

Many of you, no doubt, remember the brilliant nova of 1925 in the constellation Pictor. This star reached first magnitude and for a few brief days was one of the brightest stars in the southern sky. Now 41 years after its outburst it is still very, very slowly fading and has not quite reached 12th magnitude. It is still observed by many of our members. It is a typical slow nova.

Again many more of you will remember the brilliant nova that flashed forth in 1942 in Puppis. This was even brighter than Nova Pictoris and is a typical fast nova. By 1958, it had faded below the fourteenth magnitude.

Many interesting facts have been found about these stars. Not the least of these is that a number are close binaries. Nova Herculis 1934, for instance, is an Algol type variable with an extremely short period around a fifth of a day and a range of one and a-half magnitudes. Prior to its outburst this star had a slightly shorter period. Kukarkin and Parenago (1963) have suggested that the increase in period, since the outburst, indicates that less than half percent of its mass was lost. That means essentially that a nova outburst does not change the character of a close pair. Nova Pictoris 1925 is even more interesting. Three years after its outburst Van den Bos and Finsen saw, surrounding the star, what appeared to be three satellites of unequal brightness. It is certain that these were merely irregular patches of ejected matter that travelled away from the star.

It is estimated that about 50 galactic novae appear every year, of which we observe one or two. Since they are concentrated towards the galactic centre, a search in the Scorpio-Sagittarius region would repay anybody willing to make a regular photographic patrol of them from this country. For instance many have been found clustered around the well-known variables SX and SV Scorpii and appear on our chart of that region.

Allied with ordinary novae are what are termed recurrent novae. Compared to the explosion of an ordinary nova these represent rather small sneezes. They have a smaller range, usually of around eight magnitudes, and differ from the novae proper in having had more than one outburst. Only a limited number are known and for these there is a rough average cycle of 35 years between outbursts. Of course, quite a number of people have suggested that all novae are recurrent but we are unable to observe more than one outburst simply because ordinary novae might have a cycle that is measured in millions of years. These are frustrating stars to observe since year in and year out they remain dormant with little variation. Then suddenly one is rewarded by an outburst. Such has been the case with RS Ophiuchi, whose last outburst was discovered by myself.

Included in the eruptive type stars are several groups in which flares are frequent but small in amplitude. The best known type are the U Geminorum variables. Like so many of the eruptive class these are dwarf stars that normally have slight fluctuations during the intervals between flares. The extent of the flares range from two to six magnitudes, reached in a period of hours or one or two days. They return to their normal brightness in a period that may be from a few days to several weeks. The intervals between flares for any one star changes within wide limits, but each star has some mean cycle, usually between 20 and 600 days.

One of the best known examples in the southern sky is VW Hydri, about which little was known until our studies commenced. It deserves to rank as one of the most important and interesting stars of this group. Whilst the intervals in its outbursts may vary between 11 and 59 days it has a mean cycle of 28.72 days. There are two types of maxima, which I have termed "flat" and "normal". Flat maxima, when the variable remains bright for longer periods but with some fluctuations, are separated by five "normal" maxima. Flat maxima occur roughly every 179 days. Following such a maximum the star is very active and normal maxima follow each other in rapid succession, but with the intervals between them gradually lengthening.