

tion, the wonderful products of Nature by which we are still surrounded. The destruction of a work of art would be condemned as vandalism by all educated people, and it is difficult to believe that any intelligent woman would willingly be a party to the destruction of some of Nature's finest masterpieces. It has taken many millions of years to produce a humming-bird or a bird of paradise, and what work of art can compare with these living gems? Their destruction, once accomplished, would be irrevocable, and future generations of zoologists, with all their science of genetics, might strive in vain to produce anything to replace them.

Should such wantonness be permitted merely to satisfy the greed and vanity of a few human beings? I think not, and therefore I hope the Plumage Bill now before Parliament will be passed, and that other nations will follow our example in endeavouring to put a stop to a practice which is a dark blot on civilisation.

Possibly an even more hopeful method of accomplishing this aim would be by the formation of women's societies for the express purpose of discountenancing the fashion of wearing plumage derived from wild birds, except in the case of those the destruction of which is demanded for other and sufficient reasons. Such societies might do much useful work in enlightening the ignorant and thoughtless and in fostering a wholesome public opinion. Possibly they exist already; if so, now is their opportunity.

ARTHUR DENDY.

#### The Magnetic Storm of March 22-23 and Associated Phenomena.

THE magnetic storm of March 22-23 was one of the most considerable recorded at Eskdalemuir during the last nine years throughout which continuous records have been obtained. It began with the abrupt disturbance known as a "sudden commencement" at 9h. 12m. G.M.T. on March 22, the rapidity of the change in the horizontal components at that time being so great that the photographic impression of the moving light-spot was too faint to enable its details to be traced. The main features, however, began to develop immediately afterwards. On the traces recording the changes in declination and the westerly component there were no very large motions in the interval between the sudden commencement and 14 $\frac{1}{2}$ h., but there occurred the intense agitation due to oscillations of short period. At the same time the northerly component of force gradually rose, having superposed upon it several large, slow motions as well as numerous short-period oscillations.

The larger motions of both horizontal components began soon after 16h., and by 17h. the declination trace had passed beyond the edge of the recording sheet. At this time, when the extreme westerly declination was reached, its value must have been at least 1° 43' beyond its undisturbed value. The north component trace was similarly off the sheet upwards (*i.e.* with increased value) from 16h. to 20h. From 20h. until midnight the disturbance in the horizontal field was on a lesser scale, but during the four hours after oh. 30m. there occurred a series of large and rapid oscillations. For example, in six minutes from 1h. 20m. to 1h. 26m. the declination shifted eastwards through 2 $\frac{1}{2}$ °. The northerly component fell rapidly in value after midnight, and the trace was off the sheet downwards several times between oh. and 4h. The total range of this component must therefore, have exceeded 700γ—an unusually high value. From 4h. to 10h. on March 23 the motions were smaller, but extremely rapid, the period averaging about four minutes. After 10h. no further considerable disturbance occurred, but a

notable sudden change, in a direction north-east-downwards, took place with its maximum at 19h. 17m.

The vertical force magnetogram for the storm is of more than usual interest. So far as this component is concerned, the ordinary course of events during a magnetic storm which begins before midnight includes a gradual increase in downwards force towards a maximum which is reached before midnight, followed by a fall for an hour or more; then a check, followed by a further fall, and a gradual recovery to nearly normal value, which may be reached about 8h. In the present case four prominent maxima are shown before midnight—at 14h. 27m., 17h. 24m., 20h. 10m., and 23h. 49m. The range of disturbance between the second and highest maximum and the second minimum (at 19h. 6m.) was 565γ. Soon after midnight there occurred an extremely rapid fall in value which sent the trace off the sheet for nearly six hours. The subsequent recovery was characterised by well-marked pulsations the period of which was irregular, but averaged about five minutes, and were of unusually large amplitude. The occurrence of these pulsations in vertical force at the end of a storm is a feature requiring attention in any theory attempting to explain magnetic storms.

The disturbance was accompanied by an auroral display, including the "curtain" form at a considerable altitude, and extending, at oh. 50m. on March 23, to within 30° of the southern horizon. There was little cloud at the time, but low mist made observation of details difficult.

A. CRICHTON MITCHELL.

Eskdalemuir Observatory, March 26.

#### Science and the New Army.

NATURE of March 25 publishes a leading article "Knowledge and Power," a letter from Col. E. H. Hills, and a paragraph in the "University and Educational Intelligence," all dealing with related subjects. A sentence in the last-named paragraph throws light on the other communications. It reads: "Every officer in command of a company will be held responsible for the instruction of his men." The paragraph neglects to state, however, that the majority of these officers entered Sandhurst or Woolwich at an immature age, probably without competition, and are almost as ignorant as the men whose education they are to supervise.

During the war the lack of scientific knowledge and of habits of exact thought of these officers was shown not only by their persistent attempts to prevent the use of scientific means, but also by their child-like faith in a formula or parrot-cry. "Follow the barrage," "Counter-attack," "Defence in depth," are some that come to mind—formulae passed down through the official channels to be applied without thought to all possible situations.

In this country war is still looked upon as an art, whereas it is rapidly becoming an exact science.

The firing of millions of projectiles, involving an enormous expenditure of energy, not only in lives, but, what counts almost as much in the long run, also of labour, is a matter for exact calculation if the maximum probable results are to be obtained. At the present time such problems are solved by intuitive methods, and will be so whilst the present system of officering the Army obtains.

All hope of any real progress must be abandoned until a change is made; then, perhaps, we shall no longer see directors of research absolutely ignorant of the problems that are being solved or await solution.

A. R. RICHARDSON.

Imperial College of Science, South Kensington, S.W.7, March 31.