THE RUSSIAN THISTLE—A SCOURGE TO AGRICULTURE.

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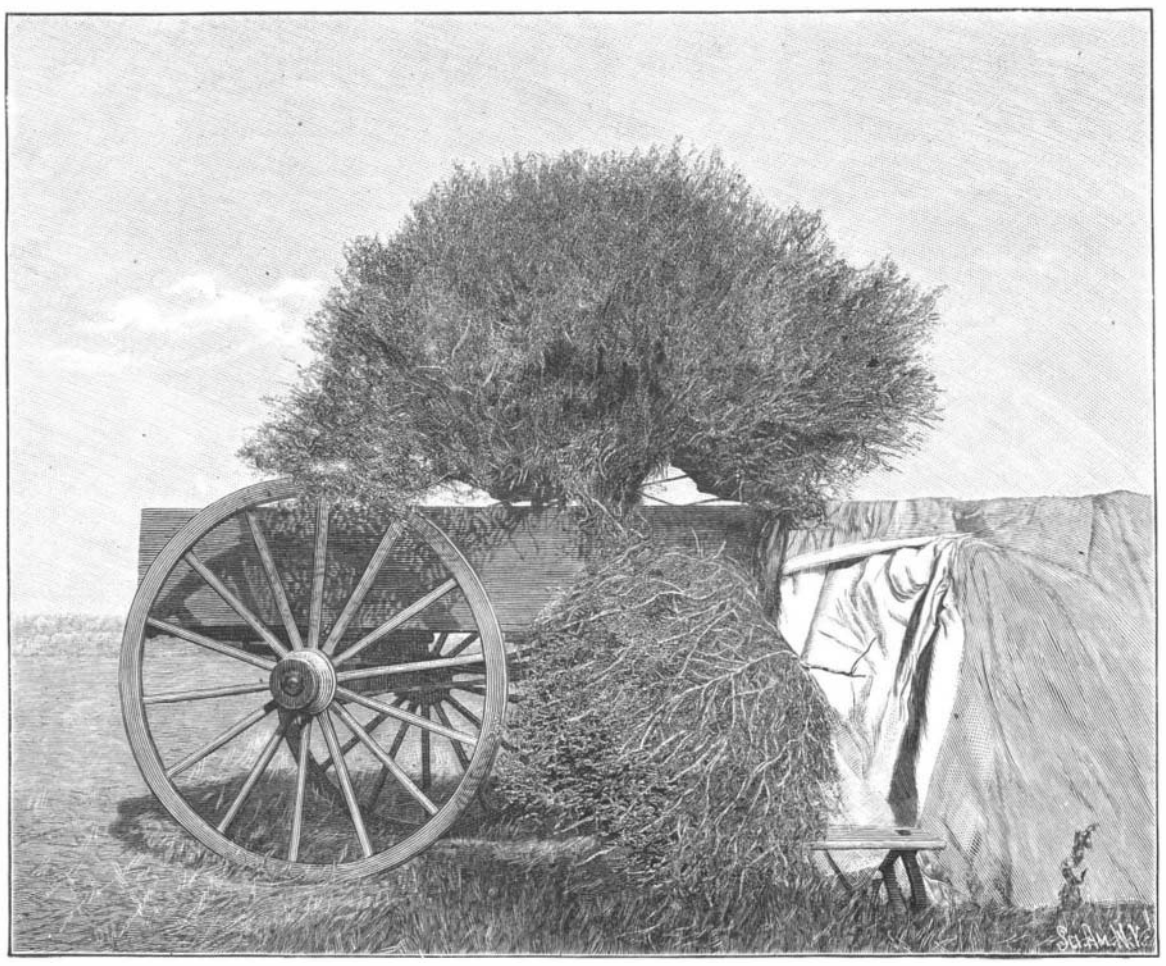
In 1891 the Russian thistle was first reported to the Department of Agriculture. Described as a species of cactus, scientific investigation showed that it was neither a thistle nor a cactus, but a variety of common saltwort (Salsola kali tragus), with the habits of the tumbleweed of the American plains.

This weed, which has become the worst scourge that has ever afflicted agriculture in the prairie States, was introduced into the United States in flaxseed brought from Russia and sown in Bonhomme County, South Dakota. In 1892 it had caused damage amounting to several millions of dollars.

Reports to the department in November, 1893, showed all the counties of South Dakota, east of the Missouri River, and twenty counties in North Dakota infested by the thistle. Its presence was also reported from four places west of the Missouri, two counties in Minnesota, three in Iowa and four in Nebraska. The seed was scattered from Denver to Madison, Wis., and from the Red River of the North into Kansas on the south. The dry season of 1894 leaves a territory of 200,000 square miles thoroughly infested by this scourge and an area of 100.000 has felt its presence as a destructive blight upon all grain crops.

Owing to the drought over this grain-growing region, no correct estimate of actual damage by Russian thistle can be formed. In the Dakotas thousands of fields of grain and flax that would have yielded a partial crop were abandoned. No harvester or thrasher has been found to handle a crop infested by this pest. It clogs the machinery, fouls the grain, and renders fall plowing impossible. The land must first be cleared of thistles before it can be plowed. If thistles are plowed under, even when partially matured, they will spring up more thickly than ever through six inches of soil.

The treeless, wind-swept prairie States are the home of the thistle. It is distributed by the wind, which rolls the full grown ball-shaped plants, from one to six feet in diameter and each holding from 20,000 to 200,000 seeds. We give a photographic illustration showing two of these balls. Like the tumbleweed, it bounds over the prairies with a movement resembling that of the jack rabbit, traveling hundreds of miles, leaping over or breaking down fences, carrying fire before the wind, or endangering property by accumulating in heaps of inflammable material. Horses or cattle cannot be driven across a field rankly grown up to thistles. No animal will eat it after its myriad of sharp spikes appear.



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Grain elevators closed, railroads without traffic, farmers without crops, settlers leaving large areas of otherwise rich farming lands, vast regions without a furrow turned where in other seasons all the grain lands were plowed for next year's crop—these are the signs on every hand of the devastation wrought by the Russian thistle in the Dakotas. At present it is impossible to predict the future ravages of a scourge that has caused damage this year running into the scores of millions and that may drive the grain farmer out of all the prairie States.

The first effects of the thistle will be to drive farmers in the infested region to tilling more cultivated crops. The grain acreage in this region will be reduced from fifty to seventy-five per cent. The granger railroads will show enormous falling off in grain freight receipts for the last quarter of 1894, as about three elevators out of four are closed for want of crops. An immense emigration is taking place out of the regions mentioned.

As the result of an official investigation of the condition of the French navy, it has been found that, out of forty torpedo boats in the service, only twenty-five were fit for service. Most of these boats were rendered unsafe by the corrosion of their hull plates and many defects were discovered in their general arrangement. This state of affairs is very unsatisfactory to the French government.

A Year's Naval Progress.

According to the annual report of the Secretary of the Navy, the interest in naval affairs has been greatly quickened by the war between China and Japan. The recent Brazilian and Bluefields incidents have shown that the respect due to the United States as a nation is largely dependent upon the presence of American war ships in foreign ports. The estimates for the current fiscal year were $27,885,914 and the actual appropriations amounted to $25,366,826. The estimates for the year beginning July 1, 1895, are $30,952,020.

The two types of vessels most urgently needed are battle ships and torpedo boats. The secretary recommends the construction of three battle ships of 10,000 tons displacement, the cost not to exceed $4,000,000 each, and twelve torpedo boats varying from 100 to 300 tons displacement, the average cost to be $170,000. The value of the battle ship in the warfare of the future is generally conceded, and Captain Mahan has pithily expressed the whole matter when he said that battle ships were to a navy "what infantry is to an army." In conflicts on land the infantry, which must always form the backbone of an army, is supported by cavalry and artillery; so the fast cruisers and the legion of smaller fry—the gunboats, the torpedo catchers, torpedo and dispatch boats—should rally round and support the battle ship, which must be regarded as the main source of reliance. We have all, perhaps, in the past pinned our faith too much to the cruiser. We must not forget that the crippling of the merchant marine of an enemy is not in itself sufficient to decide a war. The Alabama and other cruisers of the Confederacy effected an enormous pecuniary loss, but did not influence the result of the war. From 1792 to 1812 the French cruisers and privateers preyed on British commerce, but it flourished notwithstanding. Captain Mahan says:

"Military superiority depends upon heavy blows struck at the enemy's organized fighting force. Such blows must be struck by massed forces, the units of which should be individually powerful for offense and defense, because so only can they be brought under the unity of command essential to success. The same aggregate of force in two or three different vessels will rarely be equal to that concentrated in one, because of the difficulty of insuring mutual support. This means heavy vessels or battle ships."

They may also be viewed from the standpoint of economy, for they will remain for a far longer time without being outclassed than a cruiser. The limit in the size of guns appears to have been reached, and it is doubtful if any material change will be made in calibers.

The need for additional torpedo boats is even more apparent. There is something splendid in the idea that an enormous battle ship, bristling with the finest cannon and provided with the thickest armor, can be conquered by a little vessel of 150 tons burden. It is the old story of David and Goliath. Notwithstanding all of the defenses against torpedoes, such as nets and rapid-fire guns, a properly fired torpedo from a vessel costing $100,000 will destroy a great battle ship worth $4,000,000. The sinking of the Aquidaban furnished a lesson in the value of the torpedo in modern warfare. With the three torpedo boats about to be built, our navy will have six in all. France possesses 214 torpedo boats and 41 building; England has 175 and 64 building; and Russia 163 with 14 building. Such figures show how far behind other nations our navy really is. It is chiefly the fault of Congress in making such inadequate appropriations.

During the present year the Naval Observatory has been placed under the charge of Prof. Harkness, a civilian.

The Submarine Detector.

This instrument and its use are thus described in the London Electrical Review:

The apparatus is based on the principle of Prof. Hughes' induction balance, and it consists simply of an electrical arrangement contained in a small mahogany box, which is carried on board the searching vessel, and a sinker, which is trailed along the bottom. The sinker also contains an electrical arrangement and is connected with that in the box by a light electrical cable of any required length. The apparatus includes a small battery and an automatic contact breaker, which opens and closes the battery circuit at short intervals. The battery circuit includes two primary coils, one in the box and the other in the sinker. Each primary coil has its secondary coil, and both the primaries and secondaries are respectively connected up by conductors, which are inclosed in the suspending cable. In the searching vessel there is a telephone, which is included in the secondary circuit. The apparatus is adjusted so that under ordinary circumstances there is silence in the telephone. When, however, the sinker approaches a mass of metal the balance is upset, and sounds become audible in the telephone, while these are reduced in intensity as the sinker recedes from the metallic object. Three hundred feet of electrical cable were employed with the detector in searching for the Rusalka, and the depths searched varied from 15 to 50 fathoms. The search was continued for several weeks, and the exact position of the foundered vessel was at length placed beyond all question, as every time the searching steamer passed over a given spot the electric indicator of the detector sounded loudly, thus affording evidence that a large mass of metal was submerged below. After the vessel had been located the divers descended and examined her, the result of their examination being, so far as is at present known, that she had foundered through serious damage to her stern.

Fire From Steam Pipes.

The Southern Lumberman in a recent issue gives the following solution of fire from steam pipes: Neither ordinary live steam nor "superheated" steam will heat a pipe thick and strong enough to convey it to a degree sufficient to produce a fire on wood, however dry. It will not even set charcoal aglow or in a blaze. But dry charcoal, when the heat is removed from it, being nearly pure carbon, will absorb oxygen from the air under favorable conditions, so rapidly as to produce active combustion—that is, a glow or a blaze. The process of the origin of a fire from a steam pipe is: The heat from a steam pipe will, in the course of time, char, or, as the chemists say, carbonize, wood in contact or close to it. When this charring process extends to any depth in the wood it presents a surface full of fissures and cracks, thus exposing a large section to the action of the air. This process of charring drives the oxygen out of the charred portion and keeps it out while the heat is kept up. When the heat is removed the charcoal reabsorbs oxygen from the air, and if this action is rapid enough in a dry atmosphere, combustion is the result. This explains why fires in steam plants and buildings heated by steam, that originate from steam pipes, always occur after the pipes have cooled—generally during the night. The idea of "superheated" steam in a cold pipe is the most absurd one we ever "ran up against."