THE
Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

VOL. X. NO. 8...[NEW SERIES.].....*Twentieth Year.*

NEW YORK, SATURDAY, FEBRUARY 20, 1864.

Contents:

(Illustrations are indicated by an Asterisk.)

*Powers' Machine for rifling Gun Barrels	113	*Howe's Herculean Lifting Machine	1[illegible]
Influence of Food upon the Intellect	114	Quick Photographs	1[illegible]
Labor and Contentment	115	Humoring Disabled Engines	120
Miscellaneous Summary	115	The Great Naval Controversy	121
The Swiftest Ship	115	American Armor Plates	121
Canadian Reciprocity Treaty	115	The Camphor Storm-glass	121
Free Lectures on Chemistry	115	Hard Boiling	121
*Straszer's Lantern	116	The World's Indebtedness to Science	122
*McKibbin's Gun-sight	116	Memorial of Navy Engineers to Congress	122
Can we know of what the Stars are composed?	116	Special Notices	122
Engineering and Architecture	116	New Books and Publications	122
The Money Phases of Coin and Paper	117	Accidents from swallowing Leeches	152
Conflagration at Colt's Armory	117	Missionaries of Art and Science	122
Gold-mining in California	118	Change of Color in Stars	122
A Question in Hydrostatics	118	Recent Southern Intelligence	123
Letters from Inventors	118	Comparison between American and English Taxes	123
Speed of Cutting Tools	118	Recent American Patent	124
The Decimal System	118	Patent laims	124
Champagne	119	Notes and Queries	126
Preservation of Grapes and other Fruits	119	*Knowlton's Saw-mill	128
Important Patent Decision	119	Warm Swimming Baths	128

THE GREAT NAVAL CONTROVERSY.

Most of our readers in the city are aware that a sharp controversy has been going on for the past two months, ostensibly concerning the economy of working steam expansively and the speed of naval vessels. As these topics seem to have very little relation to the controversy, we have made no mention of it hitherto, and only do so now in consequence of the complexion the matter has taken. To us, it is simply ridiculous. It beats Hudibras all to pieces, and "The Adventures of Dr. Syntax" are nowhere beside the developments which this controversy is making among engineers, shipbuilders and shipowners. In this wordy warfare the following gentlemen have successively engaged:—Mr. E. N. Dickerson, Mr. B. F. Isherwood, Mr. Secretary Fox, Mr. John Baird, Commodores Craven and Boggs of the Navy, a person named "Rutherford," claiming to be a "naval agent," Mr. Olyphant, Mr. Somebody-else whose name we have forgotten, Mr. T. F. Rowland, Mr. S. W. Jerome, President of the P. M. S. Co., and a number of other miscellaneous individuals whose names are not important. A brief synopsis of the controversy may not be wholly devoid of interest to our distant readers.

Mr. Dickerson, the inventor of a cut-off for steam engines, and a patent lawyer of considerable note, conducted a law-suit in Washington, some time ago, concerning the value of working steam expansively, which suit was decided in his favor, the jury awarding him a verdict of 34 per cent saving. We have now before us a pamplet of 80 pages, which contains not only the report of Dickerson's speech to the jury, but also marginal notes and references which are extremely interesting to engineering readers. The speech itself is a graphic and amusing production; it is a compound of science, sarcasm, and personality, fully equal in point of popular interest to any of the modern novels. Mr. Dickerson, in this remarkable speech, endeavors to show that the navy of our country is in a state of decay, owing chiefly to the incompetency of the engineer-in-chief, Mr. Isherwood. Dickerson insists upon the value of working steam expansively, with an independent cut-off; while Isherwood favors the use of a simple slide-valve, without any cut-off other than a link motion. Herein is the chief point where the dispute began.

Isherwood has responded to Dickerson's remarks; and his statements have, to some extent, been corroborated by Commodores Craven and Boggs. A race between a navy ship and a merchant vessel was then proposed by Mr. Dickerson, and, after much solicitation, was acceded to by the Navy Department. In planning this race, Mr. Dickerson trod on Mr. John Baird's toes by claiming certain parts of the racing merchant steamer's engine, which was to be pitted against a Government ship, as his own. Then arose a spicy discussion between Mr. Baird and Mr. Dickerson, in the course of which Mr. Baird says that Mr. Dickerson need not bother the navy for a race, since there is a yacht built by him (Dickerson) which he ought to stake against some other yacht. This was the unkindest cut of all, for this yacht was a very unfortunate piece of business, and can't get out of her own way under steam. According to her owner's statement, she made a brief but pleasant trip of two hours and a quarter, having in that time achieved the distance of two miles! The tide being adverse, the vessel was unable to make further progress, and it was with extreme regret that the survivors of this little trip put their bark about and returned home. To Mr. Baird's little suggestion, Mr. Dickerson replies by saying that he never built the engines of the yacht in question, and had nothing to do with her, other than to adapt certain old machinery to her.

Mr. T. F. Rowland, another engineer, builder of some of the Ericsson monitors, testifies that Mr. Dickerson's statement is correct. At this crisis another gentleman, no less a personage than the owner of the yacht, Mr. Jerome, appears in print, and says that, whether he (Dickerson) is responsible or not, it cost him (Jerome) $5,000 for the engines and boilers of the yacht in the first place, and that he has bills for a further sum of $16,000 additional for "adaptations," which, it appears, were not "happily arranged."

Dickerson, with his usual promptness, replied to Mr. Jerome's epistle; and, in the course of it, he perpetrates a characteristic joke, which is this:—A certain engineer, another party in this polyangular controversy, called on Dickerson, for the owner of the unfortunate yacht, and wished to know the size of the engine, that he might estimate the dimensions of a tug-boat it would drive economically. Dickerson says, he advised his visitor not to fix the size of the tug until the engine had been tried and its power was known. This strikes us as a novel and ingenious way of getting at the size of cylinder required to drive a certain number of inches of cross section through the water. Notwithstanding this reply, we doubt not that Mr. Jerome will still feel a little sensitive about the $21,000 expended on a yacht that could only crawl along at the rate of about one mile per hour in a smooth water; he probably thinks with Hudibras aforesaid—

> "Alas! what perils do environ
> The man that meddles with cold iron."

This is about the present stage of the "Great Naval Controversy," and we await further developments with the most intense interest, as almost every day a new character appears in the public newspapers, and we think that, before the bone of contention is satisfactorily disposed of, the navy will be forgotten altogether. We should not like to say anything to discourage these controversialists, and hope they will continue their diversion; for, certainly, nothing so very funny has turned up for years. Juvenal was a fool to some of these satirists; and, for acute wisdom and sound judgment, to say nothing of courtesy, the letters of "Junius," and Lord Chesterfield's advice to his son, are thrown far into the shade. Commend us to the "Great Naval Controversy" for interesting reading and engineering information.

AMERICAN ARMOR PLATES.

Our foreign files are full of interesting information concerning the endurance of armor plates for ships-of-war, and we frequently record the severe tests which have been applied to plates made by rival firms abroad. The war has very much deranged manufacturing operations among ourselves, and the immense demands made upon our large forges for other sorts of iron, or forgings of other shapes, doubtless conflicted with that deliberate and careful attention which the production of heavy armor plates requires. Whether this assumption is correct or not, it is encouraging to see that the importance of obtaining good plating at home is attracting the attention of shipbuilders and others. There are no better ores in the world than American mines produce; and these, under the skill of our iron-workers, should and do possess powers of resistance and tenacity which must be developed as much as possible. A recent letter in a Boston paper says that a test was had of the endurance of an American armor plate, made by the Nashua Iron Co., of Nashua, N. H. Compared with one of English manufacture the result was greatly in favor of the domestic plate—the English test being at 200 yards, while the Nashua Co.'s was at only 50 feet, a difference of 550 feet. The English plates were 5½ inches thick; the Nashua Co.'s were only 4¾ inches, a difference of three-quarters of an inch less. The test proving entirely satisfactory—not even a crack in the iron—plates are now being made by the Nashua Iron Co., for Wm. H. Webb, Esq., of New York, and by him applied to his celebrated war vessel, the *Dunderberg*.

Heavy armor plates are also made at the Franklin Forge, in this city, at Reading, Pa., at Bridgewater, Mass., and doubtless at other places. The armor for the iron-clad battery *Roanoke* (4½ inches thick) was all made at these several shops, and is doubtless fully equal to any made abroad. The *Ironsides* has also solid plating, which has withstood the rebel shot admirably. There is no question but that our mechanics and forges are capable of making the most tenacious plating in the world.

THE CAMPHOR STORM-GLASS.

Dealers in philosophical and optical instruments sell simple storm-glasses which are used for the purpose of indicating approaching storms. One of these consists of a glass tube, about ten inches in length and three-fourths of an inch in diameter, filled with a liquid containing camphor, and having its mouth covered with a piece of bladder perforated with a needle. A tall phial will answer the purpose nearly as well as the ten-inch tube. The composition placed within the tube consists of two drachms of camphor, half a drachm of pure saltpeter and half a drachm of the muriate of ammonia, pulverized and mixed with about two ounces of proof spirits. The tube is usually suspended by a thread near a window, and the functions of its contents are as follows:—If the atmosphere is dry and the weather promises to be settled, the solid parts of the camphor in the liquid contained in the tube will remain at the bottom, and the liquid above will be quite clear; but on the approach of a change to rain, the solid matter will gradually rise, and small crystalline stars will float about in the liquid. On the approach of high winds, the solid parts of the camphor will rise in the form of leaves and appear near the surface in a state resembling fermentation. These indications are sometimes manifested *twenty-four hours* before a storm breaks out! After some experience in observing the motions of the camphor matter in the tube, the magnitude of a coming storm may be estimated; also its direction, inasmuch as the particles lie closer together on that side of the tube that is *opposite* to that from which the coming storm will approach. The cause of some of these indications is as yet unknown; but the leading principle is the solubility of camphor in alcohol, and its insolubility in water, combined with the fact that the drier the atmosphere the more aqueous vapor does it take up, and *vice versa*.

HARD BOILING.

A striking evidence of the slowness with which knowledge is diffused is furnished by the frequent occurrence, in receipts for cooking, of directions to boil slowly or to boil rapidly for some specified length of time. It should at this day be know that anything will cook just as quickly in water boiling as slowly as possible, as it will in water boiling with the greatest fury. Water, under the pressure of the atmosphere and at the level of the sea, boils at 212° Fah., and as long as it is open to the air, no fire, however fierce, will heat it a single degree above this temperature. If we close the vessel, however, with an air-tight cover, so as to increase the pressure upon the surface of the liquid, we may heat it to any degree whatever. But, as the pressure increases with the temperature, the strength of the boiler must be increased in the same proportion. On the other hand, if the pressure of the air on the surface of the water is diminished by raising the vessel above the surface of the earth, the water will boil at a lower temperature than 212° Fah. It takes longer to boil potatoes on the top of a mountain than at its base, because boiling water at the top of the mountain is not so hot as at its base. In sugar refineries it is desirable to boil down the sirup at a low temperature in order to avoid burning the sugar. This is effected by putting the sirup into an air-tight boiler, and draining out a portion of the air from the space above the sirup by means of an air-pump worked by a steam engine. Such a boiler