

plement had been finished. The general views on *Protoplasm* are given under *Cells*, *Amaba*, and so far as it is identical with *Sarcodæ* under *Actinophrys*, *Sarcodæ*, and other headings in E.C.S. *Rhizocirrus* is referred to under *London Clay*, and its occurrence in the living state mentioned. *Aerolites*: The latest reference is said to be 1861, implying, as it seems, that none of the information is of later date. Falls subsequent to 1861 are mentioned, and many of the facts are of later date; as, for example, those relating to the Alais and Orgeuil aerolites; Sorby's conclusions published in 1865; and Daubrée's experiments, of which accounts were given in 1866 and 1868. The article itself appeared early in 1869. As to the bibliography, the principal authors are mentioned, and a list of the works consulted was written, but was inadvertently omitted. It is also said that the latest reference under *Alca* is 1861, but this again is not correct. The writer of the article *Annelida* was not aware of Claparède's strictures at the time he wrote it; but, after all, they do not seem to affect materially the general statements given in the supplementary volume. Prof. Huxley's views respecting the systematic position of *Archæopteryx* are given under *Birds*, E.C.S. No reference is made to *Protagon* under *Blood*, E.C.S., nor is mention made of Day's colour tests, nor Dr. Richardson's renunciation. Of the last, all that was found in the Reports of the British Association is the title of his paper, which runs thus, "On Coagulation of the Blood; a correction of the Ammonia theory," and of which nothing more is said. Hence it was thought best to say nothing about the matter. Of the long string of terms which "Nemo" has culled from Prof. Huxley's last address to the Geological Society, and which are said to be omitted, the majority are given in the Supplement. For instance, to cite one or two cases: *Anthracosaurus* occurs under *Carboniferous system*, E.C.S.; *Evolution* under *Palæontology*; *Microlestes* under *Rhetic Beds*; and so on. As to the other remarks which have not been specially alluded to, it may be admitted that some of the articles might have been improved. *Foraminifera* would have been all the better if Haeckel's volume had been consulted, only Haeckel's work could not be got. It would have been very desirable if subjects which have been omitted had been inserted, and if cross references had been more numerous; but there were restrictions as to space which rendered it necessary to make a selection. Thus, *Melœ* was inserted and *Sphegidae* rejected, because there was no room for both. What a Cyclopædia ought or ought not to contain is an open question. It cannot give information upon everything; and probably very few persons not specially interested in the subject want to know about *Hyenictis* or *Ictitherium*. If regard was had to the theoretical view of the matter, and not to the cost and other practical drawbacks, a full account of all that has been done in the last sixteen years would fill several volumes as large as the Supplement to the "Natural History Division of the English Cyclopædia." I beg to sign myself

THE EDITOR

### Cuckows' Eggs

WHAT is the drift of this discussion on the eggs of the cuckow? Is it "natural selection," "mimetic analogy," or what? Are we to understand that by some process of "natural selection" the European cuckow can change the appearance of her egg to that of the selected foster parent? or that one set of cuckows lays eggs like titlarks, let us say, another like hedge-sparrows, and so on; and always select each its particular nest in which to deposit its particular coloured egg?

If this is it, *cui bono*? Of course to deceive the foster parent. Is this needed? I doubt it. I do not think the foster parent cares what coloured eggs she sits on, so long as they are about the size of her own, so as not to inconvenience her.

Let us see what cuckows do in other countries, and let me select Africa as my field. If deception is necessary in one country, why not in another? Le Vaillant is so inaccurate that one must take all his statements *cum grano*, but he is right in some things, where, I suppose, he had no temptation to go wrong. He says of *Cuculus gularis* "that its egg is olive grey, dotted with red" (gris olivacé, piqué de rouge), and that it is laid in the nests of—1, the Jean Frédéric (*Bessonornis phanicurus*); 2, Coryphæ (*Bradypterus coriphæus*); 3, Traquet-patre (*Pratincola pastor*); 4, Pie-grièche fiscal (*Lanius collaris*); and 5, Bachakiri (*Telophorus bachakiri*). Now the eggs of No. 1 are of a dirty white or buff ground,

more or less spotted with pale rufous; 2, a lovely verditer, irregularly blotched with brown; 3, also verditer, indistinctly clouded with brown; 4, pale grey, blotched at the obtuse end with greenish and reddish spots; 5, light blue, profusely spotted with brown.

*Cuculus solitarius*, he says, lays its pink egg, dotted with clear brown spots, in the nests of—1, *Bessonornis phanicurus*; 2, *Bradypterus coriphæus*; 3, Le Capocier (*Drymoica capensis*); 4, Le Reclameur (*Bessonornis vociferans*); and 5, Le fauvette à tête rousse. The eggs of the last two I do not know; those of the first two are described above; those of No. 3 are blue, with brown blotches.

*Oxylophus edolius* and *O. melanoleucus* he confounds together, but it matters little, as the eggs are alike—pure white—and deposited in nests of—1, Bergeronette brun (*Motacilla capensis*); 2, *B. coryphæus*; 3, Gobemouche mantelé (*Tchitra cyanomelas*); and others, whose eggs I do not know. Of 1, the eggs are greyish white, or rather nankin, minutely freckled with brown; of 3, they are cream-coloured, profusely spotted with red, brown, and purple spots, in a band at the obtuse end. One of my correspondents finds eggs of *O. edolius* in the nests of *Pycnonotus capensis*, whose eggs are rather deep lake, profusely spotted with dark markings! They also, I know, lay in the nests of *Pycnonotus nigricans*—eggs as of the last. I found Mud-birds (*Malacircus bengalensis*) in Ceylon, feeding a young *O. melanoleucus*, and their eggs are of a uniform deep verditer.

*Chalcites auratus* lays white eggs also, and some of my correspondents have sent what I believe to be their eggs taken from the nests of *Hyphantornis capitalis*, whose eggs are green, profusely speckled with brown, and dark salmon-colour profusely speckled and spotted with dark brown and black.

Now, will any one say, after comparing these different cuckows' eggs with those of the nests in which they have been found, that there is any attempt at imitation, and if not in so many cases, why in that of *C. canorus*?

I used to think and so I wrote ("Birds of South Africa," p. 252) that the eggs of parasitic birds "usually resembled those of the foster parent." This was my idea founded on statements concerning the European cuckow taken from books; but a valued correspondent, taking exception to my position, set me to investigate the subject for myself, and to collect together and analyse my own observations and those of my collectors in this country. She writes as follows:—"The eggs of all the cuckows that I have met with in this country (South Africa) are white, and moreover they are nearly always larger than the eggs of the bird in whose nest they are deposited. With regard to distinguishing eggs, birds of all kinds are exceedingly short-sighted. We used to amuse ourselves by changing the eggs in all the birds' nests we knew of. The owners seldom left them, but took to the strange eggs; and unless their habits were remarkably different, they would blindly rear each other's young, just as they do the young cuckows. It is not necessary, therefore, for nature to make this provision. My second son once filled a Cape canary's nest with so many eggs that when the young were hatched they were more than the poor birds could manage to provide for, and having repented of his mischief, he was obliged to help them bring up their young." (Cf. *Ibis*, 1868, p. 247.)

Since this was written, I have had the advantage of visiting my correspondent, who is well known throughout this colony for her talents, love of natural history, and powers of observation. We often discussed this subject. She and her sons assured me they never cared to select eggs like those of the foster-parent, but simply eggs of those whose food they knew to be similar. They said the confusion they caused was most amusing, but only after the young were hatched. The eggs were incubated without any demur on the part of the foster-mother. After this, surely I may ask *cui bono* the *C. canorus* imitation?

E. L. LAYARD

Cape Town, Cape of Good Hope, May 3

### The Chromatic Octave

I HAVE to thank "M. A." for his letter in NATURE of June 9th, suggesting that the wave-frequency to which the complementary of any tint is due, may be, not the geometric mean between that tint and its octave, as I suggested in a letter in NATURE of 28th April, but the harmonic mean. I can scarcely doubt that there must be some simple arithmetical relation between the wave frequencies of any tint and its complementary,