

for very feeble magnetizing forces, iron may be diamagnetic. That suggestion was confessedly speculative; its basis was the notion that the Weber-Ampere electro-magnetic molecules suffer something akin to static friction when the process of magnetization attempts to bring them into alignment. Since it was thrown out, Lord Rayleigh has proved that the susceptibility of iron is constant, and has a fairly high positive value, for magnetic forces ranging from 0.03 to 0.04 C.G.S. downwards. Below the lowest force he has investigated, it is still conceivable that there may be a change in the susceptibility, but it is extremely improbable. In all likelihood, Lord Rayleigh's straight line in the curve of B and H or of I and H extends back to the origin. This at least is certain, that if there is any region at the beginning of magnetization within which the permeability is less than unity, or even no more than unity, it must be so infinitesimally narrow that its existence has no practical interest. For such magnetic forces as act on a lightning-conductor when a discharge is passing, iron is, beyond any question, strongly paramagnetic, and the self-induction with the iron conductor consequently greater than with the copper.

Dundee, May 11.

J. A. EWING.

#### Notes on the Reproduction of Rudimentary Toes in Greyhounds.

At the present writing, I have under my observation a fine male, light clay-coloured, smooth haired greyhound, which at certain intervals well illustrates the reproduction of the rudimentary digits of its feet, after they have been accidentally amputated. To-day this dog has growing on the inner aspects of both its fore and hind feet, and situated some 9 centimetres above the soles, on each limb, a strong rudimentary toe. If we choose, say, this toe on the right hind foot as an example of them all, we find it to be loosely attached, rather more than a centimetre long to the base of the claw, which latter is large and strong, powerfully curved, and fully as big as any of the claws on the foot phalanges. I further find that this toe has a well-marked pad on its under side, but careful examination fails to detect any bone in the proximal joint, from which I also infer that the ungual phalanx likewise lacks one, though this is not so easily determined without cutting through the horny theca forming the claw. About four months ago this dog was coursing hares over the prairie of this region, which chances to be overgrown with a stiff growth of sage-brush, about 2 feet to 3 feet high. The wiry stems of this plant, as the dog bounded among them, snapped off all four of these rudimentary digits, close down to the leg in each case, as nicely as though it had been done with a knife, leaving linear wounds about half a centimetre long. Now, instead of the lips of these wounds healing across, as one would naturally suppose they would, they immediately form the basis, in each case, for the growth of another rudimentary clawed toe, fully as perfect as the one which originally sprang from the same site. These subsequent growths take about three months to attain their full size again, when they are very likely to be removed by a similar process, and once more grow out as before, and so on indefinitely.

From several points of view, this case, as occurring in a vertebrate so high in the scale as a dog, has interested me very much indeed, and I further find that it is no uncommon thing to meet with greyhounds that have never possessed these rudimentary pollices and hallucines, and it is fair to presume that in this race they are gradually disappearing.

R. W. SHUFELDT.

Fort Wingate, New Mexico, March 28.

#### Dreams.

In discussing the differences between dreams and real life, Schopenhauer expresses the opinion that the distinction between these two activities of our representative power consists merely in the possibility of the representations of real life being connected in an uninterrupted successive series, while dreams resemble the separate pages of a book torn asunder, and put together again in complete confusion. Some personal observations of my own do not quite agree with this view. I have watched my dreams for some years, and have remarked that many of them are connected with one another in separate series. It happens to me very often that my dreams consist of a series of representations logically developed (although sometimes the logic is absurd) from other series of representations dreamed long

before. It would be interesting to know if anyone else has observed anything of this kind. A. BIALOVESKI.  
Oostkamenogorsk, Western Siberia, April 6.

#### "Antagonism."

MR. COLLINS (NATURE, May 3, p. 7) claims that Mr. Herbert Spencer anticipated Sir Wm. Grove and Prof. Huxley in the expression of the idea of *antagonism*. I think that priority to all of them must be given to the author of Ecclesiasticus in the Apocrypha, who says (chap. xlii., verse 24), "All things are double, one against the other. He hath made nothing imperfect."

THOMAS WOODS.

Parsonstown, May 13.

#### SUGGESTIONS ON THE CLASSIFICATION OF THE VARIOUS SPECIES OF HEAVENLY BODIES.<sup>1</sup>

V.

##### *Classification into Species.*

WE are now in a position to apply all that has gone before in a summarized statement of the various spectral changes, including those connected with hydrogen, which take place not only in these objects studied by Dunér, but in those others to which I have referred as forming the true beginning of the group.

The following statement, however, must not be taken as anything else than a first approximation to the real criteria of specific differences. I am convinced that further thought is required on it, and that such further thought will be well repaid.

##### *The Sequence of the Various Bands in the Spectra of the Elements indicated by Bodies of the Group.*

In comparing the spectrum of an element which has been mapped in the laboratory with the absorption bands in the spectrum of a "star," we need only consider those bands and flutings which stand out prominently and are the first to flash out when there is only a small quantity present. Thus, in the flame spectrum of barium there is an almost continuous background of flutings with a few brighter bands in the green, and it is only important to consider the *bands*, as the flutings would mainly produce a general dimming of the continuous spectrum. In order to show at a glance what portions of the spectrum of an element it is most important for us to consider in this discussion, I have reconstructed the map of low-temperature spectra which I gave in my previous paper, with reference to those elements which are indicated in the spectra of bodies of Group II. Five orders of intensities are represented, the longest lines, flutings, or bands being the brightest. The lines, flutings, or bands in the lowest horizon, in the case of each element, are those which are seen at the lowest temperature, and which are the first to appear when only a small quantity of substance is present. Those in the upper horizons are the faintest, and are only seen when the temperature is increased, or a considerable amount of the substance is volatilized. The map shows that if there are any indications of magnesium, for instance, in bodies of low temperatures, the fluting at 500 will be seen, possibly without the other flutings or lines. The first indications of manganese will be the fluting at 558, and so on. Again, on account of the masking effect of the spectrum of one element upon that of another, we may sometimes have an element indicated in a star spectrum, not by the brightest band or fluting in its spectrum, but by the second or even third in brightness; this, of course, only occurs when the darkest band falls on one of the brightest flutings of

<sup>1</sup> The Bakerian Lecture, delivered at the Royal Society on April 12, by J. Norman Lockyer, F.R.S. Continued from p. 35.