where v_r , etc., are the complex diaphragm velocities, Z_{ii} is the self-radiation impedance and Z_{ir} , etc., are mutual radiation impedance coefficients. Now in close-packed arrays containing projectors which have diaphragms that are small in terms of a wavelength (say, $< \lambda/3$) the mutual radiation impedance terms $Z_{ir} v_r/v_i$, etc., are dominant. It is believed then that the argument of these complex terms will vary rapidly with frequency near the mean resonant frequency of the array.

Detailed calculations are planned to test this suggestion.

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Ultrasonic Propagation Constants in Supercooled Salol

DISCONTINUITIES in various physical properties¹ of liquids in the supercooled region have been observed by several workers. The present work was undertaken to investigate whether such changes occur in ultrasonic velocity and absorption in the supercooled region of the liquid.

The liquid chosen for study was salol (phenyl salicylate), which was selected for the sake of convenience of its melting point. The velocity measurements were made with the help of a precision interferometer capable of giving values within 0.5 m. in a thousand. The observations were taken at 6 Mc./s. with the experimental arrangement² used here earlier.

The ultrasonic absorption was measured by the disappearance of the central order in the diffraction pattern, a method³ developed earlier here. The investigations were carried out at 7.15 Mc./s. Arrangements were made for keeping the different temperatures constant within 0.1° C. by a thermostat controlled by an electric relay. The range of temperature studied was 35–58° C., passing through the melting point at 42° C. The results obtained, which were consistent in half a dozen experiments, are given in Table 1 and Fig. 1.

Results obtained in salol for velocity and absorption show a discontinuity near the melting point, the temperature coefficient of absorption being different on either side of the melting point. The slope of the temperature-absorption curve in the normal region is comparatively greater than that in the supercooled region, whereas there is no appreciable difference observed in the temperature coefficient of velocity on either side of the melting point. It is seen that the

Fig. 1

abrupt change in absorption coefficient observed near the melting point is definitely outside the range of experimental error.

It has been observed by Dodd⁴ and his co-workers that the temperature coefficient of density shows no detectable change as the liquids are supercooled. This suggests that the adiabatic compressibility must show a sudden change at the melting point. If this phenomenon be due to a sudden change in adiabatic compressibility, a corresponding discontinuity may be expected in ultrasonic velocity and absorption coefficient near the melting point of the liquid. This type of discontinuity is confirmed by the present investigation.

Further work on the problem is in progress the details of which will appear elsewhere.

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¹ Greenwood, N. N., and Martin, R. L., *Proc. Roy. Soc., A*, **215**, 46 (1952).

² Bindal, V. N., paper read at the 47th Session of the Indian Science Congress in Bombay, January 1960.

³ Parthasarathy, S., Pancholy, M., and Tipnis, C. B., *Z. Phys.*, **140**, 156 (1955).

⁴ Dodd, C., and Hu Pak Mi, *Proc. Phys. Soc., B*, **62**, 454 (1949).

An Inexpensive Castle and Sample Holder for Radioactive Counting

THE use of radioactive tracers is becoming much more extensive thanks to the training programmes in the more technologically advanced countries which offer courses to students from other regions of the world. The high initial cost of much equipment used to detect radioactivity is often the explanation for the time-lag in using the powerful tracer technique to solve important local problems in agriculture and medicine.

One means of reducing the cost is shown in the accompanying photographs. There is no necessity to buy expensive lead or aluminium castles to support the samples beneath the Geiger tube. The wooden holder (Fig. 1) for the Geiger-Müller tube is a solid block through which a hole was drilled slightly larger than the diameter of the Geiger-Müller tubes likely to be used. This block was then slotted to allow the butterfly clamps to be tightened enough to hold the tube in place.

The solid block was surrounded by wood sheets on four sides. The bottom serves not only as a brace but

Table 1

Temperature (°C.)	Velocity (m./sec.)	Absorption (10 ¹⁷ cm. ⁻¹ sec. ⁻²)
35.0	1,447.0	680
37.0	1,440.5	700
39.0	1,434.0	715
41.0	1,428.0	730
42.0	Melting point	Melting point
43.0	1,418.0	820
46.0	1,409.0	910
49.0	1,399.5	1,000
52.0	1,390.0	1,090
55.0	1,380.5	1,180
58.0	1,371.0	1,270