She has 14 masts ranged in two lines on each side of the hatchways. To each of the masts, except the pairs at both ends, are fixed two derricks, and to each mast of the end pair is fixed one derrick. She has thus 24 derricks, and they are so arranged that they can all be worked together. The ship has no 'tween-decks. Instead, she has 12 holds, each hold being divided lengthwise into two compartments.

There are thus 24 compartments, and each derrick has one twenty-fourth of the ship to unload. Obviously this is a vastly quicker method than the present slow practice, whereby often only a couple of derricks are able to work on a whole cargo—one at the forward hatchway, and one at the aft.

The masts can, if necessary, be used for sails, but the spread of canvas will be very small. She will rely on her engines, which are of 2,200 horse power. Her contract speed is 10 knots an hour, but on being tested over the measured mile she is stated to have traveled at the rate of 10½ knots.

Her dimensions are: Length, 440 feet; beam, 62 feet; depth, 29 feet. When loaded with her cargo of 10,300 tons she draws 22 feet 8 inches.

PHOTOGRAPHY BY ELECTRIC DISCHARGES.

M. Stephan Leduc, professor of biological physics at the Ecole de Médicine of Nantes, presented at a late exposition of the Société Française de Physique several remarkable photographs produced by electric discharges. The following interesting facts have been procured from Prof. Leduc:

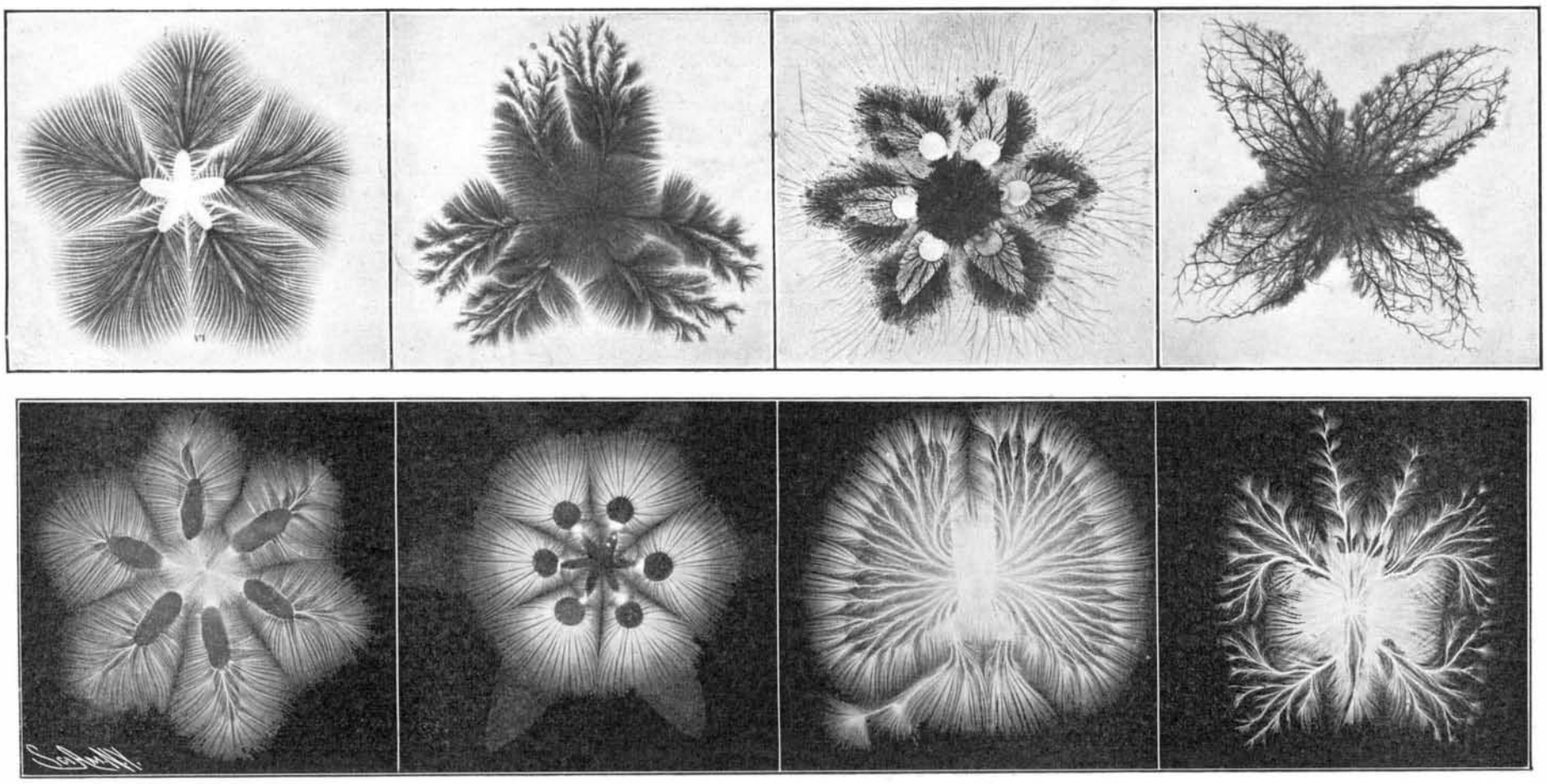
The object is to direct the electric discharge on the sensitive plate, so as to render it regular and symmetrical, while producing designs capable of furnishing *motifs* for ornamentation which may be indefinitely varied. In order to do this, the sensitive plate must be thus prepared: In the dark room lighted with red light, a dry plate coated with gelatino-bromide of silver is covered with pasteboard, from which previously the symmetrical design desired to be produced by the electric discharge has been cut out; the plate is sprinkled by means of a sieve with an insulating powder, such as fecula, starch, sulphur, or a powdered oxide or metallic salt. Then the pasteboard is taken off; the cut-out design is reproduced on the sensitive surface by the powder, the remainder of this surface remaining clean and smooth.

The result may be varied not only by employing different designs, but by distributing over the sensitive surface pieces of tin, lead, copper, etc., cut variously. The powders give to the lines more or less firmness, according to their fineness and density; the most compact powders give the finest lines, and a great diversity in appearance may be obtained by employing different powders variously distributed by means of several pasteboard covers.

The plate coated with gelatino-bromide of silver thus prepared is placed with its non-sensitive side on a metallic leaf, put in communication with one of the poles of the generator of electricity.

On the sensitive surface, in the center of the symmetrical design formed by the powder, a metallic point is placed, which communicates with the other pole of the generator. The differences of the poles likewise contribute in varying the results.

In the operation thus conducted the plate coated with gelatino-bromide of silver represents the dielectric of a condenser, of which the leaf and the metallic point form the armatures. Only one discharge is produced; the plate is carefully dried with a dry cloth, so that no powder may be left, and is then developed in the usual way. That the result is always unforeseen, makes these experiments quite fascinating. As a generator of electricity, either an induction coil (Ruhmkorff coil) or a static machine may be utilized, and the smallest generators are sufficient.



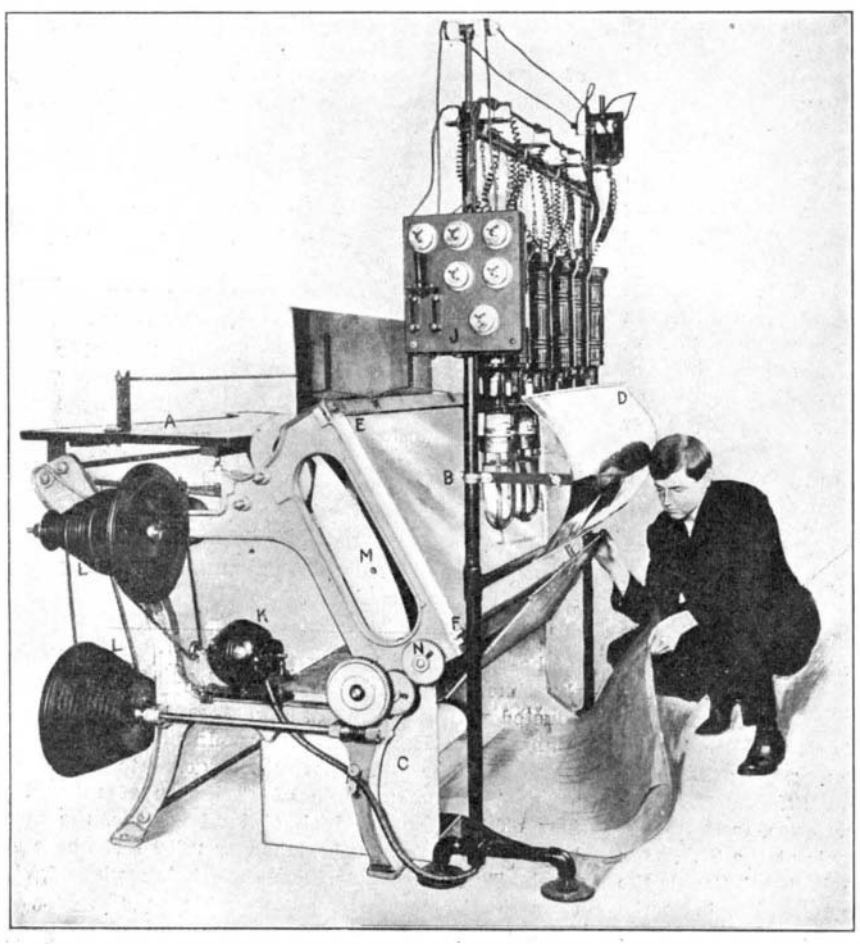
ORNAMENTAL PATTERNS PRODUCED UPON SPECIALLY-TREATED PLATES BY ELECTRICAL DISCHARGES.

ELECTRIC BLUE-PRINT MACHINERY.

The great value of electricity for blue printing has long been recognized, permitting as it does the production of prints immediately upon completion of the tracings without the inconvenience and delay caused by cloudy or rainy weather.

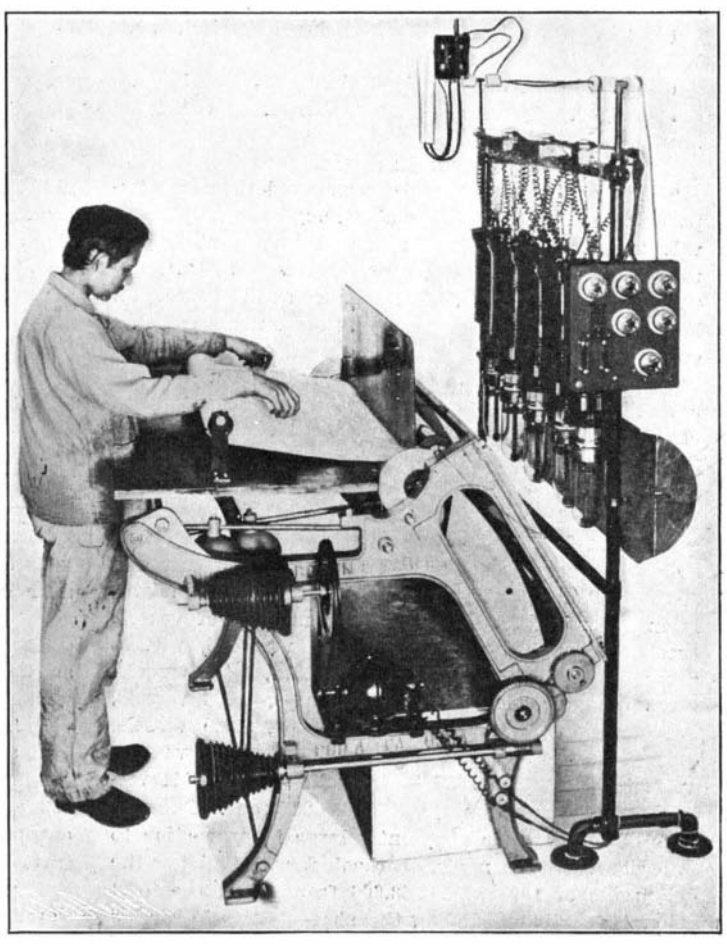
Manufacturers, architects, and engineers have long appreciated the fact that a good machine for this purpose would be invaluable, because it would enable them to obtain blue prints at any hour of the day or night without loss of time from atmospheric conditions, and without obliging the operator to remain idle during rainy weather.

The Franklin electric blue-print machine, manufactured by Williams, Brown & Earle, of Philadelphia, represents the latest and best type of its kind and



Examining the Finished Print.

THE FRANKLIN BLUE-PRINTING MACHINE.



Gulding the Paper.

overcomes entirely the many objections to the machines now in use for this purpose.

The portion of the machine by which the printing is accomplished consists of two continuous bands of transparent celluloid. Each of these bands is held firmly in position by two rollers, of which one is an idler and the other a driving roller which actuates the band. The driving rollers are geared together and revolve at exactly the same rate of speed, causing the bands to move synchronously. The transparent celluloid bands, as they travel from one roller to the other, pass over a convex surface or "hump," shaped in the section of a cylinder, and are held in absolute contact with this surface and with one another by an automatic adjustable tension device. In order to make a print, the tracing and sensitized paper are introduced between the transparent bands, by means of which they are held in absolute contact with one another, and in this position pass in front of the electric lamps. The printing is thus accomplished automatically; and the action of the machine being continuous, prints of any length can be made, or one separate print after another may be obtained in rapid succession.

The lamps and motor are furnished for the direct or alternating currents of 104, 110, or 220 volts. Either four or five inclosed arc electric lamps are used. These lamps are each arranged to pass from 2¾ amperes on the 220-volt current to 5 amperes on the 104 and 110 volt currents, making a very low cost of operation.

The motor is of 1-10 horse power and can be furnished for any current or voltage. By an ingenious cone device the speed of the bands may be altered so that the tracings and sensitized paper pass at a rapid or slow speed across the convex surface, thus making either a long or short exposure.

Prints can be made at a maximum speed of one minute exposure, or a minimum speed of 10 minutes. This great range permits all kinds of sensitized paper to be used. Tracings of any density, including paper negatives, drawings on bond paper or crumbled tracings, are all printed with ease by any intelligent boy. Thus is it possible to make prints by electric light, rapidly, at a low cost, of any size and continuously, without stopping or readjusting the machine.

Other Ship Canals Than Panama.

The renewed attention being given to the proposed isthmian canal at this time lends especial interest to a discussion of the great canals of the world, presented by the Department of Commerce and Labor through its Bureau of Statistics. The ship canals of the world, it says, are nine in number, as follows:

(1) The Suez Canal, begun in 1859 and completed in 1869.

(2) The Cronstadt and St. Petersburg Canal, begun in 1877 and completed in 1890.

(3) The Corinth Canal, begun in 1884 and completed in 1893.

(4) The Manchester Ship Canal, completed in 1894.

(5) The Kaiser Wilhelm Canal, connecting the Baltic and North seas, completed in 1895.

(6) The Elbe and Trave Canal, connecting the North Sea and Baltic, opened in 1900.

(7) The Welland Canal, connecting Lake Erie with Lake Ontario.

(8 and 9) The two canals, United States and Canadian, respectively, connecting Lake Superior with Lake Huron.

THE SUEZ CANAL.

The Suez Canal is usually considered the most important example of ship canals, though the number of vessels passing through it annually does not equal that passing through the canals connecting Lake Superior with the chain of Great Lakes at the south. In length, however, it exceeds any of the other great ship canals, its total length being 90 miles, of which about two-thirds is through shallow lakes. The material excavated was usually sand, though in some cases strata of solid rock from 2 to 3 feet in thickness were encountered. The total excavation was about 80,000,000 cubic yards under the original plan, which gave a depth of 25 feet. In 1895 the canal was so enlarged as to give a depth of 31 feet, a width at the bottom of 108 feet and at the surface of 420 feet. The original cost was $95,000,000, and for the canal in its present form slightly in excess of $100,000,000. The number of vessels passing through the canal in 1870 was 486, with a gross tonnage of 654,915 tons; in 1875, 1,494 vessels, gross tonnage, 2,940,708 tons; in 1880, 2,026 vessels, gross tonnage, 4,344,519 tons; in 1890, 3,389 vessels, gross tonnage 9,749,129 tons; in 1895, 3,434 vessels, gross tonnage, 11,833,637 tons; and in 1900, 3,441 vessels, with a gross tonnage of 13,699,237 tons. The revenue of the canal is apparently large in proportion to its cost, the Statesman's Yearbook for 1901 giving the net profits of 1899 at 54,153,660 francs, and the total amount distributed among the shareholders 51,538,028 francs or about 10 per cent of the estimated cost of $100,000,000.

The canal is without locks, being at the sea level the entire distance. The length of time occupied in passing through the canal averages about eighteen hours. By the use of electric lights throughout the entire length of the canal passages are made at night with nearly equal facility to that of the day. The tolls charged are 9 francs per ton net register, "Danube measurement," which amounts to slightly more than $2 per ton United States net measurement. Steam vessels passing through the canal are propelled by their own power.

THE CRONSTADT AND ST. PETERSBURG CANAL.

The canal connecting the Bay of Cronstadt with St. Petersburg is described as a work of great strategic and commercial importance to Russia. The canal and sailing course in the Bay of Cronstadt are about 16 miles long, the canal proper being about 6 miles and the bay channel about 10 miles, and they together extend from Cronstadt, on the Gulf of Finland, to St. Petersburg. The canal was opened in 1890 with a navigable depth of 20½ feet, the original depth having been about 9 feet; the width ranges from 220 to 350 feet. The total cost is estimated at about $10,000,000.

THE CORINTH CANAL.

The next of the great ship canals connecting bodies of salt water in the order of date of construction is the Corinth Canal, which connects the Gulf of Corinth with the Gulf of Ægina. The canal reduces the distance from Adriatic ports about 175 miles and from Mediterranean ports about 100 miles. Its length is about 4 miles, a part of which was cut through granite soft rock and the remainder through soil. There are no locks, as is also the case in both the Suez and Cronstadt canals, already described. The width of the canal is 72 feet at bottom and the depth 26¼ feet. The work was begun in 1884 and completed in 1893 at a cost of about $5,000,000. The average tolls are 18 cents per ton and 20 cents per passenger.

THE MANCHESTER SHIP CANAL.

The Manchester Ship Canal, which connects Manchester, England, with the Mersey River, Liverpool, and the Atlantic Ocean, was opened for traffic January 1, 1894. The length of the canal is 35½ miles, the total rise from the water level to Manchester being 60 feet, which is divided between four sets of locks, giving an average to each of 15 feet. The minimum width is 120 feet at the bottom and averages 175 feet at the water level, though in places the width is extended to 230 feet. The minimum depth is 26 feet, and the time required for navigating the canal from five to eight hours. The total amount of excavation in the canal and docks was about 45,000,000 cubic yards, of which about one-fourth was sandstone rock. The lock gates are operated by hydraulic power; railways and bridges crossing the route of the canal have been raised to give a height of 75 feet to vessels traversing the canal, and an ordinary canal whose route it crosses is carried across by a springing aqueduct composed of an iron caisson resting upon a pivot pier. The total cost of the canal is given at $75,000,000. The revenue in 1901, according to the Statesman's Yearbook, was £621,128, and the working expenses, £483,267. For the half year ending June 30, 1900, the canal yielded £16,488 toward paying the £112,500 of interest which the city of Manchester has to pay on the capital invested in the enterprise. The freight-paying tolls on the canal amounted to 1,487,841 tons in the half year, an increase of 12 per cent over that of the corresponding period of the preceding year.

THE KAISER WILHELM CANAL.

Two canals connect the Baltic and North seas through Germany, the first, known as the Kaiser Wilhelm Canal, having been completed in 1895 and constructed largely for military and naval purposes, but proving also of great value to general mercantile traffic. Work upon the Kaiser Wilhelm Canal was begun in 1887, and completed, as above indicated, in 1895. The length of the canal is 61 miles, the terminus in the Baltic Sea being at the harbor of Kiel. The depth is 29½ feet, the width at the bottom 72 feet, and the minimum width at the surface 190 feet. The route lies chiefly through marshes and shallow lakes and along river valleys. The total excavation amounted to about 100,000,000 cubic yards, and the cost to about $40,000,000. The number of vessels passing through the canal in 1900 was 21,571, with a tonnage of 4,282,258, and the dues collected amounted to 2,133,155 marks.

SHIP CANALS CONNECTING THE GREAT LAKES OF NORTH AMERICA.

Three ship canals intended to give continuous passage to vessels from the head of Lake Superior to Lake Ontario and the St. Lawrence River are the Welland Canal, originally constructed in 1833 and enlarged in 1871 and 1900; the St. Marys Falls Canal at Sault Ste. Marie, Mich., opened in 1855 and enlarged in 1881 and 1896; and the Canadian canal at St. Marys River, opened in 1895. In point of importance, measured at least by their present use, the canals at the St. Marys River by far surpass that of the Welland Canal, the number of vessels passing through the canals at the St. Marys River being eight times as great as the number passing through the Welland, and the tonnage of the former nearly forty times as great as that of the latter. One of the important products of the Lake Superior region, iron ore, is chiefly used in the section contiguous to Lake Erie, and a large proportion of the grain coming from Lake Superior passes from Buffalo to the Atlantic coast by way of the Erie Canal and railroads centering at Buffalo. The most important article in the westward shipments through the Sault Ste. Marie canals—coal—originates in the territory contiguous to Lake Erie. These conditions largely account for the fact that the number and tonnage of vessels passing the St. Marys River canals so greatly exceed those of the Welland Canal.

The Welland Canal.—The Welland Canal connects Lake Ontario and Lake Erie on the Canadian side of the river. It was constructed in 1833 and enlarged in 1871 and again in 1900. The length of the canal is 27 miles, the number of locks 25, the total rise of lockage 327 feet, and the total cost about $25,000,000. The annual collection of tolls on freight, passengers, and vessels averages about $225,000 and the canal is open on an average about two hundred and forty days in a year.

The Sault Ste. Marie Canals.—The canals of Sault Ste. Marie, Mich., and Ontario, are located adjacent to the falls of the St. Marys River, which connects Lake Superior with Lake Huron, and lower or raise vessels from one level to the other, a height of 17 to 20 feet. The canal belonging to the United States was begun in 1853 by the State of Michigan and opened in 1855, the length of the canal being 5,674 feet, and provided with two tandem locks, each being 350 feet in length and 70 feet wide, and allowing passage of vessels drawing 12 feet, the original cost being $1,000,000. The United States government, by consent of the State, began in 1870 to enlarge the canal, and by 1881 had increased its length to 1.6 miles, its width to an average of 160 feet, and its depth to 16 feet; also had built a single lock 515 feet long and 80 feet wide, with a depth of 17 feet on the sills, which was located 100 feet south of the State locks. The State relinquished all control of the canal in March, 1882. In 1887 the State locks were torn down and replaced by a single lock 800 feet long, 100 feet wide, and a depth of 22 feet of water on the sills. This lock was put in commission in 1896. The canal was also deepened to 25 feet. The Canadian canal, 1⅛ miles long, 150 feet wide, and 22 feet deep, with lock 900 feet long, 60 feet wide, with 22 feet on the miter sills, was built on the north side of the river during the years 1888 to 1895. The number of vessels passing through the United States canal in 1902 was 17,588, and through the Canadian canal 4,204. In 1900 the number of vessels passing through the United States canal was 16,144, and through the Canadian canal, 3,003, showing an increase of 1,200 in the number of vessels passing through the Canadian canal, and a slight decrease in the number through the United States canal, the increase in the number passing through the Canadian canal having been due to the development of the Michipocoten district. The tonnage passing through the United States canal in 1902 was: Registered tonnage, 27,408,021 tons; in 1901, 22,222,334 tons, against 20,136,782 in the year 1900; the freight tonnage in 1901 was 25,026,522 tons, against 23,251,539 tons in 1900. The Canadian canal shows: Registered tonnage in 1902, 4,547,561; in 1901, 2,404,642 tons, against 2,160,490 in 1900. A marked contrast between the business of the St. Marys Falls and Welland canals is found in a comparison of their figures for a term of years. The number of vessels passing through the Welland Canal in 1873 was 6,425, and in 1899, 2,202, a reduction of more than one-half in the number of vessels. The number of vessels passing through the St. Marys Falls Canal in 1873 was 2,517, and in 1902, through the American and Canadian canals, 22,659.

A Convention on Mosquito Exclusion.

A convention is called to be held on December 16 in New York, at the rooms of Board of Trade and Transportation, in the Mail and Express Building, in the interests of "Mosquito Extermination." It is expected much interesting data will be given; and in view of the well-known fact that certain species of mosquitoes promote the spread of malaria, the subject becomes one of special public interest, particularly as the proposed general mosquito extermination will greatly benefit the public health.

Those who are looking forward with trepidation to the time when the world's coal supply shall be exhausted will find solace in some rough calculations by John Clarke Hawkshaw, a prominent civil engineer, concerning the water power now going to waste. He says: "Assume a depth of 10 inches of rainfall to flow off each square inch of land surface, the mean height of which may be taken as 2,250 feet above sea level. Then the water from the whole surface falling through the mean height would give 10,340,000,000 horse power in perpetuity. Our present yearly output of 225,000,000 tons of coal would give that horse power for only a little over half a day."

The Mexican Cotton-Boll Weevil and the Damage It Has Caused This Season.

The most serious menace that the cotton planters of the South have ever been compelled to face is the Mexican boll weevil, which is ravaging the cotton fields of Texas. The weevil has not been found outside that State except in the instance which occurred in August at the Louisiana Sugar Experiment Station at Audubon Park in the environs of New Orleans. In that case the circumstances have led the Louisiana authorities to the conviction that the pests were purposely placed in the cotton plots by some interested person. The station authorities promptly destroyed all the cotton of the experimental plots by picking the fallen fruit, uprooting and burning the plants, and subsequently plowed and flooded the land after it had been thoroughly sprayed with crude petroleum. As there are no cotton fields within 10 miles of Audubon Park, and several examinations by the station entomologist failed to reveal any weevils, it is very probable that the colony was completely exterminated.

The difficulties in the way of controlling the boll weevil lie as much in its habits and manner of work as in the peculiar industrial conditions involved in the production of the staple in the Southern States. The weevil lives in all stages, except the imago, within the fruit of the plant well protected from any poison that may be applied, and in that stage takes food only by inserting its beak within the substance of the plant. It is remarkably free from the attacks of parasites and diseases, occupies but fourteen days for development from egg to adult, and the progeny of a single pair in a season may reach 134,000,000 of individuals.

The weevil adapts itself to climatic conditions to the extent that the egg stage alone in November may occupy as much time as all the immature stages together in July or August. These factors combine to make it one of the most difficult insects to control.

The territory at present affected by the boll weevil is entirely in Texas. The nearest approach to the Louisiana line is in the immediate vicinity of Timpson, 25 miles away. The nearest approach to Shreveport is in Wood County, about 100 miles distant. On the north it has been found in the vicinity of Sherman just south of the Red River. In the region between the latitude of Greenville and the Red River the weevil is only scatteringly present and has caused no general damage. It will require nearly two years for it to reach such numbers as to materially reduce the normal production. Although many conditions make it very difficult to reduce to figures the damage caused by the weevil, calculations made in the Division of Entomology of the U. S. Department of Agriculture, based upon statements showing the production of cotton in ten leading counties in Texas when the boll weevil was absent and when it was present, and showing the increase in ten other counties when the weevil was absent at both similar periods, appear to justify the estimate that the total damage caused by the insect is about 50 per cent. Upon that basis the Texas planters have suffered a loss of $15,000,000 during the present season, and this estimate, it is stated, agrees with those of conservative cotton statisticians. As the normal cotton crop of the United States is estimated to represent a value of $500,000,000, the probable ultimate damage, when the pest has become spread over the entire cotton belt, provided nothing were done to check it, would be in the neighborhood of $250,000,000 annually.

Nevertheless there are conditions at work that seem to indicate that planters in weevil regions are gradually adopting changes in their system of producing the staple that have a tendency to avoid damage.

The work of the U. S. Department of Agriculture with the boll weevil consists of field experiments and laboratory investigations. Mr. W. D. Hunter, of the Division of Entomology, assisted by several entomologists, has charge of the investigations in Texas, and Mr. E. A. Schwarz of the Division has conducted studies in Cuba. The field work comprises tracts of cotton grown in such manner as to constitute demonstrations of the means necessary in order that the staple may be produced profitably in spite of the weevil. These fields are located in six different points representing the five regions in Texas, which, by reason of variation in climate and soil, constitute as many distinct cotton districts. In these fields every expedient that has been found to be useful in avoiding damage by the weevil is being tried. The work of the Division of Entomology during the season of 1902 demonstrated that it is possible to produce cotton profitably in spite of the weevil; the work of the present season shows this again under different conditions of climate and soil, and in addition furnishes practical demonstrations of the value of the recommendations of the Division to planters at six different points in the State. In the laboratory the life history of the pest is being carefully investigated. In addition, Mr. Schwarz has spent several months of the present year in Cuba, studying the manner in which natural conditions, whether of parasites, diseases, climatic conditions, or of bringing about a degree of resistance on the part of the plant, control the insect where it has existed as an enemy of the cotton plant for a much longer period than in the United States. He found what he supposes to be the original food plant of the insect in the "algodon de riñon" or kidney cotton of that island. He failed to discover any parasites at all and did not succeed in finding any important tendency toward immunity on the part of the five distinct varieties studied.

The steady extension of the territory affected by the weevil year by year until the northern boundary is far north of the center of cotton production in the United States has convinced all observers that it will eventually be distributed all over the cotton belt. Although its progress has been comparatively slow during the time it has been in Texas, it has displayed no tendency toward dying out.

The fact that several European governments are sending agents to this country to procure seed to be used in experiments in producing the fiber in their colonies calls attention to the probability that the weevil may be carried to remote portions of the globe. Although the insect does not, except accidentally, hibernate within the hull of the seed, every seed house attached to a gin in the infested territory harbors any that are brought in from the fields in seed cotton. They crawl into the seed bins as they would crawl anywhere for protection. All danger could easily be avoided by fumigation of the seed or by leaving it sacked in storage rooms isolated from new cotton for a year previous to shipment.

The work of the Division of Entomology has demonstrated that no direct or specific means, such as poisons, will ever be of much avail in fighting the weevil and that there is little hope for the artificial propagation of diseases or in obtaining a variety that is in any sense resistant. Experiments, however, with cultural methods have been highly successful and have obviated the necessity of looking to direct ones.

The cultural methods consist of reducing the number of the pests in the fall by early destruction of the plants and in hastening the maturity of the crop the following spring by every means available. Fall destruction consists of plowing up and burning the plants as soon as the pests have multiplied to such an extent as to render the picking of any more cotton doubtful. Under normal conditions this should occur some time in October. The benefits resulting from this process are threefold. Many weevils are actually killed, the development of several of the so-called broods is prevented, thus further reducing the number which go into hibernation, and, moreover, the hibernating season, during which many causes bring about a considerable mortality, is lengthened.

While this apparently causes a loss of the top crop, it is not a loss when the other recommendations of the Division of Entomology are followed. A crop can be obtained which will mature before the weevils have an opportunity to do considerable damage, and this is brought about by the use of a rapid-growing variety accomplished by the planting of northern seed. This must be planted early when the season permits; the rows must be planted at a somewhat wider distance than has been the practice, and a thorough cultivation of the crop must follow. In this way it has been shown the past season that from a half bale to a bale per acre can be cropped in territory where under the old system one-tenth of a bale more or less is secured with difficulty.

By these methods it is possible to produce the staple at a margin of profit that will compare favorably with that realized in the production of most of the staple crops of the United States, even though the large yields of cotton occasionally gained in earlier years seem no longer possible in the districts affected by the weevil.

Slight Display of Leonids, A.M. November 16, 1903.

BY PROF. EDGAR L. LARKIN.

A watch was maintained for Leonid meteors at this observatory, from 0h. 40m. to 2h. 5m. A. M. on Monday, November 16, 1903. The display was feeble indeed when compared with the magnificent shower observed here on November 15, 1901, when 661 were recorded. Twelve Leonids were seen this year; the first being at 0h. 44m. and the last at 2h. 5m. A. M. Pacific time. They were all from within the sickle of Leo; two from the radiant point, that is, almost exactly "head on." The first from radiant was at 1h. 4m., and the other at 1h. 22m., and were equal in brilliancy to Gamma Leonis. The brightest meteor was equal to Arcturus, the others small. At 2h. 5m. a mountain fog condensed, ending the watch. No observations were made on the morning of the 15th, owing to fog. At 6h. 10m. and at 6h. 23m. P. M. on November 14, two meteors were seen in the south, in thin fog; and from the illumination of the vapor, it was thought that their brilliancy was as intense as that of Jupiter, which was shining through the same layer. At 5h. 30m. A. M. a bright light flashed in all the rooms of the observatory, which must have been from a large meteor, as quite a dense cloud inclosed the peaks and building at the time. This was on Sunday morning, November 15, 1903.

Lowe Observatory, November 16, 1903.

THE OBELISK OF MONT PELÉ.

Mont Pelé stands unique in the history of volcanoes in more than one particular. A little over a year ago, scientists who were studying this volcano discovered a peculiar tooth-like formation growing out of the old crater. Owing to the quantity of vapor and smoke which covered the mountain, this formation was not observed until it had grown to a height of 295 feet above the rim of the crater. The formation could not be mistaken for a cone, such as is commonly formed in craters by the heaping up of matter ejected from the volcano, since the sides were quite smooth, and approximately vertical, as shown in our front-page illustration. It had rather the appearance of a solid shaft of stone, and was hence called the "obelisk of Pelé." From the time it was first discovered it steadily increased in height, and when measured in the latter part of March, 1903, it was estimated to be 5,143 feet above the level of the sea, or 1,109 feet above Morne Lacroix, but this did not mark the maximum height, because a period of heavy volcanic explosions had reduced it somewhat and caused its form to undergo many changes. Thus, during the spring and last summer it constantly altered in height and general appearance, sometimes rising a number of yards, and then, following a period of explosions, being reduced again. From the time of its measurement in March, the losses exceeded the gains until it finally disappeared within the cone which had been formed about it. This cone seems to be made up of lava and ejecta which have been forced up from the vents, and of masses which have been shattered from the obelisk.

The peculiar phenomena of the obelisk have awakened great interest. How such a huge monument, taller than the Effel Tower, could be formed on the top of a violently active volcano is a problem that is not easy of solution. As far as we can ascertain, only one plausible theory has been advanced, and that does not seem very credible; namely, that the needle was formed of molten lava during some previous period of activity, that this lava solidified and formed a plug which closed one of the passages of the crater, and that now it has been worked loose and forced up by the recent renewed activity. The obelisk does have the appearance of having been forced up in a solid piece like a stopper in the bottle, and held by friction against the sides of the opening. The northeast side of the obelisk is very smooth, almost polished in appearance. Its true color, however, is a reddish brown partly covered with a whitish incrustation. On the southwest side fresh surfaces are constantly appearing, owing to the explosions, which cause portions to continually fall off. This side has a gray or reddish-gray appearance. It is impossible at the present time to state just exactly what the nature of the needle is, though in all probability it is largely pumiceous, which is judged from the fact that masses break off from it so easily, and also because of the abundance of pumice found in the vicinity of the Rivière Blanche.

These particulars have been abstracted from an elaborate discussion of the phenomena of Martinique by E. O. Hovey, published in full in the current SUPPLEMENT. Mr. Hovey was twice sent to the scene of the volcanic eruptions for purposes of study—once by the American Museum of Natural History, and once by the National Geographic Society. The photograph reproduced on the front page of this issue was taken by Mr. Hovey for the American Museum of Natural History.

The Current Supplement.

Emile Guarini concludes his account of the Viennese Metropolitan Railway in the current SUPPLEMENT No. 1457. Dr. O. Boudouard discusses at length the subject of "Alcohol as a Motive Power." A tandem compound express locomotive for the Russian imperial railways is described. "Some Engineering Features of Drainage" is a subject which C. G. Elliott, drainage expert of the Department of Agriculture, treats in a masterly way. Recent advances in Roentgen ray apparatus are outlined and illustrated. Dr. Salmon's paper on "Infectious and Contagious Diseases of Farm Animals and Their Effect on American Agriculture" is concluded. William Finn tells much that is interesting about the influence of sunspots upon electrical and magnetic forces of the earth. O. F. Cook's article on the Central American rubber tree is concluded. Mr. Walter J. Turney describes some interesting experiments with ultra-violet light and the electric discharge.

A correspondent suggests to us that some one ought to invent a movable cellar step which, when trod upon, will turn off a switch and thus extinguish all electric lights. There are undoubtedly so many careless warehousemen, that a device of this character could be readily introduced.