The inductive method was used to measure the Hall coefficient. Chambers and Jones (1962) have provided the theoretical analysis of the method. The relation between the electric field E and the current J in the plane of an infinite sheet normal to the direction of B is :

$$E=(\rho+R_{\mathrm{H}}\mathbf{B}x)\mathbf{J}\,. \qquad (1)$$

The oscillatory magnetic field in the plane of the sheet obeys the equation :

$$\frac{d^2H}{dZ^2}=\frac{4\pi i\omega H}{\rho(1+iU)}, \qquad (2)$$

where

$$U=R_{\mathrm{H}}B/\rho\,. \qquad (3)$$

The resonant frequencies for forced oscillations corresponding to waves in a sheet of thickness b are :

$$\omega_{\mathrm{mr}}=\frac{m^2\pi|\rho(1+\omega)|}{4b^2}. \qquad (4)$$

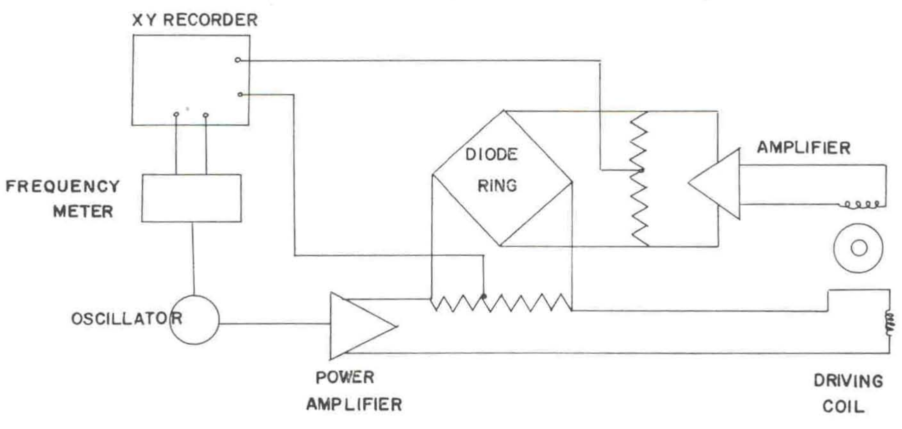
The Q of each resonance is :

$$Q=\frac{(1+u^2)}{2}. \qquad (5)$$

The resistivity ρ can be determined by measuring Q and substituting in eqn. (5).

The experimental system is shown in fig. 1, and is similar to the one used by Taylor, Merrill and Bowers (1963). Essentially a dispersion curve was obtained on the X–Y recorder from which ω_{mr} and Q can be obtained. The signal voltage and absorption curve is obtained by means of an RC circuit.

Fig. 1



Schematic diagram for measuring galvanometric properties by the inductive method.

§ 3. Results and Discussion

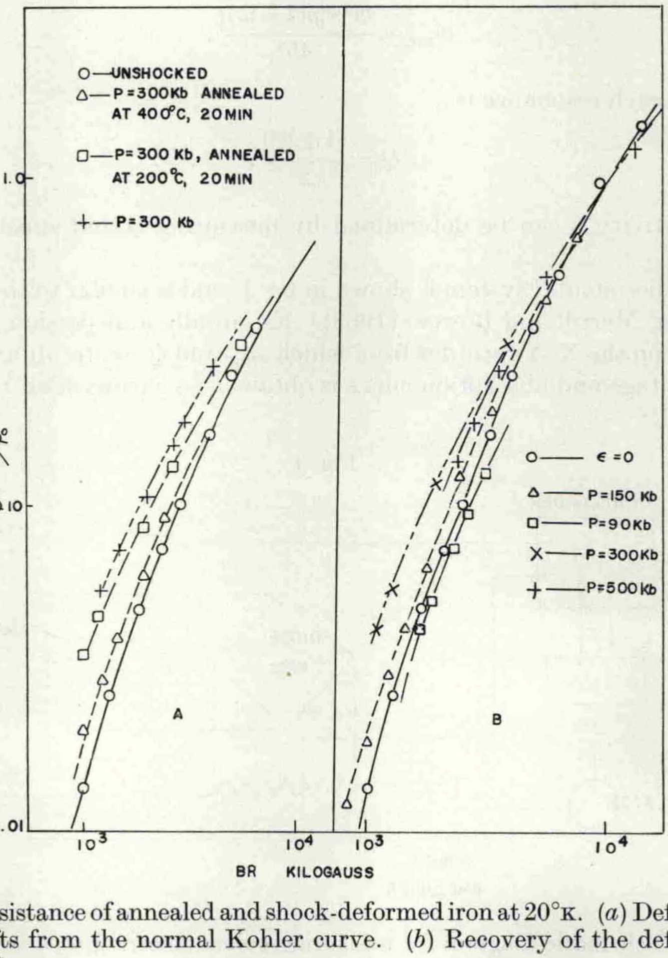
3.1. *Transverse Magnetoresistivity of Deformed Fe*

The increase of the normal resistivity at $B=0$ due to plastic deformation was measured for each Fe specimen as a function of linear strain. We found that $\Delta\rho=\epsilon^n$ with $n=1.6$. The magnetoresistivity was measured for each specimen as a function of

$$BR=B\,\frac{\rho^{RT}(0)}{\rho^{T,C}(0)} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \qquad (6)$$

R is the resistivity ratio referred to room temperature, where the resistivity $\rho RT(0)$ is almost independent of c, the impurity level.

Fig. 2



Magnetoresistance of annealed and shock-deformed iron at 20°K. (*a*) Deformation shifts from the normal Kohler curve. (*b*) Recovery of the deformation shifts.