Correspondence.

Fire Peril of Brooklyn Bridge.

To the Editor of the SCIENTIFIC AMERICAN:

Referring to your article "The Lesson of the East River Fire," in the issue of November 22, 1902:

Many years ago I called attention to the danger which exists in the case of the Brooklyn Bridge. Should the buildings on either side of the river, which are under the bridge, burn, I believe that the bridge would almost certainly fall. The rapid diminution of the tensile strength of steel, under high temperatures, could only result, it seems to me, in this case, in a disaster of the first magnitude.

Have you ever noticed the close proximity of some of the buildings to the bridge cables?

F. E. CHADWICK,
Captain U. S. Navy.

Naval War College, Newport, R. I., Nov. 29, 1902.

[The danger indicated by our correspondent is a very real one, and it is nothing to the point to urge that, because no damage has been done to the bridge by fire, during a quarter of a century, therefore the risk is more imaginary than real. The true point of view is that of gratitude that among the hundreds of fires that occur annually in the lower part of the city, there should never have been a serious conflagration among the buildings referred to by Capt. Chadwick. We hope to refer to this matter at fuller length in a later issue.—ED.]

Typesetting With an Ordinary Typewriter.

To the Editor of the SCIENTIFIC AMERICAN:

Herewith an idea which I believe is original, and should appreciate your giving it publicity, provided you see fit. It is this:

Paper or linen treated with a plastic surface of clay substance that will not crack, peel or be affected by heat. This paper to be used with the ordinary typewriter as used for flat surface or ledger work.

The type of the typewriter striking against the clay paper would leave its impression. After the writing was completed, the sheet of "clay paper" should be removed from the typewriter, and placed in a drying oven, to free it from all moisture. The paper is then ready to receive the melted lead for the electro; the method of taking off the lead impression being the same as now commonly used in printing establishments.

The idea is to do away with the expensive and present ponderous style typesetting machine, which takes up considerable valuable space, especially in large cities. There would be no need of type and leads, with the consequent saving in the cost of same. Any stenographer ought to be able to do the work of a printer without first serving his apprenticeship. Furthermore, the clay sheets could be stored away for future use without taking up nearly the space of ordinary lead electros. Of course, the present style typewriter would require some modifications to conform with the requirements necessary. Also some device should be provided for uniform indentations, so that the electro would present a perfectly smooth type surface and insure each letter printing distinctly on paper.

I see no reason why the Rowland automatic system of telegraphy, as adopted in Germany, could not be advantageously used in this connection, whereby a newspaper reporter, at one end of the wire, might typewrite his reports, which would be received at the other end of the wire on the clay paper, and thus ready for the lead impression, and then the printing press. Where is the scientific genius who can make above ideas practicable? L. A. BONNET.

Chicago Heights, Ill., November 27, 1902.

Effect of Light on Animal and Plant Life.

To the Editor of the SCIENTIFIC AMERICAN:

In his criticism of the article of Dr. James Wier, Jr., on the effect of light on animal and plant development, Mr. E. Ritchison has fallen into a slight error. At the conclusion of his letter, after quoting a few passages from the article in question, in which the growth of sensitive plants exposed to the light under variously colored glass is discussed, he says:

"From the foregoing one gets the impression that plants under a red glass are subjected to red rays of light, while the reverse must be true, as the red glass has absorbed all the red rays of light, and the remainder only have penetrated.

"Who has not observed that in a photographic dark room, where a red light is used, anything therein which is red will appear white, for there are no red rays in the room, all being absorbed by the red paper through which the light is filtered?"

Now, in the first place, the impression that one gets from Dr. Wier's article is the correct one. Red glass or glass of any color is such, only by virtue of its property of excluding all light rays, save those of its particular color. That is to say, a piece of red glass excludes the blue and yellow rays of light and allows only the red to pass. Such a piece of glass, however, is possible only in theory, since a colored glass in practice is able to exclude only a portion of the light of a color not its own. For this reason, the experiments of Flammarion described by Wier are not absolutely questionless. The only feasible manner to secure absolute results would be to maintain the plants in the red or blue portions of the spectrum of white light.

To return to the letter of Mr. Ritchison: I have been a devotee of photography for some years, and have had a fair share of work in the darkroom, but never in my vigils over the developing tray have I beheld the peculiar appearance so nonchalantly described above. If the conditions assumed by Mr. Ritchison were true, a red object exposed to the light of a ruby lantern would appear black. A red object is one which absorbs all blue and yellow rays, reflecting those which give it its peculiar color. Exposed to a red light, a red object remains practically unchanged in its color. R. A. HELTON.

Washington, D. C.

Our New Armored Cruisers.

To the Editor of the SCIENTIFIC AMERICAN:

The recent controversy over the horse power and speed of the "Tennessee" and "Washington" appears to me to involve broader questions than I have yet seen stated. I believe that confusion has arisen through the fact that the term "armored cruiser" is now used to designate two types of vessels which have arrived at a point of definite separation and must follow diverging lines.

It is a commonplace to say that each type of naval vessel is steadily progressive. With battleships the progress is rightly directed to the guns and armor. The armored cruiser, on the other hand, has steadily increased its speed until it is to-day represented by the "Drake" with a trial speed of over 24 knots.

It is, however, possible to arrest the speed of the armored cruiser at about 22 knots and to divert the progress to guns and armor again, as the Italians have done with such success in the "Vittorio Emanuele III." This, however, produces a third type of vessel, and it will tend to a clearer understanding if we give this type the distinctive name of intermediate.

Now Rear-Admiral Melville is right when he says that the "Tennessee" and "Washington," as finally designed, are not armored cruisers. They are not the armored cruisers of to-day; that type is represented by the 24-knot "Drake." They are intermediates. They may be as fast as the armored cruisers of yesterday, but that is an incident of naval progress.

The armored cruiser is a ship in which speed is the dominant factor, and which must keep progress with the navies of the world in that regard. Its theoretical function is to "catch anything afloat," while carrying sufficient armor to fight other vessels of its own class, but not to fight battleships. The intermediate is a vessel designed to "lie in the line" in an emergency, and will soon develop into one that will do so as a matter of course. At present it is confused with the armored cruiser because its speed is about the same as that of the armored cruisers of the past; but the speed of the armored cruiser is progressive, and as soon as there are a dozen or more 24 or 25 knot armored cruisers afloat, the difference will be seen to be clear and fundamental.

The Board of Construction has decided in favor of the intermediate as against the armored cruiser, and it is not my purpose to discuss the merits of that decision. The main point is that the question is not one for the Board of Construction at all. The line of cleavage has gone deeper than a question of construction, and has separated two types. Hereafter the armored cruiser must follow the "Drake" class to a speed of 25 knots or better, while the intermediate, on a speed of fully three knots less, must follow the "Vittorio Emanuele III." to a battery of 12-inch and 8-inch guns and a side armor of 10 inches over a 4-inch protective deck. The choice between two types differing so radically in power and purpose is a fundamental question of naval strategics and should be decided by the Congressional appropriation upon the recommendation of the General Board which controls the general policy of our navy. S. M. BALLOU.

Dresden, Germany, November 14, 1902.

Troubles of Gasoline Engine Builders.

To the Editor of the SCIENTIFIC AMERICAN:

We often read of the trials of the owners of the average small two-cycle launch engines, but the builders have some troubles themselves, although they are seldom unfortunate enough to get talked about in print.

We will take, for instance, the case of Bill Woods. He finds a launch and engine complete, advertised for but one hundred and fifty dollars. Figuring that he cannot get very badly "stuck," he bites at the bait and becomes "separated from his money." When his purchase arrives, he conceals his disappointment at the absolute want of beauty in the launch's lines, knows nothing of either gasoline engines or mechanics generally, trusts to luck, and after many failures, suddenly learns that he has accomplished two important tasks. He has started the engine and simultaneously learned just how to operate gasoline engines. Vain hope! Next time he tries his skill, possibly and probably a dismal failure. Various expedients, changes in sparking mechanism and adjustments are tried, and some valuable advice even may be scornfully rejected, the chances being he has received his full quota from sympathizing friends. When he finally realizes that he has something still to learn, he has made decided progress, and unless the engine is worse built than usual, he will be able to make it run with more or less success. Next some machinist or stationary engineer tells him that those engines ought not to cost more than thirty-five dollars apiece to build, and he becomes interested, takes the machine to pieces and begins to study it. He takes the village carpenter into his secret, and soon the local papers announce that Bill Woods is building patterns for a gasoline engine on "new and improved" lines, and the village is promised a new industry, etc. Next an iron foundry, possibly whose forte is grate-bars or window-weights, is treated to a view of the embryo engine, when his trials then begin in earnest. Patterns won't draw, core boxes are wrong, cores will not fit the prints; these being remedied, "cold shucks," sand and blowholes appearing, the foundryman gives it up, Bill gathers his patterns together and "steals away" to some other foundry. Perhaps here they may have done similar work, know his requirements, make necessary changes and get out some fairly satisfactory castings. Next he buys a second-hand drill press, lathe, and shaper and is fully equipped to "manufacture." After several apparently unsurmountable obstacles have been overcome, his engine is built and set up for a shop trial. The cylinder is probably not quite true, piston rings may not quite fit, and the head may be dished just enough to let water from the jacket into the cylinder; shaft may not be exactly in line, and ten to one his wristpin is not parallel with crankpin. Clearance is probably too little and, owing to leaky rings and piston when explosion takes place it has very little power, and should he be fortunate enough to get it to run at all, he has to be extremely careful not to rub his foot on the flywheel or he will stop it. Then he begins to realize that a gas engine to run well must be carefully made as well as cheaply, and he rebores cylinder, makes new piston and rings and is able to get more satisfactory results, while the papers begin to get a little sarcastic and facetious in their gas engine items. He places this new piece of wonderful mechanism in his boat, and at its first trial finds the old engine gave him more speed. Several times he starts out, and ignominiously rows or is towed back by some kind-hearted sympathizer. At last he makes a run to some objective point, usually with favoring tide, tries to return with same tidal help, and cheerfully lies about the elapsed time and speed. How his bump of importance develops!

Well, he has built his first successful (?) engine; and soliciting orders he begins what he calls their manufacture, but finds his original estimate of cost too low, except that of a great deal of expensive machinery and tools he purchased, to make interchangeable parts by gage. His facilities are limited, and he does the best he can. Some engines run and some do not. His stock of "slightly used engines taken in exchange for larger sizes" steadily increases. His methods of lubrication and insulation are most defective, and if he is able to sell any engines, they constantly give out and new parts or repairs are demanded. His technical and theoretical knowledge of construction is *nil*, while his practical experience is but little more. Still he goes on bluffing it out, always in hopes of better things.

The larger sizes bother him more than the small, and when he so far forgets himself as to attempt putting two cylinders on one base his "cup runneth over." While he could at least get along very comfortably with one, he finds two cylinders are several times too many. Come to think of it, how many satisfactory two-cylinder two-cycle engines did you ever see in operation? Ten chances to one the double-cylinder engine never leaves the shop. Better for him that it does not.

These troubles which beset the scores of small launch motor builders are not unknown to many of our larger manufacturers, with well-equipped, well-found shops, capable mechanics in charge and up-to-date methods in vogue.

The whole matter summed up is this: Almost any one can build a gas engine, but he cannot always make it run, and while we offer, free as the air we breathe, advice to owners, let us reserve some small portion for the builders of these inferior productions, unfortunately often selected in preference to the good article.

Bridgeport, Conn. A. E. POTTER.