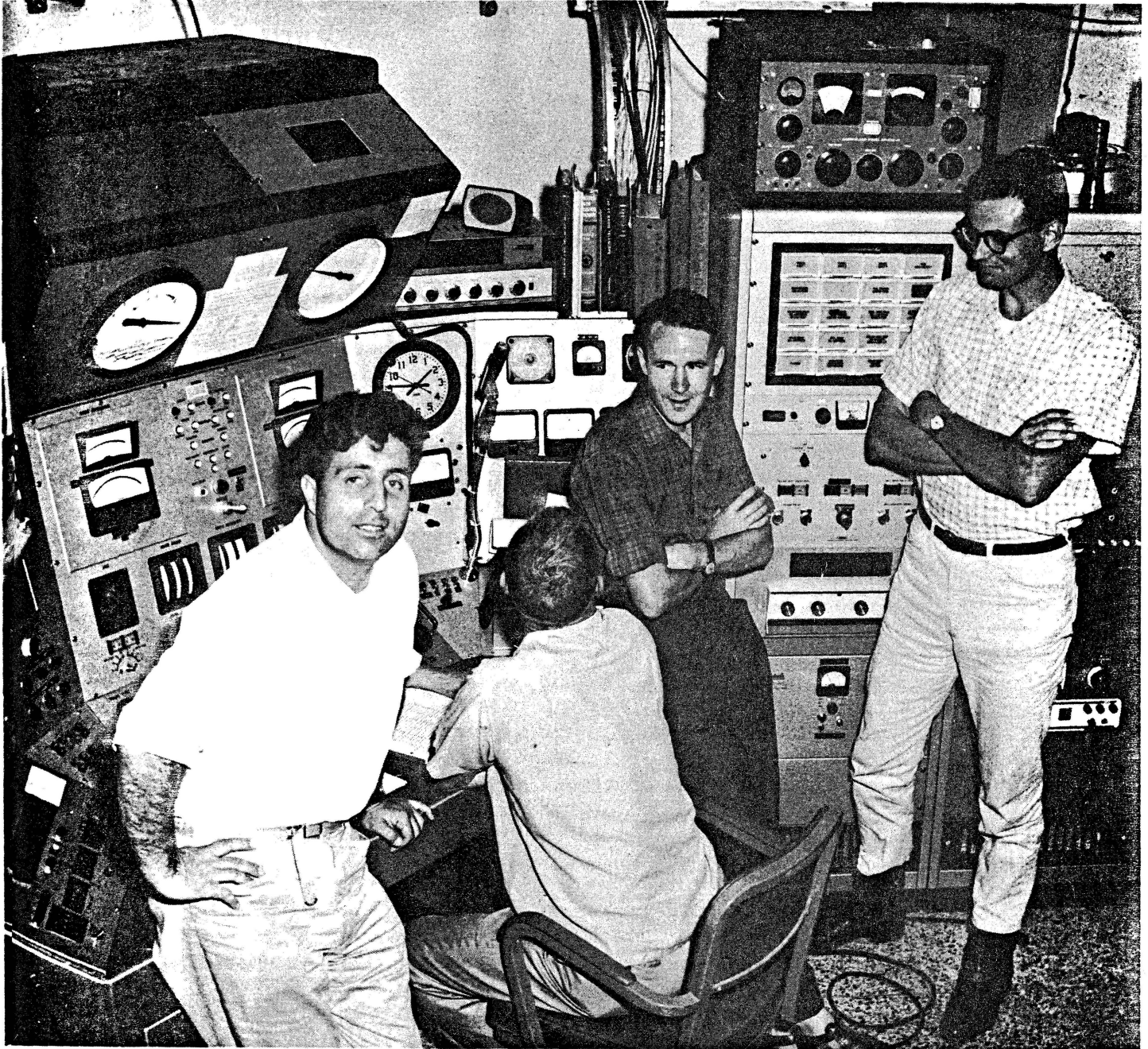


The OBSERVER

Vol. 4, No. 4

July 30, 1965



EXCITED HYDROGEN LINE (H-II) OBSERVATION AT THE 140'.

Pictured left to right above are the experts: Peter Mezger,

Troy Henderson, Bertil Hoglund, and Neil Albaugh

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Editorial Comment

This summer season provides you, the NRAO employees, ample opportunity for increased social and recreational activity, vacationing (?), home projects and of course the daily grind at NRAO. It is my feeling that the most interesting matters the Observer can report are those concerning you as individuals and as a working unit (department). Let's hear about them. Much of the information presented here is frequently "stale news" to many. Nevertheless, some areas on the site are more or less cut off from what is going on at other locations. The Observer serves the function of integrating the scattered bits of information into a common pool of knowledge available for all to read.

As temporarily the editor of the Observer, I welcome your comments, suggestions, and quality news reporting. There is one requirement that I must impress upon you. The publication of an Observer does not stop simply with the gathering of news. It must be proof read, typed, and printed. Therefore make every attempt possible to get your articles in by the 20th of the month if you desire it to be in that monthly issue. Do not wait to be asked if you feel you have an obligation to your fellow employees and the Observer.

As a last point, I shall remind you that my term as editor will end with the September '65 issue. Serious thought should be given to finding a "permanent" editor right away.

Yours respectfully,

Ellis Remsberg - Editor

The Excited Hydrogen Line

by

B. Hoglund and P.G. Mezger

One of the first tasks for the recently completed 140-foot telescope was a search for a new (or at least "nearly new") radio spectral line. Previously known lines are the neutral hydrogen line at 21 cm wavelength, and the OH-line at 18 cm wavelength. The 21 cm line has played a very important role in the determination of the spiral structure of our galaxy. It provides a method of mapping one of the major constituents of our own and many external galaxies, the neutral hydrogen, which is optically invisible.

The line for which we were looking, however, originates in regions (H-II regions) in which the interstellar hydrogen is ionized by the ultra-violet radiation of young stars. Observations of this line would fit our observing program of galactic radio sources very well, giving us information about the nature of such sources (i.e. thermal or non-thermal), their radial velocities (from which their distance can often be obtained), and the physical conditions in H-II regions (electron temperature, density, and turbulence). Rumors floating around that we looked for this line because Dr. Heesch promised 2 (two) bottles of champagne for its discovery, we consider as an attack on our scientific integrity. Offenders will be sued for at least 10 bottles of champagne. (Incidentally, Dave, we have not seen any of the champagne yet).

Kardashev, a theoretical radio astronomer at the famous Sternberg Institute in Moscow, suggested in a paper in 1959 the possibility of detecting this line in galactic H-II regions. In contradiction to his recent paper on intelligent life in CTA 102 (the Huntley-Brinkley report, the New York Times), his paper on the excited hydrogen line unfortunately did not find a wide publicity.

We looked for the excited hydrogen line last October at a frequency of 5009 MHz (corresponding to a transition between energy levels 110 and 109). We used the 85-1 telescope with a parametric amplifier front-end and the 20-channel back-end. The results were then inconclusive; sometimes a line seemed to be present, and sometimes we could not find a trace of it. (Rumors circulating to the effect that we were tuned to the wrong frequency are pure b_ _l s_ _t). Anyway, we tried again two weeks ago, this time with the 140-foot telescope and with essentially the same receiver as before (the front end was somewhat improved). Now we were in fact tuned to the wrong frequency and did not find the line at first. The local oscillator proved to be the culprit. (Without having stocks in any particular company we would like to point out that there certainly are foreign products available which do not quit working at such crucial moments in the human history). After repair of the faulty unit the line was found at once in M17 (the Omega Nebula), and in the Orion Nebula.

Last year two Russian teams reported the detection of the excited hydrogen line, but at different frequencies. It turns out that the intensity and width of the line as measured by us is different from what the Russians report. With our larger antenna and more favorable receiver bandwidth (100 KHz) we are inclined to believe our own

. . . continued on page 14

N.R.A.O.R.A.

On 19 July 1965, the new Board of Directors for the Recreation Association elected officers for the ensuing year. The following officers were elected:

Carl Davis - President
 Marvin DeJong - Vice President
 Jackie Plyler - Secretary
 James Dolan - Treasurer

The following committees were appointed by the president:

By-Laws Committee

Warren Tyler - Chairman
 Tom Carpenter
 Jackie Plyler

Finance Committee

Marvin DeJong - Chairman
 James Dolan
 Paul Devlin
 Ronnie Monk

Purchasing Agent

Neil Albaugh

Men's Activity

Ronnie Monk - Chairman

Women's Activity

Linda Friel - Chairman

Picnic Committee

Neil Albaugh - Chairman
 James Ryder
 Linda Friel

The forth coming picnic was the most important topic to be discussed. Plans are under way and another successful afternoon is anticipated. This activity is sponsored from dues money of the membership.

Please return your information sheet

about the picnic to Linda Friel, Room 212, Lab building, prior to August 4, 1965. This is necessary in order to complete plans for food and contests. Any guest tickets should be purchased before August 10 from Bob Vance or Linda Friel.

Soft Ball

The season is well under way with the participants having an enjoyable time. Games are played each Tuesday and Thursday evening at 6 p.m. Spectators are welcome to "cheer" their favorite or "boo" the opposition.

The standings through July 22 are:

| <u>Team</u> | <u>Won</u> | <u>Lost</u> |
|-------------|------------|-------------|
| Simmons | 4 | 1 |
| Davis | 3 | 2 |
| Coe | 1 | 5 |

Pool Tournament

John Cassell defeated Arnold Davidson to become N.R.A.O.R.A. pool champion (by the toss of a coin). A game could not be arranged suitable to both contestants; so, by mutual agreement, the coin was tossed. Jim Simmons and Warren Tyler were semi-finalists and received a "gimmick eight-ball" for their effort and talent. The finalists each received a jointed cue-stick.

Recreation Facilities

The recreation area has been used extensively so far this summer. For relaxation and enjoyment, the activities located there are unmatched for the membership fee.

The miniature golf has been a form of recreation for all age groups. Many members have enjoyed the facility since completion while attempting to master the skill of breaking par for such a course.

. . . continued on next page

The tennis courts are active at all times with players. The grass-tex courts offer smooth surfaces and spongy footing.

The recreation area is open seven days a week from 12:30 to 8:30 p.m. each day for the benefit of the membership. Recreational instruction is offered free to employee-members and their family members three days a week. Schedules of instruction periods for various activities are published weekly.

For the golfers, new driving range balls and drivers were recently purchased. In addition, there are four memberships in the Marlinton Country Club available when a member wishes to visit it at no cost for green fee. The following working arrangement has been initiated for the best advantage of those participants using the membership cards. These memberships entitle any NRAORA member to play golf at the club, free of green fees, provided not more than 4 members play at the same time. In the event that more than 4 members wish to play the course at the same time, the extra players will be expected to pay the normal green fees. The club manager, Mr. Ervine, may ask to see each person's NRAORA membership card for admittance. NO COUNTRY CLUB MEMBERSHIP CARD WILL BE REQUIRED.

There is possibly an activity for any age group or interest. If not, make suggestions to some of the Board members for consideration in the next budget.

Last, but most important, drive carefully and observe the speed limit signs that are posted in the recreation area. Remember, your child may accidentally wander into the road also. Let's protect everyone and enjoy the facilities.

140' News by Bill Hunter

The area around the 140' telescope has certainly improved during the past month. Extensive landscaping is underway, the work being performed by the

Works Area group. The base and structure will be painted sometime in the future. When this is all completed, I'm sure the 140' will stand out and present a very appealing, beautiful picture.

Observations are continuing with some amount of success, although we have had our share of troubles.

We're sorry to see Dick Grabe depart our ranks. I understand he is presently located in Pittsburg, Pa. and will later go to California.

Dave Van Horn has been transferred here and a very welcome addition, as this makes possible vacations this summer.

Troy Henderson is just returning from a couple weeks tour. Mr. Brown and Hunter will take the next two or three weeks. Howard is hiding somewhere in the West. Bill is loafing around the house.

There is a story going around about a guy operating the telescope who lost control in both coordinates at the same time. He had a little difficulty getting the declination brakes to set. When the thing finally stopped, he dashed outside to see where she settled down. Seems he didn't trust the position indicators either.

Au Revoir

300' News by Shep Sutton with Ralph High as Particeps Criminis (Accomplice)

Currently, the 21 Cm galactic survey program of Dr. Westerhout's is being carried out at the 300'. It is thought that by the end of this observing period most of the galaxy visible to the 300' will have been covered by scans, and that much of the data for the first high resolution galactic survey will be made available to the astronomical community. This survey will cover the approximate galactic latitude range of $\pm 1^\circ$.

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Social News:

Dave Van Horn left for the 140' (he's moved up). Since he left and took his 2X4 club with him we have been overrun with groundhogs.

We would like O'Dell to bring us another flood light. He backed over one here recently and broke it into little pieces. We are in the dark enough down here without making it worse.

A couple weeks ago Bob Viers was acting smart on top of a ladder, fell and broke a couple of ribs. He seems to be recovering rapidly.

We have some fish stories but you wouldn't believe them anyway, so we won't include them.

We wonder if there is any significance to the fact that one astronomer with a program here has the observer code 000007?

Just like big time city reporters, we have a deadline to make. We are already past it, so remember

Król woli to!

85' News by Bob Wenzel

The newsworthy notes from this area are of academic interest only. The aperture synthesis (positioning) and polarization programs of Dr. Clark have been finished. Frank Bash is now making a sample survey of approximately 150 3C sources plus all known quasi-stellar sources.

Lab Gab by Mike ("Super Spelunker") ByorickLow Noise Lab

The low noise boys are moving across the hall and changing places with the receiver and repair sections. Seems like the fellows across the hall got tired of looking out at the test mounts and

decided they were entitled to a better view.

Bernie's back from his vacation in Canada. Wonder how he taught his dog to retrieve chickens?

Dewey claims he's struck oil. Anybody know how to work a rig?

Everyone's glad to see Jim Pensinger back from Georgia (that is, everyone at Georgia Tech). Seriously, it's good to have you back, Jim. The co-ops are destined to rule the world some day (or didn't you know?).

Digital Lab

Andy Rogers has recently made an important discovery about the effects of Print-Kote Lacquer on Syrofoam (!).

We're still waiting for Claude Bare's wife to have her baby. Wonder if they'll name it Smokey?

Do all those muffin fans really provide enough ventilation for the lab?

Millimeter Lab

Rama Menon has returned.

After much sweat, the 6 Cm H II line receiver is in operation on the 140' and with it the H II line has been successfully observed.

The 3.2 mm receiver is going back to Advanced Technology, Inc. for improvement in performance.

Receivers

Anybody seen a Ferrari for sale lately? Heard Jim Dolan was in the market for a sports car.

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The receiver bunch is still working on a back end for Dr. Low's millimeter wave program.

Carl says he thinks (!) he's still working on the paramp pump stabilizer.

The receiver lab now has a fire hazard in dry weather. There's always a chance of a brush fire with Carl's beard around.

Ware's Repair

Joe Marshall, a student from West Virginia U., here for the summer is the latest addition to the fix-it-shop.

Congrats, Sam, on you baby boy. In a few months you can give him a piece of RG-9 to teeth on.

Unfortunately, Jim's chunk of silver turned out to consist of a less valuable metal.

I guess we can't all strike it rich like Dewey.

Behrens' Lab

I'm not sure whether this really exists or not, but it seems to include his office, part of the cryogenics lab, and the great outdoors (when it's not raining).

A new face around the lab is Don Logan, a technical advisor for the 140'. Welcome to the "Stronomy Plant", Don!

Say, does anyone know where Leon Morrison is really supposed to work?

Tourists - 1965 by Wally Oref

The tour season began on June 9th and up to July 20th (30 tour days) 3958 visitors registered and took our tours. In 1964, 3734 visitors registered in the same time period.

The largest single day's attendance this year was on July 4th. 323 people registered for tours on the day. In comparison, only 191 people registered on July 4th, 1964.

The most popular tour day is Sunday. The 3:30 p.m. tour on any day, generally, has the largest number of people attending.

Where do all these people come from? Mostly from West Virginia, Virginia, Ohio, Pennsylvania, and Maryland. We have already had people from every state in the union. They come in all sizes and shapes, dressed every way imaginable, and almost always with at least two children in tow.

Tourists ask a lot of different questions but some questions a lot more often than others. So far, the following questions are the visitor's favorites:

- (a) How much do the tours cost?
- (b) Will we get to look through the telescope?
- (c) Why can't we drive down through the Observatory?
- (d) Aren't these telescopes obsolete?
- (e) Where is there a place around here where we can eat, and,
- (f) If we take this tour now, can we get to Cass in time to catch the next train?

One favorite reply from tourists, after being asked by the receptionist if they would like to take the next tour, is: "Yes, we want to see what our taxes are being used for." Gulp!

The National Youth Science Camp

On July 6 and July 13 the science youth visited the Observatory. Their initial visit consisted of a general tour of the site and our facilities. They constituted an impressive as they

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moved to the different areas of interest. On the 13th invitations to the individual fellows were acknowledged by the staff members who spent most of the morning in discussion with them, concerning the work here at NRAO. Perhaps they seemed a burden at the time, but they point up the advances by West Virginia, NRAO, and our youth. The Observer wishes to congratulate those employees participating in this project and to recognize the achievements of the young men.

Summer Students' Activities by David Klein

On Saturday, July 17, the NRAO experienced a "Roman Orgy." The orgy was complete to the last detail. There were male and female gladiators fighting to their death on the volley-ball and egg-toss courts. Food and drink were more plentiful and more refreshing than any Roman Emperor had ever experienced. The day ended with a wild and festive party with dancing girls and boys.

The afternoon opened with a volley-ball tournament that was to be decided in a best out of three series. The permanent scientific staff plus Jim Dolan took on the gross Hannah House Gladiators plus Kurt Gordon. As Darwin's natural selection predicted, Hannah House won in two games. On the egg-toss field the story was different. Dr. Kellerman and Dr. Hoglund won the honors for the farthest toss among the men, while Nancy Remage and Kathy Moyd (Summer Students) took first place in the women's trials.

Following the festive games a crowd of approximately 100 settled down to a victor's dinner, which had been prepared single-handedly by Walt DeBoard. However, a co-op student had stoked the ovens. An hour or two of Frisbee followed. The crowd, which was slowly becoming a mob, began to descend upon the Hannah House. Here surrounded by his friends (?) who had worked feverishly in his behalf, Dr. Tyler was officially proclaimed SUPER SCIENTIST. He was presented with the

true emblem of a super scientist, a six pack.

Beer continued to flow into the wee hours of Sunday and every gross boy from Hannah House was extremely happy (high) except three: one was drunk, one was sleeping, and one claims he was roasting marshmallows.

I have been assured by many that every one had a wonderful time. The boys of Hannah House were most happy to hear this.

Spelunking by Gary Bream

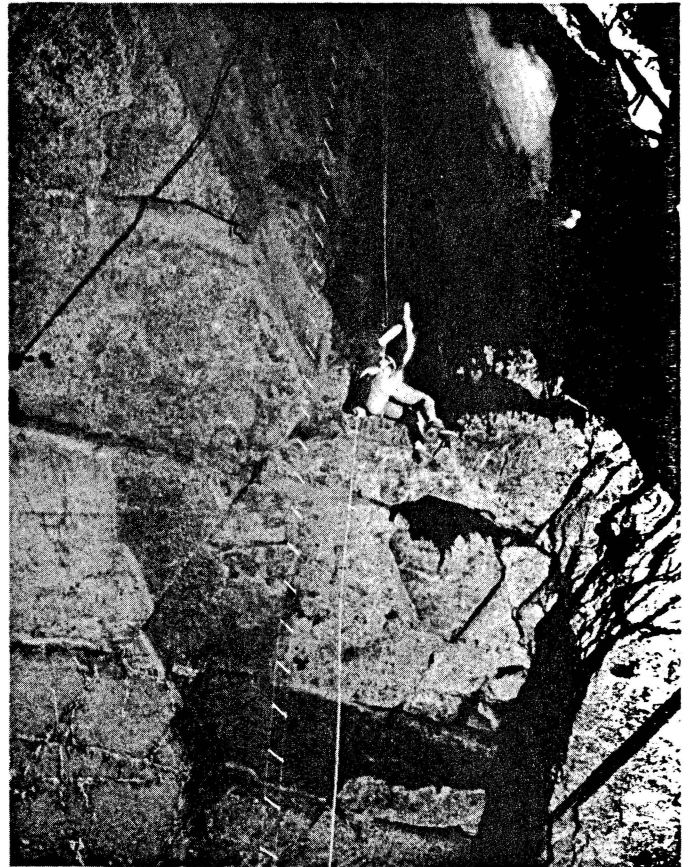
Spelunking, or the art of getting muddy in caves, is a vast outlet for the pent up energies of several observatory personnel. Furnished with equipment of their own and of the N.R.A.O.R.A., these daring explorers traverse the dark, subterranean depths of the earth, bringing to light glorious, hidden treasures of nature. Hugh rooms, bottomless chasms, and underground rivers formed millions of years ago are waiting to awe adventurers, not to mention the white cascades, delicate veils, and picturesque pendants of solid rock formation known as speleothems.

Driven by some unnatural and unexplained force, these explorers have pushed over the 165 foot drop in Cass Cave. This descent is but 20 feet from the 140 foot Suicide Falls and extends to the bottom of an underground room 900 feet long and 100 feet high. They have explored parts of an extensive new system discovered on Back Mountain last October called Cassell's Windy Cave, and rappelled 175 feet into Hell Hole (pictured on page 9). Several photographic expeditions are planned in the near future for Cass Cave and Grapevine Cave (Lewisburg) to try to capture some of the thrills and mystery of these underground chambers for topside folks.



Mild-mannered technician and daring adventurer, Neil Albaugh, descending the 175 foot drop into the cave know as Hell Hole

Rappelling the same drop on a single length of rope. The cable ladder is used for the ascent.



Computer Group

Susie Hoover, computer operator, was wed to Mr. Franklin Murphy on the 20th of June. They are presently residing at Boyer.

Cafeteria

Christina Nottingham has been transferred from the Cafeteria to Business Management.

Maxine Foe is sporting a new Chevrolet.

Visitors

Dr. Westerhout has arrived once again at the Observatory for several months. He will be observing at the 300-foot.

Aage Sandquist, "Sandy", is here for the summer months under the auspices of Dr. Westerhout. Originally from Denmark, he has his M.S. from Queens U. in Canada.

Mr. Charles Mengler and Mr. Hank Grahn are busy in the Fiscal department this summer.

Business Management

Jerry Shears has been transferred from this department to Telescope Operations. Currently he is working directly for Mr. Fred Crews.

New Hire

Ralph J. Gagnon, an assistant professor at Carnegie, is with us for the summer as a visiting research associate. He and his wife are living at the Residence Hall.

Donald Logan is employed in the Electronics Division.

Terminations

Richard Grabe - 140-foot
John Gallagher - Fiscal

Departures

Heinz Wendker has returned to Germany as his term of work at the Observatory came to a successful close for him.

He thoroughly enjoyed his stay.

Vacations

Harry Wooddell and Ed Wilson visited the World's Fair last month. No!! - They did not go together.

Jackie Plyler vacationed at Virginia Beach.

Notes of Interest

The parking area behind the computer room has been tarred. Until the hot days subside or surfacing is completed, stay clear in the better interests of your car.

An unidentified hand and who knows what else have been the main topics of conversation this month. If you're in the fog on this item, just ask the local people (although some, I hear, are tired of being questioned) and you can get no less than a dozen different explanations.

Why is it that people who have a talent for doing something well, use it for their benefit only? If a man wants a job done or desires to find out something must he be a jack-of-all-trades or can he rely on a specialist? Let's not forget that idea of the helping hand and brotherhood that the "old timers" relive for us.

I have noticed a green tent at the edge of the Residence Hall. Is this an indication of a housing shortage?

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The Saturday night square dances at the Recreation Area are a good idea, I believe. However, it might be more fun if the weatherman were invited. Otherwise only the farmers will benefit from these "Rain Dances".

Before making any trips to an area about 75 miles northeast of Green Bank in the vicinity of Lost River, W. Va. 259, and Virginia 691, consult the editor. Without a jeep it is terrible!

Concerning the campaign for "Super Scientist", the idea and the candidate was great but where is the competition? Are we Red?

No doubt John Cassell and Arnold Davidson are good pool shots but there was little evidence to back them up in the tournament. In fact, not many of the previous challengers had to even wipe their brow.

Near the computer room, the NAACP is known alternately as the Nat'l Association for the Advancement of Computer Programmers.

Someone suggested having an article entitled "Know Your Stars". However, I find it difficult to get personal interviews with Sophia Loren, Elke Sommer, and (your choice).

This column fills in for Orlo, wisdom words, and letters to Ed. Since the wit of yours truly is rather low in calibre (as can be attested by my famed joke telling), you the NRAO employees can fill the gap. Your notes of interest and possibly complaints (if appropriate) will be placed here. Gee, I sure would like to be able to sort through the many letters and pick out the better ones!

Movies for the Month of August

Aug. 23 - A Raisin in the Sun
Starring: Sidney Poitier
Claudia McNeil

The impact of an expected insurance

bequest is depicted in the eyes of each member of a Chicago South Side family. This a profound emotional experience portrayed in a magnificent motion picture.

Aug. 9 - The Night of the Hunter

Starring: Robert Mitchum
Shelley Winters

This spine-chiller presents a psychopathic killer posing as a preacher. The widow of a hanged murderer is a perfect victim. Don't miss this tense, terrifying and suspenseful drama.

Observatory Wives Tea

The August Observatory Wives Tea will be held Wednesday, August 11th, 8 p.m. - 10 p.m., in the upstairs lounge of the Residence Hall. Hostesses will be Margaret DeBoard, Ruth Weller and Joan Hovatter.

Attention N.R.A.O Wives and Women Working at N.R.A.O.

Please notify Else Hungerbuhler (phone 456-4118) or Libby Horne (456-4899) if you are interested in attending or serving as a hostess for the Wives Coffee. If you are not interested or no phone call is received your name will be put on the In-Active List. We are doing this only to cut down on the time and expense of mailing out postcards. If for some reason you have not been receiving a card, please call and tell us so your name can be put on the list.

Remember all wives of N.R.A.O. personnel and the women who work at the N.R.A.O. are most welcome at these coffees and it is a great way to meet all the "new-comers", "old timers" and visitors. We'd appreciate your thoughtfulness in giving us a phone call.

Thank you.

For Sale - Cheap

1 Glenwood Gas Stove, 4 Burners,
2 Ovens, Broiler, Warming Oven;
Works on Bottled or City Gas.

1 Oil Space Heater - Large

1 Large Desk

1 Desk Chair

See Carl Heiles

Problem

Arrange four nines in such a way
that they will equal 100.

9999

Doodles - What is it?

This won't strain your mind too
much; just your imagination.

(1)



(2)



For Sale

SX-71 Receiver and Speaker,
Excellent Condition

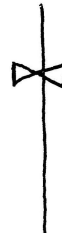
See Carl Heiles

1956 Chevy, 4-door Sedan, 6 cyl.,
Stand. transmission, winter tires,
snow chains, in very good shape,
to sell. P. G. Mezger.

Anyone interested in Horseback
Riding at the LAZY-S

Call Scottie Ext. 216
or 456-4380

(3)



(4)



Answers below

1962 AH Sprite, wire wheels, disk brakes, lim slip diff., all allowed racing
options and modifications to engine and chassis, roll bar, seat belt and
shoulder harness, fire extinguisher, 2 rear ends, many spares, new Goodyear
racing tires, all street equipment, tow bar. No races on completely rebuilt
engine. \$1500 - a real bargain. Heeschen, ext. 212.

- (1) (A) Worm crawling over razor blade (B) A good (?) drift
- (2) (A) Moth-eaten golf club (B) "Hics" waiting to be "cupped"
- (3) (A) Man caught in elevator (B) Piece of spaghetti gift wrapped
- (4) (A) Bear climbing tree as seen from other side

Answers:

PASSING OF THE BACKHOUSE

When memory keeps me company and moves to smiles or tears
A weather-beaten object looms through the mist of years.
Behind the house and barn it stood, a half a mile or more
And hurrying feet a path had made straight to its swinging door.
Its architecture was a type of simple classic art
But in the tragedy of life it played a leading part
And oft the passing traveler drove slow and heaved a sigh
To see the modest hired girl slip out with glances shy.

We had our posy-garden that the women loved so well.
I loved it too but better still I loved that stronger smell
That filled the evening breezes so full of homey cheer
And told the night-o'er-taken tramp that human life was near.
On lazy August afternoons it formed a little bower--
Delightful--where my grand-sire sat and whiled away an hour,
For there the summer morning its very cares entwined
And berry bushes reddened in the steaming soil behind.

All day fat spiders spun their webs to catch the buzzing flies
That flitted to and from the house where Ma was baking pies,
And once a swarm of hornets bold had built a palace there
And stung my unsuspecting aunt--I must not tell you where.
Then Father took a flaming pole--ah, that was a happy day!
He nearly burned the building up, but the hornets left to stay.
When Summer bloom began to fade and Winter to carouse,
We banked the little building with a heap of hemlock boughs.

When the crust was on the snow and the sullen skies were grey,
In sooth, the building was no place where one would wish to stay.
We did our duties promptly, there one purpose swayed the mind
We tarried not nor lingered long on what we left behind.
The torture of that icy seat would make a Spartan sob,
For needs must scrape the goose-flesh with lacerating cob
That from a frost-encrusted nail was suspended by a string;
My father was a frugal man and wasted not a thing.

When Grand-pa had to "go out back" to make his morning call
We bundled-up the dear old man with a muffler and a shawl.
I knew the hole on which he sat, 'twas padded all around
And once I tried to sit there but 'twas all too large I found,
My loins were all too little and I jacked-knife there to stay,
They had to come and get me out or I'd a passed away.
Then Father said, "Ambition is a thing that boys should shun.
You must use the children's hole 'till childhood days are done."

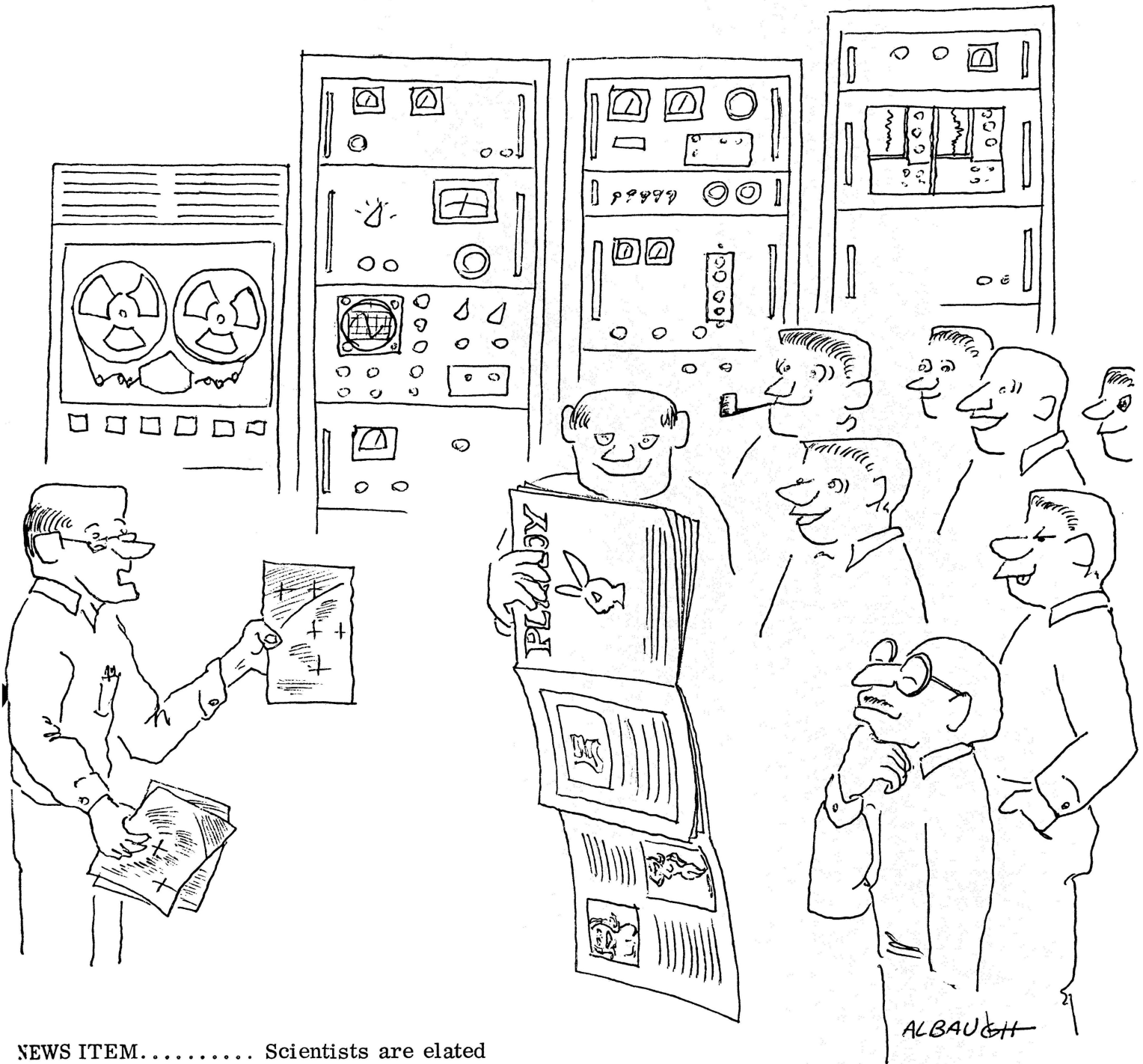
But still I marvel at the craft that cut those holes so true
The baby-hole and the slender hole that fitted sister Sue.
Ah, that dear old country land-mark! I've tramped around a bit,
And in the lap of luxury 't'as been my lot to sit,
But ere I die I'll eat the fruit of trees I've robbed of yore,
I'll seek the shanty where my name is carved upon the door.
I ween that old familiar smell will soothe my jaded soul,
I'm now a man, but none-the-less I'll try the children's hole.

--James Whitcomb Riley.

results more. Apart from M 17 and the Orion Nebula, we have found the line in several other objects *, and plan to make a survey of a number of suspected galactic H-II regions.

The success we have had so far in our observations has been possible only through the combined efforts of a large number of people. Neil Albaugh has carried a considerable part of the yoke, making a very fine job on the front-end, but missing many a movie night at Bartow. Carl Cooper kicked life into the 20-channel back-end, and frightened it into nearly continuous good operation. After a rough start, the digital group got the output system into the right gear. We owe a lot to the telescope operators, Tom Hawkins, Troy Henderson, Darrell Southern, and Dave Van Horn, who carried out the observations under the fatherly supervision of Howard Brown. The telescope mechanics kept the 140-foot in top shape, prepared coffee, hot and black as hell, and also had a keen eye on the chiller pump, which liked to introduce an artificial line into the system. Jim Dolan has been fighting an uneven battle with the Manson L.O., but will probably end up as the final victor (please!). Kathy Moyd, our precious summer studentess from Cornell put in many nights of computer programming and frequent company at the telescope.

* Apparently this put too much stress on the Manson local oscillator, which has refused to work ever since.



NEWS ITEM..... Scientists are elated at the recent photographs of Mars taken by Mariner !!!