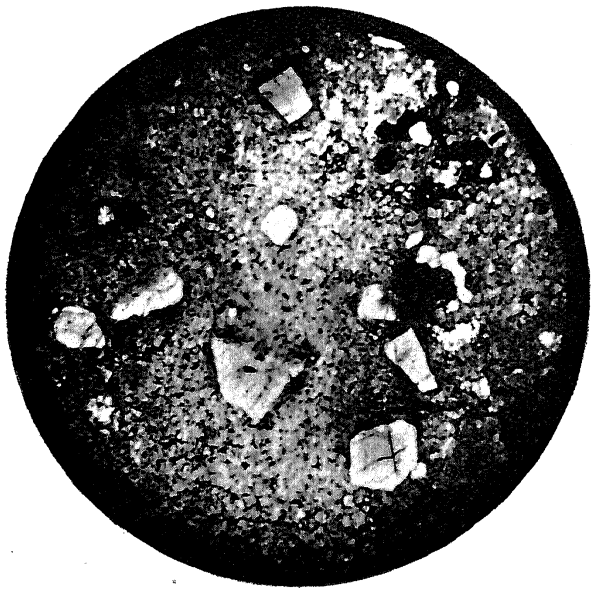
Letters to the Editor.

The Panjal Trap.

THE volcanic origin of the Panjal Trap of Kashmir was first established by the researches of Lyddeker and McMahon in 1883.[1] In his revision of the geology of Kashmir C. S. Middlemiss briefly referred to the Trap as 'genuine old basic lava flows'[2]. The microscopic characters have been described in some detail by D. N. Wadia. According to him 'the lava is a basic variety of augite-andesite'[3].

The most easily accessible and prominent outcrops of the Trap occur in the neighbourhood of Srinagar where they form the high peak of Takht-i-Suleiman and the precipitous scarp at the back of the Mogal Gardens. It is easily seen along the road leading from Srinagar to Anantnag up to a distance of $5\frac{1}{2}$ miles where the Jhelum comes close to the hill. Here the trap is extensively quarried as a building stone. During a recent visit to Srinagar the authors observed that the rock was often of a very light colour and gave low values of specific gravity common to rhyolites and trachytes. At many localities clear phenocrysts of quartz could be seen in hand-specimens, especially with the aid of a lens.

The accompanying figure is a microphotograph of a specimen taken from the quarry at Panthachuk, between the fifth and the sixth milestone, south-east of Srinagar. It shows euhedral to sub-hedral phenocrysts of quartz which have often suffered corrosion in the magma. These crystals also show original fine cracks which appear as white lines in reflected light. Phenocrysts of simple-twinned felspar are present and are turbid due to kaolinisation. The groundmass is micro- to crypto-crystalline and is of a felsitic character. Traces of a chloritic mineral and iron ore are present. In hand-specimens the rock is compact and has a grey colour with minute white and black spots of felspar and chlorite respectively scattered sparingly through the mass. Small phenocrysts of quartz are also visible under a lens. Its specific gravity is 2·63. A partial chemical analysis carried out by the usual method gave 78·89 per cent. of silica. The rock is clearly a quartz-felsite or rhyolite.



Rhyolite, Panthachuk, near Srinagar, Kashmir. × 20.

The general description of the Panjal Trap given by D. N. Wadia[4] applies to the rocks of this region except that granular augite is not seen as an essential constituent and the lavas often show phenocrysts of quartz. Pitchstone of a dark colour is not uncommon and shows a superficial resemblance to basalt. It is interesting to find that at least some of the lava-flows of the Panjal Trap are definitely rhyolites and not augite-andesites, and it is doubtful whether basic or sub-basic lavas occur in any quantity in the neighbourhood of Srinagar. Detailed study of the lavas of this formation round the Kashmir valley is being carried out by the second author of this article.

K. K. MATHUR.
S. N. WAKHALOO.

Geological Laboratory,
Benares Hindu University.
September 1, 1933.

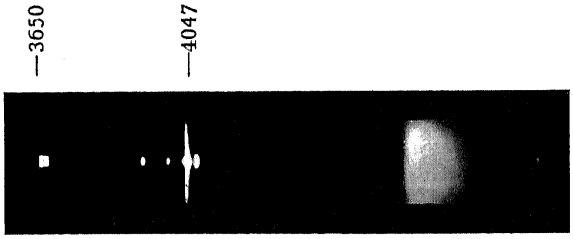
[1] *Mem. G. S. I.*, **22**, p. 218.
[2] *Rec. G. S. I.*, **40**, Pt. 3, p. 235, 1910.
[3] D. N. Wadia, *Geology of India*, p. 360, 1926.
[4] *Op. cit.*

On the Incoherence of Fluorescent Radiation.

ACCORDING to the generally accepted ideas regarding the excitation of fluorescence by light waves, we should expect the fluorescent radiations starting from neighbouring molecules in the medium to be incoherent in

phase. The following experiment demonstrating the incoherence may be of interest. The principle of the experiment, originally due to Wood, is as follows. A rectangular glass cell containing a solution of fluorescein, was placed at some distance in front of the slit of a spectrograph. The light from a distant small mercury arc, after passing through a condensing lens and the fluorescent solution, came to focus on the slit of the spectrograph. A blue violet filter placed before the arc served to cut out all the radiations in the incident light, of longer wave-length than λ4358.

Since the directly transmitted mercury radiations come to a sharp focus on the slit of the spectrograph, they will give rise to *very short* spectral lines on the photographic plate. If the fluorescent radiations from adjacent molecules were coherent in phase, these fluorescent radiations also would come to focus on the slit of the spectrograph, and give rise to a continuous spectrum having, like the spectrum of the directly transmitted light, very little extension parallel to the length of the slit. If on the other hand, the radiations are incoherent, the fluorescent band will widen considerably along the length of the slit. The accompanying spectrogram shows very clearly that the latter is the case.



The experiment was repeated with incident linearly polarised light, and the two principal vibrations of the partially polarised fluorescent radiations in the forward direction (parallel and perpendicular respectively to the vibrations in the incident light) were separately found to be also incoherent. Further with incident circularly polarised light the fluorescent radiations in the forward direction were found to be unpolarised.

Physics Laboratory, S. M. MITRA.
Dacca University,
September 5, 1933.

Seasonal Variations (Sexual Cycle) in the Testis of *Rana tigrina*.

BOTH lower and higher vertebrates offer a fruitful field for research regarding (1) seasonal variations in their organs of reproduction, and (2) an interesting line of investigation with a view to finding out whether the periodic activity of their gonads could, in any way, be correlated with the hormonic activities of their ductless glands. Oslund[1] has published a useful summary of the work done so far as the year 1925. Since then Bissonnette[2] has published a series of papers on the sexual cycle in the starling and Blount[3] has investigated the seasonal cycle of the interstitial cells in the testis of the horned toad. The difficulty of obtaining specimens of the animal under investigation throughout all the months of the year in other parts of the world may partly explain the paucity of papers on this subject. In this country Asana[4] has been working on the sexual cycle of some Indian lizards.

Frogs have been captured from one and the same locality in the vicinity of Gujarat College, Ahmedabad, at an interval of 8 to 10 days throughout the year. Observations were made and the gonads fixed from five to ten animals every time they were dissected. Adults of almost uniform size were selected.

From the latter half of October and throughout November, December, January and February externally the testes maintain their minimum size, their average volume being round about 4 c.mm. The average length and diameter of the testis during those months were ·4 cm. and ·115 cm.

[1] Oslund, R. M., "Seasonal modifications in testis of vertebrates. 1928," *Quart. Rev. of Biol.*, **111**, 254-270.

[2] Bissonnette, T. H., "Studies in the sexual cycle in birds. I. Sexual maturity, its modification and possible control in the European starling, 1930," *Am. Jour. Anat.*, **45**, 289-306.

Bissonnette and Chapnic, M. H., "Studies on the sexual cycle in birds. II. The normal progressive changes in the testes from November to May in the European starling, 1930," *Ibid.*, **45**, 307-343.

Bissonnette, T. H., "Studies on the sexual cycle in birds. III. The normal regressive changes in the testis of the European starling from May to November, 1930," *Ibid.*, **46**, 477-497.

[3] Blount, R. F., "Seasonal cycles of the interstitial cells in the testis of the horned toad, 1929," *Jour. Morph, and Physiol.*, **48**, 317-343.

[4] Asana, J. J., "Studies on the sexual cycle of some Indian lizards," *Proc. Nineteenth Indian Sci. Congress*, 1932.