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THE PROPOSED INCREASE IN OUR NAVY.

It is announced from Washington that the House Naval Committee has recommended that an appropriation of over \$30,000,000 be made for the addition to our navy of four battle ships and fifteen torpedo boats. This would be double the amount of any previous naval appropriation.

The SCIENTIFIC AMERICAN has for many years realized that our national defenses, both on sea and land, were not keeping pace with our commercial growth. We have been favorable to such a reconstruction of both forts and navy as should enable our country to present an impregnable line of defense against the attack of any enemy or possible combination of enemies.

We have always felt, moreover, that such efforts of reconstruction should be directed toward this one single object of defense; and that the sums of money appropriated for this purpose should be distributed between land and sea defenses in such proportion as to secure the most effective results.

In view of the fact that we are a Republican and not an Imperial people, whose interests are domestic and not colonial, we have always felt that the sphere of our naval and military operations lay, or should lie, within our own shore lines, and that therefore our coast fortifications should be regarded as being practically our first line of defense; and that our navy should be considered as complementary to our land defenses, and should be designed strictly with a view to co-operation with the forts in our various roadsteads and harbors.

We have noticed with regret, and some measure of apprehension, that, while naval appropriations have been forthcoming at a rate that has created a complete modern navy in a few years' time, the land fortifications, which, as we have seen, should be considered as our first line of defense, have been practically neglected. So antiquated are the old fortifications, and so incomplete the new, that for purposes of co-operation with the navy they are of very limited value.

Now, in view of the foregoing considerations, we think the time has come for the government to bend its whole energies to bringing our land fortifications up to their proper strength relative to the new navy.

While fully appreciating all that has been done in the past, we cannot help thinking that the government has attacked the problem of national defense at the wrong end. If only a part of the money which has been expended upon the navy had been devoted to constructing a system of land defenses, this country would to-day have been impregnable against attack from the sea and would have possessed the nucleus of a very respectable navy besides.

The Endicott Board of 1885 devised a complete system of land defenses, which included every maritime city of importance. The total estimate for this scheme was about \$100,000,000. We have spent upon the new navy about \$110,000,000 up to date. If the above scheme had been carried out, there would now have been mounted at our various seaports no less than 1,576 guns of 8 inch caliber and upward, as against the present 136 guns in the navy, and 360 rapid fire guns against the navy's 187.

Such a comparison as this calls for no comment, further than to say that a gun mounted within the shelter of a fort is worth at least two mounted on the unstable and exposed platform of a ship's deck.

The arguments in favor of concentrating our energies upon our land defenses rather than upon our navy are both practical and ethical—these latter being based upon the spirit of our constitution and upon those broad principles which dominate our national life, and give us our strong national individuality.

The practical arguments were admirably classified by Senator Proctor in a recent speech before the Senate, and we give them in full:

First. That a proper system of land defenses will make our great cities safe from any naval attack.

Second. Such a system can be constructed for a sum many times less than the cost of a navy like the great navies of Europe, and for a sum that may reasonably be expended.

Third. Land fortifications are much more efficient for coast defense than a navy, and when once constructed are durable, cheaply maintained and easily strengthened.

Fourth. The defense of our cities cannot be left to the navy alone, however large.

Fifth. A navy that would equal the great navies of Europe is unnecessary, and its cost makes such a navy impracticable.

Sixth. A navy quickly deteriorates and is expensive to maintain.

Seventh. The construction of land defenses should always precede the building of a navy.

The ethical argument can be briefly stated by saying that when we have adequately provided for home defense, our duty in the matter of military and naval preparation is done. Our navy should be of such proportions only as are necessary for successful co-operation with the land defenses. Our naval programme should be laid down with strict regard to a home, as

distinct from a foreign—a Republican, as distinct from an Imperial policy.

Great Britain's navy, by way of example, has been called into existence by the exigencies of the defense of an empire whose widely scattered colonies bring her into hourly danger of conflict with any one of a dozen different governments. The secret of the strength of our great republic lies not merely in the political and geographical union of its many States beneath one flag and within a single boundary line, but also in the fact that it has been both able and willing to concern itself with its own internal development, and has in the past and we hope it will in the future carefully abstain from embarrassing entanglements with the affairs of other peoples and nations.

The building up of a navy of European proportions would be a distinct departure from the national traditions above mentioned, and would involve the entering upon a policy whose execution would be as exhausting to the national treasury as its principles would be opposed to the spirit of our constitution, and subversive of the brightest hopes of its founders.

WEATHER TESTS ON THE NEW YORK UNDERGROUND TROLLEY ROAD.

In our issue of February 22 we gave a fully illustrated description of the underground trolley system now in operation in New York, and stated that it could not be called experimental in the usual sense, as the line was in daily operation and gave the greatest satisfaction. Nevertheless, there are some engineers who have claimed that, though the open conduit might stand the trial of ordinary weather, it would inevitably break down under the attack of a heavy storm of snow and rain. Such a trial was had on Monday, March 16, when a total fall of ten inches of snow was recorded; and the way in which the Lenox Avenue road endured this supreme test proves that the conduit system, as carried out in New York City, is a distinct success, even under the most trying conditions.

It commenced snowing at noon on the previous Sunday, and continued to snow more or less for twenty-four hours; the total fall being ten inches. During Monday afternoon the snow gave place to rain and sleet, and the streets were soon deep in a heavy slush. On Tuesday the rainfall was exceedingly heavy, and this, combined with the rapidly melting snow, put a heavy tax upon the surface drainage system of the city, and incidentally upon the cable and electric conduits of the Metropolitan Company.

The operation of the Lenox Avenue and Lexington roads was carried on throughout the storm without a break. There was no short circuiting, nor any delay that could be attributed to failure of the purely electrical part of the plant. The large amount of surface drainage was carried off without inconvenience; and the water in the conduit was never high enough to threaten the insulation, or in any way interfere with the current.

There are twenty-one cars on the Lenox Avenue line, and they were all in constant operation; nineteen of them running on the regular service and two of them acting as snow sweepers.

The full number of trips was made, and the time that was lost on each trip was due entirely to the slipping of the wheels, and to the increased resistance due to the deep snow. As soon as the electric sweepers had cleared the track the regular schedule time was maintained.

The seven cars on the Lexington Avenue line had a trying experience throughout the whole of Monday. Owing to the scarcity of sweepers, the tracks were not cleared, and the tracks were covered with four or five inches of slush. In spite of this, schedule time was maintained, and there was not a case throughout the whole storm of a "grounded plow."

The Lenox Avenue cars are run under a two and one-half and three minute headway, and the actual running speed is about ten miles an hour. That this service should have been maintained under such trying circumstances for the greater part of forty-eight hours without any breakdown or apparent distress, either in the power house or on the line, is a fact well worthy of record; and the advocates of the open conduit system will write the item down in red ink in their note books.

THE GOVERNMENT TESTS OF THE STRENGTH OF TIMBER.

When the government determined to undertake an exhaustive series of tests of the strength of native American woods, the fact was received by builders and engineers with much satisfaction. It was realized that the publication of the results of these tests would fill a long felt want.

The United States are rich in all kinds of timber, and especially in those woods which are suitable for structures which have to carry heavy loads. The great pine and fir forests of the extreme Northern and Southern States, with those that clothe the lower slopes of the Cascade and Rocky Mountains, have contributed to our agricultural and commercial development to an extent that is little understood. Without the cheap and abundant timber with which the pio-