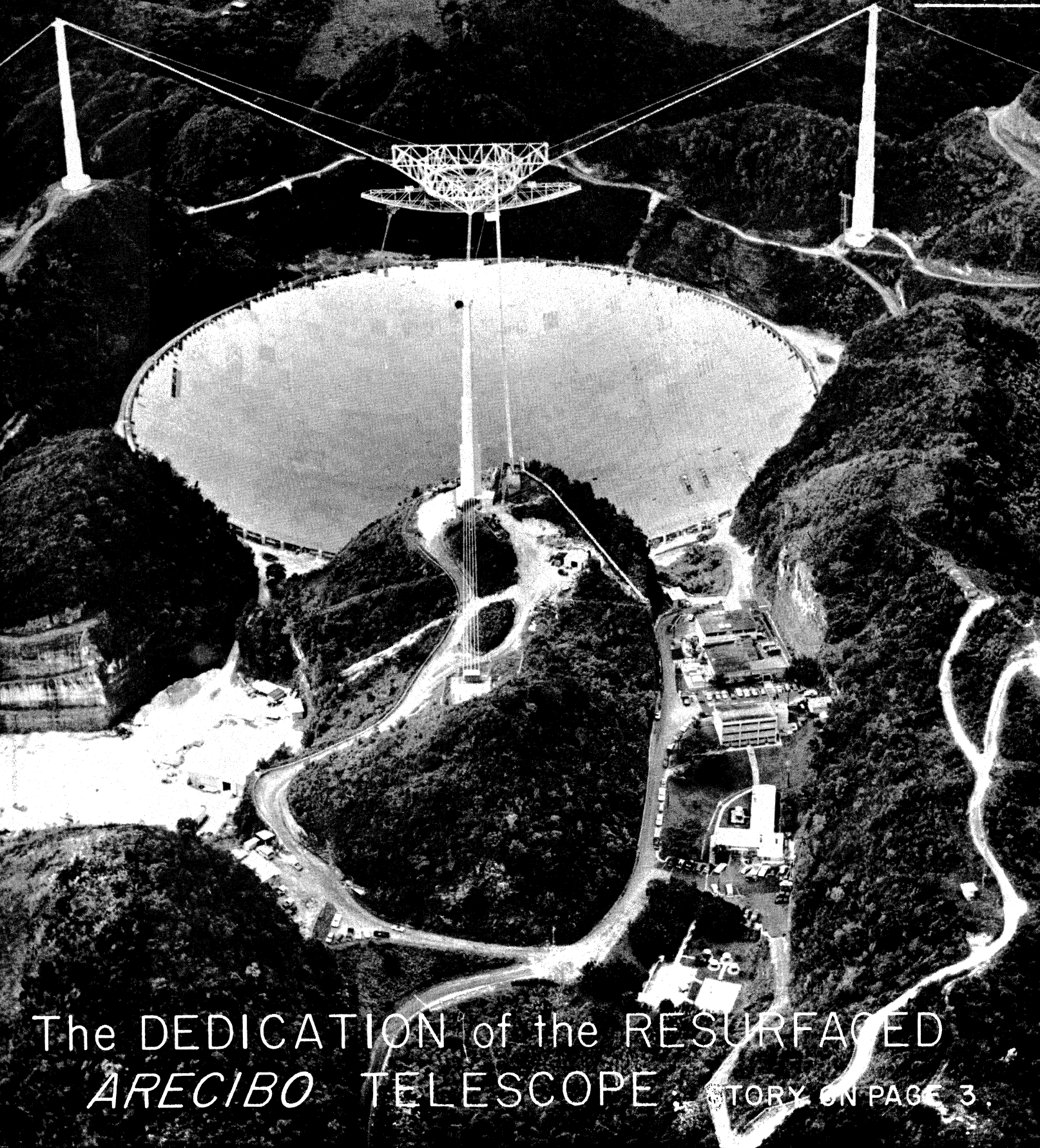
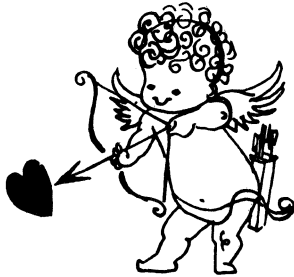


# THE OBSERVER

FEB. 75



The DEDICATION of the RESURFACED  
*ARECIBO* TELESCOPE : STORY ON PAGE 3.



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THE DEDICATION OF THE RESURFACED  
ARECIBO TELESCOPE

Yervant Terzian

I. Dedication

The message was loud and clear and was traveling with the speed of light -- finally our technological civilization was sending its first intelligent message to outer space, hoping that it will be intercepted -- and maybe we will receive an answer!

This symbolic experiment marked the dedication of the upgraded Arecibo 305-meter (1000-ft.) radio-radar telescope on November 16, 1974. The world's largest antenna had a new glittering look.

The crowd of distinguished guests gathered under a large tent near the rim of the telescope, and pondered with awe during the transmission of the Arecibo message to outer space -- one could see beautiful ladies in long formal dresses cry, famous scientists looking at the sky motionless, Directors, Presidents, and executives watched silently in disbelief. Historians will not be able to dispute anymore our technological communicative capabilities.

Speeches were brief, and surprisingly vivid -- the festivities lasted two days -- mostly fun and happy people. Headquarters for the guests was the Cerromar Beach Hotel, a magnificent seashore resort. I overheard NSF Director H. G. Stever say, "Boy, this is the way to do radio astronomy," and Leo Goldberg and Victor Blanco had to agree. The happy crowd included NSF and NASA officials, a Cornell mob, and many astronomers. Congressman John W. Davis, who was the principal speaker at the dedication, was the happiest man around since he was the one who gave the signal to start the journey of our message into space. Famous radio astronomers like A. H. Barrett, R. N. Bracewell, F. Kerr, J. L. Locke, and others all agreed that the upgraded antenna will soon make radio astronomy even more challenging, all were confident that they will get many more opportunities to visit the splendid seashores of Puerto Rico. Indeed everyone was happy -- I recall D. S. Heeschen cheerfully watching W. E. Howard III lose his green dollars on the roulette tables, despite Bill's confidence in using his "perfect system."

A new era has begun for the world's

largest radio antenna.

II. Information

The upgraded Arecibo telescope will be able to operate at frequencies as high as 7200 MHz. The new reflector surface, of about 80,128 m<sup>2</sup> (19.8 acres), was successfully constructed by E-Systems, Inc., of Dallas, Texas. The surface consists of 38,778 aluminum panels perforated with ~ 5 mm holes spaced ~ 6 mm apart, allowing 56 percent of the surface to be covered with aluminum. The tolerance of this spherical surface will be 3.2 mm r.m.s. The upgraded suspended structure, which supports the feeds above the spherical reflector, will soon be able to have a pointing accuracy of ~ 15 arc seconds.

The total cost for the upgrading was about \$8.8 million, \$3 million being provided by NASA and the remainder by NSF. Funds from NASA were made available primarily for a high-power S-band (2380 MHz) transmitter. This S-band system is a 450 kw continuous-wave transmitter built by Continental Electronics Manufacturing Company of Dallas, Texas. The S-band feed is a linearly polarized line source which illuminates about 213 m (700 ft.) of the aperture, and the antenna gain at this frequency is about 71 db with a half power beamwidth of ~ 3 arc minutes. The receiver system makes use of a ruby maser provided by the Jet Propulsion Laboratory, and the over-all system temperature will be less than 50°K. The outer two principal high frequency systems at present are at the frequencies of 1420 MHz and 1665 MHz.

Some facts about the National Astronomy and Ionosphere Center, and parameters of the Arecibo telescope and its new system are summarized below:

Organization: National Astronomy and Ionosphere Center, operated by Cornell University under contract with the National Science Foundation. Observing proposals are accepted for consideration from scientists around the world. Address: NAIC, Space Sciences Building, Cornell University, Ithaca, New York 14853.

Telescope Location: Seventeen kilometers southwest of the coastal city of Arecibo,

--continued, next page--

Puerto Rico. (Latitude 18° 21' 13" N, Longitude 66° 45' 11" W, elevation 365 meters.)

Staff: 169 scientists and supporting staff, (144 at Arecibo). A total of 16 scientists (10 at Arecibo).

Research Areas: Radio astronomy (scientific staff 9); radar astronomy (scientific staff 2); and ionospheric physics (scientific staff 5).

Cost of Facility: \$9.3 million for initial construction (1963). \$8.8 million for upgrading (1974).

Yearly Operating Cost: About \$3.5 million (1974).

The Reflector Surface: 80,128 m² (19.8 acres) of 38,778 aluminum panels defining a spherical shape with tolerance 3.2 mm r.m.s. to a sphere of radius 265.176 ± 0.024 meters (Spring 1975).

Feed Arm and Support System: 600-ton triangular platform, with a 93 meters long curved feed arm attached to it, 133 meters above the reflector. Pointing is achieved by the elevation motion (± 20° from zenith) of two carriage houses which support the feeds, and by the rotation of the feed arm to define the azimuth (360°). (Pointing accuracy ± 15 arc seconds, Spring 1975).

Receivers and Feed Systems: Systems with line feeds are available at 318, 430, 611, 834, 1420, 1665, and 2380 MHz. The aberration-correcting line feeds at these frequencies illuminate areas with diameters from 213 to 305 m of the reflector.

Parameters of the New Systems: The following systems all have 12.2 m long line feeds illuminating 213 m of the reflector surface. The approximate parameters at zenith are as follows:

Feed bandwidth (MHz)	1400-1430	1650-1680	2365-2395
Half power beamwidth (arc min)	4	3.5	3
Sensitivity (°K/f.u.)	8.5	8.5	7.8
Aperture efficiency (%)	65	65	60
Receiver amplifier	uncooled paramp	uncooled paramp	maser
System temperature (°K)	100	100	40

A new 1008 channel autocorrelator will be completed by the Spring of 1975 for spec-

tral analysis, with a total receiver bandwidth of 20 MHz. Systems at frequencies higher than 2380 MHz will be initiated in 1976.

Transmitters: The following four transmitters are available: (a) 5-12 MHz for ionospheric research, (b) 50 MHz for ionospheric and lunar research, (c) 430 MHz for ionospheric and solar system research, and (d) 2380 MHz for solar system research.

Data Processing: CDC 3300, and Datacraft 6024/4 computers at Arecibo.

The above summary of the new capabilities of the Arecibo telescope is indeed impressive. Very few people believed 10 years ago that these capabilities could be achieved. Some of those present at the November, 1974, dedication were talking for a third dedication, maybe in 1984 for the world's largest millimeter telescope. (I don't believe it!)

THE ARECIBO MESSAGE, 1974

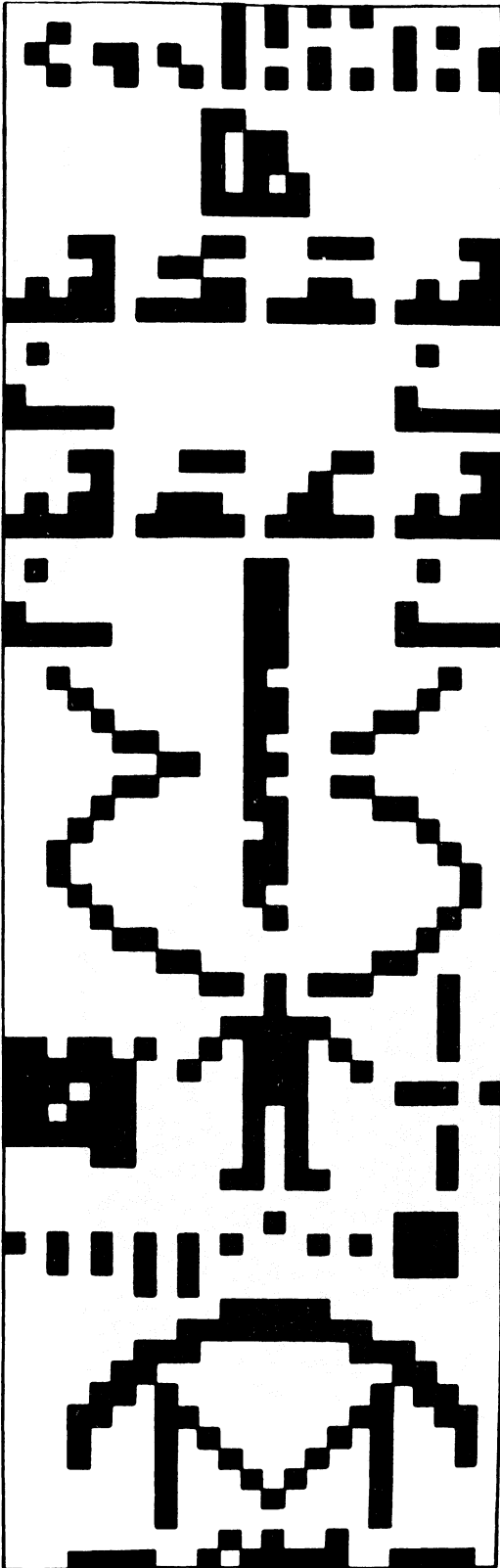
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THE DECODED ARECIBO MESSAGE, 1974



REPRODUCING THE ARECIBO MESSAGE, 1974

The Arecibo message, 1974, consists of 1679 consecutive characters, each denoted by "0" or "1". This code was transmitted by the Arecibo telescope recently into the depths of the heavens. To construct the picture from the message, follow these (simple?) rules.

1) On a piece of graph paper, lay-off a rectangle of width 23 squares and length 73 squares. Each square then corresponds to a character in the message since  $23 \times 73 = 1679$ .

2) On the graph paper, start from the upper right hand corner and move across to the left. In the message, start from the upper left hand corner and move across to the right. Fill in the square if its message counterpart is "1". Leave the square empty if it is a "0". On the graph, new lines begin on the right; in the message, a new line begins on the left. Unfortunately, the lines are not of equal length.

3) After one hour of this ridiculous exercise you will reproduce the picture. What can you recognize in it? Remember you should take the viewpoint of an alien civilization, one which may be completely foreign in all aspects to ourselves.

The meaning of the picture will be described in the next issue (if the editors can figure it out).

\* \* \* \*

CREF UNIT VALUES

1974

January . . . . .	\$40.75
February . . . . .	40.83
March . . . . .	39.32
April . . . . .	37.58
May . . . . .	35.11
June . . . . .	34.29
July . . . . .	31.71
August . . . . .	29.09
September . . . . .	25.39
October . . . . .	30.27
November . . . . .	29.23
December . . . . .	28.35

\* \* \* \*

VLA UPDATE

Bob Dorr

Much has happened since our last report to you on the VLA. In the forthcoming months the first two antennas, the Control Building and the Cafeteria Building will be bursting forth from the Plains of San Augustin along with the spring flowers. The skyline has already been changed with the Antenna Assembly Building rising 104 feet into the air and its shorter brother, the 6,000 square foot Service Building, both nearing completion. For the first time you can spot the central site when driving by on the highway, and the VLA takes on a new reality.

Actually, at the site, much more has happened than just buildings. One and one-quarter kilometers of the wye is nearly complete along with six antenna foundations. This will provide the facilities needed to receive the first two antennas and the transporter this spring and will provide the baseline for the first interferometer tests. The Service Building is scheduled for completion in February and will provide the initial office and shop space at the site. A well has been dug and a portion of the water system completed. In December a contract for \$2,386,600 was awarded for additional site work which includes a 24,000 square foot Control Building to house the computers, control electronics and offices and a 5,000 square foot Cafeteria Building. These are scheduled for completion in 1976.

Initial work space in New Mexico will be rounded out by the lease of 4,800 square feet of office and storage space on the New Mexico Tech Campus.

As we reported last year, the 1974 funding was cut from the requested \$10 million to \$5 million. The 1975 funding fared better, however, being set at \$13 million, of which \$1 million is being withheld until this spring.

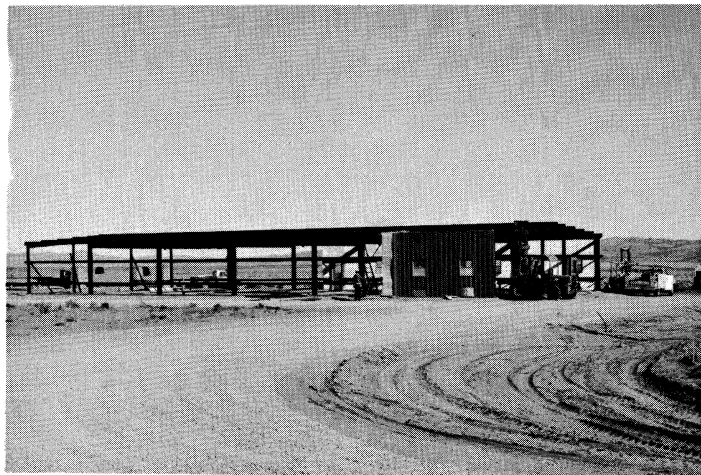
Dr. Dick Thompson, recently appointed Deputy Project Manager, and the electronics group have been involved in a beehive of activity and are looking forward to the time E-Systems delivers the first antenna so that installation of the electronics can commence. Right now, it looks as if this will be during this coming June.

Victor Herrero recently joined the project to ride herd on all the problems of fit-

ting a system as complex as the VLA together.



Erecting the Antenna Assembly Building.



Prefabricated Service Building will contain the initial laboratories and offices.

The computer group has also been active. The synchronous computer to control the array has been delivered and installed on the fourth floor of the Ivy Road Building. Dr. Barry Clark, Bill Randolph, Gareth Hunt and Ken Sowenski have all been working to get the

--continued, next page--

synchronous computer programmed and operating with the control electronics. Dr. Robert Hjellming, Nancy Vandenberg, Al Braun, Dave Ehnebuske, Jerry Hudson, Jim Torson and June Rowe are all now located at the Gallery Mall Building and have started work on the programming of the asynchronous computer which was received in December.

All told, the project now numbers 58 people.

The Project, like everything else, has been hit by inflation. To help combat its effects, we have been scouring the country to find any excess railroads the Government might have. So far we have obtained 6.7 miles of track at the Crab Orchard Wildlife Refuge in Illinois, which is now either installed in the first section of the wye or stored at the site. There are also 6.7 miles of track at Holloman AFB in New Mexico; 2.3 miles at Fort Hood, Texas; and 6 miles at Lincoln Ordnance Depot in Illinois that has been obtained and which we are in the process of getting taken up and shipped to the site. We get innumerable rumors of excess rail, follow them all up, and are occasionally rewarded with success. We can't afford to let any slip by as we need a total of some 81 miles of railroad track for the complete wye. The importance of this can be seen when it is realized that new rail for the wye would cost the Project about \$3.5 million more than excess Government rail.



Spiking and preliminary alignment of the track. Upper right: portion of the Antenna Assembly Building.

Starting in April, the first of the VLA contingent will start the trek west. This means that our spare moments will all be spoken for in making the necessary arrangements for the move. I expect this will keep us out of mischief.

\* \* \* \*

Dear Fellow Employees,

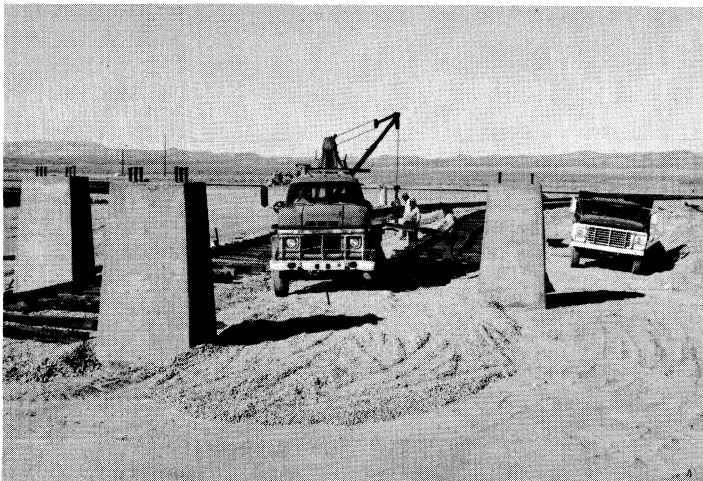
We would like to express our thanks and appreciation to all the personnel of the Observatory for their concern and kindness during the time that my leg has been broken. I would like to give my special thanks to the fellows at the Works Area who comforted me and helped put me in the ambulance, and the boys who drove me to Elkins; also all those who sent me so many nice cards and letters while I was in the hospital, and all who took time to stop and see me while I was there.

I also appreciate very much the Observatory policy which gives me a nice winter vacation.

Thanks again to all.

Jim White

\* \* \* \*



Completed maintenance pad showing the foundations for installation of the antenna base plates and the placement of rail and ties for the maintenance spur.

## OBSERVATIONS OF SCIENTIFIC JOURNALS

Marc Price

The final output of our effort at Green Bank, Tucson, and Charlottesville appears in the scientific journal literature. But, how do we stack up against the rest of "science" in our publications? This reporter has taken a look at one aspect of the scientific literature--the multiple author effect (MAE)--to see just how well radio astronomy scores.

The MAE is seen widely in astronomy journals, particularly as an outgrowth of new techniques that make "team" investigations necessary. It is also found when many investigators group together to observe one particularly interesting object. Examples of this type of research are seen in VLBI and variable source observations. The Quasar Patrol and similar groups have given us such MAE as Kellermann, Jauncey, Cohen, Shaffer, Clark, Broderick, Ronnang, Matveyenko, Moiseyev, Vitkevitch, Cooper, and Batchelor, (13 authors) in the *Astrophysical Journal* 169, 1, 1971. Although such long author lists often appear, it is more common to see articles with only six or seven authors, such as Cohen, Cannon, Purcell, Shaffer, Broderick, Kellermann, and Jauncey (*Astrophysical Journal* 170, 207, 1971).

"Coordinated observations" have been carried out on variable sources by Epstein, Fogarty, Hackney, Hackney, Leacock, Pomphrey, Scott, Smith, Hawkins, Roeder, Gary, Penston, Veron, Wlerick, Bernard, Bigay, Merlin, Durand, Sause, Becklin, Neugebauer, Wynn-Williams, Tritton, and Bertaud (giving a total of 24--and that is with counting Wynn-Williams as only one name). Again the *Astrophysical Journal* (178, L51, 1972) carried this MAE. And, what is more, we are promised that another "coordinated" study will be published in February authored by Cohen, Anderson, Cowley, Coyne, Fawley, Gull, Harlan, Herbig, Holden, Hudson, Jakoubek, Johnson, Merrill, Schiffer, Soifer, and Zuckerman (16 authors). This study will reveal the secrets of the "Red Rectangle". I might also point out that this last MAE was in (almost) alphabetical order. The causes (and effects) of alphabetical MAE's are complex and are beyond the scope of the present investigation, but if your last name is Zuckerman, for example, they are a bad business.

This then brings us to Zuckerman, Turner,

Johnson, Clark, Lovas, Fourikis, Morris, Palmer, Ball, Gottlieb, Lilley, Litvak, and Penfield (13 authors), who reported another discovery from the continuing interstellar molecule pub crawl--Ethyl Alcohol. This otherwise temperate group may have found the evidence to prove there is a bar in the center of our galaxy. Although the proof is not absolute, the scientific world is drinking heavily of this discovery.

So, that is how radio astronomy looks. What about other fields of investigation? The biggest competition we have in the MAE comes from the field of high energy particles. We recently had the announcement of the discovery of the "J" particle by Aubert, Becker, Biggs, Burger, Chen, Everhard, Goldhagen, Leong, McCarriston, Rhoades, Rohde, Ting, Wu, and Lee (14 authors). Simultaneous announcement was made by Augustin, Boyarski, Breidenback, Bulos, Dakin, Feldman, Fischer, Fryberger, Hanson, Jean-Marie, Larsen, Luth, Lynch, Lyon, Morehouse, Paterson, Perl, Richter, Rapidis, Schwitters, Tanenbaum, Vannucci, Abrams, Briggs, Chinowsky, Friedberg, Goldhaber, Hollebeek, Kadyk, Lulu, Pierre, Trilling, Whitaker, Wiss and Zipse (35 authors). Just in case anyone was uncertain about this discovery, a confirmation experiment was announced (in the same issue of *Physical Review Letters*, 2 December, 1974) by Bacci, et al. (It might be noted in passing that one of the dangers of being included in the MAE is that your name often is lost in the reference to "First Author" et al.) The above three articles ran successively in the *Physical Review Letters* for a running total of 92 authors for three articles on a total of six and one-quarter pages. The listing of the authors themselves took up nearly one entire page of space, leaving each author the responsibility of writing three lines. Since another page out of the total was filled with diagrams, only two and one-half lines remained to be composed by each author.

An interesting side product of this investigation was that it shows that it takes groups of 14 and 35 to discover the effect, but 43 to confirm it. Clearly it is easier to discover something than to confirm it. This is similar to our experience in radio astronomy (references omitted at this point for obvious reasons).

In conclusion, this reporter has found  
--continued, next page--



that although radio astronomy has not yet achieved the peak number of authors to be seen in the MAE, we do manage to hold our own. Keep up the good, good work Quasar Patrol and Interstellar sniffers.

\* \* \* \*

#### ERRATUM

Marc Price

It was recently pointed out by this reporter (The Observer, this issue) that radio astronomy scores well on the Multiple Author Effect in the scientific literature. The purpose of this article is to point out an error in one of the journal articles, Bacci, et al, discussed in that story.

Several weeks after the appearance of Bacci et al, an erratum concerning that article appeared in the Physical Review Letters (30 December, 1974) under the authorship of Bacci et al. The erratum reported the earlier accidental omission of the two additional authors, to bring the grand total to 45 authors. It also reported six misspelled names and two spurious initials. It also turned out that all of the reported addresses of authors were incomplete, requiring three and one-half column inches to report the corrections. Finally, rather as an afterthought, attention was drawn to two typographical errors and one incorrect equation.

The conclusion of this reporter is that the increase in the author list and the inclusion of the spurious initials is just one more inevitable effect of inflation.

While on the subject of errata, I might point out that one well known NRAO staff member has been known to circulate preprints of his errata--blank sheets--to indicate his supreme self confidence.

\* \* \* \*

#### INCOME TAX HELP

If you have any problems making out your income tax, you can get help by calling these IRS toll-free numbers:

In Charlottesville	800-552-9500
In Green Bank	800-642-1931

#### WAVEGUIDE

##### Question:

Why does the Personnel Officer spend 95% of his time in CV when more than 50% of the employees are located in Green Bank?

##### Answer:

Monroe Petty certainly is a big help when he is in Green Bank, but don't forget that he has a large number of other commitments as well. The main NRAO Personnel Office is necessarily located near the NRAO Director's Office where policy is made that will apply to all NRAO sites. It is a long term goal to have a personnel man here in Green Bank, but our current budget limitations do not permit it at the moment. If you have a problem that can wait until Monroe comes to Green Bank for his periodic visit and prefer to wait, by all means do so. However, if you have a problem that you would like to resolve quickly, we urge you to take it up with your supervisor, division head, with Bob Moore or with me - preferably in that order. I think that you will find that we are more than willing to try to solve Green Bank problems in Green Bank and we hope that you will give us a chance to try. (WEH)

##### Question:

Why are the employees at Green Bank not allowed to use the visitors lounge in the Residence Hall while the Charlottesville employees are allowed to do so?

##### Answer:

The key to the answer to your question is actually in the question itself! That is, the lounge is a visitors' lounge. It is not meant to be a place where Green Bank employees can rest, relax, and watch TV. They should do that in their own homes. In the past when the Redwood House was open to some Green Bank employees and not others, there was considerable unhappiness about the situation. The line that was drawn between who could go and who could not was too fuzzy to be workable. Now the line is clearly drawn and should be readily understood by everyone. The lounge is a place for our observers and visitors to go, and access to the lounge is limited to them and to other local administrative personnel who have the responsibility for its operation. (WEH)

--continued, next page--

Question:

Why aren't sick leave benefits provided by NRAO in case of maternity?

Answer:

If you've been reading the newspapers lately you've probably seen a number of court cases involving this very question. As of now, no clear-cut decision has been made which would require maternity cases to be treated as illnesses for purpose of sick leave. The basic question which remains unanswered is whether pregnancy constitutes an illness. In most quarters, illness or injury is viewed as an unforeseen occurrence for which some form of insurance, namely--sick leave, needs to be provided. However, there are many who argue that pregnancies are not necessarily unforeseen occurrences and female employees can exercise some form of control over such situations. Accordingly, these people do not feel that "sick leave insurance" is appropriate in such cases.

At present, the Observatory has chosen not to change its policy until this question has been resolved by the courts.

As you may know, the Observatory does permit a pregnant employee to take a Leave of Absence for up to six months, and guarantees, at her request, reinstatement to her original job or to a position of like status and pay at the conclusion of her leave. (MEP)

Question:

Why does the menu at the Cafeteria never or hardly ever change?

Answer:

Over a period of years the Cafeteria has experimented with a variety of menus. From these experiments, experience has shown that regular users of the Cafeteria prefer certain menus over others. This has led us to a certain amount of standardization of schedules and composition of menus. Written suggestions from any employee concerning specific suggestions will be appreciated. Additionally, we are currently preparing a survey form which will address menus as well as other Cafeteria operating factors. When the results of this survey have been received and analyzed we will review menu suggestions and where cost factors permit, changes will be considered. Don't forget, you aren't confined only to the menu "special". You can order a number of other dishes, too,

like the seafood platters and (with enough lead-time) steaks! (WEH)

Question:

In the upcoming employee evaluations, would it not be equally beneficial for employees to evaluate their supervisors?

Answer:

It would be our hope that during the evaluation process there is an honest and frank exchange in both directions. While the evaluations are mainly designed to review the performance of the employee by his supervisor, we must remember that these discussions are held with each employee so each supervisor has plenty of opportunity to engage in this two-way communication. During this process the supervisor is bound to be aware that his own effectiveness as a supervisor is judged by his employees and he will often use the discussions as an opportunity to "clear the air" of any misunderstandings that may have arisen and to try to gauge the effectiveness of his own leadership. It is certainly quite appropriate during these discussions for the employee to suggest ways in which his supervisor might improve his supervisory effectiveness, using the same type of tactful approach that we hope will be used during his own evaluation. Don't forget, too, that the supervisor is also rated--by his supervisor! (WEH)

\* \* \* \*

DON'T FORGET

You can submit questions, remarks, gripes, comments, and suggestions to WAVE-GUIDE, in care of the Editor.

\* \* \* \*

NOTICE

Beginning Monday, Jan. 20, 1975, all luncheons and dinners will be reduced by 10¢ from regular menu prices.

All drinks will be charged extra, including coffee, tea, etc., at regular menu prices.

\* \* \* \*

THE GREAT POCAHONTAS METEORITE OF 1931

Frank Clark

It all started on Sunday, November 3, 1974, when Paul Giguere and I were in Green Bank on one of our periodic visits to plum the mysteries of the universe with the 140-ft. We had hardly finished our noon-day meal when we were approached by Ms. Thera Anastasia who commenced to tell us about "The Great Meteorite of 1931".

Ms. Anastasia described for us how on a fall day in 1931 a flaming meteor flashed across the sky and slammed into their pasture not 60 feet from the family homestead, the old Dominick place, located near Laurel Mountain close to the Greenbrier River. A place now 'right well known' by Paul, George Grove, Dorothea and Wally Oref and myself. According to Ms. Anastasia the meteorite struck so close to her granddad that it knocked him straight up in the air and threw her Uncle Dominick off the front porch. It made a circular crater in the pasture roughly twenty feet across and three feet deep and uprooted a full grown peach tree.

Paul and I arranged with Ms. Anastasia to meet on the following Tuesday at her Aunt Nettie Reed's house in Marlinton from where we would make the trek to the old homestead. At the agreed upon time we appeared at the Reed House with shovels, compass, camera, tape recorder, etc., only to learn that Ms. Anastasia had already gone ahead. Mrs. Reed volunteered to show us the way to the old homestead. Since the last mile or so to the homestead was four-wheel drive road, we left Mrs. Reed with the old faithful Dart #2 and walked in. We found the old homestead and pasture where the meteorite was supposed to have hit, but no meteorite crater or Ms. Anastasia! Weary and terribly let down, we returned to Green Bank, Paul, by this time, was becoming wary and kept telling us it was another wild goose chase.

That night Ms. Anastasia called and I arranged to meet her on Saturday morning for another try. The next day I managed to sweet talk George Grove and Wally Oref into going with me. This time we arranged to use a four-wheel drive vehicle. Once up and down that mountain loaded with tools and equipment was enough. When Saturday morning rolled around, we had still another meteorite hunter on board--Wally's wife, Dort. Ole Paul still

wouldn't budge.

Doggonit, we missed Ms. Anastasia again and we were certain we had the right meeting place. We waited a while for her and then decided to go on ahead to the old homestead without her. This time we thought we had a better idea where to look because of the additional information I got from Ms. Anastasia over the phone. We searched, we grubbed, and we looked, but no crater. We finally gave up and started for home. Just as we reached the top of the mountain, we met Ms. Anastasia coming in. We weren't going back but she convinced us she knew right where the crater was. So...we went back down that hairy road again for a last look.

From the landmarks she remembered, she found a spot where she said that the crater should be. All we saw was a slight depression that looked semi-circular in shape. In the center of the depression we dug through topsoil down to gravel. There was no evidence of a meteorite or even a hint of one. All we found were bits and pieces of pottery and a lot of roots.

George almost assembled a dish from all the pieces of pottery he and I found in the dirt. While we were grubbing in the dirt we never gave a second thought about the roots. We should have; but, after all, they were just roots. A few days later I related to those roots. I got the worst case of poison ivy I've ever had. My hands swelled up like puff balls and my fingers were so swollen and sore I couldn't even open a door. It was four days before I could go back to work. Later, on a return trip to Green Bank I learned that George had broken out with a rash on his wrists and still had some late in January.

While we were coming back up the mountain I distinctly remember George saying that he was coming back sometime to look for that meteorite with a metal detector. If I was George I'd take along a poison ivy detector too. Lotsa luck, George, but please don't ask me to go with you.

Folks, there's a moral here somewhere!

\* \* \* \*

Frank,

Haven't you heard somewhere the phrase: "Ask and ye shall receive; seek and ye shall find...?"

## JANSKY BASEMENT SPRINKLER SYSTEM

Bill delGiudice

As many of you in Green Bank know, we have installed a sprinkler system in the basement of the Jansky Lab. We have received questions and comments ranging from casual curiosity to serious concern. Here are some real and anticipated questions and answers which we hope will help your understanding of the system.

Q. After all these years why put a sprinkler system in now and why only in the basement?

A. The value of the contents of the building has been increasing over the years as more and more equipment and material is added. When we began storing the racks and frontend boxes in the basement, it was obvious that the risk we were taking by adding so many eggs to an already full basket was unacceptable. A very destructive fire could knockout graphics, electronics, fiscal, the clock, plus all systems not actually on the telescopes.

Statistically basement fires are more likely to cause complete destruction of an entire building than fires starting anywhere else. After weighing cost of protection against probability of fire, the most protection per dollar came with sprinkling the basement. The system is designed for easy expansion to protect the first and second floors and any additions if conditions justify it.

Q. Do all sprinklers open when fire occurs?

A. No. Only those directly over the fire open and discharge water. Incidentally, sprinklers are 96.2% effective. The 3.8% failures are usually traceable to human failure, such as closing a control valve.

Q. What about accidental discharge?

A. Well, if you hit one hard enough to bend or break it, water will flow, but if you mean will a head just open up on its own, the odds are 3,325,000 to 1 against that happening. We have 94 heads in the basement if you want to figure the specific risk.

Q. Isn't it foolish putting sprinklers over the electronics stored there?

A. Concern about water damage is common, and usually unfounded. As I said, the sprinkler will go off directly over a fire. Whatever you are putting water on has already been damaged by fire. If you don't put water

on it the fire will continue to grow until it doesn't matter anymore. But look at how much water is used. Each sprinkler will spray 40 gallons per minute directly over the fire. A firefighter will get as close to the fire as he can with a hose and hit it with 250 gallons per minute. In fact, in six out of ten cases where sprinkler systems are used the fire is out by the time the firefighters arrive. In the remaining four cases the fire is held in check for the firefighters to finish it.

Q. What do I do if I hear the sprinkler bell ring?

A. If it is during the normal work day just leave the building promptly. The switchboard operator will call the Observatory fire brigade, and the fire department. If you discover the bell ringing at other times notify the guard promptly. Do not go looking for the fire yourself. If you are inside the building, get out.

Q. I work in the lab and I can't hear the bell where I am, what about me?

A. Well, sprinklers are not primarily to sound an evacuation alarm but to simultaneously start extinguishing the fire while summoning the fire fighters. We have provided for alerting the occupants via the switchboard operator, but if you get left behind, the standard procedure for firefighters entering this type of building includes a complete search. Throughout the history of automatic sprinkler uses there have been perhaps a dozen cases in which occupants have been killed by fire. In nearly every such case, the individual was the object of the fire, and could not have responded to the bell.

\* \* \* \*

### MUG PHOTOS FOR SALE

For those of us who can never remember which face goes with which name, the mug boards have been invaluable. On the next two pages we have printed copies of the Charlottesville and Green Bank boards.

Good quality 8-1/2 x 11 inch reproductions are available to all employees for the price of \$1.50 each. Send order with payment to Ed Fomalont in Green Bank (make checks payable to NRAORA.)

\* \* \* \*

# GREEN BANK N R A O PERSONNEL





## THE BEARD HOUSE

Linnae Madron

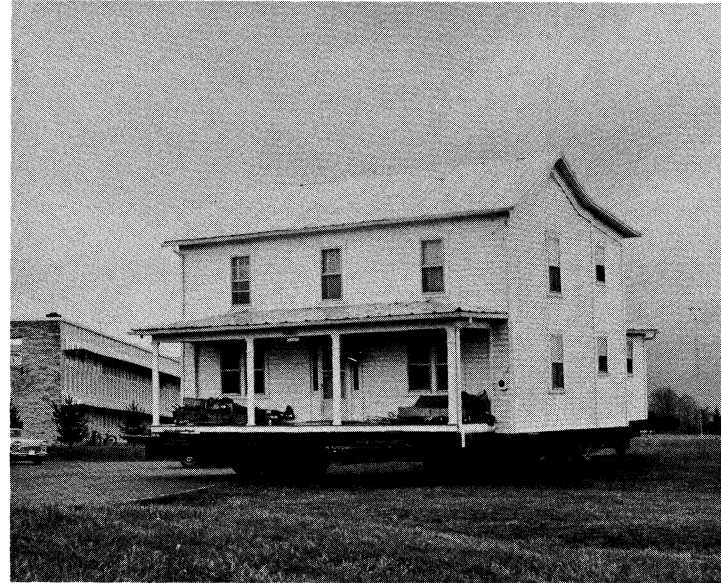
The Beard House, fifty some years later to be called the "Nutbin", was built in 1901-1902 by Irb Beard and his neighbors for the young Irb Beard Family. The land on which the house was built was part of the 'home tract' of J. O. Beard (Irb's father) and as was the custom of the time, a parcel, 39 acres, was given to the son so he and his wife could settle nearby. After the death of Irb in 1936 and his wife's in 1942, the house was occupied by sons and their families. Moro Beard (Irb's son) was born here.



The Beard House in 1957

In 1956 the NRAO bought the house and acreage and did extensive remodeling to the house. They replaced the original shingled roof with a metal one, added two bathrooms, resurfaced the wood paneled walls with plasterboard, installed plumbing throughout, and replaced a narrow stairway.

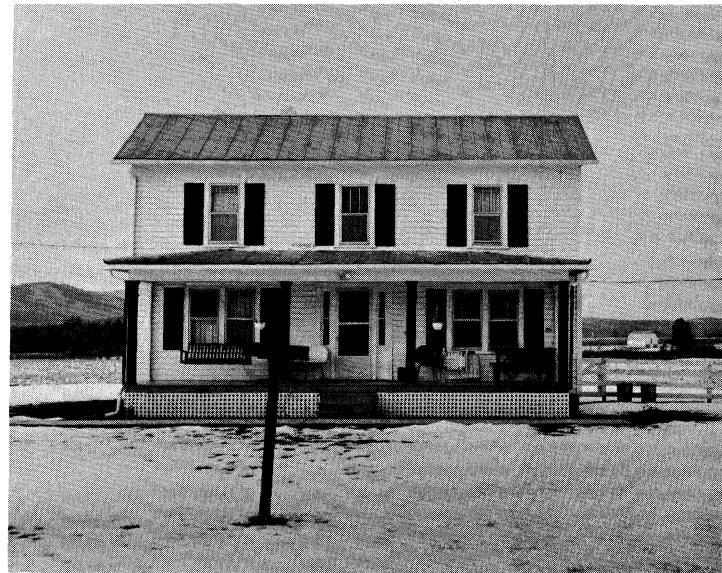
From January, 1958, to 1960 NRAO used the house as an office building and an electronics lab. Drs. Heesch, Findlay, Hvatum, and Drake had their office here during this time. Warren Wooddell was the lab technician and Beaty Sheets the secretary. It was during this time that a person now unknown dubbed the Beard House the "Nutbin" because of the scientists who worked there. The name has stuck ever since.



The "Nutbin" being moved in 1969

In 1960 the staff moved to the Jansky Lab which had just recently been completed. The "Nutbin" became a dwelling once again.

In the fall of 1969, the "Nutbin" was moved from its original location northwest of the Works Area to its present location west of the Liberty Presbyterian Church.



The "Nutbin" in its present location

The "Nutbin" is now the home of the Duane Madron family.

\* \* \* \*

SERVICE AWARDS

Bob Moore

The eighth annual NRAO Service Awards Banquet was held in the Green Bank Cafeteria on Friday, January 10, 1975, for nineteen employees who completed ten and twenty years of continuous service with A.U.I. as of December 31, 1974. Dave Heeschen presented certificates and lapel pins to eighteen employees for ten years service and to one employee for twenty years service. Employees honored were:

10-YEAR AWARDS

Dorman Williams
Monroe Petty
William Shank
Morton Roberts
Barry Clark
Charles Sutton
Toby Mann
William Howard
James Coe
David Williams
Robert Ervine

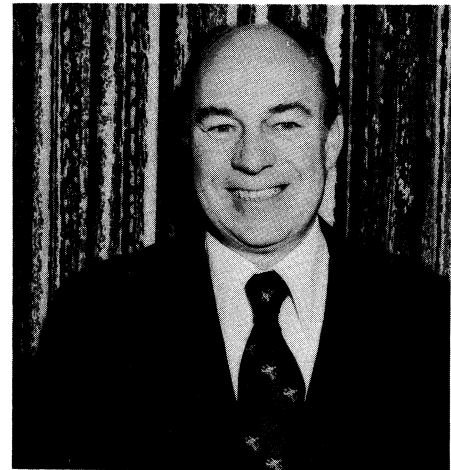
William Meredith
Alfred Braun
Herbert Hanes
George Behrens
Russell Bussard
David Van Horn
Neil Albaugh

20-YEAR AWARD

John Lancaster

Bill Howard welcomed the entire group to the Awards Banquet which included the award winners, retirees, associate and assistant directors, and division heads. In all, fifty-nine persons attended the banquet.

20-Year Award



John Lancaster

10-Year Awards



Left to right: D. Williams, M. Petty, W. Shank, M. Roberts, B. Clark, C. Sutton, T. Mann, W. Howard, J. Coe, D. Williams, R. Ervine, W. Meredith, and A. Braun

\*\*\*\*



**GOLD - A GOOD INVESTMENT?****W. E. Howard**

On December 31, 1974, it became legal once again for Americans to own gold bullion; yet there was no mad rush to the banks. One week later the government intended to auction off up to 2 million ounces of its gold stockpile; yet only about half this amount was sold at prices that varied from \$153/oz. to over \$180/oz. What conclusions can be drawn from this lack of enthusiasm? Is gold a good investment? Is it a good speculation? Is ownership of bullion better than gold stocks or gold coins? How can one get into the market without being stung? How does gold ownership rate alongside other possibilities such as the ownership of stocks, bonds, antiques, paintings or even comic books? I shall attempt to give a personal, probably somewhat conservative view of the situation.

Before considering gold investment, or any investment for that matter, everyone should be sure to have enough funds in liquid form (e.g., a checking or savings account) to last at least half a year to a year in case of an unexpected personal financial catastrophe. Only after a reasonable margin of safety is achieved should one think of other types of investments.

Most people don't want to put all their investment eggs in one basket, so they spread their long-term investments into land, equity in their home, common stocks, bonds and other collector-types of investments. The bold investor during times of inflation will stress growth common stocks which have low yield but promise longer term appreciation, and he will borrow on credit in order to pay money back later in inflated dollars that have less purchasing power. The conservative investor, during times of depression, wants cash because virtually all other types of investment such as the cost of his house, his stock and his antique collection have gone down in value (large supply, no demand). The decision of where to invest nowadays is more complicated than at any time in the recent past because the country is caught in a period of two-digit inflation (which will rapidly wipe out cash-types of savings), national budget deficits (which lead to inflation), unemployment (which tends to improve only as budgets tend to become more unbalanced), and a business recession (which must ultimately lead to de-

flation if the recession deepens to a depression). A person's investment "game plan" may range from bold to conservative, depending upon whether the economic picture looks bright or uncertain. Let us assume that our current game plan should be on the conservative side and see what alternatives there are.

The investor who does not know if inflation or deflation will win out seeks a way to get a reasonable rate of return on his money while insisting that his cash is preserved. There are three ways to do this: (1) purchase of short-term Treasury Bills, (2) purchase of high-grade corporate bonds that will mature within a year or two, and (3) participation in a no-load mutual fund that deals in high yield, short term, liquid assets, such as the Reserve Fund. None of these routes offers the bold investor the chance to make a killing, but we are assuming that the times dictate a conservative approach to investment, at least until our economic crystal ball clears a bit. Even the conservative investor seeks to diversify his investment in order to lessen his risk, and the next question that should be asked is what portion of an investment portfolio should be devoted to various types of investment? Largely the answer to this depends on individual circumstances and the question cannot be answered in general. However, even if the conservative investor has funds tied up in his home, land, and blue-chip common stocks, it is not unwise to consider gold for diversification.

The chief advantages of gold are that it is chemically inactive, rare, has a high value per ounce (hence is easily stored), is moderately easily bought and sold (more easily than paintings or antiques but less easily than corporate stock), and is accepted virtually everywhere as a common store of value. Its chief disadvantages are that it brings in no income, needs to be stored in a safe place, incurs handling charges when bought or sold, often commands a premium when purchased in small quantities and, like most investments, takes some knowledge of the subject and of proper timing of the purchase and sale in order not to be stung. A conservative investor might consider having between 5 and 15% of his investment in gold; an arch-conservative might go considerably higher. We will consider only the metal now,

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not the common stocks of companies that mine gold. Gold stocks should be considered as a conservative stock investment because the fortunes of a mining company often depend more on the effects of international politics, on company management and on the management itself than on the demand for the metal.

Assuming we have decided to make a gold purchase, what should it be? Basically, we have two choices, the purchase of bullion or the purchase of gold coins. I am against a bullion purchase for the following reasons: (1) unless the quantity purchased exceeds a few thousand dollars, the premium paid on small quantities is nearly as high as that on coins when the latter are carefully chosen; (2) if you have the gold bar stored for you, there is a storage charge, while if you take possession of the bar, it may have to be assayed (for a fee) when you sell; (3) the market for selling bullion bars will probably have fewer outlets than the market for selling gold coins; and (4) the government is more liable in the future to call in bullion than to call in coins - remember that gold coin ownership was legal in 1974 but bullion was not. I lean toward the purchase of gold coins for the following reasons: (1) the spread between the buy and sell price is small and these prices are about 5 and 9% above the bullion price in the coin, respectively; (2) coins may be bought or sold through coin dealers as well as banks (but careful selection of the vendor is still necessary); (3) coins may be safely stored in your safe deposit box and sold without being assayed, since common-gold coin counterfeits are both uncommon and are generally recognized by a practiced eye; and (4) a gold bar is only a gold bar, whereas coins come in a very interesting variety of denominations and sizes, are printed by a number of different countries, carry a range of dates and mint marks, and command much aesthetic appeal. For the investor who can afford to put a small part of his investment funds into gold, this type of ownership has appeal over the long term, since the historical "store of value" in gold gives us relative assurance that its purchasing power will remain fairly constant through inflations or depressions. As an example of this, a British gold sovereign can be bought today for about \$60, the equivalent of about 30 hours work at minimum wage. A sovereign was approximately equivalent to the wages of the same worker for the same number of hours

in the nineteenth century!

The best coins to buy on a first purchase should be those that have the lowest dollar value per ounce of gold in the coin. This means we should avoid coins that are rare (you are paying for numismatic value, not gold value, in rare coins) and avoid all the pretty gold coins that are being minted by private mints for the unwary collector who doesn't mind paying up to three times the gold content for aesthetic reasons and who will have trouble getting his value back if he wants to sell. Recommendations are the Austrian 100 Corona (1915) or the Hungarian 100 Korona (1908) restrikes (beautiful, big, 0.98 oz. of gold per coin and lowest price per gold content), the Mexican 50 peso or 20 peso recent dates, the British sovereign, the South African Krugerrands and the US \$20 Double Eagle. All of these coins should be in Brilliant Uncirculated (BU) condition, with the possible exception of sovereigns dating before World War I. If you like these, you can branch out to other types later. These coins are usually less expensive in units of 10 or more coins, so consider teaming up with a friend to split an order. Quotes may be obtained and orders given sometimes by a toll-free telephone call. The firms below are among those that appear often in the numismatic literature:

Manfra, Tordella and Brookes - New York City - (not toll-free) 212-757-1856 for quotations by recording; 212-757-9670 for orders,

Deak and Co., Inc. - Washington, D. C. - (not toll-free) 202-872-1620,

Perera - New York City - (not toll-free) 212-586-2175,

Vollmers - Bloomington, Illinois - 800-447-1302,

Republic National Bank of N. Y. - New York City - 800-223-5578, and

Colonial Coins - Houston, Texas - 800-231-3556.

In conclusion, I would say that gold is a bad speculation (since its price has fluctuated quite a bit recently and timing is of paramount importance to the speculator), but it should be a reasonable long-term investment, especially if purchases can be made at or near the lower cut-off price that our government accepted in the January 6 auction (\$153/oz.). In general, people were wary of that auction because gold speculators had

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driven up the price in anticipation of a rush that never appeared and, until the government set the cut-off bid price, no one knew what a reasonable price should be. Now we at least have an indication. Gold coins have an edge over bullion and one should buy from recognized dealers, not from the myriad of fly-by-night outfits that have come into the trade recently to make a quick profit on commemoratives. There is certainly no guarantee that gold will be a miracle investment, but it is at least as reasonable an approach toward conserving the buying power of the investor as the other avenues we have mentioned -- especially in today's uncertain times.

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### THE NRAO WISHING WELL

Our Charlottesville Correspondent

For years we have dispaired individually and collectively the leak in the library roof at Edgemont Road. It was a source of disappointment and shame for us when visitors came to the Observatory. This situation has recently undergone a complete about-face. With the addition of a colorful (and useful) 20 gallon plastic can, this former eyesore area has been transformed into the NRAO Wishing Well. This delightful scene, with the green mold on the carpet, and the multicolored journal covers surrounding it, reminds one of a tropical waterfall. It is indeed restful to the troubled mind of the scientist seeking thoughtful study (or the New York Times) in the library reading area.

The Wishing Well is complete with several smaller buckets that give the impression that you could lower one into the well to obtain some of the cool, refreshing, pure, rain water to drink of. In addition, a tasteful sign identifies the Wishing Well (indicating that the funds collected will be put to good use by the librarians) and even suggests a wish for those who feel no pressing needs of their own. The suggested wish is as follows: "I wish the library roof didn't leak." An alternate form might be, "I wish they would fix the library roof".

Until somebody's wish comes true, we will have our own little bit of tropical paradise and this delightful Wishing Well.

\* \* \* \*

### SOCORRO HOUSING

During December of 1974, Peter Napier went house shopping in Socorro, New Mexico. He investigated many houses, five that were for rent and ten that were for sale are described here. Peter thought, perhaps, other NRAO employees might be interested in what kind of housing was available in Socorro, New Mexico, and he gave the Observer his notes on the houses to publish in this issue.

Peter used his own rating system on these houses. At the end of each house description you will find the letter A, B, C, or D. In Napier's rating system this is what each letter means (see note at end of article):

- A - My wife would be happy here.
- B - My wife would live here.
- C - My wife would live here if I did some fast talking (maybe).
- D - No way.

#### Houses for Rent:

1. 3 bedrooms, 1 bath. Unfurnished, small, old. Will rent as is for \$125 per month. Will recarpet for \$150 per month. Available now. - C
2. 3 bedrooms, 1 bath. Unfurnished, 701 Liels Street. \$200 per month. Will hold for \$100 per month. Available now. - B (with some repairs)
3. 3 bedrooms, 1 bath. Den with fireplace. Kitchen and dining room together. New carpet and drapes. Fenced back yard, landscaped with bar and grill. Cement patio. Near grade school (2 blocks). Rent \$225/month, includes water (may reduce this rent for good tenants). Available now. Will hold for less than full rent. - I haven't seen it. Sounds like A.
4. "Beautiful home". 3 bedroom ranchstyle. Available June 1, 1975, for 1 year only. Rent \$225. - I haven't seen it, but it sounds like A.
5. 4 bedroom, 2 baths. Immediately over the road from VLA offices. Presently being rented for \$200 per month. Tenant expects to notify owner that he will move out on Feb. 1, but he hasn't told owner he will move so you can't

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negotiate yet. Tennant will tell Joe Egler before he notifies owner. Very likely that the house will go up for sale or the rent will increase. - A-B

#### Houses for Sale:

6. 4 bedroom, 2 baths. Beautiful home. Huge living room with 2-way natural stone fireplace. 2540 sq. ft. Asking \$43,000 but in Oct. '74 asking price was \$37,500! \$25,000 at 7 1/2% existing mortgage (\$226 per month). Buyer must fund rest. Taxes \$316 per year. Range, oven, dishwasher. - A+
7. 3 bedroom, 1 + 2 x 1/4 baths. \$28,000. Living room, extended dinette, garage partly converted into den. Large corner lot 120' x 150'. 1100 sq. ft. plus 10 x 30 garage. \$10,000 existing mortgage (\$93 per month). Owner wants \$6,000 down and will finance remainder at 7%. Lot of fruit trees. Taxes \$140 per year. - C-B
8. 3 big bedrooms, 2 full baths. 1800 sq. ft. \$27,000. Original house 20 yrs. old with additions 5 years old. Large kitchen, 1 car garage. 75' x 150' lot. Cinder block with white stucco construction. Owner wants \$7,000 down and he will carry the rest. - C
9. "Mathews House", 1500 sq. ft. \$30,000. Coming on market soon. Very nice back yard. - I haven't seen it, but possibly a B.
10. "Globeldone House", 3 bedrooms, 1 3/4 baths, 2 car garage. \$30,000. On Newbury Road about 1 mile north of town. A great feeling of being in the wide open spaces (although surrounded by future subdivision). \$23,000 existing mortgage at 9%. \$7,000 down. Available March '75. - I haven't been inside, but probably B.
11. Large, new, beautiful home on north side of town. Asking \$47,000. \$24,000 existing mortgage (\$200 per month). \$7,000 down, owner will carry rest. - I haven't been inside, but definitely an A.
12. 4 bedroom house on 1 acre. 2300 sq. ft. \$60,000. Must refinanced. - I didn't

see it; probably B.

13. 4 bedroom house, belongs to school teacher. \$42,000. Large house. - I haven't seen it (Dick Thompson has). Probably B.
14. 3 bedroom, 1 1/2 baths. \$27,000. Needs to be refinanced. - D-C
15. Double wide, 3 bedroom, mobile home. \$17,500. On 1 acre of land. Possibly good investment (has a \$60,000 home on next door lot). - not rated

#### IMPORTANT NOTE:

My wife hasn't seen any of these! See me to establish relative wife ratings. Anyone living in a fairly modern Charlottesville house would probably downgrade my ratings by one level. I have some photos.

\* \* \* \*

GREEN BANK BOWLING

Dick Hiner

On January 14 we completed the first half of our league bowling schedule with a record of 42 wins and 30 losses. This put us in third place going into the second half.

During the first half of the league season, Wendell Monk bowled the high series with a 581 on November 19, 1974. Wendell was also high for the total number of pins for the first half.

Members of the NRAO team for the first half were Jim Gibb, Gerry Valencia, Claude Williams, Bob Vance, Dick Hiner, Russ Poling, Wendell Monk, Ray Hallman, and Jon Spargo, who dropped out in November after his son was born.

On January 21, 1974, the second half of league play started. The team members for the second half are Jon Spargo, Don Hovatter, Gerry Valencia, Wendell Monk, Bob Vance, Dick Hiner, Russ Poling, and Howard Brown. So far in the second half we have a record of seven wins and one loss. Bob Vance had the high series with 562.

\* \* \* \*

NOW - TOTAL GRAPHIC CAPABILITY

Peggy Weems

There's been a lot of noise and dust, carpenters and plumbers, sawing and hammering, down in the basement of the Jansky Lab lately. But as a result the Green Bank Photo/Graphics Department is getting a "new" look for 1975. Gene Crist, Ron Monk and Brown Cassell, despite dust on their negatives and engineers under the sinks, have somehow still turned the work out on time. Hopefully some of their trials and tribulations will now come to an end, for a couple of weeks ago a wall was razed between rooms 014 and 013 making one big pressroom which will house printing supplies, the 1850 Multilith Offset Printing Press, and in impressive new machine known as the 3M Brand MR-412 Camera Plate System.

The MR-412 possesses "Total Graphic Capability", because instant line negatives, positive transparencies, photostats, halftones and offset printing plates for use on the offset press can be prepared on this new machine. No darkroom is required as the machine houses its own photographic chemicals in a light-tight compartment. Changing of the three types of light sensitive photographic materials, which are supplied in roll form, is also accomplished in standard room light, and the photographic chemistry is the same for all three roll types.

How will this new machine affect the user of the Green Bank Photo/Graphics Department services? A speed-up in the preparation of plates for the offset press will be the most noticeable difference. Previously, when a job called for offset printing, you or a secretary would type the original copy on paper offset masters or on bond typing paper. The paper offset master is hard to correct and must be properly prepared or it will not produce acceptable offset copy. It is also difficult to xerox the paper masters for preprints or proofing purposes without incurring some damage. However, if the master has been properly prepared, it can be run immediately on an offset press with little time loss for preparation by the Photo/Graphics staff. The paper master cannot be run, stored and run a second time.

The second, and most commonly used method, typing on bond paper, was easier for you but was very time consuming when the originals arrived for printing in the Green Bank Photo/

Graphics Department. Each page took 45 minutes to get from its original form to the press. Imagine how long it took to produce an average 200-300 page report for the press using the old process camera/darkroom method!

The new MR-412 can produce four press ready plates per minute from bond paper originals. In addition, original copy can be enlarged or reduced from 150% to 45%. The copyboard of the MR-412 accepts original up to 30" x 40" and easily takes large "D" size engineering drawings. It is ideal for computer printouts, forms, reports, manuals, etc.

With the MR-412, corrections, deletions, or additions to the original copy should be made on the original copy and then the original is re-shot. Changes should not be made on the plate as this is now more time consuming than making changes on the original and re-shooting.

The MR-412 plates can be stored for future runs. Since the plate material is a synthetic base polyester, the 1850 Multilith press can't chew them up and spit them out in small pieces as it sometimes did with the paper plates!!

Photostats are an intermediate step in the platemaking process. These stats can be inked or written on, xeroxed, used for art layouts, or for quick proofs. They can be used as a permanent record for filing purposes. If you need enlargements or reductions of rough copy, this is the route to go. The stat gives you a sharp black-on-white high contrast print.

Positive transparency material (PTM) and instant line negative material (ILN) are also available in rolls. Both PTM and ILN material opacity is the proper density for sharp auditorium projection requirements. Vu-graphs and art overlays can now be rapidly prepared from suitable originals. Imagine, it took about 90 minutes to make one vu-graph before (and 20-30 at a time was not an unusual request). Now -- four minutes, and there's your vu-graph ready to mount, in either positive or negative format, as you specify!! A transparency can be made from almost anything with sufficient contrast, even three-dimensional objects.

The MR-412 truly has "Total Graphic Capability". Speed of operation will make it a definite asset for both you as the user and for the Photo/Graphics Department in production.

--continued, next page--

For additional information about "our new look in '75", contact Gene Crist, Ron Monk or Brown Cassell in Green Bank. Peggy Weems,

in Charlottesville, will be glad to advise other off-Green Bank site users in the preparation and use of materials for the MR-412.

### 3M Brand Camera Plate System

The camera lens shoots  
4. a picture of the original copy and . . .

Images the camera  
5. plate material  
(loaded in roll form).

The imaged material is then automatically cut to a pre-determined size by a plate cutter and conveyed by gear-driven rollers through a series of four special processing baths:

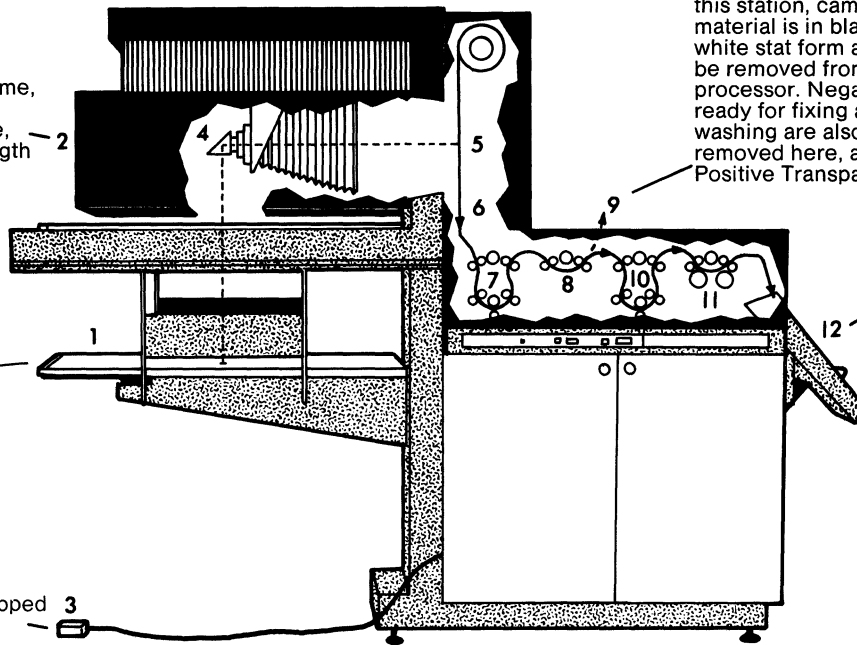
Optional stat exit — at this station, camera plate material is in black-on-white stat form and can be removed from the processor. Negatives ready for fixing and washing are also removed here, as are Positive Transparencies.

Next, the exposure time, enlargement or reduction percentage, and desired plate length is set on the control panel, and . . .

Original copy, up to 30" x 40", including three-dimensional objects and large "D" size engineering drawings, are positioned on the camera copyboard.

The foot switch is tapped 3 to set the unit in operation.

Plates are delivered dry and ready for immediate use or can be stored — without gumming — for future use.



7. The developing station

8. Spray station

10. Activator station

11. The final wash station

\* \* \* \*

### NEW EMPLOYEES

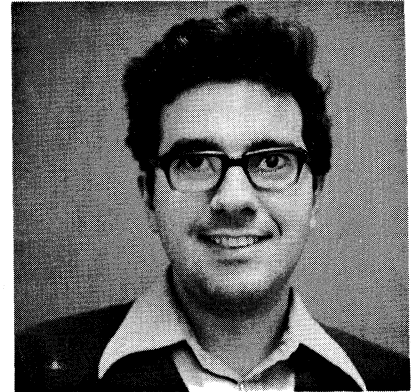
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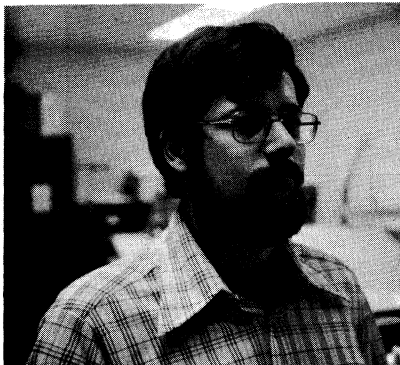
David B. Coombs  
Technical Specialist  
VLA Project - CV



Elizabeth H. Godwin  
Secretary A  
VLA Project - CV



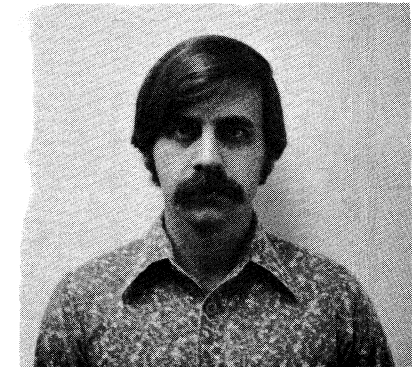
Victor Herrero  
Electronic Engineer  
VLA Project - CV



Joseph S. Fine  
Int. Technician  
VLA Project - CV



Karen M. Johnson  
Senior Clerk  
VLA Project - CV



Ronald D. Womeldorf  
Intermediate Tech.  
Tucson

### TERMINATIONS

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Bertha M. Allenson	VLA Project - CV
Saundra M. Mason	VLA Project - CV
Kenneth C. Kern	Scient. Services - CV
Harry L. Beasley, Jr.	Computer Division - CV
Kent M. Harmless	Electronics Div. - Tucson
Stephen L. Galhouse	Electronics Div. - Tucson
Fred R. Cole	Plant Maint. - GB (RETIRED)
Elke Taylor	Administrative Services - GB

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RETURN FROM LEAVE OF ABSENCE

Sebastian von Hoerner  
Richard A. Sramek

Basic Research - GB  
Basic Research - CV

We are sorry to report the death of Carl Wooddell who died on January 20, 1974. Carl was a senior electronics technician in the Green Bank Lab. He joined NRAO in September, 1961.

RECEIPES

Cafeteria Staff

Carrot Cake

2 cups finely grated carrots  
2 cups sifted flour      1 tsp. baking powder  
1 tsp. baking soda      1 tsp. cinnamon  
2 cups sugar              4 eggs  
1/4 tsp. salt              1 1/2 cups salad oil

Combine 1 1/2 cups salad oil and 2 cups sugar. Mix well. Add 4 eggs, one at a time, beating well after each addition. Gradually add dry ingredients, mixing well. Then add 2 cups finely grated carrots, stir in with a spoon. Turn into 3-8 inch or 2-9 inch layer cake pans which have been greased and floured. Bake in oven (350 degrees F). Bake 50 or 60 minutes. When completely cool, frost with nut icing.

Nut Icing

1/2 cups butter or margarine  
1 pkg. (8 oz.) cream cheese  
1 box confectioners sugar  
1 tsp. vanilla extract  
1 cup chopped nuts

Combine butter and cream cheese and beat until light and fluffy. Gradually add, while beating, one box confectioners sugar. Add one tsp. vanilla extract and one cup of chopped nuts. Mix well. Ice cake.

\* \* \* \*

Jan: "Has you boy friend's English improved any?"

Helen: "No, he still ends every sentence with a proposition."

CV CHRISTMAS PARTY

Ann Jackson

Charlottesville-NRAO held its children's Christmas Party Sunday, December 22, 1974, in the NRAO auditorium. The auditorium was seasonally decorated with a beautiful tree and other decorations. The entertainment got off to a lively start with a magic show. The magician was very good and kept the children totally involved in the show. The children were also entertained with a Christmas movie and cartoons. Santa Claus (from the North Pole), rendered us a visit to give out the beautifully wrapped gifts and boxes of candy to the anxiously awaiting kids. The party went very well, although the auditorium overflowed. Refreshments were served and included green and red Christmas punch, assorted Christmas cookies, hot apple cider with cinnamon sticks, nuts and mints. We all enjoyed the party very much. Until next year....

\* \* \* \*

"It will not be amiss to distinguish the three kinds, and as it were grades, of ambition in mankind. The first is of those who desire to extend their power in their native country; which kind is vulgar and degenerate. The second is of those who labor to extend the power of their country and its dominion over men; this certainly has more dignity, but not less covetousness. But if a man endeavor to establish and extend the power and dominion of the human race itself over the universe, his ambition is without doubt both a more wholesome thing and a nobler than the other two."---Sir Francis Bacon (contributed by Ken Cottrell)

\* \* \* \*





"HERE'S THE PISTOL MA!"

"LEAVE ONE SHELL FOR YERSELF IF IT  
GITS BY ME"