

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 37 PARK ROW, NEW YORK.

A. E. BEACH.

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NEW YORK, SATURDAY, OCTOBER 9, 1880.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Air, compressing, by water, American industries, American Institute fair, etc., with corresponding page numbers.

TABLE OF CONTENTS OF THE SCIENTIFIC AMERICAN SUPPLEMENT No. 249.

For the Week ending October 9, 1880.

Price 10 cents. For sale by all newsdealers.

Detailed table of contents for the supplement, categorized into I. TECHNOLOGY AND CHEMISTRY, II. ELECTRICITY, ETC., III. PHYSIOLOGY, HYGIENE, ETC., IV. ART AND ARCHITECTURE, V. NATURAL HISTORY, ETC.

AMERICAN NAVAL DEFENSES.

In a recent number of the SCIENTIFIC AMERICAN it was shown that the City of New York could easily be reached by the shells of a hostile fleet either from the outer bay or from the open sea. This possibility in case of war can be met only by constructing ships for an efficient navy.

Take Boston, for example. There are supposed to be ample fortifications to protect it, yet it is even more defenseless than New York. Lying at a distance of less than seven miles from the State House, a war ship would be entirely outside of the effective range of any gun mounted to defend Boston to-day.

Turning to the Pacific coast, San Francisco might at first sight appear safe, being sheltered by hills varying in height from 300 to 1,000 feet. But, in reality, these elevations would be no protection whatever. The distance from the wharves in the inner bay to deep water on the other side of the peninsula is about six miles.

But, even supposing that such accurate firing should be possible as to confine all the damage done within the limits of the navy yards themselves, can we afford, at the opening of a great war, to have our three principal navy yards destroyed? And yet, unless before such a war comes on, they are utilized to build war ships to meet the enemy at sea, they might just as well perhaps be destroyed.

A navy cannot be produced in a few weeks—especially if our navy yards are laid in ashes—and it is really astonishing that the business men of this country do not act more resolutely to induce Congress to give us a navy worthy of the name.

COMPRESSING AIR BY FALLING WATER.

Mr. J. P. Frizell, C. E., has recently given in the Franklin Journal a paper relating the results of some experiments made by him at St. Paul, Minn., upon the means of compressing air known as the trompe.

In the tank the current was directed along the lower portion by a partition of plank placed 21 inches below the top. This partition was full of holes to enable the air to rise freely, and the space above it was called the air chamber. There was a hole at the level of the partition to enable the air to escape into the ascending shaft as soon as the air chamber was full, and made known this fact to the observers by the large masses of air rising to the surface.

EMPLOYERS' LIABILITIES.

The tendency of legislation to throw safeguards around human life, and to hold railway corporations and others employing men in more or less dangerous occupations to the duty of making use of all available means to lessen the hazards of travel and labor, is well shown in the recent bill before the British Parliament, known as the Employers' Liability Bill.

By the terms of the bill the employer is liable for personal injury to a workman in cases where the injury is caused: (1) by reason of any defect in the ways, works, machinery, plant, or stock-in-trade connected with or used in the business of the employer; or (2) by reason of the negligence of any person in the service of the employer who has superintendence intrusted to him while in the exercise of such superintendence; or (3) by reason of the negligence of any person in the service of the employer to whose orders or directions the workman at the time of the injury was bound to conform, and did conform, where such injury resulted from his having so conformed; or (4) by reason of the act or omission of any person in the service of the employer done or made in obedience to the rules or by-laws of the employer, or in obedience to particular instructions given by any person delegated with the authority of the employer in that behalf; (5) by reason of the negligence of any person in the service of the employer who has the charge or control of any signal, points, locomotive engine, or train upon a railway.

New Discoveries on the New England Coast.

The United States Fish Commission's steamer Fish Hawk has made two dredging trips the past summer along the New England coast. The dredging was done chiefly between 150 fathoms and 325 fathoms, and the yield was immense. More additions were made to the marine fauna of New England than in the previous six years.

FOUR MILLION TWO HUNDRED THOUSAND tons of hot water, averaging 135° F., are annually pumped from the Comstock mines. To heat this mass of water by artificial means would require a consumption of over 50,000 tons of coal a year.