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The Editor is always glad to receive for exa ination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

AN UNPARALLELED VICTORY.

When Japan boldly threw down the gauntlet to Russia, the world wondered at her daring; Russia was the "Colossus of the North"; Japan, the youngest of the nations to be born into our modern civilization, had not yet reached the dignity even of comparison with the mighty Muscovite empire. By sea and by land Russia overtopped Japan on every point of comparison. Hers was the third most powerful navy of the world, with half a million tons of fighting ships to command, and the unlimited resources of the empire to back it. Japan's little navy, on the other hand, had but just graduated into recognition. Although the foretaste which she had given of her quality in the Chinese war led us to expect that Japan would make a creditable effort, the best that we expected from her was that she would ultimately go down to defeat, everything lost but the honor of having fought a brave but hopeless campaign.

So the world thought and spoke, as the curtain was being rung up for the opening scene of the naval war. To-day, after eighteen months of the fiercest and most bloody fighting of modern times, the curtain has been run down upon the final act. In that brief interval, we have seen the third greatest navy of the world literally and absolutely swept out of existence, and this by a modest little navy that finds itself at the close of the war as strong in material and stronger in efficiency than at its beginning.

If Japan had won out with the loss of half her fleets, and the battered remnants had limped home in a condition of absolute exhaustion, it would have been a feat equaled but not surpassed in naval history.

But that she should have absolutely annihilated, in pitched battles upon the high seas, two successive fleets of the enemy, and have sunk, driven ashore, or otherwise put out of action fourteen battleships, twelve other armored vessels, and a dozen protected cruisers, without any diminution of her own fighting strength, is a feat for which naval history can find no parallel. That her navy is intact cannot be disputed; for her captures and new construction during the war about offset her losses.

Wherein are we to look for an explanation? Certainly not to any disparity in the materials of war, for the ships, engines, guns, and armor of the Russian navy were the best that the leading shipyards and gun factories of Europe and America could turn out. Nor was the distance of the seat of war from Russia's home ports so serious a handicap as might be supposed; for at no time did Japan make any serious effort to prevent the sending of re-enforcements and supplies. In the case of the Baltic fleet, she evidently encouraged its advance, feeling assured that every ship that entered the immediate zone of war was one ship lost to Russia.

Nor can the result be set down to cowardice. The Russian is no coward. He gives place to none in his ability to fight a losing battle to the bitter end. This was abundantly proved in the battle of the Sea of Japan; for the stories of the eye witnesses on both sides agree that the Russians fought with the grim energy of despair.

The explanation of the result is to be found first and last in the Japanese people themselves—in certain excellent traits of their character, many of which are due to a system of ethics that is older than our western civilization. Among these may be mentioned: Intense patriotism; self denial; scrupulous honor in all matters affecting the welfare of the State; a keen sense of duty; strict discipline; unquestioning obedience to authority; absolute unity of purpose; a firm belief in the destiny of their race; patience and endurance; an absence of self consciousness and posing, that may well put our "white" civilization to the blush; a close attention to detail; and lastly, a combination of great prudence and forethought with a marked ability to adapt themselves quickly to the circumstances of the hour.

It was a foregone conclusion that a people such as this, being naturally born to a seafaring life, would render a splendid account of themselves in the stress of a naval war. The ships were maintained in a high state of efficiency, and they were perfectly familiar to officers and men; the fleets were accustomed to maneuver in fighting formations; the marksmanship, judging from this last fight, was excellent; and lastly, the whole series of operations was controlled by an admiral who must be admitted to possess the highest qualities of his profession in the highest degree.

ELECTRICITY AS A STIMULANT TO PLANT GROWTH.

The flora of the north polar region is remarkable for rapid growth, fertility, and brilliancy of coloring, phenomena which seem incompatible with the climate. For the Arctic summer, though nightless, is very short, the sun is low, and its rays are often intercepted by fog and clouds, so that it cannot furnish an amount of light and heat favorable to very rapid growth.

The investigations of Prof. Lemstrom, of Helsingfors, and others, tend to show that electricity exerts a great influence on the growth of plants, and this view is confirmed by the luxuriant vegetation of the zone of action of that violent electrical manifestation, the aurora borealis. Furthermore, a close connection has been found, in Finland, between fruitfulness and frequency of auroras. Finally, Lemstrom was led to attribute to the sharp points of plants, such as the beard of grains, the function of "lightning rods," which collect atmospheric electricity and facilitate the exchange of the charges of the air and the ground.

Thereupon he proceeded to submit the suspected effect of electricity upon vegetable growth to the test of experiment, beginning in 1885 with a number of flower pots containing similar soil and seed. Some of the pots were subjected to the action of an influence or inductive statical electric machine, one pole of which was connected with the soil in the pot, and the other with a wire netting stretched over it. The other pots were left to nature. The electric machine was driven several hours daily. Within a week the electrified plants showed a more vigorous growth than the others, and in eight weeks the disparity in weight, of grain and straw alike, amounted to forty per cent. This favorable result suggested a field experiment with barley, in which an increase of 37 per cent was obtained by electrification. In the following year the experiments were extended to various plants. The results were contradictory in some respects, and showed that the advantage derivable from electroculture depends also upon other factors, such as temperature, moisture of air and soil, and the natural fertility and the manuring of the latter. The supply of water proved to be of especial importance. Extensive experiments with potatoes, carrots, and celery showed increases in crop of from 30 to 70 per cent. Potted strawberry plants, in the greenhouse, produced ripe fruit, under electrical influence, in half the usual time. Small differences, possibly due to extraneous causes, appeared when the direction of the current was reversed. Other field experiments gave increases of 45, 55, occasionally 85 per cent for grain, and 95 per cent for raspberries, while cabbage, tobacco, flax, turnips, and peas grew better without electrification than with it.

Then Lemstrom, in order to test the effect of climate on electro-culture, transferred his experiments from Finland to Burgundy, where he found his earlier observations confirmed, particularly in regard to the great influence of irrigation. He concluded that the more vigorous growth induced by electricity must be sustained by a rapid ingestion of food, that is to say—a rich soil being presupposed—by an abundant supply of water. With copious watering peas, which in the earlier experiments had reacted unfavorably to electrification, now showed a difference of 75 per cent in favor of the electrified plants, carrots gave an increase of 125 per cent, and sugar beets augmented their percentage of sugar by 15 per cent. The experiments in Burgundy also confirmed the importance of the character of the soil. The richer the soil, the greater is the advantage of electrical culture, which is quite useless in very poor ground. Hence, the Sahara cannot be converted into a garden by electro-culture.

In 1888 Lemstrom's experiments ceased for a time, but other investigators attacked the problem from a different side, endeavoring to affect by electrification, not the growing plant, but the seed. The Russian botanist, Spechniew, submitted grain to electrical action, and thought that it sprouted earlier and more vigorously than grain not so treated. Pautens, who in 1894 repeated Spechniew's experiments on a larger scale, came to the conclusion that electricity had no effect on dry seeds, but that it promised excellent results when applied in connection with moisture—which in itself promotes germination. The same conclusion was reached by Kermey, who in 1897 electrified grain strewn on moist sand in a glass cylinder through which it could be observed. The metal top and bottom of the cylinder were connected to the poles of a galvanic battery.

But while electrical treatment of dry grain is comparatively simple and cheap, electrification during germination is even more difficult and costly than the application of electroculture to the growing plant. Grandeau and Leclerq, therefore, returned to the latter method, but, instead of using an artificial source, they studied the effect of atmospheric electricity by covering part of a field with wire netting. The uncovered plants showed an increase of 50 or 60 per cent in growth and fruitfulness over the plants which were shielded by the netting from natural electrical action.

In 1898 Lemstrom resumed his experiments with the aid of an improved electrical machine and distributing apparatus. Again he observed remarkable increases of crop—with tobacco 40, potatoes 50, peas 56, sugar beets 40, carrots 37, grain 25 to 30 per cent. Spechniew and Bertholon obtained similar results.

As it is not practicable to cover fields with electrified nets, and as the influence of atmospheric electricity had been proved, Lagrange and Paulins have recently sought to increase the supply of the latter by setting among the plants galvanized iron rods to serve as conductors, and have thus obtained great increase in crops. This, as well as other methods of electroculture, is probably too expensive to be applied to ordinary field crops.

But in the cultivation of fruits and vegetables, particularly under glass, the economic conditions are very different. For, as electroculture promises not only greater, but also earlier crops, which command high prices, its introduction would secure to local gardeners large sums which now go to the South and would, at the same time, benefit consumers by reducing prices somewhat, though leaving them still remunerative. Floriculture offers another promising field for the application of electrical methods.

All this, however, belongs to the future. Much study and experiment and probably many failures must precede the general introduction of electroculture, though the results already obtained are certainly promising.

In what way is the growth of plants affected by electricity? Plants transform the energy of the sun's rays into chemical energy. Though the heat produced by the electric current may have some direct effect, especially in germination, the electrical energy supplied cannot, in general, replace or even greatly reinforce the energy of sunshine. It is rather to be regarded as a stimulus to metabolism and all the vital processes. One of these is the capillary elevation of water, which is promoted by a positive electric current flowing upward. This is one possible explanation of the promotion of growth by electricity, and though in some cases the best effect is obtained by directing the positive current downward, or in the opposite direction to the assumed principal flow of sap, these exceptions may mean that more food is supplied by the leaves than is commonly supposed. Another possibility is an increase in activity in both leaves and roots. The electrical influence on the flow of sap, however, appears to be proved by the fact that electroculture is beneficial only in connection with an abundant supply of water. According to Kermey, there is also an electrolysis of water within the plant, and further experiment may prove the existence of other electrical actions.

SOMETHING NEW ABOUT THE VOCAL MECHANISM.

To a recent issue of the British Medical Journal (No. 2308) Major R. F. E. Austin, of Imtarfa, Malta, contributed a very interesting paper on commonly overlooked factors in vocal mechanism, in which he asserts that the universal idea that all of us naturally possess either a good, bad, or indifferent voice is wrong, and contends that Nature is directly responsible for one, and one only, of these conditions and that the others must be attributed to man's unconscious departure from Nature's laws. It will be news to many that by far the greater number of us do not possess full control of the adductor muscles of the cords, and are therefore unable to place and keep the cords in the most appropriate position quickly. The author states that it is surprising what a number of professional voice users, as well as amateurs, fail in this respect. According to his thinking, the majority of voices are lost, not from overwork, but as a result of improper emission.

Major Austin contends that, in order to obtain quickly the thorough control of any muscles or set of muscles, they should be developed by brisk movements, which fully contract them. In the case of the adductor muscles of the cords, this can only be done by using the voice in a most inartistic although physiological manner. That is to say, words should be sung or spoken quickly in acute penetrating tones ("pat-a-wat-quack" being given as an excellent phrase for the purpose). The voice should be extended up and down, note by note, in this manner until the limits of the compass are reached. Classification into soprano, baritone, etc., should not be attempted before this has been done.

When the singer is able to obtain acute metallic