up to a magnitude corresponding to that of the ordinary metal.

(3) In fields above H_k, B and μ agree with the known data on ordinary metals with an accuracy of 0·2 per cent. $\mu = 1$.

(4) When the field strength is decreased again to values near H_k, the phenomenon is completely reversible. A further decrease of H causes a very rapid fall in B, which, however, suddenly ceases when B reaches a certain value B_h. However, in different experiments carried out with the same specimen, this value was completely non-reproducible. The remaining induction B_h varies from 60 to 80 per cent of the maximum value of B. In some cases B was found to decrease slightly with time. Violent shaking of the specimen caused no noticeable change in B.

(5) When H is further reduced, B also decreases. In this part of the curve a considerable discrepancy is discernible between the results obtained with the first and the second method. It may be that the conditions under which the first method may be applied are not fulfilled in this part of the curve. For small values of H the curve obtained by the second method is completely reproducible and does not depend on how far B jumps in the H_k region.

(6) At $H = 0$, the specimen always retained a residuary induction, which was fairly well reproducible and equal to 18 per cent of the maximum value of B at the moment of transition, as measured with the second method.

(7) When H is increased in the negative sense, the residuary magnetisation decreases. Along the entire falling portion of the curve a return to a former value of the field strength causes no change in the induction. (Compare line AC on Fig. 1.) When the field strength equals $-H_k$, the residuary induction vanishes, and a further change in the field-strength leads to a completely symmetrical cycle.

Our experiments show that in the vicinity of H_k a sudden change occurs in B with increasing as well as decreasing field strength. These results do not agree with the former concept of a supraconductor, in which, when the field-strength is decreased, the induction should be maintained constant by means of induced persistent currents (Fig. 1). The actual fact that a jump takes place in the induction in falling field strengths we are inclined to ascribe to the formation of a new phase with $B = 0$.

We hope to obtain a more simple relation between B and H for single crystals, with which we have begun experiments.

At $H = 0$, the persistent currents give rise to a residuary magnetic moment in a supraconductor. Mendelssohn and Babbitt[5], apart from ourselves, observed this phenomenon in a sphere of tin and found the residuary moment to be 1/6 of the maximum moment at the point at which supraconductivity is destroyed.

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Spectrum of Nickel Hydride

RECENTLY we have observed the spectrum obtained by introducing nickel carbonyl vapour into the flame of a Meker burner. Just above the blue-green cones, in the hottest part of the flame, we find a very wide-spaced band structure which can only be attributed to a hydride.

Examination of this wide-spaced structure under high dispersion shows that it consists of two well-defined bands, degraded towards the red, with heads at λ5712·6 and λ6245·9. These show well developed P branches, slightly weaker R branches, and Q branches which start with high intensity and quickly fade out. The general intensity distribution, taken in conjunction with the fact that the continuity of the R and P branches through the origin is broken by six missing lines, indicates that the bands arise from transitions of the type $^2\Delta \rightarrow {}^2\Delta$. The term differences show that the bands have a common final level. The initial level of the λ5712·6 band shows marked perturbation. Preliminary estimates of the rotational constants are:

	λ5712·6	λ6245·9
B'	5·6 cm.$^{-1}$	5·5 cm.$^{-1}$
B''	7·6 ,,	7·6 ,,
I'	$4 \cdot 9 \times 10^{-40}$ gm.cm.^{2}	$5 \cdot 0 \times 10^{-40}$ gm.cm.^{2}
I''	3·6 ,, ,,	3·6 ,, ,,

We conclude that the spectrum is to be attributed to the molecule NiH. This is supported by the observation that the same structure is obtained when a discharge from a 10,000 volts transformer is passed between nickel electrodes in a flame of hydrogen burning in air.

The hydride bands fade out towards the top of the flame, where they are replaced by a second, much more closely spaced, system of bands believed to be due to the oxide NiO. In addition, the flame shows two groups of nickel lines; the first between λ2300 and λ2480 is restricted to the base of the flame; the second between λ3000 and λ3900 extends through the whole of the flame. The bands of C_2, CH and OH, which are also observed, occur in the spectrum of the flame alone.

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Conductivity of Tellurium

THE influence of relatively few foreign atoms on the electron properties of tellurium supports A. H. Wilson's theory[1,2] of semi-conductivity. The accompanying curves (Fig. 1) illustrate the decrease in the electrical resistance of tellurium by the addition of copper and antimony.

This high sensitiveness to impurities explains the lack of agreement among various investigators as to the specific resistance of tellurium. The conductivity of the tellurium we studied could be entirely attributed to an impurity of about 0·01 per cent antimony or bismuth, so that it seems possible that ideally pure tellurium would have a much higher resistance than has been observed. This assumption is strengthened too by its abnormal thermoelectric power[2].

The addition of 0·2 per cent antimony or bismuth to our tellurium caused the electrical conductivity to increase about a hundred times and the temperature resistance coefficient to change from negative