In an attempt to eradicate the trouble, an exhaustive series of trials have been carried out with soil fungicides, including sulphuric acid, Cheshunt compound, formaldehyde, mercuric chloride, and cresylic acid. The most satisfactory results were obtained by using sulphuric acid (1 in 80) applied to the soil on the same day as the seeds were sown. Cheshunt compound did not prove to be nearly so valuable as a fungicide for this particular purpose, although when applied to growing seedlings it exerted a distinct manurial effect and stimulated growth. Formaldehyde, mercuric chloride, and cresylic acid did not give results which could be compared with those obtained by using sulphuric acid.

The application of sulphuric acid at sowing time also greatly controlled the growth of weeds, and the cost of weeding the seed beds has been reduced by fifty per cent through its use, after allowing for the cost of the acid and of its application. The blow-lamp method recommended for weed control by Messrs. Benjamin Reid of Aberdeen has not given such good results under conditions obtaining in Northern Ireland.

Sulphuric acid as a fungicide and weedicide has given equally good results when used on a large scale, and the treatment is now included in the routine of raising conifer seedlings in the forest nurseries of the Ministry. Up to the present, no adverse effect on the soil has been experienced by the application of the acid.

It is expected that a full account of the work which has been carried out will appear in volume 3 of the *Journal* of the Ministry of Agriculture for Northern Ireland, to be published in 1930.

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The Frenkel Adsorption Isotherm.

DURING an investigation into the temperature coefficient of the adsorption maximum of gases on a solid surface, we have had occasion to examine the Frenkel adsorption isotherm. This is written (*Zeit. f. Phys.*, **26**, 133 ; 1924, equation 9a) :

$$\frac{S}{n} = \sigma_0\left(1 + \frac{\sqrt{2\pi mkT}}{p\sigma_0\tau_0}\right)e^{-u_0/kT}$$

Frenkel deduces from this equation that at sufficiently low values of T the number of adsorbed molecules, n, approximates to a maximum value S/σ_0. It is difficult to see how this result is obtained. When p is very large this isotherm gives at the saturation maximum a value of n which approximates to $\frac{S}{\sigma_0} \cdot e^{u_0/kT}$, and it is therefore at high temperatures and not low that n approaches S/σ_0. Moreover, the existence of a marked temperature coefficient in the value of the adsorption maximum is very surprising, for the Langmuir isotherm which was developed from almost identical assumptions and using the same method has not this temperature coefficient.

A closer examination of the equation has explained the discrepancy, for it appears that Frenkel has made a slight algebraic error in deducing the final equation. The corrected isotherm is

$$\frac{S}{n} = \sigma_0\left(1 + \frac{\sqrt{2\pi mkT}}{p\sigma_0\tau_0} \cdot e^{-u_0/kT}\right),$$

which gives the saturation maximum S/σ_0 which is independent of T.

F. J. WILKINS.
A. F. H. WARD.

Laboratory of Physical Chemistry,
Cambridge, Aug. 14.

Attempts to induce Rainfall.

THE Colony of Hong-Kong has suffered from an unprecedented deficiency in rainfall during the twelve months ending June 30, 1929, with consequent distress to the population, owing to water shortage.

Amongst the many suggestions received from the public by the local Government was the proposition that powdered kaolin, sprinkled from aeroplanes above suitable clouds, would induce precipitation ; the method was stated to have been employed with success in other countries. After discussion with other government officials, I made the following recommendation :—

"I consider that the experiment might reasonably be attempted once. I have little doubt of its failure, but this avenue of relief may then be considered sufficiently explored and be definitely closed thereafter."

My personal opinion is plainly expressed in the foregoing ; had the Government refused to countenance the experiment, however, there would have remained a feeling in the public mind that one possible solution of the water problem had not been tried. The experiment was made by the unit of the R.A.F. stationed here, and no precipitation occurred.

The reports in the local press are now being commented upon by journals outside the Colony, usually with the implication that this Observatory was responsible for the inception and conduct of the experiments. This was not the case ; the experiments were authorised by the Government to discount any subsequent criticism. No belief in a materially successful result was held by the administration or its advisers, including my colleagues and myself.

C. W. JEFFRIES
(Acting Director).

Royal Observatory,
Hong-Kong, July 31.

Dew: Does it Rise or Fall?

I THINK it may be said to do both. There is no doubt, as Mr. John Aitken proved many years ago, that *real* dew rises as vapour from the ground and condenses on cold surfaces near the ground. This may be observed on plantain or dandelion leaves growing, for example, on a hard gravel path ; the hard material loses its heat slowly during the night and, though there is no visible condensation, moisture continues to rise. The leaves will radiate their heat after sundown from the upper surface and moisture will deposit on the under surface only. There are, of course, other ways of showing the same effect.

Another form of dew, which may be termed *false* dew, is caused by cold air, formed during radiation, flowing from a higher to a lower level. The cold air tends to cool the objects with which it is in contact and the water vapour present in the warmer air is thereby condensed. Mist over water and marshy ground is formed in this way and this dew may therefore be said to fall. Some years ago I was able to show that at the lake level at Coniston the temperature of the air in the early morning before sunrise was several degrees lower than at the top of the Coniston Old Man (2633 ft.), and whereas the grass was dripping with moisture at the foot of the mountain, that on the top was as dry as on a warm summer's day. The cold air had descended and been replaced by the warmer air from below.

J. B. COHEN.

Coniston.