The following measurements show the sizes of the structures involved :

Length of arm of chromosome	17·0 μ
No. of spirals	33
Diameter of chromatid	1·2 μ
Calculated diameter of chromosome thread $= \frac{17 \cdot 0}{33}$ μ =	0·52 μ.

Evidently the structures shown by this technique are comparable with those illustrated by Vejdovsky at metaphase in *Ascaris*[3] and by Darlington at telophase in *Fritillaria*[4]. The whole volume of each chromatid is taken up by a chromosome thread 0·5 μ in diameter compactly coiled to give a rod approximately twice its diameter.

These findings are therefore incompatible with those of Sharp[5] and other workers of the chromonema-matrix school.

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[2] Welsford, E. S., *Ann. Bot.*, **28**; 1914.
[3] Wilson, E. B., "The Cell in Development and Heredity" (New York, 1925). Fig. 59.
[4] Darlington, C. D., *Proc. Roy. Soc.*, B, **117** (in the press).
[5] Sharp, L. W., *Bot. Gaz.*, **88**; 1929.

Use of Reflected Light in the Examination of Fossils

SEVERAL very ingenious methods for facilitating the microscopic examination of the structure of plant fossils have been recently described and illustrated in NATURE. No mention, so far as I have noted, has been made of that by which the smoothed surface of a fossiliferous rock is examined by reflected light, as may be done with the 'ultropak' microscope. In this instrument, as many will know, the light is introduced laterally into the body of the microscope, reflected downwards by an annular mirror and brought to a focus by an annular condenser in front of the objective.

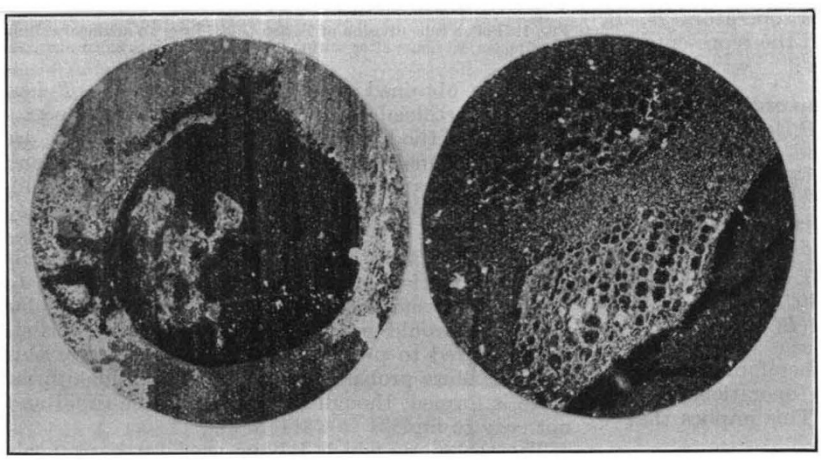

FIG. 1. Photomicrographs of coal. Left hand : Megaspore or megasporangium on smoothed surface of Wigan coal parallel to bedding. × 32·5 diam. Right hand : Transverse section of stem seen on smoothed surface of Westphalian coal. × 75 diam.

The accompanying photomicrographs (Fig. 1) were made by this way from ordinary coal. The method is equally applicable to siliceous and calcareous fossils ; but the results, obtained with a few minutes' preparation from coal fossils, usually so hard to deal with, seemed to me most surprising. Higher magnifications giving 300–400 diameters with oil-immersion lenses are also feasible.

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Effect of Orange Juice on the Growth of *Laminaria* Gametophytes

SOME interesting nutritional effects have been observed in cultures of gametophytic and young sporophytic plants of *Laminaria saccharina* Lamour. by the addition of low concentrations of orange and other fruit juices. After the *Laminaria* spores had been introduced into petri dishes containing 25 c.c. of filtered sea-water, orange juice was added in the proportion of 1 c.c. of a 1 per cent extract to each dish. Control cultures were kept under identical conditions of light and temperature.

Normally, on germination the contents of the spore pass through the germ-tube into the enlarged distal end, giving the early stage of the 'effective plant'. In cultures containing sea-water alone, the young gametophytes remained in this condition for a period varying from a few days to some weeks. In cultures to which orange juice has been added, this temporary resting stage is greatly reduced.

Previous investigators have shown that sexual organs may be produced either in the one-celled condition or from any cell of a filamentous gametophyte. The filamentous form of gametophyte is produced either when temperature and light intensity are high, or when phosphate is present in excess of nitrate[1]. The presence of orange juice stimulates the formation of filamentous gametophytes and also the production of sexual organs (Fig. 1, *a* and *b*).

Algologists have frequently observed that, in culture, the plants floating in the surface film of the medium show reactions different from those of the submerged plants. It is, perhaps, not without significance that in cultures to which orange juice has been added, the greatest growth is usually observed in the submerged germlings.

Analyses of sea-water made at different times of the year show a marked diminution in the amounts of dissolved nitrate and phosphate present during the spring and early summer. Experiments carried out with cultures supplied with 1 c.c. of 0·01 molar potassium nitrate, potassium iodide and potassium phosphate in addition to the fruit juices show an acceleration of growth and development which is equally marked (Fig. 1, *c* and *d*). Vigorous young sporophytes have been produced in these treated cultures.

Further experiments are in progress to determine the effect of different concentrations of various fruit