younger ornithologists. Regular gatherings were assumed to be impossible, hence the expedient of coöperation through correspondence was hit upon as the instrument to bring about the results aimed at. That good has resulted from this necessarily rather loose organization cannot be denied, as witness the several papers of no mean value which were based upon this idea of coöperation by correspondence.

The time came when a change was demanded, and it was made. Now the time has come when another more profound change is demanded, and it has been made. That it will result in a decided forward movement those who have lived the life of the Club are confident.

DIE VÖGEL—HANDBUCH DER SYSTEMATISCHEN ORNITHOLOGIE.

BY DR. ANTON REICHENOW.

A CRITIQUE BY W. F. HENNINGER.

(Read at the meeting of the Wilson Ornithological Club, at Chicago, February 6, 1914.)

The first volume of this work contains one map, 185 cuts and 529 pages.* The writing of this phenomenal work was caused, according to the author's own words, by the fact that in spite of the richness of German ornithological literature there was no German "Handbuch" or Manual of Systematic Ornithology in existence that took into consideration all the existing forms of birds. To supply this obvious need Dr. Anton Reichenow has presented us with a splendid work, that gives us in terse language as complete a Manual as seems necessary for placing a bird in a system of classification and in its proper relation to other forms. It is limited in its scope, however, as to subspecies and closely related species. Still all European birds, all the birds of the German colonies

* The second to be published in the summer of 1914.

and all of the more important species are given. The paper on which it is printed is good and the binding, as in all European works, perfect, in great contrast to the majority of American works, with their absolutely miserable binding. The type is clear and errors are not to be found, no index of errata being necessary.

The general notes occupy 66 pages, with an extra page of references to works on systematic ornithology and current literature, among which the Auk and Condor of American journals are mentioned. This chapter contains information on the skeleton, muscles, brain, senses, digestive apparatus, respiratory and vocal organs, vascular system, genital organs, eggs, time of incubation, feathers, colors, moult, uropygial glands, bill, feet, caruncles and phosphorescent tracts, flight, ability to swim, voice, mating, nesting, care for young, nutrition, propagation of plants by birds, intellectual qualities, bastardy, mimicry, age, numbers of species, faunas and geographical distribution, migration, height of same, velocity of flight, origin, genealogy, system of classification, nomenclature, abbreviation of authors' names, terminology given in German, Latin, English, French and Italian, and instruction as to measurements.

In spite of its brevity this chapter contains for instance splendid explanations of terms as dromaeognathous, desmognathous, schizognathous, aegithognathous, schizorhine, holorhine, diastataxism and eutaxism, so that in short terms we have here that for which otherwise an extensive library is needed. Feather change without moult or aptosochromatism is disposed of with the statement that a feather once completed is apparently no longer in any connection with the circulation of the blood. However, such a change without moult seems to take place in the appearance of the salmon color on the lower side of Mergus merganser and americanus, and on the head, back and lower neck of Bubulcus ibis in the spring.

Special attention is paid to the forms of feet found in birds, and later in the explanation of the system of classification this becomes of the utmost importance.

The intellectual or psychic qualities of the birds are neither anthropomorphised nor considered to be merely reflexive. The brain activity of birds is stated not to differ from human thinking in *quality* but only in quantity. Attention is called to the fact that the young bird will build its nest as carefully as the old one, but on the other hand, the young bird learns to know danger and perfects his song by imitating older ones. We incline to the opinion that of the four essential qualities of human brain activity, i. e., conception, memory, perception and language, birds certainly have a conception of things and memory, and this explains the imitative ability, but that the bird lacks perception and language. At times it seems as if birds do have a perception of things, e. g., the Crow, but upon closer investigation we will find in the majority of cases it is only a matter of conception and memory.

The Faunas (10 or 11 in number) as given are:

1. A North Pole Fauna. Characteristic forms are the Alcidae, Colymbidae, Stercorariidae, the genera Rissa, Xema, Pagophila and Rodostethia; some species of Ducks and Tringidae, Lagopus, Falco, Nyctea and Passerina.

2. The South Pole Region. Characteristic forms: Spheniscidae, Procellariidae, a few Terns, Ducks, the Sheathbills (Chionidae) and but one land bird, Anthus antarcticus.

3. The Palaearctic Region, with no peculiarly characteristic forms.

4. The African Region, south of the 20th parallel north latitude. Characteristic forms: Families Scopidae, Balaenicipidae, Musophagidae, Coliidae and Struthionidae. This region is also the center of abundance of many other forms, as the Larks, Bustards, Weaverbirds, Vultures and others.

5. The Madagascar Region, characterized by the Mesitidae and many peculiar genera of Parrots, Cuckoos and Oscines.

6. The Indian Region, characterized by the Pheasants, Peafowls, Argus Pheasants, certain Parrots, the Eurylamidae, Chloropsidae, Perirocotidae and Dicaeidae.

7. Australian Region. Characteristic forms are the Dromaeidae, Casuariidae and Paradiseidae.

8. New Zealand Region, characterized by the Apterygidae, Nestoridae and Stringopidae, several Ducks, Rails, Plovers, Hawks and others.

9. Nearctic Region, North America from the limit of tree growth in the north to northern Mexico, with the exception of the extreme southern part of Florida. No peculiar forms.

10. Neotropical Region, the remainder of the Western Hemisphere, is by far the richest in bird life and bird forms and also in peculiar families: Rheidae, Palamedeidae, Eurypygidae, Aramidae, Thinocoridae, Tinamidae, Opisthocomidae, Cracidae, Rhamphastidae, Bucconidae, Galbulidae, Momotidae, Cotingidae, Dendrocolaptidae, Formicariidae, Pteroptochidae, Dacnididae. Also as having the center of abundance there: Conuridae, Trochilidae Tyrannidae, Icteridae, Tanagridae.

11. Birds of the Ocean.

The migration of birds is then spoken of and no attention whatever paid to the fallacies of a Gätke in his "Birds of Heligoland," and the migration routes in general are given. As to the origin of bird migration Weissmann's theory (1878) is considered the most plausible one, namely, the emigration of birds after the glacial period from the tropics during the warmer season of the year and the return at the approach of cold weather along the same routes, which in time became an established habit through natural selection among those who possessed the inherited custom.

We beg to differ with the learned author. We think that Mr. Frank M. Chapman has so far given the best reason for the migration of birds. "Auk," XI, 1894, pp. 12-17, shows that the causes of bird migration are internal and not external, that many animals have an instinctive desire for seclusion during the season of reproduction, and that in the case of Sea-birds, for instance, dissection will show an enlargement of the sexual organs and that it is this physiological change which warns the birds that the season of reproduction is at hand. "The object is the same with the Warbler, as well as with the Sea-birds. Dr. Allen later on calls attention to the fact, the great fundamental fact, that the life of animals, and especially of migratory animals, is made up of annual cycles, as is the life of plants, which have their fixed and determinate seasons for flowering and fruiting. This is the key to the impulse of the spring migration, of which the fall migration is but the necessary complement, inasmuch as in most instances the winter conditions of the breeding grounds of most species are prohibitive of their continued residence therein throughout the year." ("Auk," XXV, 1908, pp. 332-333.) These facts and conclusions are so correct and final that no other theory is necessary. As the "Auk" is numbered among the journals used by Dr. Reichenow, we fail to understand why he overlooked these investigations of Mr. Chapman. In fact, I do not believe that he overlooked them, but it seems impossible to convince any of the European savants that anything good can come out of America. It is high time that a good many of them should have their eyes opened to the fact that the "uneducated Americans" are doing a goodly piece of the world's scientific work, but from personal experience I can say that they die hard. Several pages are devoted to the fossil birds and the classification of birds according to Fürbringer is quoted in full. The writer then proceeds to give his own system. He says that a system based upon the internal organs has a high value, but that the internal organs are just as much subject to changes as the external parts through the conditions of living, food and motion. The author says that such genealogical rows as Fürbringer's have a high value to give further investigations the right direction, but can *not* serve as systems which have the practical value to give a clear perspective of the masses of forms so as to learn to know the manifold forms. For this there is needed a "logical system" based on a few apparent characteristics. The genealogical representation, which should teach how the various forms have developed out of one another, presupposes the knowledge of the separate individual forms, while the system should first teach us the knowledge of these forms. In a practical system the principal point is to limit the coördinate groups as much as possible in regard to number, and rather to create subordinate categories and in a logical way to divide every major group into smaller ones down to the species. System and genealogy pursue absolutely different purposes and must be coördinate.

He points out the contradiction between calling the former a natural system and the other one an artificial one, because nature builds up no such categories, but creates individuals only. Nature has the desire to vary, the inclination to divergence and the wiping out of dividing lines. The point is evidently well taken, but we can not see why later on he then speaks against Trinomialism, at least in part.

Dr. Reichenow's system is as follows:

1st Row. *Ratitae: Short-winged birds,* i. e., birds without a keel on sternum and rudimentary wings.

2nd Row. *Natatores: Swimmers.* Characteristic is the webbed foot. Exceptions: Anseranas with split toes and Fregata.

3rd Row. *Grallatores: Stiltfooted birds.* Characteristic is the foot, tarsus not feathered, bill without cere. Exceptions: Scolopax, which has the tarsus feathered, webs between the feet have Droma, Recurvirostra, Cladorhynchus and Phoenicopterus.

4th Row. *Cutinares: Cerebills.* Bill with a cere, feet often raptorial or fissorial. A cere is found in the Parrots, but their feet are not raptorial.

5th Row. *Fibulatores: Pair-toed birds.* Birds with climbing feet.

6th Row. *Arboricolae: Treebirds.* Forms of feet are characteristic; bill without cere, except Caprimulgidae, which have an incomplete or rudimentary cere.

This system is certainly scientific and simple. Of course difference of opinion will continue, but Dr. Reichenow's is as good as any that has been advocated and has the advantage that it is more in conformity with the classification of other classes of animals.

Dr. Reichenow then proceeds to tell us that the last international congress of zoölogists has modified the law of priority in regard to names, i. e., to retain certain well-established names, as Falco, Buteo Psittacus and others, regardless of the law of priority. This will be received with great satisfaction by a great many scientists and perhaps all amateurs. The Reviewer thinks differently on the subject. He believes that the law of priority should be rigidly enforced. The time will come, and is nigh at hand, when most of the disputed cases will be settled. It is not honorable to take away from some man the right and honor of having coined a name, though it may cause *us* a good deal of inconvenience to find out to whom that first right belongs. Because men have blundered in the *past,* or have been careless, is no reason why *we* should not right things and give honor to whom honor is due.

Dr. Reichenow also comes out against Trinomialism, especially in regard to geographic variations. Undoubtedly sins along this line have been too frequent, but the reason is simply because many geographical variations have been named that deserved no name whatever; not that the differences do not exist, but the utility of name-giving ceases in such cases, e. g., our Song Sparrows. This fact is pointed out in the great work, "The Macrolepidoptera of the World," and what holds true in regard to butterflies, where the differences are much less conspicuous than in birds, is true in a far greater sense in regard to birds. Outside of these geographical variations, Dr. Reichenow is, of course, a trinomialist. The relation of a geographical variation to its main species, however, must find some kind of expression, and, if not trinomials, what then? Any other way would be far more cumbersome! The rest of the general remarks are of minor importance.

The Ratitae are divided into four orders and five families, and, of course, include the Ostriches, Rheas, Emus, Cassowaries and the Apteryges.

The Natatores include the Penguins and Divers (families Alcidae, Colymbidae), the Longipennes (Albatrosses, Fulmars, Petrels, Shearwaters, Gulls, Terns), all the Steganopodes, and all the Lamellirostres, five orders and fourteen families and ten subfamilies. While we do not expect to have all of the American birds treated as stated in the preface of the work, we note the following: In the enumeration of the Alcidae the series breaks off abruptly with Simorhynchus cristatellus. Aethia pygmaea and pusilla could easily have been mentioned to complete the series, Ptychorhamphus aleuticus not being recorded at all, while several rarer forms are given. The common Loon is mentioned from Greenland only, and the Blackthroated not credited to America at all. We consider this a grievous fault because it creates the impression that both of these species are not found on the North American continent at all, and while, of course, any American ornithologist knows better, some of the younger European beginners, who will no doubt use the book in their studies, will get an incorrect idea. In accordance with Dr. Reichenow's ideas as to trinomialism, Colymbus nigricollis cal. gets credit as a full species, as, for instance, among the Geese, Chen Hyperborea nivalis and Branta C. Hutchinsii, Colymbus holbölli is not given; if considered identical with griseigena, the geographical habitat of the latter should be extended to cover America. None of the Albatrosses is credited with an occurrence in America. Among the Petrels Oceanodroma hornbyi is given a place, while many other more common forms are omitted. We do not understand why such an undue prominence should be given this form and others not even mentioned. No distinction is made between the genera Megalestris and Stercorarius, and, we think, justly so. Under Procelsterna only two species are mentioned; the new form from Necker Island is not recorded. No record of Hydrochelidon n. surinamensis is found; if considered identical with nigra, the habitat should include America. The Frigate birds are credited with laying two or three eggs, on what authority we know not. The American ornithologists have found them laying only one egg. For the Surf Scoter the generic name Macrorhamphus Lesson is chosen. Now, as far as we know, Lesson's "Traite d'Ornithologie" was published in 1831, while in 1817 already T. Forster, in his "Synopsit. Cat. Brit. Birds," used the name for the Dowitcher, the specific name of which (griseus) dates back to Gmelin, in 1789; and under the name for the Dowitcher we again find Macrorhamphus, this time quoted from Leach.

The Grallatores are divided into three orders: *Cursores,* with four suborders: Limicolae (families Charadriidae (subfamilies Chioninae, Haematopinae, Cursoriinae, Charadriinae and Oedicneminae), Dromadidae (African), Scolopacidae (subfamilies Himantopodinae, Totaninae and Scolopacinae); suborder Calamicolae (families Rallidae (subfamilies Rallinae, Gallinulae and Fulicinae), Aramidae, Jacanidae, Eurypygidae and Mesitidae); suborder Arvicolae (families Otididae and Gruidae); suborder Palamedeae (families Palamedeidae). Order *Pelopatidae,* with one family: Phoenicopteridae. Order *Gressores,* five families: Ibididae, Ciconiidae, Scopidae, Balaenicipidae and Ardeidae.

This row is very complete, though we would like to have seen Himantopus mexicanus, Totanus flavipes and Totanus solitarius mentioned, as well as others. The very peculiar form, Numenius tahitiensis, should certainly not have been omitted. Several Japanese forms are also missing which we would like to have seen embodied in the work. Nycticorax nycticorax is not distinguished from naevius, and here the Reviewer thinks Dr. Reichenow right and our American ornithologists wrong.

The Cutinares are divided into five very different orders: 1. Deserticolae, with three families, none of which is nearctic. 2. Crypturi, with one family, neotropical. 3. Rasores, with five families, of which the second Cracidae is represented in our fauna by the Chachalaca, the fifth and sixth by the Grouse, Quails and Partridges. Here the wrong name, Pedio*cae*tes, appears again instead of Pedioc*oe*tes, while we know that Baird originally and correctly wrote Pedioc*oe*tes, as Dr. Gill has pointed out in the "Auk." 4. Gyrantes, the Pigeons, with four families, of which the second and third only are found in the nearctic region. Of Chamaepelia no subspecies are given, and the Island of Jamaica is the only habitat mentioned. Leptoptila is, of course, spelled correctly, and not wrong, like in our check list, but not attributed to the nearctic region, as is the case with several others. 5. Raptatores, two orders, Accipitres and Striges. The former order has four families: Cathartidae, Vulturidae, Serpentariidae and Falconidae. The Cal. Condor is said to be apparently extinct. We can assure Dr. Reichenow that it is by no means extinct. Accipiter cooperi is given, but not velox. Buteo lineatus is likewise omitted, but the rare Buteo brachyurus is fully treated. The treatment of the Gyrfalcons will also not meet with the approval of our ornithologists. Striges: All of the subspecies of the Strix flammea are given, but nothing is said of the North American form, Pratincola.

The Fibulatores are divided into two orders: the Parrots and the Scansores. Only the former are discussed in the present volume and our two forms are duly given, but it should have been stated that the Carolina Parrakeet is apparently extinct.

It is, of course, a very unpleasant task to call attention to such minor details and defects in a work of this kind, and they certainly do not detract materially from the value of the work, but in a critical review the minor points as well as the major ones should be taken into consideration and due attention given them. As it is, however, Dr. Reichenow's book will long stand out as a work of phenomenal learning and knowledge and his system of classification will be recognized as not only thoroughly scientific, but also as eminently practical. He has presented us with a work for which we all should be very thankful and which any student of ornithology will do well to use in the pursuit of his studies and investigations.

BIRD SURGERY.

The accompanying illustration represents the wing bone of the Greater Snow Goose (Chen hyperborea nivalis) found when skinning the bird in the fall of 1912. The fracture, made by a No. 4 shot, must have been made either during its flight south or else upon its feeding grounds during the summer. The illustration shows how well nature heals its wounds and how quickly.

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Newport News, Va.