

The O B S E R V E R

Vol. 2, No. 7

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Page 1



TOUR BUSES

Left to right: Wally Oref, Clifford Barkley, Dorothy Drake, and Merritt Gum

TWO DIESEL BUSES ADDED TO OBSERVATORY FLEET

If you see a blue-bodied bus with a silver top roaring down route 28, don't flag it to pick you up and drop you off at the next corner. It's not the Cass-Green Bank-Arbovale Express. It's only one of the NRAO tourist buses on its regular tour route. The captain at the wheel will either be Merritt Gum or Clifford Barkley, depending on which of the two buses you see at the time.

The Observatory has acquired two diesel buses for touring purposes and in doing so has struck another blow against man-made radio noise. Tourist cars with their noisy ignition systems will sit in the parking lot while their occupants take a care-free tour of the site and facilities.

After the lecture and movie in the conference room the buses are scheduled to leave the Jansky Laboratory at 3:00 p.m. on regular tour days. From the laboratory they will go to the calibration horn, 85-foot, 40-foot, and 140-foot by the way of the main Observatory road. They will travel to the 300-foot over the back road, past the base of the 140-foot, and return to the laboratory by the high school road and route 28. Tour time by bus is one hour -- give or take a few minutes either way.

While not new buses, Paul Devlin and his crew have done an excellent job reconditioning them to look and to run like new. Both buses will be equipped with intercom systems.

You can take a ride free on our buses. All you have to do is take a regular tour (yep, that's the catch). Who knows? It could be educational. How many of our employees know how many operating telescopes the Observatory has? Do you?

EDITORIAL

The picture of the NRAO site taken in the early 1900's, which appeared on the cover of the May issue of The Observer has been the cause of much discussion, both on and off the site.

A brief explanation of the picture was given in the text; however, due to some who misunderstood the purpose of the picture, a more detailed explanation follows.

The picture was taken behind what is now Farmers Supply, looking southwest toward the property which is now the NRAO site. The steam engine is a tractor which was used in conjunction with a threshing machine; it is not a moonshine still as some would like to believe.

There are some people who believe the reason for printing this picture was to show a difference of living standards before and after the arrival of NRAO to the Green Bank-Arbovale area. Had this been our purpose, I'm sure we could have found pictures which would have told a better story.

Our reason was to show the NRAO site, or as much of it as possible, as it appeared more than 50 years ago. Pictures, which can be copied, taken during that period are very scarce. Therefore, we had no choice of pictures which we could use. To those who were offended we extend our apologies and hope they understand our reasons.

We wish to thank the following people who provided us with information and research material: Mrs. Nola Shears, Mr. Moody Orndoff, Mr. Forrest Irvine, Attorney Sharp's office, and Mrs. Thomas Dunbrack.

We hope to continue this project and would appreciate any information, pictures, and research material, which we may borrow, to help us with a detailed and accurate history of the area. The Editor.

SUMMER STUDENT PROGRAM

Over 100 applications were received from students throughout the United States wishing to participate in the NRAO's summer program. After many hard hours of consideration thirteen graduate students representing eleven universities and nine undergraduates representing eight universities were chosen.

In our graduate summer program this year we have:

William Burns from Corapolis, Penn., who is doing his graduate work in Electrical Engineering at Carnegie Tech and is working under the supervision of Dr. Wade.

Carlson Chambliss from Hartford, Conn., has been at the University of Pennsylvania in the field of Astronomy for one year after completing his undergraduate work at Harvard.

Marvin DeJong, his wife and one year old son have arrived from Troy, New York where Marvin is in Astronomy and Physics at Rensselaer.

Mark Fagerlin, who is working in the Electronics Lab, is in Physics (Radio Astronomy) at the University of Florida having done his undergraduate work at University of Puget Sound in Tacoma, Washington.

Allen Harris is an astronomy student at the University of Pennsylvania and his home is Philadelphia. Allen has been working with Nigel Keen.

Carl Heiles, his wife and son are back with us for another year. Carl is in Astronomy at Princeton and is originally from Toledo. The Heiles are living in an apartment in the Residence Hall.

Edward Ng, originally from Hong Kong, arrived from New York. Edward is in Physics and Astronomy at Columbia University, having completed his undergraduate work at the University of Minnesota and Trinity College. He is working with Nigel Keen.

Douglas Pease, a first year graduate student in Math and Physics at the University of Connecticut, did his undergraduate work at Dartmouth and West Virginia University and is a semi-resident of Pocahontas County -- Buckeye -- where his parents have a farm. Doug is working with Dr. Low on his millimeter wave project.

James Seebach is from Case Institute in Ohio, an astronomy student who did his undergraduate work at Union College in Schenectady.

Yervant Terzian is with us once more from Indiana University where he is an astronomy graduate student. Yervant spent part of last year instructing in Elementary Astronomy and is quite busy now working on his master thesis.

Richard Weber from Glen Moore, Penn., is an astronomy graduate student at the University of Maryland. Richard may be found working with Dr. Gart Westerhout near the accounting offices.

Jerome Cohen is with us once again this year. Jerry is from Carnegie Tech in Electrical Engineering and is working under the supervision of Dr. Wade.

William Gingerich from West Virginia has been a student of Electrical Engineering at West Virginia Institute of Technology in Montgomery, W. Va. Bill is married and has two children. His family will not be with him here at the Observatory this summer.

SUMMER STUDENT PROGRAM, Continued

Students in the undergraduate program are:

Jonathan Cook, a student in physics at Trinity College, Hartford, Conn. Mr. Cook hopes to do his graduate work in astronomy and is working under the supervision of Dr. Heeschen. He makes his home in Muskogee, Oklahoma.

Joseph Finch of San Antonio, Texas is a junior physics major at Texas A. and M. presently working with Dr. Johnson.

Elizabeth Pike, our only female summer student, is a junior Physics major at Vassar. Elizabeth is from Connecticut and is working with Dr. Drake.

Jeffrey Linsky of Buffalo, New York has just finished his undergraduate work in Physics at MIT. Jeffrey will be working with David Hogg in preparation for his graduate work in Astrophysics which he will begin this Fall.

Michael Parker also at MIT has just finished his third year in Electrical Engineering. Michael can be found working in the Electronics Lab. His home is Bunnell, Florida.

Wade Poteet from South Charleston, W. Va., has just finished two years at North Carolina State in the school of Physics. Wade is working with Nigel Keen and has lately been seen climbing an antenna under NJK's direction.

Paul Thomas is from Kentucky and a third year student at the University of Louisville in the Department of Physics. He can be found working in the office of Dr. Bertil Hoglund.

Peter Tong, whose home is in Philadelphia, graduated from the University of Delaware in Electrical Engineering this June. He is working in Electronics with Jim Dolan.

Robert Drake, a student at Cornell University, is working with Dr. Low in his millimeter wave project.

A FIRST ATTEMPT TO OBSERVE THE RADIO ASTRONOMICAL EFFECTS OF WEST FORD, J. W. Findlay and B. Hansson

The following brief note describes an experiment which so far has failed and for the failure of which the experimenters have so far been unable to find a satisfactory explanation. The note will be of interest to the readers of the Observer but obviously is not meant for general publication.

Attempts were made to observe the transit through the beam of the NRAO 85-foot radio telescope of the patch of the WF belt which was being illuminated by the Millstone Hill WF transmitter. The coordinates of this illuminated patch were calculated for 5 minute intervals of time by Lincoln Lab and supplied to NRAO before each pass. The NRAO telescope was positioned in advance of each transit at the HA and declination of the expected transit and a drift curve observed. The transmitter was very near to 7750 Mc/s, (small corrections due to Doppler and other reasons were known and allowed for). The average power radiated exceeded 10 kw. The receiver was a very simple total power crystal mixer with a "radio astronomers" noise temperature of about 400 °K. The receiver time constant was 2 seconds and two bandwidths, 8 Mc/s and 1 Mc/s, were observed simultaneously. The Lilley figure (AJ 66, 105, 1961) for the expected antenna temperature adjusted for the bandwidths used, suggests that antenna temperature changes of about 2 °K (8 Mc) and 18 °K (1 Mc) should have occurred. The peak to peak noise on the records was about 0.5 °K (8 Mc) and about 1.3 °K (1 Mc). No WF signals were received.

Errors may have occurred in either setting the receiver frequency or in positioning the telescope. Double checks (exhaustive and exhausting) were made on both these sources of error.

WEST FORD, Continued

NRAO hopes to look again, but 5-6 weeks must elapse since the telescope has other duties. Dr. Harold Weaver at the University of California hopes also to attempt to observe using his 85-foot and the Camp Parks transmitter.

Many people at Lincoln helped by computing illuminating, and discussing. We hope to get a positive result next time.

was represented by Peter Good, who acted as liaison between Pacific Crane and Rigging Co. and ON-FILM CO.

We thought the beard worn by Charley White of PC and R was grown because he expected to have a major role in the film being made. He still has the beard so he must have grown it for some other reason. He apparently rules the roost at his home. We know some other fellows around here who shaved off their beards upon request from their wives.

140-FOOT TELESCOPE

Mr. W. A. Grottaku, Vice President and Chief Engineer of Pacific Crane and Rigging Company, arrived at the 140' on June 3rd for a series of conferences with AUI and S and W representatives.

Mr. Greenwood, after returning from a trip to Sun Shipbuilding and Dry Dock Co. in Chester, Pa., on which he was accompanied by Peter Good, remarked that Mr. Good buzzed around at Sun Ship like a "Blue Tailed Fly". This was Mr. Good's first trip to a fabricator's shop as photographer for the 140'. We hope he remembered an important thing about movie making and put some film in his camera. We're awaiting development of his first footage and hope he has something on it.

Mr. Small returned from his Memorial Day weekend in New York on Monday night, June 3. Some difficulty was experienced in finding a place to land the plane, which flew him down from Brookhaven, because of bad weather conditions. They finally landed in Clarksburg with only "minutes" of their gas supply remaining. Man, level land isn't found everywhere in this state in case it's needed for emergency landings. Hope they don't cut it that close again.

On Friday, June 14th, ON-FILM CO., a professional movie firm was on site making a movie on aluminum welding for ALCOA. The 140'

300-FOOT TELESCOPE

The end of this month concludes the NRL polarization experiment. The NRL people seem quite happy with the results they are getting, and are quite enthusiastic about the 300' telescope.

The Department of Terrestrial Magnetism, Carnegie Institute of Washington takes the 300' next, with their travelling feed and multichannel receiver. This will be their third visit to the 300'. Their program is expected to last six weeks.

In anticipation of the great amount of equipment necessary to install and operate a multifeed system on the 300', operations people have been busy planning a temporary Works Area provided console, while the regular console is being relocated upstairs. Location of the operating console upstairs will give the operator some view of the telescope and a better idea of weather conditions.

Telescope Operations welcomes two new members to its group -- Lloyd Hunter and Darrell Southern. Both hail from the Beckley area. Lloyd has three children and hopes to move his family to this area before too long. Darrell is a very eligible bachelor.

85-FOOT TELESCOPE

The 85' telescope has recently undergone extensive changes at its focal point and in its cabling. A ring, which provides a more suitable equipment area behind the focus, replaces the conical Blaw-Knox provided feed support termination.

The first feed to be installed on this new ring is the so-called shaped feed provided by Henry Jasik. A week of testing this feed is anticipated, after which time the much touted maser, operating at 6 cm, will be installed.

Dick Spurlock has aptly demonstrated his agility in climbing the 85'.

Jim White, who janitors at the 85' and 300', has complained about what appeared to be car tire skid marks on the floor of the 85' control room. One too many, Jim? Seriously, how did the marks get there?

ENGINEERING DIVISION

Work has started on the new warehouse building by E. L. Harris and Son, Inc., a construction firm from Charleston, W. Va. The building will be 60' wide by 160' long, contain 9,600 square feet of floor space and be completed in the fall.

Some site work is now in progress on the 85-Interferometer project and it is hoped that steel erection will start the latter part of August.

Paul Hahn, the engineering co-op student from Drexel, has been replaced by Wayne Statler. William Sheets, a summer student from WVU, also joined the Division for the summer and the men (Don Newsom and Jim DeBrunner) from All-State Engineering will work within the Division.

RECREATION AREA

Base work is progressing steadily on the two new tennis courts now under construction for this summer so that construction costs will be kept to a minimum.

The two new tennis courts will be to the south and adjoining the present courts.

A new filter system has been installed at the Hannah well and a water line run to the tennis court area. A drinking fountain will be placed at the tennis courts. Additional plumbing at the well will permit laying a line to the picnic area in the future.

The work order is in for the long sought for tennis-handball wall. The wall will be located at the east boundry (towards Deer Creek) of the basketball court. Plans call for a wall 28 feet long, 16 feet high with a 5/8 inch plywood wall facing supported by 2 x 6's.

Recently new signs have been placed to guide people to the picnic area. Please enter the picnic area as indicated by the signs. Several other signs have been erected to indicate safe driving speeds in the recreation area. Many instances of excessive speeds have been witnessed in the past. We don't want a single child injured. Watch them -- they won't watch you.

And where are all the budding golf pros. The Marlinton golf course awaits you. The lush green turf is begging for the touch of your feet and the gentle caresses of your lovin irons.

Best of all golf is free to members of the NRAORA. All you have to do is pick up a membership card and head for the number one tee. If you have never played -- so what? Arnold Palmer wasn't a pro the first time he played either. In the words of that famous senator, good old Jack S. Phogbound, "Tis better to have played and duffed, than to have never duffed at all."

LAB GAB

The traveling wave (ruby) maser is now in the low noise lab where necessary experiments are being performed on it to insure proper functioning when it is installed on the 85-foot telescope.

The 85-foot dish has had an appreciable face lifting job done on it. A new front end support in the shape of a ring in place of the old pillbox has been installed making it a little easier to install front end systems for receivers we use here at the lab.

The maser system was built by Airborne Instruments Lab on Long Island in New York. It receives at 4995 megacycles per second and can detect almost infinitesimal amount of signal from outer space. The maser ruby is cooled by liquid helium to a temperature of about minus 452 degrees F, which is in turn kept cool by liquid nitrogen, all in a triple walled vacuum dewar flask (a fancy thermos bottle).

It is expected to be installed on the 85-foot dish by the first of July. Oh yes -- the services of a good service station operator are need to "gas" up the maser every day in all kinds of weather -- any takers?

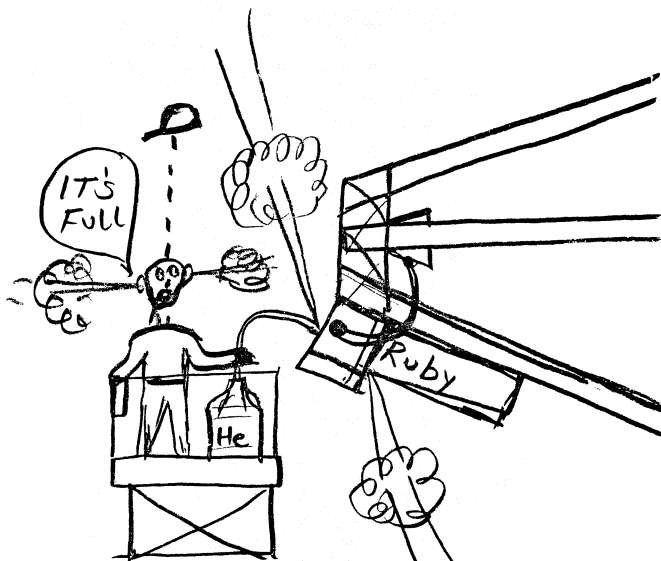
We will have to do without any "Ole Sarge says" sayings until Dick Skaggs comes back from his 2 weeks Army camp duty. He will no doubt have a few sage sayings for us.

Dewey Ross returned recently from a business trip to Washington -- where he discovered how to run a lab with one unit oscillator and one old volt-ohm-meter. When asked for a statement concerning his trip, all he said was "Bah Humbug."

Lost -- one station wagon mattress.

Mr. Ralph Cooper has joined the lab as an electronic technician. He will be working with John Hensley in the test equipment repair group.

We understand Peck McPherson is having an "unexpected vacation" in the Pocahontas Memorial Hospital. Best wishes from all of us and we hope to see you back soon.



Hein Hvatum participated in Operation Rescue. See him for details.

Bert Hansson returned from a trip to Boston and New York with a new Corvair.

Bertil Hóglund returned June 17 from a trip to the west coast, etc. He says he had a very nice time despite the car troubles.

Nigel Keen vacationed in Mexico City and we hear that he has many interesting stories to tell.

Paulo Mariotto, from Brazil, now working at Carnegie in Washington, will be visiting the Observatory for several weeks. We hope you have a pleasant stay.

Visitors -- B. Lindblad, Sweden; Gregg Smith and Bob Wolczok, AIL, New York; George Peter and Durwood Teeter, Cornell University, New York; Henry Jasik and A. D. Bresler, Jasik Labs, New York.

NATIONAL RIFLE ASSOCIATION

The Director of Civilian Marksmanship, Department of the Army, has announced that it is making available to members of the National Rifle Association the .30 M-1 carbine.

The stated purpose of the National Rifle Association when formed in 1871 was to promote the marksmanship of those persons subject to military service. Of course, the NRA programs have now expanded to include many facets of the firearms field. Its program for the average citizen-member has been to provide through the DCM surplus or unserviceable weapons at a nominal fee. Unserviceable weapons are those that are safe to shoot, but have damaged or missing peripheral parts. Unserviceable also has meant those weapons that are outdated to the point that they are no longer issued to troops. They will, in most cases, serve very well as training weapons.

One of the early rifles made available to the NRA members was the military version of the Winchester Model 87 single-shot low-wall musket, which sold for \$1.50. Perhaps the most famous has been the 1903-1903A3 30-06 Springfield which has just been discontinued, but sold for \$14.50.

The cost of the M-1 carbine to NRA members is \$20.00 as opposed to \$70-80 asked by commercial suppliers for weapons in near first-class condition.

The NRA has been flooded by requests for the carbine by its members -- over 100,000 requests have been received in less than two months.

The M-1 carbine is no great shakes as a hunting gun. It was designed primarily as replacement for the service pistol. It is semiautomatic, gas operated with a detachable 15 or 30 round clip.

One can get some idea of its ballistic properties by comparing it to some of our more popular calibers.

Caliber	Bullet (grains)	Energy ft. lbs./100 yds.	Velocity ft./sec. at 100 yds.
.22 long rifle	40	97	1045
.30 M-1 carbine	111	615	1580
30-30	150	1360	2020
.30-06	150	2280	2620

Several conclusions may be drawn by look-at the above tabulation, but the most obvious one to the deer hunter is that the carbine bullet has little more than half the energy of the time-honored "thutty-thutty". This, of course, is the reason why most people believe the carbine to be woefully inadequate for deer. The general feeling is that most states will outlaw the carbine for deer hunting.

On the other hand, however, the M-1 carbine can fill a definite need in the shooter's gun lineup. It does give a half decent showing on varmints up to 100 yards. It is the type of gun that one would enjoy shooting at running targets with, or shooting rapid fire at fixed targets.

NRA, Continued

In these days of supervelocities and magnum calibers, the carbine enjoys the characteristics of light recoil, light weight, and light report. These factors add up to say that the M-1 carbine can be quote a bit of enjoyment, and is certainly worth the modest \$20,00 asked for it. Ammunition is available from the DCM, or commercial outlets.

MESSAGE FROM MR. AND MRS. V. R. VENUGOPAL

Before leaving Green Bank we desire to express our sincere thanks to all the employees of NRAO and their families for making our stay here happy. We enjoyed our stay in this part of the USA and carry with us very pleasant memories.

Best wishes to all.

Mr. and Mrs. V. R. Venugopal

BIRTHDAYS -- JULY

4	Vincent Scott
5	Warren Wooddell
12	Bruce Nottingham
21	Gene Crist
23	Ed Wilson
26	Glen Grandon
27	Bert Hansson
29	Maxie Gumm
30	Ralph Perry
31	Ed Gardner

NRAORA PICNIC

The date selected for the Observatory picnic is July 13. The exact time will be announced later, but it will begin in the early afternoon. Plans for food and refreshments are proceeding nicely as are entertainment preparations. Cooperation and interest are needed to make this a successful occasion. So remember you have a date at the recreation area on July 13, Saturday afternoon. Bring the family and a big appetite.

CONSERVATION NEWS

One of West Virginia's newest public fishing areas, Plum Orchard Lake, was officially opened Saturday, June 22.

The lake is located in Fayette County, about 4 miles from the Mossy Interchange of the W. Va. Turnpike and is stocked primarily with large mouth bass.

Present regulations for the lake will permit motor boats, with restricted speeds, on some parts of the lake. At full level, the lake has a shore line of 6 1/2 miles and will be over 1 1/2 miles long at the longest point.

Neil Horner is thinking of going into the farming business. There is a question of \$125,000.00.

Margaret Irvine's father died June 21 with a heart attack. Margaret was Mr. Callender's former secretary.

FOR SALE --

1957 Buick station wagon.
See or call Troy Lusk, ext. 260.

FOR SALE --

One Shetland pony about 1 year old.
This is a young stallion, quite spirited. He is black with white spots, and will make a very nice pet for the children when trained (the pony, that is). For more details, see Bill Meredith.

WANTED --

A bumper or tripod jack suitable for a 1956 Buick. See or call Wally Oref, ext. 211 or 456-2239.

FOUND --

Zippo cigarette lighter with "Bruce" carved on the side.
See Virginia Irvine.

THE CASS SCENIC RAILROAD

Ride the Cass Scenic Railroad behind a unique steam Shay locomotive in beautiful mountainous Pocahontas County.

1963 Centennial Operating Schedule

June 15 through September 2

Saturday, Sunday, and holidays - 11:00 a.m., 1:00 p.m., and 3:00 p.m.

Wednesday, Thursday, and Friday - 1:00 p.m. and 3:00 p.m.

No trips on Monday and Tuesday

Note: Schedules are adhered to as closely as possible but the railroad reserves the right to alter schedules as operating conditions demand.

ROUND TRIP FARES

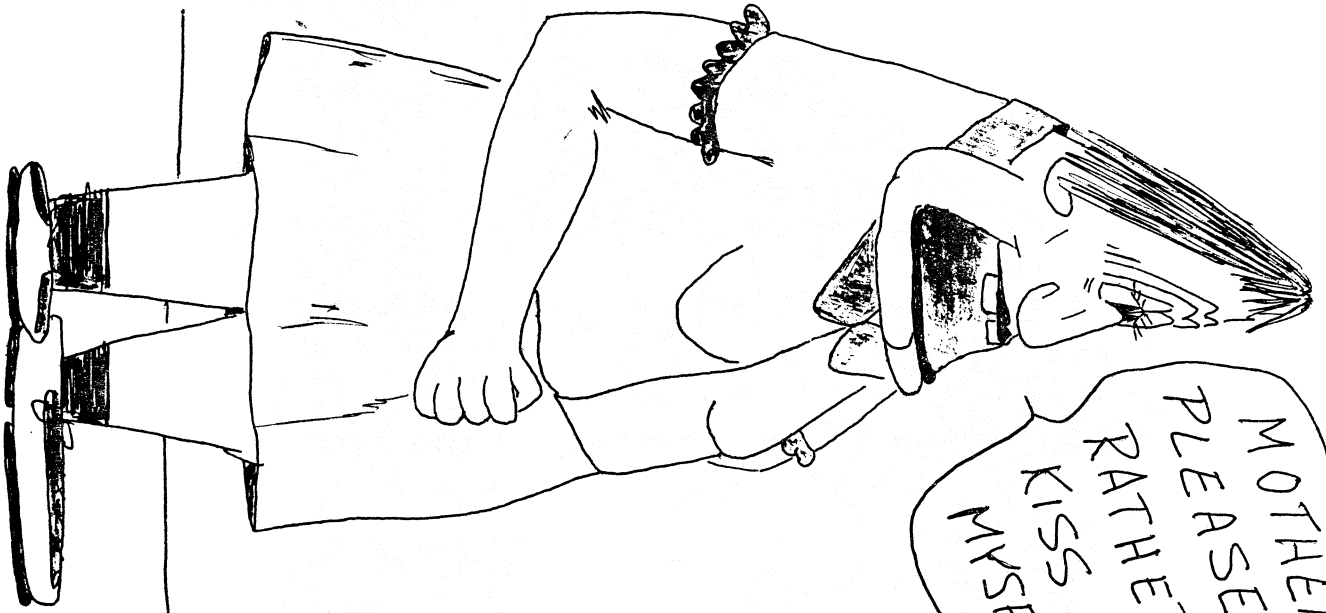
Adults \$2.00, includes tax

Children, under 12 \$1.00, includes tax

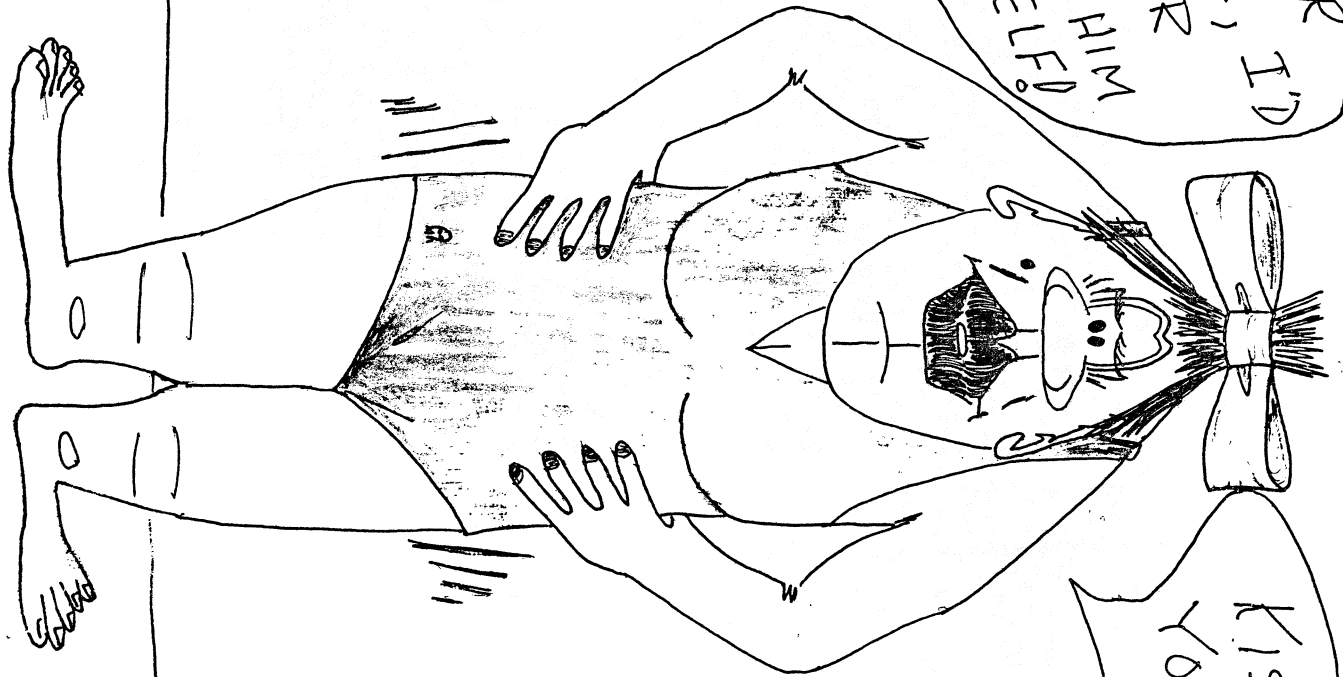
Tickets may be obtained at the ticket office in the Cass Depot.

Sandwiches and soft drinks are available nearby, or bring your own picnic lunch. Picnic tables are located on the mountain, at the end of the four mile railroad line. The eight mile round trip takes about two hours.

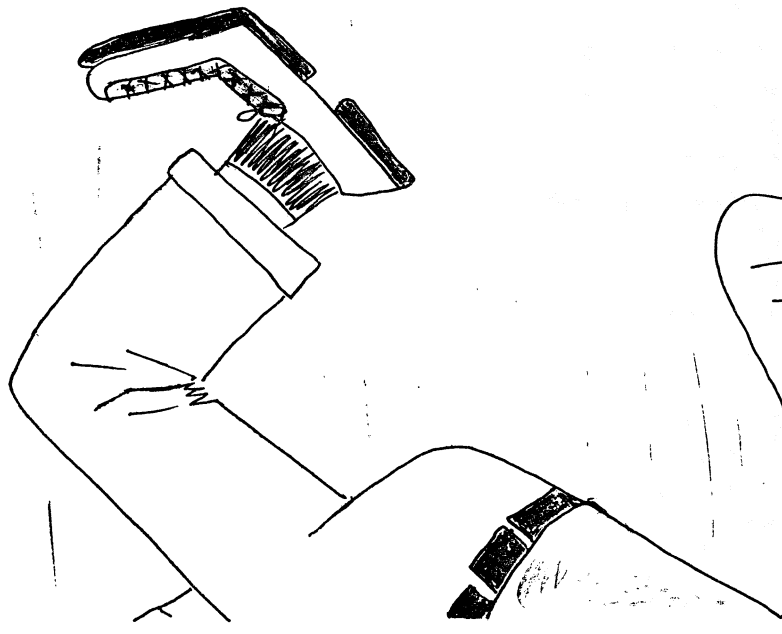
For additional information call 456-4264.



MOTHER, I'D
PLEASE, I'D
RATHER
KISS HIM
MYSELF!



KISS ME,
YOU FOOL!



HELP!!