A PRELIMINARY REPORT ON AN ECOLOGICAL PROBLEM IN THE ILLINOIS RIVER VALLEY.

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The problem is concerned principally with an observation of the effects of alternate draining and flooding on the botanical content of the Illinois River valley. The river in question has suffered a variegated history in the past seventy-five years, in fact, there is probably no other river in this section of the country that has been as much altered and as much removed from its original, or we might say, its primitive condition.

The most outstanding alteration has been due of course to the construction of a series of deep-water-way dams. Between 1877 and 1892 four such dams have been completed; one at Kampsville, 45 miles from the river's mouth, one at La Grange, one at Copperas Creek, and one at Henry. In 1871 the Illinois Michigan Canal, and in 1900 the Chicago-Drainage Canal were completed and the diversion of Lake Michigan water was initiated. The presence of these dams and the addition of the lake waters materially increased the average height of the river and in the early nineties thousands of acres of the lower river bottom land were flooded. This motivated and occasioned the construction of a series of reclamation projects and rapid construction of levees began in 1892-1900. This is especially true of the area extending from Kampsville northward to Pekin and later to some extent in the neighborhood of Hennepin. Some areas were pumped out and drained a few years after flooding, some not until they had been submerged for periods of time varying from six to twenty years and in fact some are now in the process of reclamation. In many cases it is not practical to reclaim the drowned land and these tracts still lie under water just as they were twenty-five years ago.

It is obvious that the field presents a wealth of material for plant ecological research. Within a few square miles there are areas in which comparative studies can be made of a wide range of ecological conditions; from the primitive, unmolested condition, flooded and unflooded, through all

ages of reclaimed and cultivated land from twenty-five years to that very recently reclaimed. Fortunately for the investigator, but less happily for the valley land owners further field for research was made possible by the high waters of last Fall which broke the levees and submerged the enclosed area. In many cases there will be no attempt made to repair the damage, due to lack of money, and the once cultivated land will return to its condition before reclamation.

To facilitate study the investigator decided that a motor boat large enough to live in would be expedient. Such a boat was constructed in Carlinville, Illinois, and was trekked overland on a large hayrack, not with oxen, but with a farm tractor. Since the cruiser weighs almost three tons and is twenty-three feet in length, some rather interesting problems were encountered in its transportation and launching, but this was accomplished on June 25, 1927. The boat is fully equipt for cooking, eating, and sleeping, and there is sufficient room for research materials, and facilities are present for microscopic work, photographic developing and printing. A small auxiliary boat is carried for use in shallow water.

During the last summer several minor objectives were attained. First, a preliminary superficial survey was made of the entire field to gain an idea of the general set-up of existing conditions. This included a trip from a point 30 miles from the mouth of the river to a point four miles above Starved Rock which consumed approximately a month. Secondly, a detailed survey was made of the Kampsville area to secure specific information pertinent to the problem. This area was worked thoroughly as far as time permitted because it presents a representative and inclusive picture of the entire field. Third, a preliminary survey was made to determine the extent of water pollution as was evidenced by the presence or absence of aquatic plants. It was the hope of the investigator to find places in the river where plant life was distinctly and obviously impossible due to pollution from cities. Journeying northward from Kampsville there was no observed diminution in the shallow water aquatics until a point eight miles below Peoria was reached where the amount of plant life in the water fell off rapidly to practically nothing immediately below Pe-

oria. Above Peoria the unpolluted-water-condition existed and persisted up to Hall's Landing Light which is between Lacon and Hennepin and about 124 miles below Chicago: the principal source of pollution. This was practically the northern limit of aquatic plants other than algae; (no attempt was made to make a thorough examination of the Thallophytic content of the river). Although no particular effort was directed in this direction, algae were certainly not conspicuous except for one species of Spirogyra which was found sparingly as far north as Starved Rock.

The point of total absence of aquatic plants was farther north than the investigator anticipated. This might be partially explained by the higher level of the river and of the greater dilution of the sewage due to the rains of August. The plants used as indicators of the condition of the water were as follows: *Potomogetans,* Polygonum, Sedges, Sagittaria, *Lemna,* Spirodela, *Ceratophyllum,* Hibiscus, *Vallisneria, Elodea.*

It is the intention of the investigator to spend at least two more summers in pursuit of the problem.