THE DEVELOPMENT OF THE HIGH-SPEED LAUNCH OR AUTOMOBILE BOAT.

Our illustrations show two new motor-boat hulls designed recently by Mr. Sutphen Sutphen, and built by the Electric Launch Company, of Bayonne, N. J., one for the American branch of the Paris firm of Panhard & Levassor, and the other for Hollander & Tangeman, the American representatives of the Italian F. I. A. T. motors and automobiles; while the line cut gives a longitudinal section, plan view, and transverse sections of a speed launch designed, built, and run successfully last summer by Mr. C. D. Mower, the official measurer of the New York Yacht Club and the editor of "The Rudder."

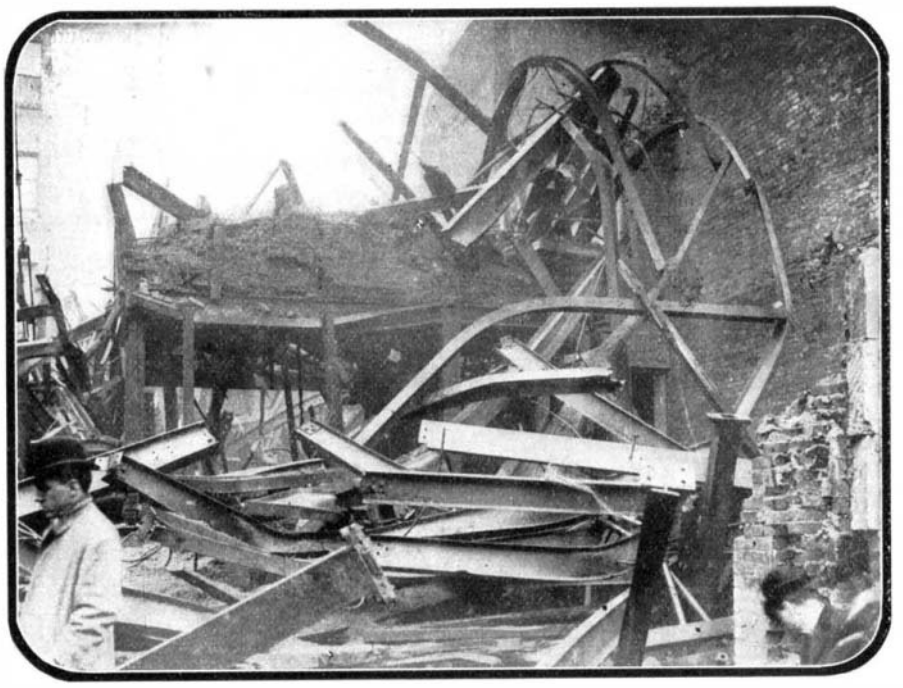
When, last summer, French automobile enthusiasts organized an automobile boat race from Paris to the sea, and carried out the same successfully on the quiet waters of the Seine, Americans recognized, from the pictures and published reports of the participants, that the French automobile boat was but a lighter and speedier type of the standard American launch, such as has been in use here for more than a decade past. In fact, some of the automobile boats were simply American launches, such as the Lozier and the Eagle, which participated in the cruiser class. The English Napier 40-foot automobile boat, fitted with a 75-horse-power motor, won from a French boat, fitted with a German Mercedes motor, in a race held at Trouville after the termination of the former races. The Napier boat had previously covered 8½ miles in 24 minutes, 44 seconds, in the race for the Harmsworth trophy in Queenstown harbor, as illustrated in our issue of August 8, 1903; and it beat the Mercedes 10 1-5 seconds in a mile race, its time being 3:30 3-5, which is equivalent to a speed of 17 1-3 miles an hour. It also won from this boat in a 3-mile race.

The success of the motor boat abroad led importers of foreign automobiles and motors to build such speed craft in this country, and the hulls illustrated herewith are two of the latest to be built in America.

The F. I. A. T. hull, which is shown lifted by three men, weighs but 550 pounds, and its weight complete, with motor and accessories fitted, is 1,300 pounds. The hull is 35 feet long by 4½ feet beam; and it is built of two layers of narrow, thin planking, the outer layer, of mahogany, running horizontally, and the inner one, of cedar, diagonally. The two layers have a sheet of specially prepared, very thin canvas between them, and they are riveted together by 20,000 small copper rivets. A 24-horse-power F. I. A. T. motor of 130 millimeters (5.118 inches) bore and stroke and capable of a maximum speed of 1,100 R.P.M. drives the propeller shaft through a regular automobile cone clutch. The propeller is a three-bladed one, of 36 pitch.

A general idea of the lines of the peculiarly shaped hulls of these two boats is to be had from the cross sections of Mr. Mower's boat, the "Express," which are

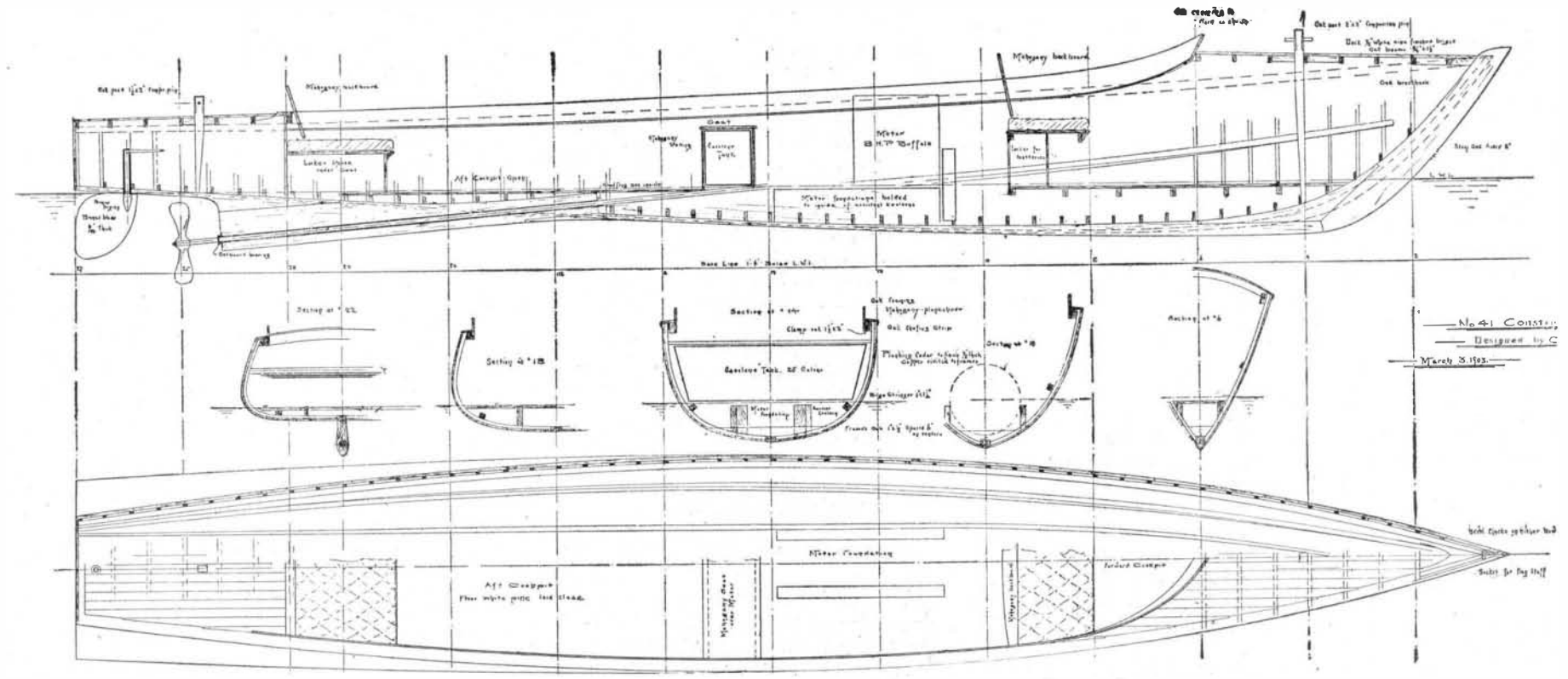
Looking Northwest, Showing the Westerly Wall.



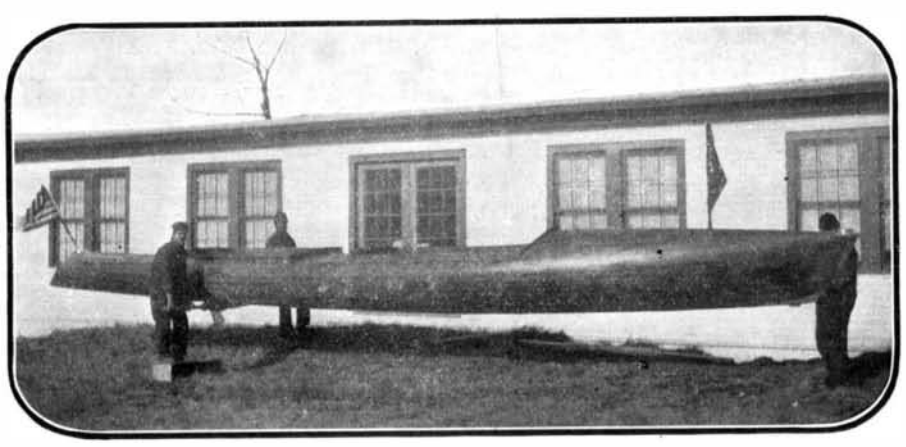
Looking Northeast, Showing Easterly Wall.

Note in foreground of both views the broken flange bolted to base of overturned cast iron column. The mottled effect is due to the honeycombed condition of the flange. In its fall the building lunged against the tall building seen to the rear, scoring the brickwork and sweeping down the fire-escapes. The wreck is discussed in our editorial columns.

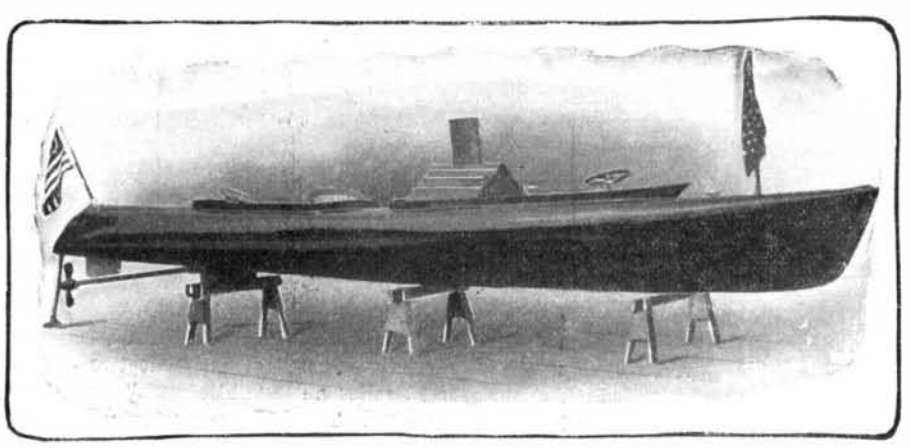
THE DARLINGTON APARTMENT HOUSE DISASTER, NEW YORK CITY.



Inboard Profile, Sections, and Plan Views of the High-Speed Launch "Express."



A 35-Foot Automobile Boat Hull Lifted by Three Men.



A Typical Automobile Boat Fitted with a 15-Horse-Power Motor.

HIGH-SPEED MOTOR BOATS.

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shown in the annexed diagram, while the general arrangement of all boats of this kind is also to be noted in the longitudinal section and plan views. As the five cross-sections of the hull of the "Express" clearly show, the bow is of a very sharp V section so as to cleave the water easily, while this sharp V section is modified and made rounding toward the middle of the boat, and changes gradually to an extremely flat U section at the stern, so that the after body, with its decreasing draft, slides on the surface of the water. The hull of the F. I. A. T. boat, besides being flat, tapers upward at the stern sufficiently to clear the water line for the last four feet of its length when the boat is at rest. When the boat is in motion, however, its stern rests on the water, and its total water line is then 34 feet. The hull draws but 8 inches of water, the point of greatest draft being at the bow. This boat is to race the "Vingt-et-un"—the Smith & Mabley 31-foot racing launch equipped with a four-cylinder 3 13-16 x 5½ American-built Mercedes motor, and a 16-inch three-blade propeller of about 28 pitch—for a valuable cup trophy. The "Vingt-et-un," it is claimed, made a mile on the Hudson River, on November 5 last, and with the wind and tide, in 2 minutes, 26 seconds. She is rated at 18 horse power, but her builders declare she will develop 22. Her weight complete at the time of the trial was 850 pounds. The lines of this boat are more like those of the regular launch than those of the automobile boats here shown.

The Panhard boat consists of a complete French auto boat equipment in an American hull. The hull is built upon a light oak frame, which is double planked with elm and mahogany, the latter being used on the outside. The 15-horse-power, 91 x 130 millimeter (3.582 x 5.118 inch), four-cylinder motor is placed just ahead of the center of the boat, with the operator's seat in front of it. A regular automobile inclined steering wheel is provided. On each side of the operator is a long vertical lever extending upward from the floor of the boat. One of these operates the cone clutch back of the motor, by which the propeller shaft, with its two globular universal joints, may be disconnected, while the other reverses the propeller blades for reversing. Attached to the boat on each side of the steering wheel is a small handle that moves over a notched segment. One of these handles controls the spark and the other the throttle. The motor is fitted with the Krebs automatic carbureter (described in our issue of February 14, 1903), and it is in every respect like the regular automobile motor. A horizontal exhaust chamber is fitted just below the smoke stack, and the exhaust gases pass out of the latter. This is the arrangement used in France, instead of conveying the exhaust through a pipe passing through the hull and into the water. The rear cock-pit has luxuriously upholstered individual seats capable of accommodating six persons. The boat is expected to make 17½ miles an hour at 750 R.P.M. of the motor. As the latter can be speeded up to 1,200 R.P.M., the boat should be good for spurts of 20 miles an hour or over. This speed, which seems to be the average aimed at, was exceeded a year and a half ago by a 55-foot, 120-horse-power launch designed by Mr. H. T. Leighton, of Syracuse, N. Y., and run on Oneida Lake at a speed of 23 miles per hour over a mile course that had been measured on the ice and staked off when the lake was frozen. Mr. Leighton had built several fast launches previously, and had had the benefit of a good deal of experience with this type of boat. The particular launch in question was 55 feet over all and on the water line, 7¾ feet beam on deck, and 6½ feet beam on the water line. She was of the regular launch type, with a torpedo-boat stern, and her engine was an eight-cylinder one of the two-cycle type. This boat, therefore, is the fastest small craft that has yet been built, and her engine is probably the first eight-cylinder gasoline engine to be constructed in the world. Thus it appears that America still holds the palm in the matter of fast launches.

Another launch of this type that has made very fast speed in and around New York harbor, is the "Standard," a 58-foot boat having a regular torpedo-boat hull fitted with an 8 x 10, six-cylinder, slow-speed, Standard marine motor. Despite the fact that the double planked hull of 3-16-inch mahogany warped badly between the timbers, thus making the bottom of the hull corrugated instead of perfectly smooth, this boat made the fast time of 21 miles an hour. The hull is being rebuilt, and the builders hope to exceed this speed considerably in the near future.

Among the motor boats exhibited at the recent Sportsmen's Show in Madison Square Garden was the "Dolphin II.," which was designed by Mr. Graef after experiments last summer with a smaller, 25-foot model. The latter boat, driven by a single-cylinder, two-cycle motor, running at 830 R. P.M. made over 13 miles an hour without producing any side or stern waves. The hull is built on the wedge principle, tapering from a sharp V section at the bow to a straight, horizontal line at the stern, the bottom not rounding in the least. The "Dolphin II." has an over-all length of 31 feet, 8 inches; a length on the water line of 30 feet; a beam on deck of 4 feet, 2 inches; and a beam on the water line of 3 feet, 10 inches. The weight of the four-cylinder, 25-horse-power, Standard motor and reversing gear in this boat is 510 pounds, and that of the hull, 564 pounds. The total displacement, with crew aboard, is 1,770 pounds. Judging from the speed attained with the under-powered "Dolphin I.," the new "Dolphin" should be very fast. In the limited space of the tank at the Sportsmen's Show, she has already shown a speed of over 16 miles an hour.

Other firms that are building automobile boats, and that exhibited high-speed, four-cylinder, automobile type motors for the same at the Sportsmen's Show, are the Lozier Motor Company and the American Darracq Company. The former company now has under construction a 25, a 36, and a 37-foot boat of this type, fitted with its 4½ x 5½, 24-horse-power motor; and the latter is fitting up a 32-foot hull designed and built by Herreshoff, with a 3¼ x 4-inch, 20-horse-power engine.

The above description of some of the automobile boats, or high-speed launches, that have been built in this country, shows how the desire for rapid pleasure boats by men of wealth, stimulated by the use of modern and speedy automobiles, has caused the designing of a new type of craft which has been made possible by the development of the high-speed, light-weight automobile motor. In fair weather, this new type of boat may yet be used for business as well as for sporting and pleasure purposes, and it will doubtless open a new era of speed on the water, such that the largest and speediest boats afloat may have to look well to their laurels.

THE JAPANESE DESTROYERS.

Never, surely, in the history of strife upon the sea did an engine of destruction justify its name with such terrible emphasis as when the Japanese torpedo-boat destroyers made their ever-memorable attack upon the Russian fleet at Port Arthur, and in a few minutes time put out of action two modern battleships and one of the finest protected cruisers afloat. Practically no particulars of the fight, or rather of that special part of it that fell to the lot of the torpedo-boat destroyers, have reached us, and it may be several weeks, if not months, before we are authoritatively told in what formation and using what particular tactics the destroyers made their bold raid upon the Russian fleet. According to present accounts, they dashed into close quarters and came within such short range that they could not well miss their mark. The puzzling feature. if this be true, is that the boats should have been withdrawn practically unscathed; for it is a pretty generally accepted maxim that the torpedo boat that comes so close as to make perfectly sure of its quarry is equally sure of paying the penalty of its own destruction. If the attack was made at short range, the immunity of the destroyers could only be explained by the probable fact that in ignorance of the imminence of war the officers were ashore, the crew in their hammocks, and only an ordinary peace-time watch was being kept. In such case, it would be possible for the torpedo boats to make the circuit of the battleships and escape before the gun detachments could reach their stations and open fire with any kind of accuracy.

On the other hand, it is quite possible that the Russian fleet, being anchored near the harbor entrance, was rather closely bunched together. The destroyers may have discharged their torpedoes at a long range of say 2,000 yards, and simply directed a stream of them into the fleet, with the certainty that although some might pass through, other torpedoes would be sure to find a mark.

The Japanese fleet of destroyers, like the rest of their navy, is brand new, and embodies the latest ideas of the two leading torpedo-boat builders of the world—Thornycroft and Yarrow. The oldest of their boats, represented by the destroyer "Usugumo," is not more than five years old. The "Usugumo" is one of six similar vessels built by Thornycroft at Chiswick, England, and launched in 1898-1900. The dimensions are as follows: Length 210 feet, beam 19.5 feet, and draft 7.2 feet; displacement, 275 tons. The speed of these six vessels varied from 30 to 30.55 knots per hour on trial. Each is armed with one 12-pounder rapid-fire gun, mounted forward, and five 6-pounders. They carry a complement of fifty-four officers and men, and have a coal capacity of 80 tons. These half-dozen Thornycroft boats are distinguished by having two large elliptical funnels, most of the other Japanese destroyers having four smaller circular funnels. Each boat carries two 18-inch torpedo tubes.

In 1901-1902, Thornycroft launched for the Japanese government two other destroyers, named respectively "Shirakumo" and "Asashio." They are larger and more powerful boats, 216.7 feet in length, 20.7 feet in beam, and with a draft of 8.3 feet and a displacement of about 300 tons. Twin engines of 7,400 horse power drive them at a maximum speed of 31 knots an hour. The armament is the same as that of the six boats above described. The contribution of the Yarrow firm at Poplar, London, to the Japanese navy is seven destroyers of the following dimensions: Length 220 feet, beam 20.6 feet, draft 9.6 feet, and displacement about 360 tons. With 6,000 horse-power these vessels have shown speeds on trial of from 31 to 31.62 knots an hour. They carry the same armament of one 12-pounder, five 6-pounders, and each mounts two torpedo tubes. The latest of these are the "Kasumi" and "Akatsuki," both of which were launched in 1902. They carry 95 tons of coal and a complement of fifty-five officers and men. All of these vessels have four funnels and a single pole mast forward. The Japanese themselves launched in 1901 at Yokosuka four destroyers of the same dimensions and speed as the last-named Yarrow boats, and these are at the present time believed to be all in commission, making a total of nineteen destroyers.

In closing our description we would say a word with regard to the seaworthiness of these ships. Popularly they are supposed to be suitable only for use in quiet seas and practically calm weather. As a matter of fact, in their long journey from England to the Orient, they showed remarkably good sea-going qualities. This is due largely to their increased size over early torpedo boats, and to the generous freeboard that each of them, as can be noticed from our photographs, possesses. Of course, in heavy weather it is necessary for these boats to slow down to a lower speed than would be required in the case of gunboats, scouts, or small cruisers, and it is in recognition of this fact that the navies are beginning to build vessels of the scout type possessed of an extremely high speed, the most celebrated representative of this class being the Russian cruiser "Novik," which, with a displacement of 3,000 tons, has a speed of 26 knots an hour. It is probable that in rough water the "Novik" would be able to overtake, and destroy with her 4.7-inch guns, any destroyer that she might sight in the open.

The Pele Club.

The Pelé Club, which is an organization comprising the newspaper and magazine correspondents and artists, the army and navy officers and the scientists of the United States who went to Martinique directly after the great eruptions of May, 1902, held its second annual meeting at the New Willard Hotel, Washington, D. C., on Saturday, February 27. The members of the club, now about eighty in number, are scattered all over the world, so that the attendance at the meeting, though small, was considered very good and those present made up in enthusiasm what they lacked in numbers.

Prof. Robert T. Hill, the president of the club, in the course of his remarks in opening the session, spoke of the large amount of information regarding the characteristics of explosive volcanoes which had been assembled through the efforts of the members of the club. One feature of the record is the great number of photographs taken which have permanent value through the many geological and human phases of the phenomena which are thus preserved. About 1,500 such negatives and prints have been assembled at the American Museum of Natural History which are accessible to all the members. President Hill advanced the proposition that the time was ripe for the expansion of the Pelé Club from the nucleus already in existence so as to include all persons interested in the scientific study of volcanoes and vulcanology. There is no society in this country having for its primary object the study of volcanoes, in spite of a wide interest in the subject. The idea was received with favor and the organization of the new society will be pushed vigorously.

The club has in course of preparation and expects to issue this year a book upon the eruptions, which will be the composite work of many contributors relating largely personal experiences. Dr. E. O. Hovey, the chairman of the editorial committee, reported that chapters had already been submitted by Major H. J. Gallagher, U. S. A., of the general staff, on the organization of the United States relief expedition and the assembling of the stores; by Lieut. Commander J. B. Barnadou, U. S. N., on the nature of the exploding cloud; by Prof. Israel C. Russell, of the University of Michigan, on the contributions to the science of vulcanology resulting from the study of the eruptions; by Prof. Robert T. Hill, formerly of the United States Geological Survey, on the geological history of the Caribbean islands; by August F. Jaccaci, formerly of McClure's Magazine, on Père Mary, the brave parish priest of Morne Rouge, the real hero of the time; by H. H. Smith, relating how the correspondents did their work; and by other members of the club, relating personal experiences or contributing scientific observations.

During the evening Dr. Hovey related the history of the wonderful spine which rose above the top of the new cone of eruption and dominated the mountain from October, 1902, to July, 1903, full description of which appeared in the Scientific American

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