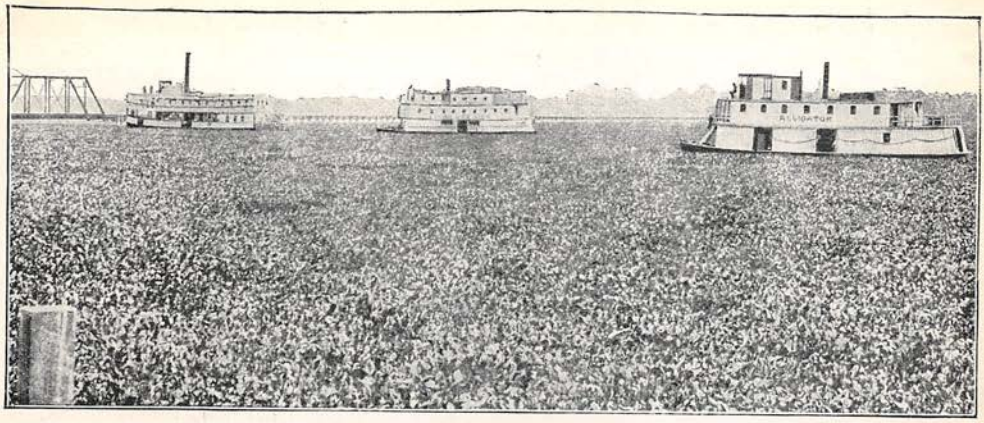


THREE STEAMERS BLOCKED BY HYACINTHS IN THE ST. JOHN'S RIVER.

A RIVER CHOKED WITH HYACINTHS.

By Walter Akroydd.

Illustrated from photos by A. P. Lewis, *Adrian, U.S.A.*

AGRICULTURISTS in this country suffer considerable inconvenience from various natural pests, but it is doubtful whether any of their grievances can compare in magnitude with that which at the present moment is occupying the attention of residents on the banks of the St. John's River and its tributaries, in Florida. For several years they have been strenuously battling against the plague of the hyacinth plant, which has invaded their waterways, seriously hindering navigation, reducing the fishing and lumbering industries to a comparative standstill, and inflicting severe pecuniary loss upon those who depend on the last two occupations for their livelihood. Indeed, the plague has reached a stage so serious that the War Department of the United States recently investigated the matter, and bills were presented to Congress formulating suggestions for remedying the evil. So far, however, the plants have triumphed.

This curious nuisance possesses many peculiar characteristics, the most salient of which is the fact that this particular hyacinth will only thrive in water or in places where the soil is very marshy. As a rule, however, it simply floats upon the surface of the water, without any attachment whatever of its roots to the soil, and under these conditions it flourishes much the more luxuriantly. Its prolific growth is, indeed, a matter for marvel, and has caused much uneasiness among the inhabitants of the district, for the streams, rivers, creeks, and ponds are covered with dense masses of hyacinth plants, packed so closely together, in many cases, as to render the water quite invisible.

As will be seen from one of our illustrations, the flower is not of that pretty bell-shape which characterises the bloom of the hyacinth or bluebell as we know them in Europe, nor is the range of colours so varied, the flowers being invariably either of a light blue or violet hue. Lack of variety in tint is compensated by the profusion of bloom which distinguishes the plant. In springtime, when the flowers are in full bloom, a large expanse of these delicately tinted blossoms provides a very striking picture. The leaves grow to a considerable size, a bunch of stems frequently averaging from one to two feet in height. The roots also grow, in many cases, to a length of three feet, and exceptional growths measuring eight feet from the top of the flower to the tip of the longest tendril of the root are occasionally found.

It is not definitely known when this plant first made its appearance in the St. John's River, but it would seem that a pond at Edgewater, four miles above the town of Palatka, was first infested with it. In 1890 this sheet of water was cleaned out and the plants heedlessly thrown into the river. The sluggish waters of the latter appear to have been quite as congenial to the plants as that of the pond from which they had been so

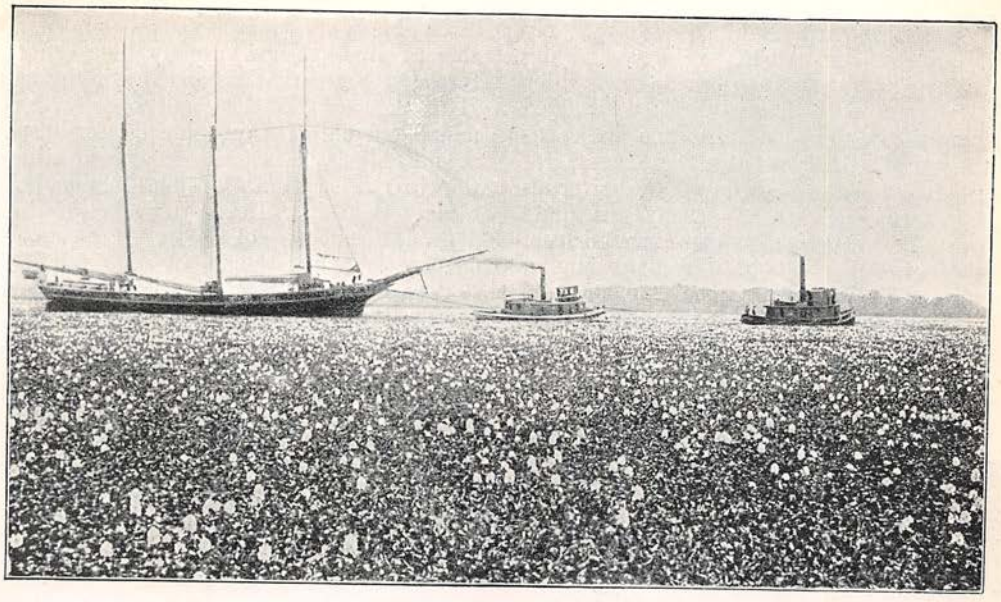
summarily removed. At any rate, they grew luxuriantly and produced heavy clusters of bloom, which rendered the river quite beautiful at the spot. Settlers and travellers to the neighbourhood were much attracted by the pretty sight, and, ignorant of the multiplying propensities of the plant, carried away specimens to grow in the river nearer home to vary the beauty of its existing

THE WATER-HYACINTH PLANT IN BLOOM.

vegetation. Four years later the fishermen in the river took alarm at the ubiquity of the hyacinth, when they began to suffer inconvenience through the frequent entanglement of the weed with their nets. Steamboats also had their progress retarded by huge clumps of hyacinths sufficient to bring vessels to a standstill when they came in contact with them.

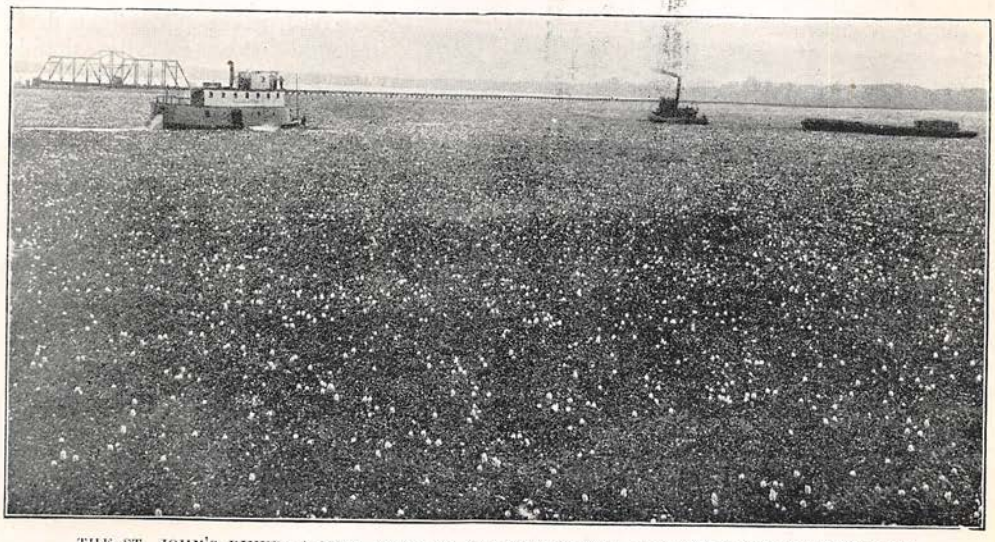
At the present moment the hyacinth infests the St. John's River for a distance of over 200 miles, the banks on either side of the waterway being fringed with a border of the plant varying from twenty-five to two hundred feet in width, while it is estimated that the total amount of coast-line affected is considerably over 1,000 miles in extent. The main reason why the hyacinth has obtained such a firm hold on the St. John's River lies in the sluggishness of the stream, which runs at the rate of only about one and a half miles an hour. In the tributaries of this river, where the current travels at about four miles per hour, the plant has no chance of obtaining a hold, the swift current tearing it away from the banks and carrying it into the St. John's River. So far other rivers have been kept free from the nuisance, but as there is always a possibility of its being introduced into other waters by uninquiring admirers of its beauty, Mr. Herbert J. Webber, an assistant in the Division of Vegetable Physiology and Pathology of the United States Department of Agriculture, who was instructed by that Board to investigate the plague, has wisely suggested that the State of Florida should enact laws forbidding the introduction of the water-hyacinth into lakes and ponds having an outlet, for once the plant obtains a footing it can never be entirely eradicated.

Those settlers who encouraged the cultivation of the water-hyacinth ten years ago are now reaping the fruits of their action. As may be seen from our illustrations, the river at the part affected is covered with a dense mat of the plants stretching from one side to the other. At this spot the river is exactly one mile wide, so that a very comprehensive idea of the supremacy of the plant may be gathered. Small boats with screw-propellers find it impossible to make headway, as the plants become entangled in the screws so that they cannot revolve. Side paddle-wheel steamers fare better, but are often brought to a complete standstill. In this case the difficulty is that the plants collect between the wheel and the bulkheads, making a thick,



TWO TUG-BOATS TOWING VESSEL THROUGH THE WATER-HYACINTHS.

impenetrable blanket, so that it is often absolutely impossible to reverse the engines. On one occasion no less than three excursion steamers were blocked by the plants, unable to move one way or the other. Steamers with low-pressure engines have their injection pipes choked, so that sufficient water cannot be obtained for the condensers. Occasionally this evil is remedied by blowing a powerful jet of steam through the injection pipes, but this is an extremely hazardous course, for injection pipes are not constructed for the purpose of withstanding heavy pressure applied from within. And the navigator's trouble is still further increased by the presence of pieces of wood and other *débris* which lie concealed among the plants and are not revealed until the vessel crashes into them. In fact, so great has the menace to navigation become that, unless some very drastic method is resorted to for the removal of the hyacinths, the river traffic to and from Palatka will cease, and this would be a severe blow to the town, as, at



THE ST. JOHN'S RIVER, A MILE WIDE AT PALATKA BRIDGE, BUT COMPLETELY COVERED BY THE WATER-HYACINTH.

the present moment, eight large steamers ply regularly up and down the river, carrying mails, freight, and passengers.

But not only has navigation suffered severely from the nuisance. The timber industry has also been greatly reduced, for logs cannot be rafted down the river as they were when the waterway was quite clear. The amount of timber exported from Palatka is about 55,000,000 feet per annum, representing a value of some £20,000. It is estimated that from the difficulty in rafting the logs the timber merchants suffer an approximate loss of £6,000 every year.

Fishermen, too, have been severely handicapped in following their vocation, on account

A FLORIDA CREEK COVERED WITH WATER-HYACINTHS.

of their inability to manipulate their nets among the plants. Occasionally open spaces occur, so that the nets may be lowered; but this is a risky undertaking, as the nets are caught up by the drifting hyacinths and carried away. Something like five hundred men are engaged in this industry upon the banks of the St. John's River, and the outlook for them is by no means prosperous. One large employer of fishing labour reckons that he has experienced a loss of about £200 a year through damage to nets, loss of time, and depreciation in the results of the catches.

Another and much graver danger is that the hyacinths impede the flow of the water. When heavy rainfalls or floods occur the small islands of plants are caught up by the current and carried rapidly along until further progress is barred by a bridge. Here the weed collects and forms a formidable dam. The pressure of the water accordingly becomes tremendous, and either the barrier succumbs or the surrounding country is flooded. In the year 1894, during a flood, the plants collected in this manner against the foundations of a railway bridge that spanned the river at Rice Creek, and some sixty-five feet of the trestles were destroyed, while at another bridge men had to be specially employed to push the plants through, so that the waters should be allowed to continue their natural course and not desolate the neighbouring country.

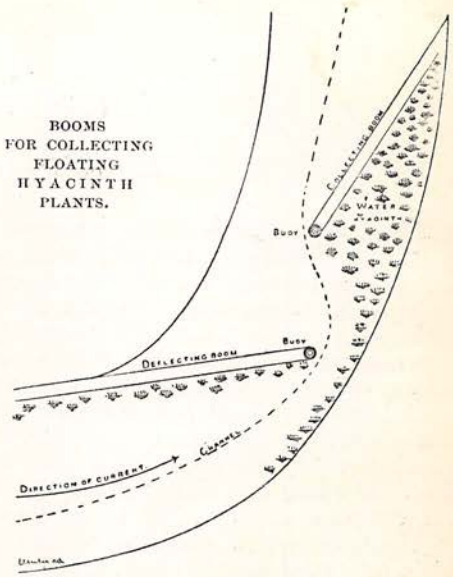
Various schemes have been advanced for exterminating the plant, but it is generally accepted that its complete banishment is absolutely impossible, owing to the firm footing which it has obtained, so that the only hope now is to hold it well under control. Strange to say, cattle thrive upon it wonderfully, and hundreds of animals may be seen along the shores of the St. John's River in winter grazing on the weed with great relish. But it is doubtful whether this utilisation of the water-hyacinth will be sufficiently extensive to keep it in check, consequently more formidable weapons of war have been suggested. The assistant engineer of the War Department recommends the construction of a light draft stern-wheel-steamer, having a double bow or outrigger which, on being forced into a mass of plants, would cause them to gather toward the middle of the boat, where an inclined carrier would pick them up and deposit them in front of rollers driven by machinery. These rollers, in turn, would force the water from them, thus greatly reducing their bulk. The crushed material could then be delivered to barges alongside, to be deposited where it could not cause any further injury.

This process, however, would be very expensive, for the steamers would have to be retained in constant employment in order to keep the waterway clear for navigation. Absolute extirpation, though very much desired, is regarded as completely out of the question, since that would mean the unending task of destroying every single plant, root, and seed from which a new growth could

possibly spring. The only expedient, therefore, to which resort can be made is to keep the surface of the river comparatively free from the weed by means of these steamers. But even this drastic method is fraught with difficulty, as the crushing machinery is liable to be constantly injured and made of no effect by the logs, driftwood, and general rubbish brought down by the stream and strongly entangled in the luxuriant growth of the objectionable plant.

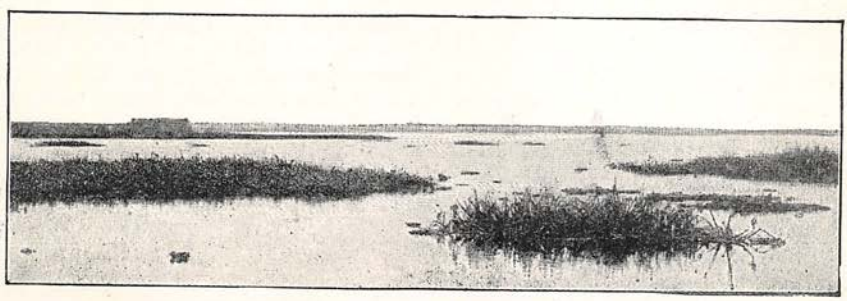
Another suggestion is the arrangement of two booms, as shown in our illustration. The plants travelling with the current strike the deflecting boom and round the buoy at the end. As the course of the current has been diverted by the collecting boom, the plants are arrested by the latter and brought to a standstill. They can then be removed from the river, to be burned or otherwise destroyed. Strange to say, the water-hyacinth is killed directly it comes into contact with salt water or other impurities, and it has been suggested that destructive substances should be placed in the water. So far, however, none of these schemes have been systematically carried into effect.

There is, however, another expedient by which this pest might be kept in check—the introduction and spread of its natural enemies. After prolonged, careful search Mr. Webber has discovered a disease which he considers would do widespread damage among the hyacinth plants. This is a parasite fungus which attacks the leaves in spots and in time completely kills it. It is interesting to recall the fact that a somewhat similar evil—the water weed—infested several of the rivers and canals of this country many years ago to such an extent that navigation was seriously threatened. Although botanical experts devoted their



BOOMS FOR COLLECTING FLOATING HYACINTH PLANTS.

energies to the discovery of some disease that would have fatal effect upon the weed, all their attempts for some time proved unavailing. At last, however, they were spared further efforts in this direction, for the plant suddenly began to decrease in profusion, and in a short while disappeared altogether. This sudden and complete extinction of the water weed was attributed to the presence of natural enemies in the water in which the plant had previously flourished. Mr. Webber, therefore, urges that extensive search should be made in the natural haunts of this leaf-spotting fungus for the purpose of introducing it among the hyacinths in large quantities. If it does not entirely kill off the plants, it will at any rate serve to keep their growth in check.



DRIFTING ISLANDS OF HYACINTHS.