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NEW YORK, SATURDAY, MARCH 11, 1905.

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.

A PORT ARTHUR MYSTERY EXPLAINED.

Thanks to the courtesy of the officers of the Port Arthur fleet, one of whom devoted a whole morning of his brief stay in New York to an interview with the Editor, we are enabled, in the present issue, to answer, in great detail, a question which was uppermost in the minds of most of us during the various operations of the Russian fleet at Port Arthur. We refer to the fact that ships which had been torpedoed or mined, and were, therefore, supposed to be out of the fight for good, would reappear, apparently in good fighting trim, in an incredibly short time after the various disasters. It was known that there was but one drydock available at Port Arthur, and that it was not large enough to admit more than one vessel at a time. By what magic then, we asked, were these awful injuries repaired, and the prognostications of experts, naval and amateur, as to the supremacy of the torpedo so rudely set at naught?

The answer to this question, as given in the article published elsewhere in this issue, will possess a fascinating interest, particularly as this is the first time that the facts have been made known to the world. Moreover, the story, coming as it does direct from some of the chief participators in that wonderful naval and military struggle at Port Arthur, is not without a touch of true dramatic interest over and above that due to its technical features. Throughout the course of the war we have recorded, either by pen or picture, every event of leading importance as it transpired; but necessarily this record has been chiefly a story of the successes of the Japanese fleet. It gives us, therefore, much pleasure to present this authentic account of the magnificent effort made by the officers and men of the Russian imperial navy to retrieve the disaster that fell upon them on that memorable night of the 8th of February, 1904.

PROPOSED MANHATTAN LOOP FOR BROOKLYN ELEVATED ROADS.

That the whole system of transportation in the city of Brooklyn is in a wretched state of inefficiency goes without saying. The tracks are rough, the cars, which are too light for their work, are poorly heated, and their motors are of insufficient power for modern requirements. The service on every line, surface or elevated, is altogether inadequate, and on every possible point of comparison the system is years behind that which can be found in many smaller cities of America that do not compare in extent and population with Brooklyn. The most important duty that the Brooklyn lines perform, or rather fail to perform, is that of getting the busy toilers to and from their work on Manhattan Island with some degree of dispatch and comfort. The B. R. T. which, being interpreted, stands for Brooklyn Rapid Transit, is a vast combination of several ill-assorted and unrelated street and elevated roads, upon which the unfortunate Brooklynite is dependent for his means of getting about. For various reasons, which do not come within the province of a technical paper like the SCIENTIFIC AMERICAN, this B. R. T. is in a state of poverty and disrepair which is a disgrace to New York city, and must be seen to be appreciated.

We said that the chief duty of the B. R. T. is to get the Brooklyn toiler to his work and back again, with comfort and dispatch. He is brought in; he is taken back; but not with comfort and dispatch. Rather is he herded, driven, loaded, and unloaded, under conditions as to space and air, and even cleanliness, which remind the writer forcibly of a certain half-hour when he stood pitifully regarding a herd of "dumb driven cattle" that were being unloaded at the Chicago stockyards. There is a saying among suburban railroad men that "the money is in the straps." Judged on this basis, the B. R. T. should be simply smothered in wealth; for at certain hours of the day a strap is a luxury so scarce on a Brooklyn car as to provoke a competition for its possession, only less strenuous than the headlong rush to secure a coveted seat.

There are many causes that contribute to this transportation fiasco. One of these is the fact that each of the two bridges across the East River is a terminus, and that there is no connection whatever between them. The trains and cars that cross to Manhattan, unload and receive their hundreds of thousands of passengers at two separate centers which are not related either to each other or to the general system of transportation on Manhattan Island. It has long been recognized that the only sensible way to prevent the useless congestion at these two terminals is to connect them by a system of tracks, and thereby form a loop around which the trains can circulate, unloading or receiving their passengers at various points on Manhattan.

Just now there is a spirited controversy as to whether this loop shall be built by way of an elevated structure or a subway. It is the laudable wish of the Rapid Transit Commission to prohibit the erection of any more elevated structures, and build all future extensions of existing roads in subways. They would prefer to connect the two bridges by a subway below Center Street. The Brooklyn cars would then cross the East River by one bridge, pass down by a four per cent grade into the Subway, and return by the other bridge, thence making the circuit of their various routes on Long Island.

To this scheme the Brooklyn Rapid Transit Company is unalterably opposed, being in favor of the connection of the bridges by an elevated structure over the same route proposed by the Rapid Transit Commission. Although it is not so stated, the B. R. T. objection is based upon the facts (well known among railroad men) that the equipment of the Brooklyn elevated roads is unsuitable for use in the Subway. The majority of the cars are too light, weighing much less than the heavy Subway cars; they are not fireproof; and their electrical outfit, motors, wiring, etc., if it used the higher tension current with which the Subway is equipped, would be liable to constant short circuits and danger of fire. On the other hand, if the B. R. T. were equipped with heavier cars to match the Subway electrical installation, it would become necessary to strengthen the whole of the Brooklyn elevated structures. Hence the use of the proposed Subway loop by the B. R. T. would necessitate an outlay altogether of from $7,000,000 to $10,000,000. Of course, the very best thing to do at present would be to build the Subway, and make the necessary improvement in the rolling stock and elevated structures of the B. R. T.; but this company is (or claims to be) so impecunious as to be quite unable to face the outlay. All things considered, we think that in the present dilemma, the suggestion made at the last meeting of the Rapid Transit Commission is worthy of at least careful consideration. It was proposed to build an elevated structure between the two bridges, with the understanding that it is to exist only for a period of five years, during which it would be leased by the B. R. T. At the end of that time the proposed Subway loop beneath the East River and through certain districts in Brooklyn will be in operation. By this time, also, it is to be hoped that the B. R. T. will have recuperated to the extent of being able to bring its equipment up to the level of that of the Rapid Transit Subway in New York.

NEW EXPERIMENTS IN TURPENTINING.

The old system of boxing southern pine trees for the production of turpentine and resin has very greatly reduced the pine timber wealth of the Southern States. Three years ago the Bureau of Forestry determined that something should be done to eliminate so destructive a method of procuring naval stores. Its three years of experiments toward this end have demonstrated that a new system of turpentining, which requires the use of earthen cups and metal gutters, not only greatly conserves the life of the timber tapped, but also gives an increased yield of resin, and therefore a greater profit than is possible by boxing. The box method and the new cup and gutter system of turpentining are fully described and illustrated in Bulletin No. 40 of the Bureau of Forestry.

While the new system is not yet in use by all turpentine operators, its application is extending as rapidly as the necessary equipment can be secured. At present there is but one company supplying the kind of cups and gutter iron required. It is hoped, since the demand for this material is very great, that in the near future the supply will be sufficiently increased to enable turpentine operators to procure the needed equipment.

While, in the work just completed, the Bureau of Forestry has performed an important service to the turpentine industry, it feels that a still more conservative method of turpentining can be found which, consistent with a maximum yield of turpentine, will inflict the smallest possible injury upon the trees. With this in view, the Bureau has begun an entirely new line of field experiments, in order to determine to what extent the wound now made in tapping the trees can be lessened.

The principal experiments now set on foot comprise the practical working of a number of different turpentine crops. One set of trees will be used to determine the best width of face to be cut on trees of different diameters.

Another set of trees will be used to demonstrate the rate in height at which weekly chipping should proceed, in order to stimulate a full flow of resin. It is believed that the weekly chipping now practised cuts away in height, at one time, too much of the living wood. At present this upward chipping amounts to about 18 inches every year, and it is thought that this can be reduced at least one-half or two-thirds. Such a saving in face height will permit a considerable increase in the number of crop years, which should give a much increased total yield of resin, as well as reduce the demand upon the area of pine forests. There will also be an economy for operators in not having to move their equipment from one set of trees to another as frequently as is the case at present.

Still another set of trees will be devoted to finding out how deep toward the center of the tree each streak should be chipped. Under the present practice, it is believed that an unnecessarily deep cut is made, thereby greatly reducing the vitality of the tree and consequently its capacity to produce resin.

WIND PRESSURE ON BRIDGES.

Referring to our recent discussion of the question of the proper amount of wind pressure to provide for in bridges, a correspondent draws our attention to the fact that no mention was made of the extra surface which is presented to the wind when a train moves onto a bridge. He asks whether this surface should not always be taken into account, and its effect provided for in calculating the wind stresses on any given span. Our correspondent is entirely right in supposing that allowance should be made for train surface, and indeed this is always done. It was not our intention, in the article referred to, to cover the whole question of wind pressure, but merely to draw attention to the fact that the unit pressure adopted has been unnecessarily large, and to give the process of reasoning by which our engineers have arrived at the lower figure which is now likely to be generally adopted. It is probable that in the early days of bridge designing, no account was taken of the great increase in the area of a bridge which takes place when a train, or even a large number of horse-drawn vehicles, is crossing a bridge. The proportion of the train surface to the bridge surface, and consequently of the strains due to each, will of course be very much larger in the shorter spans. In the longer bridges the proportion will rapidly decrease; but it can never reach a point, even in a structure of the length of the Brooklyn or the Forth bridge, at which it becomes a negligible quantity. There can be little doubt that it was the increase of surface due to the entrance of the passenger train upon the big spans of the Tay Bridge, that was the immediate cause of their being blown bodily sidewise into the river.

STUDIES OF THE FOOD VALUE OF FRUIT.

At the University of California, Prof. M. E. Jaffa has carried on, in co-operation with the U. S. Department of Agriculture, a number of investigations which have to do with the food value of fruits and nuts, the special object of this and the earlier work which it continues being to study the value of such foods when they constitute an integral part of the diet.

Nine dietary studies and 31 digestion experiments were made, part of them with persons who had lived for a number of years on a strictly fruit and nut diet, and others with university students who had been accustomed to the ordinary fare. In the majority of the dietary studies and all but one of the digestion experiments fruit and nuts constituted all or almost all of the diet. Thus, in one series of tests the daily ration consisted of apples and bananas, alone or in combination, eaten with walnuts, almonds, Brazil nuts, or pecans. In other experiments different combinations of grapes, pears, figs, walnuts, and other fruits and nuts were eaten with small quantities of milk, cereal breakfast foods, etc., the latter articles being taken simply to give a relish to the experimental dietary combinations, some of which were rather unusual.

In connection with this work the nutritive value of individual fruits and nuts was studied and many data were collected and summarized regarding the composition and energy value of these materials, an interesting feature of the work being a comparison, on a pecuniary basis, of these and some common foods as sources of protein and energy. In general, it may be said that the chief nutrients in fruit consist of sugars and other carbohydrates and in nuts of protein and fat. In other words, while both fruits and nuts furnish the body with energy, nuts furnish some building material (protein) as well. Some idea of the range may be gained from the fact that at ordinary retail prices in the United States, 10 cents expended for fresh grapes will supply the body with about 830 calories of energy, and in the case of dried apples or apricots will supply about 1,200 calories, as compared with 6,600 calories from 10