It is not proposed to enter into any detailed criticism of this volume. Some idea of the scope of the work was given in the former notice; we are glad to hear that an English translation is in preparation, and when this appears a further opportunity will be given for a general account of the whole. In point of interest the second volume is fully equal to the first; there is, however, perhaps more room for adverse criticism of certain parts. Speaking quite generally it may be said that while the "biology," or natural history of the subject is admirable, the morphology is on the whole rather weak. The former, however, is the more important for the general reader, for whom the book is intended.

The account of reproduction begins with the asexual organs of propagation, including spores, buds, and gemmæ. This is succeeded by the much more extensive section on reproduction by fruits, including all sexual processes. The great value of this part lies in the extremely full, and in many respects original, treatment of the fascinating subject of the pollination of flowering plants, to which nearly 300 pages are devoted. Special stress is laid here on the phenomena of *geitonogamy*, or the crossing of different flowers on the same inflorescence, and of *autogamy*, or self-fertilisation of hermaphrodite flowers. The whole account is of the greatest possible interest, and familiar as the subject has now become, innumerable fresh points of view are opened up.

The second part of the volume is on the history of species, including the whole subject of variation. Changes produced by external agencies, such as parasitic fungi, and gall-forming insects, form the subjects of special sections.

As regards the origin of new species, the author, like Prof. Weismann, attributes the greatest importance to sexual reproduction, and especially to cross-fertilisation. He occupies a peculiar position in so far as he believes that hybridisation has played an important part in nature as a source of new forms.

This second part of vol. ii. includes classification, and a fairly full account is given of all the important groups of plants, each cohort, or "Stamm," receiving separate treatment.

Sections on the distribution of species, and on their extinction, conclude the book.

A really good index is added, which will be a great boon to all who wish to make use of the vast store of facts which the book contains. The illustrations, consisting of twenty coloured plates and 1547 figures in the text, reach the same high standard as those of the previous volume.

To the book as a whole the highest praise must be given. No such popular account of the natural history of plants has appeared before. The publication of an English version will be anticipated with great interest.

D. H. S.

Bibliografia Medica Italiana. By P. Giacosa, Prof. straordinario di Materia Medica e Chimica fisiologica all'Università di Torino. (Torino-Roma: L. Roux e C., 1893.)

This work is a collection of abstracts of the chief papers bearing on the medical sciences published by various Italian authors during the year 1892. Prof. Giacosa has been aided in his work by several experts, whose names are a sufficient guarantee for the accuracy of the abstracts, such as Profs. Marcassi of Palermo, Maggiora of Modena, and Sperino of Torino. The medical reading public is familiar with the excellent *Jahrbuch* and *Centralblätter* published in Germany, which deals chiefly, though not exclusively, with scientific papers by German authors. There has been a great want of similar publications of Italian work, and Prof. Giacosa's "Bibliografia" is a welcome addition to medical literature. In it will be found abstracts of all the chief Italian papers published

in 1892 on parasites and helminthology (zoology), physiology, biological chemistry, pharmacology, histology, human and pathological anatomy, bacteriology and hygiene. The abstracts are done by experts in the particular subject, are short but clear and intelligible, and have the advantage of not being critical.

The Evolution of Decorative Art. By Henry Balfour, M.A., F.Z.S. (London: Percival and Co., 1893.)

It is remarkable that in these days, when the question of "origins" holds a place of commanding importance in almost every department of investigation, comparatively little should have been done to trace the evolution of art back to what Mr. Balfour calls "its very simplest beginning." Mr. Balfour does not, of course, undertake to present in this small book anything like a complete view of the subject. His aim is merely to indicate some of the main conclusions to which he has been led by his own researches. He finds in early art three distinct stages—(1) adaptive; the appreciation of curious or decorative effects occurring in nature or as accidents in manufacture, and the slight increasing of the same by artificial means in order to augment their peculiar character or enhance their value as ornaments; (2) creative; the artificial production of similar effects where these do not occur (imitation or copying); (3) variative; gradual metamorphosis of designs by unconscious and conscious variation. Mr. Balfour brings out admirably the significance of these stages, and it is scarcely necessary to say that the Pitt Rivers collection, of which he is curator, provides him with ample means for the clear and effective exposition and illustration of his ideas.

LETTERS TO THE EDITOR.

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Palæontological Discovery in Australia.

MANY readers of NATURE will learn with interest that I have this day received a telegram from Prof. Stirling, of the University of Adelaide, as follows:—

"Made discovery immense deposit fossil remains excavated several nearly complete skeletons Diprotodon besides two thousand bones also large Struthious bird giant Wombat particulars letter."

I need scarcely add that I shall await with impatience the promised particulars of this discovery, which may prove to be one of great importance.

ALFRED NEWTON.

Magdalene College, Cambridge, April 21.

An International Zoological Record.

IT is much to be regretted that the praiseworthy agitation of this subject, opened by Mr. Minchin (NATURE, vol. xlv, p. 367), has not been continued. There cannot be the slightest doubt of the desirability of such a reform. Possibly the reason why the letters of Mr. Minchin and Mr. Bathers (*ib.* p. 416) have not aroused more interest lies in the fact that they both wrote as recorders. They showed the absurd burdens that the actual system imposes upon the recorders; but they left somewhat in the background the advantages which the great world of zoologists could receive.

However this may be, it is certain that the rank and file of investigators of the present day are supporting an utterly unnecessary burden, and one from which they ardently desire to be freed. Any one who desires to test the sentiment has only to make inquiries among those of his acquaintance. Having myself agitated in this quiet way a method of reform that had occurred to me nearly two years ago, I can hardly doubt that the concurrence of opinion is strong enough to effect a radical change, if only concerted action can be taken.

Mr. Minchin and Mr. Bathers have pointed out that the

recorders at present do the same work many times over, and suggest a plan by which it can be avoided. The salient feature lies in separating the duties of recorder and bibliographer, and in having the entire mechanical work *done once* for all concerned in the preparation of the record. The plan is an admirable one, but why thus restrict the blessings of a competent bibliographer? The scheme to which I have alluded in the preceding paragraph simply substitutes a *bibliographical bureau* for the bibliographer, a feature necessitated by the additional duties imposed upon it.

The business of recording a publication according to the latter plan may be referred to *three stages*. Let me suppose the bureau constituted at a centre such as the British Museum, and show its working. The *first stage* of recording is conducted wholly by the central bureau, with such aids from outside as might be found expedient. [I refer to assistants in other countries. In the case of Russia it would be at first probably necessary, although in general to be avoided as far as possible.] In the first place the bureau would make complete lists of all zoological papers as they are published. At intervals of a week, or of two weeks, these lists would be given to the press and printed successively in two forms. One would constitute a pamphlet similar to the bibliographical part of the *Zoolog. Anzeig.*, but would give all the titles *promptly*. The other form in which the list would be printed would have the titles widely spaced, would be printed on strong, stout paper, and would appear in sheets, leaving one side blank. These sheets could then be cut up at will into slips of uniform size and shape to serve further bibliographical elaboration. During the printing of the slips it would have been the duty of the bibliographer to have sorted the titles carefully, and, in the case of larger works and works with ill-characterised contents, it would further have been his duty to have ascertained the *topics* dealt with, so that at the end of the period he would be able to *sort and classify* the 150 titles, which appear at present weekly.

Thereupon the second stage of recording would be begun. Each reviewer would receive at once slips indicating the papers concerning him, together with a page-number in the case in which his topic is only incidentally dealt with. Thus the mechanical labour of the reviewer would be reduced to a minimum. Not merely, however, the reviewers could be thus informed, but *also any specialist whose field of work sufficiently coincided with one of the divisions of the Record* to induce him to subscribe to the series. Thus, for example, a worker on the development of the vertebrate nervous system would find his wants admirably met. The second stage of recording would be carried on wholly by the reviewers, who, however, in addition to writing reviews as at present, would also index the topics of the paper in a more detailed way than would be possible for the bibliographer in his first hasty survey; or this work might be left to the bibliographer, who, in what I have called the third stage, collates the reviews which have been returned to him. The reviewer should also note any incidental observations of interest to other reviewers which the bibliographer may have overlooked.

In stage 3 the bibliographical bureau becomes a bureau of publication, and it is believed that with such an organisation the Record for the year could be very promptly issued. At the same time, however, the bureau would be able, by the use of the slips at its disposal, to embody the indexes furnished by the reviewers (or, possibly better, made out by the bibliographer from their abstracts) in a permanent slip index, which would grow with the years and become a record of inestimable value. This part of the plan alone, I see, has been independently advocated by Mr. Cockerell (*NATURE*, vol. xlv. p. 442); but, inasmuch as he overlooked the indefinite multiplication made possible by the use of printed slips, he failed to note the highest use which the bureau can serve. To my mind this consists in *informing the individual investigator of every work which concerns his speciality* by sending him the proper slips.

The value of such a service can hardly be exaggerated. It relieves the individual of endless labour: it gives a completeness to his knowledge of the literature that no individual endeavour could attain; and finally, it saves him the annoyance which indefinite titles occasion him in using the ordinary means of seeking for papers relating to his subject. So long as a fundamental observation on the development of the Wolffian Duct can be published under the title, "Observations on the Lymph," so long as the bulletins announce "Contributions to the Development of the Vertebrates," we have no right to expect authors to

have a full mastery of their subject, unless they can receive aid from a central bureau such as I have described.

The expense of maintaining at several points a complete index, such as that in the bibliographical bureau, is not such as to make it infeasible, and I fancy it would be done in several zoological centres. The labour of the bureau would probably assume considerable proportions; but, inasmuch as it would in each case save much more of the scattered and oft-repeated labour of individuals, it would be quite self-supporting. For the perfect working of the scheme it is important that authors should send "extras" to the bibliographer. Mr. Bathers suggests that they would gladly do this if there were only one asking for them instead of a number, as is now the case. Here Mr. Bathers again writes as a recorder. I was unaware that papers were desired, and would not know even where to send a copy. With the scheme I have proposed, also those who now unintentionally withhold their papers would contribute them; for the organisation would at least be well known.

Respecting further details, there is no occasion of bringing these forward now. I may simply add that I have had opportunity of seeing paper slip catalogues in use in a very large scale in the Government service in Russia, and learned that they gave excellent satisfaction. It may be also of interest to any who may further concern themselves with this subject that the present volume of zoological publication is not far from 2000 pages weekly.

I have made inquiries among many of my friends in different countries in respect to their interest in such a plan as I here propose, and it has received such endorsement that I cannot doubt that it affords a remedy for a real evil. I am well aware that such a plan needs to be much modified; but I submit it in this form. I have already a long list of persons and institutions who have promised to subscribe to the slips, could they be obtained at a reasonable price; among others of librarians, who would use them to save copying in making out the "card catalogues" in vogue in America. This support was obtained when the scheme was but little elaborated, and when there was almost no prospect of success. I am confident that were the undertaking once begun the support would be very great. It needs organised action such as the various scientific bodies can give it. Let the British Association appoint a committee and invite others to join them in forming an International Commission, or let them respond should the call come to them. Let all considerations of national pride be set aside. Surely England, with her enormous library and museum facilities, will receive her share.

Leipzig, Germany, April 16.

HERBERT H. FIELD.

Lion-tiger and Tiger-lion Hybrids.

SINCE the date of my previous communication on the above subject (see *NATURE*, p. 390) I have had some correspondence with Mr. John Atkins, son of Mr. Thomas Atkins, the result of which has been not only to clear up several discrepancies which I pointed out as occurring in the previously published accounts by Sir Wm. Jardine and Mr. Griffiths, but moreover it enables me to present for the first time a detailed account of what, so far as I can ascertain, are the only authenticated cases of the interbreeding of a lion and tigress. I am aware of the classical references to the reputed breeding of the leopard and lioness; but that part of the subject I do not propose to discuss now. In the first place I should state that the proprietor of the menagerie, when the first hybrids were seen, was Mr. Thomas Atkins, not "F." or "J. Atkins" as quoted previously. Mr. John Atkins came into possession later on. The parents of the hybrids were the same all through for ten years, from 1824 to 1833, during which period six litters were born. The lion was bred in Mr. Atkins's menagerie from a Barbary lion and a Senegal lioness. The tigress was born in the Marquis of Hastings's collection in Calcutta, and was purchased when about eighteen months old by Mr. T. Atkins from a captain, to whom she had been given by the Marquis. Being of the same age as the lion, she was placed together with him in the same cage, and two years afterwards she proved to be in cub.

The following statement regarding the successive litters has been revised by Mr. John Atkins, and as he has preserved notes of the facts which are recorded, they may be accepted as authentic. I need hardly add that but for his ready and full response to my queries this account could not have been written.

First Litter.—Born October 24, 1824, at Windsor, two males