

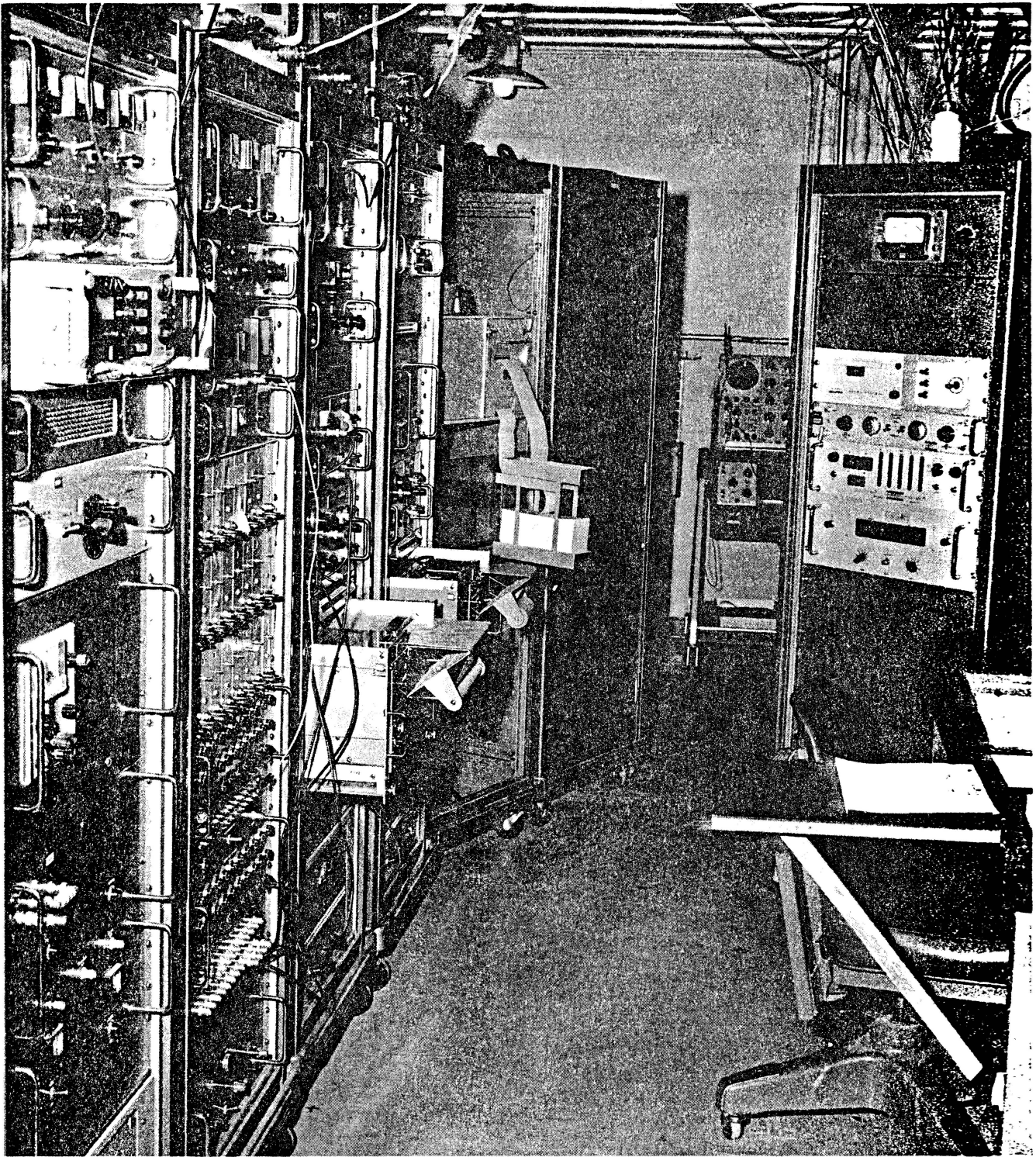
The OBSERVER

Vol. 2, No. 9

September 30, 1963

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Published monthly by the National Radio Astronomy Observatory Recreation Association.



MULTICHANNEL RECEIVER

Story on following page

THE MULTICHANNEL RECEIVER by Bertil Hoglund

During the past month the multichannel receiver has been working with the 300' telescope, searching for neutral hydrogen radiation from distant galaxies. Nearly two years of construction work thus has reached the final and, hopefully, long lasting phase.

The radiation we are looking for with the multichannel receiver comes from neutral hydrogen atoms in the deep space between the stars in our galaxy and other galaxies. The characteristic feature of this radiation is the fact that it is confined to a narrow frequency range (around 1420 Mc/s, wavelength 21 cm). It is thus a spectral line, as opposed to the continuous frequency distribution of the signals the radio astronomer is usually concerned with. Neutral hydrogen is the most common constituent of interstellar matter, and contributes further and important fraction to the total mass of many galaxies. Since neutral hydrogen is optically invisible, the 21 cm radiation it emits is apparently of very great importance to the astronomer.

The frequency of the hydrogen line is affected by the relative velocity between the observer and the emitting hydrogen region, this is the well known Doppler shift. By studying the frequency variation of the hydrogen line radiation received from various parts of a galaxy the astronomer can thus determine the relative velocity distribution across the galaxy. From such a knowledge he can deduce the rotation curve, that is, the variation of the galaxy's rotational velocity with distance from the center of the galaxy. Another important parameter that can be calculated from the observations is the total amount of neutral hydrogen gas in a galaxy.

As has been known for many years, all galaxies (except a few nearby ones) seem to recede from us with a velocity that increases with the distance to any particular galaxy. The Doppler shift connected with this velocity can be quite appreciable. The multichannel receiver can be turned over a 30 Mc/s wide range, which corresponds to a velocity range of

6000 Km/s, which in turn corresponds to a galaxy 180 million light-years away. Another question is, of course, if the signals emitted from such a distant galaxy are strong enough to be received at all with our present sensitivity.

The receiver records simultaneously radiation received within a 2 Mc/s wide band. This band is covered by 20 channels, each 100 Kc/s wide and separated by 100 Kc/s from neighbouring channels. In order to improve the receiver stability it is switched, but not between antenna and load as in the N.R.A.O. standard receiver. Instead it is switched between two frequencies, one fixed at 1425 Mc/s, (which is always outside the frequency range where the hydrogen line radiation can occur), and one lower frequency (signal frequency) the value of which depends on the particular galaxy observed. In the channels where the line is received there will be a higher signal level when the switch is in the signal frequency position than in the comparison position. The resulting square wave modulation is separated out in a detector, amplified and phase detected.

The output from the 20 channels is punched out on tape and also recorded sequentially on a recorder. The digital output system is largely due to John Parker.

The front end consists of a parametric amplifier followed by a tunnel diode amplifier. Total system noise temperature is 250°K (including antenna noise).

August 20th the receiver was started on the telescope without much trouble and has been operating quite well since then. Observations are being made by Dr. Morton S. Roberts from Harvard, the leading authority on neutral hydrogen in external galaxies. Dr. Roberts has previously used the 60' Harvard dish and a maser frontend for his observations. The larger collecting area of the 300' telescope and the higher resolution has made it possible for Dr. Roberts to improve on his earlier results. Thus far he has been observing 75 external galaxies with a maximum Doppler shift of 10 Mc/s.

(continued)

Of these he has seen hydrogen in 25 directly from the analog records and he believes that reduction of the digital output data will increase the total number to close to 40. In 10 of the galaxies hydrogen has been observed for the first time, and the number of "new" galaxies will probably be doubled when the digital results are included. Many of the galaxies observed are of a type where one does not expect much neutral hydrogen, which explains why only about half of the total number of observations give positive results.

Of the many people to whom I am indebted for their contribution to the construction of the multichannel receiver I wish to mention Frank Perry for his devoted and skillful work. He should be rather pleased with the good results already obtained.

The receiver will go off the antenna October 1, the next observing period being scheduled for March - April next year. In the meantime, further improvements will be made on the equipment.

TOURS AND TOURISTS

The regular tourist season began June 15, 1963 and ended September 2, 1963. During this time 8,160 visitors were registered at the reception desk. Visitors came from 42 states. Of the 42 states represented, 84 per cent came from West Virginia and four nearby states. West Virginia contributed 66 per cent of the visitors and Virginia, Pennsylvania, Ohio, and Maryland contributed the other 18 per cent. The summer daily average was 138 visitors per tour day.

August was the most popular visiting month. More people came in August of this year than in any other single month since the observatory was opened to the public. Slightly over 4,400 people were registered in August for a daily average of 190 persons per tour day.

The largest single day's registration occurred on September 1, 1963 when 512 visitors were registered.

The 8,160 visitors who were registered at the reception desk this summer do not tell the whole story of observatory visitors. This is because it was not possible to count the non-registering visitors. The people who drove in and out of the observatory having arrived too early or too late for the regular tour. However, periodic counts of non-registering visitors indicated that for every person who registered, at least one other person did not register. Using this as an estimating guide, it is probable that at least 20,000 persons visited the observatory this summer.

OUR APOLOGIES

Due to circumstances beyond our control, we were unable to print an OBSERVER for the month of August.

OUR THANKS

We of the OBSERVER staff wish to thank all those who gave their time and submitted articles during the past year.

This is the last edition to be published by the present NRAORA Board of Directors, however, we hope that you support the new board and the new Observer staff as well as you have supported us.

The Editor

SAFETY

To all new employees and to the old employees who sometimes wander aimlessly here and you, we ask that you be alert when traveling in the vicinity of the NRAO Rifle range, which is located in the South West section of the recreation area.

Occasionally the signs marking the boundary are removed or laid aside to allow the passage of a vehicle and are not put

SAFETY (cont'd)

back where they should be. Therefore, there is no warning for those who do not know the range boundaries.

Everyone should familiarize themselves as well as their families with the boundaries and be sure not to wander between the stands and the targets. This area should be considered a Restricted Area at all times.

GOLF MEMBERSHIP CARDS

Golfers! Please return golf membership tickets the morning after you have played. There have been complaints that some individuals have been keeping tickets too long.

GENERAL MEETING

A general meeting of all NRAORA members will be held at 1630 EST on Wednesday, October 2, 1963 in the Lab basement conference room.

The purpose of this meeting is to elect eleven members to serve as directors of the association for a term of one year, and to ratify the following amendments to the constitution:

- Article VII, Section 2, which reads:
"Voting shall be cumulative, i.e., each qualified member shall have one vote for each board member, and these votes shall be distributed as the member wishes."

To be amended to read:

"Each qualified member shall have one vote for each board member and the votes are not cumulative."

- Article XVII, Section 5, which reads:
"A two-thirds (2/3) majority of all general members shall be necessary to

ratify an amendment."

To be amended to read:

"A two-thirds (2/3) majority of the general members present shall be necessary to ratify an amendment."

The following members have been nominated by the nominating committee. However, nominations can be made from the floor.

Bird, Dick	Hogg, David
Callender, Frank	Hovatter, Don
Davis, Carl	Plunkett, Jack
Grandon, Glen	Sheets, Jamie
Hamed, Tony	Smith, Sidney
Vance, Bobby	

All members are urged to attend.

Dr. Heeschen, Dr. Findlay and Dr. Mezger attended the Tokyo URSI meeting September 8 through 20.

Fred Crews has moved into the office formerly used by Dr. Drake. His telephone number is 208.

Millimeter Wave Telescope -- Work has been completed on installation and power wiring for the 12-ft. Nike mount. This work consisted of constructing a reinforced concrete slab and installing the instrument on it. Conduit was run back to the lab building for the power wiring. Provision was made for installing other instruments in the future.

Dr. Findlay made the first official trip out of the Observatory's 2500 foot turf airstrip on September 3.

LAB GAB

Congratulations to Carl Wooddell and his pretty bride. Yep, old Carl finally joined the ranks of us happily married, but numb husbands. Let's see how late she'll let him stay out now.

And now a word from our commercial receiver builders. "Our receiver will give you the best gain, the best stability, the best noise figure, the best signal, the best equipment, the best workmanship - and - oh, what was that you said? Will it work? I beg your pardon, that's beside the point." Unquote.

Hey how come the "cheef" is working in the front end lab - I thought he was always the middle man????.

We hear John Sapp has tickets for W.V.U. games for sale. Cheap!!

Mrs. Rose Kuhlken is out of the hospital now and feeling much better. But she has to take it quite easy for awhile. She and Bill wish to thank all those who showed such an interest in her welfare, and to Mrs. Frank Perry who took care of little Kris while Bill worked, and to those who made kind offers of help in that line.

To all people in the lab - try and make that NRAORA meeting to elect a Board of Directors for the coming year. Those who don't come and vote - get what they deserve and can't squawk. -- Legally that is!!

My, My - if all the deer and squirrels and ducks and grouse and etc., that is being shot in the lab, before the well known season starts, - was laid end to end, it would -----.

For those who wish to fish in Northfork Creek - please bring your own water - the state will supply the fish then.

For rent -- one R & D Lab. All technicians are on TDY to other labs and there is plenty of room to be shared with one lonely interferometer R & D technician.

The maser is down from the 85' dish temporarily and in its place will go the West Ford experiment. This consists of a 7.7 KMc receiver and a 1400 Mc receiver. This is under the able direction of Bert Hansson. Sort of like trying to make hay in a needle-stack.

Who belongs to this quote?

"I only drink, for my steadiness to improve,
I became so steady last night, I couldn't even move."

Virginia Irvine spent a week in Indianapolis, Ind. and attended the Don McNeil Breakfast Club at the Greenbrier in White Sulphur Springs while on vacation.

Mr. and Mrs. Jamie Sheets accompanied their daughter, Becky, to Morgantown, W. Va., on Tuesday, September 10. Becky is enrolled as a Freshman at the West Virginia University School of Nursing.

Dr. and Mrs. Hugh M. Johnson are spending a 3-weeks vacation in Los Angeles and San Francisco, California.

For Sale -- '56 De'Sota - 4 door.
See Carl Wooddell

The following letters appeared in Science and were written by former staff members.

THE LITTLEST ASTRONOMER

Once upon a time there were three astronomers who lived on top of a mountain. On this mountain was a large telescope for the astronomers to use. The biggest astronomer was a very intelligent theoretician, who knew almost all there was to know about the theories of the stars. The middle-sized astronomer was a very charming person who knew all the wonderful words needed to describe the stars. The littlest astronomer, who often listened to the other two, had learned a great deal, but he was mostly curious about what else could be found out about the stars.

One day the littlest astronomer looked out the window and said, "My, it looks as if we will have a clear night tonight. Who would like to use the telescope?"

"Not I," said the biggest astronomer, "I have to write applications in sextuplet for money to hire assistants."

"Not I," said the middle-sized astronomer, "I have to prepare my television interview for tomorrow."

"Very well," said the littlest astronomer, "I will use it myself." And he did.

The following day the littlest astronomer, who was eating his breakfast while the other two were having lunch, said "I got some interesting observations of the stars last night. Who will help me reduce them?"

"Not I," said the biggest astronomer, "I have to interview five people today for jobs as my technicians."

"Not I," said the middle-sized astronomer, "after my TV interview I am having dinner with the mayor."

"Very well," said the littlest astronomer, "I'll do it myself." And he did.

And so the years rolled by. The biggest astronomer obtained lots and lots of money for his research, and he had lots and lots of people working for him who were discovering many interesting things about the stars. The middle-sized astronomer became very famous--his picture even appeared on the cover of a weekly magazine. But the littlest astronomer just spent his time at the telescope and in his office. Because of this he was the one who answered the telephone when the dean of the near-by university called.

"Who would like to help some students with their research?" asked the littlest astronomer.

"Not I," said the biggest astronomer, "I'll hire them as my assistants, if they wish, but I haven't time to look over their own studies."

"Not I," said the middle-sized astronomer, "but I could probably recommend them for a good position when they have finished."

"Very well," said the littlest astronomer. "I will do it myself." And he did.

The students come and studied hard. They were fortunate to be able to listen and learn from all three of the astronomers who lived on the mountain, and in the process of time they left to become astronomers living on other mountains all over the world. The littlest astronomer was sorry to see them go.

After many years, when the three astronomers were very old, the president of the country in which they lived came to visit them.

"My, what a wonderful observatory you have here!" said the president. "Do you operate the great telescope every night?"

(continued)

"Yes," said the three astronomers at once.

"I have seven assistants," said the biggest astronomer, "each one gets two nights a month to observe for me."

"I always pose for the pictures," said the middle-sized astronomer, "whenever any newsmen want stories of the telescope."

"Oh yes," said the president, "I have read them myself."

"I use it too," said the littlest astronomer.

"And what do you do with the measurements you make here at night?" asked the president.

"I have a staff of fifteen assistants to compute the important data we obtain. I try to be here to look over the final data, but usually I'm very busy with administrative details," said the biggest astronomer. "Then my staff of writers compiles the data and I publish it."

"Yes," said the president, "I have seen what a long list of publications you have. You must be the greatest astronomer in all the world!"

"I report these findings to the general public," said the middle-sized astronomer. "Without their support we would not be able to have this fine staff of assistants."

"I have a few students who help me," said the littlest astronomer.

"Well, well," said the president, "I would be greatly honored if you would dine with me and my cabinet. My Minister of Science would like to meet you," said the president to the biggest astronomer he added, "and my Minister of Public Relations would like your autograph." Then the president, being a very gracious gentleman, turned to the littlest astronomer and said, "You can come too."

"We would love to," said the biggest and middle-sized astronomers simultaneously.

"No thank you, sir," said the littlest astronomer. "It is a clear night and there will be no one on the mountain but me. I shall use the telescope."

And the littlest astronomer took his leave of the other astronomers and the president. In the twilight the others could not see that he was smiling to himself as he walked to the telescope.

by Beverly T. Lynds

THE LITTLEST ASTRONOMER (continued)

On another mountain lived three other astronomers. The biggest astronomer was very smart; he knew more than just about anybody about telescopes and the stars. He had built the Great Telescope on the mountain and it was famous all over the world. He liked to build telescopes, but best of all he liked to explore the sky with them and see a thing a little better than it had ever been seen before. He couldn't do this much any more. He knew that there were not enough telescopes for all the good astronomers, and that we would learn more about the sky, in the long run, if he spent his time getting more telescopes instead of just using the Great Telescope. Getting more telescopes was hard work, and he had to spend much time far away, where the keepers of the money lived.

The middle-sized astronomer was also smart. He was an expert on making telescopes work, and on making special calculations, and particularly on what was an important thing to work on. He liked best to explore the sky with the Great Telescope, and to understand something a little better than it had ever been understood before. He couldn't do this much any more. All day the littler astronomers came to his office and asked him to give advice about their projects, to fix their mistakes, and to adjust the telescope a little better for them so

(continued)

They would do better the next night. He always helped them, and all the astronomers discovered more as a result. The astronomer was glad. When the biggest astronomer was gone, as he often was, the middle-sized astronomer had to do all the biggest astronomer's work, too. Sometimes he had to say something about astronomy on television. He didn't like this, because it was embarrassing, but he knew that if he didn't say it the television people might have a bad astronomer say things that were wrong, and then all the astronomers would be embarrassed and unhappy. It was hard work, but there was no one else who could do it.

The littlest astronomer was smart, but he had never tried to be an expert at anything. Nobody come to him for advice, because he didn't know any more than anyone else. He was glad no one bothered him. Best of all he liked to explore the sky with the Great Telescope, and that's all he did. He published lots of papers.

One afternoon the keeper of the Great Telescope came to the three astronomers and said, "The middle-sized astronomer has adjusted the telescope carefully and it will be a beautiful night tonight. Who would like to use the telescope?"

"I can't," said the biggest astronomer. "I was up all last night coming from the city where the keepers of the money live, and I am very tired. It was very uncomfortable, because I bought the cheapest ticket to save money. This evening I must find a way to build another Great Telescope that is better than ours, but which costs a little less. Our Board of Trustees needs the answer day-after-tomorrow. It will be hard, but I think I can do it. And I would like to play with my little boy just a little-- I have not seen my family for a week."

"I can't," said the middle-sized astronomer. "This evening I must go to a college where there are no astronomers and tell the science students how exciting astronomy is." He had asked the littlest astronomer if he could

give the lecture, but the littlest astronomer had said he had too many observations to study, and besides, he gave so few lectures that he wasn't very good at it.

"I can," said the littlest astronomer. And he did.

Later that night, as the littlest astronomer finally went to bed, the biggest astronomer was still awake, looking at the dark ceiling of his bedroom and worrying.

"Have I found the best and cheapest way to build a Greater Telescope? Will it best explore the most important problems I know of?" He tossed and turned, knowing he must be right so that all the astronomers could learn more about the sky.

The middle-sized astronomer was still awake, too. He had driven through a bad snowstorm until very late, because the students had kept him so long asking questions. Some had decided they wanted to be astronomers, too, and he was glad. But tomorrow he would have to make a very careful calibration of the Great Telescope so that the littlest astronomer could analyze his observations. He tossed and turned, trying to decide the best way to make the calibration. It had to be right if all the astronomers were to get the right answers. No one but the little astronomers would ever know who had arranged for them to get these right answers.

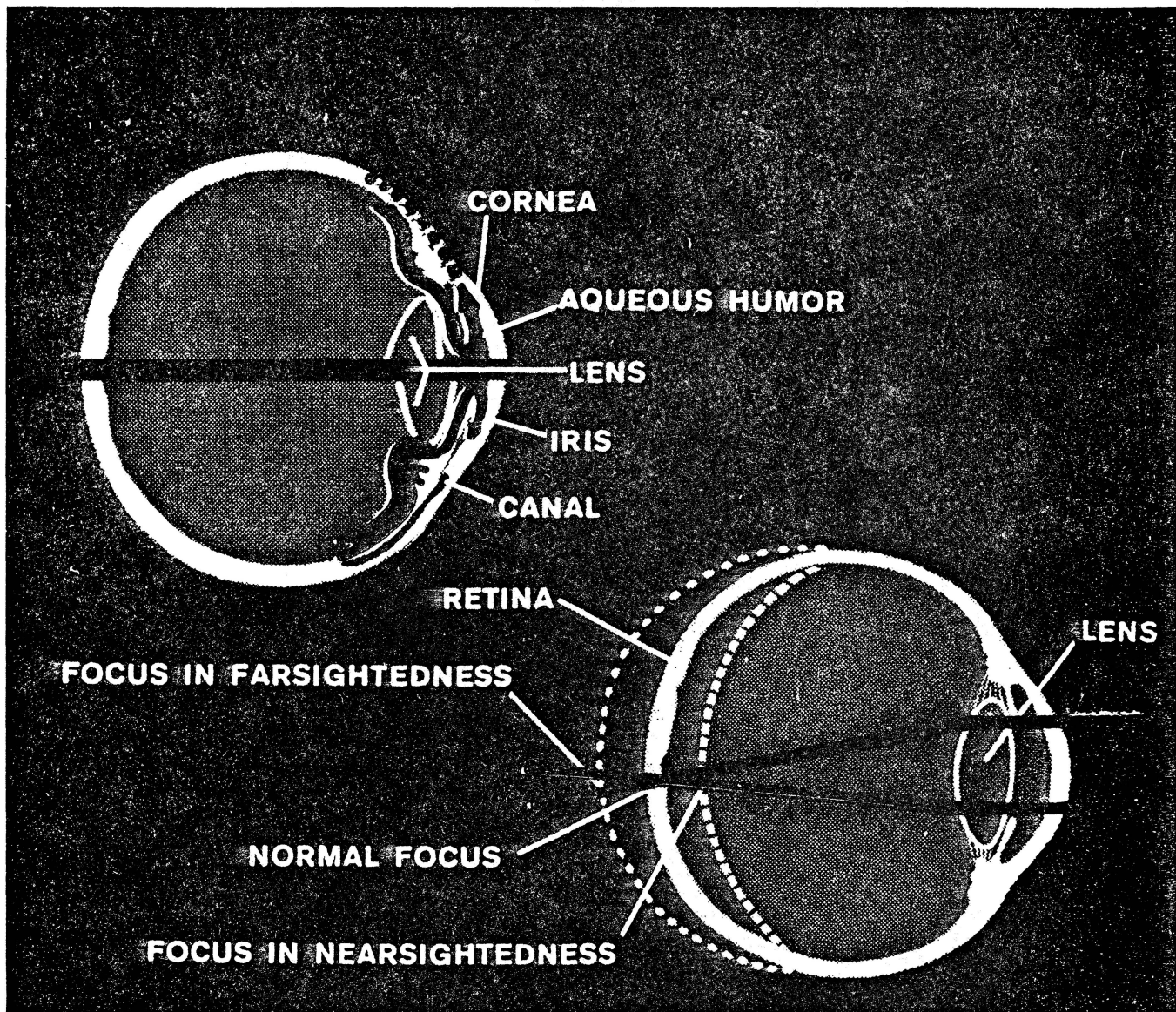
The littlest astronomer was sound asleep, and very happy. No one had bothered him all day. He could use the Great Telescope almost any time he wanted. He did just as he pleased, all day, every day. It was a good life.

by F. D. Drake

HOUSES FOR SALE

Modern 7 room home consisting of 4 bedrooms, living room, dining room, kitchen and bath. Also a 5 room business or apartment building. Both located on Route #28. Approx. 4 acres. May be seen by appointment. Phone 456-412.

Ralph Lowe



Glaucoma (eyeball at upper left) results when fluid in front of lens, called aqueous humor, accumulates because it cannot drain through canal. Canal may be clogged (red dotted line in upper half of figure) or may be cut off (lower half) by a thickening of tissue between cornea and iris. In farsightedness and nearsightedness (figure at lower right) lens focuses light rays either behind or in front of normal focusing area on retina.

FREE

GLAUCOMA CLINIC

October 16, 1963

Green Bank High School

WHAT IS GLAUCOMA?

Leading cause of blindness.

CAN GLAUCOMA BE CONTROLLED?

Yes, if caught in early stage.

WHAT ARE EARLY SYMPTOMS?

1. Glasses -- even new ones -- don't seem to help.
2. Blurred or hazy vision which clears up after a while.
3. Trouble in getting used to darkened rooms, such as at the movies.
4. Seeing rainbow-colored rings around lights.
5. Narrowing of vision at the sides of one or both eyes.

WILL THE TESTS TAKE LONG? -- No.

WHO WILL CONDUCT THE TESTS? -- Dr. Martin.

Sponsored by Durbin Lions Club

LIONS CLUB GLAUCOMA SURVEY

Glaucoma is a disease of the eyes in which the pressure inside the eyes increases to a level which damages the retina and optic nerve. There are several causes of this rise in pressure, but the commonest type of glaucoma comes on without warning in older people. More than 2 persons out of each 100 past the age of 40 have chronic glaucoma, leading to 12% of our blindness.

Prevention of blindness from glaucoma depends on early diagnosis and treatment by a medical doctor who has specialized in eye care. Drugs will lower the pressure in most cases, but a few require surgery.

The Lions Clubs and the National Society for the Prevention of Blindness desire to aid in preventing blindness from all diseases. This glaucoma survey is one of their many activities in sight conservation. Take care of the only pair of eyes you will ever have.

THREE MAIN POINTS TO REMEMBER ABOUT GLAUCOMA

1. It usually strikes people over forty.
2. It is difficult to detect in the first stages.
3. It can usually be controlled if diagnosed early.

LIONS CLUBS ARE FIGHTING GLAUCOMA

The Lions Clubs supply the manpower and facilities for community glaucoma clinics at which the public receives free examinations.

The glaucoma message is directed especially to people past forty. On the basis of several studies, the estimate has been calculated that 1,000,000 people, or two per cent of the total, in the over-forty age group have glaucoma.

Although glaucoma, like many other diseases, is more prevalent among the underprivileged, the clinics have found it in all strata of the population.

How much discovery of glaucoma and subsequent treatment mean to the individual was expressed by one patient in her appreciative comment that "with my new glasses, plus the drops taken four times daily, I know I am one of the lucky ones who will never need a white cane or a seeing-eye dog."

Effectiveness is not limited to the clinics. Many ophthalmologists regard the educational service of the clinics their greatest value. The publicity given glaucoma sends many, who will not go to a public clinic, to their ophthalmologists for a private examination. Eye physicians report a decided increase in the number of patients who ask to have their eye pressure taken.

Basically, glaucoma screening is the examination of the eyes by an ophthalmologist (a physician specializing in the study and treatment of defects and diseases of the eye) for indications of increased vitreous fluid pressure within the eyeball. This pressure, most common in people over 40, gradually crushes the life out of the optic nerves and causes blindness. In some cases it can be treated surgically; in others, the use of prescribed, medicated eye drops can temporarily relieve the pressure. All cases of glaucoma, if diagnosed soon enough, can be arrested by these means.

Unfortunately, neither a cause nor a preventive is known--at least not for certain. There are indications that glaucoma is somehow linked to nervous tensions, as ulcers are, or that heredity may be a factor. But so far neither theory has sufficient proof. Until more evidence is in, the best defense is to know the symptoms and what to do when they appear.

Intense pain in the eyes, especially in dark or dimly lit rooms, and the appearance of rainbow-colored haloes around lights are perhaps the most alarming danger signals. If you detect either condition, get help at once, for these are marks of acute glaucoma and demand immediate action. It should be pointed out, however, that one should not become panicky because of the appearance of haloes; in the majority of cases they are caused by other conditions, such as nuclear cataracts and conjunctival secretions. Clouded vision, a frequent need for new glasses (none of which ever feel quite right), loss of side vision, and unusually inflamed or tired eyes are other warnings that suggest a trip to the doctor.

The safest thing is not to wait until symptoms appear; then it may be too late. Periodic examinations, which can spot the danger of future attack, are your best weapons. These checkups are neither expensive (about the cost of having your car waxed) nor very time-consuming (roughly half an hour). Chronic glaucoma doesn't often occur in people under 40, so the danger is less until then; after 40, though, checkups should be no more than two years apart.

The W. Va. Lions Sight Conservation program spends around \$15,000 annually on eye operations. The participants mostly underprivileged have sight today - thanks to Lion members and other individuals who have pledged their eyes. As of September 6, 1963, 1000 eye pledges have been received.

The Lions Clubs sponsor Red Cross Blood Mobiles and purchase glasses for needy individuals. For more information contact M. T. Waslo, President Durbin Lions Club.

PLYLER-WOODDELL

John Carl Wooddell and Margaret Jo Plyler were united in marriage on September 13, 1963. The double ring ceremony was performed at Marlinton by Rev. R. H. Skaggs.

Those present were the grooms parents - Mr. and Mrs. E. C. Wooddell of Marlinton, the brides parents - Mr. and Mrs. O. E. Plyler of Cass, Mr. and Mrs. Howard Bowers, and Mr. and Mrs. Warren G. Wooddell of Cass.

After a short honeymoon, the couple will reside in Cass, West Virginia.

CERAMICS

Ceramic workshops were cancelled during the month of August due to vacations, gardening, and numerous other activities.

The regular scheduel - every WEDNESDAY NIGHT, 7:00 P.M., became effective Wednesday, September 25th.

A special invitation is sent out to all who have never attended any of these workshops before. There is no fee to join. Each individual can decide just how much they want to spend. We have a nice variety of greenware with a varied price range. As far as the plans are now, we will not have an instructor this year but any new members can easily learn from the ones who have been attending regularly.

Ceramics is an ideal way to meet the other wives and employees. It also gives the women an excuse for "an evening out" - (husbands make wonderful babysitters!) Many lovely items have been made here at Green Bank. It is an excellent way to add new items for your own home and also a good way to make several items which are very suitable gifts. Christmas is only a few months away, so keep this in mind.

Meeting place - Arbogast House, opposite Works Area Building.

ENGINEERING DIVISION

The concrete floor is being poured in the new Warehouse and electrical work has been started.

The main roads within the Observatory have been black topped. Maybe we won't have another "rutty" Spring like this past one.

A new turf airstrip has been opened for airplanes on official observatory business. The first single engine airplane landed August 30. Dr. Heeschen and Mr. Riffe arrived in the A.U.I. Aztec - a twin-engined airplane on September 20.

The 85' interferometer project is running close to schedule with the first station ready for structural steel.

Wayne Statler, our co-op student from Drexel is now back in school and has been replaced by Charles H. Buhrman and Ronald E. Kert, both from Drexel.

SEPTEMBER BIRTHDAYS

3 Virginia Irvine
4 Lenard Howell
6 Niel Horner
12 James Arbogast
14 Basil Gumm
16 Lyle McPherson
16 Harry Wooddell
20 C. B. Cassell
21 Carolyn Dunkle
22 Arnold Davidson
24 R. Gillispie
27 Anna Grace Ware
28 Teo Zatta
29 Odell Johnston

TELESCOPE OPERATIONS

The Telescope Operations Division held a "nutritional get-together" on Monday, August 19, at the N.R.A.O. cafeteria. The occasion was to enjoy a delicious T-Bone steak dinner. This happening was aided by the equipment change-over between D.T.M. and the N.R.A.O. multichannel receiver at the 300' telescope. This marked the first chance for such a delightful occasion since early in 1962.

Dr. Drake gave an interesting talk of his future plans with the Jet Propulsion Laboratory in California by briefly describing its location, operation, and mission.

We would like to express our thanks and appreciation to all concerned who made this enjoyable evening possible.

George Grove has recently purchased a farm located on Saulsbury Run near Boyer. He will undoubtedly rough the winter there if he can find a carpenter and plumber for adding modern conveniences.

Congratulations from the 300' telescope personnel to Mr. and Mrs. Maxie Gum on the new boy born Sunday, August 25. This is their third child.

Bob Vance and family enjoyed a week's vacation in Ohio visiting relatives and friends.

Dick Spurlock, Dick Bird, and Bill Terrell are recruiting a party for complete tour of the Cass cave in the near future. Plans are for going all the way - falls included. Anyone interested should contact one of them.

D.T.M. completed observations on Monday, August 19. Their equipment was removed and the N.R.A.O. multichannel hydrogen line receiver was installed.

The observations are being programmed by Dr. Mort Roberts from Harvard.

An observer on route 28 was recently shocked by sounds coming from the focal point of the 85' telescope which were in the form of male voices in accompaniment with a wierd musical instrument. The song closely resembled "Ride Me Kangaroo Down". Further investigation proved this emanation to be coming from two rather reserved people who were waiting on the maser to pump down and were warping a piece of aluminum to get the accompanying effect.

140-FOOT TELESCOPE

Major components have arrived at the job during the past month. The declination shaft was the most important received and all remaining superstructure work was opened up for Pacific Crane & Rigging Co. after the shaft was installed. The project has gone a 60 hour week in an effort to complete the aluminum welding of the super-structure during good weather.

All sections of the yoke and counterweight have been shipped from Sun Shipbuilding & Dry Dock Co. Several sections have been received at the job site and Pacific Crane & Rigging Co. has started fit-up of these sections. The yoke hub arrived in Bartow on August 26th. This is the heaviest shipment made of current components. Weight of the yoke hub is in excess of 140 tons.

Mr. Grabe returned on August 26th from a two week trip to visit his daughter, son-in-law and grandchildren in California. He also visited a brother there. He traveled to Mexico, says he had no trouble with Mexican

(continued)

officials during his trip there.

We suggest someone make a recoil patch for one technician in the lab to put in the middle of his forehead. He bought a Weatherby - Mark V with a big scope on it. Seems that darn scope catches him between the eyes on the recoil. A bottle of Seven Crown might be good to carry along as a pain killer when using this gun.

FCR SALE

National Model RAO-6 Ham Receiver, 540 Kc to 30 Mc. 11 tubes. 5 bands. - \$40.

Heathkit Capacitor Checker. Excellent condition. -- \$15.

Dr. Bernard F. Burke, chairman of the National Academy of Sciences Subcommittee on Radio Astronomy, has been named winner of the American Astronomical Society's 1963 Helen B. Warner Prize for astronomy.

Dr. Burke, cited for his contributions to radio astronomy and especially for his discovery of radio emission from the planet Jupiter, will receive a monetary award at the society's annual December meeting in Washington.

Dr. Findlay gave two papers at the New York Academy of Sciences Conference on Large Steerable Radio Antennas --- Climatological and Aerodynamic Considerations, on September 4. The papers that Dr. Findlay gave are entitled "Radio Astronomy" and "Operating Experience at the National Radio Astronomy Observatory".

Mr. Pleasants attended the New York Academy of Sciences Conference on Large Steerable Radio Antennas.

BUSINESS OFFICE

The contract has been let for the construction of the Foundations and Runway for the 85' Interferometer project. Garbart Construction Company of Terra Alta, W. Va. being the lowest bidder, was awarded the contract.

Callison Construction Company, of Clarksburg, West Virginia, was the successful bidder for hardtopping the following site roads:

1. High School road to 140' telescope
2. 300' road
3. Hannah road
4. 140' road

Bayliss & Ramey, Inc., of Charleston, West Virginia, was awarded the contract for the Electric Power Distribution System at the site of the 85' Interferometer project.

Work is now in progress on all of the above contract jobs.

Ground was broken on September 10, for a guard station at the main entrance to the Observatory. The building will be completed by October 15.

ARCHERY NEWS BRIEFS

The archery fans at last can start practice. There are four target mats and targets going in within the next week.

The association has bought six practice bows and twelve dozen arrows, fingertabs,

ARCHERY NEWS BRIEFS (cont'd)

and arm guards to be used by any member of the NRAORA.

With the hunting season just around the corner, now is the time for all enthusiast to start binding that idiot stick.

GREEN BANK RIFLE AND PISTOL CLUB

Mr. Michael Waslo, Regional Vice President, West Virginia Wildlife Federation will speak at the October 2nd meeting of the Green Bank Rifle and Pistol Club. Door prizes will be given away at all future meetings, to encourage membership participation in club functions.

The club will raffle off a Savage 22 Magnum over 20 GA Magnum, October 4th. The winner will have a choice of the gun or \$45.00. Tickets can be purchased from any club member. The profits realized from this raffle will go into the treasury of the club to help buy ammo and supplies for such things as the Junior Club.

Paul Devlin instructor, reports that the 22 cal program with the Junior Club (11 to 15 Yr. age group) which he has been conducting has progressed very well.

The club has received from the Department of the Army, Office of Director of Civilian Marksmanship, the following items to be used by our members. 1500 targets, 2840 rounds 30-06, 600 rounds .45 cal ammo. Due within the next month are 4 each 22 cal rifles.

We would like to encourage all our members to attend our next meeting to be held at the Arbogast house, next Tuesday - October 1, 1963, at 7:30 P.M. Prospective new members are welcome too.

Club Officers of the Green Bank Rifle and Pistol Club are:

Mr. T. F. Zatta, President
 Mr. J. L. Dolan, Vice President
 Mr. J. F. Hensley, Secretary and Treasurer.

SMART PARTS FROM GRAPHIC ARTS

Hear ye! Hear ye!
 All ye lassies, both sweets
 and sassies,
 Now ye shall regret,
 and ne'er forget;
 When young Don be gone,
 that naught any,
 of the eligible many
 would beget or let,
 Don slip away;
 Shame on thee, I say.

The above is our way of breaking the news of Donald G. Crum, senior draftsman in Scotties' Dept., leaving the observatory. Don has decided to return to college to study mechanical engineering. He plans to attend Beckley College for the first two years, while also being employed by Gates Engineering Co., then finishing his objective in a full time campus engagement.

We wish to add our sincerest hopes of good luck and feel sure that we will have another good engineer in the next four years.

We will all miss Don very much, and hope he will come back to visit us often. Best of wishes and good cheer from all of us.

Note: To all you unhitched females -- hankies are attached on the Observer's rear; to help dry your tear.



ATTENTION:

All and any that have the ability to decode or decipher the above hieroglyphics may well be on their way to fame and fortune -- as it has all the "BRAINS OF INTERNATIONAL ACCLAIM." STYMIED. "Send your answers to the Editor."

FOR SALE

Two (2) Acoustic Suspension Speaker Systems.
See Bert Hansson

OVSERVATORY WIVES MEETING

The next meeting will be held Wednesday,
October 9, 1:00 - 3:00 PM, upstairs lounge
of the Residence Hall. Hostesses: Joan
Hovatter and Peggy Terrell.

I... ugh... I
need another
coffee break.

