

obtained with end-on tubes, from 5 to 10 mm. in diameter and about 30 cm. long, with quartz windows, and at pressures in the neighbourhood of 5 mm. The necessary exposure varies from five minutes to an hour, according to the width of the slit, the absorptive power of the medium, etc. I have obtained a beautiful photograph of the absorption spectrum of benzol vapour with fifteen minutes' exposure.

E. P. LEWIS.

University of California (Department of Physics), Berkeley, California, May 18.

The Relation between Chromosomes and Sex-determination in "Abraxas grossulariata."

In a paper on this subject in the *Journal of Genetics* (vol. iv., June, 1914, p. 1) I gave evidence that in a strain of *A. grossulariata* which I have bred for several years two kinds of eggs are produced, having respectively twenty-eight and twenty-seven chromosomes. Since the somatic chromosome-number is fifty-six in the male and fifty-five in the female, it seemed evident that the eggs with twenty-eight were male-determining, those with twenty-seven female-determining. In this strain some families in each generation consist entirely of females, so it was hoped to prove the correctness of the conclusion with regard to sex-determination by finding that in families consisting entirely of females all the eggs contain twenty-seven chromosomes. I have now examined the eggs of several such families, and find, contrary to expectation, that the equatorial plate of the inner polar spindle contains twenty-eight chromosomes about as frequently as twenty-seven. The new material confirms the observation that twenty-seven occur in one spindle and twenty-eight in the other, but it seems to make it certain that the presence of twenty-eight chromosomes in the inner spindle does not necessarily cause the production of a male—at least, in the strain which produces all-female families. A possible explanation of the anomaly is that in all-female families a chromosome is eliminated at a later stage, but at present I have no direct evidence for this. I have material preserved in the hope of testing this suggestion, but the investigation is likely in any case to be a lengthy one, and circumstances may prevent my continuing it for some months. I therefore make this short statement of the facts as at present known, in order that it may not be assumed that the existence of male- and female-determining chromosomes has been finally demonstrated in *Abraxas*.

LEONARD DONCASTER.

Zoological Laboratory, Cambridge, June 7.

Cavities due to Pyrites in Magnesium Limestone.

In some districts it seems that iron pyrites formed an important constituent during the deposition of the Magnesium Limestone—not only in the north of England, but in America also in some of the Magnesium Limestones of the Cambrian age.

The Durham beds at Fulwell Hill Quarry give us ample evidence of this, as regards the English beds, by their very numerous cavities, the shape of which, which cannot be attributed to anhydrite, affords the clue. Unless carefully sought, the salts of iron are not noticed, nor are ferruginous band-stains conspicuous or frequent.

Some years ago I obtained specimens from the Roker Cannon-ball bed; some of them, recently placed in the Jermyn Street Museum, have been examined by Mr. A. F. Hallimond, the assistant-curator, who

has labelled them "pseudomorphous after mispickel." These, however, were formed on the outside of the calcareous spheres. I have also secured from the Fulwell Hill Quarry a few specimens of the concretionary structure with cavities containing limonite in powder. There are, however, a large number of empty cavities that apparently once contained pyrites, which are free from the prevalent "marl" powder, from dolomite, or from any traces of anhydrite. They are from about 1/2 in. up to about 6 in. in diameter, are roughly spherical, but with projecting cones; they are often decorated with strings of white calcite, though occasionally they are iron-stained (see Fig. 1).

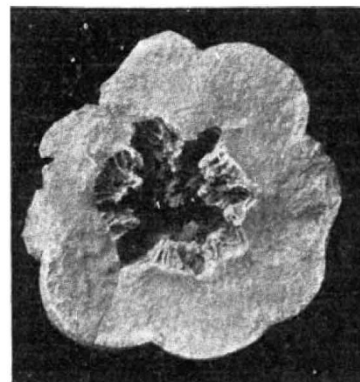


FIG. 1.—Baryoidal mass (section) with cavity. $\times \frac{1}{2}$.

Rarely, more or less solid specimens are met with (Fig. 2) which are casts of similar cavities, due to the deposit in them of calcium carbonate. Dr. J. Lister, of the Technical Institute, Tunbridge Wells, has kindly examined these for me, and has found them to contain a notable amount of calcium fluoride, which, so far as I am aware, is a new observation.

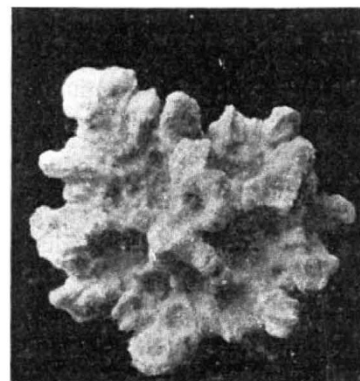


FIG. 2.—Calcite cast of a cavity probably after FeS_2 . $\times \frac{1}{2}$.

Other kinds of cavities are occasionally met with in the concretions of these beds, but, except the so-called cells, there are no others of frequent occurrence, while these, to which I am directing attention, are found in all the beds, both of limestone and marl. I have seen no traces of copper.

GEORGE ABBOTT.

2 Rusthall Park, Tunbridge Wells, May 12.

POISONOUS GASES IN WARFARE AND THEIR ANTIDOTES.

IN the Concise Oxford Dictionary a "Stink-ball" is defined as "a vessel containing explosives, etc., generating noxious vapours, used formerly in naval warfare and still by Eastern pirates." The Germans have shown the world how science may be degraded in its application to the purposes of the pirate, and our military commanders have now to deal with a new weapon previously unheard of in the field. Steps have already been taken to provide protection for our men, but a survey of the whole question of the composition and the properties of the gases which