ever, it was not until May 1945 that we obtained a sufficiently large number of ticks from a presumed 'non-resistant' area to test alongside ticks from a presumed 'resistant' area. These two gatherings of ticks arrived at our laboratories within forty-eight hours of each other, and batches of a hundred fully engorged female ticks from each locality were dipped in arsenical solutions of different concentrations. A hundred ticks from each area were treated in tap water as controls. After dipping, the ticks were dried in a manner simulating natural conditions, and they were then placed in pairs in tubes and kept in an incubator at 25° C. and 100 per cent relative humidity.

In both cases the tap water had little or no effect on laying, as 95 per cent and 93 per cent of the ticks so treated laid large batches of eggs, and hatching was also heavy.

Ticks from the presumed 'non-resistant' area responded readily to the arsenical treatments, as only 37 per cent laid after treatment in 0·16 per cent As_2O_3 (7-day dipping strength), while 0·32 per cent As_2O_3 and 0·64 per cent As_2O_3 reduced laying to 7 per cent and 1 per cent respectively. The effect of the arsenic on hatching was also apparent, as only three batches of eggs laid by ticks treated in 0·16 per cent As_2O_3 showed partial hatching. The treatment has to all intents and purposes resulted in a perfect control.

On the other hand, ticks from the presumed 'resistant' area were little affected by the arsenical washes, as laying occurred in 95 per cent, 83 per cent and 63 per cent of the ticks treated in 0·16 per cent, 0·32 per cent and 0·64 per cent As_2O_3 respectively. Hatching was also fairly heavy, as 76, 68 and 35 of the batches laid by ticks treated in 0·16 per cent, 0·32 per cent and 0·64 per cent As_2O_3 showed hatchings. In this case the treatment has resulted in a very imperfect control, even with concentrations of As_2O_3 which would injure cattle.

It is also interesting to note that the arsenical solutions produced a well-marked time-lag in egg laying, which is also further emphasized in the hatchings. This lag is so constant that it cannot be explained by experimental error.

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Electric Discharge on a Dielectric Surface (Lichtenberg Figures)

THE following method of developing a latent Lichtenberg figure on the surface of certain types of solid dielectrics is very successful. So far, only a 'silicon' type of synthetic resin, 'Novalak' (fusible phenol formaldehyde polymer), ester gum and cumar resin have been used; but it appears necessary merely that the dielectric should be hard and brittle at ordinary temperatures and should soften quickly at some higher temperature. For example, in one experiment a piece of the resin was fused and poured on a clean glass plate to form, when cool, a hard smooth and uniform coating. This was placed between a needle point and an earthed metal plate. A single positive (or negative) voltage surge of magnitude 10 kV. was applied. No change of the surface was visible. On gently heating the resin coating, however, until the softening temperature was just reached, thread-like grooves appeared which, in a few moments, assumed the characteristic form of a Lichtenberg figure. At this instant the heating was stopped, otherwise the figure disappeared rapidly as the resin liquefied.

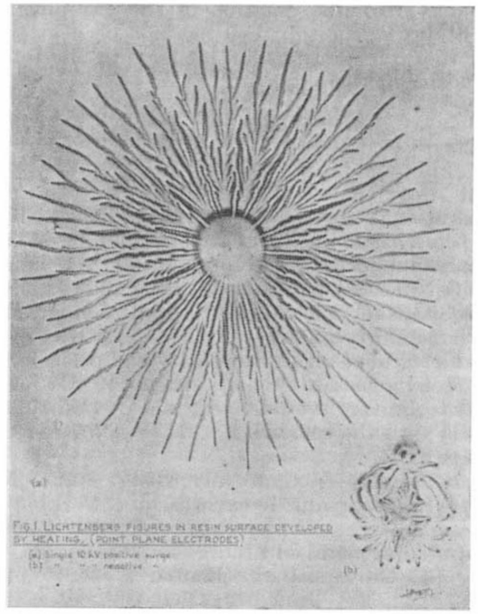

FIG. I. LICHTENBERG FIGURES IN RESIN SURFACE DEVELOPED BY HEATING. (POINT PLANE ELECTRODES)
(a) Single 10 kV positive surge
(b) " " " negative "

To photograph the figure, the coated plate was placed in a photographic enlarger, in the position normally occupied by a negative. A black disk superimposed over the image of the illuminant, formed in front of the lens, stopped all the emergent light except that differently refracted by the minute grooving. The accompanying reproduction shows the results obtained with a positive and negative surge respectively.

It is hoped to give later a detailed explanation of the mechanism; its association with bound electrostatic charges and the resultant attraction is clear.

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Formation of an Addition Compound of Calcium Silicate and Sodium Fluoride

IN connexion with some experiments concerning the decomposition of calcium fluoride by fusing with silica and sodium carbonate, the formation of needle-shaped crystals was observed. The crystals were analysed, and it appeared that the formula of the compound must be Ca_2SiO_4NaF, as is seen from the following data:

	% CaO	% SiO_2	% Na	% F.
Observed	51·5	28·6	11·0	8·5
Calc. for Ca_2SiO_4NaF	52·36	28·04	10·74	8·87

An X-ray investigation of the compound by the Laue, rotation, and Weissenberg methods has given the following results. The Laue symmetry is $C_{2h}-2/m$. The deviation from the symmetry $D_{2h}-mmm$ is, however, very slight. The diagonal axis