grass called *lalang* (*Imperata cylindrica*, Cyr.), which is not only useless, but very injurious, both by reason of its inflammability, and because it prevents any cultivation of the land covered by it, except with a great deal of labour and expense. Wherever the land is burnt or having been under cultivation is suffered to run to waste, it is soon covered with *lalang*, whatever may have been the previous vegetation, except where the soil is sandy, or wet, or shaded by trees. The treatment of the soil by chemicals, such as salt, sulphate of iron, &c., apart from the heavy expense connected with it, is liable to have a very injurious effect, even for many years, on the plants with which the ground is afterwards afforested. The introduction of some more actively growing plant to combat and destroy the *lalang*, has been proposed, but this would be to destroy one noxious weed by another still more noxious. When trees are tall enough to throw a shade upon the ground, the *lalang* quickly disappears, nor can it penetrate even into forest glades if but a few trees bar its progress. It is suggested, therefore, that shade trees and bushes should be gradually planted.

OUR ASTRONOMICAL COLUMN.

Objects for the Spectroscope.

Sidereal Time at Greenwich at 10 p.m., December 26 = 4h. 22m. 20s.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
			h. m. s.	° ′
(1) G. C. 839	—	—	4 15 32	+19 7
(2) 47 Eridani	5	Reddish-yellow.	4 28 54	− 8 25
(3) ε Tauri	4	Whitish-yellow.	4 22 12	+18 56
(4) μ Eridani	4	White.	4 40 0	− 3 27
(5) R Leporis	Var.	Red.	4 54 36	−14 56
(6) U Geminorum ...	Var.	Variable.	7 48 34	+22 17
(7) Neptune, Dec. 26..	—	Greenish.	4 2 21	+18 59
,, Jan. 2 ...	—	—	4 1 44	+18 57

Remarks.

(1) This is described in the General Catalogue as an exceedingly interesting object, but very faint and small; according to Hind it is variable. I have not been able to find any record of its spectrum. Continuous observations over a considerable period, even with small dispersion, may throw light upon the nature of the changes which take place.

(2) A star of Group II., in which Dunér records the bands 2–8. Bands 2 and 3 are the strongest, indicating that the star is well advanced in condensation towards Group III. As in similar stars, dark metallic lines and lines of hydrogen should receive special attention, as the stages at which these make their appearance have not yet been determined.

(3) Vogel classes this with stars of the solar type, and the usual differential observations are suggested. (For criteria, see p. 20.)

(4) According to Konkoly, this is a star of Group IV. The usual observations of the relative intensities of the hydrogen and metallic lines are required, so that the star may be placed in line with others on the temperature curve.

(5) This is a variable star of Group VI., but the range of variation is small (6·5–8·5). The origin of variability in stars of this group has not yet been satisfactorily explained, and there is no record of the spectroscopic changes which accompany the changes in magnitude. Further observations are therefore necessary, and it is suggested that variations in the intensities of the carbon flutings should be particularly noted. The star was at minimum on October 23.

(6) This variable reached its maximum on December 21, and, as the period is only 86 days, observations may be made from maximum to minimum, providing that sufficient optical power is employed. The magnitude ranges from about 9 at maximum to 14 at minimum. The colour is stated to vary from white at maximum to reddish at minimum. The spectrum has been described as continuous (probably near maximum), but the colour-changes indicate that considerable variations in the spectrum may also be expected.

(7) The spectrum of Neptune was first observed by Secchi, in 1869. He noted that there were three broad dark bands, which were nebulous at the edges, and that there was a remarkable absence of red light. Vogel gave a more detailed account of the spectrum in 1872 (*Bothkamp Beobachtungen*, 1872, p. 71). The bands then recorded were as follows:—

Wave-lengths.	Remarks.
597	End of spectrum.
565·7	End of a wide dark band.
556	Very feeble band.
540	Middle of the darkest band.
518	Faint band.
513	,,
507	,,
485·8	Middle of a dark band.
477	Middle of a wide dark band.

The whole spectrum is very similar to that of Uranus. The proximity of the edges of some of the dark bands to the bright flutings of carbon and manganese led Prof. Lockyer to suggest that in Uranus and Neptune we might have to deal with the radiation of those substances, the dark bands being produced by contrast. Acting on this suggestion, I made observations of Uranus with a 10-inch equatorial, and afterwards, in conjunction with Mr. Taylor, with Mr. Common's 5-foot reflector. Direct comparisons certainly showed coincidences of the flutings of carbon with luminous parts of the spectrum. No solar lines were visible, but Dr. Huggins has recently photographed the spectrum, and found nothing but solar lines. In a recent observation of Neptune, I thought the bright flutings were more evident than in Uranus, but I have not had an opportunity of making comparisons. Further observations with reference to the existence of bright flutings are suggested. A. Fowler.

Variable Star in Cluster G.C. 3636.—Prof. Pickering writes (*Astr. Nachr.*, 2941) that photographs are being taken at Wilson's Peak, Southern California, with a telescope of 13 inches aperture. Four photographs, with exposures of about one hour each, were taken of the above cluster, whose position for 1900 is R.A. 13h. 37m. 35s., Decl. + 28° 52′·9. A star about twenty seconds south of the centre of the cluster was found to be much brighter on May 21 and June 8, 1889, than on May 31 and June 17, 1889. Two maxima seem to be indicated by the photographs separated by an interval, during which the star becomes comparatively faint. Visual observations made at Cambridge Observatory since June appear to confirm this variability.

Changes in Lunar Craters.—A few observations made by Prof. Thury (*Astr. Nachr.*, 2940), of craters in the terraced ring of Plinius, indicate some striking changes. On November 1, Plinius presented the same aspect as that described in 1882 by MM. Elger, Gaudibert, and H. Klein. Two craters, cutting one another, appear in the middle of the ring, and it is thought that one of these was not visible in the middle of September. The central opening seems to have been enlarged, for on November 1 its diameter was estimated as at least one-third of the total crater, whereas in September the diameter of the opening was rather less than one-fourth of the total diameter.

The interpretation put by Prof. Thury upon these appearances is that in the centre of Plinius there are two small craters, the aspect of which is modified by the different amounts of snow and ice about them. Emissions of heated gas and vapour would affect considerably the state of the lunar surface, for if, in the beginning of an eruption, water-vapour were predominant, it would be immediately condensed around the crater, forming a circular field of snow, so that the apparent enlargement of the opening may be due to the melting of the snow surrounding it by the hot gases emitted.

ON THE FUTURE OF OUR TECHNICAL EDUCATION.

LAST week we referred to an address delivered by Sir Henry Roscoe at Goldsmiths' Hall on Tuesday, December 17, after the distribution of the prizes and certificates to the students of the City and Guilds of London Institute. He spoke as follows:—

In his admirable address delivered last year on a similar occasion to the present, Sir Lyon Playfair pointed out that one of the important objects for which the City Guilds were originally founded was to develop and restore arts and sciences,