range ($\Omega \times 100$). If the battery has been in use for some time, or if errors are suspected on the high resistance range, it is worth while *removing* the battery and checking its short circuit current on the 100 mA. d.c. range. If the battery fails to give a reading greater than 25mA. it should be discarded.

INSULATION RESISTANCE MEASUREMENT

Two courses are open, the first merely calling for a battery or other source of d.c. voltage in the order of 130 V. to 160 V. The left-hand switch should be set at 'RESISTANCE' with the right-hand switch at 'INS' and the meter leads should be connected to the battery. The pointer should be brought to zero on the ohms scale by means of the adjuster marked 'ZERO $\Omega \times 100$'. To test, connect the unknown resistance in series with the meter and its value will be that shown on the ohms scale mulitplied by 1,000. Resistances up to 200 megohms can, therefore, be read on this range.

The alternative method makes use of the 'Resistance Range Extension Unit', described later.

LOW RESISTANCE MEASUREMENT

The meter setting marked L.R. is for use with the Resistance Range Extension Unit. The method of use is described in the section covering accessories.

DECIBEL MEASUREMENT

The decibel scale can be used with any of the a.c. voltage ranges. It has a logarithmic scale shape and is useful in so far that it gives a measurement closely related to the impression of aural intensity in sound reproduction apparatus. A difference of one decibel is about the minimum difference which can be appreciated when comparing two intensities. For convenience, the scale is marked in decibels both positive and negative from a reference point. The difference in level between a negative value on the db. scale and a positive one is the sum of the two, i.e. the difference between —5 db. and + 6 db. is 5 + 6 = 11 db. It will be appreciated that when changing from one voltage range to the next higher, the pointer indication will fall, although input is kept constant. For a voltage range ratio of $2\frac{1}{2}$:1 this corresponds to a reduction of 8 in the indication of the db. scale. It follows, therefore, that 8 should be added to the reading every time an increase of $2\frac{1}{2}$ times takes place on the range. In the same way, 12 should be added for an increase of 4 times on the range, or 8 + 12 = 20 db. for an increase of $2\frac{1}{2} \times 4 = 10$ times in the range ratio.

The following might serve as an example: Suppose that the meter is connected on the 25 V. a.c. range across the primary of an output transformer and that a reading of + 9 db. is indicated (corresponding to 12·5 V. on this