

sphere of molecular action was measured exactly. A number of physical problems were treated, with which in England Lord Kelvin, the late Prof. Clerk Maxwell, Prof. Reinold, Prof. Rücker, Lord Rayleigh, and others have also occupied themselves. The criticism therefore seems not justified.

I know very well that in Germany several representatives of the descriptive natural sciences do not agree with my views about the structure and the movement of protoplasm. For instance, Prof. Pfeffer<sup>1</sup> reproached me with "having, without deducing my views from admissible foundation on experience in organism, exclusively constructed them by physical experiments, and thereupon demanded, in an unwarranted manner, a peripheric oil-layer for protoplasm."

Here, too, let me remark, that I concluded the existence of this peripheric oil-layer from the globular form of the surface of protoplasm in plasmolysed cells and that I tried for months to find in living cells the characteristic periodic spreading, suspected by me, on the inner side of the hypothetical oil-layer. I have several times observed this spreading and the destruction of the globular form caused thereby. The observations of living cells have led me to fresh physical experiments, which I published in the year 1888, together with my theory of the structure and movement of protoplasm. These theories I have always found corroborated in the continuation of my researches since 1888. My adversaries, on the contrary, have as yet not given a satisfactory physical explanation for the above stated phenomena, the globular form of protoplasm surface and the movements in the vicinity thereof. Up to the present day I believe my views to be correct and irrefuted.

The facts observed and the physical conclusions inferred by me, may appear extraordinary and not very intelligible to another science, but they are none the less correct and useful. Biological science must, well or ill, take into account the fact that the development of the cell and the life of the organic nature depends on masses and layers which cannot be perceived by the microscope alone.

Heidelberg, October 22.

GEORG QUINCKE.

#### Human and Comparative Anatomy at Oxford.

In the article which appeared in your last number under the above heading, expressions occur which may, I think, lead to misconception as to the position of the department of Human Anatomy. It is of such importance in the interest of scientific medical education that the academical teaching of human anatomy should *not* consist merely in "technical training in anthropotomy," that I cannot allow the statement that the teaching of the subject in Oxford is of this nature to pass without comment. Had the writer of the article in question taken the trouble to inquire of the University lecturer here, or of any of the University professors of human anatomy elsewhere, for instance at Cambridge, Edinburgh or Dublin, or had he consulted any of the leading text-books of the subject, he would have found that its scope is much more extended than he supposed. The misstatement having been made, however unintentionally, must be corrected.

Let me add that the department, which was founded in 1885, was not connected in its origin with the department of Comparative Anatomy, and has had no relation whatever with it since.

J. BURDON SANDERSON.

#### Asymmetrical Frequency Curves.

OWING to the haste with which I looked through the proof of my letter in last week's NATURE (p. 615) two slips escaped me, which I hasten now to correct. The ordinates in the diagram should have been marked

$$\frac{a^n}{c}, \frac{ax^n}{c}, \frac{ax^{n-1}}{c}, \frac{ax^{n-2}}{c}, \dots, \frac{ax}{c}, \frac{a}{c}$$

&c., the factor  $\frac{1}{c}$  having been dropped. Further, the value for  $c$  should have been

$$c = \frac{\sqrt{2(\mu_2^2 - \mu_1)\mu_3 + 3\mu_3^2}}{\mu_2^2}$$

my  $a$  having been converted into a square power.

The method applied to Dr. Venn's curve fits it with an accuracy only surpassed by the generalised probability curve itself.

KARL PEARSON.

University College, October 28.

<sup>1</sup> Pfeffer, "Zur Kenntniss der Plasmahaut und der Vacuolen" (*Abhandl. Leipzig, Akad. math. phys. Klasse*, 1890, xvi. p. 279.

#### Telegony.

AS already stated in my previous letter, I have discussed this subject in my recently published "Examination of Weismannism" more fully than in NATURE. If "M. D. H." (NATURE, October 19) will consult the reference given in that letter to this work, he will find the facts to which he directs my attention are there given, together with certain reasons for concluding that they do not materially affect the point in question.

Hyeres, October 26.

GEORGE J. ROMANES.

#### AN ORNITHOLOGICAL RETROSPECT.

DURING the year 1892 there were at least three publications which are of great value to ornithologists, though from somewhat different points of view. They are Prof. St. George Mivart's little work on the "Elements of Ornithology,"<sup>1</sup> Dr. Gadow's "Classification of Birds," published in the Proceedings of the Zoological Society, and Capt. Bendire's "Life-Histories of North American Birds."

To thoroughly appreciate the value of Prof. Mivart's "Elements" one has to be the curator of a museum. Many people, like myself, must have been puzzled by the frequent demand for an elementary, but comprehensive book on birds, such as a man can carry with him on his travels, and many people about to journey abroad have asked me for a small book which would explain to them what certain birds were like. I prophesy that Prof. Mivart's book will make many collectors, and its handy size is one of its best features. There have been many introductory works on ornithology published in this country and America, notably those of Prof. Elliott Coues, but nearly all of them are too bulky, and that is the fault with the most popular works, such as the "Standard Natural History" and Cassell's "Popular Natural History." Commencing in an easy and unconstrained manner, Prof. Mivart in his Introduction leads his pupil on through the various forms of bird-life, his object being not to weight the tyro with too heavy material for study at starting. All the leading Avian types are passed in review and they are illustrated by some admirable woodcuts by Mr. Keulemans, drawn especially for the work. It is, therefore, possible for any one to understand what a particular form of bird is like, the only drawback to this mode of illustration being the impossibility of illustrating the subjects on the same scale, so that some of the smaller forms appear to be larger than they really are in comparison with the bigger birds. This was, however, unavoidable.

Three chapters (pp. 134-234) are devoted to the anatomy and osteology of birds, and a fifth chapter deals with their geological and geographical relations (pp. 235-250). That on the "Classification of Birds" summarises the chief characters for each order, sub-order, and family, and lastly there is an enumeration of the genera with the number of species in each. This is of course mainly derived from the British Museum "Catalogue of Birds," and I find that on adding up Prof. Mivart's figures, the number of known species is 11,900. The last time that a computation of the number of birds was made was in 1871, when the late Mr. G. R. Gray finished his "Handlist of Birds," and admitted 11,162 species as then known. This was probably a correct estimate, as I have generally found that the "Handlist" contained about enough false species to counterbalance the number of species described since the work was issued. For similar reasons, Prof. Mivart's estimate of 12,000 species will turn out to be approximately correct, and then by adding the number of species described since his book was published, and others discovered since the issue of the "Catalogue of

<sup>1</sup> St. George Mivart, "Birds: The Elements of Ornithology." 8vo, pp. vi.-329. (London, 1892.)

Birds," we may fairly consider that about 12,500 species of birds are known to exist at the present day.

Dr. Gadow's "Classification of Birds" is based on very careful and exact study, and certainly carries this perplexing subject several steps further as regards the higher groups. There is now a good opportunity for any naturalist, working on the same exhaustive lines, to give us a classification of the Passeries, and it is to be hoped that Dr. Gadow will some day be induced to take up this study. In my address to the Ornithological Congress at Budapest in 1891, I advocated the employment of every external and internal anatomical character, as well as the nesting habits and the geographical distribution, for the achievement of a natural classification. Dr. Gadow has not only worked upon the same lines, but has further personally examined the anatomical features on which his classification is mainly based, and he has selected some forty characters, which he considers to be of essential value in determining the various orders and families. Dr. Shufeldt will doubtless not agree with the author's conclusions regarding the *Macrochires*, and it seems to me somewhat strange to find the Hornbills allowed no higher rank than as a sub-family of the *Upupidae*, while the position of the *Striges* in the *Coraciiformes* will doubtless excite a good deal of criticism. There can, however, be no question that the amount of work which Dr. Gadow has managed to compress into some five-and-twenty pages will be found to contain some highly original ideas, and such as must materially influence the mind of the next worker on the classification of birds.

The third work alluded to above is the "Special Bulletin" of the U.S. National Museum, a goodly 4to volume of 416 pages, with 12 coloured plates of eggs. The figures are beautifully rendered by chromolithography, and the publication is altogether a notable one. The letterpress is the work of Capt. Charles Bendire, who is known to be one of the most practised oologists of the present day. He has described and figured in the present volume the eggs of all the North American game-birds, pigeons, and birds of prey, and he has used his opportunity to the greatest advantage by giving an excellent account of the life-histories of the species, together with the latest information respecting their geographical distribution. Capt. Bendire's work forms one of the most important of the recent contributions to ornithological knowledge, and the succeeding volumes will be awaited with eagerness by ornithologists.

The issue of several good faunistic works on various parts of the British Islands, brings within measureable distance the time when it will be possible to take a detailed review of the ranges and occurrences of the birds which inhabit the above-mentioned area. Some of the books alluded to are of the lighter kind, like Dr. Hamilton's "Riverside Naturalist,"<sup>1</sup> and Mr. John Watson's "Poachers and Poaching,"<sup>2</sup> wherein the authors relate their own personal experiences of animal and plant life. In Dr. Hamilton's book the birds occupy nine chapters (pp. 21-165), and he gives a series of chatty and well-written notes, giving quite a full review of the birds which come under the notice of the fisherman or stroller on the river's bank. The book is a pleasant companion for a holiday outing, and it is a pity that the illustrations are not more up to the mark, for M. Robert's woodcuts are not worthy of insertion in any book which pretends to scientific accuracy, as they are evidently drawn from stuffed birds, and in some cases it is impossible to tell what they are meant for, the illustration of the "redbreast" on p. 105 being equally suggestive

of a black redstart, while the sparrow-hawk's head on p. 153 is certainly that of a cuckoo!

Mr. Watson's collection of essays, gathered from several publications, is very good reading, and ranges over a wide field of subjects, with some of which "poaching" has nothing to do. As is inevitable in a series of articles contributed to different publications, the author travels over the same ground more than once in the course of the book, but the latter is always readable, and when Mr. Watson writes from his own first-hand experiences, he tells his story as a field naturalist should. In some of the remarks which he makes, however, we notice that he does not always acknowledge the source of his inspiration.

Some of the faunal works issued during the last year or two have been of special excellence, especially those published by Mr. David Douglas, of Edinburgh, which deal with the Zoology of Northern Britain. One of the most interesting of these is the "Birds of Iona and Mull," edited from the MSS. of the late H. D. Graham by Mr. J. A. Harvie-Brown. The work was originally edited by the late Robert Gray, the well-known author of the "Birds of the West of Scotland," whose appreciative preface is also given in the work; but he did not live to see its publication. The volume consists firstly of letters sent by Graham to Robert Gray, not only from Iona, but from his later home at Littlehampton, in Sussex, where his references to shooting at Pagham must kindle remembrances in a few of us who can still call to mind collecting in that fine old haunt of the naturalist. After some "extracts from diaries," a list of the birds of Iona and Mull is given. The book is enlivened throughout by sketches by the author, illustrating the wild country in which he lived, and the shooting experiences so well related in its pages. These little sketches are spirited and amusing enough, though sometimes the sportsman seems to be firing "in among the crowd" of his companions in the boat. From the usual position of the gun, the little dog—who was Graham's constant companion in his collecting-trips—must have had some narrow escapes, and perhaps that is why the last picture in the book represents the dog's tombstone.

Another of Mr. Douglas' excellent publications is the "Vertebrate Fauna of the Orkney Islands," by Mr. T. E. Buckley and Mr. J. A. Harvie-Brown. The birds occupy the bulk of the volume (pp. 91-264, app. pp. 297-302), and are treated in a very full manner, as might have been expected from the well-known reputation of the authors. The natural history of the Orkneys has been several times chronicled, the best-known works being those of the Rev. George Low, who wrote about 1770, and of Messrs. Baikie and Heddle, in 1848. The list of writings relating to the natural history of the islands, as given by Messrs. Buckley and Harvie-Brown, is considerable, and some excellent photographs of scenery are given, in addition to some spirited pictures of bird-life by Mr. J. G. Millais. The above-named authors have also published, in 1892, a "Vertebrate Fauna of Argyll and the Inner Hebrides," which forms a companion volume to the "Fauna of the Orkneys" and the other works on Scottish Natural History published by Mr. Douglas.

To Mr. R. H. Porter we are indebted for the publication of some very useful contributions to British Ornithology. In 1891 was published Mr. Borrer's "Birds of Sussex,"<sup>1</sup> with six beautiful coloured plates by Keulemans, illustrating the Gyrfalcon, the Honey Buzzard, the Rufous and Aquatic Warblers, the Nutcracker, and the Squacco Heron, all rare visitors to Sussex and the British Islands generally. Mr. Borrer is one of the old school of ornithologists, and has been an esteemed correspondent of

<sup>1</sup> "The Riverside Naturalist. Notes on the various forms of life met with either in, on, or by the water, or in its immediate vicinity," by E. Hamilton. 8vo. pp. i.-xviii. 1-401. (London, 1890.)

<sup>2</sup> "Poachers and Poaching," by John Watson. 8vo. pp. i.-viii. 1-326. (London, 1891.)

<sup>1</sup> "The Birds of Sussex." By William Borrer. 8vo. pp. xviii, 385, pls. i.-vi. with map. (London: R. H. Porter, 1891.)

all the well-known writers on British birds during the past fifty years, from Yarrell downwards. His notes range over a number of years, and, from his long experience as a collector, he has been able to write an exhaustive list of the birds of Sussex, on which he is undoubtedly the best living authority. Mr. Pidsley's "Birds of Devonshire"<sup>1</sup> is also a useful contribution to our local knowledge, and is accompanied by an excellent coloured figure of the Buff-backed Heron in breeding plumage, in which state, however, it does not appear to have been met with as yet in Devonshire. Mr. Pidsley's book, however, is eclipsed in size and importance by another work on the ornithology of the same county by Mr. D'Urban and the Rev. Murray A. Mathew.<sup>2</sup> Both these gentlemen have long been known as workers at the statistics of Devonshire birds, and the accounts of the species are very complete as regards their distribution in the county. A very good notion of the geography and natural features of the district is added, and some photographs of Lundy Island and other noted haunts of birds are given, as well as coloured plates, by Keulemans, of the Black Redstart, Montagu's Harrier, and a dark variety of the Rough-legged Buzzard, as well as the Great Black-backed Gull, which is one of the rarities contained in the Albert Memorial Museum at Exeter. It is a little curious that neither Mr. Pidsley nor the authors of the larger work on the "Birds of Devon" allude to the Montagu specimen of the Gull-billed Tern, which received its name of *Sterna Anglica* from the author of the Ornithological Dictionary. The specimen was taken in Sussex, and is still in the British Museum, having so far survived the decay which has overtaken a considerable portion of the Montagu collection. Several specimens from the latter no longer exist, having no doubt perished in the course of years, as none of them seem to have been properly preserved, and in most cases still have the bones of the trunk inside them. In addition to the list of the British-killed examples of the Gull-billed Tern in summer plumage, we may add to the enumeration given by Messrs. D'Urban and Mathew a beautiful bird in the British Museum from Christchurch, presented by Baron A. von Hügel.

Mr. D'Urban adds some tables showing the lines of migration of birds across Great Britain, opening up a new and fascinating branch of ornithological study to English readers.

The most recent addition to our local Avifaunæ is Mr. Whitlock's "Birds of Derbyshire,"<sup>3</sup> which is on the plan of similar works issued of late years, giving a county map and photographic illustrations of the most salient features of the district treated of. Derbyshire is a most interesting county, as it comprises within its area so many different kinds of country, each with varying characteristics. The notes on the migration of birds are good, as are also the accounts of the Ring Ouzel, Dipper, Pied Fly-catcher, and other birds which frequent the famous peak.

Amongst other books of interest to the student of British Ornithology may be mentioned a popular edition of the St. John classical work, "A Sportsman's and Naturalist's Tour in Sutherlandshire." Mr. Wintringham's "Key to the Classification of British Birds" is a small book, which gives tables of the orders, families, and species of birds inhabiting the British Islands; but it

should have been called a "List" not a "Key," as there is not a single character given whereby a species may be distinguished. When a complete analysis has to be made of all the works which deal with British Ornithology, so as to illustrate by statistics the distribution of birds throughout Great Britain, Mr. Miller Christy's little "Catalogue of Local Lists of British Birds" will be found most useful.

A recent reviewer has stated in the columns of a leading London paper, that ornithologists are the only people to whom, in the present day, the "insulting character of Dr. Dryasdust is applicable," that they, as a body, take no interest in any problems connected with the past history or evolution of birds, "like Gallio, caring for nothing of these things, and, like Gallio, acquiring a considerable reputation by their attitude!" No wonder that, to this reviewer, the volumes of the British Museum "Catalogue of Birds" appear "most terrible publications." To understand the latter a man must be an ornithologist, which the writer of the above-quoted nonsense evidently is *not*. A direct contradiction to the sage declarations of the reviewer is given by glancing at the list of ornithological works of the year 1892, when it will be seen that in every branch of the subject considerable progress has been made, and that this country is by no means behind the rest of the world, either in the number or the quality of its productions. Lord Lilford has continued his beautiful coloured figures of British birds, a work now hastening to a successful issue, and accompanied by a series of short but entertaining notes, based upon the author's wide experience as a field naturalist in younger days. On the Continent, some of the results collected from the various stations of observation in the different countries, and summarised by Drs. Meyer and Helm, Dr. von Middenkorf, Mr. Winge, and others, are bound to form an important basis for reliable conclusions when a new history of European birds has to be written. One of the most complete of these summaries is to be found in Prof. Giglioli's third and concluding volume on the Italian orns.<sup>1</sup> In this volume Dr. Giglioli summarises the general results of the observations of the corps of auxiliary naturalists who have helped him with statistics, and the migrations of birds are treated of under various headings and according to localities, while the notes on nidification of Italian birds and their food are also classified, a copious index enabling the crowd of facts relating to each species to be easily found. Four parts of the large folio work on the birds of Italy were also published in 1892 by Dr. Giglioli, with coloured figures by Signor A. Manzella.

Dr. Pleske's great work on the ornithology of Russia is making progress, and considerable addition to our knowledge of the Avifauna of Thibet and Mongolia has been achieved by the Russian travellers Grum-Grzimalo and the expedition of Prince Henri of Orleans and M. Bonvalot.

In Ethiopian ornithology there are several interesting events to chronicle. Prof. Barboza du Bocage has published a supplement to his "Ornithologie d'Angola," embodying the results of recent exploration in that province, and bringing the work up to date. The collections made by Señor Francesco Newton, for the Lisbon Museum, in the island of St. Thomas, have also been described by Prof. Bocage, and some interesting new species discovered. The writer has finished the description of Mr. F. J. Jackson's collections, formed during the latter gentleman's journey to Uganda, and Mr. H. H. Johnston, C.B., has sent several consignments from Nyassa Land, where he has an experienced naturalist, Mr. Alexander White, working for him. The visit of the

<sup>1</sup> "The Birds of Devonshire." By William E. H. Pidsley. Edited, with an introduction and short memoir of the late John Gatcombe, by W. A. Macpherson. 8vo, pp. xxx. 194. 1 plate and map. (London and Exeter, 1891.)

<sup>2</sup> "The Birds of Devon." By W. S. M. D'Urban and Rev. Murray A. Mathew. With an introduction, and some remarks on the migrations of Devonshire birds. Pp. lxxxvii. 453. Plates i-ix. With three maps. (London: R. H. Porter, 1892.)

<sup>3</sup> "The Birds of Derbyshire." By F. B. Whitlock. Annotated with numerous additions by A. S. Hutchinson. Pp. vi. 243. (London and Derby, 1893.)

<sup>1</sup> Giglioli, E. H. "Primo Resoconto dei risultati della Inchiesta Ornitologica in Italia." Parte Terza ed. Ultima. "Notizie d'Indole Generale, Migrazioni, Nidificazione, Alimentazione, etc." 8vo, pp. vii. 518. (Firenze: 1891.)

latter to the Milanji mountains resulted in the discovery of several new species, allied representatives of others inhabiting Kilimanjaro, Elgon, or even the Camaroon peaks. The collections made by Emin Pasha and Dr. Stuhlmann in Uganda resulted in the discovery of some interesting novelties, which have been described by Dr. Reichenow, at Berlin, who has also received some important collections from the Camaroons, from Dr. Preuss, and from Togoland. Mr. Johnston, at the present moment, appears to be the only patriotic Englishman who is taking pains to explore the natural history of the countries under his rule, whereas the Germans seem to have in every one of their "spheres of influence" and protectorates some well-informed naturalist who occupies himself with the natural history of the district.

The Indian region, formerly the scene of so much ornithological activity, seems, during the last few years, to have passed into a quiescent stage, and the principal work is now being done by Mr. Hose and Mr. Everett in Borneo, and Mr. Styan in Southern China. Dr. Modigliani's collections, from the Island of Nias, were described last year by Count Salvadori, and showed that some of the species found by the traveller were akin to those of the Nicobars, while, curiously enough, others were allies of Bornean forms rather than Sumatran, though the latter affinity would have been expected. The death of Mr. Davison, at Singapore, has deprived us of one of the best-known Indian naturalists. His explorations in Tenasserim gained him immortal fame as a collector, and, had his health been stronger, he would no doubt have continued his researches into the natural history of the Malay Peninsula, where much still remains to be done. His last expedition to Pahang resulted in the discovery of a very fine new starling (*Æthiopsar torquatus*).

Dr. A. B. Meyer, who has identified himself with the pursuit of Natural History in New Guinea and the Moluccas for many years, has received some collections from Kaiser Wilhelm's Land in north-eastern Papua, wherein have been some interesting new species, while in the southern portion of the great island Sir William McGregor has discovered some extraordinary new forms of birds, one of which, *Paramythia*, is such a puzzle that no one has been able to define its place in the natural system with any confidence. The completion of Count Salvadori's "Uccelli di Papuasie e delle Molucche" marks an epoch in the history of Austro-Malayan ornithology, and this wonderful work with its appendices will remain for ever a monument to its painstaking and accomplished author.

In Australia the most notable work of recent years has been Mr. A. J. North's description of the nests and eggs of the birds inhabiting that continent.<sup>1</sup> This book not only contains a vast amount of additional material on the nesting-habits of Australian birds, but is accompanied by photographic illustrations of the eggs, while a few coloured copies have been prepared, one of which has been sent to the Natural History Museum. An appendix describes the nests and eggs of the birds inhabiting Lord Howe and Norfolk Island.

In New Zealand Sir Walter Buller has been assiduously collecting additional notes to supplement his recently completed work on the birds of that country, and Prof. Hutton has given some notes on the Moas, which will have to be critically compared with Mr. Lydekker's recent determinations of these struthious birds. By far the most interesting event, however, of recent years has been the discovery by Mr. H. O. Forbes, the celebrated Malayan traveller, of the remains of *Aphanapteryx* in the Chatham Islands. *Aphanapteryx* was previously known only as a former inhabitant of the Island of

Mauritius, and the discovery of identical remains in a locality so far distant as the Chatham Islands, has opened up possibilities of speculation of the most intense interest, and Mr. Forbes' recently exploited theory of the former existence of a great Antarctic continent has changed the ideas of many zoologists with regard to the origin and geographical distribution of many forms of animals and plants. It is decidedly the most interesting episode of the year 1892.

Polynesian ornithology has undoubtedly been forcibly brought before our notice by the careful work which has been done by Mr. Wigglesworth, in his "Aves Polynesiae," and a complete list of the species inhabiting the Pacific Islands, with their synonymy and geographical distribution, has been published in the "Abhandlungen" of the Dresden Museum, under Dr. A. B. Meyer's care. Mr. Scott Wilson, with the help of Mr. Evans, has reached the fourth part of the "Aves Hawaienses,"<sup>1</sup> and with one more part the work will be brought to a conclusion. Mr. Wilson gives some interesting notes on the habits of the species, but it is doubtful whether he has obtained all the material necessary for a monograph of the Hawaiian Avifauna, judging by the number of new species which the Hon. Walter Rothschild has been receiving from his collector, Mr. Palmer. These may, of course, be included in the final part of the work, thus bringing it up to date. A visible improvement is to be noticed in the plates of Mr. Frohawk, and the coloured figures of the species look something like the actual birds, instead of being a sort of map, as heretofore.

Except for the splendid paper by Dr. Gadov, before mentioned, on the classification of birds, very little anatomical work has scarcely been done, in England at least; and it is to be hoped that Mr. Beddard, who has before now written some useful ornithological papers, and on whom the mantle of Garrod and Forbes is supposed to have fallen, will give us some further results from the splendid opportunities which he enjoys as prosector at the Zoological Gardens.

R. BOWDLER SHARPE.

#### HENRY OLDENBURG, FIRST SECRETARY OF THE ROYAL SOCIETY.

"SIR, you will please to remember that we have taken to task the whole Universe, and that we were obliged to do so by the nature of our Dessein. It will therefore be requisite that we purchase and entertain a commerce in all parts of y<sup>e</sup> world w<sup>th</sup> the most philosophical and curious persons, to be found everywhere." So writes Henry Oldenburg to Governor Winthrop of Connecticut on October 13, 1667. And in these words he briefly expresses what was the chief aim of the best years of his life. It was mainly by his immense correspondence that Oldenburg forwarded the cause of science, or, as it was then called, of the "new experimental learning," by that and by his assiduous discharge of secretarial and editorial work. Without being a man of brilliant genius, he was just such an intelligent, reliable, energetic, and conscientious worker as was needed at that time to form a centre for the new movement. In the history of literature Henry Oldenburg is a familiar figure as the friend and correspondent of Milton; in the history of philosophy, as the friend and correspondent of Spinoza; but neither literature nor philosophy is indebted to him to the same extent as science.

It is somewhat remarkable that, although the name of Henry Oldenburg is so familiar in the history of the seventeenth century, no complete life of him has ever been written. The only attempt at a con-

<sup>1</sup> North, A. J. "Descriptive Catalogue of the Nests and Eggs found breeding in Australia and Tasmania." (Catalogue No. 12 of the Australian Museum, Sydney, N.S.W.)

<sup>1</sup> Scott B. Wilson, assisted by A. H. Evans. "Aves Hawaienses: the Birds of the Sandwich Islands." Parts iii. iv. 4to. (London: R. W. Potter, 1892, 1893).