

Another Brazilian biological journal, *Zoologia* (No. 7, 1943, Boletim 32, Universidade de São Paulo, Brasil), although chiefly biological, contains a paper by Paulo Sawaya on the occurrence of acetylcholine in the cardiac tissues of the marine crab, *Callinectes danae*, which "is perhaps the commonest swimming crab in Brazil". A large quantity of acetylcholine was found in the cardiac tissue. The technique of attempts to perfuse the heart is described and the effects on the heart of acetylcholine, eserine, atropine, nicotine and adrenalin are described. Extracts of the cardiac tissue of *Callinectes danae* contained substances which acted like acetylcholine on the hearts of the amphibians *Bufo marinus* and *Siphonops annulatus*. The experiments indicated that *Siphonops annulatus* can be used for testing the action of acetylcholine. Five plates record the kymograph tracings (cardiograms) obtained with the hearts of these three species.

The greater part of this issue is, however, occupied by a paper of 246 pages on the Naididae of Brazil, by Ernesto Marcus, with a summary in English of ten pages, a bibliography of seven pages and 33 plates. The paper discusses the structure, bionomics and taxonomy of 24 species, all found near the city of São Paulo and in the State of São Paulo. They belong to the genera, *Chaetogaster*, *Nais*, *Dero*, *Aulophorus*, *Pristina* and *Naidium*. Some problems of variability, morphogenesis, regeneration and histology are considered.

In the same volume, Michel P. Sawaya discusses the intrazooecial rings of the Crisiid Bryozoa, and Domingos Valente describes his work on the effect of numbers of individuals on the oxygen consumption of the crab *Trichodactylus petropolitano*, which normally lives in darkness under stones and water plants in rivers. The author concludes that the isolated animal uses oxygen at a greater rate than do groups of four crabs; and two crabs used more than four. This group effect is not eliminated by darkness. The effect of visual stimuli on oxygen consumption was studied in crabs placed in relation to their own mirror images in aquaria mirrored on one vertical side. The oxygen consumption of isolated crabs thus placed in contact with their own mirror images was decreased. Mirror image and group effects are thus both positive, but the former were not very marked.

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SYSTEMATICS OF THE POTATO

A THOROUGH understanding of potato taxonomy is a necessary pre-requisite of a large-scale programme of breeding for new types. With this in view the British Empire Potato Collecting Expedition sent out by the Imperial Agricultural Bureaux during 1938-39 made extensive collections in Mexico and South America. The systematic results are now described by Dr. J. G. Hawkes (Imperial Bureau of Plant Breeding and Genetics, Cambridge, pp. 142, June 1944, 7s. 6d.), who has classified all the material obtained on a basis of morphological, geographical and cytological criteria. Five new cultivated and thirty-one new wild species are described in addition to very many new varieties and forms; but although some twenty cultivated and one hundred and fifty wild species of potato are now known, it is concluded that, at least so far as the wild species are concerned, the wealth of variation still lies practically untouched, and probably three or four times as many wild

species await discovery in the less accessible regions.

The cytological investigation of the collections shows that it is only in Mexico that the whole polyploid series occurs. Here only six diploid species are known, whereas tetraploid, pentaploid and hexaploid types are common. In South America diploid wild species are the rule, and there are no pentaploid or hexaploid wild species and only one pentaploid cultivated species. Among cultivated species in every country tetraploid clones occur much more frequently than diploids, triploids and pentaploids.

As regards the origin and evolution of cultivated potatoes, reasons are advanced for supposing that moderately high-yielding wild potatoes were first taken into cultivation in the Lake Titicaca - Cuzco region of north Bolivia and south Peru. Light is thrown upon the problem as to which types of potato were first cultivated by an analysis of the different kinds of weed and semi-cultivated species. This leads to the conclusion that the tetraploid weed species may be either types that had once been cultivated and have now been replaced by higher-yielding varieties of *S. andigenum*, or amphidiploids which were never cultivated to any great extent. The diploid species, on the other hand, are probably the wild species most closely related to our cultivated diploids from which the tetraploids arose before or after their being taken into cultivation. The two tetraploids *S. andigenum* and *S. tuberosum* (*s.str.*) are considered to have had a common origin in the south Peru - north Bolivia region and not to have been derived from distinct wild species, while the evidence as to the origin of the European potato is thought to favour an introduction from the Andes, and most probably Columbia, rather than Chile as has been supposed.

STRUCTURE OF THE WALLS OF PHLOEM FIBRES

R. D. PRESTON (*Chronica Botanica*, 7, 414; 1943) points out that there is now considerable scope for the botanist, and especially the biophysicist, to make his contribution to the knowledge of the fine structure of the cellulose walls of plant cells.

Owing to their commercial value, the fibres of the phloem (sclerenchyma) have so far been chiefly studied; in these the X-ray diagram indicates the presence of cellulose chains in the longitudinal direction only, while observations on swollen walls by optical methods have led to the view that at least two layers are present and that they differ in direction of the cellulose chains. Crossed cellulose chains definitely occur in the walls of certain algae. The X-ray diagrams of hemp and jute fibres reveal the presence of only one direction of cellulose chains which runs parallel with the major extinction plane and remains unaltered during thickening processes of the fibre walls.

However, by optical examination of swollen walls, there is indication of heterogeneity in cross-section which does not appear to be accounted for in entirety by the differential distribution of lignin and pectin. The latter causes also differential swelling of the wall in different regions and leads to the production of striations of various kinds; also the swollen material is easily broken into separate fibrils with associated change in direction of cellulose chains, which appears to have misled at least one worker. Swelling under