

dynamic cooling of a column of air ascending over the land by day; the great range of temperature and extreme susceptibility to frost, to excessive radiation of heat from the ground through unusually clear sky produced by dynamic warming, and evaporation of cloud, in the column descending over the land by night.

The winds and weather of the upper Lake Region are usually under the control of passing cyclones but statistical analysis of wind records affords a verification of the foregoing hypothesis by showing the existence of a diurnally reversing component of the wind.

ANOMALOUS TEMPERATURE EFFECTS UPON MAGNETIZED STEEL.¹

BY N. H. WILLIAMS.

SMITH and Guild, in experimenting with short steel rods of high carbon content, found that, upon heating the specimens, the magnetism was reversed in the neighborhood of 200° C. Their explanation ascribed the reversal to the difference in action of the self-demagnetizing field of the magnet upon the iron and the carbide components of the steel.

The present paper deals with experiments which suggest an entirely different explanation.

It is found that the reversal is dependent upon the method of magnetizing the rod and that it can be prevented entirely by preventing an oscillatory discharge through the magnetizing coil.

THE POSITIVE POTENTIAL IN THE PHOTO-ELECTRIC EFFECT.¹

BY W. H. KADESCH.

TWO main sources of error have been especially troublesome in work on the positive potential. These are due, first, to the relatively short range of frequencies to which the easily manageable metals are sensitive, and secondly, to the effect of ageing of surfaces, and of photo-electric fatigue. The use of the strongly electropositive metals as electrodes in this research made it possible, not only to illuminate with light of greater wave-length than has hitherto been used but also to expose a new surface with the greatest readiness whenever desired.

Cylindrical electrodes of sodium and potassium were fixed to the rim of a wheel which could be rotated by means of an electro-magnet, the shaft of the wheel carrying a soft iron armature. In the plane of the wheel, and at opposite ends of a diameter, were placed a Faraday cylinder, and an auger-like knife operated by means of a second electro-magnet. To make an observation the electrode was turned first toward the knife, by means of which a slice of any desired thickness was taken off, then toward the Faraday cylinder, in position to receive the illumination. The source light was a spark about 2 mm. in length between iron terminals. The analyzing device was a quartz spectrometer.

¹ Abstract of a paper presented at the Chicago meeting of the Physical Society.