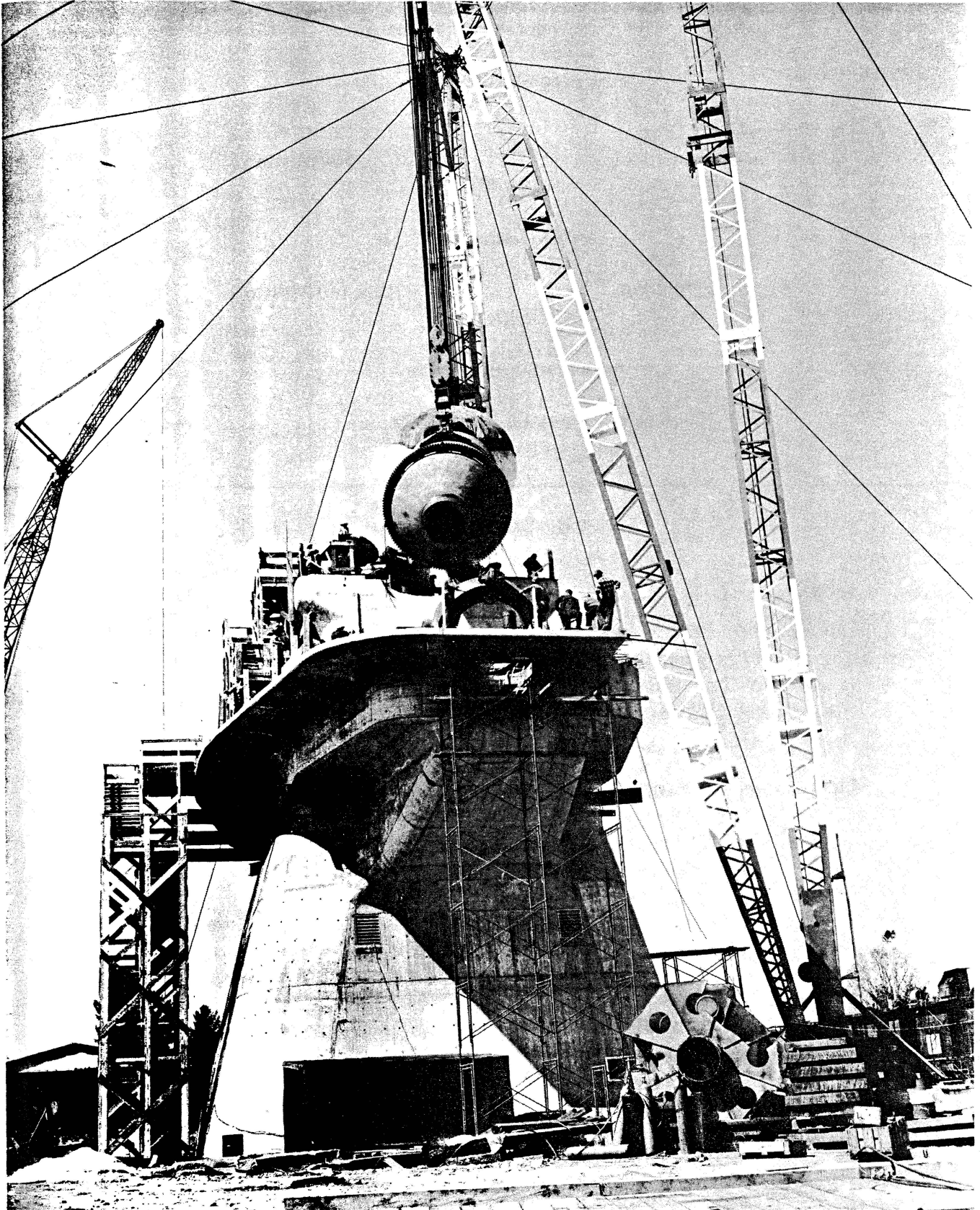


The O B S E R V E R

Vol. 3, No. 7

May 28, 1964



140' SPHERE AND SHAFT

Observer Editor:
Peter B. Good

Cub Reporters for Month of May:

Leroy Webb
Tom Hawkins

Howard Lambert
John Hungerbuhler

Don Hovatter

Articles Submitted by:

Howard Lambert

Jacob Baars

Neil Albaugh

Typist: Norma Brockway

Photography and Printing by:
Graphic Arts Dept.

140' SPHERE AND SHAFT

by
Howard Lambert

Most Observatory personnel will recognize our cover picture this month. If you don't recognize the 140' it is, perhaps, an indication that you just came on the scene today. The 140' has been around for quite a long time and work now appears to be progressing very well and it is expected that we will see the 140' to a successful completion.

The operation shown in the cover picture is that of lifting the assembled polar axis shaft and sphere into position on top of the pedestal building. An enormous amount of work went into preparations for making this life and it was certainly satisfying to see it completed with no difficulty.

This assembly weighs 385 tons, and although one of the most critical, it is not the heaviest lift which will be made. The yoke hub assembly, which we expect to lift in the near future, will weigh in excess of 400 tons.

After setting of the shaft and sphere on the 5th pad head and in the tail bearing housing, John Ralston and Sidney Smith, assisted by the Scientific Staff, sighted through the shaft on the night of May 16th to locate position plots of Polaris. These plots indicated the centerline of the shaft to be three (3) minutes of arc to the West and seven (7) minutes of arc high, both at the tail bearing. The South end of the shaft was dropped .980" to bring it nearer true.

.....continued on next page.....

Final adjustments of main bearing hydropads and tail bearing hydropads remain before it can finally be said that the shaft and sphere assembly is completely in place, however, they are off the ground, on the building, and we are going strong.

REPORT

April was a kind of a month at the end of which a telescope operator should be willing to write a report about what was really going on there. For that reason there was a guest reporter who promptly was too late with his story. So, this month you can read a special story about the , which you can believe or not. In any case, it is the truth.

Observers during most of the time were Heinz Wendker and Jacob Baars. They worked with a 2 cm (about 25/32 of an inch) receiver and they are absolutely the most strange observers we ever had on the 85. During the finest weather, on sunny and clear days, they made shifts of almost twelve hours, while anybody else would be fishing or something like that. But as soon as the weather is bad, you see nobody; they are simply not interested. I think it is because they are not used to good weather in Europe.

We understand that it was a hard time for the operators. Before coming out on their shifts they were supposed to look out of the window; if there were no stars they could stay in bed. But the next morning Len wanted them to pull ies along the site and in the evening the observing conditions could be good again. Very annoying altogether. Don found a solution - he simply came every night. Who can prove that there are no stars in Cass when you can't see them here. It seems that his son (three weeks old now) already asks for spaghetti and chianti. Italians change very slowly. This month our film star is Len, because Leroy had some trouble with his and the movie seems to be in color. performed at the 300 because the con- there was nicer. But look now at the 85. There are two operating panels,

the other one for the interferometer 85 and all the mess is cleaned up. It is a pity that you did not see Howard the other day when he put on the brakes of 85/2 from our control board and saw from our window that the telescope slewed west. Cables are sometimes very difficult to connect in the right way.

The two older operators, Darrell and Bill, are still in good shape. They both drink lots of coffee and are very slow in going home. Darrell still refuses to eat the banana his landlady puts in his lunch. It seems that Jaap takes care of that.

Since a week or so we have a 6 cm system on the scope; Heinz Wendker is the observer and he promised to give us around the clock program of the kind we are used to. So, life will be more regular this month. Perhaps we won't need a guest reporter then. Probably this report will be quite different the next time. Bud don't blame this reporter. He has done his best. Take it easy.

Don Cardarella is the proud father of a 7 lb. 13 oz. boy born May 11. We understand that Don is pretty good at house-keeping and taking care of his two little girls.

Bill Hunter is spending his leisure time building a new home in the Arbovale suburbs.

300-ft TELESCOPE

The one hundred channel, hydrogen line, autocorrelation receiver, as reported last month, is on the instrument and information for four programs is being collected at this time.

..... continued on next page.

Dr. Menon and Dr. Williams are looking at the absorption lines caused by hydrogen in our immediate neighborhood, i. e., Milky Way, and are observing primarily, but not altogether, outside the galaxy. A few of the more familiar sources checked at random are listed: 3C145, better known as the Orion Nebula, is intergalactic approximately 1,000 light years distant, and is a bright star surrounded by a cloud of gas. 3C273, a nebula at some one billion light years distance, and is thought to be pulsating at thirteen year intervals. 3C147, entitled Quasi-Stellar by recent articles in Time, Newsweek, and Life magazines, is thought to be larger than the largest of galaxies, but free of stars, and was originally believed to be intergalactic until recently discovered to be receding at 76,000 miles per second. It is now considered the most distant object and probably the strongest radio emitter in the universe. (A light year is the distance light travels in one second, 186,000 miles multiplied by the number of seconds in one year.) (3C represents sources from the Third Cambridge Radio Survey Catalogue, conducted by Cambridge University, England.) Dr. Williams is visiting for the second time in a year from the California Institute of Technology, and will be with us for the duration of the correlator. Some of us are trying to persuade him to join NRAO, a talent of his caliber is difficult to acquire.

Dr. Westerhout, a familiar figure to all of us is doing the calibration checks on the correlator, plus making high latitude and galactic plane observations.

Dr. Roberts is observing a few N. G. C. (New General Catalogue) sources. These are some of the same sources he observed so far with the twenty-four channel receiver. He is comparing results of the two hydrogen line receivers with the intention of making ~~are~~ observations with the correlator.

Dr. Roberts' original program was to associate amounts of hydrogen to particular types of galaxies, with some sort of inflationary pattern in mind. (Reported

beautifully in an article by Dr. Roberts in Scientific American last year.)

Dr. Burke and Dr. Turner visiting from the Department of Terrestrial Magnetism (D. T. M.), Carnegie Institute, Washington, D. C., were here last summer with a one hundred hydrogen line (filter type) receiver. This receiver was constructed entirely in a trailer, and was mated to our instrument. At the present time they are observing M31 (M stands for Messier, who in 1783 catalogued 103 galaxies). M31 is the famous Andromeda Nebula, which is similar to the Milky Way in structure, and is approximately 1.9 million light years distant. They are also scheduled to observe M33, the most distant galaxy of our local group of some twenty galaxies (local designates anything within two million light years. M33 is an open spiral type galaxy, smaller than Andromeda, made up of groups of star clusters that seem to be arranging into a tighter spiral. Burke and Turner are also doing some calibrations, perhaps with the idea of using the correlator more extensively.

What makes the autocorrelator so unique among receivers is that it performs a computer function by averaging the background level to the hydrogen level, and presents this output as the correlator function. This is perhaps the fore-runner of computers at the telescopes; all an astronomer would have to do is give us a program. Final reduction would be done at the back end of the receiver. (Just dreaming - but who knows.)

Welcome Harold Crist, relief operator for the summer who is presently training at the 300-ft on weekends. Harold is a life long resident and a teacher at Green Bank.

140 -Ft TELESCOPE

An apology is in order to Mr. Greenwood for missing him in our article last month. Credit was given to Mr. Grabe for expediting shipment on spherical bearing, but credit was not given to Mr. Greenwood for expediting shipment of the pad and jack, which is another of the important components of the 140-ft. Sorry, accept our apology Mr. Greenwood.

On Friday, May 1, all 28 - 5 1/2" diameter bolts were inserted into the sphere. On May the sphere was lifted and moved to the polar shaft for connection to it. The 28 bolts were inserted (all simultaneously) into mating holes in the shaft. The operation went very well with no damage to any threads on bolts.

Peter Good, I was about to say, hadn't done anything at all this month. He has really - covering shipment of the sphere from Bartwo to the job site; connection of the sphere to the shaft and lifting of the assembled shaft and sphere onto the building. Further, he and Gene Marcum through his scorch test with his camera lights while shooting footage of the 140-ft console. I've been through this scorch test when Pete was doing preliminary tests of the lighting equipment. If you've ever wondered why the Hollywood stars push TV commercials for deodorants, don't. I would say they must continue to look for something good after perspiring under those lights.

John Ralston traveled to Brookhaven on April 29 and 30 concerning instruments and procedure for aligning the 140-ft Telescope.

The first surface panel arrived at the job site on May 6. Our man in Cohasset, George Grove, keeps us informed on status of production work on panels.

It was gratifying to see so much interest displayed in the lifting of the shaft and sphere on May 15th. We think it is now apparent to all Observatory personnel that things are really being done at the 140-ft.

On Sunday, May 17th, my wife, my children, three other guests and I came from Franklin to the Observatory for a picnic. With the exception of rain (which Jim White said would not come) about one third of the way through our dinner, we had a wonderful time and strongly recommend that you support the Recreation Association. It is a wonderful thing for the Observatory, and you.

RIFLE MATCH

On May 20th the Green Bank Rifle and Pistol Club held a small bore rifle match at the Observatory Rifle Range.

Basically, the match rules were: 5 rounds for sighting in and 10 round for score. The distance was 50 yards and the position off-hand only. Highest possible score was 100

The winners were:

		Score
First place	Don Hovatter	99
Second place	Covert Poling	95
Third place	John Hungerbuhler	90*

* Claude Bare also had a score of 90, however John had the most rounds in the X ring.

The honor of cleaning the rifles was awarded (on the basis of score) to Herb Hanes, Paul Devlin, John Parker, and Fred Crews.

Another match was held at 5:00 p.m. Tuesday, May 26th.

The rules of the next match were as follows:

Distance	50 yards
Positions	(3) standing, kneeling and sitting
No. Rounds	(35) 10 for each position plus 5 for sighting in
Cost	75 cents for the 35 rounds

BUT SERIOUSLY by Snodgrass

If Shakespeare had been another Methuselah, we would have celebrated his 400th birthday this year. Despite the lapse of time since his era, he is still one of the great observers of humanity, and he is surely the most significant playwright of all time. He had the turn of phrase that so clearly distinguishes the artist from the artisan: the Bach from the Richard Rogers.

For Art has nothing to do with money, knows no national boundaries, cannot be graded by highly paid experts, is morally neutral, and is ever changing in its relationship to the world. Art is the great leveller. The world is reading more books than ever before, listening to more music than ever before, painting more pictures than ever before, acting in more plays than ever before, and if we are merely concerned with statistics this appears to be a very satisfactory state of affairs; a closer look at the situation is not so encouraging, however. Let us consider drama for example. In Shakespeare's day a dramatist was very much a part of the play, and in many cases he wrote parts specially for particular actors. The plays were performed before extremely critical audiences, without the protection of orchestra pit, footlights and dramatic conformity. There was no scenery, special lighting or prompter. As late as 1920 many theaters were still operating in this way. But the death-knell of drama as a popular art form was the advent of popular cinema, live spectacular and (the greatest monster of them all) television. These three agents of destruction have given us a new unreality and remoteness. Entertainment has taken the place of fulfillment. The peddlars of this new social dope tell us it is good for us; after all aren't they experts...

The decline in the appreciation of live drama

in particular, and of art in general, may also be due to the idea that culture may be obtained on the cheap: one night a week at the Women's Institute and we are experts; join the Big Turnover Book Club, and we will guarantee literary expertise by the end of the month; learn to play the piano by the Richter (abridged) method, and we will be sought after by all the drawing rooms of New York and Green Bank - if they are not watching television. Art is suddenly a way to impress old friends and to gain new ones. (My goodness, we must learn to play a musical instrument. Did you see how impressed the ambassador's wife was with the Jim Snodgrass concerto for cheese-grater and two Pepsi cans?)

Shakespeare lived in the halcyon days of a powerful independent nation. There was an egalitarian feeling in Britain which was two hundred years ahead of the other European countries. The kings Henry had laid firm foundations for the Elizabethan era, and the religious, military and political independence was heady stuff: Shakespeare himself said, "Britain is a world by itself, and we will nothing pay for wearing our own noses". Other pungent comments include "A barber's chair fits all buttocks" and "In converting Jews to Christians, we raise the price of pork". Shakespeare is not just being clever; he is being as political as he is literary. Art is communication at its highest level, and Shakespeare was using his plays as political and social comment beside the superb language and the sparkling wit. The masses who had begun to be aware of their human rights, rapidly understood the language of Shakespeare and his contemporaries. For the first time in history the people were able to taste the fruit of their artistic community. It is a dubious comment on 400 years of "civilization" to see what has happened to folk are since Shakespeare.....

ENGINEERING ESSENSE

Interferometer:

The new telescope was for the first time lifted off its foundation and entirely supported by the wheeled dollies on May 18. Telescope foundation plates were grouted in on 5/21 and bolts kirksited on 5/22.

Presently the installation of shop fabricated coax carrying cable aluminum tray is taking place and will be completed on 5/26/64.

Three new Floodlights were installed onto structure on 5/12/64.

Cable reel installation for the Lifting Platform Tower was completed 5/21/64.

Two 1000 ft. lengths of 50 pair communication cable were laid into cable tray by 5/19/64. Termination connections at 600-750-900-1050 meters will take place tentatively week 5/25/63 once we receive Terminal Boards.

All the 2000 ft. of additional no. 2 Power cables were laid into tray by 5/21/64. Shop built transformer stand and purchased transformers were installed. On 5/25/64 concrete will be poured into Transformer Stand foundation to anchor them into ground. Power will be available at all points week 5/25/64.

Bayliss and Ramey Electrical Contractors were the successful bidders for the coax cable laying job. They arrived on site 5/4/64 and had all the required ditch length dug and cable laid by 5/20/64. There remains about 40% of ditch to be backfilled which should be completed week 5/25/64. Additional length from Station No. 1 to No. 2 will be dug up and laid only after receiving and testing cables on site around 5/28/64.

Grounding of the cable tray was completed 5/22/64. One ground every 50 feet of cable tray.

- i) Contractor has completed backfilling all station foundations and is presently involved in grading for drainage and final road grade. Job status about 80% completed.
- j) Additional culvert lengths were added onto west side of ravine to allow for backfilling in order to prevent erosion and earth escapement further this will enable us to lay coax cable into the ground rather than thru or on special tray to cross this ravine. Roadway contractor shall also make repairs to the damaged control cable tray which resulted by his equipment operator pushing earth against tray supporting posts.
- k) 4160 V Power Line Station No. 2 and No. 6 will be dug up, cables laid Mail boxes installed and grouted with a tentative completion date of 6/5/64. This work is also done by Bayliss and Ramey Contractors.
- l) On 5/6/64 the interchangeable feed mounts for the 85-ft - 1 and 2 were completed and installed.
- m) Encoder covers for the 85-ft-2 fabricated in our shop were completed and installation will follow during week 5/25/64.

140-ft Telescope:

- a) Engineering has laid out and staked emplacement on the South slope of the West parking lot, to erect one complete set of surface panels of the 140-ft. for measurement and performance test purposes. First stage - forming and pouring of concrete platforms for panel support on 5/25/64.

Second State - Actual erection of outer surface panel to exactly match ultimate method by 5/27-28 as a number of prototypes of stools and revised jack assemblies have to be fabricated by our shop.

- b) Shop has presently in fabrication a receiver mounting ring which will be completed by 5/29/64. continued on next page.

The first of a series of Power Distribution System preventive maintenance was undertaken and completed at the 140-ft. Substation on 5/3/64. Other substations will all be scheduled to undergo the same procedure.

Engineering is studying the S and W design requirement of additional reinforcement for the aluminum back-up structure.

Engineering and Drafting:

A major portion of engineering and drafting time has been allocated to prepare some preliminary plans, specifications and drawings for a number of interchangeable

or receiver mounts for the 300-ft - 140-ft - 85-ft - including polarizing - rotating - focusing possibilities.

The variable speed drive arrangement on the Reber Dish will be completed by 6/64 and available for review.

Drexel Students are presently occupied by rearranging and modifying drawings of site, power, water, sewage, roads, etc., in order to bring them all up to date and concurrent with installations.

General:

Airstrip - Considering the temporary air status of the airstrip as undertaken, we can say that at this point it is 80% completed. Remaining work is on drainage ditches presently being built.

Surplus Equipment - Herb Hanes and Paul Devlin have visited various Defense locations on 5/4 to 5/7/64 and have requisitioned a number of machines and equipment presently being processed by N. S. F. and G. S. A. and expected to begin to arrive on site week 6/1/64.

de St. Clair and Paul Devlin have

visited additional Defense locations on 5/13 to 5/15/64 and were successful in requisitioning an amount of electrical equipment and cables, presently being processed by NSF/GSA. Shipment expected to arrive during week 6/1/64.

Workshop - Basil Gumm, Welder in our shop who has sprained his ankle while working on the 85-ft telescope has been ordered off his feet by Dr. D. Martin as of 5/18/64. He is due to return on 5/25/64.

This has reduced the welding force by 50% at a critical time, and the results were felt ostensibly as part of the shop personnel had to work overtime on fabrication and installation of the aluminum coax trays.

Note: Ratio of fabrication and shop work as to installation for this month amounts to 1:1 in man hours.

A newly purchased Heavy Duty Grinder was delivered on May 5, 1964.

Jet Engine - Engine was dismantled and encapsulated on April 29, 1964. All parts were parked in Vehicle Compound. Mr. G. Railsback consultant on this job left Green Bank on May 1st, 1964 to return to N. J.

LOST AND FOUND

One Timex watch found in Recreation Area
Owner call - Identify - and pick up

Phone 456-4118

FOR SALE

One Kenmore seven (7) cycles fully automatic washing machine. One year old - \$289 value, Sell for \$100.

Phone 456-4118

KITTENS

BEAUTIFUL KITTENS

PERSIAN KITTENS

(Black and White)

Are being given away

Contact Mrs. Elizabeth Hvatum

Phone 456-4616

The Observatory Wives' regular monthly meeting will be held in the upstairs lounge of the Residence Hall Wednesday, June 10, 1964 from 1:00 to 3:00.

The hostesses are Mrs. Gardner and Mrs. Horne.

EXPLOSIVE!

SHOCKING!

A motion picture that has won world wide acclaim!

HARRY MEL
BELAFONTE FERRER
in

"The WORLD, the FLESH and the DEVIL"

Every person will want to see this truly great film.
Check your calender for 8:00 PM, JUNE 1st

Put everything aside and be sure to attend one of the most amazing films you have ever seen.

- ▷ NOT INTENDED FOR CHILDREN.
- ▷ NO ONE PERMITTED DURING THE LAST 30 MINUTES OF THE MOVIE.