Correspondence.

Electrical Destruction of Grass.

To the Editor of the SCIENTIFIC AMERICAN:

Your letter of June 12, inclosing a request from Mr. Wm. E. W. Yerby, Greensboro, Alabama, for information as to the feasibility of killing nut grass by electricity, has been received and referred to the Division of Botany.

Nut grass could doubtless be killed by a strong current of electricity, but it is very doubtful whether this could be economically applied in fields away from established electric light or trolley lines.

In 1895, Mr. Charles G. Armstrong, of Chicago, conducted some experiments in weed killing by electricity on the Yazoo Division of the Illinois Central Railroad. The results of the experiments were said to be successful, but I have been unable to learn that this method has been adopted elsewhere or continued there. The apparatus used for killing the weeds along the railroad track consisted of an alternating generator producing a current of 2,000 volts pressure, a transformer by means of which the current was stepped up to from 6,000 to 24,000 volts, and two brushes for applying the current to the weeds as the car passed slowly along the track.

An experiment on a small scale was also tried by Mr. Armstrong in killing weeds along a wagon road. The transformer and brush were placed in a hand cart, and the current was taken from a street car trolley wire. This was said to prove fairly successful, but I have no record of the kind of weeds killed or the condition of moisture in the soil at the time. In a trial of this method of weed-killing at the Michigan Agricultural College, it was found that while the tops of perennial weeds, such as Canada thistle, were killed, the roots in moist earth were uninjured. I have no record of the strength of current used in this instance.

It has been suggested that for field purposes an electric current could be conveyed by a cheap trolley wire on temporary supports from a regular trolley line or from a dynamo driven by a thrashing engine. The dynamo could be attached to a self-propelling engine drawing the transformer and brush, but the expense of working the rather dangerous and complicated apparatus would doubtless exceed the cost of eradicating the weeds by means of thorough cultivation, which would at the same time greatly improve the condition of the soil. Moreover, nut grass is propagated by underground tubers, some of which are borne at the ends of long, slender rootstocks several inches below the surface of the ground, and are surrounded by moist soil except during severe droughts. It would require a very strong current of electricity to kill these tubers, as the strength of the current would be dissipated as soon as it reached moist earth.

Nut grass may be eradicated in three years by any method which will completely prevent the development of any green shoots above the surface of the ground. Wide-tooth cultivators and hoes are among the best tools to accomplish this. Pigs that will root well are also used to advantage, and hens, geese or ducks confined over small patches of nut grass have been found effective in its extermination.

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Moving Pictures of Growing Plants.

The Agricultural Department is now making some interesting experiments, in which the moving-picture camera has been utilized. In one of their greenhouses the Division of Vegetable Pathology has an instrument of this kind in operation. It photographs the growth of a small oak tree. The machine works automatically, taking one picture per hour. At night the exposure is made by electric light. The camera has been running for two weeks, and in about two weeks the experiments will be discontinued. When the series of pictures is completed, it will be possible to reproduce upon the screen the growth of a plant from the time the first shoot appears above the ground until the tree is in full leaf and a foot or more high. Of course, this experiment has no very great scientific value, but it will be an important test of the capacity of the machine, which it is intended to use in watching the progress of plant diseases, blight, parasites, etc. If it is found that the experiments are successful, the agricultural colleges and experiment stations can receive positives which can be thrown upon the screen which will convey many important lessons.

The Expiration of the Eads Jetty Contract.

The Eads jetty contract, which was entered into by the United States with Capt. James B. Eads, in 1874, to keep a channel of at least 26 feet at the mouth of the Mississippi River, expired July 8. The Eads estate will be compelled, however, to keep the channel open for 535 days, in order to make good the number of days in which the water of the channel was under 26 feet. On the day of the expiration of the contract a ship drawing 26 feet 10 inches went through the jetties without touching bottom.

Miscellaneous Notes and Receipts.

To ascertain whether lumber is dry and sound, hold the ear to one end of the beam and have some one knock on the other end with a key. If the wood is all right, the knock can be heard distinctly, even if the beam is thirty yards long.—Maler Zeitung.

To Remove Rust Spots from White Linen.—Mix in a glass potassium oxalate, 5 grammes; lemon juice, 5 grammes; and salt, 5 grammes, with soft water, 80 grammes. Of the liquid obtained, put a little on the spots, then hold them to a tin vessel filled with hot water and heated thereby. The respective places are afterward washed with soap water. -- Praktischer Wegweiser.

Production of Belt Grease.—For the preparation of a semi-liquid belt grease, the Seifensieder Zeitung gives the following formula: Melt 6 kilogrammes of pinoline, 2·5 of fish oil, 5 of resin, 2·5 of wool fat, and add 1 kilogramme of gum solution and, with stirring, 1 kilogramme of tallow. Pour the mass into suitable vessels and continue stirring until cool.

Belt grease in sticks is produced as follows: Add to the above composition 10 kilogrammes of resin and 7 of ceresine. The tin shells used for shaping, which are provided with a stopper on one side, are placed in a vat filled with water, and the mass is filled into these moulds. After cooling, the stopper is taken out and the stick is pressed out of the tube. The sticks are next wrapped in tinfoil and packed in cardboard with label.

Hard Solder for Brass.—The Physico-Technical Imperial Institute (Physisch-technischer Reichs-Anstalt) has conducted tests with hard solders for brass, obtaining the following results:

The hard solders are known to consist mainly of copper, zinc, and lead or tin, sometimes with admixtures of cadmium or bismuth. Fifty-three hard solder alloys were tested, and it was found that the drawbacks which so many hard solders possess are due chiefly to the disparity between the brass of commerce and that of the small brass foundries, aside from the unequal and unsuitable composition of the solder material.

Hard solder of brass and zinc must only be prepared from the metal proper which is to be soldered.

The sharp line of the utility of the hard solder for brass lies in the mixture: copper, 46 parts, and zinc, 54 parts. Such a solder, however, though sufficiently malleable on the whole, is too hardly fusible for general use. By the addition of 3 per cent of tin, it is true, the fusing point is lowered, but the malleability is practically suspended, thus making the durability of the soldering doubtful. Admixtures of slight quantities of readily fusible metals have only little influence upon the lowering of the point of fusion; but as soon as they are added in such amounts that the fusing point goes down considerably, the malleability is arrested in every case.

Cadmium is entirely unsuitable for the production of readily fusible hard solders, since it causes them to oxidize strongly in the fire and consequently to fuse very sluggishly.

As regards malleability, ready fusion, and good behavior during the melting, only one hard solder remained of the fifty-three tested; same contains, besides copper, only zinc and silver. In conformity therewith the Imperial Institute has determined on the following composition as being practical:

a. Of good fusion: Copper, 48 parts; zinc, 48 parts; silver, 4 parts.

b. Of ready fusion: Copper, 43 parts; zinc, 48 parts; silver, 9 parts.

c. Of quick fusion: Copper, 38 parts; zinc, 50 parts; silver, 12 parts.

The property of being thinly liquid, of these solders, as well as their malleability, is not attained by any other solder; the latter property even excels that of the best copper-zinc solder twice over. They do not turn black in pickling, like all readily fusible hard solders containing tin and zinc, but are characterized by a pleasant, gold-like color, so that goldsmiths and jewelry manufacturers may also use them with advantage.

According to the Imperial Institute, the Ulm Brass Works are now manufacturing hard solders which are sold in the market as silver hard solders 1, 2, and 3. In order not to have the points of fusion lie too closely together, the said firm has given its silver solders the following composition:

1. Copper, 50 parts; zinc, 46 parts; silver, 4 parts; of good fusibility.

2. Copper, 43 parts; zinc, 48 parts; silver, 9 parts; of ready fusibility.

3. Copper, 46 parts; zinc, 52 parts; silver, 12 parts; of quick fusibility.

For general use in workshops, but especially for wholesale manufacturing, solder No. 2 is the most commendable. No. 1 is suitable for first soldering, while No. 3 is destined for third soldering, and is to replace all quickly fusible hard solders containing tin and much zinc. The slight increase in cost caused by the utilization of silver is amply counterbalanced by secure working and time gained.—Journal der Goldschmiedekunst.

Science Notes.

Oxford University has conferred the degree of D. C. L. on Prof. Simon Newcomb.

Charles Darwin's statue, the gift of Prof. Poulton, has been put in the Oxford University Museum next to the statue of Sir Isaac Newton.

The Clyde shipbuilding returns for the year just ended show that 125 vessels were launched, representing an aggregate tonnage of 234,877.

Lord Salisbury is an ardent chemist, and has announced that he has discovered an important chemical process at his laboratory at Hatfield House, and that he will communicate the same to the world at a forthcoming meeting of one of the learned societies.

On the Fourth of July 1,500 pounds of red and blue fire were burned on the summit of Pike's Peak at an altitude of 14,143 feet. The affair was really a State one, and trainloads of people were brought to witness the event. The illumination was plainly seen at Denver, 75 miles to the north, and at Pueblo, 45 miles to the south.

The Board of Health in New York was recently surprised to learn that a restaurant was being conducted in Washington Cemetery, which lies between Gravesend and Coney Island. The Board of Health considered it rather extraordinary that there should be a restaurant in the cemetery and strange that people should go there to eat. The place has been inspected and condemned.

Iced chloroform, according to The Medical Times, has been used as an anesthetic in Prof. Shorburg's clinic in the Julius Hospital at Würzburg, Bavaria, in over 14,000 cases without a single unpleasant result. The advantages claimed for this preparation of chloroform are the quickness of its action, its comparative freedom from danger and the absence of the nausea and depression so common with other anesthetics.

Raphael's Sistine Madonna, which is one of the most beautiful paintings in the world, has been recently attacked by a young German critic named Jelinck, who attempts to prove that Raphael never painted the picture at all, and that it has been extensively restored. The latter is undoubtedly true, but the painting itself is an arch-authenic work of the Urbinate master. It is believed by critics that the painting was really intended for a processional banner. This view is based on the texture of the canvas.

A favorable account is given in The Scottish Geographical Magazine of the economic condition of German East Africa. The trade is steadily on the increase, which is largely in consequence of the fact that the government has constructed nearly 800 miles of railroad for wheel carriages. The principal products are tobacco, sugar and coffee. The exports for the year 1897-98 were nearly three times as great as those of the previous year, notwithstanding the fact that the coffee plant suffered great injury from drought and locusts.

At the present time it is hard to say what will or will not be built as an attraction at the Paris Exposition. Novelties of all kinds have been suggested, but most of them have not been approved of by the authorities or they have been abandoned owing to financial reasons. The latest project is a representation of Pompeii as it appeared before its destruction A. D. 79. Archæologists and artists have warmly approved of the attempt, and the Italian Minister of Fine Arts has promised to give all possible aid in insuring accuracy. The time is now very short in which to produce any satisfactory work.

Howard J. Rogers, Director of Education and Social Economy to the United States Commission, Paris Exposition, speaking of the educational exhibit of the United States, said: "It is impossible to estimate how many sections of the country will be represented in the educational exhibit, but he thinks there will be from sixty to seventy-five. The cities which have made adequate appropriations, and which will be represented completely in all departments from the kindergarten to the high school, are Boston, New York, Newark, Albany, Chicago, St. Paul, Omaha, and Denver. Many other cities are preparing work in special ways, or to illustrate special features. The educational exhibit will be distinctly national in form, although all material contributed by any city or State will be properly credited to that locality. The effect is to show, irrespective of State lines, the best and most advanced work which is being done in every grade of public school work, and in college and university departments in the United States. To accomplish this the exhibit will be arranged by grades, so that in examining one can find in one section all the primary work of each country, in another all the grammar school work, and so on. In the department of higher education the same scheme will be followed, and instead of a certain definite amount being assigned to the greater universities, the space is divided in nine departments, viz., law, medicine, theology, pure science, philosophy, language and literature, fine arts. All of the great universities of the country are preparing exhibits in two or more of these departments as they choose."