

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, for the U. S. or Canada... \$3 00
One copy, six months, for the U. S. or Canada... 1 50
One copy, one year, to any foreign country...

Australia and New Zealand.—Those who desire to receive the SCIENTIFIC AMERICAN, for a little over one year, may remit \$1 in current Colonial bank notes. Address MUNN & CO., 361 Broadway, corner of Franklin Street, New York.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5.00 a year, for U. S. and Canada. \$6.00 a year to foreign countries...

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, to any address in U. S. or Canada, on receipt of seven dollars.

The safest way to remit is by draft, postal order, express money order, or registered letter.

Australia and New Zealand.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for a little over one year on receipt of £2 current Colonial bank notes.

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

NEW YORK, SATURDAY, FEBRUARY 9, 1889.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Advice, good, Rufus Cook's', 'Apparatus, track-laying, Herman's', 'Agriculture, railway', etc., with corresponding page numbers.

TABLE OF CONTENTS OF

SCIENTIFIC AMERICAN SUPPLEMENT

No. 684.

For the Week Ending February 9, 1889.

Price 10 cents. For sale by all newdealers.

Detailed table of contents for the supplement, including sections like 'I. BIOGRAPHY.—Professor Rudolph Julius Emanuel Clausius', 'II. BIOLOGY.—Yeast: Its Morphology and Culture', etc.

A RUMOR ABOUT THE COMPASS.

The London Electrician has a dispatch from Berlin to the effect that a means has been discovered of using electricity for ascertaining the true north, instead of the magnetic needle; that, in short, the new means will be altogether superior to the compass, and is likely to supersede it.

If this is true it will be welcome news to the mariner, for since the coming of iron and steel ships the needle has played many fantastic tricks; requiring a fairly good knowledge of magnetism and other phenomena to understand it. The liquid or "Ritchie" compass, that came with the monitors, in which the needle is submerged in spirits of wine or alcohol, is, of course, a great improvement on the old-fashioned and wabbling "card," and the lines of deviations, and the corrections for the same, laid down on all the ocean charts, are powerful aids to the mariner.

"RECIPES FOR MAKING GOUT."

Under this title, an English society journal, having exhausted, and it infers without avail, its best advice as to the prevention of this dread malady, lays before its epicurean readers some specimen compounds peculiarly adapted to develop gout in those previously free and to excite its most virulent symptoms in the already afflicted. It has medical authority for its promise that the recipes it gives are really among the most exciting causes yet discovered in scientific or even what might be called haphazard cuisine; taking no account of the lesser causes, no doubt crediting the gouty with sufficient intelligence to foresee the effect upon the metatarso-phalangeal joint of the great toe of the midnight lobster and the after-dinner port.

It has often been observed of those afflicted with gout—the tone of the letters addressed to the society journal in question furnishes still another evidence of it—that they appear more concerned to discover new remedies to lessen the pain when they shall be again attacked than in adopting a practical means for preventing its recurrence.

HEMP VS. IRON IN OCEAN CABLES.

A timely and instructive letter it is that Judge R. L. Weatherbee, the manager of the cable companies' repairing service, sends to the Halifax (N. S.) Chronicle. He refers to the rapid impairment of ocean cables, and asserts that the cause of this is to be found undoubtedly in the use of iron, which rots away where hemp would stand.

wreck of the Royal George, sunk in 1782, "is as perfect as when submerged."

How important this subject is may be understood from the fact that thirteen cables have been laid across the Atlantic at a cost of \$75,000,000, which, so far, have cost \$25,000,000 for repairs; 7,000 miles of this is, at this moment, lying abandoned because of unsubstantiality; the average life of a cable of the present construction having been estimated at twelve years.

MACHINE GUNS IN SHORE DEFENSE.

A discussion is now going on in the English press regarding the defenselessness of the British coast, notably the southern and eastern portions, the dangers of invasion, and the best means of protection. The latest theory is advanced by Captain Willoughby Verner, and described in the current number of the National Review (English); the author being evidently an artilleryman, and of the land forces rather than of the marine; his theory, like most of those preceding it, sound or shaky, according as it is regarded from the land or the sea.

He says that at many points of the coast ships could not come close in shore for the rocks, a statement abundantly supported by the soundings, as given on the admiralty charts; that it would require time to launch and man the boats, and still more to get them to the beach, thus affording time to prepare the defense. But let us suppose that the enemy, instead of obligingly making ready to fall into this cleverly constructed mouse trap, should select a bold portion of the coast for his enterprise, occupying himself during the day hours with making things lively about the shore, and, at short range, playing upon everything having the appearance of a battery, and when night came, and under cover of a hot enflaming fire, embarking his expeditionary force in boats armed not only with machine guns, but as well with shields to protect them from the fire of those in battery ashore.

Admiral Porter and other high authorities have recorded the opinion that the result of the coming naval war, let it be between powers whose relative forces have heretofore been well defined, is likely to be uncertain, because of the introduction of war material of a novel description and the necessity for a complete change in tactics. Because of this change in conditions and the lack of data gathered from the operations of actual war, it is not easy to suggest a theory of attack or defense which does not contain a self-evident fallacy.

NAVAL WARS OF THE FUTURE.

When the English heard of the Monitor and Merrimac fight, they realized that their magnificent steam war ships, the finest in the world, were obsolete. Hampton Roads signaled the appearance and prescribed the type of the ship that was to be; or, as the Admiral of the Navy, David D. Porter, says in his recent paper, whose title is quoted above, "the guns at Hampton Roads sounded the death knell to all these grand vessels" (the British fleet).