into account in estimating the shifts accurately. A discussion of these applied to the band head shifts and the shifts in the rotational structure of the individual bands will be presented in detail elsewhere.

M. G. SASTRY.

Andhra University,
Waltair,
June 30, 1941.

[1] *Ind. Jour. Phys.* (in press).
[2] Jevons, *Report*, p. 209.
[3] Tanaka and Koana, *Proc. Phys. Math. Soc.* (Japan), 1934, **16**, 365.
[4] *Rev. Mod. Phys.*, 1935, **7**, 83.
[5] Jeppesen, *Phys. Rev.*, 1934, **45**, 480.
[6] Van Vleck, *Jour. Chem. Phys.*, 1936, **4**, 327.

MAGNETIC SUSCEPTIBILITY OF STRONTIUM

THE thermomagnetic properties of some sixty elements were measured in a comprehensive manner by Honda[1] and Owen.[2] The specific magnetic susceptibility of strontium was found to be $-0{\cdot}20$.[3] The observed values of the susceptibility of this element were, however, all positive. Stoner[4] suggested the possibility of an overcorrection for the relatively large iron content. In view of the present uncertainty of the susceptibility of strontium, a careful thermomagnetic investigation of this element was undertaken.

A pure Merck specimen of the metal was available. A spectroscopic examination showed traces of calcium and lead. The Curie method was adopted, taking small quantities of the fused metal in light pyrex glass bulbs. The susceptibilities were determined at field strengths between 3 and 8 kilogauss. The variation of the specific susceptibility with field strength showed traces of ferromagnetic impurities. The susceptibility at infinite field strength was determined from the $\chi, \frac{1}{H}$ graph. The mean specific susceptibility of strontium calculated from observations made on eight samples, was found to be $+1{\cdot}05$. The element was thus found to be paramagnetic.

The gram atomic susceptibility of the metal is therefore $+92{\cdot}0$. Kido's[5] value for the ionic susceptibility of Sr^{+2} is $-15{\cdot}6$. This shows that the two valence electrons of the strontium atom have a susceptibility of $+107{\cdot}6$ (per gram atom of the metal). The width of the occupied energy range in the completely degenerate state of the valence electrons works to about 0·6 volt. Our result supports Stoner's[4] observation that in the alkaline earth elements, the electron energy bands are much narrower than for free electrons.

Experiments on the temperature variation of the paramagnetic susceptibility of strontium are in progress. A detailed account will be given elsewhere.

S. RAMACHANDRA RAO.
K. SAVITHRI.

Annamalai University,
Annamalainagar,
August 2, 1941.

[1] *Ann. der Phys.*, 1910, **32**, 1027.
[2] *Ibid.*, 1912, **37**, 657.
[3] All susceptibility values are given in 10^{-6} unit.
[4] *Magnetism and Matter*, 1934, p. 512.
[5] *Sci. Rep. Tohoku Imp. Univ.*, 1933, **22**, 835.

A BRIDGE METHOD FOR DETERMINING THE FREQUENCY OF AN ALTERNATING CURRENT IN THE AUDIO-FREQUENCY RANGE

THE various bridge methods for measuring the frequency of alternating current, so far suggested and employed, have been classified by Hague[1] with reference to their adjustment characteristics and their arm elements. The new bridge whose circuit diagram is shown below has an adjustment characteristic of the form $f = a\sqrt{x}$, which is a parabola.

The branch AB of the bridge contains the primary coil of the mutual inductor M; its self-inductance is L; in series with it an adjustable non-inductive resistance box is connected; P denotes the total resistance, including that of the coil, in the branch AB.