

sulted in sufficient shock to disable a submarine boat within a radius of 30 feet. The drawbacks to the scheme, however, were that the pole was shattered into fragments, at every discharge of the torpedo, while the torpedo boat destroyer itself also sustained a severe shock. Although various other contrivances have been tried, the outrigger torpedo and pole have proved to be the most feasible means for fighting the submarine. The experimental staff has now devised a new and stronger pole, which withstands the shock of the torpedo when detonated, but at the same time allows it to be fired with full effect. A series of trials with the apparatus has been carried out at Portsmouth in connection with a torpedo destroyer, and no ill effects were experienced upon the vessel during the discharge of the torpedo. So satisfied is the Admiralty with the apparatus, that it is to be generally adopted in the British navy.

#### THE UNITED STATES AND THE METRIC SYSTEM.

Despite the many efforts periodically made to abandon a system long since discarded by every civilized country with the exception of Great Britain, we still cling with Anglo-Saxon stubbornness to the yard, although it hampers us in our trade and complicates our methods of computation.

The most recent agitation in favor of a more rational system takes the form of a bill now before Congress, the purpose of which is to authorize the adoption of the meter by the different departments of the United States government. Most scientists are in favor of the bill. Indignant protests, however, have not been wanting. The American Society of Mechanical Engineers, for example, believe that the metric system "will inconvenience and hinder trade and manufacturing, and require an expenditure of time and money that cannot be expressed in figures, sweeping away as it does the advantages accruing from the numerous established standards now recognized and universally adopted throughout the country."

Keeping that very strong condemnation in mind, it is rather interesting to learn what manufacturers themselves think of the metric system. The Director of the new National Bureau of Standards recently sent out some thirty letters to the leading machine-tool makers in the country, asking for an expression of opinion. The replies received, so far from indicating any opposition, show an overwhelming confidence in the mechanical possibilities of the metric system. Indeed, many of the manufacturers were making machine-tools to metric dimensions.

The American Society of Mechanical Engineers opposes the adoption of the metric system on the ground that the standard inch is better adapted to the calculations of the machine-shop than the millimeter. It is true that by continual bisection of the inch wonderfully accurate measurements are made. And yet the constant tendency in machine-shop practice to use the tenth, hundredth and other decimal parts of an inch, would seem to show a desire to adopt a more scientific system of measurement.

In a half-hearted way the metric system is even now partially used by the government. Foreign mail matter is weighed by grammes, and yet, most reference books and postal guides give the equivalent, for the most part inaccurately, in ounces. The Revised Statutes of the United States, section 3,515, read:

"The weight of the piece of five cents shall be seventy-seven and sixteen-hundredths grains troy." Why this needless circumlocution for five grammes? Surely the business interests of the country can not profit by so complex an expression of weight.

The present movement in favor of the metric system is partially due to the use of metric units in electrical engineering, the standards of which were fixed upon a metric basis by the law of July 12, 1894. The unit of power is the watt, which is equal to 10,000,000 units of power of the centimeter-gramme-second system, and which is practically equivalent to work done at the rate of 1 joule per second. By reason of the enormously rapid development of the applications of electricity, most of us are familiar with the more important electrical units. Especially is this the case with the kilowatt, which is fast taking the place of the old "horse power."

For years the United States Mint has employed the metric system in matters of assay and coinage. Our small silver money weighs 1 gramme per 4 cents. We use the metric weight in everyday life without our knowing it. Who hears of the troy pound nowadays in coinage?

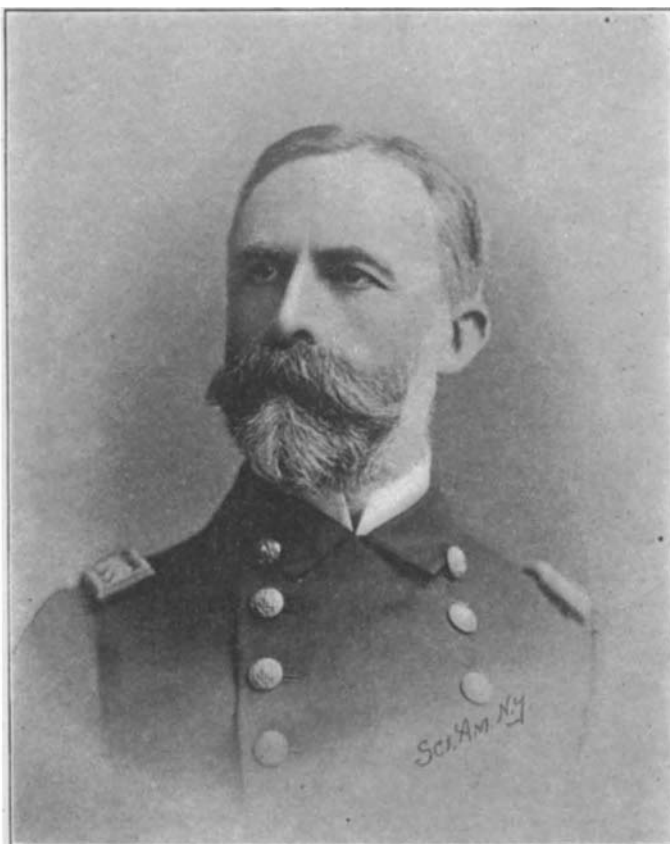
Pharmacists, who of all men should cling tenaciously to the troy system, have long been accustomed to the employment of metrical units. The United States Pharmacopœia, the book most often referred to by the apothecary, is based upon the metric system; so is the Dispensatory, used by physicians. Fine chemicals are

now sold chiefly by metric weight; so are glassware and rubber stoppers. Even catalogues in which the prices of goods are given in metric terms are not infrequently met with.

The United States Coast and Geodetic Survey is another department of the government which has long since adopted the metric system. Superintendent of Standard Weights and Measures T. C. Mendenhall, who is one of our foremost authorities on the subject of weighing and measuring, has, with the approval of the Secretary of the Treasury, established the metric system in the Office of Weights and Measures.

In the field of manufactures, the prospect of an early adoption of the metric system is encouraging. In the April, 1900, report of the American Railway Associations Committee, manufacturers were enumerated by whom the metric system is used. The list of products made by metric measurement included watches, injectors, refrigerating apparatus, screw-cutting lathes, scales, drills, gages, measuring implements of all kinds, and draftsmen's tools.

From the standpoint of dollars and cents—the standpoint of the American exporter, who is just now very much the object of public attention—the metric system should certainly commend itself. With the exception of England, every country with which he deals uses the system. No foreign merchant who is accustomed to purchase by kilogrammes and meters, is likely to trouble himself with our complex English units. How well this fact has been recognized is shown by a consideration of some of the products which we export. Ordnance, including both heavy and light, which we have sent to foreign countries, is calibered in millimeters.



*W. T. Sampson*

The Baldwins build locomotives which are made to travel on one meter gages. Indeed, there is not a first-class shop in the country that is not ready to fill orders for machinery made according to metric measurements. With the increase of our exports, a still wider application of the system may be expected.

When it is considered that the metric system is an international system, that it is simpler than any other (for it is much easier to convert centimeters into meters than it is to convert inches into feet or yards), and that the young men who have graduated from our technical colleges are familiar with its units, there seems to be no very good reason why the change advocated by the measure now before Congress should not become a law. Nothing in this measure prevents any one from using the old system if he so desires. Land can still be sold by the acre in the country and by the square foot in New York city. But one thing at least is certain—if the United States government adopts the system officially, and uses it in its commercial relations with private persons and foreign nations, it will sooner or later be adopted throughout the country.

An item recently appeared in the New York Sun that gives the bibulous man something to think about. It is said that H. Charles Obendaugh, of Binghamton, N. Y., has perfected a process of distillation and compression whereby whiskey can be compressed and carried like pills. Before the possibilities of the whiskey pellet the imagination must stand aghast.

#### ADMIRAL SAMPSON.

In the death of Admiral William T. Sampson the country has lost one of its most distinguished men, of whom history, we believe, will speak in even yet more positive terms of approbation than do we, whose painful duty it is to record his death and give the customary brief obituary to his honorable, patriotic and most useful life. Nowhere will the worth of the late Admiral be more freely acknowledged than among his brother officers in the United States Navy. It was a fortunate circumstance for himself and for the Navy that the period of its reconstruction found him in the prime of his physical and intellectual powers, for to no one more than to Admiral Sampson is our new Navy more indebted for the universally admitted excellence of its ships and material. His reputation could very well have rested, at least as far as the history of our modern Navy is concerned, with the good work that he did as Chief of the Bureau of Ordnance of the Navy in the construction of the new type of high-power built-up breech-loading rifles and such radical improvements as face-hardened armor plate; for Sampson was an ardent supporter of the Harvey theory, and the early application of Harveyized armor, be it known, placed the United States ships for many years far in advance in defensive qualities of all the vessels of the navies of the world.

When the exigencies of the war with Spain demanded the selection for the command of our Navy of a man with special qualifications, Sampson, although not the senior ranking officer, was chosen, the selection being made because of the technical knowledge, executive ability, calm, judicial sense, and unquestioned courage which he had abundantly displayed in his earlier career. The manner in which Admiral Sampson conducted the naval operations in West Indian waters amply justified the nation's choice, and the technical and military features of the campaign, as ordered by him, have received the practically universal indorsement of naval experts throughout the world. It is true that, for a while, his record was obscured by those miserable miasmas which arise from the swamps of political intrigue and personal hostility; and it is to be feared that the positive cruelties to which he was subjected by his political enemies may have helped to bring about his premature death. Whether that is so or not, it is certain that already the miserable Santiago controversy is being forgotten, and that the heart of the American people is more than ever with the man who, through all the bitterness of that strife, never once opened his lips to make any reference, tacit or otherwise, to the subject.

William T. Sampson was born at Palmyra, N. Y., February 8, 1840. He was born (to his greater honor, be it said) of humble parentage. Whatever of greatness he achieved was won by dint of the sheer force of sterling character. As a lad he divided his time between labors on his father's farm and the Union school, and from the very first he began to draw out ahead of his fellow scholars. He entered the Naval Academy in 1857; three years later he graduated at the top of his class. He had his first taste of the sea in the frigate "Potomac" in 1861; in 1862 he was a lieutenant. Two years later he was detailed to the ironclad "Patapsco," and in the following year, while he was executive officer of that vessel, he was ordered to enter Charleston Harbor and remove or destroy the submarine mines and torpedoes by which the city was protected. In carrying out her work the "Patapsco" was blown up by a submarine mine, and Lieutenant Sampson was thrown clear of the vessel by the force of the explosion, being subsequently rescued from the water with twenty-five of his men. He was attached to the Naval Academy from 1868 to 1871, and in 1874 was made a Commander. From 1879 to 1882 he commanded the "Swatara" on the Asiatic station. Then followed two years at the Naval Observatory, during which time he was a member of the International Prime Meridian Time Conference. He had charge of the torpedo station from 1885 to 1886, and at the same time he was a member of the Board on Fortifications. The period from 1886 to 1890 was spent at the Naval Academy. In 1889 he was promoted to the rank of Captain, and in 1892 was made Inspector of Ordnance, and in 1893 Chief of the Bureau of Ordnance. At the outbreak of the Spanish war Captain Sampson was made Acting Rear-Admiral by the late President McKinley and placed in supreme command, hoisting his flag on the cruiser "New York." He was held to be a great authority on torpedo work, and his lectures at the War College have a world-wide reputation. It was due to his influence that the double-deck turret was introduced on the battleships "Kearsarge" and "Kentucky," and as Chief of the Bureau of Ordnance he was largely instrumental in the construction and equipment of the very fine gun factory at the Washington Navy Yard. His death has left a gap in the ranks of our abler naval men that will not be easily filled.