

with ease; but, as it cools, it grasps more tightly than the clutch of a miser's palm. The largest sized guns are composed of five separate cylinders, counting the barrel, which is inclosed by the first jacket to the muzzle point. There are scientific reasons relating to the laws of expansion under the strain of explosion which determine the degree of compression exercised by these outer cylinders; but with these we need not trouble the reader.

As it takes from fourteen to fifteen months to build up a 110 ton gun, one of these large pieces of ordnance may at any time be seen standing in the shrinking pit as it is sketched by our artist, and the visitor may easily be lucky enough to see one of its "jackets" put on. The building up being finished, the joinings of the cylinders must be turned and planed; after which the bore of the gun has to be ganged and accurately ground. The compression of the outer hoops always contracts the bore more at the breech than the muzzle end; and this has to be cut and ground out. It is then ready for rifling—another operation consuming much time. It is performed by an ingenious machine working upon a long shaft, and so constructed as to revolve as it cuts correspondingly to the twist of the groove. The cutter has to travel eight to twelve times through

will reassemble for purposes of organization in halls assigned them. In the afternoon the sections will meet, and the vice-presidents will deliver their addresses. In the evening Prof. Morse will deliver his presidential address.

The list of eminent names of vice-presidents and secretaries insures a valuable series of papers, and we believe that the New York meeting will certainly compare in interest with the Montreal meeting of 1885. The association has a future before it, and for the sake of that future, should meet with all encouragement. An affiliation with the foreign associations of like name and constitution is to be hoped for, and movements in that direction have already been inaugurated.

THE NEW BRITISH RACING YACHT THISTLE.

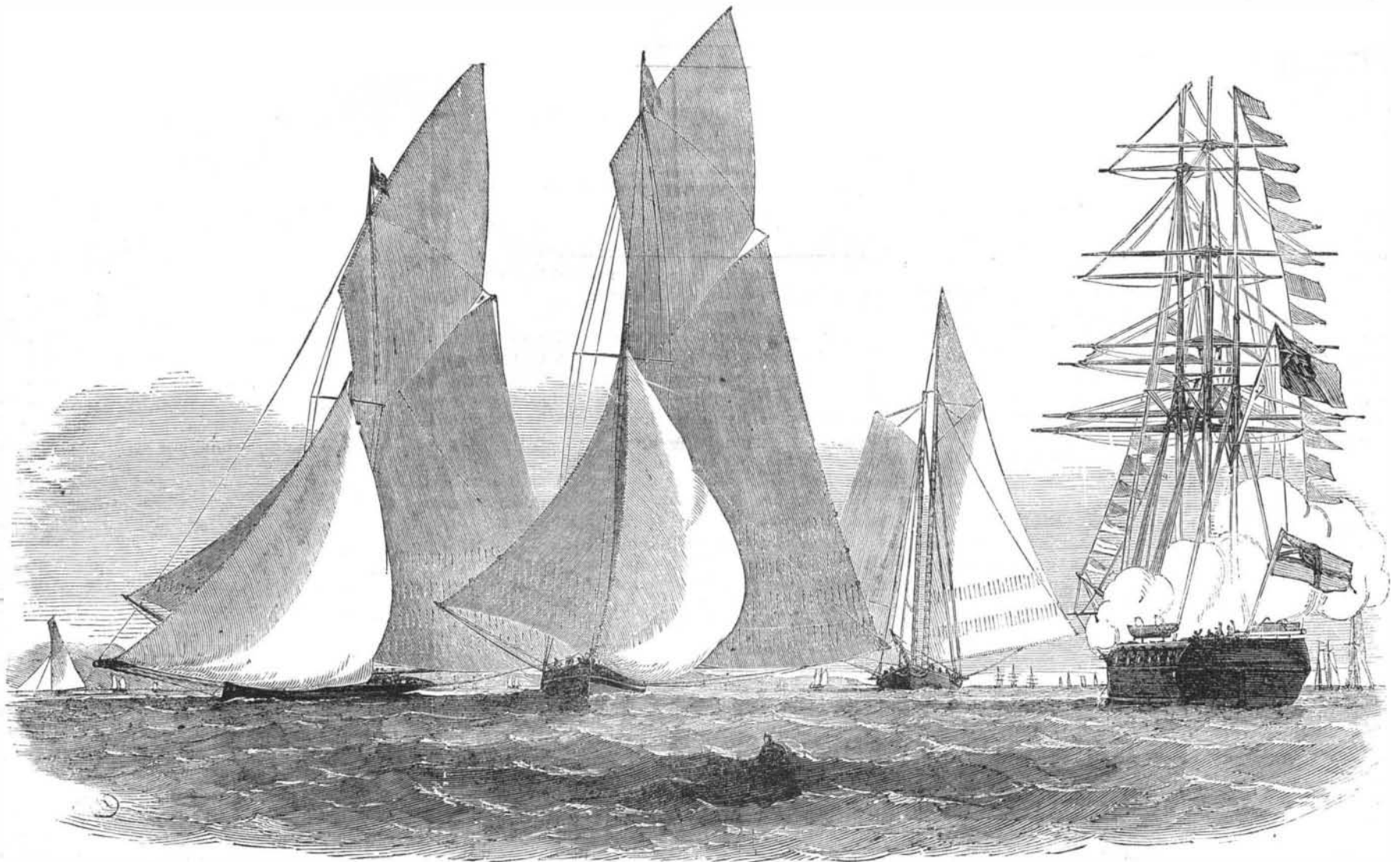
Shortly after the disastrous defeat of the Galatea in American waters last fall, it was rumored that a final and desperate effort was to be made to wrest the famous America or Queen's cup from this side of the Atlantic, and to that end a new craft was being built, the design and details of which, it was said, would be different from anything hitherto seen. The rumor was finally confirmed, but the whole matter was kept

she is said to have crossed the line with a speed of 13 knots an hour.

The Thistle was built by Messrs. Henderson & Co., of Glasgow, Scotland, and is owned jointly by Mr. James Bell, of Glasgow, and (it is reported) by Mr. Clark, the famous Scotch thread manufacturer of Newark, N. J. She is built throughout of steel, and she measures 85 feet on the load water line; extreme breadth, 20 ft. 4 in.; depth of hold, 14 ft. 1 in.; registered tonnage, 100 tons, or 140 tons rating. The mast is of Oregon pine, and the spars and canvas are American, inasmuch as they are the biggest on record. The ease with which she has defeated all the English crack yachts makes her a most serious competitor, and it is to be hoped that General Paine's new unnamed yacht will prove to be all that is expected of her, and that the international contest of September 26 will be marked by the manly spirit of honest rivalry that has characterized each of these competitions since the Queen's cup was first captured by the America in 1851. In this connection we reproduce a picture of this event, taken from an early print of the period.

Effects of Lead.

Mr. Wynter Blyth has had an opportunity of exam-



MOSQUITO.

ARROW.

AMERICA.

BRILLIANT.

ROYAL YACHT CLUB REGATTA.—[From Print published in 1851.]

the guns in making one groove; and in the largest sized guns there are as many as eighty grooves. It is not surprising, therefore, to hear that it takes at least a month to rifle a 110 ton gun. It need not be said that the most absolute accuracy is necessary, and that at any of these later stages of manufacture a mistake which might easily spoil the gun irretrievably would be a calamity.

The Thirty-sixth Meeting of the American Association for the Advancement of Science.

New York, for the first time in the history of the American Association, is to be the place for its annual meeting. It is to last from Wednesday morning, August 10, until Tuesday evening, August 16. Matters in this city are in charge of a local committee, of which President Barnard, of Columbia College, is chairman. At his request, the trustees of Columbia College have tendered the use of the several halls and offices of the college for the purposes of the association.

Everything is hoped for from this meeting. Last year the meeting was held in Buffalo, and the attendance seriously fell off, but the attractions of the metropolis and the favorable auspices of the place of meeting will, it is believed, prove an attraction, and cause the members to assemble in greater numbers than ever before. The president, Prof. Edward L. Morse, of Salem, Mass., will call the meeting to order on the first day, and will resign in favor of Prof. S. P. Langley, of Washington, the incoming president. The general meeting will adjourn, and the different sections

shrouded in mystery; and although it was finally known where and by whom the new yacht was being built, no admission to the yard was attainable, and she was only visible to a favored pledged few. Attempts were made by American yachting men to obtain some clues as to her probable size, but even this was not successful.

At one time a clew was thought to be discovered, and a rich and patriotic New Yorker immediately ordered the laying of a keel for a yacht of smaller size than the Genesta and Galatea; but when the Thistle was launched, it was found that these rumors were incorrect, and that the new boat was about the size of the Galatea, being, in fact, two feet less on the water line. General Paine, of Mayflower fame, at once decided to try and improve on this celebrated racer, and is now having built for him, from designs by Mr. Burgess, a steel yacht, which will also be of a different type from anything now afloat.

Much interest has suddenly been developed in the result of this experiment, owing to the remarkable record that has so far been made by the Britisher. Out of seven races in which she has so far taken part, she has secured three first prizes, one second, and one third prize. On the other two occasions she was out of the race, owing to having missed the buoy in a fog and having at another time run into a calm. On May 28 she won the new Thames Channel match from Southend to Harwich, a distance of 50 miles, beating her nearest competitors, the Genesta (our former rival) and Irex, by nearly two hours and three-quarters. In this race

ining portions of the bodies of two out of five persons who have at different times died more or less suddenly from, as it is believed, the effects of lead poisoning. In one case he separated about a third of a grain of sulphate of lead from the liver and about the thirteenth of a grain from one kidney, besides finding lead qualitatively in the brain. In the other he was able to examine the brain with more minuteness, and estimated that here the cerebrum contained about a grain and a half and the cerebellum about a quarter of a grain of sulphate of lead. Mr. Blyth went on to remark, in the paper he read to the Chemical Society of London on these investigations: "There has hitherto been no reasonable hypothesis to explain the profound nervous effects of the assimilation of minute quantities of lead, but if it is allowed that lead forms definite compounds with essential portions of the nervous system, it may then be assumed that in effect it withdraws such portions from the body. In other words, the symptoms are produced, not by poisoning, in the ordinary sense of the term, but rather by destruction—a destruction, it may be, of important nerve centers."—*Lancet*.

Photographs in the National Park.

One of the most skilled and distinguished of practical photographic artists is Mr. F. Jay Haynes, of Fargo, Dakota. He is the official photographer to the Northern Pacific Railway. A series of new pictures by him consist of a number of admirable views in the National Park, Colorado, showing the great geysers in operation, snow scenes, etc.