at the higher level in order to find something subsequently to be reduced to, or explained by, mechanistic principles if possible? But with *everything* mechanistic in the sense only of being consistent with mechanistic principles, or of being caused, would there not still be something left over which would not be *identical with* mechanism in the precise and technical sense of that term? It is the conviction that there would be—a conviction which can be based on proof—that has actuated the reviewer to write this rather long notice of Professor Loeb's book. Everything that exists is not identical with nor explainable by mechanism in the technical meaning of the term, although it is compatible with it in the sense that one fact can not contradict or exclude the reality of another, and is in some relation with it. And all science is not physics, chemistry and physical chemistry. The tendency of many scientists to maintain the negative of these two propositions is a misleading influence and a stimulus to false hopes, especially when prominence in science lends its weight to the claim. But the tendency is not only a dangerous one; it also represents a bias which is contrary to that broad-mindedness which is held to mark the scientific mind. It is because Professor Loeb's book exemplifies this tendency to so marked a degree, that the opportunity of reviewing the book has been used to enter protest. As a collection of essays in the application of physical chemistry to biology one can only praise the volume. But as a philosophic work, which finds in this application ground for insinuating the universal validity of the mechanistic conception in some precise sense, but really making this only most general, one can only doubt and question. The scientist may justifiably resent the intrusion of the philosopher into science's realm, unless the philosopher becomes scientist. But when the scientist becomes philosopher, as does Professor Loeb, he exposes himself to that broader scientific criticism which is philosophy. The venture may be daring, but does not the daring only seem? For are not "we ourselves only chemical mechanisms"? Then where lieth the blame if some atoms become philosophers and in the combat some philosophers become atoms?

E. G. Spaulding
Princeton University

The Birds of Africa. By G. E. Shelley. Volume V., Part 2. Completed and edited by W. L. Sclater. London: Henry Sotheran & Co. 1912. Pp. viii + 165–502; pls. L.–LVII.

The publication of Captain G. E. Shelley's elaborate work on the birds of Africa was interrupted in 1906, after the appearance of the first part of the fifth volume, by the serious illness and consequent death of the author. Mr. W. L. Sclater, whose knowledge of the African avifauna well fits him to carry out the original plan, has undertaken to complete the work; and the present instalment is the first to appear under his supervision.

The general treatment of the subject is the same as in previous volumes. Brief diagnoses of superfamily groups, or "sections," are given; also keys to families and subfamilies; with diagnoses of families and keys to genera. Each genus is defined, furnished with proper synonymy, a key to its species, and in most cases with a statement of its geographical range. Under specific headings are given pertinent synonymy; descriptions of the adult plumage of both sexes, and, where possible, of juvenal and nestling; brief measurements, apparently of single birds; a general statement of geographical distribution, and a good account of habits, often two or three pages long, and including mention of many particular localities where the bird has been observed.

Little account is taken of subspecies, when recognized as such, and none are given separate headings. They are treated, if at all, in the text under their respective species, with sometimes a binomial, sometimes a trinomial name. Some are, however, considered as absolute synonyms; while a few are given full specific rank. Of those recognized as subspecies the synonymy is given, and usually, though not always, the diagnostic characters.

The book includes nominally 209 species

belonging to the following five families: Dicruridæ, Vangidæ, Campophagidæ [*lege* Campephagidæ], Laniidæ and Prionopidæ. The peculiar genus *Aerocharis* is here in the Vangidæ, but should constitute a family by itself—Aerocharidæ.

The genus *Edolius* is synonymized with *Dicrurus,* and *Abbottornis* with *Artamia;* while the several subdivisions of *Lanius* (*Fiscus, Enneoctonus, Phoneus* and *Otomela*), which have not even consistent color characters for their separation, are all given full generic rank. The generic name *Telophorus* Swainson is very properly given a place instead of *Pelicinius* Boie; but no satisfactory generic characters for the group so designated are given to separate it from *Chlorophoneus,* or either of these from *Laniarius.* The name *Tschagra* Lesson is used for the group commonly known as *Telephonus* Swainson, but this should be called *Pomatorhynchus* Boie, as contended by Dr. Reichenow.

Only a single species—*Vanga griseipectus,* from southern Madagascar—is described as new. Our author considers *Laniarius abbotti* inseparable from *Laniarius nigrifrons,* but it seems to us to be distinct. Likewise all the readily recognizable subspecies of *Dicrurus adsimilis* (here called by the preoccupied name *Dicrurus afer*) are ignored.

On the eight colored plates fourteen species, including the one here first described, are figured. These plates are by Mr. H. Grönvold, and remind us not a little of the work of the late Mr. J. G. Keulemans.

HARRY C. OBERHOLSER

BOTANICAL NOTES

ANOTHER AFRICAN PLANT ENUMERATION

A SHORT time ago the writer reviewed Muschler's "Flora of Egypt",[1] and referred particularly to the absence of certain plants, or types of vegetation from the region included in that work (the lower Nile Valley, southward to Nubia), and now we have a contribution from South Africa which permits of some striking contrasts. This second publication is a "First Check-List of the Flowering Plants and Ferns of the Transvaal and Swaziland," by Professor Joseph Burtt-Davy and Mrs. Reno Pott-Leendertz,[2] constituting a 66-page octavo pamphlet, in contrast with the two volumes by Muschler. Yet in this little pamphlet we find enumerated 3,264 species, against 1,632 in the larger work. Moreover, the geographical area covered by the South African pamphlet (117,000 square miles) is less than half that covered by the Egyptian book.

Running rapidly through the check-list, the following numerical data attract attention. There are here recorded 97 species of ferns, including one *Marattia,* 5 Hymenophyllaceae and 78 Polypodiaceae. One finds also of *Equisetum* 1, *Lycopodium* 6 and *Selaginella* 5 species. The conifers are represented by *Podocarpus* (3 species) and *Widdringtonia* (1 species).

Of the grasses there are 146 native and 44 introduced species, the former including such genera as *Andropogon* (11 species), *Panicum* (19), *Eragrostis* (25), while of the sedges there are given 105 species (*Cyperus,* 27; *Scirpus,* 12; *Carex,* 10). Four palms are listed, and 189 Liliaceae (but no *Lilium*), with such genera as *Anthericum* (31 species), *Aloe* (17), *Scilla* (22) and *Asparagus* (13). Iridaceae with 79 species is notable for its 28 species of *Gladiolus.* So too we may note the 123 species of Orchidaceae (*Habenaria,* 23 species; *Disa,* 18 species; *Eulophia,* 31 species).

To give an opportunity for comparison we may mention further that there are 275 species of Leguminosae (*Acacia,* 33; *Crotalaria,* 12; *Indigofera,* 29) and 52 species of Euphorbiaceae. Anacardiaceae include 43 species (*Rhus,* 36); Tiliaceae, 25 species (but no *Tilia*); Violaceae, 2 species (*Viola,* 1); Ericaceae, 11 species (*Erica,* 10); Asclepiadaceae, 156 species (*Asclepias,* 28); Convolvulaceae, 62 species (*Convolvulus,* 14; *Ipomoea,* 37); Labiatae, 103; Scrophulariaceae, 138; Acanthaceae, 108; Cucurbitaceae, 230. Of Compositae there are 304 species (*Vernonia,* 14;

[1] SCIENCE, December 20, 1912.

[2] *Annals Transvaal Museum,* 1912.