facilities of the Station are offered. The location is admirably suited to the purposes in view. Near at hand there is a very great variety of aquatic situations and a rich and varied aquatic fauna. The aquatic insects most abundantly represented are caddice flies, dragon flies, may flies and aquatic Diptera: much work has already been done here on the life histories, habits and ecology of these.

The Station for the present season finds quarters in the Adirondack Fish Hatchery building at Saranac Inn, where an abundance of running water renders possible the rearing of the insects which live in the limpid streams outside. The initial equipment of the station was excellent, and the work has been prosecuted under favorable circumstances. While no instruction is offered here, an effort will be made to report the result of the work in such form as to be available for the use of teachers of natural science generally.

The houseboat 'Megalops' of the Zoological Survey of Minnesota has just been closed and put into winter quarters near the southern boundary of the State. This houseboat was built at Mankato a year ago last spring, for the purpose of investigating the fauna of the Mississippi and Minnesota rivers from Mankato to the southern boundary of the State. Special attention was given to the fishes. The reptiles, amphibia and mollusks also received considerable attention. The smaller forms are to be studied more carefully at stations to be established where the experience of the past two seasons has found the conditions to be most favorable. It is the intention of the Director of the Survey, Professor Nachtrieb, to use the houseboat as headquarters for these investigations near the head of Lake Pepin. Thus far the houseboat has proved to be a most satisfactory and economical institution for such work. The results of the investigations will be published in the Zoological Series of the Reports of the Geological and Natural History Survey of Minnesota.

Some very excellent and satisfactory work has also been done on the birds of Minnesota during the past season. This work is under the immediate direction of Dr. Thomas S. Roberts. The work on the fishes is under the immediate direction of Professor U. O. Cox, of Mankato.

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*THE COLORADO POTATO BEETLE.**

The Colorado potato beetle *Leptinotarca decem-lineata* Say, is one of several closely allied forms that have spread over North America until one or more is found in almost every part of the continent east of the Rocky Mountains, and south of 50 degrees north.

The parent form *L. undecem-lineata*, seems to have originated in the northern part of South America. When the great northward migration came following the retreat of the continental glacier, it is probable that this form also went north, and in its journey encountered the diversified Mexican region, where it split into several racial varieties, each characteristic of a certain climatic area. As the advancing hordes spread northward, three well marked climatic belts were encountered, the Pacific Coast belt of Mexico, and the Mexican table land, and the low Gulf Coast area.

From the Pacific coast strip not much evidence is obtainable as to the presence of these beetles, or the changes produced upon them. On the table-land, however, the form was diminished in size and the pigmented areas are broken up into smaller spots. This form which is called *L. multilineata* grades into *L. undecem-lineata* on the south, and to the northern part of the Mexican plateau passes imperceptibly into *L.*

* Abstract of a paper presented before the Section of Zoology of the American Association.

decem-lineata, the latter form extending northward along the eastern slope of the western highlands, and west of the arid region, spread as far north as the Canadian boundary, and perhaps even farther.

The low humid Gulf coast area also produced a characteristic form, *L. juncta*, which can be traced into the parent form in the lower part of the Mexican region, and which spread up the Mississippi valley into southern Illinois, and along the Gulf, and up the Atlantic coast to Maryland.

Such was the distribution of these beetles until the middle of the nineteenth century. About 1840 the potato began to be cultivated in the cañons of Colorado, and *L. decem-lineata* soon left its old food plant, *Solanum rostratum*, for the new *S. tuberosum*, causing, no doubt a rapid increase in the number of the species. In 1849–50 began the rush to California from Council Bluffs west along the Platte river. There are several accounts extant of the sale of potatoes to emigrants by thrifty Irishmen at Omaha and Council Bluffs, and judging from the haste and carelessness of the emigrants there can be no doubt that potatoes were lost or thrown away along the route. The valley being fairly fertile and moist, these potatoes grew until there was a more or less continuous line of potato plants from Council Bluffs along the Platte river to the cañons of the Colorado region. Along this route *L. decem-lineata* moved eastward so that in 1859, ten years after the '49 rush to California, the beetle is reported as injurious to crops at a point just east of the arid belt and about on the 98th meridian. During the next twenty years it reached the Atlantic coast and covered the entire country between latitudes 37° and 47° north.

Connected with the advance of this form there are several features of general interest. The beetle is double-brooded over the whole area, but it is only the second, or August brood, that flies to any great extent, and, consequently, has pushed into the hitherto unoccupied territory. However, the new areas covered have not been overrun by the unaided flying of the beetles eastward. If no outside agent were at work the beetles would fly west as often as east, so that alone no great advance would be made. It is to be noted that the beetle is not a strong flyer, that it is unable to advance successfully against the wind, and that the direction of its flight is, therefore, controlled largely by the wind. In August and September there are established certain well defined wind tracts, and it is along these that the beetle has advanced with the greatest rapidity, the advance being directly proportional to the wind velocity in any region for a given year. The most rapid advance has been in the track of the prevailing westerlies along the lakes and down the St. Lawrence valley. This point is proved by contrasting the northern advance with the extremely slow advance southward, the latter being due in part to the temperature and moisture conditions, but largely to the variable winds of the southern part of the United States in late summer.

The entire advance of this form east of the arid belt has been independent of lines of travel, there being no evidence of any considerable transportation by human agencies.

At the present time the beetle is found throughout all that portion of North America which lies east of the Rocky Mountains and between latitudes 32° and 55° north. It has been found as far north as 65°, but to my knowledge has not gained a foothold in Labrador or Newfoundland.

It is interesting to note that as *L. decem-lineata* has advanced *L. juncta* has retreated before it. Formerly *juncta* was abundant in southern Illinois, and in Delaware, Maryland and New Jersey, but now it has retreated to the Carolinas on the Atlantic coast and to lower Mississippi on the south.

In a relatively short time this insect has overspread a large area and has encountered various climatic conditions and the question at once arises as to whether these conditions have yet produced any appreciable effects. If, using the Colorado specimens as a type, we compare these quantitatively with specimens from other parts of the United States, the presence of several already well-marked varieties is shown. These are correlated closely with the climatic conditions of the several areas for the months of June, July and August. Without going into details at the present time, I shall simply mention the areas in which these incipient varieties are forming. In the northwest is found the well-marked 'Dakota type' which has spread over the Dakotas, Manitoba and parts of Wisconsin and Nebraska. In the southwest is the 'Texas type,' found in northwest Texas, Arkansas, Kansas and New Mexico. In the region about the Great Lakes there is the 'Lake type,' and in the northeast is found the 'New England type,' which covers New England and Nova Scotia, while in the southeast there are the 'Atlantic coast type,' and the 'Southern Appalachian type.'

These types are not as yet far removed from one another, nor are they easily seen on inspection. However, measurements show changes in dimensions and in coloration in the several areas, so that there can be no doubt that there are slowly forming several races of the beetle in different parts of the United States and Canada as a direct result of the diversity of environment. As 45,000 specimens from different parts of the United States have been studied the error from too few individuals is obliterated.

W. L. Tower.

THE EIGHTH INTERNATIONAL GEOLOGICAL CONGRESS AT PARIS.

The Eighth Congress of Geologists assembled in the *Palais des Congrès*, Thursday, August 16th, at 4 p. m. M. Karpinsky, retiring president, gave the opening address and was followed by the president, M. Albert Gaudry, in a cordial address of welcome. The geologists of the continent were well represented and appeared in full dress with all their medals and decorations. England and America were comparatively inconspicuous both in numbers and in attire.

The registration was 288 upon the second day. All the most distinguished geologists of Europe were in attendance. England sent an exceptionally small number. Among the Americans present were Messrs. Stevenson, Hague, Osborn, Ward, Willis, White, Cross, Scott, Todd, Kunz, Choquette, Adams, Matthew, Ries, Willmott, Rice; the three first named were chosen as vice-presidents. M. Barrois closed the first session with reports upon the program and upon the geological excursions which were arranged in a most admirable manner before, during and after the congress. On the same evening a delightful reception was given by the Geological Society of France in their new quarters, Rue Danton 8. On Friday morning the section of geology and tectonics, presided over by M. Geikie, held its first session, with communications by Geikie, Chamberlin, Joly, Lapparent, Munier-Chalmas and Roland. In the afternoon the section of mineralogy and petrography listened to a report of the petrographical commission by M. Lacroix. In this connection may be mentioned the fact that during the Congress plans for an international petrographical journal were successfully matured.

On Saturday at ten o'clock the Section of Applied Geology met under the direction of M. Schmeisser, and at one o'clock M. Zittel presided over the first session of the Stratigraphy and Paleontology. The important business of this session was the discussion of the final report of the strati-