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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.

THE LOCK-AND-LAKE CANAL APPROVED.

Our prediction that the Commission of Engineers which accompanied Mr. Taft to the Isthmus would report favorably on the present plan and construction of the lock canal at Panama, will in all probability be verified. Without exception, the reports which have been cabled from the Isthmus since the arrival of the Commission speak in the highest terms of the present condition of the work, and indicate that the expert engineers, after carefully looking over the ground and examining the reports of sub-surface investigation, are agreed that the canal will be finished by the date, January 1, 1915, which has been set by Col. Goethals and his assistants. As a matter of fact, if each of these half dozen highly-paid experts had remained in his own office in the United States, and there received the full plans of the work, the detailed reports of the several division engineers, and the samples of the material brought up by the borings, they would probably have made just as competent a report, and fully as favorable, as they will now turn in after walking over the ground in person.

However, it is possible that a few people have been disturbed by the intentionally misleading criticisms of the canal, which have been made in the public press; and the fact that this Commission has walked or ridden over the ground, will, no doubt, give an added amount of reassurance, when their final report is made public. Let us hope, however, that this is the end of the creation of special commissions to visit and report on the canal. Such expeditions are as costly as they are unnecessary. Either the army engineers are competent to build the canal, or they are not; their glowing reports of rapid progress and satisfactory conditions are either true or false. Everyone who is qualified to pass an intelligent judgment upon their work was satisfied, long ago, that they were both highly competent and that their reports were marked by scrupulous verity. We believe that the SCIENTIFIC AMERICAN voices the almost unanimous opinion of the people of the United States in its belief that Col. Goethals will complete the canal ready for opening on the day that he has named to the Commission.

CUBA'S DEBT TO OUR ENGINEERS.

For more reasons than one, it may be said that the improved conditions of the island of Cuba, as the result of American occupation, are due mainly to the American engineer. We say this without any disparagement of the most excellent work of an administrative character that has been done by the retiring Provisional Governor, Charles E. Magoon, whose genius for organization had been demonstrated at the Isthmus of Panama, before he assumed the difficult duties of his late office in Cuba. If we were called upon to name the directions in which American influence has been impressed upon the island with most immediate beneficial results, we would unhesitatingly name sanitation and transportation. By the cleaning up of the notoriously unhealthy city of Havana, to say nothing of other cities of less importance; by the brilliant work of our Army Medical Department in the extermination of yellow fever; and by the construction of railroads and highways, the United States has justified its political interference in the affairs of that sadly distressed country. The sanitary engineer has cleaned and repaved the streets, improved the water supply, and taught the Cubans how to dispose of sewage with the least possible risk to public health. The railroad engineers, under the leadership of that distinguished Canadian, Van Horn, have built a trunk line throughout the length of the island and equipped it with modern rolling stock; and now, under Governor Magoon, there has been constructed a complete system of macadamized roads of first-class quality, which not only includes a main artery running from end to end of the island, but provides at the proper intervals intersecting roads which extend from coast to coast, and serve to bring the whole island into touch with the inland towns and the cities of the seacoast.

Although it cannot be denied that our interference in the affairs of Cuba has brought certain valuable advantages to this country of a political and military character, our administration of the internal affairs of the island, and the fact that now for the second time we have voluntarily withdrawn from the active control of government, have been accepted both here and abroad as indisputable evidence of the sincerity and largely altruistic character of our relations with the island during the decade which has intervened since the Spanish war.

CONGRESS AND MILITARY AERONAUTICS.

In rejecting the bill for the appropriation of $500,000 for the purchase of balloons and aeroplanes for military purposes, the House of Representatives has given a serious blow to the development, in this country, of what we believe is destined to become, if it is not already, a most important branch of military operations. The failure of the bill to pass is due either to lack of interest or want of information; but probably to a mixture of both. To anyone who is conversant with the present state of the art of military ballooning as developed in France and Germany, it is evident that the matter is rapidly passing, if it has not already passed, from the experimental to the practical stage. For proof of this, we have only to refer to the fact that last year a balloon with a lifting capacity of 16 tons made a cross-country trip of 248 miles, during which, at times, a speed of 34 miles an hour was maintained; and that the machine which accomplished this feat was capable of carrying from fifteen to twenty people. Flights of approximately the same distance have been made by a smaller machine of the same general type, which has been developed in France. There are certain firms which stand ready to deliver war balloons, capable of carrying from six to eight people, and of making flights of from 200 to 300 miles at an average speed of 30 miles an hour. During the last year, moreover, an aeroplane made a continuous flight of over two hours, at a speed of 36 miles an hour, and other aeroplanes have made direct flights of nearly 20 miles, across country, at speeds of over 50 miles an hour.

The refusal of the House to encourage the development of military aeronautics will enable the foreign powers to gain a long lead over the United States, similar to that which they held at one time in naval and military affairs. We refer to that period, subsequent to the civil war, when the long neglect of our navy and coast defense, during a period of great development abroad, had not only placed our seaboard completely at the mercy of several European powers, but had even rendered us open to successful attack by the more ambitious of the South American republics. It has taken us over twenty years to bring our navy and our coast defenses up to a standard which is at all commensurate with our rank among the nations of the world; and it is well understood among naval and military men that an attack upon this country by a first-class naval power during the earlier years of this period of reconstruction must have inevitably spelled disaster.

It took Congress and the country at large a long time to realize that the building of battleships and fortifications is a matter, not of months, but of years; and that it takes years to enlist and drill the men, and educate and train the officers, to the point of efficiency at which they can get the very best results out of the war material which is placed in their hands. At the battle of Santiago, in 1898, out of every 100 shots fired, less than five per cent struck the enemy, and it has required ten years of training to raise the quality of our marksmanship to the average of sixty per cent of hits which now obtains.

Similarly, if the United States is content to sit back and let the foreign powers develop their fleets of aeroplanes and war balloons, and gain that experience in their manipulation which can come only by constant practice, it is liable to find itself in the same precarious condition as regards military aeronautics as existed in naval and military affairs during the period to which we have referred above. We have yet to make a serious beginning; and every year of neglect will count heavily in that future day, when, awakening suddenly to the true conditions, Congress begins to make lavish appropriations in the endeavor to remedy the supineness and neglect of the past. Aeronautics is a particularly difficult art. The navigation of the air, and particularly navigation for an offensive purpose, will make familiarity and long experience of even greater value than they are in the navigation and maneuvering of fleets and squadrons upon the high seas. It is our firm belief that in its refusal to grant the appropriation asked, Congress has lost touch with the attitude of the country at large.

THE HIGH-PRESSURE FIRE AUTOMOBILE.

The installation of a motor-driven hose tender for actual service test by one of the pioneer high-pressure fire companies in New York city is an event of considerable significance—not that automobile fire apparatus is particularly novel, for its use in both Europe and America is increasing rapidly, especially in the smaller cities, but because it indicates that in the conservative opinion of the fire authorities of New York city, who have too much at stake to risk premature experiments, it seems probable that the new heavy hose wagons can be handled more efficiently and economically by gasoline motors than by horses. The new high-pressure service renders available an adequate supply of water at the desired pressure at any hydrant in the protected district immediately after the receipt of the alarm at the pumping station. As soon as the firemen are at the scene of action and in position with their heavy hose, it is only a matter of time to quench a fire. It is necessary, however, that there should be no delay in transporting men and hose. If the motor wagon can get under way from the fire house, and carry as great if not a greater supply of the heavy hose and the crew of firemen more rapidly than the wagon drawn by three horses as ordinarily in use, it goes without saying that it works for increased efficiency, and that ultimately it must be adopted throughout the high-pressure district.

So far the motor wagon now in use has met the requirements not only under normal conditions, but with snow and ice on the streets. With a speed capacity up to 30 miles an hour, it has in many cases arrived at fires considerably earlier than the lighter horse-drawn apparatus. The reliability and freedom from breakdowns and repairs still remain to be demonstrated in actual use. In a few months the question of the general use of automobile apparatus in place of horses in the high-pressure districts of large cities will be definitely decided. This most recent fire department tender shows a great improvement on the large horse-drawn hose wagons added for the high-pressure service. It is larger and it has the same or additional hose-carrying capacity without the extreme width which made the maneuvering of horse-drawn wagons on narrow or crowded streets so difficult. It carries of course the turret nozzle or deck pipe, and shows a more practical arrangement of outlets for connecting hose lines, while its acetylene searchlight is available at night fires if needed as well as in running.

The new tender is without tools or appliances for coping with small fires or for entering closed buildings. This would seem a defect, in that the high speed of the motor tender will often bring it first on the ground at a small fire that may not require the heroic treatment of the high-pressure, or at a fire where a favorable position promptly secured by breaking or chopping into a building might enable an incipient blaze to be promptly suppressed. The high-pressure apparatus is really heavy artillery designed to deal with serious fires. It would seem to be a logical development to arrange for skirmishers, as it were, or firemen who could be carried to the spot on a special high-speed motor car fitted with extinguishers, chemical tanks, and a small amount of light hose, axes, door openers, and other tools, and possibly scaling ladders and ropes for the rescue of life, the general idea being to have the apparatus much more mobile and speedy than the modern ladder truck. This could precede the high-pressure tender with its heavy hose. If it carried an officer, he would be on the spot to direct the heavier apparatus as it came up. Thus time would be gained at a serious fire, not to mention the putting out of incipient blazes with a minimum damage by water.

THE NEW YORK MOTOR BOAT SHOW.

The annual Motor Boat Show under the auspices of the National Association of Engine and Boat Manufacturers will be held this year in Madison Square Garden, New York, from February 15th to 23d. Over 150 builders of marine engines and all kinds of pleasure craft will exhibit. Several of the most successful racing motor boats will also be shown. In this connection it is interesting to note that the racers "Standard" and "Dixie II," the latter of which won the Harmsworth Trophy in the international race in Long Island Sound last summer, will be sent to Monaco to contest in the international races there from April 4th to 11th. The "Dixie II" has been remodeled, while the "Standard" is a new boat designed by Clinton H. Crane, and fitted with a double-acting 6-cylinder engine and four magnetos.

Filling Mass for Wood Pores.—To 1 part each of oil of turpentine and siccative, add 1½ part of linseed oil varnish, ½ a part of oil of varnish and 5 parts of starch.