

3. MARTIUS: *Flora Brasiliensis*; fasc. 36, 37, 38. fol. Dec. 1864.—The *Gesneraceæ*, by Dr. Hanstein, the curator (succeeding the late Dr. Klotszch) of the Berlin Herbarium; with eleven plates. The *Salsolaceæ* (*Chenopodiaceæ*), by Prof. Fenzl, of small importance in Brazil; with five plates, one of them illustrating *Chenopodium anthelminticum*, and one *Roubieva multifida*. *Magnoliaceæ*, *Winteraceæ* (retained, as likewise *Schizandreæ*, as ordinarily distinct), *Ranunculaceæ*, *Menispermaceæ*, and *Berberideæ*, by the acute Dr. Eichler; twenty-six plates, one of them devoted to the anatomy of the wood of *Drimys Winteri*, and two to that of Menispermaceous stems, which the author appears to have discussed with much ability.

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4. *The Journal of the Linnæan Society*, No. 31 (Dec. 1864), is especially rich in articles upon Dimorphism and even Trimorphism in plants, and upon the agency of insects in their fertilization. There is 1. *Notes on the Fecundation of Orchids, and their Morphology*, by the late Dr. Cruger, Director of the Botanical Garden, Trinidad; *Catasetum* and *Stanhopea* being the principal subjects, and the conclusions of Mr. Darwin being fully confirmed. 2. *Dimorphism in the Flowers of Monochoria vaginalis*, by Dr. Kirk. The additional kind of flower would seem to be somewhat after the fashion of that of *Utricularia clandestina*, and arranged for self-fertilization. 3. *On the Individual Sterility and Cross-Impregnation of certain species of Oncidium*, by Mr. John Scott. He shows by experiment "that the male element of *O. microchilum* will fertilize the female element of the two distinct species, *O. ornithorhynchum* and *O. divaricatum cupreum*, and yet be completely impotent upon its own female element; nevertheless, the susceptibility of the latter (female element) to fertilization is shown by its fertile unions with another individual of the same species, and likewise by a fertile union with an individual of a distinct species;" and the same is true of *O. microchilum*. 4. *Notes on the Sterility and Hybridization of certain species of Passiflora, Disemma, and Tacsonia*, by the same author. Species which, in cultivation, are perfectly sterile upon the application of the pollen to the pistil of the same individual, are readily fertilizable by the pollen of other individuals of the same or of an allied species, and their pollen is likewise potent upon such individuals; although in hybridization the influence frequently is not reciprocal. For instance, *Passiflora racemosa* may be fertilized by the pollen of *Tacsonia mollissima*, upon the ovules of which, conversely, the pollen of the *Passiflora* is utterly impotent. There are two Passionflowers, totally impotent when self fertilization is attempted, the pollen of one of which effects the development of the ovaries of the other, but never the seeds, while conversely even the ovary fails to develop. And there are two species of *Tacsonia*, the pollen of one of which causes the ovary and even the seed-coats of the other to develop, but never the embryo, while conversely the effect is sometimes the same, but generally nothing at all. Although general conclusions should be hesitatingly drawn from limited experiments upon cultivated plants, yet the known facts conspire to show that no sharp line is drawn in nature between fertility and sterility in crosses. 5. *On the Sexual Relations of the three forms of Lythrum Salicaria*, by Charles Darwin. Here we have the results of an investigation which Mr. Darwin has before

referred to. A curious case it is, and treated with the wonted sagacity and point of this prince of biological inquirers.

"In *Lythrum Salicaria* three plainly different forms occur: each of these is an hermaphrodite; each is distinct in its female organs from the other two forms; and each is furnished with two sets of stamens or males, differing from each other in appearance and function. Altogether, there are three females and three sets of males, all as distinct from each other as if they belonged to different species; and, if smaller functional differences are considered, there are five distinct sets of males. Two of the three hermaphrodites must co-exist, and the pollen be carried by insects reciprocally from one to the other, in order that either of the two should be fully fertile: but, unless all three forms co-exist, there will be waste of two sets of stamens, and the organization of the species as a whole will be imperfect. On the other hand, when all three hermaphrodites co-exist, and the pollen is carried from the one to the other, the scheme is perfect; there is no waste of pollen and no false co-adaptation. In short, Nature has ordained a most complex marriage-arrangement, namely, a triple union between three hermaphrodites,—each hermaphrodite being in its female organ quite distinct from the other two hermaphrodites, and partially distinct in its male organs, and each furnished with two sets of males."

One must study this instructive paper to see how neatly it is shown, "that only the longest stamens fully fertilize the longest pistil, the middle stamens the middle pistil, and the shortest stamens the shortest pistil. And now we can comprehend the meaning of the almost exact correspondence in length between the pistil of each form and the two half-dozen sets of stamens borne by the two other forms; for the stigma of each form is thus rubbed against the same spot of the insect's body which becomes most charged with the proper pollen." For the use which Mr. Darwin makes of this case, and the theoretical deductions drawn from a genus which presents trimorphic, dimorphic, and monomorphic species, the illustration of the advantage of trimorphism, and of the now established fact that sexual differences,—“thought to be the very touchstone of specific distinction,”—may characterise and keep separate the coexisting individuals of the same species in the same manner as they do those groups of individuals which we denominate species, we must refer to the memoir itself, not having space for a full abstract. Mr. Darwin, on raising from seed some individuals of our *Nesaea verticillata*, ascertained that this plant is also trimorphic. We commend it to the particular attention of any who may be disposed to prosecute farther such investigations, which, though requiring genius to originate, are easy to follow up, and almost inexhaustible in interest.

Of the remaining papers in this number of the Linnæan Journal, one is *On a Peloria and Semi-double Flower of Ophrys arenifera*, by Dr. Masters, to which a note is added, mentioning a nearly similar monstrosity of *Pogonia ophioglossoides*, (known to him from a description by Prof. Gray), collected by Rev. J. A. Paine, in a bog near Utica, N. Y. Several flowers were detected, last year, all sharing more or less of the peculiarity, viz: having three *labella* and the column resolved into small petaloid organs; the two accessory *labella* and a small petaloid body on the