*Cat and Bird Stories.* From the *Spectator*, with an introduction by John St. Loe Strachey. Pp. xiii + 279. (London: T. Fisher Unwin, 1896.)

STORIES of animal intelligence are interesting, and they are of value in considering the relations between habit and instinct, and the question of reasoning power, when they can be trusted. But accurate observers are few, and sentiment often causes a simple fact to be buried in anthropomorphic imaginings, so that stories have to be taken *cum grano*, and the identity of the writer must be known before their scientific value can be appraised. We must, therefore, demur to the author's remark that "the bird and other stories in the present volume . . . have a distinct scientific as well as a literary value. They are not merely good reading, but the record of important facts in Natural History." Many of the letters are, however, anonymous, and they have been reprinted without asking permission of the writers. No man of science would have the temerity to cite irresponsible anecdotes from a collection got together in this way, as evidence of animal intelligence. The stories are no doubt entertaining, but the less that is said about their scientific value the better will naturalists be pleased.

The sub-title of the volume is worth preserving. It states that to the cat and bird stories are added "sundry anecdotes of horses, donkeys, cows, apes, bears, and other animals, as well as of insects and reptiles."

*Handbook of Courses open to Women in British, Continental, and Canadian Universities.* Compiled for the Graduate Club of Bryn Mawr College. By Isabel Maddison, B.Sc., Ph.D., assisted by Helen W. Thomas, A.B., and Emma S. Wines, A.M. Pp. iv + 155. (New York: The Macmillan Company.)

THE need of a handbook defining the position of universities in regard to the admission of women to their courses, has been strongly felt ever since the movement for the higher education of the gentler sex began. In the volume before us the need is admirably supplied. From the book, women graduates who desire to continue their studies abroad, and students who wish to know where they can attend courses and where receive degrees, can derive all the information they require as to methods of admission, cost of living, names of professors and lecturers, &c. It will be to women what the invaluable "Minerva Jahrbuch der gelehrten Welt" is to every one desiring information on institutions for higher education.

We notice that Queen's College, London, is omitted (though it has a charter), while King's College is included. As it is proposed to publish a new edition annually, the omission may be put right in the next issue.

*Ostwald's Klassiker der Exakten Wissenschaften*, Nos. 76-79. (Leipzig: Wilhelm Engelmann, 1896.)

PROF. OSTWALD'S reprints of physical classics are too well known to need recommendation. Four volumes have recently been added to the series, viz.:—

No. 76: "Theorie der doppelten Strahlenbrechung, abgeleitet aus den Gleichungen der Mechanik," by F. E. Neumann (1832), edited by A. Wangerin.

No. 77: "Über die Bildung und die Eigenschaften der Determinanten," by C. G. J. Jacobi (1841), edited by P. Stäckel.

No. 78: "Über die Functionaldeterminanten," by C. G. J. Jacobi (1841), edited by P. Stäckel.

No. 79: "Zwei hydrodynamische Abhandlungen." (1) "Über Wirbelbewegungen" (1858). (2) "Über discontinuirliche Flüssigkeitsbewegungen" (1868), by H. Helmholtz, edited by A. Wangerin.

The editorial remarks are very full in each case, and they add to the value of a unique series of republished scientific papers.

## LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

### Production of X-Rays.

OBSERVERS who use Wimshurst machines should remember that part of their difficulty in obtaining X-rays with a steady current and low vacuum may lie in a peculiarity of the machine itself, viz. that it will not work well when short-circuited. Machines with permanently charged armatures do not suffer from this defect, though certainly it does appear that a given quantity delivered in jerks is optically more effective than the same quantity delivered smoothly. But this seems to be a physiological rather than a physical fact, because I do not find it true photographically. The easiest plan to get a jerky current is to use what I have elsewhere called a B-circuit—attachments to outside of jars,—and the bulb is then, as Mr. T. C. Porter says, almost objectionably brilliant. OLIVER J. LODGE.

### Responsibility in Science.

UNDER the above heading, Mr. C. Chree wrote to protest against some remarks in my address to Section D of the British Association, which met recently at Liverpool. Having only just returned to England, this is my first convenient opportunity of replying to his letter, which appeared in NATURE of October 15 (p. 572).

Mr. Chree objects to the view that "physicists as a body" have accepted Lord Kelvin's and Prof. Tait's conclusions as to the age of the earth. In a matter of such great importance and interest, and one which has courted criticism for so long a time and on occasions of such exceptional prominence, it is probably fair to conclude that, with the great majority of physicists, "silence gave consent." Furthermore, many distinguished physicists have expressly told me that they could find no flaw in the case.

If Lord Kelvin and Prof. Tait express a strong opinion, if this opinion is quoted again and again, and is only criticised by geologists and zoologists, no physicist saying a word, it is likely enough that the geologist and zoologist may come to entertain an exaggerated notion of the amount of support conceded to the opinion by the whole body of physicists.

The point does not seem to me to be a very important one; and I do not imagine that "physicists as a body" will be much aggrieved because I assumed that they agreed with Lord Kelvin on this point.

Mr. Chree then proceeds to impute to me various opinions which I do not hold, and supports the imputation by finding, in my address, a "strong flavour" of views which only exist in his imagination, or by asking whether I believe some opinion which I never expressed, and which he then goes on to demolish.

Thus, I never said, or implied, or believed that "a solid is *rigid* in the mathematical sense," or that "electrical and thermal conductivity necessarily . . . vary together." I understand that Prof. Schuster's conclusion as to the high internal electric conductivity *suggests* a high thermal conductivity, and no more than this can be got out of my address; and this, I have reason to believe, is an opinion shared by Prof. Schuster himself, and probably by the majority of physicists.

The author also takes some pains to show that other forces besides the tides have influenced the rate of the earth's rotation. He might have spared himself the trouble. I was not writing a treatise on the subject, but attempting to give an account of Lord Kelvin's views, and Lord Kelvin considers the tides to be all-important in this respect. He considers and dismisses as comparatively unimportant the agencies alluded to by Mr. Chree.

The evidence from the mean density of the earth was never put forward as conclusive, but only as suggestive.

I can only account for the remark that I "might be well advised to allow for the possibility that Lord Kelvin's speculations do not possess a monopoly of physical uncertainties," on the hypothesis that Mr. Chree has not read my address carefully, or has failed to comprehend the attitude I assumed. I all along recognised the "physical uncertainties" on every side, and made no claim whatever to replace them by certainties. My whole object was to show that no certain conclusions can be reached



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