

Prof. Goodman have greatly added to our knowledge of the friction of bearings, as distinguished from the friction of rest, as found in our academic text-books. Messrs. Archbutt and Deeley have given a clear and extensive account of the modern ideas on friction.

Prof. Osborne Reynolds' monograph on the theory of friction is certainly one of the finest works on the subject, and it is to be regretted that his results are not more generally known to engineers.

The portion of the present volume relating to the chemical and physical examination of oils is thorough and copious; it will be of great service to chemists, but is somewhat beyond the range of most engineers, who, if they test their oils in any way, use the mechanical oil-testing machine, which, while useful in its way, does not give the same knowledge of the properties of a lubricating oil as does the chemical test.

We consider that oil-testing machines are only capable of yielding satisfactory results in the hands of experts, and then only when much time is expended in experiments. For research purposes they are most admirable, and from their use we have obtained practically all we know of friction; but for commercial testing we should prefer to rely on chemical and physical methods. The design and care of bearings are well described in the second part; all forms of bearings, from those of watches and clocks, cycles and large engines, are illustrated. We are pleased to see the block packings for piston rods described; the ordinary gland packing is certainly a defective form, and is the cause of considerable loss of power, even when no serious heating occurs. The omission of the system of forced lubrication seems a pity, especially as Messrs. Belliss and Morcom have applied it with so much success to their well-known quick-revolution engine. The work is, we consider, of the greatest value, and should be in the hands of both designers and users of all forms of machinery in which lubrication is important.

F. W. B.

*Darwin and Darwinism, Pure and Mixed.* By Dr. P. Y. Alexander. Pp. xii + 346. (London: Bale, 1899.)

THE decade which followed the appearance of the "Origin of Species" witnessed the publication of innumerable books and articles dealing with Darwin's great work. Although many of these were solid and valuable contributions to the literature of evolution and natural selection, the mass as a whole was characterised by the large proportion of works which proclaimed with the utmost confidence the opinions of authors unknown as naturalists. Men whose claim to a hearing was of the slenderest kind spoke with contempt of Darwin's reasoning powers or the rashness of his generalisations. After 1870 such works became rarer, and at the present day are, happily, quite uncommon. The book before us is, however, about as bad an example as can be found. It would not have been astonishing in 1869 to be told by a writer unknown as an original observer or thinker that "Mr. Darwin's capacities of thinking and drawing inferences from the immense masses of fact he had collected were not at all equal to his powers of observation, investigation and classification," or to observe the calm satisfaction in the following sentence: "My little effort will show that, wherever I have paid special attention to any department of natural history or natural science, I am apt to find Mr. Darwin at fault, more especially in his generalisations." The mildest statement which can be made about the publication thirty years later of such opinions by a Mr. P. Y. Alexander—author of "Hereditism," "Parasitism," &c., notwithstanding—is that the work is an anachronism.

The literary style may be sufficiently exemplified by a couple of quotations from the "Argument of the Book."

"(2) Mr. Darwin went for essential *slowness* as a necessity of nature. He said in 'Origin' 'Nature can never take any great and sudden leaps.' When instances were presented to him of 'sudden leaps,' he tried to gloss it over, and always harked back on *slowness*" (p. ix.).

"(7) Mr. Darwin's notion that 'domestic animals which have long been habituated to a regular and copious supply of food *without* the labour of searching for it are more fertile than the corresponding wild animals,' shown by instance on instance to be *absurd*, opposed to the practice of all great breeders, and is, besides, physiologically impossible" (p. xi.).

It is probable that the reader who looks at such sentences as these will not feel sufficiently encouraged by the manner or matter to penetrate further, even though "the most absolute refutation of poor Darwin's fallacy" should be later on established, to the entire satisfaction of the author.

E. B. P.

*Electric Wiring Tables.* W. P. Maycock. Pp. iv + 144. (London: Whittaker and Co., 1900.)

MR. MAYCOCK'S pocket-book of tables should prove very useful to those electrical engineers whose work consists solely of wiring and fitting. It contains in a very convenient form tables of all the quantities likely to be wanted in such work, and has the advantage of being quite up to date, the values in the tables of the safe currents, resistances, &c., of copper conductors being calculated on the basis of the recommendations of the Institution of Electrical Engineers Committee on Copper Conductors, which only made its report at the beginning of this year. It is, perhaps, a disadvantage of the pocket-book that it is so limited in its scope, and we are inclined to think that it would appeal more strongly to the particular class of electrical engineers for which it is designed if more general information were included. A summary of the fire insurance rules should certainly be inserted, and it would be useful if some idea were given of the approximate costs of wiring on the different systems alluded to in the section on "Systems of Wiring." Some of the tables are simply "Ready Reckoners"; for example, the tables of "Price and Length of Conductors" give the prices of different lengths of conductors calculated from the price per yard, and would apply equally well to wood-casing and metal-piping, a fact which should be indicated in the title of the table. The table giving the current taken by different numbers of lamps working at different pressures and different efficiencies is a very useful one, particularly now that high-efficiency lamps are being brought forward. The same can hardly be said of the list of towns supplying on the alternate current system, since no details are given as to pressure and frequency. The usefulness of the pocket-book would be considerably increased by the addition of an index.

*Raggylug, the Cottontail Rabbit; and other Animal Stories.* By Ernest Seton-Thompson. Pp. 147. (London: David Nutt, 1900.)

MR. SETON-THOMPSON'S success as a writer about animal life lies in the fact that he endows his subjects with human faculties and sympathies. It is, of course, illogical to make animals consider everything from an anthropomorphic point of view; but, after all, this is the only point of view which it is possible for us to conceive, and there is no objection to occupying it, provided that its artificial nature is borne in mind. By following this method, Mr. Seton-Thompson's animal stories have a sentimental interest, and they create a love of animate nature in the minds of all who read them. There are four stories in the present volume, and each is as instructive as well as interesting narrative of animal life. Children will read the stories with delight, and adults will find their sympathies awakened by them.