treatment might have made a slow but a steady and complete recovery. These cases are more common than those first mentioned.

The advocates of the "mind cure" claim, it is true, that the view here given does not represent the case fairly. They state continually that organic diseases are healed as promptly and as readily as those which are only functional. In regard to this, we must remember two things: First, that functional diseases, as already shown, simulate the organic completely, and are constantly mistaken for them; and that the practice of every physician shows him that their proportionate number is by many fold the greater. But the main difficulty is in the second point, which is that an instantaneous cure of a serious organic disease is *impossible* through any natural agency. This point, though sure and certain, is taken but seldom into the account.

An organic disease necessarily involves a change of tissue. There is in the affected organ an increase or a diminution of the natural tissue itself, or otherwise a tissue of distinct nature is substituted for it. Referring to one organ merely—the heart. It is laboring, we will say, with pericardiac effusion—"water on the heart"—and can continue in life and action only with a hard struggle. Even if the diseased pericardium could be instantaneously made perfectly sound, what could remove the fluid already present and choking out the life of the patient? It passes belief that any agent, either mental or physical, could cause it to disappear. The same difficulty exists as in every form of disease to which the valves are liable. To allow recovery, a physical removal or supply of tissue becomes necessary; and, as our minds are constituted, and in the present state of our knowledge, this is plainly to us an *impossibility*.

THE FISH TORPEDO AND ITS ENEMY.

In warlike Europe, the attention of the military authorities is constantly directed to the improvement of war ships, fortifications, and the torpedo service. Here, where we have neither modern fleets nor land works, the Government is very properly concentrating much of its attention upon the torpedo service, so that, even if we have no teeth to bite with, we may at least be prepared to resist attack of those who have.

At a time like this, however, when the demand for effective torpedoes has set ingenious mechanicians to work all over the world, and unique systems come so fast that the one almost treads upon the heels of the other, it would seem to be at least injudicious in the Government to decide upon the relative merits of and to adopt any particular system, because the next movement may bring forth a rival system to render the favored one ineffective and impotent.

The truth of this received only recently a striking illustration. No sooner did our Government decide to adopt the "Sims" fish torpedo, and give its order for a large number of these subtle missiles, than the news came of the successful trial in English waters of a torpedo catcher which, if only a part is true of what is promised for it, can render the "Sims" torpedo as impotent and harmless as a spiked gun.

This "Sims" torpedo, which, under the direction of the Engineer Corps, has been quietly undergoing examination and test for several years at Willet's Point, may be generally described as composed of two cylinders, the one wholly submerged, and containing a firing charge of explosives, and the other, connected with it by steel rods and intended to support its weight, having only its upper surface above the water line. It is directed and controlled from the shore by electrical transmitted energy through a wire which it reels off as it progresses.

The extent of its range is two miles, the operator ashore being enabled to observe its progress and maintain it in its course by keeping his eye fixed upon two balls poised upon steel rods that project perpendicularly out of its back. Numerous experiments show that this torpedo cannot be thwarted by the ordinary torpedo boom and other similar obstructions, it having shown its ability to dive under them and keep on its course unchecked and intact. Nor can the upper cylinder, the purpose of which, as may be imagined, is to buoy up the under one, be easily destroyed. Lieut.-Col. Abbott says that, in the tests, this surface cylinder has been riddled with shot, and yet the packed cotton within proved sufficiently buoyant to support the strain from below.

Tne "Sims" torpedo is indeed an admirable though scarcely a novel contrivance—the electrical apparatus being now in use in several old systems; and, were it not for the existence of the newly devised torpedo catcher and a few other things, might be looked upon to furnish an effective defense against the modern war ship. But, while the newly adopted torpedo can only make twelve knots an hour under the most favorable conditions of wind and tide, the torpedo catcher has a *mean* speed of 20·70 knots, and can make 23 knots per hour. In other words, the "catcher" is nearly twice as fast as the torpedo, and it would seem as if this "Sims" torpedo would have about as much chance with the "catcher" as a mouse has with a cat.

The projectors of the torpedo say that it can not only go under a boom laid to stop it, but can also blow up any ordinary obstruction and bring up still another torpedo which it has in tow to accomplish the real object of its mission.

But it is immediately apparent that, since it relies both for power and direction on electrical energy transmitted from the shore, the cutting of the wire which conducts the current would leave it to drift harmlessly about among the waves. So fast a craft as the torpedo catcher could overhaul it in short order, and would only have to drag a grappling iron across its wake to leave it *hors de combat*.

Again, the guns on a modern war ship have a range of nine and (the De Bange guns) even eleven miles, and need not come within two miles of the shore—which is its maximum range—to carry on their work of destruction. To be sure, the "Sims" torpedo may be operated from a ship as well as from the shore; but in that case, the ship would have to be of modern construction and heavily armed, and this would necessitate a recourse to great ships and great guns, the very thing this torpedo is supposed to be a substitute for.

It looks very much as if we had adopted the mouse as a protection against cats.

FIRE FROM STEAM PIPES.

It was asserted with confidence by the fire chiefs, at their fall convention at Long Branch, that steam pipes had been known to be the direct cause of a number of disastrous fires. The evil, in their estimation, was sufficiently grave to deserve attention from all municipal authorities. Experience in different parts of the country seemed to confirm their statement, with the one exception of Baltimore. In that city one of the commercial sheets has denied such an effect of steam heating, and questions whether a single authentic case of a fire, caused by steam pipes can be brought forward. This has naturally raised a controversy, in which one side asserts the existence of overwhelming proof, and the other ridicules their belief in such fables. It is usually hard to satisfy one's self of the real cause of a fire, since there are so many possible ones; but such evidence as we have seems to clearly indicate that steam pipes not only can, but have produced very serious conflagrations. When timber is brought in contact with hot pipes, and particularly in inclosed spaces, it becomes extremely dry, and finally charred. If air be suddenly admitted, such timber is very apt to burst into flames, its thorough dryness rendering it dangerously inflammable. Experiments conducted by Mr. Damrell, in which these conditions were present, gave just such a result. A state of affairs producible at will is possible by accident, and the same result must follow. In this case, the requisite conditions are very apt to be unintentionally fulfilled, for a steam pipe is ordinarily put out of sight whenever possible, and, to economize space, is permitted to come in contact with anything that may cross its path.

As far back as the early part of 1880, Mr. Edward Atkinson gave us a number of instances in which heated pipes were the direct cause of fire. Two or three of these cases may be recalled, as they are so much to the point. A steam pipe which ran across a yard, in a wooden box, was surrounded with fine charcoal, as being a good non-conductor of heat. Within twelve hours, the charcoal was in a state of vigorous combustion. At another time, a pipe carried through a sill in contact with the wood was sufficient to cause combustion within less than twelve months. Coming from so high an authority, this evidence has the weight of conviction, and can scarcely gain anything by being multiplied.

Improvement in the Treating of Fibers for Textiles.

Mr. Wesley W. Hamilton, of Brooklyn, N. Y., has recently obtained several patents in the United States and foreign countries for an improved process of treating animal and vegetable fibers, whereby many such substances heretofore unavailable may be made suitable for textiles, cordage, upholstering purposes, and numerous other uses. Jute and flax, when reduced in length to about that of cotton fiber, it has heretofore been found impossible to spin on cotton or wool machinery, either alone or when mixed with other short fibers. At the first part of our late civil war, it was especially sought to more largely utilize flax in England, by splitting up its fibers with acids and alkalies, to make them more nearly resemble cotton; but the flax fibers remained in the end only straight, solid pieces, destitute of the curliness, softness, and pliability characteristic of cotton. During the past fifty years, many patents have been taken out, here and in Europe, and especially in England, to make the short fibers of flax and jute capable of being spun, as can be done with cotton and wool; but they have all failed because of not imparting to the fibers the softness, pliability, and clinging, curly form always found in cotton and wool. By these inventions of Mr. Hamilton, it is claimed that all previous difficulties of this nature are obviated, not by the use of chemicals, which would impair the strength of the fiber, but simply by mechanical pressure and heat, in an operation which can be effected at very slight cost. Mr. Hamilton has been for several years engaged in perfecting his invention, which has not yet been employed in any manufacturing industry, but he has samples of a great variety of fibers thus treated, which show a wonderful transformation of what are usually considered the most intractable of fibers. Of calf, cattle, and goat hair, white and dyed, all his samples show decided woolly qualities, some of the calf hair being in a condition so it would take an expert to separate it from a fine sample of wool. Coarse and fine jute and flax, cut in lengths of one and two inches, are shown in a form very much like wool, and which undoubtedly admit of their being easily spun, either alone or with cotton or wool; while istle and cocoanut fiber, hog hair, and many other similar substances, are presented in a curled form, which adds largely to the variety of uses to which they may be applied.

PHOTOGRAPHIC NOTES.

Showing by Projection upon a Screen the Fixing of a Developed Gelatine Plate.—A member of the Society of Amateur Photographers of this city, Mr. J. J. Wilson, recently had occasion to deliver a lecture on the principles of photography before the Bowery Branch of the Young Men's Christian Association, and by a very simple and interesting experiment succeeded in showing to the large audience the appearance of a plate when developed, and also when in the process of fixing.

A special narrow tank was made, large enough to hold a plate 3¼ to 4¼, by clamping together two small sheets of glass, between which, around the three edges, was a strip of India-rubber packing, three-eighths of an inch thick, or square. This made a water-tight joint. The tank was then placed in the oxhydrogen lantern, taking the same position the usual lantern slide occupies, and was filled with the ordinary fresh hypo fixing solution.

A sensitive plate was exposed behind a negative (the exposure in this particular instance being made by the light of a burning match), and developed in a tray in the usual manner. Then it was washed and carefully placed in the hypo tank, reversed the same as a lantern slide. The powerful oxyhydrogen light was then turned on, but owing to the peculiar color of the film and its density, not a particle of light could be seen on the screen. But as the hypo gradually dissolved out the undeveloped portions of the film, the picture, which at first was faintly perceived, slowly grew more distinct and brighter, until it finally came out clear and plain, the moment the fixation was complete, to the surprise and pleasure of the observers.

The illustration was plainly seen upon the screen by every one, and gave a most excellent idea of the changes in the film during the process of fixing.

At Mr. F. C. Beach's suggestion, Mr. Wilson had previously tried to illustrate in the same manner the development of a plate, by putting in the tank an ordinary iron developer, and exposing and immersing a gelatino-chloride plate (noted for their extremely thin and transparent films), but found that the peculiar color of the film was such, notwithstanding its transparency, as to effectually cut off the yellow oxyhydrogen light, and thereby prevent the success of the experiment.

White Backing for Sensitive Plates.—It has been recently found by experiment that if a piece of white paper be interposed between the septum of a double plate holder and the glass plate, thereby forming a white backing, a greater amount of detail can be brought out in a plate which has had an instantaneous exposure than if the backing was left out. The theory of this is based on the ground that with the recently improved sensitive negative gelatino-bromide paper, it is easier to bring out the details in an instantaneously exposed picture than if the same were on glass. As the paper is white, it was supposed that a white backing upon a sensitive plate would have a similar effect. The experiment seems to prove that it does.

Advertising in Italy.

A convenient little advertising plan that comes from Italy is quite good enough to have been a Yankee conception. It is a railway ticket with pocket for an advertising card, and is in use on the North Italy Railway. The device is so simple, and withal so serviceable to both traveler and advertiser, that it is almost a wonder that none of our American inventors has contrived a similar arrangement. If one buys, for instance, a ticket from Milan to Venice, he finds inserted in the pocket a neatly printed sheet of paper giving all necessary information regarding the Venetian shops and hotels. Each advertisement sheet is divided into forty spaces, twenty on each side. The price of advertising in one of these spaces is fifteen francs, or about three dollars, for ten thousand copies. When all the spaces are occupied, the railway company thus makes an additional hundred and twenty dollars on each ten thousand tickets sold.