brighten up from invisibility to become the most luminous objects in the X-ray sky for a few days and subsequently decline below the threshold of the detectors. They are commonly referred to as X-ray Novae or Transients.

And, indeed, the X-ray novae A 0620-00, TrA X-1 and H 1705-25 have been identified with optical novae. These three sources share many characteristics, as for instance soft X-ray spectra and lack of regular X-ray pulsations. Moreover, the transient A 1744-36 might correspond to the optical nova Hen 1481. It appeared in 1951 at the position of the X-ray source. If this identification is correct A 1744-36 is a recurrent X-ray/optical nova like A 0620-00.

Another class of transients display very hard spectra and mostly regular X-ray pulsations. No corresponding optical novae have been observed at their positions. A 0535+26, 4U 0115+63 and A 1118-60, the "X-mas" source (since it flared up on Christmas 1974), belong to this group. There is now growing evidence that they might be related to Be stars, early-type main-sequence stars spinning at their break-up velocity.

Unfortunately, positions of most transients are not very accurately determined. Therefore the chance of accidental associations should be kept in mind.

Be stars are, however, also found as optical counterparts of persistent X-ray sources, notably 4U 0352+30 = X Per, MX 0053+60 = γ Cas and 4U 1145-61 = Hen 715.

Observations on La Silla

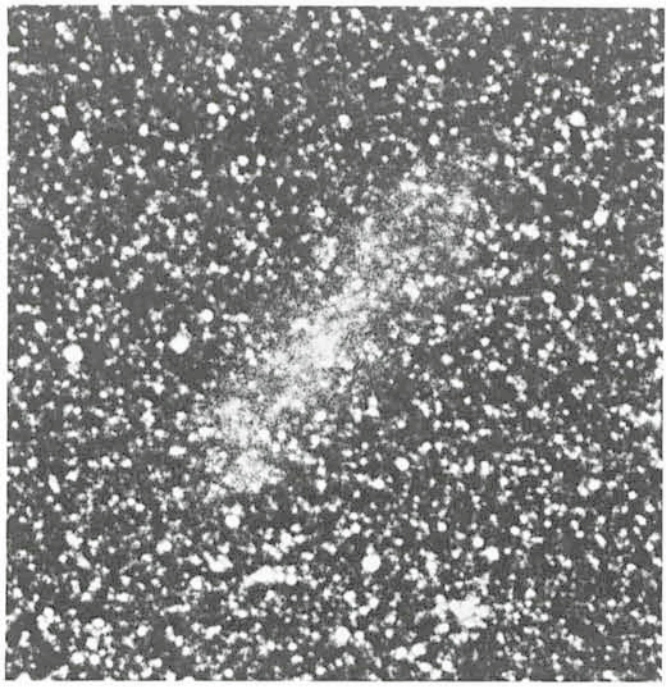
A number of X-ray error boxes have been observed during the last two years with the ESO 50 cm, 100 cm and 152 cm telescopes. An early-type star like a Be star might easily be detected by means of UBV photometry, even on nights of poor photometric quality. Subsequent observations of candidates, however, need "good" nights to detect variations, which could be less than 0.05 magnitude.

The proposed identification of the transient MX 0656-07 with a Be star may serve as an illustrative example. This source was detected by the SAS-3 satellite in September 1975. Subsequently, Schmidt and Angel searched in vain for a corresponding new star. Later the position was refined by Ariel 5 to a 90 per cent error circle of 3 arcmin radius, which made a photometric survey feasible.

UBV photometry of about 20 stars revealed a reddened early-type star of visual magnitude V = 12.35 and colours (B – V) = 0.87, (U – B) = –0.16 with possible variations of a few hundreds of a magnitude in the following nights.

In January 1978, Dr. West kindly took two short-exposure, 123 Å/mm spectra with the 3.6 m telescope confirming the early spectral type of about B2. Hα and Hβ are clearly seen in emission and the presence of many strong interstellar lines confirms the high reddening of E_{B-V} = 1.0. Spectroscopic observations with higher resolution and more photometry are planned to determine its luminosity and to reveal possible periodic light variations as seen in most X-ray binaries. As was mentioned earlier, the possibility of a chance coincidence cannot be ruled out completely, although the apparent density of Be stars in this direction of the galactic plane turns out to be quite low.

Future observations, preferably to be carried out simultaneously in the X-ray and optical band, and the possible detection of transients at a very low level with more sensitive satellites as HEAO-B will help us to understand the underlying mechanisms of X-ray outbursts in these most interesting systems.



NGC 1809: Behind the LMC

▲

The object NGC 1809 has long been known. It lies southwest of the central bar in the Large Magellanic Cloud and is apparently heavily obscured by the LMC stars. The photo is reproduced from ESO Quick Blue Survey plate No. 1133 of field 56, which was obtained in 1975 with the ESO Schmidt telescope. It shows NGC 1809 as an elliptical nebula with a central condensation.

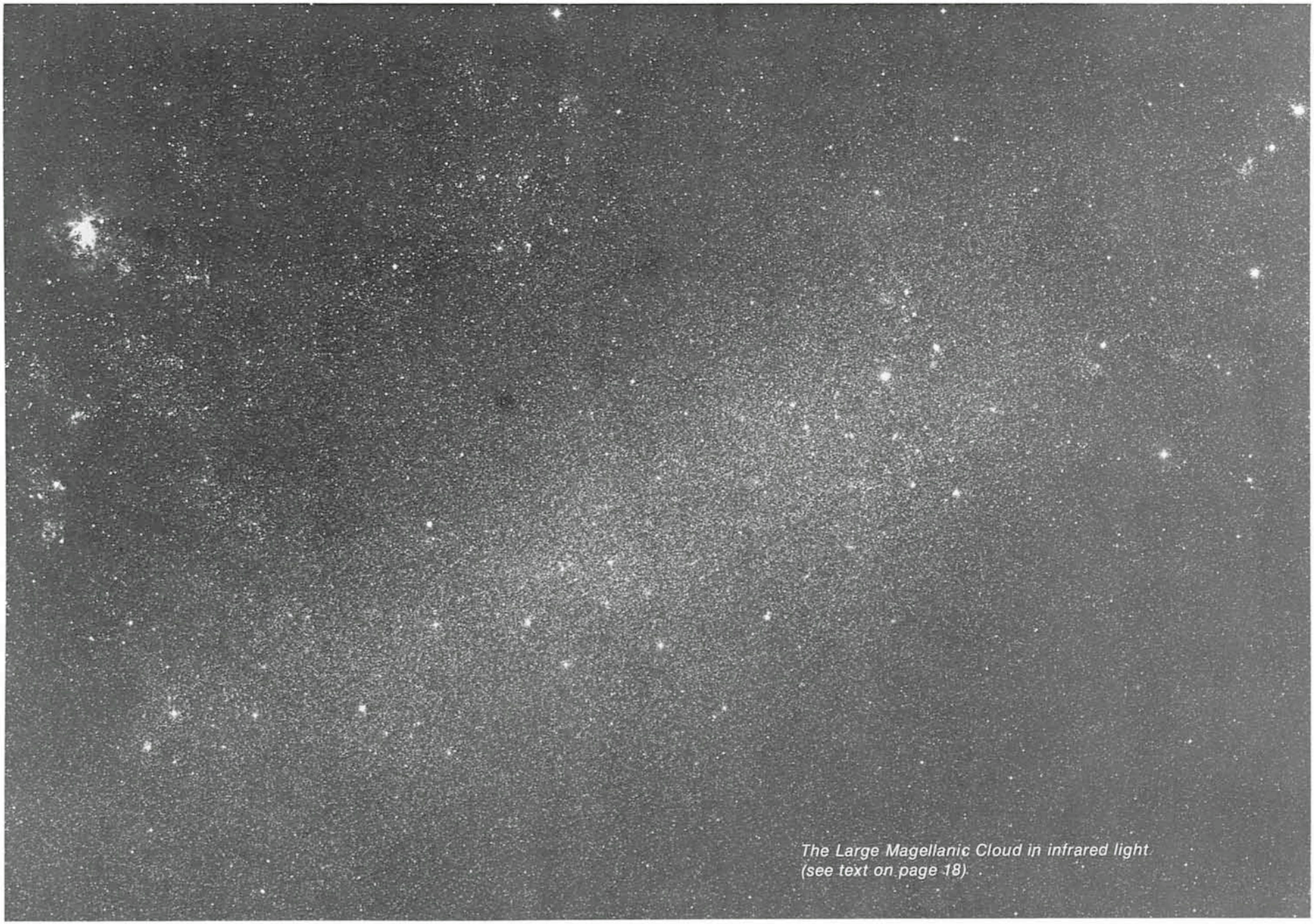
It is obviously rather difficult to obtain a spectrum of this object, due to the large number of LMC stars. Nevertheless, a 20-min 123 Å/mm spectrum with the Cassegrain spectrograph on the 3.6 m telescope just shows some weak emission lines on top of the heavy LMC stellar background. The velocity is about 1,000 km/s, much too high to make NGC 1809 a member of the LMC. It is therefore a galaxy behind the LMC, shining dimly through the absorbing layers of dust in the LMC. It is also possible that NGC 1809 is associated with a radio source in the most recent Parkes catalogue of southern radio sources.

The detailed results are being published in a note in Astronomy and Astrophysics by ESO astronomer R. M. West.

The Large Magellanic Cloud in Infrared Light!

Deep plates of the Magellanic Clouds are presently being compiled at the European Southern Observatory, by means of the 1 m Schmidt telescope. On page 19 we show the Large Cloud as it looks in infrared light (7000–9000 Å) on a unique IV-N plate, obtained on January 16, 1978, behind a RG715 filter. The exposure time was one hour. The plate was sensitized and guided by Guido Pizarro. The plate is remarkable because of its uniformity; normally it is very difficult to hypersensitize infrared plates without the risk of large non-uniformities. Water (H_2O) and ammonium (NH_3) were used for this plate.

It shows mainly the redder stars in the LMC and suppresses the gaseous nebula. The stars are resolved even in the central part of the bar. The nebula to the upper left is 30 Doradus, the brightest H II region in the LMC. ▶



The Large Magellanic Cloud in infrared light
(see text on page 18)