of the antheridium follows that described by Schlumberger for *Woodsia ilvensis*. The opercular cell is thrown out bodily. The sperms show 2½ coil with the beak slightly notched at the apex. The structure and development of archegonium is as usual for the Leptosporangiates. Only in one case three instead of the usual 2 free nuclei in the neck canal were observed.

The embryogeny has not been studied. Three, and occasionally four, sporelings have been observed growing from a vigorously growing prothallus.

The chromosomes are cylindrical elongated.

PRAN NATH MEHRA.

Lahore,
Nevember 24, 1932.

The Magnetic Properties of Nickel Colloids.

RECENT work[1] has shown that the diamagnetism of bismuth colloid depends on the size of the particle. It was felt that an extension of the work to ferro and para magnetic metals would be of interest. Accordingly, some preliminary work has been done with nickel.

Nickel colloid was prepared by the method of the intermittent current arc from an induction coil, the sparking being arranged between two nickel electrodes in normal propyl alcohol. The colloidal powders were obtained by settling or by centrifuging. Finally the powders were obtained in small bulbs and sealed. The whole work was done in vacuum so that there was no chance of the particles getting oxidised.

The values of the intensities of magnetization of the powders were determined by the Curie method in a constant field strength of about 4,500 gauss, the necessary precautions being taken.

It was found that the intensities of magnetization of the colloidal powders were in all cases *less* than that of pure nickel, the values in these experiments varying from 70 to 85% of mass value.

Attention may be drawn to the work of Montgomery[2], who working with nickel colloidal suspensions gets similar discrepancies.

Further information regarding the magnetic properties of the nickel colloids in relation to particle sizes is being obtained and the detailed results will be published elsewhere.

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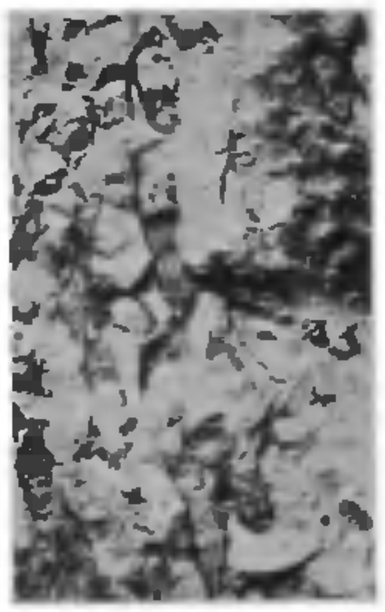
Annamalainagar,
November 28, 1932.

On a Fossiliferous Quartzite from the Trichinopoly Cretaceous.

IN the course of our study of the flints and cherts associated with the upper beds of the Trichinopoly Cretaceous area, we have come across a fossiliferous quartzite which we think is a very unusual type of rock. We have pointed out elsewhere that all the flints and cherts of this area are the result of silicification of original organic limestones, and have recently announced the discovery of numerous algæ in several sections of these rocks. Under the microscope these flints and cherts are, as a rule, seen to be almost entirely composed of cryptocrystalline silica. An exceptional type of silicification is the one represented by the fossiliferous quartzites now under study. Many of these quartzites are gray in colour and are more or less fine-grained; sometimes they are quite white and granular, presenting the typical saccharoidal appearance. The rock is highly fossiliferous, the organic structures—corals, and the casts of lamellibranchs and gastropods—being easily recognizable, even in hand specimens. Under the microscope, all the sections show a typical mosaic aggregate of quartz grains, thus revealing the true quartzitic nature of the rock. A remarkable feature of these quartzites is that they also reveal broad patches of algæ, mostly *Lithothamnion*. Very frequently the entire algal patch seems to be shattered and the details of the structure more or less obliterated. Now and again, however, we see the algal structures sufficiently clear to admit of easy identification, as such. A few foraminiferal sections, chiefly of the family Miliolidæ, are also seen here and there. Under cross nicols these algal patches, foraminiferal shell sections and coral sections are all seen to be uniformly resolved



Quartzite—showing corals.
About 1/5 natural size.

[1] For details and references to previous work, see S. R. Rao, *Ind. Jour. Phy.*, **7**, 35, 1932.

[2] C. G. Montgomery, *Phy. Rev.*, **39**, 163, 1932.

into a mosaic of quartz gains showing that it is a true case of a quartzite derived from the silicification of a fossiliferous rock. A fossiliferous quartzite of this nature is an unusually interesting type of rock. Dr. Lees in his paper on the Chert Beds of Palestine (*Proc. Geo. Assn.*, **39**, Pt. 4, 1928) has mentioned a similar rock type which he describes as follows:—"In some places an unusual quartzite bed outcrops interbedded with Cenomanian limestones. It is intensely white in colour and has a sugary surface texture. Mr. G. S. Blake showed me some definite, though indeterminate, fossil shapes in this quartzite which aroused suspicion as to its real nature. A thin section shows nothing but a regular mosaic of quartz crystals. Several opaque patches suggest some organic structure." Obviously Dr. Lees is here speaking of a rock very similar both in nature and origin to the type that we are now describing; but whereas the fossil shapes he has seen are "indeterminate" and "suspicious", those in our type are absolutely clear and convincing.

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November 19, 1932.

Some Physiological Investigations of Fern Prothalli under Cultural Conditions.

AN investigation of the behaviour of the prothalli of some Polypodiaceæ (*Anisogonium esculentum* Ptesl., *Pteris longifolia* L., *Goniopteris prolifera* Roxb., *Nephrodium molle* Desv.) under various physiological conditions has been carried on by the writer for some time and has produced some interesting results. In one set of cultures placed in a corner of the glass-house in which the prothalli were submerged under water, a large number of filamentous outgrowths were observed from the surface and marginal cells of the prothalli after one month. The filaments are septate, branched apparently similar to the filaments of some algæ. They grow towards the direction of light. The length of the cells in different filaments or even in the same filament is very variable. The cells formed in the light of very low intensity are much longer, narrower and with a small number of chlorophyll grains as compared with the others formed in the light of comparatively higher intensity. Usually in the same filament, the cells at the base are much longer as compared with the cells in the upper region where they become relatively more favourably placed with respect to light.

The possible factors which could have been effective in bringing about this filamentous response in flat prothalli, under the conditions in which the cultures were placed could be:

(1) Submerged condition as such;
(2) Abundance of free moisture;
(3) Feeble light.

These three factors have been isolated one by one and their effect studied. Prothalli submerged under water (supplied with nutrition) and those floated over it in the same culture have both produced such filaments, so that the submerged condition does not seem to be an influencing factor. In another experiment some flat prothalli were placed in feeble light on soil and frequently watered so that the soil remained muddy while some more were placed in identical conditions alongside except that they were given just the amount of water that would keep them living, to act as controls. After two months the prothalli of the first culture produced large number of filaments while those acting as controls kept to their normal shape. Abundance of free water is therefore one of the causal factors. In the third experiment prothalli growing on soil were supplied with abundance of water so that the soil remained muddy throughout. One of the cultures was placed in rather feeble light and another in open day-light. After 3 months there was an abundance of filament formation in the former while in the latter the usual form of the gametophyte was retained. It seems obvious, therefore, that feeble light in conjunction with abundance of free moisture is responsible for bringing about the filamentous condition—the one alone being without any result.

Bearing these results in mind, the writer next tried the gametophytes of *Adiantum lunulatum* Burm., an apogamous fern that usually develops tracheids in the general body of the prothallus. The normal form of the prothallus is cordate. Submerged under water and placed in feeble light the development of the tracheids is stopped in the tissue of the gametophyte. The prothalli lose their usual cordate form and during further growth become strap-shaped. Quite long ribbons one layer of cell in thickness and sometimes branching laterally