short, that it is one of the rare examples of a term preoccupied as a family name but based on a genus which is perfectly valid.

Nearly eighty years ago Wiegmann* proposed the family Glirina for the wombats (*Phascolomys*) of Australia and Tasmania, which are now referred to the Phascolomyidæ. This course was also followed by Wagner in 1855, in the Supplement to Schreber's Säugthiere (Vol. V., pp. xv, 332).

In 1837 Ogilby,† in discussing the relationships of the peculiar aye-aye (*Cheiromys*) found in Madagascar, remarked: "It is only, indeed, the absence of the marsupial character which would make us hesitate to unite the *Cheiromys* with the Didelphidæ; but this circumstance is so material as to require that it should be placed in a different subfamily. At the same time, its analogy to the Rodentia ought not to be overlooked; and it is for the purpose of expressing this relation that I propose to denominate the small group which I am obliged to form for this animal, Gliridæ. I suspect, indeed, that the *Cheiromys* bears a more intimate relation to the real dormice (*Glis*) than we are yet aware of."

Thus Gliridæ has been used for three different groups of mammals belonging to as many different orders, Marsupialia, Primates and Rodentia. But since it is generally recognized that family names must be based on one of the included genera, this name is not available either for the aye-aye or the wombat, while its prior application to these animals invalidates its later use for the dormice, the only group which contains a genus *Glis*.

It remains to be determined what family designation should be applied to the dormice. Besides *Glis* and its synonym *Myoxus*, two other genera have been selected as types of higher groups: *Platacanthomys*, made the type of the subfamily Platacanthomyinæ by Blyth in 1876, and *Graphiurus*, the type of the subfamily Graphiurini by Winge in 1887. Either of these names might be used for the family. Platacanthomyinæ has the advantage of priority, but is open to the objection that it represents an aberrant section, so different, in fact, that some authors have not associated it with the dormice at all. *Graphiurus* is also aberrant, and according to Winge should be separated from all the other genera. This view Thomas does not accept, holding that "it might be quite as correct to separate *Glis* and *Muscardinus* on the one side from *Eliomys* and *Graphiurus* on the other by the pattern of the teeth, as to separate the last-named from the rest by the structure of the anteorbital region." Evidently a family based on the Indian *Platacanthomys* or the South African *Graphiurus* would not represent exactly the same group as that formerly known as Myoxidæ.

Under these circumstances it seems desirable to adopt a new family name, Muscardinidæ, based on *Muscardinus*, a genus which is closely related to *Glis*. The family of dormice may then be subdivided into the Muscardininæ for *Muscardinus*, *Glis*, *Graphiurus*, *Eliomys;* and Platacanthomyinæ for *Platacanthomys* and *Typhlomys*, reserving Winge's Graphiurinæ for *Graphirus* and *Eliomys*, in case it should be desirable to make a third subfamily for these genera, as suggested by Thomas.

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* Wiegmann & Ruthe's Handbuch d. Zool., p. 52, 1832.

† *Charlesworth's Mag. Nat. Hist.*, I., p. 523, Oct., 1837.

SCIENTIFIC BOOKS.

Differential and Integral Calculus for Technical Schools and Colleges. By P. A. LAMBERT, M.A., Assistant Professor of Mathematics, Lehigh University. New York, The Macmillan Company. 1898. Pp. x+245. Price $1.50.

An Elementary Course in the Integral Calculus. By Daniel Alexander Murray, Ph.D., Instructor in Mathematics in Cornell University. New York, Cincinnati, Chicago, The American Book Company. 1898. Pp. xiv + 288. Price.

The late Judge Cooley, it is said, made it a point to advise his students never to buy a law book not containing a suitable index. If Professor Lambert's book were provided with this common convenience and with a table of answers and if the pages were less crowded and the margins not so narrow, the size of the volume, which contains fourteen chapters including three dealing with differential equations, would more nearly agree with its scope. Even then, however, the book would belong, where the author doubtless intended it should belong, to the class of text-books which in order to distinguish them from their more comprehensive and cumbrous rivals, are sometimes described as thin. It is hardly to be imagined that, among those extra-scientific features of a book that may properly be considered in determining its acceptability as a text-book for classes, mere thinness could count for much. Certainly a slight difference of length, breadth, thickness or weight could not be decisive. Perhaps the most competent teachers are apt to prefer the thin text-book as less likely to dishearten and overwhelm the beginnner by multiplicity and as leaving more room for personal view-point and individuality; but then the least competent, too, are, for obvious reasons, prone to the like preference. In this case the thin book will prove friendly to sciolism rather than to knowledge, as the student will hardly escape the impression that the science is as thin as the book.

The English is in general clear, precise and correct. The style is, however, uniformly dry, the reader being soberly conducted through the 'enchanted realm of open mystery' with scarcely a change of mood or variation of pulse. Books for boys, however logical and scientific, one could wish might be more vital and vitalizing, more human, more cheerful and sympathetic, addressed not so exclusively to the analytic and formularizing powers, but to the appreciation also, to the faculties of estrangement and curiosity, of wonder and admiration, looking not less towards knowledge but more towards culture. But even if we may not rightfully expect inspiration, we may, at all events, demand direction, orientation, judicious accentuation. The author does occasionally remark that some notion is fundamental, but in general the student is left to his own resources for discriminating the more from the less important matters. Cardinal theorems, at least, might have received the common emphasis of italics.

The first hundred pages are concerned with algebraic functions, which, by the way, again receive the old definition. Transcendental functions follow. Integration, in which considerable use is made of trigonometric substitutions, is throughout treated simultaneously with differentiation. By this arrangement, it became possible to introduce at an early stage a goodly variety of physical, geometric and engineering problems which serve to illustrate the practical utility of the calculus. In addition, by way of encouraging practice, numerous exercises, invariably called problems, have been inserted.

The author desires 'by a logical presentation of principles to inspire confidence in the methods of infinitesimal analysis.' It is really not at all necessary. College atmosphere is saturated with belief in the validity and power of this subtile analysis. The faith is acquired by a kind of 'cerebral suction.' The average student has too much of this 'confidence' even before he begins the study, and as a rule too much also at the end. A genuine intellectual conviction, though it may not follow doubt, certainly can not precede it; and the rigorist's first object would seem to be not to inspire, nor to preserve, but rather to mitigate the student's unearned confidence. To beget a wholesome skepticism is an indispensable preliminary, but this is as little undertaken in this book as in the majority of its competitors.

It should by no means be inferred that the book is devoid of modern elements. The notions of absolute and uniform convergence, for example, are introduced, and the conditions for term-by-term integration and differentiation of power-series are considered; but the work is not preëminently 'logical.' The infinitesimal

is regarded as 'a quantity which becomes indefinitely small.' According to the definition of limit, page 3, either of two *variables*, as $\frac{1}{2^n}$, $\frac{1}{3^n}$, n increasing, may be the limit of the other. On page 10 we are told that when a point, moving continuously on a given curve, passes a specified point of the latter, it tends at that instant to move on the tangent. There is, of course, no such tendency, and continuity is not defined till several pages later. On page 25 the conclusion, 'Hence the first derivative, etc.,' is, as stated, entirely unwarranted by the premises. 'Any finite constant' is much too sweeping. It appears to be assumed throughout that continuity implies derivability. The explanations of the differentials *dy* and *dx*, pp. 39, 40, are interesting and curious. It would be supererogatory to give here an exhaustive enumeration of the peculiarities encountered, the foregoing specimens, taken at random, being perhaps sufficient.

The final three chapters present plainly and pleasantly an introduction to the practical phase of differential equations. The existence theorem, naturally not proved, is however *tacitly* assumed, and such fundamental questions as whether all modes and orders of elimination lead to the same equation are neither met nor propounded.

Dr. Murray's book is a simple, fresh, luminous and suggestive presentation of the elementary subject-matter of the integral calculus. While it was written primarily for engineering classes and particularly adapted to conditions prevailing at Cornell University, still the needs of others have been regarded and the work is not ill-suited as a guide to any one beginning the study of this branch of mathematics. The first two chapters, in particular, furnish an unusually full account of fundamental concepts and operations. The two conceptions of integration, as the inverse of differentiation, and as a process of summation, are shown to be one. On pages 9 and 11 and elsewhere, the symbol $\int$ is spoken of as denoting now a sum and again the limit of a sum, with seeming indifference.

Chapter XII. deals briefly with the important subject of integral curves, and in the next chapter, which is final, we find a brief discussion of some common and important differential equations.

For the convenience of any who may not have the time—several months, at least—necessary for the mastery of all the matter offered, a list of lessons for a shorter course is suggested. Many other minor features help to enhance the acceptability of the book. The exercises are numerous and many of them are not found in other works. A table of answers is appended as also a short table of integrals. Binding and paper are substantial and printing and proof-reading well done. There is no great pretense of rigor but there is life. The book was not stillborn.

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GENERAL.

THE Adjutant-General's office of the War Department has undertaken the issue of a 'French-English Military Technical Dictionary,' compiled by Cornélis De Witt Willcox, first lieutenant of artillery, U. S. Army. The first part, which has just been issued, contains 160 pages and reaches the word *espace*. The book is clearly printed with a judicious use of block and italic type. It will prove useful not only in the army and navy, but also to students of science in different directions. Many of the words translated will not be found in a good French dictionary as 'Littré et Beaujean,' yet they occur in scientific books. Not many Americans could give the equivalent of words such as *abouement*, *abougri*, *abraquer*, etc., and it is convenient to have at hand a dictionary in which they can be found. It is a matter for congratulation that there are in the army officers capable of such good scientific and literary work, and that it is encouraged by the authorities.

THE Experiment station of West Virginia University has recently issued Bulletin, No. 56, prepared by Dr. Hopkins, summing up the work done by him as entomologist of the Station during the past eight or nine years. This is a large bulletin of over 360 pages, and contains much valuable data collected by the entomological department during the time named, as it