

OBSERVATIONS ARE MADE - WHAT THEN?

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At times some rumors get back to Headquarters that observers say they make their observations and send them to Headquarters where they disappear into a bottomless pit!

That is far from the truth! Here is the sequence of events. When the morning mail is opened all report sheets are put in one pile. They are sorted alphabetically, dated, and the observers' code initials are entered in color in a special place. Then they are filed in a folder with other reports received that month.

On a nearby table are five stacks of 8 1/2" x 11" sheets; one or more for each variable which is being observed. The sheets are coordinate paper printed in light blue (for ease in plotting) with ten small squares per inch. The normal scale is 100 days and 2 magnitudes to the inch. The sheet is printed for 1000 Julian Days, and magnitudes 4 to 16. For the irregular and rapidly varying stars, or for stars with small ranges, the appropriate coordinates are written or typed in.

A folder with the reports and one stack of plots is taken home by the Director each night in an attempt to keep in touch with each observer's work and the activities of each variable by plotting for several hours. Others in the office take over some of the plotting during the day. By the end of a month, the previous month's observations are all plotted and more than half of the current month is done. In this way we have an up-to-date source of information about each variable.

It is very necessary to keep our plots up-to-date so we can answer the many phone calls and letters we constantly receive. For instance, a phone call from Arizona came in and an astronomer said he had noted some very peculiar polarization effects in μ Cephei and wondered if we had any visual observations. I was delighted to say: "Yes, we had a long series of observations from observer B and he had a sharp rise in brightness at that time." Of course, it has not always come out so happily, and some times I have to say that we had been getting observations of a certain star, but that for some unknown reason the observations had stopped at the crucial time. Very often an astronomer has some spectroscopic plates and would like to know the phase and visual magnitude. It is good to be able to pull out the plot of our observations and give him the information immediately.

Of course, this work does not always go as smoothly as it sounds. In all AAVSO work, the variables are arranged in order of designation, as explained in the Manual (1). The order is by the first 4 digits (1900 R.A.), then if 2 or more stars are the same we put the most northerly (last 2 digits) first. That is, we list from the North Pole to the Equator, to the South Pole. Some observers do not do this, which means we have to leaf back and forth in the pile of plots, which of course takes more time. Some observers do not use the 1900 coordinates for the designations which means in some cases we have to go to the catalog for the correct one. Some observers write illegibly or type over a number, which causes

delay. Some forget to underscore for southern declinations. Some do not use the official 3-letter abbreviations for the constellations.

We try to correct all of these things while doing the plotting in order to have the reports reasonably clear and correct for the key punchers when they start work on a folder.

All observations are being put on data cards and all cards are verified. This is necessary even though statistically a few errors should not matter, but if these errors happen to be the only observations made of a variable near that time they can be misleading.

When we are sure we have all observations made during a certain time interval, including any sent in very late, we sort all the cards by star and then by date for each star and file them in special drawers. The cards are then edited, with the plots and unnecessary "fainter than's", and observations which are definitely too far off the curve being removed. These cards are then taken to the Smithsonian Astrophysical Observatory for a print-out which Barbara Welther has programmed to indicate any cards out-of-order or punched with an incorrect layout. A misplaced decimal can throw off the whole program. After further hand-checking and corrections, the cards are put through the computer to get the ten, five, or one-day mean curve, as required.

The preparation of the computer plots for publication is a very time-consuming operation. They must be checked for evenness of inking and any defects must be blotted out. The reduction may be such that larger numbers must be used for the coordinates. Titles must be made up for the proper reduction and pasted in place. The long period variables for which we have mean light curves must have the observed maxima and minima indicated.

If the one-day mean curves have large seasonal gaps with no observations, each must be studied individually to determine the amount to be cut out to leave strips the proper length.

The curves have to be mounted on large sheets of paper figured for the desired reductions. The pages have to be numbered and an index made up before the report can be sent to the printer. Even then the work is not done. For with even the most expert and careful printer, the plates have to be checked to make sure no pasted-on title or number is missing, or has slipped out of place with handling.

When the final printed reports are delivered to the office, it is time for celebration and great rejoicing, but alas -- there is not time for that, as the next batch of cards is waiting to be processed.

We are always delighted to receive letters and remarks from the observers and I deeply regret that I just do not have enough hours in the day or days in the week to answer all of them. I feel that it is very important to the AAVSO for me to answer requests for special information from astronomers, as that service is really the reason for our work. I hope the observers understand and will forgive me. I also wish that the members would read carefully the reports and the Manual for Observers (1), so they would not write about things which have been explained, and make suggestions about things to do when we are already doing them.

For some years I had hoped to use data processing methods with our observations, and at last we are able to do it. Machine computing and plotting of the curves for publication

is the only way we can possibly keep the work up-to-date and have any hope of getting the observations of the previous 50 years in a useable form. And we are catching up. Report 29 will be in the hands of the printer very shortly, and work is already being done to prepare Report 30 for publication, which will bring us up to 17 June, 1966. The machines have made this possible.

I would like to give a few hints and suggestions to the observers concerning their programs. First of all, I wish more observers would make use of the Annual Predictions we mail early each year. It is a waste of time for an observer with a small telescope to try to find a variable which is certainly near minimum and fainter than 13. There are always exceptions! So few of our observers do any work in the hours before dawn that almost anything at that time is useful. This, of course, applies especially to the irregulars for which we do not have predictions.

As a reminder to observers, I want to say that no observations of eclipsing binaries or RR Lyrae stars should be sent to headquarters. They require special techniques and should be sent directly to the committee chairman, Marvin Baldwin, who will edit them and send the totals to us if they are useful observations. Single observations of these stars are of no use to us. Again, exceptions: observational runs on the eclipses of any of the U Gem stars or novae or nova-like variables will be gratefully accepted at headquarters.

REFERENCES

1. Mayall, Margaret W. 1970, Manual for Observing Variable Stars, (AAVSO, Cambridge, Massachusetts).