of his earliest studies he returns as to a first love. On the soul-theories of savages and the corresponding eschatology he writes convincingly. The plurality of souls in pulse and blood and breath and shadow, the gradual elimination of some of these and the syncretism of the rest, the place of the dream image in the evolution of the cult of *manes* and in the selection of totems, the literal and unsymbolic character of the latter, the order in which the heavenly bodies enter into primitive worship—these are the points on which Dr. Schultze compresses year-long work into moments of insight and selective description. Believing, as he does, that Germany has a colonial future in direct contact with primitive stocks, Dr. Schultze offers his essay to the understanding of the savage as a help forward to the achievement of the educational mission of his country. A pious gift. H. W. B.

The Study of Bird-Life. By W. P. Pycraft. Pp. 240. Illustrated. (London: George Newnes, Ltd. 1900.)

THIS little volume belongs to "The Library of Useful Stories," now in course of issue by the publishers; and although it must have been difficult to compress a general review of the leading facts of bird-life into such a small compass, the author may be congratulated on the success of his attempt. As Mr. Pycraft is a morphologist rather than a systematist, it would naturally be expected that he would incline rather to the morphological and phylogenetic aspects of his subject, and this we find to be the case. We have, for example, an excellent chapter on the morphology of the bird's wing, while two others treat of avian pedigree, and a third is devoted to the distribution of birds in space and time. Perhaps the most specially interesting chapter in the volume is the one dealing with the flightless birds and their fate, since this is a subject on which the author is peculiarly qualified to speak with authority.

Although, of necessity, written from a purely popular standpoint, the volume contains many passages which are well worth the attention of the scientific ornithologist. If there be a fault, it is the introduction of irrelevant matter, the place of which might have been better occupied by details pertaining to the subject in hand. And if a second edition be called for, the author will perhaps be inclined to modify the statement in the tenth chapter, that "the kind of rock" in which bird-remains are found is sufficient to give a notion "of the bird-life of that particular period of the earth's history." R. L.

An Introduction to the Differential and Integral Calculus and Differential Equations. By F. G. Taylor, M.A., B.Sc. Pp. xxiv + 568. (London: Longmans, Green and Co., 1899.)

THE appearance of still another treatise of this kind shows how earnest and how prevalent is the desire to introduce students of physics to a knowledge of the calculus at as early a stage in their career as possible.

The author has studied simplicity of treatment, but has evidently striven to secure accuracy as well as clearness and distinctness in his exposition of the principles of the subject. A special feature, which will be of great advantage to the ordinary student, is the detailed discussion of numerous examples.

Interspersed throughout the several chapters the student will also find an abundance of not too-difficult exercises carefully graduated and with answers appended.

A fair and not excessive amount of space is devoted to the subject of curves, and the illustrative diagrams are distinctly drawn.

The section on the integral calculus concludes with applications to volumes and surfaces of revolution, centroids, and moments of inertia.

The last section of the book forms a good introduction to the methods of dealing with ordinary differential equations of the first and second orders.

ENGLAND'S NEGLECT OF SCIENCE.

JUST before the first movement organised by Lord Roberts there was probably not one thinking person in England who was not ready to vote for an immediate change in all sorts of English methods of doing things. Consequently everybody was willing to listen to the advice of men who had for years been crying in the wilderness and prophesying disaster. Now, however, that we have worried through our military trouble, we shall probably feel so much ashamed of our intense fright as to put aside most of our desire for reform, and even to have less thought of it than before the war began. It is, therefore, the duty of those who have earned the right to a hearing to prevent the nation from sinking down into its sleepy acquiescence with old methods of working; and I am glad to see that Sir Norman Lockyer, in his speech at the Royal Academy dinner, referred to scientific education as a great, necessary line of defence of our country, secondary only to that of our naval and military forces. Again, two articles have appeared in the *Kölnische Zeitung* (March 10 and 11), which criticise our manufacturing and business and military want of method with an unsparing pen. The German writer and many English writers seem to think that we ought to copy Germany. Nobody can feel more than I do the great necessity which exists for reform; but I think that our reform must be far more thorough than anything which can be regarded as a mere copying of Germany; the methods which we adopt must be English methods, invented by Englishmen for Englishmen. If our methods are to help to lead in the future to a history comparable in glory with the history of the past, there must be a great common-sense reform in education in England from top to toe. My friends, Profs. Ayrton and Armstrong, and I have so often pointed out the deficiencies of England in matters which we have carefully studied here and in foreign countries, that I hardly know whether an idea on this subject is my own or one of theirs; I do know, however, that we preach often on this subject, and that we never seem to be much attended to.

One thing that seems to be quite exasperating is that almost all the most important, the most brilliant, the most expensively educated people in England; our poets and novelists; our legislators and lawyers; our soldiers and sailors; our great manufacturers and merchants; our clergymen and schoolmasters, are quite ignorant of physical science; and it may almost be said that in spite of these clever ignorant men, and men like them in other countries, through the agency of a few men who are not ignorant, all the conditions of civilisation are being completely transformed. I do not merely mean here ignorance of the principles of science, I mean also ignorance of all those methods of working which come from experimental and observational scientific training. The great men go occasionally to popular scientific lectures (as they go to the Royal Academy), and they think that they comprehend something of the latest scientific discoveries because they have seen some fireworks and lantern slides; they are genial to scientific men when they meet them at dinner parties; but, in truth, scientific men are as much outside their counsels as sculptors or painters, or musicians or ballet-dancers. Among these great men a few visits to Albemarle Street are sufficient to create a reputation for science. I wish to show that this ignorance of our great men tends to create ignorance in our future leaders; is hurtful to the strength of the nation now, and retards our development in all ways.

These great men really direct the building of ships of war, and the creation of munitions of war; that is, they select the men who have to do these things, and they also lay down the unscientific rules which prevent their selected men from doing their work scientifically.

I will give an example. They order that the building