

Scientific American.

ESTABLISHED 1845

MUNN & CO., - - - EDITORS AND PROPRIETORS.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, - - NEW YORK.

TERMS TO SUBSCRIBERS

One copy, one year, for the United States, Canada, or Mexico \$3.00
 One copy, one year, to any foreign country, postage prepaid, £0 16s. 5d. 4.00

THE SCIENTIFIC AMERICAN PUBLICATIONS.

Scientific American (Established 1845)..... \$3.00 a year.
 Scientific American Supplement (Established 1876)..... 5.00
 Scientific American Building Edition (Established 1885)..... 2.50
 Scientific American Export Edition (Established 1878)..... 3.00

The combined subscription rates and rates to foreign countries will be furnished upon application.
 Remit by postal or express money order, or by bank draft or check.

MUNN & CO., 361 Broadway, corner Franklin Street, New York.

NEW YORK, SATURDAY, SEPTEMBER 30, 1899.

THE ARMS AND THE MAN.

In the opening days of the Spanish war, when the eyes of the whole world were bent with close attention upon the combatants, there were two questions in every one's mind, the answers to which were awaited with no little interest: Would the ships of the new navy of the United States, excellent as they appeared upon paper, stand the searching test of a sea fight, and would the officers and men, regarding whose tactical skill or amenity to discipline doubts were freely entertained abroad, prove equal to the exacting requirements of modern naval warfare?

The answer came earlier than it was expected and from a far-away and totally unlooked-for quarter. On that eventful morning of May the first, eighteen hundred and ninety-eight, the fortunes of war gave to Admiral Dewey the opportunity to declare that in the quality of its ships, in the daring and well considered enterprise of its officers, and in the deadly skill of its gunners, the United States had not fallen away from the splendid traditions of the past.

In discussing the arms and the man, it would be a gross injustice to that branch of the naval service whose field of operation is confined to the draughting-board and the proving ground if we failed to do justice to the excellence of the little fleet which carried Dewey through the famous battle of Manila Bay. In every case the ships from keel to truck were the product of our own ship-yards and gun factories, and in the flagship "Olympia" was represented one of the most successful vessels ever designed for our own or any other navy. With her powerful and well protected batteries, the high freeboard, and unusual speed, she embodied the characteristic features which have marked the later cruiser designs of our construction department. The other fighting ships of the fleet, though of an earlier date, and, therefore, not possessing such all-round excellence as the "Olympia," were marked by the distinctively American feature of heavy batteries, the "Baltimore" carrying four and the "Boston" two 8-inch, in addition to six 6 inch guns, the "Raleigh" one 6-inch and ten 5-inch rapid-firers, and the gunboats "Concord" and "Petrel" carrying respectively six and four 6-inch guns.

The hulls, engines, guns, mounts and ammunition were of American make, and had all been designed, built, and set afloat practically within the past ten years. Never, since 1883, when we began to build, had the material of the new navy been put to the test, and only the line and staff and the naval constructors knew just how much depended upon the verdict that would be rendered by the engagement of that early Sunday morning. The result was seen before the sun had reached its meridian, in the utter destruction of the Spanish fleet, and the silencing of the fortifications under whose shelter it fought, at the cost of practically no injury whatever to the American ships.

It is no reply to this to say that the enemy's ships were altogether inferior. Mere negative qualities in Montojo's fleet may have increased, but they did not cause the disaster. It was the positive excellence of our engines, the accuracy of our guns, the reliable quality of our shells, that rendered certain (other things being equal) the victory of Dewey's fleet over the combined sea and land forces of the enemy; and no ungenerous attempts to minimize the obstacles to be overcome can affect the significance of the results. The sunken ships and silenced forts of Manila Bay were a tribute to the material as well as the men of the American navy.

But, after all, it is the qualities of the man upon which the thought and sentiment of the American people are fixed in this hour of celebration. And in honoring Dewey by the present overwhelming outburst of enthusiasm, there is in the minds of the American people no intention to exalt the heroes of the far-away Pacific at the expense of those who won the decisive victories by sea and land at Santiago. The destruction of Montojo's fleet at the opening of the war was not one whit more complete than the annihilation of Cervera's squadron at its close—the blockade of Manila has its counterpart in the impene-

trable cordon which was drawn around Havana and Santiago; and the heroism of that midnight dash into the supposedly mine-strewn channels off Cavité found a worthy echo in the trip of the "Texas" through the mine fields of Guantanamo Bay and the matchless self-sacrifice of the "Merrimac."

In passing in procession down the long line of triumphal march, Dewey and the men of the "Olympia" represent all that is best and bravest in the American navy. Every great war has produced its popular hero, and in its desire to select some one man to play worthily the role of returning conqueror, the nation has turned instinctively to the gallant sailor whose brilliant campaign in the far-away Southern seas struck the keynote of victory at the very opening of the war, and whose masterly diplomatic control of the difficult situation created by that victory has marked him as possessing at once the qualities of statesman and soldier.

THE NATIONAL EXPORT EXPOSITION.

Wherever American manufactured products are known their excellence is recognized. The genius and ingenuity of mechanics trained in the workshops of the United States, where there is every incentive to the exercise of the inventive faculty, have produced machinery which has attained a world-wide celebrity and in many cases is the best obtainable. Likewise the finished products of various industries of the United States have obtained for themselves a commanding place in the world's markets. Our supremacy is shown in a very practical manner by our magnificent trade balance, which is proportionately increasing month by month. It is singularly appropriate that our entrance into foreign trade upon a large scale should be marked by some form of commemoration in this, the closing year of the century. The National Export Exposition at Philadelphia, which opened its doors September 14, is the first exhibition of its kind ever held in this or any other country, and is organized on broad and liberal principles, the object being to aid the American manufacturer to exhibit his products and to show him for comparison what is manufactured in other countries in the same line, together with the details of quality, quantity, and price, thus enabling him to study the markets of the world by viewing the collections gathered under one roof. Ample appropriations by Congress, the city of Philadelphia and the State of Pennsylvania, supplemented by generous contributions of the citizens of Philadelphia, provided money sufficient to carry out the plans of the projectors of the Exposition on a liberal scale.

The scheme of holding a national exposition of the manufactures of the United States specially suited for export was thought of by the officers of the Philadelphia Commercial Museum, and was first discussed publicly by a number of prominent citizens of Philadelphia in October, 1897. The ground was broken for the main building the last week of March of this year, and in less than six months handsome and commodious structures were reared, and every arrangement made for the opening of the Exposition.

Philadelphia is, perhaps, as good a location for such an exposition as could be wished for, as it is a city turning out over \$600,000,000 worth of manufactured products annually, and it is the seat of the Philadelphia Commercial Museum, which is in itself a unique enterprise. By this Exposition the country virtually challenges the world to produce articles as good and as cheap as those here exhibited, which vary from articles as small as a spool of thread to the largest locomotive. Our supply of raw material is unequalled, and our factories are splendidly equipped for manufacturing. The genius and activity of American engineers in designing and constructing these plants have been the wonder of foreign experts, and American workmen have wisely never opposed the introduction of modern methods or labor saving devices as they do abroad. Their characteristic energy, adaptability, and ingenuity, have advanced American manufactures and made it possible for us to export many lines of goods which, a few years ago, would have been considered to be out of the question. The workmen are better paid, better fed and clothed, and live better in every respect than their foreign brothers, and at the same time we are enabled for the aforesaid reasons to produce goods which, owing to their quality and price, sell without difficulty in the markets of the entire world. These facts are amply demonstrated by the Exposition, which, it is hoped, will begin a new era in the extension of American trade in foreign countries.

Other nations are constantly making plans to secure markets outside of their own dominions. While France, Belgium and Germany established schools in which to educate their active men for commercial supremacy, and while Great Britain and other Continental countries have opened bureaus for the systematic study of commerce and its relations to their manufacturing interests in foreign fields, the United States remained almost alone as the only country which took no steps to market her products outside her own dominion. Recently, however, the excellence of our goods became

recognized abroad, and the result has been a constantly increasing demand. The manufacturer found himself confronted by foreign trade requirements of which he knew but little, and it has been the pleasant duty of the Philadelphia Commercial Museum and our consuls to inform them as to these requirements, and to-day we have commercial experts all over the world, who are sending home reports for the benefit of our own manufacturers.

To supplement and complete this well-studied system for the introduction of American manufactures in foreign markets, it was necessary to take one further step; this was the development of a plan by which the buyers of American products in foreign countries could see for themselves our admirable methods of manufacture, the skill which we employ in making our goods and the superior materials which enter therein. To carry out this part of the work, the National Export Exposition was organized as it stands to-day, and now the foreign buyer can see a large and diversified exhibit of American wares, and it is gratifying to note that the governments of the whole world have been invited and a large number of delegates have been detailed to visit the Exposition and report upon it. Thus, the producer and the buyer from the four quarters of the globe will be brought together in close contact. It is not an international exposition but is intended solely to foster American trade. With this limitation the Exposition will admirably fulfill its purpose.

THE EUPHRATES VALLEY RAILROAD.

It is said that an English syndicate has secured the concession from the Sultan of Turkey to build a railroad through the Euphrates Valley to the Persian Gulf. If the scheme materializes, the railroad will run through the reputed site of the Garden of Eden. Biblical scholars have reasoned that this tract was in Mesopotamia, the district lying between the rivers Tigris and Euphrates, and if this is the case the railroad will traverse it. The project of building a railroad from Constantinople to the Persian Gulf was broached many years ago by the late Ferdinand de Lesseps, but his attempts were in vain. England and Russia have both tried to obtain a similar privilege. At last Germany received permission to build a railroad from a port opposite Constantinople to Angora, and the Anatolian Railroad was the result. The extension of this railroad from Koniah, first to Bagdad and thence to Bassora on the Persian Gulf, has been a pet scheme of Emperor William, and according to The New York Herald, the move which the English syndicate is now about to undertake is a result of the entente cordiale between the two countries.

To Great Britain it means a new and shorter road to India, as five days may be saved, and to Germany it means a new field for colonization and a good feeder for a road already in operation. The first year the Anatolian Railway carried three hundred carloads of wheat, the second year seven hundred carloads of cereals. The railroad has done much to alter the character of the country, to build up towns, to open factories, and bring good European colonists to cultivate the soil. One of the chief obstacles to the progress of the country has been the shiftless Turkish inhabitants, who did not wish to use modern tools and have not sufficient ambition to try to get rich. They will not sit in the seats in the railway cars, but squat on the floor, so that at last it was necessary to take out the seats and leave the passenger coaches almost like cattle cars. The sparse population of the district through which the railroad runs is an advantage for the new comers from Europe, who have no difficulty in finding all the land they require.

The climate of the different parts of Asia Minor and Mesopotamia is so varied that the greatest variety of products can be raised successfully in different parts of this broad domain.

THE MAUSER PISTOL.

Dr. J. D. Griffith, of Kansas City, has just completed for the government an official test of the Mauser pistol in use by the German calvary, and it is under consideration for adoption by the United States. The test was made with targets and human bodies, and the results were most satisfactory. At ranges from 50 to 500 yards the Mauser pistol is the most effective and deadly weapon of its kind ever invented, and up to the maximum range tried it is practically as good in the hands of a marksman as a Krag-Jorgensen, a Lee or a Mauser rifle. If nothing but flesh resists the passage of the bullet, it makes a round incision where it enters and a knife-like cut where it departs. Should a bone be in the way it is often shattered into fragments. The pistol shoots very accurately and will kill at a range of 500 yards. The bullets pass through a human body at that range. If the bullet should enter a vital organ, it would undoubtedly kill a man instantly, and would incapacitate a soldier if it struck a bone. The pistol fires ten shots without reloading, and can be emptied in less than three minutes. The bullets weigh 85 grains and have a lead core surrounded by a nickel-plated copper jacket.