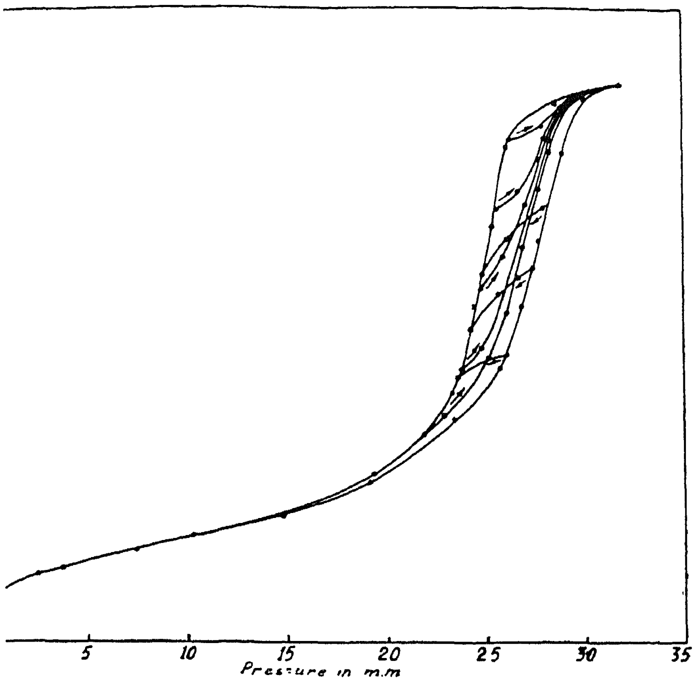

FIG. 1

path traces an independent curve till it reaches the peak of the hysteresis loop. In these experiments, the starting points on the sorption and desorption curves were reached from the zero and the saturation pressures respectively.

These significant observations are satisfactorily explainable only on the basis of the cavity concept. In the porous titania gel, there are capillaries of varying shapes and dimensions. Some of them are V-shaped pores and some are cavities having narrow necks, the latter alone being responsible for the hysteresis effect. During sorption these cavities are filled up in the same way as the V-shaped pores. During desorption, however, they get emptied only when they are exposed to pressures below the minimum at which water condensed in the necks of the cavities will just be in equilibrium with the vapour. At any point along the sorption curve forming the hysteresis loop there are always some cavities filled with water. When desorption is effected some of the water is entrapped and consequently the hysteresis loop is crossed till the main desorption curve is reached. At points along the desorption curve, there are some of the bigger cavities yet unemptied. When sorption is tried at these points separate curves are traced in juxtaposition to the main sorption curve and all these curves reach the peak of the hysteresis loop.

In another investigation on the scanning of the hysteresis loop obtained in the sorption of water on silica gel, exactly similar results have been obtained. The results on the scanning of the hysteresis loop definitely prove that a cavity completely filled with the liquid is emptied only when it is exposed to a pressure less than what is just sufficient for water in the neck of the cavity to be in equilibrium with the vapour, whereas the hysteresis loop itself can be caused even by a slight lowering from the minimum pressure which is enough to completely fill the cavity with the liquid. If a cavity has two or more necks of different dimensions, it is the largest neck that determines the pressure at which the emptying of the cavity takes place. It follows from the cavity concept that the true equilibrium curve is the sorption curve because along the desorption curve, the cavities retain the liquid in a metastable equilibrium and that the hysteresis effect in all porous adsorbents must be a rule rather than an exception. One of the causes, however, for the nonexistence or the disappearance of the hysteresis effect has been shown to be the elasticity of the cavity wall.[5]

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[1] Allmand, Hand and Maning, *J. Phys. Chem.*, 1929, **33**, 1694.
[2] Foster, *Proc. Roy. Soc.* (Lond.), 1934, **146A,** 129.
[3] Lambert and Foster, *Ibid.*, 1932, **136A,** 363.
[4] McBain, *J. Amer. Chem. Soc.*, 1935, **57**, 699.
[5] Rao, *Curr. Sci.*, 1939, **8**, 256.

Alleged Optical Isomerism of 6-Co-ordinated Cupric Salts

IN general, cupric ion does not form 6-co-ordinated compounds and readily stops at four. In 1927 Wahl[1] claimed to have prepared a lævo-rotatory diaquo bis ethylene diamino cupric iodide [Cu en$_2$ (H_2O)$_2$]I_2. It is obvious that a cation Cu(en)$_2$ would be inactive and it is only the formation of a 6-co-ordinated complex by means of two water molecules that could make the activity possible. Further, the complex must have to be remarkably stable: if the latter were even partially dissociated off in solution, the compound would racemise. Johnson and Bryant[2] on reinvestigation found that Wahl's iodide dihydrate effloresces in air and the constitution of the complex ion in the crystal is $[Cu(en)_2]^{++}$, the co-ordination valency being four, not six. Optical isomerism is therefore excluded. The authors state that the ion $[Cu\ en_2(H_2O)]^{++}$ even if formed in aqueous solution, is too unstable to permit of resolution. The present observation is in agreement with this remark in so far as the analogy between the structures $[Cu\ en_2 - (H_2O)_2]I_2$ and $[Cu\ pn_2\ (H_2O)_2]I_2$ may be regarded as relevant. It has been found that in diaquo bis propylene diamino cupric iodide, one molecule of water is very loosely held and the crystals of the diaquo compound rapidly lose their lustre and form the monohydrate. A 6-co-ordinated cupric ion, therefore, does not exist in the solid state and the presence of octahedral configuration cannot be said to have been established in the case of copper by optical resolution.

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1 *Soc. Sci. Fenn. Phy. Math.*, 1927, 4, 14.
2 *J. C. S.*, 1934, 1783.

Twig Blight and Fruit Rot of Mango

IN Bombay mango trees become affected in the monsoon by a disease producing on the twigs water-soaked areas, which rapidly enlarge in extent. Invariably there is a rapid upward extension of the invaded region, and the lateral spread is quite limited in extent and never girdles the twig. The affected bark ultimately turns dark brown, and the shoot dries up (Fig. 1). Numerous dark brown pycnidia are formed at the margin of the invaded region of the bark, but in the affected area their number is small. They measure from 88 to 248 μ in diameter (56·8 to 145·5 μ in culture) and have an ostiole, which perforates the epidermis. The hyaline pycnospores measure 16·5 to 26·1 by 4·8 to 6·9 μ. The disease also affects the ripening fruit during storage and produces a black rot especially at the stalk-end of the fruit.

FIG. 1

Showing the drying up of twigs of mango trees due to infection with *Phoma* sp.

A species of *Phoma*, which is probably new to science, was readily isolated from the diseased bark and was also obtained from naturally infected mango fruits. Inoculation experiments on wounded stems with 3 to 4-week-old cultures of the fungus grown in potato-dextrose agar gave positive results. In inoculation experiments a vertical slit was made in the bark with a sharp knife, and bits of mycelium were applied to the cut surface and covered with paraffin or wrapped over with wet cotton wool. In about 72 hours water-soaked areas appeared round the slits, and infection spread more rapidly towards the apex of the twig than at the sides, ultimately killing the twig. Green twigs of *Pairi* and *Alphonso* varieties of mango between the ages of one and two years are highly susceptible to infection, whilst younger shoots and those with mature bark fail to take