

TABLE 1

<i>Segments composing fragment</i>	<i>Number of fragments</i>	<i>Responsive</i>	<i>Unresponsive</i>
1 & 2	2	2	
3	1		1
3 & 4	3	2	1
4	1		1
5	2	1	1
5 & 6	1	1	
6	1	1	
7	1	1	
8	3	3	
10	1		1
9-13	1	1	
10-11	1		1
10-13	4	3	1
11-13	1		1

one preparation of segment 8 continued to respond for 4 days while a fragment consisting of segments 9-13 was still responsive on the twelfth day after operation when it was discarded. Observations on small fragments of this caterpillar thus confirm the results of earlier and cruder experiments with large fragments (Minnich 1925), viz., that the receptors for sound vibrations are generally distributed over the body with the possible exception of the extreme posterior end.

REFERENCES

- Minnich, Dwight Elmer, 1925, The reactions of the larvae of *Vanessa antiopa* Linn. to sounds. *Jour. Exp. Zool.*, 42(4), 443.
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SEROLOGICAL STUDY OF THE RELATIONSHIP OF COMMON ANIMALS

ALAN A. BOYDEN
Rutgers University

The 1936 collection of blood sera to be used in a study of the relationships of animal species as indicated by the precipitin reaction was begun at the Marine Biological Laboratory of the Carnegie Institution, at Tortugas, Florida, continued at the United States Bureau of Fisheries Laboratory at Beaufort, North Carolina, and concluded at the Mount Desert Island Biological Laboratory. At the latter station the collection of Crustacean bloods was supplemented by the addition of blood sera of the following species: *Carcinides maenas*, *Cancer borealis*, *Cancer irroratus*, *Hyas araneus* and *Homarus americanus*. In each case the blood was allowed to clot, the serum collected and filtered through Seitz filters, and stored in sterile condition in vaccine vials.

The further steps in this study will require the preparation of antisera for these sera by the injection of rabbits, and the testing of such precipitating antisera with all the available Crustacean bloods. It is important in this analysis that the precipitin reactions be performed with really comparable antigens and that the influence of lipoids on the reactions be accurately estimated and corrected. With such precautions evidence is accumulating that the serological data may yield measurements of protein similarities in related species of value to the student of animal relationships.

THE DEVELOPMENT OF THE LEAF AND SPOROCARP OF *REGNELLIDIUM* LIND

DUNCAN S. JOHNSON

The Johns Hopkins University

A complete study of the vegetative and reproductive structures of this rediscovered monotypic Brazilian water fern is being made. Last summer's work at Salsbury Cove was devoted to the younger stages of the leaf and of the sporocarp arising from its petiole.

The leaf of *Regnellidium* is developed by a bifacial apical cell (Fig. 1) formed near the dorsal midline of the creeping stem. The first $25 \pm$ semicircular segments of this initial are cut to 5 sectors each, by 5 radial anticlines formed in a regular sequence (Figs. 1, 2, 3). Then each of the sectors and the marginal cell left between the last two sectors are, in the segments forming the petiole, cut by periclinal and further anticlines (Fig. 3) to form the epidermis, the central vascular strand and the intermediate parenchyma tissues of the mature leaf stalk. In the 2 or 3 pairs of segments of the leaf initial (Fig. 4) that form the *single* pair of pinnae of the leaf the cutting-off of sectors from the marginal cell continues (Fig. 5) until some $20 +$ sectors have been cut off from each of the two edges of the marginal cell. Thus are formed the two reniform rounded pinnae which come to lie face to face. Beyond the two pinnae, the leaf initial cuts off several more series of segments (making a total of $30 \pm$ in the whole leaf). These last segments, however, do not form a second distal pair of pinnae here as they do in *Marsilea*. There is no evidence from the development that a proximal pair of leaflets has disappeared, as has been suggested.

The sporocarp of *Regnellidium* is likewise formed by a bifacial initial arising at the base of the petiole. This initial cuts off alternately to right and left some $25 +$ segments, which in the region of the capsule, are cut by 7 or 8 sector walls to leave a marginal cell between the last 2 walls. Then certain definite marginal cells, distributed along the length of the capsule, elongate radially and divide tangentially to give rise to the radial rows of megasporangia and microsporangia in each of the 6 or 7 sori in each half of the capsule (Fig. 6). Meantime, the sectors formed on the ventral and dorsal sides of these marginal cells grow vigorously in the ventral direction