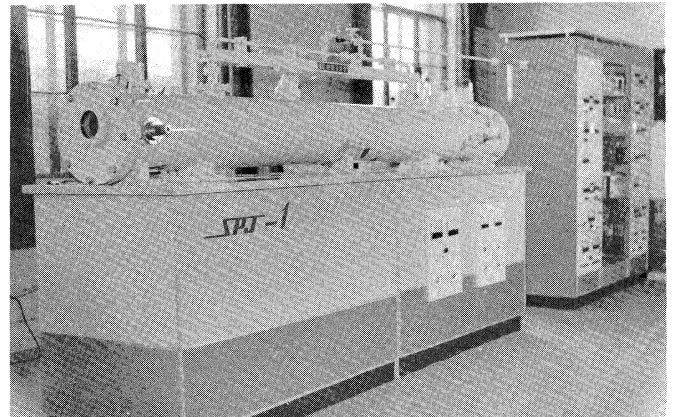
People in China are hard-working and industrious. They work six days a week, there is no paid vacation, and there are only four national holidays a year. Two for the New Year, one for May Day and one for the National Day. Conditions inside China today might appear harsh to the western world, but they have been considerably improved over the past few decades.

Political meetings are held during the working hours, and, in general, working efficiency is not a priority in many organizations. Most of the concerns are not profit oriented so that some of the pressures which are an intrinsic part of the capitalist societies do not exist there. Job security is very high but housing is a big problem. Most of the organizations provide their workers with apartments at the low rent of about 5 per cent of the monthly income. There is socialized medicine, costing about 15 cents a month for the medical protection of a family. There is no private ownership of automobiles and no inflation. There were no salary increases during the unsettled period of the Cultural Revolution. There is no starvation, and food is reasonably sufficient. The crime rate is almost nil.

Electrical energy consumed per family is about one-fortieth of that in the U.S.

Will the Real Mr. Hua Please Stand Up?

During the war against the Japanese in the thirties, there were all kinds of paramilitary groups fighting together with the Nationalist or the Communist troops. One group was called "Zou-Hua-Cho-Kuo-Zen-Feng", roughly translated "The Chinese Advance Troop in Saving the Nation". The members of this group were mainly teenagers, and their mission was to undermine the enemy by sabotage, scouting and sometimes even fighting. Mr. Su was a zealous and much decorated member who discarded his original given name and adopted the abbreviated title of the troop, calling himself Hua-Kuo-feng. In 1976, he was elected to succeed the deceased Chairman Mao. He is still Mr. Su in his private life, however.



Cesium beam clock of Shanghai Observatory is accurate to about 1 second in 250,000 years.

The Nanking Astronomical Instrument Factory

One difficulty facing the Chinese astronomy community is the lack of qualified industrial support. In lesser degree this is also true in the States. To deal with this problem the Academy of Science supports a factory to produce instruments for the needs of all

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observatories in the whole nation. This organization, plainly called "The Nanking Astronomical Instrument Factory", was originally a division of the Purple Mountain Observatory, and is located a healthy twenty minute walk down the hill from the top of the Purple Mountain. Later this division expanded and subsequently grew into a full-fledged institution. In the sixties, the Academy decided to split the observatory and the factory into two separate entities.

The factory has a mechanical shop to fabricate mountings of various designs, an electrical department to assemble all electromechanical devices, and a group of scientists and engineers for the general research and development. It has the capacity to produce optical lenses up to 2 meters in diameter. The sizeable projects they are presently engaged in are a 2-meter optical reflector for the Peking Observatory in Hsin-lun and an impressive four axis satellite tracking camera. They have produced all the astrolabes used by the time service throughout the country, as well as the 60-centimeter Schmidt Telescope and two 2-meter radio telescopes in Nanking.

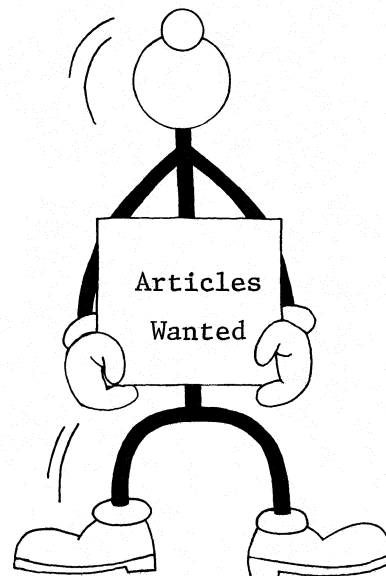
Due to recent interests in radio astronomy, the factory is preparing for the development and construction of large and precise radio telescopes.

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Stephen Grellet was a French-born Quaker who died in New Jersey in 1855. Grellet would be unknown to the world today except for a few lines which made him immortal. The familiar lines, which have served as an inspiration to so many people, are these:

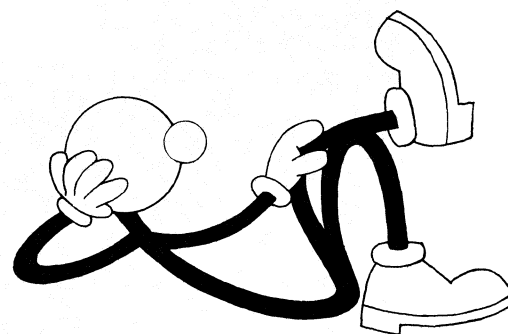
"I shall pass through this world but once. Any good that I can do, or any kindness that I can show any human being, let me do it now and not defer it. For I shall not pass this way again."

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The next *Observer* is scheduled to be out in late December.

We hope you will submit an interesting article.



We're waiting to hear from you!