

twenty; of the Surf not more than ten, and of the Red-throated Loons a single pair. The Grebes were in small scattered companies, numbering in all about twenty Horned and twelve or fifteen Holbæll's, all in dingy winter plumage. We shot a few of the Holbæll's, and found them to vary much in size, and in the length and color of the bill, but scarcely at all in plumage. Both kinds of Grebes lingered on the lake for several days, after the other refugees had gone. On one morning near the end of the storm (Oct. 12), all the Ducks and Grebes and the two Divers were together,—in our little mountain pond-hole barely more than a mile long.
—GERALD H. THAYER, *Monadnock, N. H.*

RECENT LITERATURE.

The International Catalogue of Scientific Literature.—The first annual issue of the International Catalogue of Scientific Literature, comprising the literature of the year 1901, consists of a volume for each of the seventeen branches of Science into which scientific literature is divided for the purposes of the Catalogue. These branches are indicated by the letters A to R, Zoölogy being branch 'N' of the series. A copy of Volume N¹ having been officially sent to 'The Auk' for review, we have endeavored to give it the careful consideration its great importance demands.

The 'International Catalogue of Scientific Literature' is an outgrowth of the well-known 'Catalogue of Scientific Papers' published by the Royal Society of London, which in twelve large quarto volumes covers the period 1800-1883. A Catalogue covering the period 1884-1900 is now in preparation, to be issued under the same auspices. These volumes give only the titles of papers, but a subject index to the first series, "which will serve as a key to these volumes and also form an independent record, is in an advanced state of preparation."

The possibility of preparing a complete index of current scientific literature, to include subject indexes as well as titles of papers, began to be considered by the Royal Society in the year 1893. As it was apparent that the resources of the Society were inadequate for such an undertak-

¹ International Catalogue | of | Scientific Literature | First Annual Issue | N | Zoology | — | Published for the International Council | by the | Royal Society of London | London : | Harrison and Sons, 45, St. Martin's Lane | — France: Gauthier-Villars, Paris | Germany: Gustav Fischer, Jena | — | Vol. XVII: 1904 (February) — 8vo, Pt. I, Authors' Catalogue, pp. xvi + 368; Pt. II, Subject Catalogue, pp. 369-1528.

ing, international coöperation seemed necessary, and was sought. The proposition met with such general approval that steps were soon taken to secure an International Conference of Delegates to be appointed by the different Governments. Such a Conference was held in London, July 14-17, 1896, and was attended by delegates from twenty-one countries. The plan adopted provided for the collecting of the material by local organizations established for the purpose in the various countries, the final editing and publishing of the Catalogue to be entrusted to a Central International Bureau, under the direction of an International Council. It was agreed to establish the Central Bureau in London. Schedules of classification were later prepared by this International Committee, and submitted to a second International Conference held in London October 11-13, 1898. The schedules and principles of classification reported by the Committee were adopted, and the settlement of final details of the schedules was referred to a Provisional International Committee. This Committee met in London August 1-5, 1899. The financial part of the undertaking was also adjusted, and the Royal Society was "requested to organize a Central Bureau, and to do all necessary work, so that the preparation of the Catalogue might be commenced in 1901." A third International Conference was held in London in June, 1900, and the final details for the publication of the Catalogue by the Royal Society were definitely arranged.

The supreme control of the Catalogue is vested in an International Convention, which is to meet "in London in 1905, in 1910, and every tenth year afterwards, to reconsider, and, if necessary, to revise the regulations for carrying out the work of the Catalogue," etc. "The materials out of which the Catalogue is formed are to be furnished by Regional Bureaus." These have been established to the number of thirty. "Each complete annual issue of the Catalogue is to consist of seventeen volumes, the set to be sold to the public for £18"; the price of individual volumes will vary according to their size, "from about ten to thirty-nine shillings."

Having thus given a brief history of the inception and progress of the work, we will proceed to a consideration of Volume N, covering the literature of Zoölogy for the year 1901, premising, however, that the department of ornithology will be taken as a criterion of the work. The volume consists of two parts, which may be bound separately or together, three title-pages being furnished, and the pagination being continuous. Part I consists of about 380 pages, of which the Preface (briefly summarized above) occupies eight (vii-xv), and the explanatory introduction and an index (repeated in four languages) about 80, followed by an 'Authors' Catalogue' of 259 pages (pp. 109-368). This includes about 6000 titles, arranged alphabetically by authors. The titles are each followed by "Registration numbers" in brackets, these varying from one to four or more, according to the nature of the paper.

Part II, consisting of 1151 pages, contains the 'Subject Catalogue,' a

list of the journals cited, with their abbreviated titles (pp. 1485-1512), and the 'Topographical Classification,' the latter in four languages (pp. 1513-1528). All titles given in Part I are here reprinted, classified according to subject matter, and alphabetically arranged by authors under each division. These divisions are grouped under (1) 'Comprehensive Zoölogy,' and (2) 'Special Zoölogy.' Special Zoölogy is divided into 29 sections, with the following 8 subdivisions under each section: Comprehensive and General Works; Structure; Physiology; Development; Ethology; Ætiology; Geography; Taxonomy and Systematic. Each subdivision is designated by a four-figure registration number.

The classification here adopted has been the subject of more or less unfavorable criticism; the principal objection to it, however, seems to be that it is different from any of those previously employed, and is therefore to this extent inconvenient without any obvious advantage in the innovations. To some extent the present Catalogue is a duplication of work already being well done, and the only reason for its existence would seem to be that it should be more nearly complete and more satisfactorily arranged than any of those which occupy the same field.

In order to test its completeness reference was first made to a publication near at hand — the 'Bulletin' of the American Museum of Natural History for the year 1901, which resulted in the surprising discovery that of 22 zoölogical articles contained in that volume the titles of only 16 appear in the zoölogical volume of the International Catalogue, more than one third having been omitted. This is the gravest case of omission thus far noticed, but a small percentage of omission has been found in every case where a test has been made, the omissions often including some of the most important papers in the volumes examined. Only the general articles of 'The Auk' are listed, the scores of (often important) minor articles being omitted, though uniformly entered in the other current bibliographies.

Under Aves we find no reference to the journal 'Aquila,' nor is it listed in the general list of journals at the end of the volume; titles of important papers in the leading ornithological journals are often omitted, while the minor journals are either very imperfectly indexed or wholly ignored. In the case of authors, of 14 papers by R. B. Sharpe listed in the Zoölogical Record only 2 appear in the International Catalogue; even his 'Hand-List of the Genera and Species of Birds,' of which Vol. III appeared in 1901, is not mentioned. Stark's 'The Birds of South Africa,' of which Vol. II appeared in 1901, is omitted, as is Ridgway's 'Birds of North and Middle America,' of which Part I came out in 1901; nor is there any mention of any of Mr. Ridgway's papers for that year. DuBois's 'Synopsis Avium,' of which four fasciculi were issued in 1901, is also absent; and so on through a long list of works and papers by prominent authors, too numerous to be enumerated here.

Turning to the 'List of New Genera and Species,' it is found that the same incompleteness is conspicuous; in the families Fringillidæ, Icteridæ,

and Corvidæ, for example, one fourth to one third of the new genera, new species, and new subspecies are omitted, and the titles of the papers in which they are described are also absent from the general list of titles. As another test, it is found that under Anatidæ there are 39 references in the Zoölogical Record and 52 under Anseres ('special') in Vol. N of the International Catalogue; but of these 24 relate to a single work — Finn's 'How to know the Indian Ducks' — overlooked in making up the Z. R.; excluding this work leaves the comparison as 39 in Z. R. against 28 in I. C. In the latter a titmouse (*Poecile salicaria bianchi*) is included under Anseres and omitted under Paridæ. Further, there are only 3 references in the I. C. under Icteridæ against 16 in Z. R., with the consequent omission in the I. C. of 2 new genera and 12 new species and subspecies.

Turning now to 'Geographical Distribution,' and taking Africa (with Madagascar) for comparison with the 'Ethiopian Region' in the Z. R., we find 16 titles under each, but of these 32 titles 12 of those in the Z. R. are not in the I. C., and 11 of those in the I. C. are not in the Z. R. under 'Ethiopian Region,' but several of them occur in the Z. R. list of titles. Several of the I. C. titles are only remotely pertinent to the subject under which they are ranged. The space occupied by the 16 references under Africa in the I. C. is nearly a full page; in the Z. R. only 4 lines, consisting merely of cross-references to the list of titles.

In the section Aves, as in the other sections, the titles of papers relating to its subject are reprinted from the general list of titles in Part I, and here segregated in alphabetic order. They are again reprinted in full under each of the various subheadings of Aves to which they may relate, necessitating their repetition from three to six or eight times, at great expenditure of both space and funds. The subdivisions under the section Aves are very numerous, as follows:—

Comparative and General Works, divided into: General, Treatises, Economics, Technique, History, Biography, Bibliography, the last three collectively forming one division.

Structure, divided into: General, Comparative Anatomy, Special Anatomy and Histology, Nervous System and Organs of Sense, Osteology, Alimentary System, Circulatory and Respiratory Organs, Urogenital System, Special External Characters, Organs of Uncertain Nature.

Physiology, divided into: General, Production of Caste, Function of Special Structures, Metabolism, Physiological Chemistry, Environmental Effects.

Development, divided into: General, Ogenesis and Ovum, Embryology, Postembryonic Ontogeny, Changes during Life.

Ethology, divided into: General, Habits, Migration, Hibernation, Parental Relations, Sexual Relations, Oviposition, Voice, Luminosity, Pelagic Animals, Instinct, Psychology, Parasitism, Colour and Habits, Defensive Processes, Resemblances, Utility and Harmfulness.

Variation and Ætiology, divided into: General, Substantive Varia-

tion, Teratological Variation, Bionomic Variation, Statistical Variation, Mathematical Variation, Crosses and Hybrids, Evolution.

Geographical Distribution, divided into: General, The Earth as a Whole, Scandinavia, Russia in Europe, German Empire, Holland, British Islands, France, Portugal, Italy, Switzerland, Austria-Hungary, Balkan Peninsula, Mediterranean and Islands, Baltic and Islands, Asia, Asiatic Russia, China and Dependencies, British India, Malay Peninsula and Archipelago, Baluchistan, Asiatic Turkey and Arabia, Africa, Mediterranean States, N. E. Africa, The Soudan, West Africa, Congo State and Angola, East Africa, South Africa, Madagascar, North America, Alaska, Canadian Dominion West, Canadian Dominion East, United States, N. E. United States, S. E. United States, W. United States, Central and South America, Mexico, West Indian Islands, Venezuela, Colombia and Ecuador, Peru, Argentina and Uruguay and Paraguay, Australasia, New Guinea and Islands from Wallace's Line, Australia, Queensland, New South Wales, Victoria, West Australia, New Zealand, Arctic, Arctic Ocean, Islands North of Europe and Asia, Atlantic, North Atlantic Ocean, Canaries, Azores, Madeira, Cape Verde (these four as one division), Pacific, Behring Sea and Islands, Sandwich Islands, Ladrone, Pelew, Caroline and Marshall Groups, with other Islands N. of Equator and W. of 180°, Galapagos Islands, Antarctic, Islands to Southward and Southeast of New Zealand.

Taxonomy and Systematic, divided into: General, Casuarii, Æpyornithes, Pygopodes, Impennes, Tubinares, Steganopodes, Herodiones, Anseres, Alectorides, Fulicariæ, Limicolæ, Gaviæ, Alcæ, Pterocletes, Columbæ, Accipitres, Crypturi, Galli, Coccyges, Psittaci, Coraciæ, Striges, Anisodactylæ, Caprimulgi, Cypseli, Heterodactylæ, Pici, Passeres. The titles under each of these groups are divided into General and Special, except in the case of Passeres, where the titles are arranged under the headings of families, and again subdivided under General and Special. Under Special the matter is arranged alphabetically by genera, the technical name being the title, followed by the name of the author in heavy type, and the reference. Then follows the 'List of New Genera and Species.'

This system of minute classification is, to a degree, a convenience, at the cost, however, of much space and the multi-reprinting of many of the titles,¹ and renders almost unnecessary the annotation of titles of papers of a mixed or more or less general character. The distribution of titles under these numerous subdivisions is quite open to criticism, and even the utility of many of the subdivisions may be questioned, but lack of space forbids more than a brief illustration of these general state-

¹ Thus the title of Buturlin's paper on the Wild Geese of the Russian Realm is entered in full no less than *seven* times, instead of once, with cross-references under Anseres and the Faunistic divisions.

ments. Under the division 'History, Biography, Bibliography' of 'Comprehensive and General Works' are only five titles, one of which is bibliographical, three are biographical, and the fifth might be placed under both history and biography; while under 'General' of the same division, which has 73 titles, four or five should be assigned to bibliography, or at least repeated there (under the 'system' provided), while a large proportion of them should go exclusively under the various geographic subheadings or under migration, or should at least be repeated there, but are not; while one (the journal 'Psyche') belongs to Entomology and not to Ornithology at all, there being no reference to birds at any of the several pages cited. In the general list of titles (only a small proportion of those that should be listed) are to be found the titles of a considerable number of biographical papers that are not entered under 'Biography.' Furthermore, there is no division for Bird Protection, which has grown to be an important subject the world over, and is surely ornithological. A few titles are included among the 73 under 'General,' but only a very small proportion of the literature of the subject is covered by them. William Dutcher's important report on the Protection of Gulls and Terns is cited in the general list of titles, but not under 'Economics' nor under *Gavia*, under both of which it should be entered; and so on in almost numberless cases.

Our examination of Volume N of the International Catalogue has led to a rather careful examination of current works of a similar character, and therefrom have arisen many surprises. No specialist can make use of any of them without soon becoming aware of their many shortcomings, particularly their many and serious sins of omission. Only the literature of ornithology for the year 1901 was taken into consideration in this connection. The International Catalogue is found to contain about 950 titles, against about 850 in the Zoölogical Record for this period. But fully one half of the former are not contained in the latter, while one fourth of those in the latter are not in the former. The two together contain about 1200 different titles, of which one half are lacking in one or the other, and of which less than one half are found in both works. The Carus and Field 'Bibliographia Zoologica' for the years 1901 and 1902 (Vols. VI and VII) contain about the same number of ornithological titles for the year 1901 as are contained in Vol. N of the International Catalogue, but among them are many not given in either the Zoölogical Record or the International Catalogue. The card system of Field's 'Concilium Bibliographicum,'—based, so far as author's titles go, on the 'Bibliographia Zoologica,'—renders it too difficult to critically compare the ornithological titles for 1901 with the other current bibliographies, but it is evident that the 'Concilium' contains many important titles that are omitted from both the others, and must therefore lack many that the others contain. As, however, the entries relating to any given year extend usually over several years in the gathering and publication, it is quite certain that the number of ornithological titles above assigned to

the Field system is much too small, since it includes a conspicuously large number not in either of the others. As regards the comparative utility of these several bibliographies, it must be conceded that thus far the 'Concilium Bibliographicum' stands — in view of the explanatory annotations on the Concilium cards, and the broader scope and relatively greater completeness of this system, — in the first rank of modern zoölogical bibliographies, and that it has earned, and should receive, sufficient support to guarantee its permanence.

From the examinations made in this connection it is evident that the ornithological literature for the year 1901 consists of not less than 1500 titles that are properly citable in bibliography; and, taking the four formal bibliographies for that year collectively, probably nearly all have been gathered in, but no one of them shows the degree of completeness that should be attained. Doubtless perfection in a field so difficult to entirely compass is beyond the possibility of attainment, owing to the virtual impossibility of bringing together all of the widely scattered and often obscurely published works and papers relating to the subject.

The defective handling of Volume N, so far as its incompleteness is concerned, is apparently not chargeable to any one of the Regional Bureaus, since the defect is widely distributed, and apparently general. Neither is it the fault of the system of the work, but to the carelessness of individual workers to whom the regional work has been assigned. The intended scope of the work seems ample, judging by the character of the publications cited, but probably, in addition to much carelessness, a wide range of individual judgment is exercised on the part of the original gatherers of the material, as regards papers that are considered citable. Doubtless we may safely hope that the character of the Catalogue will improve as the work progresses, and especially as it is stated that "Any portion of the literature of 1901 which may not have been dealt with in the first annual issue will be included in the corresponding volumes of the second annual issue of the Catalogue."

The method of citing the place of publication of the individual papers is so definite and satisfactory that no improvement can be suggested, but some changes might be made that would greatly facilitate the use of the Catalogue. The registration numbers and other arbitrary signs are doubtless indispensable, but it is too much to expect that the casual user of the work can always carry in mind their significance; and even were this practicable some other page headings, in a volume of over a thousand pages, than the sectional numbers, which mean nothing until the system has been mastered, and the specialist has memorized those that relate to his own field, would be of great convenience. The subject matter of each page can easily be indicated in the page heading. Thus if, in *Aves*, instead of simply the numbers 5803, 5807, 5815, etc., at the outer top corner of the first seventy pages there were added *Aves: Titles*; *Aves: General Works*; *Aves: Structure*; *Aves: Physiology*, and so on, it would save the user much time in turning these seventy pages to find some particular

division of the subject matter embraced therein. And then for the next thirty pages, if, instead of merely 5831, there were added the name of the group, as Aves: Casuarii; Aves: Anseres; Aves: Passeres, etc., it would certainly save the average user much vexation of spirit. To further facilitate use there should also be a separate index for each 'branch' under 'Special Zoölogy,'—one for birds, another for mammals, and so on through the 29 sections, giving page references to each of the subdivisions of the subject matter. The indexes should be placed at the end of the sections, so that in this way each section would begin on an odd page instead of in the middle of a column, as now, without any marked break to catch the eye.—J. A. A.

Cooke's 'Some New Facts about the Migration of Birds.'¹—Professor Cooke's 'new facts' are presented under the following subheadings (1) 'Introduction'; (2) 'Causes of Migration'; (3) 'How do Birds find their Way?'; (4) 'Casualties during Migration'; (5) 'Distance of Migration'; (6) 'Routes of Migration'; (7) 'Are Birds Exhausted by a Long Flight?'; (8) 'Relative Position during Migration'; (9) 'Relation of Migration and Temperature'; (10) 'Variation in the Speed of Migration'; (11) 'The Unknown.' The 'Introduction' states briefly the present resources of the Biological Survey for investigations of the migration of North American birds, after nearly twenty years spent in the accumulation of data. As to causes of migration, the author states: "The broad statement can be made that the beginnings of migration ages ago were intimately connected with periodic changes in the food supply, but this motive is at present so intermingled with others unknown, or but imperfectly known, that migration movements seem now to bear little relation to the abundance or absence of food."

Under 'How do Birds find their way?' he admits that "among day migrants sight is probably the principal guide," and that it "undoubtedly plays a part in guiding the night journeys also"; but he believes they also possess a power, whatever its nature, that "may be called a sense of direction," which serves to guide them unerringly over ocean wastes. He further says: "A favorite belief of many American ornithologists is that coast lines, mountain chains, and especially the courses of the larger rivers and their tributaries, form well-marked highways along which birds return to previous nesting sites." That many birds reared in Indiana, Illinois, and elsewhere to the northwestward visit South Carolina and Georgia in their fall migration has, however, long been known. "The truth seems to be," he affirms, "that birds pay little attention to

¹ Some New Facts about the Migration of Birds. By Wells M. Cooke, Assistant Biological Survey. Yearbook U. S. Depart. Agriculture for 1903, pp. 371-386.