which were smooth at transference), eleven developed keels of varying strengths, one remaining smooth. The keel-inducing influence thus seems to act during the first few weeks of life. Snails first showed the keel at the age of about seven weeks. Though the discontinuous development of the keel has not yet been produced in the laboratory, its natural occurrence, on one occasion at least, seems to be due to accidental change of conditions from keel-inducing to smooth-inducing.

From the above experiments it appears that *P. Jenkinsi* exists as both keeled and smooth genotypes. Further, since brackish water *per se* does not induce a keel, it seems that the environmental factor responsible for the appearance of the keel is Algal. Moreover, this agency needs only to act in early life to induce a keel for the rest of the life of the snail. The Alga probably acts partly in a quantitative manner to produce keels of strengths varying from a scarcely perceptible ridge to the fully aculeate form.

As already stated, the offspring obtained from jars immersed during April and May at Christchurch were a mixture of keeled and smooth and smooth respectively. These results may throw some light on the many negative results previously obtained in experiments on the inheritance of the keel. It appears likely that, especially in freshwater, the keel-inducing species of Alga may have a relatively short life under the laboratory conditions tried hitherto. Jars with a healthy growth of brackish water Algæ from Christchurch on pebbles yielded 100 per cent keeled offspring from keeled parents. In the above two jars, however, the Algæ only remained healthy for a short time, later forming a flocculent precipitate. The keeled snails in the April jar were older (larger) than the smooth snails. This may be significant as suggesting that the older snails were in the labile condition for keel production at a time when the keel-inducing Alga was still alive in sufficient quantity in the culture. It is to be expected that some smooth colonies will prove on breeding analysis to contain a proportion of genotypically keeled specimens.

I am indebted to Miss C. H. Popham, of Christchurch, for helping in the collection of field material and to Mr. Moffatt, of Hambleden, for facilities in housing experiments.

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A Method of Obtaining Tissue Cultures of Adult Fibroblasts

IN recent years we have made several attempts to infect tissue cultures of fibroblasts from chicks and fowls of various ages with the virus of Rous sarcoma No. 1. Although we were not satisfied that such infection can take place *in vitro*, we gained some experience in methods of obtaining tissue cultures of adult fibroblasts, which may be of interest to others.

Resting adult connective tissues did not give satisfactory cultures, and it was necessary to devise a method of setting up local connective tissue proliferation, and afterwards removing cells at various intervals of time. Methods involving open operations were avoided, because of the risk of airborne bacterial contamination. In our first experiments, we implanted various kinds of threads into the breast muscles of fowls and withdrew them after different time-intervals, together with proliferating cells that had become entangled in them. This method, though satisfactory up to a point, had the disadvantage of introducing foreign matter into the culture medium and was sometimes accompanied by infection. The most satisfactory method was as follows. Small glass capillary tubes, 1·5 cm. long and 2·0 mm. outside diameter, were implanted into the breast muscle of fowls by means of a trocar and canula. The tubes were open at both ends, but a constriction at one end allowed a knotted thread to be retained by the tube and served to withdraw it at the desired time. A small skin incision can be made before inserting the trocar and canula to reduce the risk of introducing organisms from the skin; but this was not found to be necessary if the skin was well prepared with 1 : 1,000 acriflavin in 50 per cent methylated spirit immediately before operation. After introducing the tubes through the canula, the latter can be withdrawn, leaving the free ends of the threads protruding from the wound. These can conveniently be tied together and anchored to the skin with a stitch which also closes the wound.

Such small tubes, when withdrawn after intervals of one to ten days, are found to contain fibrin clot invaded by fibroblasts and macrophages; they are, in fact, miniature tissue cultures. By breaking the thin capillary tube, the contents can easily be liberated for implantation into suitable culture medium in roller tubes or other type of tissue culture apparatus. The method has the advantage of simplicity, and reduces handling with consequent risks of infection by airborne organisms. Cultures obtained in this way were maintained for about two weeks on fowl plasma desiccated embryo extract medium without the addition of any living cells.

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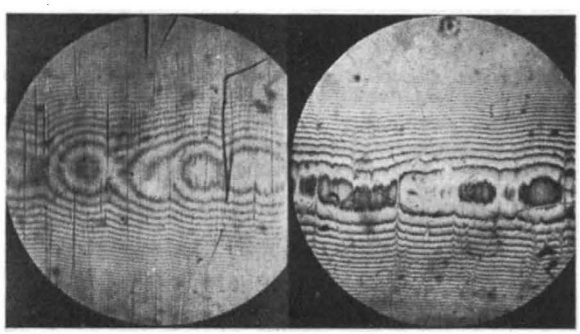
Silvered Mirrors for Interferometric Measurement

THE simple interferometric devices used in Great Britain[1] and on the Continent for testing the surface quality of workpieces of less than 20 micro-in. surface roughness have recently been improved by applying a partly reflecting mirror as suggested by L. Leinert[2]. This method has been compared with



PHOTOGRAPHS OF A LAPPED RING, USING SODIUM LIGHT. (*a*) PHOTOGRAPHED THROUGH AN ORDINARY GLASS COVER SLIT; (*b*) PHOTOGRAPHED THROUGH SILVER SPUTTERED MIRROR. MIRROR BY COURTESY OF MESSRS. C. J. WHILEMS, LTD., ILFORD OPTICAL WORKS, FORREST ROAD, BARKINGSIDE, ESSEX.