Some Notes on Dr. A. R. Wallace's "Darwinism."

I HAVE just read this most interesting work, "Darwinism"—seeming to me the clearest and most useful account of the Darwinian theory of evolution ever yet published—and while reading it I have made note of a few matters which I may, perhaps, be allowed to touch on here.

On p. 43 are quoted the numbers of varieties of the two snails, *Helix nemoralis* and *H. hortensis*, enumerated by a French author—no doubt Moquin-Tandon. These numbers, however, fall far below those actually known at the present day. These snails vary in many ways, but taking variations of *banding alone*, I know of 252 varieties of *H. nemoralis*, and 128 of *H. hortensis*.

To further illustrate the extreme variability of the Mollusca, take the varieties of land and freshwater Mollusca found in the British Islands. Of the 88 species of land shells we have 465 named varieties, and of the 46 species of British freshwater shells are 251 varieties. So that, excluding probable synonymy, we have about 5 named varieties in Britain to every species of inland mollusc.

In the same way, the numbers of *Rosa* and *Rubus* quoted on p. 77 are below the mark. Of *Rosa canina*, 33 varieties are known in the British Islands, while the British *Rubi* number 63 supposed species.

A good example of a species "occupying vacant places in nature" (p. 110), is afforded by the little mollusc *Cæcilianella acicula*, which is simply organized, and lives in great numbers underground (*vide Naturalist*, 1885, p. 321).

The true cause (as it seems to me) of the variability of freshwater species seems hardly indicated on p. 110. All freshwater productions, except those inhabiting large river basins (as the Mississippi), present these peculiarities—they are exceedingly variable and plastic, so that we get few but polymorphic species. Now, for the successful spread of freshwater organisms, it is necessary that they should be *plastic*, to adapt themselves to the new environment of every pond or river, and the varieties thus required must *not become fixed species*, because it is their very changeability under new environment that makes them successful in the struggle for existence and increase. Freshwater forms migrate more than is commonly supposed, and the contents of any pond or river are ever varying. Hence the necessities I have indicated. These points are exceptionally clear in the case of the *Unionidæ* of Europe and North America (see *Science Gossip*, 1888, pp. 182–184).

Colorado presents an exception to the rule (p. 112), that two species of *Aquilegia* are rarely found in the same area. In Colorado we have *five* columbines, viz. *A. formosa*, *A. chrysantha*, *A. brevistyla*, *A. cærulea*, and *A. canadensis*. But *A. cærulea* is the only one that can be called abundant.

On p. 139, it is stated that specific characters are essentially symmetrical. Yet the ocelli and spots on the butterflies of the families *Satyridæ* and *Lycænidæ* surely afford specific characters, and they are frequently asymmetrical (see *Entomologist*, 1889, p. 6).

On p. 151, we are told that in Ireland hardly one of the land molluscs has undergone the slightest change. This is not quite true, as the following forms seem to be peculiar to Ireland: *Arion ater* var. *fasciata*, *Geomalacus maculosus* vars. *allmani*, *verkruzeni*, and *andrewsi*, *Limax arborum* var. *maculata*, *L. arborum* var. *decipiens*, *Succinea vitrea* var. *aurea*, and *S. pfeifferi* var. *rufescens*. But these peculiar forms are not more numerous (but less so) than would be found in almost any continental area of equal size.

The theory (p. 206) that a recent change of food-plant has to do with the presence of green and brown varieties of the larva of *Macroglossa stellatarum* seems hardly tenable, as so many larvæ of different species and genera vary in the same manner.

I have thought (*Ent. Mo. Mag.*, 1889, p. 382) that asymmetrical variation in insects occurred most often on the left side. On p. 217 it appears that the same thing occurs in some Vertebrata.

On p. 230 the idea of environment directly influencing the prevalent colours of organisms is put aside as improbable. Yet it has seemed that moisture was the cause of a certain phase of melanism, especially among Lepidoptera. Evidence bearing on this point has been given during the last few years in the *Entomologist*.

The land shells on the small islands off the coast of Kerry, Ireland, are pale in colour, as I have recorded in Proc. South London Entom. and N.H. Soc. for 1887, pp. 97–98.

The point on p. 233, about the conspicuous colours of the Aculeate Hymenoptera, seems open to question. In temperate regions, at least, the *Aculeata* are mostly of very dull colours—as the *Andrenidæ*, many of the *Apidæ*, and hosts of others. Even the brilliant green *Agapostemon* flies among bright green foliage and yellow flowers, and is not very conspicuous when alive in its native haunts. On the other hand, the non-aculeate *Chrysididæ* and *Chalcididæ* are often exceedingly brilliant in colouring.

It seems quite doubtful whether the abundance and wide distribution of *Danais archippus* (p. 238) is due to immunity from parasites, &c., while its migratory habits are a quite sufficient explanation of the facts. Besides, it has at least one parasite—the *Pteromalus archippi*.

The "progressive change of colour" (p. 298) is well illustrated by the change from yellow to scarlet exhibited by so many groups of species. Scarlet species nearly always occasionally revert to yellow, and there are generally yellow species in the same genus. For details see Proc. South Lond. Ent. and N. H. Soc. for 1887.

Yellow flowers (see p. 316) seem the most attractive to insects in Colorado, and Mr. F. W. Anderson tells me that the same is the case in Montana. From reasons given in *Canadian Entomologist*, 1888, p. 176, I am of the opinion that insects cannot distinguish red from yellow.

It has seemed to me (see p. 359) that the agency of wind in distributing insects is greatly exaggerated. I believe whirlwinds may be most important as distributing agents, but ordinary gales less so. Many species of insects migrate, but usually *during calms*. Also (p. 360) the opinion that insects are often carried to the summits of mountains by winds seems to me without sufficient support. Many species of insects *live* only or habitually at high altitudes, and their presence there is no proof that they were carried there by winds, especially when they are specifically distinct from the species of lower regions. *Plusia gamma*, on the summit of Mont Blanc, is not very remarkable, as the moth is a great wanderer, and quite capable of finding its own way to high altitudes. Finally, I believe winds very rarely blow *up* mountain slopes. I have lived some time at the base of the great Sangre de Cristo Range in Colorado, and although violent winds blow *down* very frequently, I have *never observed an upward wind*, and residents whom I have questioned are unanimous in saying that they have never known a strong wind blow *up* the mountains. And the way the trees are bent and twisted at timber-line (11,500 feet), often with only branches on the side towards the valley, well indicates the direction of the winds.

I think, perhaps, the scarcity of Monocotyledons in the Rocky Mountains (p. 401) as compared with northern regions, is more apparent than real—the difference indicated in the books being due to the fact that the western grasses are not so well known as the eastern ones. Ferns are rarer on continents than on islands, and the dryness of the Rocky Mountain region is unfavourable to them.

A good instance of the effect of environment (see p. 419) recently came under my notice. The polymorphic snail *Helix nemoralis* was introduced from Europe into Lexington, Virginia, a few years ago. Under the new conditions it varied more than I have ever known it to do elsewhere, and up to the present date 125 varieties have been discovered there. *Of these, no less than 67 are new, and unknown in Europe, the native country of the species!* The variation is in the direction of division of the bands. An incomplete list of these varieties is given in *Nautilus*, 1889, pp. 73–77.

It seems doubtful (see p. 433) how far prickles are a protection from snails and slugs. I found prickles in the stomach of *Parmacella* (a slug), as recorded in *Journal of Conchology*, 1886, pp. 26–27.

It is a minor matter, but it seems a pity that the nomenclature of the species in a standard work like "Darwinism" should not be scrupulously exact. Thus (p. 17), "*Phalæna*" *graminis* should be *Charæas graminis*. "*Helisonia*" (p. 44) should be *Helisoma*, and it is only a section, or subgenus, of *Planorbis*. On p. 235, "*filipendula*" and "*jacobeæ*" should read *filipendulæ* and *jacobææ*. "*Sphinx fuciformis*," of Smith and Abbott (p. 203), is really *Hemaris diffinis*, while on p. 204, "*Sphinx*" *tersa* is a *Chærocampa*, and "*Sphinx pampinatrix*" is *Ampelophaga myron*.

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West Cliff, Custer Co., Colorado, January 22.