tion by reducing the field space. Dimensions and angles of the pole pieces are shown in Figure 2.

The pole pieces are located in a Dewar vessel (see Figure 1) so allowing measurements in the temperature range from ambient to that of liquid helium. The distance between the pole pieces was secured by a spacer in the form of a brass tube in which they are soldered using pure tin as this does not yet become superconducting at 4·2° K. In order to reduce helium consumption, the spacer tube that supports the pole pieces also forms a container that can be filled with liquid hydrogen at first and can be pumped down later. In this way, the test arrangement can be cooled down

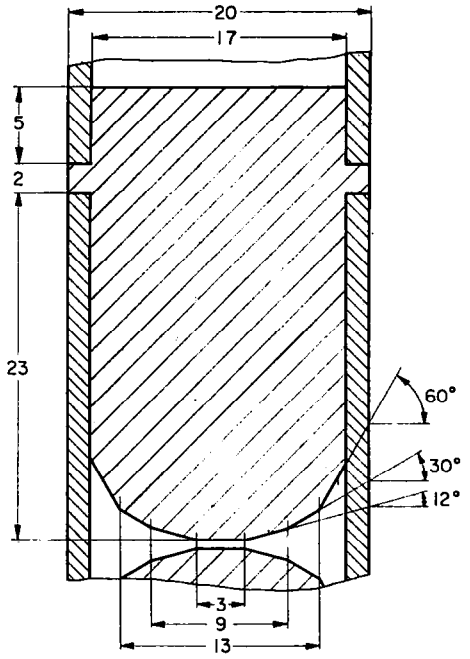

Figure 2. Dimensions of the pole pieces in millimetres

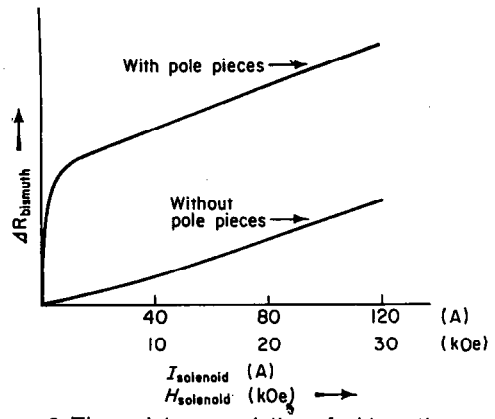

Figure 3. The resistance variation of a bismuth preparation versus solenoid current

to about 12° K before the Dewar vessel is filled with liquid helium.

As the solenoid is cooled with liquid nitrogen, no additional shielding against heat influx by liquid nitrogen is required. The maximum field strength is 71 kOe (measured ballistically); the curve of field strength as a function of the solenoid current is plotted in Figure 3, using as parameter the resistance variation of a bismuth preparation.[3]

It will be noted that fields of intermediate intensity can be obtained with very low consumption of liquid nitrogen (proportional to I^2). Finally, as the solenoid is wound from commercial lacquer-insulated copper wire with spacers between the layers, the electromagnet can be built with little difficulty and at low cost in the laboratory workshop.

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AN APPARATUS FOR STUDYING N.M.R. AT TEMPERATURES DOWN TO 0·3° K

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THE arrangement of the apparatus for obtaining a temperature of 0·3° K, similar to that described by Esel'son et al.[1] is shown in Figure 1. The metal cryostat 8 is a permanent system of two Dewars with common vacuum and nitrogen shield, ending in a tail. The vacuum space is only pumped by a rotary pump, so that the inner part of the apparatus can be cooled rapidly after filling with nitrogen. The remaining gas is then gradually pumped out by the activated charcoal fixed to the inner wall of the helium Dewar. The inner diameter of the cryostat tail is 36 mm, the outer 48 mm, and the length 285 mm. The cryostat is easily connected to and disconnected from the cap

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