made of a freshly-killed specimen in February of this year, and shows this feature well. It should be noted that the drawing is of the nature of a 'map' and shows the upper surface on the left side and the under surface on the right.

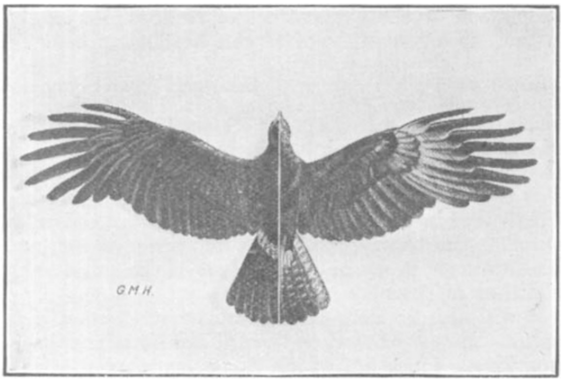

FIG. 1. Black eagle, *Ictinœtus malayensis perniger.* Left side, dorsal; right side, ventral.

It seems possible that an aeroplane with wings built on this plan would possess a lower stalling speed than those of orthodox shape, and I commend the suggestion to the attention of aircraft designers.

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Wildfire of Tobacco on *Nicandra physaloides*

THE wildfire disease of tobacco, caused by *Bacterium tabacum*, was first described in the United States in 1916; since then it has been reported from many parts of the world and has been the subject of extensive and detailed scientific investigations in many countries. The host range of the organism is a point of considerable importance and it has been found that many species of plants can be artificially infected with *B. tabacum*, with the production of definite pathological leaf symptoms. Yet, so far as I am aware, there are only three records (cowpea[1], tomato[2], and cucumber[3]) of the natural infection of plants other than tobacco. It is therefore of interest that I have found *Nicandra physaloides*, Gaertn. to be abundantly infected with wildfire in tobacco fields at Balfour in the East Cape Province, South Africa. This annual solanaceous weed is not indigenous but is widespread throughout arable lands. The infection was first observed in the late summer of 1932 among plants growing between the tobacco rows in a damp corner of the field; the following season, wildfire was very prevalent in tobacco and practically all the *Nicandra* plants throughout the same field showed wildfire spotting.

The leafspots on *Nicandra* are rounded in shape and measure 1·5–10 mm. in diameter, with an average of 6–7 mm. In colour they are dull brown with a definite dark edge and usually with several raised concentric rings; they lack the well-marked 'halo' which is characteristic of wildfire lesions on tobacco. The leafspots yielded a pure culture of bacteria which in general appearance and behaviour resembled parallel cultures of *B. tabacum* from tobacco. It was not possible to make a detailed examination of cultural characters, but parallel needle-prick inoculations were made with cultures of both organisms, on to experimental plants of tobacco and *Nicandra*; on the former the symptoms were identical and included a well-developed halo; on the latter in both cases a dull brown glassy lesion was formed. The *Nicandra* organism was recovered in pure culture by isolation from both the tobacco and *Nicandra* lesions, and when re-inoculated into both hosts, the characteristic symptoms again appeared.

Re-isolation from *Nicandra* completed the proof of the pathogenicity of the organism, whilst its similarity in culture and symptoms leaves no doubt as to its identity with *B. tabacum*.

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[1] Tisdale, W. B., Rep. Florida Agric. Expt. Sta., 1924.
[2] Chapman, G. H., and Anderson, P. J., Bull. 203, Mass. Agric. Expt. Sta., 1921.
[3] Johnson, J., *Phytopath* **14**, 4; 1924.

Remanence in Single Crystals of Iron

QUITE recently, Kaya[1] has published a very interesting series of measurements on the remanence in very oblong single crystals of iron. He finds that the remanence in the direction of the axis of the crystal wire is:

$$I_r = \frac{I_\infty}{l + m + n} \quad (1)$$

where l, m and n are the cosines of the angles between the three crystallographic axes (which are the directions of easy magnetisation) and the axis of the crystal wire (which is also the direction of the external fields) and I_∞ indicates the saturation intensity.

Kaya imagines this result to be in disagreement with the present theoretical conceptions, according to which the remanence ought to have the value:

$$I_r = I_\infty\, l \quad (2)$$

where l is the largest of the three cosines.

If, however, one takes into account the fact that a component of the magnetisation perpendicular to the axis of the wire I_p will be accompanied by a demagnetising field $(-2\pi I_p)$, and by a contribution

$$F_d = 2\pi I_p^2, \quad (3)$$

to the free energy*, Kaya's result can easily be explained. F_d will provide an enormous contribution to the total free energy as soon as I_p differs appreciably from zero. Therefore I_p has to be practically zero in all weak fields.

In a very weak external field, the magnetisations in the spontaneously magnetised elementary regions will thus be distributed in such a way over the three directions of easy magnetisation, that (as has been indicated also by Kaya):

$$I_x = \frac{I_\infty\, l}{l + m + n},\ I_y = \frac{I_\infty\, m}{l + m + n},\ I_z = \frac{I_\infty\, n}{l + m + n} \quad (4)$$

and so

$$I = \sqrt{I_x^2 + I_y^2 + I_z^2} = \frac{I_\infty}{l + m + n}. \quad (5)$$

So we find, in agreement with the theoretical conceptions, that the experimental remanence is identical with the magnetisation to be expected theoretically for very weak external fields.

In stronger fields, magnetisation in the elementary regions will be deflected from the original directions