

**SOME HABITAT RESPONSES OF THE
LARGE WATER-STRIDER, GERRIS REMIGIS
SAY, VOL. LIII., NO. 628-629, SEPT.-
OCT., 1919 [PP. 394-505]; VOL. LIV., NO.
630, JAN.-FEB., 1920 [PP. 68-83]**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649320790

Some habitat responses of the large water-strider, *Gerris remigis* Say, Vol. LIII., No. 628-629, sept.-oct., 1919 [pp. 394-505]; Vol. LIV., No. 630, jan.-feb., 1920 [pp. 68-83] by C. F. Curtis Riley

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E. J. Riley
D. F. Curtis

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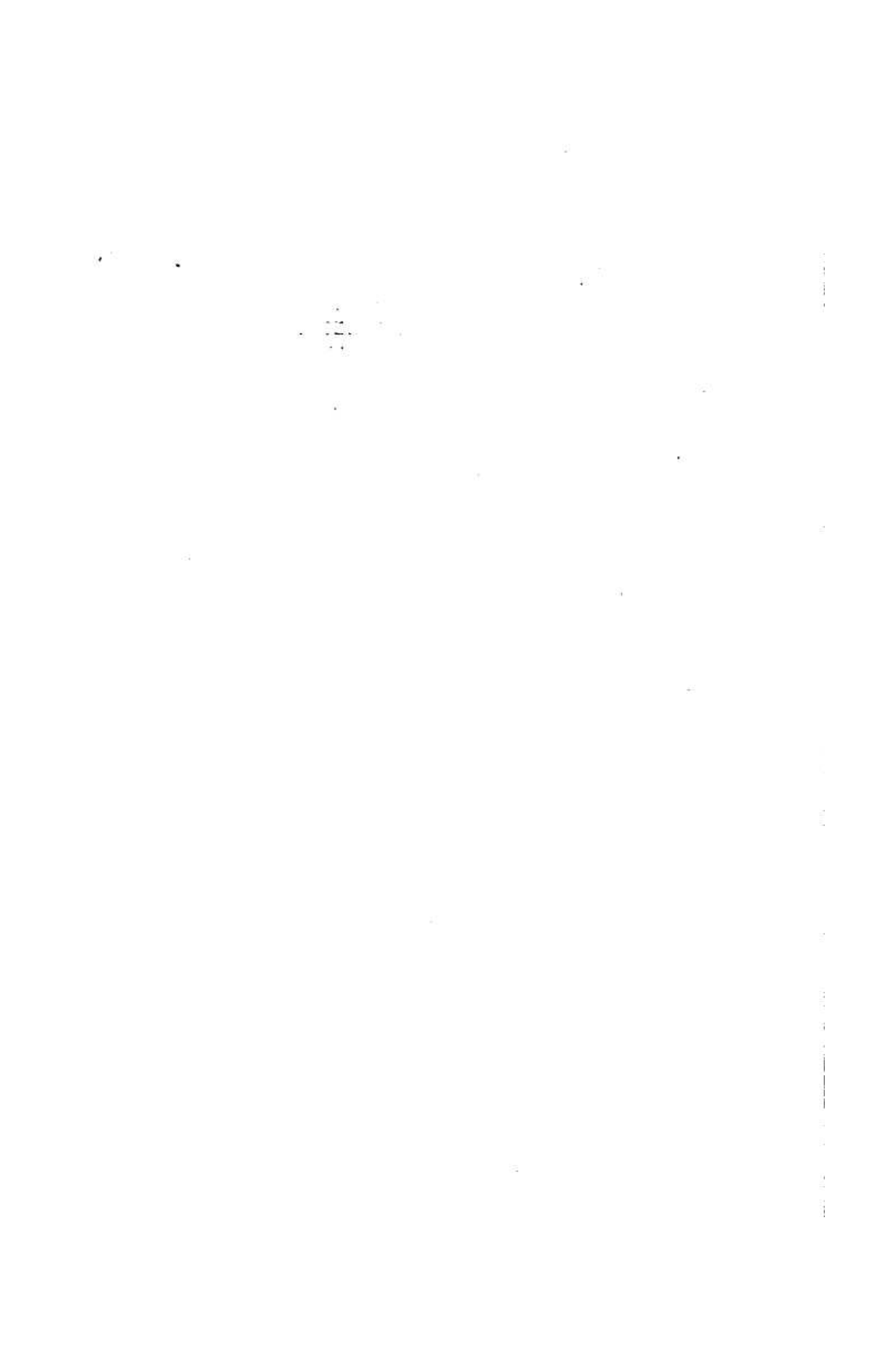
SOME HABITAT RESPONSES OF THE LARGE
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C. F. CURTIS RILEY

NEW YORK

1920

[Reprinted without change of paging, from the *AMERICAN NATURALIST*, 1919-20.]



[Reprinted from THE AMERICAN NATURALIST, Vol. LII., Sept-Oct., 1919]

SOME HABITAT RESPONSES OF THE LARGE WATER-STRIDER, GERRIS REMIGIS SAY

C. F. CURTIS RILEY

THE NEW YORK STATE COLLEGE OF FORESTRY AT
SYRACUSE UNIVERSITY, SYRACUSE, NEW YORK

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I. INTRODUCTION

THE large water-strider, *Gerris remigis* Say (Fig. 1), is one of our most interesting and familiar aquatic bugs. During the years 1911-1913 inclusive, I made a somewhat intensive study of the responses of this species to the physical conditions of its environment, in the vicinity of Urbana, Illinois. This study has been continued, intermittently, up to the present time. The present publication forms only a part of the entire investigations. Part of this paper treats of observations made near Urbana, Illinois, and part treats of observations made near Syracuse, New York.

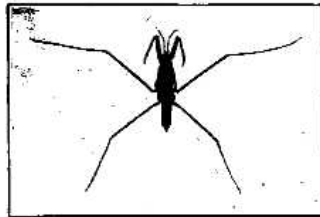


FIG. 1. The large water-strider, *Gerris remigis* Say, natural size. (Folsom.)

In the summer of 1911, a severe drought occurred in the vicinity of Urbana. In fact so extended was the period of dry weather, that many streams in the region, that usually were to be classed as permanent, became absolutely dry, and others were reduced to a few isolated pools. Water-striders, *Gerris remigis*, were trapped in many of these pools. As the gerrids belonging to this species are *mainly* apterous insects, they were unable to migrate by flight to some other body of water. Because of this, serious results might accrue to those individuals that were isolated in such situations when the pools became dry. It was a matter of interest to know what would become of these hemipterons when the water entirely disappeared. Therefore, a number of observations were recorded in connection with this subject.

II. PHYSICAL CONDITIONS OF AND BEHAVIOR IN BROOK HABITAT DURING SEVERE DROUGHT AT WHITE HEATH

1. *Description of Physical Conditions.*—Frequently certain physical conditions were found to exist in brook habitats in the early stages of droughts that had a direct bearing upon the very existence of the water-striders, *Gerris remigis*, but which will be mentioned here only very briefly. I wish to refer particularly to a brook, flowing partly through a forested region, near White Heath. This brook is situated about eighteen miles southwest of Urbana, and the physical conditions to be considered are such as existed during a drought, in the summer of 1911. During the earlier periods of this drought, I often found, in the drying brook bed, small pools of water not entirely isolated from each other. (In Figs. 2 and 3 are shown drought stages in the bed of the brook near White Heath that are very similar to those under consideration. The only difference here, of importance, is that the pools are in somewhat earlier drought stages than are those to which I have referred.) Such pools were connected by means of riffles not more than 6-12 inches wide (Figs. 2, 3). When food became scarce in pools of this character, or when a scum, often due to bacterial growth (Fig. 3), formed on their surfaces, I have observed that the water-striders made their way from one pool to another, by means of these small riffles of water, until such connecting links disappeared and the majority of the pools became dry. Eventually the gerrids were concentrated on the surfaces of the few isolated pools that remained. Sometimes, the bacterial growth, which was of a gray color, caused the death of hundreds of water-striders.

Such pools as have been mentioned persisted longer in that part of the brook's course that extended through the wooded region. In such a region the pools were larger, with a greater volume of water, than frequently was the case in more exposed situations. These conditions were due primarily to the protection afforded to the



FIG. 2. Detail of brook near White Heath, along margin of forested region, showing conditions during early stage of drought (July). Arrow indicates direction of current. *a*, pools on surface of which water-striders, *Gerris remigis*, live; *b*, small riffle connecting two pools; water-striders pass from one pool to another by means of such riffles. *c*, dry bed of brook exposed during early and late stages of drought. (Original.)

water by the surrounding trees. There, undoubtedly, is less evaporation in a region of this character than is true in those parts of the brook which are situated in regions lacking both trees and shade and are thus exposed to a high temperature and to the full effects of the summer sun. Very similar facts were observed near Charleston, Illinois, by Adams (1915, pp. 65, 66) in connection with a small stream in a forested area. He makes the following statement:

This small temporary stream in a ravine formed the southern boundary of the area examined. . . . At the season of our examination it was a series of small disconnected pools. . . . On the surface of the pools were numerous specimens of a water-strider, *Gerris remigis*. The forest cover is undoubtedly an important factor in the preservation of such pools, as it controls the evaporating power of the air.

In this connection I wish to state that the water-striders were found in far greater numbers, in the late spring, summer, and early fall, on those portions of the stream that flowed through the forested area. After several years of observation, I have come to the conclusion that the shade and lower temperature are the important factors in influencing the gerrids to remain in such situations. De la Torre Bueno (1911, p. 246) has observed somewhat similar facts, as is indicated in the quotation:

It [*Gerris remigis*] is to be found most frequently on running waters, although it also frequents still, but to a less extent. . . . They congregate in groups in shady, slow-moving parts of streams, at the tree roots projecting from banks into the water, in the shadow of bridges, and in general in almost any place where they have some shelter from the burning rays of the summer sun.

This observer (1917, p. 201), again writing of *Gerris remigis*, states that:

These beasties are common and familiar sights to the lover of the quiet flowing waters running to the distant seas. In these haunts, in some still little bay or moveless backwater, under a bridge, or in the shadow of a tree, or in the cool recesses of an overhanging bank, you may see *remigis* gathered in numbers, rowing silently about. . . . Here they rear large families and spend at ease the sultry dog-days.