

Candidates for admission or promotion will be required to furnish the Board of Examiners with evidence of their abilities in the execution of mechanical drawings, and their proficiency in penmanship.

The Examining Board will report the relative qualifications of the persons examined, and number them, giving to the best qualified the lowest number.

When, in the opinion of the Department, the wants of the service require the admission of Engineers of any grade above that of Third Assistant, the same qualifications and restrictions as to times of service will be exacted, as by the regulations are required for promotion to the grade in question: *Provided*, that all appointments to the grade of Second Assistant shall be made between the ages of twenty-one and twenty-eight; and to that of First Assistant, between twenty-five and thirty-two; and to that of Chief Engineer, between twenty-eight and thirty-five.

The Assistants must employ all favorable opportunities for acquiring a practical knowledge of the fabrication of the different parts of steam engines and their dependencies, that they may be able to repair and replace such parts as the space and means for making and repairing can be furnished in steam vessels. When other qualifications are equal, candidates whose skill and abilities in these particulars are superior will have precedence over others, for admission or promotion, who may be considered equal in other particulars.

NOTE.—As resignations are of almost daily occurrence in the Naval and Marine Corps, the number of officers, as given above, may vary somewhat from the number on the pay roll.—REP.

It will be seen by these particulars what the actual condition our navy is at this momentous period of our country's history.

Our Correspondence.

Aquarium.

MESSRS. EDITORS:—On page 151, present volume, SCIENTIFIC AMERICAN, the promise was made to state the habits and peculiarities of the fish, and of the other inhabitants of the aquarium. Infinite and wonderful are the views which may be obtained in one of these tanks. And in noticing the fish let us first begin with the stickleback, which is among fishes what the humming-bird is among the feathered tribe; the largest one of these I have ever had or seen was not two inches in length. It is quite narrow, and very quick and nimble, being shaped much like the salt water mackerel. He would die a thousand times rather than give up a battle with another fish, and so ferocious is he that it is the exception rather than the rule, if he does not attack a fish placed in the same tank with him. No matter how large or how small his neighbors may be, they are quite sure to find but little mercy, and still less timidity, in their Lilliputian adversary. I had one of these fish that kept the entire end of the tank, and woe be to any fish that dared to intrude on what he considered as his personal property. At one time a bullhead, five or six inches long, tried to push him out of the way, but as the stickleback did not agree to it, he punished him thus:—Raising his spines he moved back a short distance, and, returning seemingly with the speed of a bullet, he ran under the fish, cutting him open with those cruel spines, just as well as it could have been done with a knife; and then sailed around the tank in the most consequential and self-approving style imaginable. They trouble the gold-fish less than any others; but sometimes they will even attack large gold-fish, many times their own size, and frequently they find themselves between the jaws of these fish, but scarce ever are they swallowed; for when just in that position, they erect their spines and refuse to go any further. If the gold-fish attempt to crush him, it must, of course, be somewhat injured by the sharp little spines. I have often released this little fish from what to us seems a not at all desirable situation, when off he would swim as if nothing had happened, and not long after would try it again. They are very fond of feeding on the tails of tadpoles, or on frog's feet, and these members are not at all safe when there is such a thing as a stickleback in the tank. I have heard it said that they build nests in the water, in which the female spawns; but have never seen anything of that kind; but there are seasons of the year in which their colors are much brighter than at others, and when he remains in the sunlight moving his delicate little fins, I know of nothing more beautiful. Their bodies seem almost transparent, and especially beautiful are the males, which may generally be distinguished by their pugnacious propensities. Tadpoles come next on the list; they will soon be seen to grow very fleshy, then two feet will make their appearance near the tail, followed in the course of a month by two more back of their head, and gradually the tadpole becomes changed into a perfect frog, the tail

being absorbed in the formation of the legs; and who can tell with what feelings of novelty, mingled with surprise and delight the once poor tadpole, but now Hon. Frog, gives his first croak as he dives into the water?

A word in regard to feeding fish. They are apt to be fed too much, and great care should be taken not to place an unnecessary quantity of food in the tank, as it decays and renders the water impure. The best food is a small angle worm, or fresh raw meat cut up in small pieces, and given to them once or twice a week. There are a great many rules which might be given, but the management of an aquarium is best found out by experience; and when the balance between animal and vegetable life has been found, the water may be kept in the tank for an indefinite period of time. I had a small tank in which water and a suitable stock of fish were kept for thirteen months, and not a single fish or plant died during that time; but it at last was broken, and thus the water was changed sooner than intended. Now, in conclusion, if you wish a pure, healthful and innocent study and amusement, either make or buy an aquarium; it will be money well invested.

T. D. A.

Rochester, March 2, 1861.

Valued Testimonial.

MESSRS. EDITORS:—Please allow me, through the columns of the SCIENTIFIC AMERICAN, to express my sentiments respecting the high estimation which I entertain of the value of your paper to mechanics, inventors, manufacturers and others. The information which it contains, I have found to be thoroughly useful, and of great importance to myself as a practical mechanic; and as an organ for introducing new inventions to the public, it stands unrivaled. Your kindness to correspondents has been of great assistance to me in furnishing information which has been the means of my obtaining a valuable patent through your agency, and of introducing me to the Collins Company, by which I have been enabled to bring my cast steel molded plows to perfection and public use.

F. F. SMITH.

Collinsville, Conn., March 6, 1861.

The Baltimore Mechanics' Fair for 1861.

By a circular received from E. Whitman, chairman of the Committee on Exhibition, we learn that the Thirteenth Annual Exhibition of the Maryland Institute for the Promotion of the Mechanic Arts, will open early in October next. Steam power, with all the shafting, fixtures, &c., free of expense, will be in readiness for propelling the machinery, also laborers to assist in arranging the same. All freights from New York, Boston and Philadelphia, by steamboat, on machinery exhibited at this Fair, will be settled by the Institute both ways, and if the owner is not present, or has no agent there, by forwarding the bills of lading to the chairman of the Exhibition Committee, they will receive his personal attention in fitting up and arranging the same for exhibition.

Mr. Whitman says:—"From the success of our former exhibitions, the facilities and conveniences offered at the exhibition in October next, together with the central locality of our city between North and South, we flatter ourselves that we shall be able to offer greater inducements to manufacturers, mechanics, artists, inventors and others to exhibit at this Fair than has ever been offered at any similar exhibition in this country."

OLD COPPER CENTS TO BE WITHDRAWN FROM CIRCULATION.—The Director of the Mint, at Philadelphia, has arranged with Adams' Express Company for the transportation, free of cost to the shipper, of the old copper cents to the mint to be exchanged for those of the new issue. They must be arranged in packages of not less than \$20 each. Our ferry companies will be inexcusable if they pay out any more of the old cumbersome coin.

CEMENT FOR SHIPS AND WOODEN PIERS.—A substance for coating ships' bottoms and wooden piers exposed to the attacks of the ship-worm has been patented by S. Zoubtchaninoff, of Paris. It consists of bitumen 4 parts by weight, common resin 4 parts, crude turpentine 6, colza oil 2, sulphuric acid 8. The whole of these ingredients are placed in a cauldron heated and stirred until they are completely incorporated together. Apply it hot with a brush.

Column of Varieties.

An inch pipe, one foot high, holds 9.42 cubic inches. The soluble indigo of commerce makes a good blue ink when slightly diluted with hot water. It is incorrosive for steel pens, and it flows freely.

Excavations were lately recommenced in Pompeii, and among the first discoveries made was a druggist's shop, containing pill-boxes in abundance.

A deep purple ink, called mauve, is now becoming somewhat fashionable. It is made from the common aniline purple liquid employed for dyeing silk.

The *Alta California* states that the gold and silver ores in Tulare county are yielding at the enormous rate of from \$1,500 to \$6,000 to the tun of quartz.

The *Melbourne Herald* states that in less than a quarter of a century, Australia has increased from a population of 170 to 530,000 persons; and in ten years has exported 23,000,000 ounces of gold.

According to Humboldt, the destruction of forests on the tops and sides of mountains results in the scarcity of wood for fuel and building, and the drying up of mountain springs and rivulets.

Within the past ten years an American aquatic plant has become so abundant in the rivers and canals of England as to offer serious obstacles to navigation. It is supposed to have been introduced with some logs of American timber.

The sugar crop of Louisiana for last year amounted to 228,753 hogsheads, at the ratio of 1,150 lbs. to each; the molasses crop amounted to 18,414,550 gallons. Steam engines are used on 1,009 Louisiana sugar plantations; 283 are operated by horse power.

Very minute quantities of lead, mixed with copper, render the latter so brittle that it cannot be drawn into wire. Sulphur affects copper in nearly the same manner. Annealed copper wire is a better conductor of electricity than hard drawn wire.

The cars of the Pennsylvania Railroad Company are lighted with gas, which is supplied at the works of the company at Altoona. The gas is forced under a very high pressure into a receiver in each car, which contains a supply for three burners to last 18 hours.

In Montreal the skating pond is roofed over, so as to prevent its being covered with snow. It is lighted at night, and the band of the Canadian Rifles generally attends. The ladies frequent it, wearing short dresses, looped up so as to be out of the way, and Turkish trowsers.

An American engineer, who has lately made an extensive tour through the manufacturing districts of Great Britain, counted 46 new steamships in the course of construction on the river Clyde. These vessels range in size from 6,000 tons to 200, but most of them are over 2,000 tons.

Upwards of one million papers of seeds have been put up at the Agricultural Department of the Patent Office within the past two months and sent to members of Congress for distribution. Each collection or batch comprises 54 varieties of vegetable and about the same number of flower seeds.

The American Association for the Advancement of Science was to meet at Nashville, Tenn., on the 17th of April, but we understand that the meeting is to be postponed for one year, owing to the disturbed state of the country—an unwise step; science should go forward unfettered by political considerations.

On the northern lakes wild moanings are frequently heard under the ice, especially just prior to thaws. This is caused by imprisoned air seeking an outlet. It is frequently heard at a great distance like the wailings of a bound giant, then it bursts out like explosions of artillery, frequently causing huge rents several miles long.

At a late meeting of the Manchester (England) Philosophical Society, Dr. C. Calvert stated that he had recently analyzed several samples of snuff, in all of which he found traces of red lead. This is a most dangerous adulteration, as the lead in such snuff will ultimately accumulate in the heads of snuff-takers and produce dreadful diseases.

Dr. Landerer, of Athens, states that garlic stands pre-eminent, as a plant, which snakes dislike. In Greece, gardeners who suffer frequently from their bites while collecting cucumbers and melons (under the large leaves of which the reptiles conceal themselves) find it an excellent plan, before commencing operations, to strew crushed garlic among the plants to frighten off the reptiles.