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The Editor is always glad to receive for examination 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.

"GOD'S WILL BE DONE—NOT OURS."

For the third time in the history of this Republic we are called upon to endure the unspeakable anguish of seeing a beloved President stricken in our midst by the hand of the assassin.

Lincoln! Garfield! and now McKinley! Surely the cup of our national sorrow has been filled to the brim.

It will not be given to many of us to look again upon the face of our martyred President; nor need we. In affectionate and reverent memory we shall carry the image of that face—so dignified, grave, gentle and sincere—and, carrying it with us, we shall realize with tender sorrow that there has passed out from our midst a leader, truly wise and great; one of whom posterity will repeat that his record is chronicled not less in the deep, personal love of his people, than in the lofty purpose and spotless integrity of his official life.

Particular pathos will always attach to this tragic event from the fact that it could scarcely have happened if the President had not so freely and trustfully mingled with the people, and exposed himself to that very form of death to which he fell a victim. "Of the people, by the people, for the people"—only once, surely was there a President who, so assiduously and with such evident sincerity, sought to keep in personal touch with the citizens of the workaday world. The promiscuous handshaking with the Chief Executive, for which no parallel exists in any other country, affords an unrivaled opportunity for the stroke of the assassin. In no other country would it be allowed, or, if allowed, be possible. To the American people, however, this custom is the expression of one of the most cherished traditions of their national life; and the fact, truly pathetic, that our beloved President has died a martyr to his zealous fidelity to this national observance will give an added luster to his memory, which will brighten with the lapse of years.

Alas! what more shall we say of him. As we look upon that poor, stricken form, we feel that to indulge in wordy panegyric would be to trifle with a sacred theme. To say that he was statesmanlike, sagacious, patient, broad-minded, conscientious, lovable, and supremely patriotic—in a word a Christian and an American—and that his character was rounded out by an unaffected and all-pervading humility, is to summarize but a few of the public and private virtues which will cause posterity to proclaim him, as we do now, one of the most illustrious and beloved Presidents on the roll of the American Republic.

For seven long days the American people have watched by the bedside of their President; and, now that the end has come, they join with him in those last words, so characteristic of the man: "God's will be done—not ours."

PROPOSED REMODELING OF THE CROTON DAM.

The mere suggestion that there are serious defects in the design of the great Croton Dam will come as a surprise to those who are conversant with the history and character of this famous structure. The dam, although not the longest, is the loftiest in existence, and in all the history of similar structures there has been no parallel to the enormous amount of excavation which has been necessary before a reliable rock foundation could be secured. The greater part of the dam is of solid masonry construction, and its cross-section and the first-class nature of the work are such as to place its stability beyond the shadow of a doubt. Unfortunately, considerations of economy led to the construction of about 400 feet of the dam on a system which, while it was favorable as to cost, was, to say the least, doubtful as to stability and per-

manence. The solid masonry structure gives place, on the southerly 400 feet of the dam, to an earthen embankment with a thin, vertical, masonry, diaphragm in its center. While many earthen dams of this character have been built and are giving good service, there is no record of the system being used on a work of the great size and importance of the Croton Dam. Moreover, it is considered that the abrupt transition from the solid masonry to the composite structure introduces elements of risk which might lead to ultimate failure. The engineer in charge of the work, in recommending to the commissioners that an expert board of engineers be appointed to examine the dam, and report upon the desirability of carrying the masonry structure entirely across the valley, is evidently prompted by the same misgivings which many engineers have felt regarding the dual system of construction ever since the plans were first made public; and we are of the opinion that the consequence of failure in the way of a water famine would be so serious a matter to New York city, that the few months' delay, and the increased expenditure of half a million dollars involved in the requested change, should not be allowed to stand in the way for one moment. The expert commission consists of three well-known engineers, and is presided over by Mr. J. J. R. Croes, president of the American Society of Civil Engineers. The findings of this body will certainly be awaited with no little interest by those who realize the vast interests which are at stake in the present discussion.

A GREAT SALVAGE FEAT.

The recent arrival and departure from this port of the American Line steamship "Philadelphia" marks the successful climax of a feat of salvage which is in many respects the most remarkable ever achieved. It will be remembered that two years ago the steamship "Paris," while on her way from Cherbourg to New York, ran upon the dangerous submerged rocks on the south coast of England known as the "Manacles," where she remained, hard and fast, and exposed to the full fury of the Atlantic storms for a period of several months. She was finally floated by a German salvage company and towed to the shipyards of Harland & Wolff at Belfast. The constant pounding on the rocks destroyed a large section of her double bottom, and it was decided that the repairs should include a thorough reconstruction of the vessel. Advantage was taken of the opportunity to give her a complete set of new engines and boilers, besides thoroughly overhauling and renovating the ship from stem to stern. The external appearance of the "Philadelphia," as she is now named, is changed by the substitution of two smokestacks in place of the three she formerly carried. The stern also has been remodeled and considerably widened in the region of the propellers, so as to bring the latter entirely inboard.

The underwater changes consisted of the thorough reconstruction of the double bottom, the insertion of new keel, bilges, and frames where required, and the carrying out of the plating of the hull around the propeller shafts so as to form complete tunnel ways extending to the boss of the propellers. Quadruple-expansion engines have taken the place of the old triple-expansion, and a complete battery of new boilers has been installed. The present horse power of the vessel is 20,000, as against the old indicated horse power of 18,000, and when the engines have worn down to their bearings it is intended to drive the vessel at a sustained sea speed of 21 knots an hour. The best day's run on her maiden trip, when the engines were not pushed, was 19.9 knots an hour. The first and second cabins have been decorated with hardwood and embossed leather, and the removal of one of the three smokestacks and other structural changes have increased the passenger accommodation, and have brought the "Paris" up to the full pitch of excellence of a modern, first-class transatlantic liner. Those who saw this handsome vessel steaming down the harbor found it difficult to realize that only two years ago she was lying an apparently hopeless wreck upon the rocks of the English coast.

CANAIGRE GROWING IN THE UNITED STATES.

There is every indication that the world's supply of tannin is destined shortly to be derived from a new source. The substances which are used comprise mostly oak and hemlock barks, gambier, sumac and their extracts. Last year 136,284 tons of tannin material were consumed in England alone, while in the United States the consumption was about 1,500,000 tons. With the increase in the demand for leather, the accessible supply of tanning substances has not kept pace, and both practical tanners and men of science have been searching not only the vegetable kingdom, but also the domain of chemistry, to discover new ways of producing tannic acid. This has at last been discovered in canaigre (*Rumex hymenosepalus*). Canaigre is a corruption of "cana agria,"

or sour cane, by which the plant is known to the Mexicans. The plant is an annual, being planted and harvested in the crop form, and is, therefore, not subjected to slow growth as a tree. It is a bulb or tuber akin to the potato or dahlia, growing under cover of the earth and sending up a stalk and mass of leaves to a height of from 15 inches to 3 feet above the surface. It is a remarkable root in appearance, and it is indigenous to the arid plains of New Mexico, Arizona and California. The Agricultural Department in 1878 analyzed the root and noted its large percentage of tannic acid. This resulted in the shipment of a quantity of the roots to Germany. It was found that they arrived in more or less fermented and spoiled condition. Subsequently the roots were sliced and dried, and they now reach their destination abroad in excellent condition. In time the shipment amounted to 800 carloads. The roots contain 35 per cent of tannic acid.

The next step was to extract the tannic acid from the roots and ship the extract instead of the roots. Canaigre is now regularly cultivated, and in the current number of our SUPPLEMENT will be found a most interesting illustrated description, showing the roots in cultivation and the gathering of the wild canaigre. The article is from the pen of Mr. J. E. Bennett.

RAPID DEVELOPMENT OF WIRELESS TELEGRAPHY.

The recent successful transmission of wireless messages to and from the steamship "Lucania" when she was yet 200 miles from the port of New York, brought home vividly to the people of this city the fact, perhaps too little recognized, that the new system is commercially a marked success and a decided contribution to the safety and convenience of modern ocean travel.

The history of practical wireless telegraphy commenced, as far as this country is concerned, with the International Yacht Races of 1899, when, thanks to the enterprise of The New York Herald, the hourly position of the yachts was reported from the race-course off Sandy Hook to this city, and forwarded thence throughout the whole world. The necessary apparatus was fitted on board the steamer "Grande Duchesse," and the messages transmitted from the vessel were taken up by the wireless station on Navesink Highlands, whence they were sent over the ordinary telegraph wires to the office of the Herald. No application of wireless telegraphy of any great importance had been made in this country since 1899 until the recent installing, under the same auspices, of a station on the Nantucket Shoals lightship for the purpose of communicating with incoming ocean steamers. The Nantucket lightship is stationed about 40 miles south from Siasconset on the island of Nantucket. At the highest point in the village is a mast which carries 180 feet of vertical wire, the receiving and transmitting instruments being located in a cottage near the base of the mast. Aboard the lightship is a vertical wire 106 feet in length and the necessary instruments to complete the installation. With this apparatus it was found possible to communicate with the steamship "Lucania" when that vessel was 72 miles east of Nantucket, and within half an hour after the lightship was in touch with the vessel the ship was able to communicate with New York city, the distance from the "Lucania" to her destination being then approximately 200 miles. For several hours messages were exchanged between New York and the passengers on the ship, who were able to obtain a summary of events which had happened since the ship received its last wireless communication from the Irish coast at the commencement of the voyage. The successful carrying out of this experiment has the immediate result of lessening by more than half a day the period of time during which a transatlantic steamer is cut off from communication with the outside world.

Considering its revolutionary character, the success of wireless telegraphy has been unusually rapid, for it was only as recently as the summer of 1896 that Marconi, then but twenty-two years of age, landed in England in the hope of interesting the government in his invention and having an opportunity to demonstrate on a large scale its practical value. Thanks to the instant appreciation and encouragement of some of the leading electrical experts of that country, Marconi was able to make the necessary experiments on a large scale, and in the year 1898 he succeeded in dispatching a message over a distance of 34 miles between two points in England. It was not until March of the following year, when Marconi established communication across the English Channel, that the new system attracted the attention of the world at large and demonstrated its great commercial possibilities. Subsequent developments have included the successful transmission of messages between warships at sea and between merchant vessels and the shore; while the range of the system has grown so rapidly that in June of this year messages were exchanged between two stations in England which were 223 miles apart. Although

Marconi has always been extremely conservative in his estimate of the range to which his system may be extended in the future, the rapid increase in distance covered which has taken place in the past twelve months gives hope that the limit is far from having been approached.

THE NEW FRENCH LINER "LA SAVOIE."

So rapid is the increase in the fleets of the great transatlantic companies that the advent of a new, first-class vessel ceases to cause the decided sensation which marked the arrival of such a vessel only a decade ago. This falling off of public interest is not due to any decrease in the size, speed or appointments of the modern liner, but merely to the rapid succession in which the new vessels make their appearance in New York Harbor.

Of recent years all the leading companies have added to their fleets, either singly or in pairs, high-speed vessels which have been a great advance upon any previously owned by these lines. First came the "City of Paris" and the "City of New York," of the old Inman and International Line; then followed the "Teutonic" and "Majestic," of the White Star Line; the Cunarders "Campania" and "Lucania;" the North German Lloyd "Kaiser Wilhelm;" the White Star liner "Oceanic," and the Hamburg-American "Deutschland." The latest pair of crack ships to sail for New York are the "Lorraine" and "La Savoie," of the Compagnie Générale Transatlantique. The first-named made her maiden trip to this port last year, at which time she was described in our columns. The sister ship, "La Savoie," has just completed her first round voyage, and has taken her place in the front rank for speed, by crossing the Atlantic at an average of 21½ knots an hour, her speed developed on trial having been more than a knot greater than this.

The vessels of this company do not reach the great proportions of those of the German and English lines, and this simply for the reason that the capacity of the port of Havre, both in respect of depth of water and dock accommodations, puts a limit both upon draft and length. As a matter of fact, "La Savoie" has the largest dimensions that can be accommodated at the French port, as 5 feet more of length and a foot or two more of draft would shut her out of the docks altogether. "La Savoie" is 580 feet in length over all; 60 feet in beam; she has a depth of 39.6 feet; there are six decks, and she is built with sixteen transverse and one longitudinal watertight bulkheads. The motive power consists of two sets of triple-expansion engines, each engine having one high-pressure, one intermediate, and two low-pressure cylinders. The shafts are of nickel steel; the propellers measure 21 feet 5 inches in diameter and are three-bladed, the blades of bronze and the hubs of cast steel. On the trial trip "La Savoie" developed over 22,000 horsepower, and attained a speed of over 22½ knots an hour. The displacement of the vessel is 15,300 tons. There is accommodation for 446 first-class passengers, 116 second-class, and 400 third-class. The dining rooms, both first and second-class, are located on the main deck, and the smoking rooms on the promenade deck. The passenger accommodation includes many novel features, the most striking and commendable of which is that every stateroom has at the head of the bed a telephone communicating directly with the steward's room. This is a step in the right direction which will commend itself to all who have had any experience in ocean travel; it remains for some company to introduce elevators in order to bring ocean travel literally up to the comfort and convenience of first-class hotels on shore. That important feature of the modern liners, the decoration, has been carried out with the quiet taste which is characteristic of all French work of this kind. The external appearance of the ship is decidedly handsome. She has a graceful sheer, and the location of the smokestacks and the masts has evidently been determined with an eye to giving a well-balanced effect in a broadside view of the vessel.

GERMANY'S COMMERCIAL DEPRESSION—ITS CAUSES AND EFFECTS.

The British Foreign Office has received from its Consul-General, Mr. Francis Oppenheimer, at Frankfurt-on-Main, an interesting and exhaustive report dealing with the commerce and trade of Germany. Therein the Consul gives an elaborate résumé of the remarkable and rapid progress of the country within the past few years, and its present unsatisfactory condition.

Germany's industrial progression started in the year 1894, and until 1900 continued with wonderful uninterruptedness. The demand for German articles was prodigious, and orders accumulated and increased so rapidly that the markets of the world were flooded with the products of German industry. Prices, however, remained normal, and the extraordinary sale of German goods was probably due to the low price. In 1900, however, occurred a famine in coal and iron, which constitute the fundamental bases of all indus-

tries. Considerable anxiety ensued as to what would happen, and several interesting debates were held in the Imperial Diet concerning the question. Public confidence, however, was restored, and a continuance of prosperity was anticipated.

The Consul-General advances two reasons for the justification of this opinion. "There has been," he states, "a remarkable increase in the number of industrial enterprises, the result of which was fresh and more work for great and small industries." The other reason resulted from "the formation of numerous syndicates." As this country is the land of trusts, so Germany is the country of syndicates. There is scarcely a ramification of trade the members of which have not combined for the regulation and control of prices, and even the quantity of output has been regulated by them. Protected by tariffs the syndicates have been enabled to inflate their prices to that limit which just renders foreign importation and competition impossible. Another means of preventing foreign competition is that the syndicates refuse to supply any customers who purchase similar articles from foreign manufacturers. The retailer must obtain all his goods from the home manufacturer, or be boycotted. The result of this industrial despotism is that the retailer is considerably limited in the choice of his source of supply, while the foreign competitor finds no market for his goods. Another serious phase of the situation is that the home retailer discovered that while he was paying tremendous prices for his goods, the same articles were being placed upon the foreign markets at a ridiculously low figure, which absolutely precluded the manufacturer from reaping any profit. In short, the retailer was not only paying dearly for his goods, but he was also paying for the loss that the manufacturers were incurring in the foreign markets.

Such a condition of affairs could have but one outcome. The inevitable result has ensued. The manufacturers, secure from foreign competition by the protective tariffs, have increased their prices to such an extent that now they have attained an unenviable and absolutely untenable position. The retailer refuses to pay the exorbitant prices, with the result that the demand has considerably decreased. The commercial depression which at first was considered to be only temporary in character has now developed into a matter of grave importance. In the early part of 1900 it was impossible to obtain sufficient labor to cope with the orders in hand. Now it is difficult to find adequate work for the laborers. Some industries, such as coal mining, are still fully occupied, but others, such as the iron trade, are experiencing serious times. The staffs are being considerably reduced, and wages are declining. Unless something unforeseen happens in the near future to revive the prosperity of the country serious situations will develop. The unemployed problem will become acute. The government has endeavored to save the situation by levying new tariffs and increasing old ones, but reprisals from other countries are promised if such drastic measures are enforced. And for all this the syndicates are entirely responsible. Had they not assumed such an intolerably despotic attitude no such crisis would have developed. Money has become so dear that it is impossible for any profits to be made. The first industry to suffer from this tendency was the building trade. Builders were unable to raise on mortgages at a rate that would leave them even a small margin of profit. The result was that work in this line came to a standstill. Cessation of work in this trade affected the iron, glass, cement, stone, and cognate industries. Once the canker set in it has rapidly spread, and all efforts to stem the tide of depression have so far been completely nullified. The public have now painfully realized that the syndicates have failed to bestow those benefits which for times of trouble had in theory been anticipated, and their power and influence on the markets is now regarded more as an evil rather than a blessing.

The Consul-General opines that the high-water mark of German prosperity has been attained not by chance, but systematically and scientifically, and he states that Germans may well be proud of what they have achieved in comparatively so short a span of time. He advances, however, a word of warning. The increase of the tariffs will result in the absolute exclusion of the foreigner, while the syndicates will take immediate advantage of the augmentation of the customs to increase their prices. The British exporters have felt the effect of the tariff considerably, but they are now surmounting the difficulty in the only possible manner, and one that is likely to affect the syndicates very severely. Several British manufacturers who cannot manufacture their goods in England to sell them profitably in Germany are establishing branch works in Germany. They can there compete with the syndicates upon their own ground and upon the same terms. The English manufacturer now undersells the syndicate at a price which is highly profitable to himself, and since he has to recoup no losses incurred by forcing another or foreign market, it cannot be described as unfair competition. Already several British firms

have branch works in Germany, and, owing to the success that has attended this policy, several other firms who have hitherto had an extensive trade with Germany, but which has been killed through excessive tariffs, are emulating their efforts. When this competition becomes sufficiently powerful the syndicates will experience serious times and will eventually be crushed. The English firms may suffer somewhat in the output of their English factories owing to the establishment of such branch works, but it will enable them to direct their attention to new markets, where there is no opposition by heavy protective tariffs.

The Consul-General strongly condemns the policy of organizing industries into syndicates or trusts. The home country must be the sufferer in the long run, as Germany has now found out to its cost, and eventually such combinations will be killed, and the home trade pass more completely into the hands of the foreigner.

SCIENCE NOTES.

A deposit of prehistoric ivory has been discovered in Alaska.

M. Deutsch, the donor of the hundred thousand francs prize for the aeronaut who succeeds in making the trip from St. Cloud to the Eiffel Tower and return in thirty minutes, is considering the advisability of modifying the original conditions, owing to the danger of maneuvering over Paris. The line of route may be changed so as to go around Mt. Valerian, starting and returning to St. Germain, Paris.

J. B. Nagelvoort has recently stated (Nederl. Tijdsch. v. Pharm.) that colchicum flowers contain as much as 0.1 per cent of colchicine, which is nearly ten times as much as has been hitherto found. Since, however, he has merely relied upon color reactions for the alkaloid, and does not appear to have determined its melting point, the statement must be accepted with reserve, since the purity of his alkaloid is open to question.—Pharm. Zeit.

The Colorado Cliff Dwellers' Association is making every effort to preserve the ruins which lie on the Mesa Verde, in southwestern Colorado. There are from three hundred to four hundred cliff dwellers, including the cliff palace on this Mesa. As these ruins are in the Ute Reservation, the state and national government does not have any direct control over them. A ten years' lease has been obtained by the association from the Ute chiefs. The Secretary of the Interior has ratified the lease, and the association now has charge of the ruins. A toll road will be established, and the money received will go in part to pay for the rent which the Indians receive and also to keep the ruins from weathering and to protect them from vandals.

H. Causse has previously stated that contaminated waters have the property of restoring the color to Schiff's reagent and of giving an orange color with sodium para-diazo-benzo-sulphonate. He now finds that pure waters will restore the color to hexamethylene rosaniline decolorized by sulphurous acid, while polluted waters give no color with the reagent. The reagent employed is hexamethyltriamidotriphenylcarbinol, known commercially as "violet crystals." It is employed in the form of a 1 per mille solution in water saturated with sulphurous acid. One hundred c.c. of the water to be tested is placed in a stoppered flask, and 1.5 c.c. of reagent is added. If the water be pure, a violet ring is formed on the surface, which gradually permeates the whole liquid. Another quantity of the water is heated to 35 to 40 deg. C. in a stoppered flask for two hours, and then cooled; this, treated as above, gives the violet reaction, but much more intensely if the water be pure.—Comptes Rend., 133, 171.

An important and enterprising scheme which will do much to foster commercial relations between Russia and England is to be made by a number of Russian agriculturists and dairy producers. At the present time the major portion of the butter imported into England comes from Denmark, but a large quantity is also supplied by Russia. The latter country is now to attempt to obtain the monopoly in this supply. A direct butter trade between various parts of Siberia and England is contemplated, and to accomplish it a number of landed Russian proprietors and traders from various parts of the country are going to visit England to study the requirements of the English nation with regard to this commodity and other dairy produce. The deputation will be under the direction of Prince Sherbatoff, president of the Moscow Agricultural Society. They will visit farms, dairies and cattle-breeding establishments in England, so as to become thoroughly familiar with the English method of farming and to carry out the same schemes as far as practicable in their own country. By this means the trade relations will be considerably improved between the two countries, and it will lead to a larger demand from Russia for English agricultural machinery.