

Vergleichende Morphologie der höheren Pflanzen  
Von Prof. Dr. Wilhelm Troll. Band 1: Vegetations-  
organe. Teil 1, Lieferung 2. Pp. 173-508. (Berlin:  
Gebrüder Borntraeger, 1937.) 27 gold marks.

ON the first page of this second "Lieferung" of Part I of the first volume, in continuation of the introduction to the main heading, "The Construction of the Shoot and Shoot-systems", the author discusses the 'phyton-theory' of Schultz, Gaudichaud and Celakovsky, but rejects it as not taking account of the structure prevailing at the stem-apex.

Section I of the main thesis on shoot-construction deals with nodes and internodes. Section II treats of the shoot-axis and leaf. Genuine cases of *terminal* foliar organs exist, but they are regarded as derivative. A chapter is devoted to the cortication and alation of the stem by leaf-bases. Leafless shoots form the topic of another chapter, and the rhizophore of *Selaginella* is described and its morphological nature discussed. The author concludes that a comparative and experimental study of the problem shows that the rhizophore is decidedly a modified *stem*. The leafless shoots of Psilotales are described.

In Section III many pages are devoted to the "Phenomena of Lateral Symmetry in the Structure and Leaf-formation of Shoots". 'Flattened shoots' are described in detail. The phylloclades of *Asparagus*, *Ruscus*, etc., are regarded as of shoot nature.

The final section of this "Lieferung" is concerned with the large subject of branching. That of the Pteridophytes and Lycopsideæ is discussed. Considerable space is devoted to the Lepidophytes from the Coal-period. In particular, the *Stigmaria*-problem is fully dealt with. After a special comparison of *Stigmaria* with the mature and seedling structures of *Selaginella spinulosa* and its rhizophores, the author concludes that *Stigmaria* and the rhizophores of *Selaginella* may be regarded, not as a mere "parallel modification" as Scott stated, but as strictly homologous structures.

As in the first "Lieferung", so in this one, the subject-matter is illustrated throughout by very numerous and excellent figures and photographs.

W. C. W.

#### The Metabolism of the Frog's Heart

By A. J. Clark, M. G. Eggleton, P. Eggleton, R. Gaddie, C. P. Stewart. (Edinburgh Medical Monographs.) Pp. xii+308. (Edinburgh and London: Oliver and Boyd, 1938.) 15s. net.

THIS useful monograph contains a full and critical summary of recent work on the chemical processes in the frog's heart and their relation to muscular activity. So much of our knowledge of muscle physiology is based upon those peculiar and highly specialized organs, the muscles of the hind legs of the frog, that information from other sources is needed as a corrective to one-sided views.

On the whole, heart muscle seems to be a more generalized type of tissue than skeletal. As the authors point out, the frog's heart (and perhaps any heart) is not well adapted to correlating energy exchanges, expressed as heat, tension or work, with

chemical processes. For this purpose a muscle with straight parallel fibres capable of developing high tensions is necessary. To compensate for these defects, the frog's heart is well suited to measuring the chemical processes themselves, though on account of its small size a very refined technique is needed. The development of this technique has been almost entirely the work of Prof. A. J. Clark and his colleagues at Edinburgh during the past ten years. They are also responsible for most of the results.

The subjects dealt with are as follow: the structure and chemical composition of the heart; oxygen usage and its relation to carbohydrate and non-carbohydrate metabolism; anaerobic processes; phosphorus metabolism; the effects of asphyxia and certain depressants on the heart's activity. There follows a discussion of the way the heart's metabolism varies with changes in the electrical and mechanical responses, and of the light these processes throw on the fundamental nature of muscular activity. The last chapter gives a useful comparison of the frog's heart with other types of muscle. There is an appendix on methods.

Through the Great Arid Filter (Man's Drift to Europe)  
By A. J. McInerny. Pp. 46. (Otley, Yorks: The Author, c/o Printerdom, 1938.) 2s.

MR. MCINERNY here elaborates further and in some considerable detail his theory of the part played by the desert in the development of the more advanced races. It is a special adaptation of the more general theory of the influence of geographical environment in moulding man and his culture; but whereas it is most generally held that arable land is an essential condition of progress, the initial stages of cultivation being regarded as the first step towards the higher forms of civilization, the author on the contrary holds to 'thermal aridity' as the efficient cause. The stimulating effect of the solar energy and wide range of variation in temperature of the desert, it is maintained, has transformed non-progressive jungle man into the progressive white races of Europe. On this view, the long-headed races are a product of the desert belt extending from Africa to India, of which the Sahara is the most important section, and the broad- or round-heads emerge from the area of the Caspian. The 'Brown Race', cutting across this desert belt, represents an intermediate stage in the development. In the Far East the Chinese are regarded as the equivalent of the Egyptians, their further development having been arrested for reasons which are stated, while the Japanese represent the Europeans, the efficient cause here being the Gobi Desert.

Mr. McInerny has applied his theory to racial distributions, past and present, with no little ingenuity, and makes it something more than plausible; but until the mental processes underlying progress are more fully understood, as well as the effect of the reactions to 'thermal aridity', it cannot be accepted hastily as proved. In the cultural context, the hypothesis seems to postulate a stimulus which at times is rather remote.