

the presence of methyl alcohol in alcoholic mixtures or in ascertaining its amount.

The author deals with the question of alcohol as a fuel, especially in the internal-combustion engine, and gives details of the results of special investigations which have been made in America and in Australia to elucidate its relative advantages as compared with other forms of motor spirit. Lastly, his chapter on the physiological effects of alcohol gives a careful summary of our present knowledge of its action on the human organism, mainly based upon the report (published in 1918) of the Committee appointed by the Central Board (Liquor Traffic) of the United Kingdom. It is a well-balanced and impartial account of established fact concerning a most important subject, intimately related to the national welfare.

The book is well illustrated; indeed, this, perhaps, constitutes its only demerit; the necessity to use so-called "art" paper throughout in order to reproduce the large number of "process" figures adds greatly to its weight, and thus detracts from its general utility. We would willingly have dispensed with many of the pictures, some of which add little or nothing to the attractiveness or usefulness of the book. Its convenience in handling, and as a work of reference, would thereby have been increased.

A GREAT ARTIST OF NATURE.

A Naturalist's Sketch Book. By Archibald Thorburn. Pp. viii+72+60 plates. (London: Longmans, Green, and Co., 1919.) Price 6 guineas net.

ALL artists are more or less influenced by the work of some previous craftsman whose technique they admire, and it is no detriment to the achievements of so superb an artist as Archibald Thorburn to say that on him has fallen the mantle and style of Joseph Wolf, the greatest artist of bird and mammalian life the world has ever seen. Thorburn himself admits this influence, and renders an adequate tribute to the bygone master. Yet, whilst the care and delicate handling of birds, mammals, landscape, and natural features bear some similarity in their rendition to Wolf in treatment of form and sense of beauty, Thorburn's style is all his own and distinctly original. In one respect, at least, and that a most important one, he excels even Wolf for the beauty, accuracy, and strength of his colour. This has never been surpassed by any artist of ancient or modern times in water colour.

In the work before us we are presented with a series of finished sketches, mostly in

colour, and drawn direct from life. Having for his models the most restive and elusive of all sitters, the average artist is content to draw roughly in pencil characteristic poses, and then has to rely for colouring in his details of feather and fur on such skins or stuffed specimens as he is able to procure. Thorburn, it is true, uses only such aids *afterwards* to correct the coloured sketches he makes direct from Nature, and thus he obtains the proper lighting and the real effect of fur and plumage as it is in Nature. Thus he gives us a perfectly satisfactory representation of the creature depicted, and with all the effect of true colour without ultimate studio work, which is always liable to inaccuracy. No one, unless he is an artist himself in this difficult line, has any idea of the rapidity, skill, and accuracy of observation that are required to be *always* successful, and whilst it may be said that even Thorburn occasionally fails slightly in his drawing, 99 per cent. of his work is beyond criticism, and perfectly successful.

In no family of birds is Thorburn more complete in his knowledge than in the case of the game birds and raptorials. His eagles, falcons, grouse, partridges, and black game are drawn from life with a dexterity that is amazing. He puts a wealth of colour and a "bloom" on his plumage that we who know these birds best are left in wonder at his skill. There are just the right softness and rotundity all done with a few unlaboured washes. Details of the plumage in the form of primaries, secondaries, scapulars, and tail are, in the case of each species, rendered with exactly the right number of feathers. No point that is characteristic of any species is lost. A golden eagle in repose shows just the one fluffy feather on the flank, and in flight the striking whites of the under-feathers, which show only when the bird is in movement. We do not need to be told that the series of sketches of game birds, hawks, owls, and smaller perching birds are drawn direct from life, because here, in this beautiful volume, we who are naturalists see them as they really are in all the beauty of life and movement. Perhaps Thorburn is more successful with creatures in repose than in intense action, but this may be due to the fact that the public prefers birds and mammals in their quieter moods, and he likes to render them so.

Probably the artist's work is most successful because he takes such infinite care with all his details before attacking his finished pictures. If he has to do a plate for some work, one or two coloured figures from life are not sufficient. He draws carefully all the "soft" parts, such as feet, bills, and eyes, directly from some dead or living

specimen, and thus gains a first-hand knowledge of the whole creature before commencing his final essay.

The text which the artist supplies of how and when he made his sketches, supplemented with original observations of the habits of birds and mammals, is both adequate and interesting. At the end of the volume are some beautiful studies of landscape and plant life, notably the exquisite sketch of a thistle (plate 60), snow-covered furze and pines (plate 58), the eagle's hunting-ground (plate 57)—a perfect handling of the high tops—and pheasant covert (plate 56).

The volume will do much to enhance the reputation of Archibald Thorburn as an artist, and those possessed of the necessary wealth have the opportunity of purchasing something that will live as long as the taste for Nature, high art, and beauty continues—and that remains for ever.

It is an unfortunate truism that few men, least of all artists, are recognised as supreme craftsmen during their lives. The day is coming shortly—if it has not already arrived—when the public, and even art critics, will awake to the fact that this century has produced two great artists of Nature—namely, Joseph Wolf and Archibald Thorburn—and those who possess a complete set of the work of these two masters will be very fortunate.

In the volume under review we notice only two slight errors. We have never seen a white-tailed eagle (plate 4) so dark as the specimen figured, nor have we observed a green cormorant (plate 36) with a "bushy" crest of the shape depicted.

J. G. M.

SUBMARINES AND SEA POWER.

Submarines and Sea Power. By Charles Domville-Fife. Pp. viii+250. (London: G. Bell and Sons, Ltd., 1919.) Price 10s. 6d. net.

THE author has already written several books dealing with the development of submarines and also with their exploits on actual service under war conditions. In the present volume an attempt is made to discuss the influence of the submarine, now an important weapon in naval warfare, "on national life in time of war in order to awaken those who administer the empires of to-day and to-morrow to the need of provision against a new and growing menace which has changed the older theories of sea power."

Much of the matter in this book has already been covered in the author's previous publications, particularly that in the chapters on the evolution of the submarine. The difficulties of navigating the submarine, the restrictions imposed by limited

depth of water and other hydrographical features, the conditions for favourably attacking an enemy and for escape from one, and other factors dealing with the employment of submarines, are dealt with in some detail, particularly in so far as they affect the use of naval power. The immediate effect of the German submarine menace upon our "sea power" during the Great War is discussed, and the author makes some suggestions based on our recent unpleasant experience for the guidance of future administrators.

So long as details of construction and of working the submarines are under review, the author is on safe ground, but in developing general arguments, in stating his premises, in the marshalling of his facts, and in selecting his language, he is not so happy. A plaintive appeal is made in the preface that the book may be read to the end before any definite opinion is formed. The appeal is necessary.

The author has not considered his subject on broad lines. When one has defined a submarine as a mobile ambush which can be set not only on this side of an enemy, so that he will have to encounter it in his advance, but also well within the enemy lines without incurring any serious risks, and with a considerable degree of protection by reason of its power of submergence, whilst retaining its powers of observation, the serious restrictions it imposes upon the movements of a surface fleet become almost obvious. The submarine affects enormously the tactics of a surface fleet, but the experience of the war has not shown that the submarine has appreciably altered the application of naval strategy. It will alter types of ships.

A picture is drawn or suggested of what might have happened to our sea-borne commerce had Germany possessed at the outbreak of war 1000 high-powered submarines. Such a picture is not instructive in any way in regard to the future aspect of the submarine question. The success of the German submarine—for it was undoubtedly a most successful weapon for harassing our sea power—as a matter of fact lay in its surprise application contrary to the Hague Convention. Had Germany possessed 1000 submarines Britain would have had in all probability 10,000 partial antidotes. Fortunately, such favourable conditions for surprise by submarine cannot occur again. A measure of the success of submarine activities is obtained from the book, in which it is stated that 600 merchant ships and fifty warships were destroyed, and that 1500 patrol ships, with guns and ammunition and depth-charges, and 2000 minesweepers had to be built or used in combating submarines.

The chapters at the end of the book dealing