However, there is more to respiration than the passage of air in and out of the upper respiratory tract, or of water over the gills of fish; the most serious criticism of the book is that there is little attempt to correlate anatomical adaptations with physiological function. Thus, for example, there is nothing on foetal respiration; in discussing diving mammals and birds, the discussion barely goes beyond the use of stopwatches, and the names Scholander and Irving are never mentioned. There is no mention of adaptations to altitude nor any discussion of the relation between respiratory gas exchange and the size and metabolism of mammals.

Instead of this, the author has inserted two highly compressed chapters on respiratory gas exchange and the neural control of respiration which apply only to man or common laboratory mammals. The latter chapter, in particular, provides a synopsis that is potentially misleading for the novice and irritatingly dogmatic for the professional.

Where space is at a premium, a statement such as "The effects of changes in arterial *p*H upon pulmonary ventilation do not, however, depend on the alteration of *p*H *per se*, but are determined by the extent to which the *p*H change is caused by or gives rise to coincident alterations in arterial PCO_2" is not only ambiguous but positively misleading since no mention has been made of the medullary *p*H-sensitive chemoreceptors or of the role of the *p*H of the cerebro-spinal fluid.

The bibliography contains 98 references of which only about a half are primary sources.

There is a very real need for a comprehensive book with this title, a book which would gather together the work done so far and emphasize where the tracts of ignorance lie; Schmidt-Neilsen's recent *Physiology of the Desert Animal* is an admirable model. It might require a reincarnated John Hunter, to whom Sir Victor is clearly much indebted, to do justice to such a labour. In his absence, Sir Victor and Messrs. E. and S. Livingstone, Ltd., might consider expanding this book with Sir Victor's unique contribution as the nucleus. Zoologists and respiratory physiologists would then be much in their debt.

M. J. Purves

THE PROTURA

The Protura

A Revision of the Species of the World with Keys for Determination. By Prof. S. L. Tuxen. (Actualités Scientifiques et Industrielles, No. 1311.) Pp. 360. (Paris: Hermann, 1964.) 54 francs.

THE Protura, a group of small Arthropods usually placed for convenience with the Insecta, were not recognized at all until 1907 when Silvestri described the order and the first species; even now there are fewer than 150 known species. The original descriptions, with a few exceptions, are inadequate, resulting in names being applied to different species by different workors and in the formation of many synonyms. The only remedy for this is to interpret conclusively all the specific names by examining the type material—designating lectotypes where necessary and erecting neotypes where the types are lost. This, together with a re-assessment of taxonomic characters, has been done by Prof. Tuxen in *The Protura: a Revision of the Species of the World with Keys for Determination.*

In this, 48 pages are devoted to morphology, partly based on original work by Prof. Tuxen, with emphasis on the characters used in the classification. Post-embryonal development is dealt with in three pages, while techniques of collecting, examination and preservation are outlined in one. A list is provided of references to ecology and distribution (arranged geographically) together with a systematic list of all the known names, ten pages of references to the literature, and indexes to names and subjects. The rest and greater part of the book contains the systematic discussion, keys, figures and descriptions of the species, including discussion of the intra-specific variation of some of the characters; all are clearly and conveniently presented.

Thus, for the first time a critical re-assessment of all the morphological and systematic information about the Protura is contained in one volume and it should now be possible to determine Protura material correctly. However, in using the keys it becomes apparent that for identification the specimens must be in good condition and some familiarity with the order is necessary, the arrangements of the sensillae and setae of the foretarsus being especially difficult to resolve; in this respect it is unfortunate that some of the figures of the foretarsus, as mentioned in the preface, have been so much reduced. One other criticism that might be made is the number of genera which have been used for the relatively small number of species, but in Prof. Tuxen's opinion this is a necessary, perhaps only temporary, step to survey a group in which relationships and evolutionary lines are difficult to assess.

It is hoped that this work with its high standards of taxonomy will induce similar standards in the work of subsequent taxonomists of the group and encourage the collection of information on the biology and ecology of the Protura. Further, their distribution may prove to be of considerable zoogeographical interest.

Theresa Clay

MORE ABOUT COCONUTS

Coconuts

By Dr. Reginald Child. (Tropical Agriculture Series.) Pp. vii + 216 + 25 plates. (London: Longmans, Green and Co., Ltd., 1964.) 42*s.* 6*d.* net.

IT is often surprising to observe, in quite different parts of the world, that coconuts are so badly grown, or so indifferently maintained. Of course, it can be appreciated that, with rising costs of labour, the crop is probably one on which only marginal sums can be spent. That, at least, is the general assumption. However, in these days of scientific agriculture, from the application of which other major tropical crops have certainly profited, it might reasonably be expected that more could be done to improve this important and valuable crop. The potentialities are there: very considerable areas could be utilized, in simple ways, for the cultivation of the coconut, if only . . . ! In fact, there are regions where scientific agronomy is being practised to advantage.

Accordingly, the handy volume prepared by Dr. R. Child, formerly director of the Coconut Research Institute of Ceylon, and produced as one of the *Tropical Agricultural Series*, under the editorship of Mr. D. Rhind, is to be welcomed. (The last considerable monograph on this crop, *The Coconut Palm*, was prepared for the Indian Central Coconut Committee by Dr. K. P. V. Menon and Dr. K. M. Pandalai several years ago.) A further circumstance which adds to the value of the new volume is that the relevant research and technical literature, which is often not too readily accessible to the grower who does not happen to be closely associated with a scientific department or institution, is presented in condensed form. Indeed, in a special chapter, the author has been at pains to inform his readers on this point, for, as with other pan-tropical crops, the literature tends to be somewhat scanty and widely scattered. In fact, various journals and reports are now being produced regularly in Ceylon, the Philippines, India, Malaya, Fiji, etc., and in Paris for regions within the French economy. There has also been recognition of the need for co-operative scientific work in tackling the problems of cultivation and protection—and