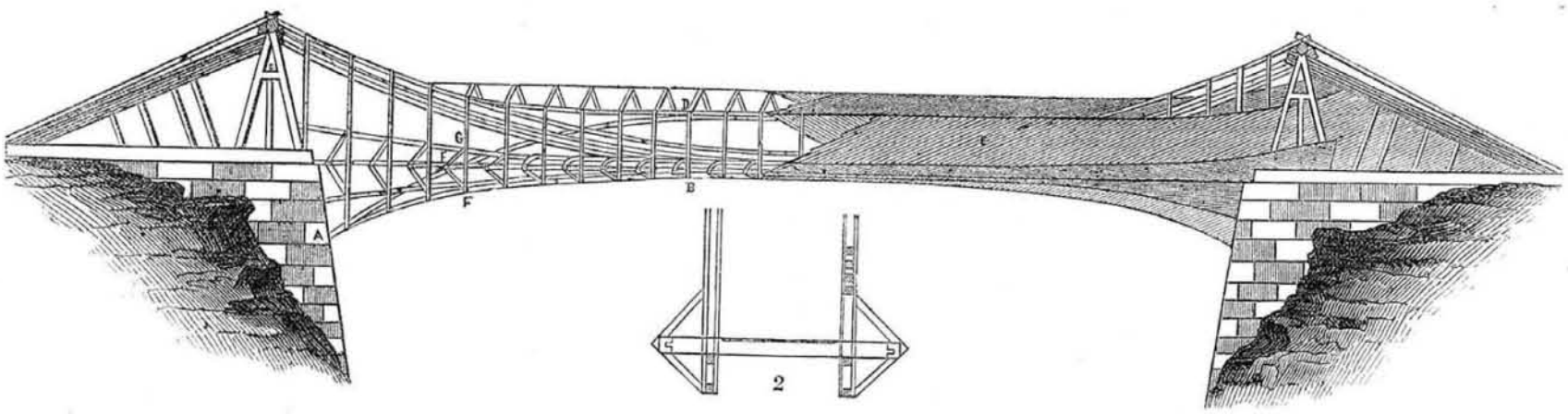
WHITE'S TUBULAR SUSPENSION BRIDGE.

The accompanying cut represents a new design for a bridge invented by Mr. Ammi White, Boston, and intended to supersede the necessity of piers in crossing our largest rivers. It represents one of 500 feet span, and can, with safety, be extended he says, even for railroad purposes 1,500 feet. The mode of construction is as follows:

Erect the towers on good and firm abutments, or on a rocky bank; then extend across the stream two or more sets of stringers, according to the number of road-beds needed. The number of stringers in each set will depend upon the amount of strength required in the bridge. Each stringer is made by selecting a tree of propers ize, which is sawed square and is tapered from the top to within about five feet of the base. This serves as a starting point, on which are spliced good sound boards, six or seven inches in width, on a curve of 40 feet in 500, tilll the required length and thickness is obtained, the whole terminating in a corresponding timber, which forms the other extremity. In securing one board upon another, care is taken to fix keys of wood or iron into mortices, made half into one board and half into the other, to prevent the stringer from elongating, which, with the additional bolts placed near the dowels, is as incapable of divulsion as the tree itself. This suspension chain or stringer is run across the stream by means of a wire cable and pulleys, and when locked and keyed fast in the towers, with the two back stays at C, is allowed to take a catenary curve. After a sufficient number have been extended across, the suspension rods are bolted to them and to the girders, which are made slightly arching, and to the floor-joist at B. The rafter is connected with the stringer and top of the suspension rod at D, to which is bolted the roof, constructed of double diagonal boarding. The floor, if a turnpike bridge, made of double diagonal planking bolted together, is then laid, and, in the capacity of cross-bracing, serves to render firm the whole structure. If a railroad bridge, the cross bracing is fitted under the floor-joist, in connection with the girders at B. By loading



either kind of bridge with double the weight it is required to sustain, the girders will be brought down to a level, and while the weight is on, the sides are covered with a double diagonal boarding, similar to that of the roof, both of which must be firmly attached to the towers and back-stays, to form a part of the strength of the bridge. The direct arches are formed by bolting together planks on the right curve, and in the above cut, one springs from the abutment at A, and connects with the stringer at the top of the suspension rod; the other starts from the same point and connects with the girder at B, both connecting in their course with the suspension rods. The side-guards, or braces, are formed by fitting a fender rave to the floor-joist, which extends over the girder several feet according to the length of the bridge. Short rafters connect at the fender rave at F, and the suspension rod, E G. These, together with the projecting floor-joists, are covered with double diagonal boarding. These braces prevent the bridge from vibrating. The back-stays, connected with the studs inserted in the sills of the towers, extend back on shore the required distance, and are firmly attached to stone posts, deeply set in the ground at the extremity of the sills at H.

Fig. 2 is a cross section showing the floor-joists, suspension rods, braces, &c.

Among the advantages claimed over other bridges are—strength, economy, and durability.

Strength. It is obvious, on careful examination of the above design, that in its construction are combined many of the well established principles of science, not the least important of which is that wood, of which the stringers are composed, will bear a greater strain according to its weight, than iron. Thus, too, the roof, instead of being a dead weight upon the bridge, like others of different construction, formed as it is, will sustain not only itself, but a large portion of the rest of the structure. Also, the double diagonal boarding of the sides being attached firmly to the suspension rods and towers, form, in connection with the roof, an immense tube, and being connected with the suspension chains, which it is impossible to pull apart, and being still farther rendered firm by the direct arch, together with the side guards, it will not break down, deflect, nor vibrate, with any weight it is required to sustain.

Economy.—That this structure is comparatively economical, is obvious from the facility with which materials for its construction can be procured; they consisting mainly of boards and planks, which can be put together much more cheaply and expeditiously than large timbers hitherto used. And even if the roof should be dispensed with, the inside, like the outside, being covered with a double diagonal boarding, leaves only the road bed exposed to the weather, which can be replaced without detriment to the main structure; also, being so constructed that it receives the strain longitudinally, a comparatively light structure will sustain an immense weight, besides dispensing with piers, which is by no means a small item in bridge building, especially over our broad, rapid rivers and deep ravines.

Durability.—Little need be said under this head, when we call to mind the well established fact that small timber, planks, and boards, when thoroughly seasoned and secured from the weather, will last vastly longer than large timber which cannot be thoroughly seasoned in any reasonable time, the consequence of which is, the inside becomes decayed, while the outside is apparently sound.

Persons interested in bridge building, and desirous of obtaining further particulars, may address Ammi White, 17 Prospect street, Boston, Mass., or Joshua P. Thayer, Cambridgeport, Mass.

Variations from Climate in Organic Life.

Organic life assumes new characteristics under new influences. The domestic animals of Europe were not found in this country on its discovery. They escaped from the Spaniards, and ran wild for centuries. In consequence, new and striking characteristics have been acquired in accommodation to the novel circumstances. The wild hog strikingly resembles the wild boar of Europe. The hog of the mountains of Parasmus resembles the wild bo ar of France. Instead of bristles, which the stock has from which he sprang, he has a thick fur, often crisp, and sometimes an undercoat of wool. Changes in color have taken place, and the anatomical structure has altered.

The ox has undergone similar changes; some in South America called "pelones" having a clothing of fine fur; others with a naked skin, like the Mexican, or Guinea dog. In Columbia, the practice of milking cows was given up, and the secretion of milk is confined to the period of suckling the calf.

The wild dog of the pampas does not bark like the domestic dog, but howls like a wolf. The wild cat has lost the sweet music of the caterwauling concert. The wild horse of the higher plains of South America is covered with long, shaggy fur of a uniform chestnut color. The sheep of the central Cordilleras produces a thick, matted, wooly fleece, which breaks off in tufts, and never re-appears. The goat has lost her large teats, and produces two or three kids annually. Similar changes occur in geese and gallinaceous fowls. Rumpless ones have sprung up, wanting the caudle vertebræ. Cats are frequent on White river without tails.

The fat-tailed sheep of Tartary loose their mass of fat on removal to Siberia. The African sheep has become like a goat covered with hair. The Wallachian sheep are different still. The wild horses of Siberia have anatomical differences from tame ones. It is a question among naturalists whether the dog and wolf belong to the same species, though it is referred to one species. But between these the differences are immense, from the gigantic St. Bernard, and the New Foundland, to the little lap dog in a lady's arms. The cow, the domesticated fowls, and pigeon, have put on infinite varieties of size, color, and character.

Yacht Racing in America and Europe.

Darius Davison writes us that it is his intention to build a yacht within the period of six months from the date, of a tonnage and cost equal to the tonnage and cost of the yacht "America;" said yacht to be built, modelled, and rigged different from any vessel or yacht afloat. And to be held ready at any time within the period of one year from the date (after being completed) to sail against any vessel or yacht, or number of vessels or yachts, now afloat in this country or Europe, that may be entered for the race. The trial of speed and sailing qualities to take place at any time chosen by a majority of the owners of vessels entered for the race, and to be run as they shall choose, for any distance, upon the ocean or inland waters, in a heavy or light breeze, with or against the wind. The owner of any vessel entered for the race, not satisfied with the time and circumstances chosen by a majority to make the trial of speed and sailing qualities, shall be at liberty to withdraw such vessel, at any time before one week preceding the time chosen for the contest. This provision is not to apply to the vessel entered by the subscriber; his yacht to be held ready to sail at any place and time within the period specified, and under any circumstances chosen by a majority of the owners of the other vessels. That only first class well-tried sail vessels or yachts may be entered for the race. The prizes to be sailed for are as follows:—

In case the subscriber's yacht win the race, the vessel which comes out second, and the last out in the race, to be forfeited to him. And in case his yacht is beaten, he will deliver her, with all her appurtenances to the winner of the race, as a prize.—[Tribune.

[We don't know Mr. Davison, but the above seems to be fair, yet we venture to predict that it will be a long long time before Mr. Davison makes good his bravado. He has published so many strange challenges about this thing and that thing he was going to do, all of which have yet to be done, that we have no confidence at present in what he puts forth as anything worthy of superiority. What has become of his steamship that was to sail to England in less than nine days, we believe, and with which he challanged the world for millions? The Tribune is a great paper for publishing and noticing all such *nothing-in-them novelties.*

Antidote for Arsenic.

Mr. Gideon Paul, of Detroit, Mich., writing to us, says, "the hydrated sesquioxide of iron is a better antidote for arsenic than the protoxide, and that, I am sorry to say, is not kept, as a general thing, in druggists' stores."

Sails of the Yacht America.

The sails of the yacht America were made of cotton duck, manufactured at Colt's factory Paterson, N. J. It is said that a vessel with cotton sails will sail one knot per hour faster than with canvas. It is closer and retains the wind much better.