Correspondence.

Underground Steam Pipes.

To the Editor of the Scientific American:

In your issue of January 20 appears an article under the above caption, in which points are raised that do not meet my approval, although indorsed by yourself. The writer of the article is of the settled opinion "that the system will prove a blank and disastrous failure," and forms his opinion from three considerations: First, cost of original plant and subsequent repairs. Second, utility and convenience to parties who use the steam. Third, effect on public convenience, etc.

I chance to live in a city of 15,000 inhabitants, being the chief city and county seat of a county containing 60,000 inhabitants, with an area of 22 by 30 miles of the very richest soil for agricultural purposes, and underlaid at an average depth of 125 feet with an average 7 foot vein of coal for manufacturing purposes. My city is already a thriving manufacturing place, destined to become (in the language of our Mayor) "the Pittsburg of the West." It has upward of 15 miles of excellent macadamized streets, generally crowded with travel. In 1879, one Jacob Brosius, quite an enterprising citizen of our city, undertook the work of supplying our city with steam from a common source, by means of underground pipes in the streets, called the Holly system. A small piece of ground was selected for the location of the boilers, and about ten miles of pipe have been laid in the streets of the city. There are ten boilers at the supply works. The pipes were laid about four feet deep in the streets along the side, but not in the center, thus leaving plenty of room for travel and causing no impediment. The workmen employed first dug a ditch, and in this ditch placed a box well covered with pitch, called double air space insulating box, and on the bottom of this box they laid four inch tile. In this box were placed the steam pipes, and the ditch filled up to a level with the street and covered with macadam. The cost of all this was only $45,000.

Several factories, among them the renowned "Brosius Oil Works," public buildings, among them the court house, a large three-story brick building, and numerous private dwelling houses, are operated and warmed by steam supplied through these pipes from boilers one mile away. This proved satisfactory during the hard winter of 1879–80, and is working well now, with the mercury at zero. The pipes have not been touched since they were placed in the ground, and the traveler never knows he is walking or riding over the steam that is warming the city. The cost of repairing in three years is nothing, and if the whole pipe should give way at one time, which is hardly possible, it could be readily replaced.

The pipes laid in this manner are not subject to any change of temperature from the outside; and as factories run in summer as well as winter, they are seldom, if ever, permitted to cool off. The iron pipes are common steam pipes, and would require some time to wear out by the scaling off process I am disposed to say, then, that the "cost of the 'plant' and subsequent repairs" are not in the way of the success of the system. Nor is "the utility and convenience to parties who use the steam" against its success, but largely in its favor, for it is quite a comfort to have your rooms and halls at an even temperature all the time, meeting with no inconvenience in three winters. How often would a stovepipe have to be cleaned in that time? As to the inconvenience to the public, they know nothing about it. Of course steam supply companies may fail, but that will not prove that the system is wrong practically.

Of course these pipes are subject to corrosion and will wear out, but I fail to see why that should prove that the system is a failure. The same thing was said of the railroad enterprise, but what is the result? I think I know something about the practical workings of underground steam pipes, and I pronounce the system a decided success.

DON TURNER.

Belleville, Ill., January, 1883.

P. S.—I inclose you a model of the insulating box, and circulars explaining its construction.

[NOTE.—The statement that there have been no leaks or troubles or even repairs with the Belleville Steam Works, seems rather extraordinary, although the projectors have no doubt had a clear way for their pipes, and freedom from the blockade of sewers, gas, water, and electric pipes that have caused so much trouble in New York.

The wearing and cutting of the interior of the pipes, mentioned in a communication from a correspondent a few weeks since, have not yet had time to cause apprehension. It would be a great advantage to the reputation of the system as developed in New York, to have a detailed description and plans of this most perfect plant. If there is any advantage and profit in the system of street steam supply, it should be made apparent, if anywhere, in such plants as that at Belleville, Ill., St. Paul, Minn., and Lockport, N. Y., where, in addition to plane sailing, as the saying is, individual enterprise and strict economy have been the controlling influence in the engineering and financial policy.—ED. S. A.]

HUNGARY is entering the field of silk culture on a large scale. Reports for 1881 show that there were then 2,976 producers, who turned out 41,537 kilogrammes of cocoons, which yielded a profit that, augmented by State aid, provided for the establishment of a model school, which has already given great impetus to this industry.

The American Collection for the London Fish Exhibition.

A Washington correspondent of the New York *Times* states that the collection of objects illustrating the fishing industries of the United States, to be shown at the exhibition of fish and fisheries to be opened in London on the 1st May, is substantially complete. As shown by the late census, the fisheries of the United States exceed in value those of any other country, and it is the design of the Fish Commission to make the American exhibit at London as superior to all others as our Berlin display was. The collection for this purpose is now distributed in the various departments of the National Museum, and, says the correspondent named, the visitor is amazed at its completeness. It shows both what has been done and what is being done to develop our important fishing interests, and comprises a complete representation of American ichthyology.

The exhibit contains a full set of plaster casts of all the important fresh and salt water fish of the national waters, modeled from natural specimens and colored from life.

These casts will be further supplemented with photographs of all the fish, each picture giving the exact length and size of the fish. To these are added alcoholic preparations of the fish themselves. All the works written on American fish are to be sent, with the fishing literature of to-day. To illustrate the whaling business every variety of harpoon, lance, and gun in use, with all the projectiles employed in the capture of the cetaceans, are shown on screens. This collection is endless. The archæology of whaling has been exhausted to make this exhibit perfect. There will be sent a perfect whale boat, thoroughly equipped with everything that is wanted, down to the tinder box. In this collection are exhibited the log books of former whaling cruises, which are very curious specimens of marine compilations.

When a whale is captured, it is the habit of the captain to print with a wooden stamp, right across the page, a picture of a whale, but when whales are seen and not captured, the fact of having sighted them is shown by means of another stamp, which presents the tail only of the creature. Looking over such logs, it is curious to notice that, considering the number of whales seen, few have escaped capture. All the makeshifts of the whaler, who is so long away from the land, have been brought together, such as strange lamps, manufactured out of tumblers, and other ingenious things. Here are rough skates, fashioned out of files, which some ice bound sailor has made and used, perhaps, for sport or to follow the sea elephants over the slippery ice. There are charts here, too, over which New Bedford skippers have pondered for many a long dark winter's day when nipped in the ice, wondering whether they could ever get free of the floes and track their way back to the New England coast.

Clever Yankee inventions are there here for slicing blubber so as to try out the oil, and various are the tubs, buckets, and pails in use in securing the oil. Here is a peculiarly formed vessel, which is lowered down into the head of a spermaceti whale, so as to bale out every drop of the precious oil. Old New England haunts have been ransacked in order to procure these objects, belonging to the past and present, all of which serve to explain the history of the whaling business. In a special portion of the museum building the heads of departments, with workmen under their charge, are placing the various objects on screens.

Two objects particularly attract attention. One is the bow of a whale boat, and on it is the figure of a harpooner as large as life, with arms outstretched ready to throw the iron. The other is the bowsprit of a sword fisherman, with a man out on the bowsprit, harpoon in hand, in the act of darting the grains into the *Xiphias gladius*. These two exhibits, which are exceedingly clever in conception, the action of the figures having been skillfully modeled, will decorate the entrance to the American exhibit in London.

In order to better explain the complete character of any department, that of the oysters will show as well as anything else that thoroughness which is the main object of the United States Fish Commission. The geographical distribution of all the edible mollusks on the American coast will be shown by means of maps. Then the biology and embryology of the oysters will be explained. Next will be shown the varieties of oysters and such differences as may be due to environment, with those changes having their origin in culture. The fishery of the oysters will then be illustrated with models of all the varieties of vessels, boats used, with the actual dredges, tongs, etc., which serve to take them.

A model of an oyster bed in its natural condition is being made, with other models showing how excessive dredging has changed its face. All the enemies of the oysters are to be exhibited. After this come the numerous methods of packing and canning oysters for food. For instance, a pungy dumps on a Baltimore wharf her hundreds of bushels of oysters, and in an hour afterward they have been opened and canned and ready for transportation. The apparatus and industrial methods are all to be shown by models. In this oyster exhibit alone there will be fully three hundred different objects.

An exceedingly novel feature of the exhibition will be the presentation of all the phases of fishing, illustrated in a pictorial way. To do this, photographic artists attached to the museum have traveled all along the coast and taken their pictures from life. Besides this, a whole series of sketches in crayon have been made illustrative of river and sea fishing. Every picture has attached to it a printed label. For instance, here is one entitled "Dressing Mackerel," which reads as follows: "On the left is a man splitting a mackerel. In the center another 'gibbing' or eviscerating the fish, which he holds in his left hand. The man on the right, dressed in a 'petticoat barvel,' is 'cutting away,'" etc.

Every stage, then, in American fishing is illustrated, from the way the fish is caught until it is finally prepared for food. Here are scenes of vessels caught in a gale of wind, with fishermen in dories rowing for their lives, in order to escape from the coming storm. Characteristics of the fishermen have not been overlooked. Here is a group of Irish fishermen who draw the net or set the line in and around Boston, who still, in a certain measure, adhere to the old country methods, using some of their Irish gear. Here are Portuguese, Malay, Kanacka, and Chinese fishermen, the gleaning of the American seas attracting labor from all parts of the world. The Indian porpoise fisherman is represented, who launches his frail boat and, with a rusty musket, rarely misses the ocean pig.

In food preparations the exhibition will be very comprehensive. Of canned fish over 200 various brands will be shown, almost every fish packing house of importance in the United States having sent samples. It may be stated, as showing how great is the development of this business, that $5,000,000 worth of general fish products are exported to-day from the United States, of which as much as $2,000,000 is represented by canned goods alone. The oil from the menhaden, the fertilizers, the fish glues, all find an appropriate place.

In fish culture, every process in use in the United States will be exhibited. One of the most attractive features will be a series of tables provided with the various apparatus. This apparatus may be divided into three departments—the closed apparatus, the trough, and the floating apparatus. There will be a large water tank, the water in which will be forced through the fish hatching appliances by means of a gas engine. Form, color, and appearance of the various kinds of eggs will be imitated by means of glass beads. Another important feature will be the models of a group of experts in the act of procuring the eggs and the milt from the salmon. These figures of life size will show exactly the manipulation used in stripping salmon.

There will be photographs of all the American fish which have been propagated by fish culture in the United States, as explaining the development of the egg; an entire series of specimens will be shown, illustrating the growth of the fish in the egg from day to day, to be followed with others explanatory of the size and condition of the fish after it has been hatched out. The fish hatching apparatus will be practical working ones, exactly such as are used, with all the appliances which serve for the transportation of the eggs, the young fish, the feeding troughs, the fish pens, with models of the cars used to carry young fish over the United States. Finally, on a large map will be shown all the batching houses in the country, with the various points where shad, salmon, trout, white fish, carp, etc., have been distributed.

When the section of apparatus used by our fishermen is examined, the visitor is amazed at its magnitude. Here is a model of that vast net used by the mackereler, and to show its size a model of a mackerel schooner, with the seine boat, is suspended near it. Some idea is thus had of proportion. The lines, hooks, trawls, and engines of capture will fill innumerable cases. After this come the rods, reels, lines, and flies used by the angler. Here are cases of flies, with pictures of the insects which they imitate.

A fishing box—one of those light, portable houses which pack up in small space—will show our English friends how the American angler takes his ease. This house will have in it all the traps the angler may want, his bed, his store, and his cooking utensils.

Nothing has been forgotten or overlooked which might illustrate the ways and manners of our New England fisherman, for here are his amusements, his games, the literature he reads, the medicines he takes, the clothes he wears, the food he eats. There is the greasy pack of cards, thumbed almost out of existence, with which he plays euchre or high low jack, and the accordion that wails melancholy of nights, or the fiddle, which, when he scrapes, brings the wind.

As to books, his library is larger than one would think. There are his Bible, Shakespeare, Walter Scott, and next to it "Robinson Crusoe;" there are "Two Years before the Mast," all Dickens, with the "Red Rover of the Seas," and old Captain Marryat with the younger Russell. Here are love stories of the most languishing kind, with song books innumerable.

Fisherman Jack takes little medicine if he can help it, but here is his rough and ready pharmacopœia; plasters for his wounds, and castor oil, and blue mass, and one immensely big box, as large as a salt box, labeled epsom salts.

Were the description extended over innumerable columns, it would hardly give more than a scant idea of the thoroughness of this exhibition. All the sea birds, the animals which prey on fish, will be sent, together with all the primitive fishing gear in use by the American Indians. In addition to the objects illustrating fish and fishing, the Lighthouse Board and the Life Saving Service will send exhibits. Everything has been so arranged and systematized that the process of installation in England will require but very little labor.

Some Facts about Alaska.

Commander Henry Glass, U. S. Navy, who was for some time stationed at Sitka, Alaska, with the United States ship Jamestown, and afterward visited every part of the coast in command of the Wachusett, was in San Francisco recently, where he was interviewed with regard to the productions and possibilities of our great northern territory.

The fisheries of Alaska he thought very valuable, and destined to play an important part in the commerce and industries of the Pacific coast. Salmon of fine quality are found in the greatest abundance in every creek and river of the territory. It is probable that several canneries will be in operation this year (1883). The waters in places are teeming with halibut of the finest quality, and already the herring fishery has become of great value, works having been established during the past year for the manufacture of herring oil. Great numbers of whales frequent the inner channels and bays, and arrangements are now being made to prosecute whaling extensively. This can easily be done, and at much less expense than in the open seas, as small and inexpensive vessels can be used on the calm bays and channels of southeastern Alaska. To the northward and westward of Sitka are banks of considerable extent, where very fine codfish are found in great abundance.

The vast timber products of Alaska promise to be of great value in the near future.

On all the islands and the mainland of Southern Alaska are heavy forests of fir, spruce, alder, and cedar. Up to the present time very little timber has been cut in Alaska—only that needed for consumption in the Territory. But, with the inroads now being made on the timber of California, Oregon, and Washington Territory, Alaska must soon become a source of supply, and from the accessibility of the timber along the extensive shore line it can be exported very cheaply. On many of the islands are found large quantities of a hard yellow cedar, superior to any found elsewhere on this coast. This wood is quite hard, is easily worked, takes a high polish, is quite aromatic, and is said to possess the power of resisting the attacks of the teredo, which, if true, would make it very valuable in ship building. Commander Glass was told when in command in Alaska that the timbers of a Russian vessel constructed of this wood, after being some forty years under water, were found perfectly sound, and that they had not been touched by the teredo.

Of the mining prospects of Alaska, Commander Glass was quite hopeful. The placer mines of the Harris district are already valuable. During 1882 over $200,000 in gold dust were sent away, only the crudest machinery being used by the miners.

Quartz mining is equally promising in the same district, several extensive ledges having been discovered and traced one or two miles, and although only surface work has been done in prospecting, a great deal of fine quartz has been shown. The want of laws and courts to adjudicate disputed claims has prevented any extensive work being done up to the present time. With the organization of the Territory, capital would be attracted there and mines of value be developed.

Coal has been reported in several portions of the Territory, but as yet nothing of value has been discovered. Copper is reported in considerable quantities about the Copper River, to the westward of Mount St. Elias. This, however, Commander Glass had no opportunity to investigate.

At present nothing of importance is done in agriculture, only a few small gardens being planted about the principal settlements to supply vegetables. The summer is too short for any of our cereal crops, but potatoes of very fine quality could be grown in Alaska, and in all the valleys fine grasses grow luxuriantly, and portions of Alaska will hereafter be valuable for grazing purposes.

Southeast Alaska produces furs of value, and quite a large trade is carried on. Land and sea otter, lynx, several varieties of the fox—the most valuable being the silver gray fox—bear, and deer skins are exported, in considerable quantities.

Contrary to popular opinion, Commander Glass regards southern Alaska as an exceedingly healthy country, with a climate not at all severe. The lowest temperature that he saw recorded in Alaska during the two winters he was there was four degrees below zero (Fahrenheit); this was only on one day of January, of 1882, in latitude 59 degrees north. The highest temperature recorded on board ship during the summer was 80 degrees; this was at Sitka, about the middle of August. The mean temperature for December, January, and February, as found by hourly observations taken on board the Jamestown, was about 32 degrees (Fahrenheit). A great deal of rain and snow fall in southeastern Alaska, and there are few perfectly clear days during the year in what is known as southeast Alaska, say from Mount St. Elias to the southern boundary at Portland Canal. The climate of western and northern Alaska differs very greatly, and a very low mean temperature is experienced in that portion of the territory. This difference is largely due to the influence of the Japanese current, or Kuro Siwo, a portion of which is deflected by the Aleutian Islands, and impinges on the coast in about the latitude of Sitka.

THE engineer constructing the Washington monument reports that it reaches a height of 340 feet.

FLEXIBLE SELF-GAUGING FAUCET.

The engraving shows, in two views, an improved self-gauging faucet recently patented by Mr. William T. Robertson, of Montgomery, Ala. This device answers all the purposes of an ordinary faucet without being liable to the objections of wear and leakage, and at the same time it serves to indicate at any time the level of the liquid in the barrel.

A tap or tubular plug is screwed into the barrel or other vessel near the bottom, and on the outer end thereof is secured a flexible tube, which is about equal in length to the depth of the barrel. On the free end of the flexible tube there is a metal valve seat, to which is fitted a ball valve and a cage to retain the valve. The valve is so adapted to its seat that when the tube is vertical the valve is seated,

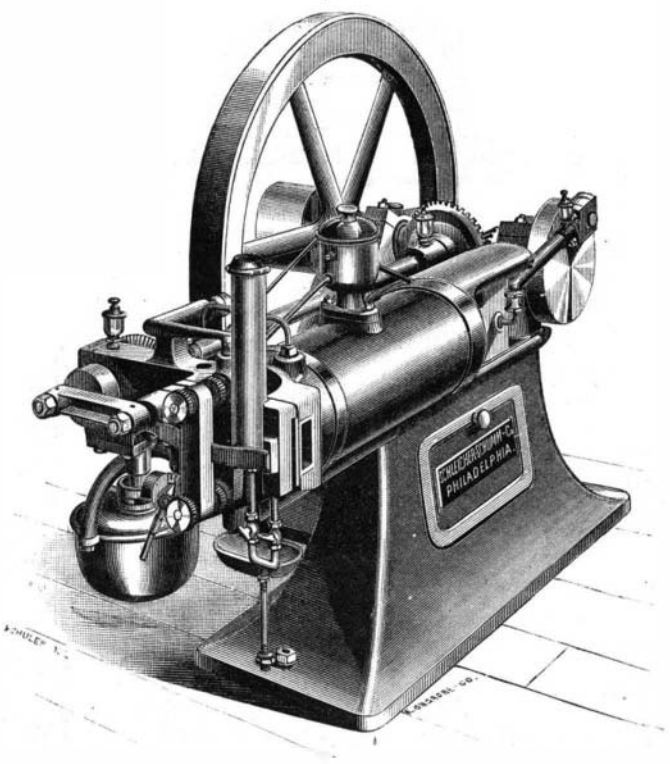
FLEXIBLE SELF-GAUGING FAUCET.

and when the tube is let down to draw liquid from the barrel, or to ascertain the level of the liquid in the barrel, the valve unseats itself and allows the liquid to escape, while the valve is retained by the cage in position to reseat itself when the tube is again put in a vertical position.

Near the upper end of the barrel spring clips are applied in position to secure the tube when in its vertical position. These clips are apertured transversely to secure a padlock to prevent theft. It will be noticed that this device is free from parts liable to derangement, and will at any time gauge the depth of the liquid in the barrel.

THE NEW OTTO ONE-HORSE POWER SILENT GAS ENGINE.

Since the "Otto" gas engine was invented, and its practicability fully demonstrated, large numbers of them have been put into use in our cities where other engines could not be operated to any degree of advantage. The sizes



THE NEW OTTO ONE-HORSE POWER SILENT GAS ENGINE.

made, however, were not below two-horse power, and the demand for smaller amounts of power could not be satisfied, on account of difficulty in making a smaller machine, at a cost proportionately reduced.

Messrs. Schleicher, Schumm & Co., Philadelphia, the well known builders of the "Otto" engine in this country, have now constructed a one-horse engine, which is offered at a proportionately reduced price, the special construction of the engine permitting a reduction in the cost of manufacture without sacrificing quality.

Our illustration shows the engine from a point that makes all its main parts visible, the governor being particularly apparent. This latter will regulate the speed of engine, and, at the same time, the consumption of gas, which varies in an automatic manner, in proportion to work done, from two to five cents per hour.

The engine has already found its way extensively into the workshops of jewelers, printers, and amateurs, and is seen giving attraction to the show windows of tea and grocery stores. For similar work the new size engine was purposely constructed, and the demand found for it is such that the makers cannot always fill it promptly.

The special features of gas engines, we suppose, are known to our readers. Above all, there are the advantages of perfect safety and cleanliness, there being no boiler, steam, coal, or ashes. A gas engine is also started at once whenever wanted, and is ready thus without preparation, and when stopped there is no continuation of expense. Engines of large size—as high as 25-horse power—are at present constructed, as well as smaller sizes, competing with steam, and surpassing it in many cases on the score of economy and absolute safety.

Illustrated catalogues, prices, and any information desired can be obtained by addressing Messrs. Schleicher, Schumm & Co., 33d and Walnut Sts., Philadelphia, Pa.

Sandakan Harbor, Borneo.

Captain Green, of the steamer Tannadice, entered the harbor of Sandakan, North Borneo, on a recent voyage from Australia to China. He gives the Australian press an interesting description of the settlement newly acquired by Great Britain there. The harbor, he says, surpasses that of Sydney, not only in extent but also in beauty of scenery. From east to west it is seventeen miles, and from north to south fourteen, and its shores are thickly covered with magnificent timber, many of the trees being 300 feet in height. No fewer than seventeen rivers flow into the harbor, two of them being navigable for twenty miles inland for vessels of a draught of twelve feet. The Kinibatangan River, a little way down the coast, is described as being navigable for 400 miles, with a draught of twenty-six feet when the bar is crossed. The town of Elopura is built on rising ground about a mile and a half inside the harbor, and already contains a population of 3,000 Chinese and natives. The climate is reported to be exceptionally cool for the tropics.

Wooden Ship Building in Maine.

In an extended review of wooden ship building in Bath, Maine, the Boston *Advertiser* shows that Bath is not only tha greatest wooden ship building place in the United States, but the greatest in the world. The value of the shipping built there within a century past is estimated to be upward of $50,000,000. The largest annual production was in 1854, when 64,327 tons were built, or 87 vessels. Of this number 59 were ships. In the ten years ending 1840 the building amounted to 69,559 tons. The next decade showed a gain of about 70 per cent, the total being 118,732 tons. Between 1850 and 1860 the product nearly trebled, and reached 324,888 tons. The war period brought the yield of the next term down to 163,539, but between 1870 and 1880 there was a gain of 37½ per cent, giving a total for that period of 225,046 tons. During the past year the tonnage of vessels launched at Bath was 39,090, with vessels of 13,520 remaining on the stocks. The cost of a completed wooden ship, or other new vessel, is reckoned at from $50 to $55 a ton.

The vessels launched last year at all the Maine ship yards gave a total tonnage of 62,567 tons, with 23,016 tons on the stocks. The official report of the wooden ship building of the whole country for the year ended June 30, 1881, places Maine at the head, with 41,374 tons. Next in rank is Michigan, with 5,852 tons. Then come Massachusetts, with 4,723 tons; Wisconsin, 3,429 tons; Pennsylvania, 3,278; and California, with 3,197 tons.

In one of the Bath ship yards is a planer, said to be the largest in the world. It is capable of working a keel piece of timber sixty-six feet long, five feet wide, and two and one-half feet deep. The keel comes out of the machine ready for laying on the blocks, and perfectly smooth and true on all sides. A beveling saw is another capacious machine, which turns out timber sawed at any desired angle from the horizontal, and by it curved timber and ship knees can be worked true to the line.

The steam engine which runs these machines runs also a bolt cutting machine which will nip off round iron of any diameter up to two inches; also a large and a small circular saw, a machine for making tree-nails, and, in the finishing shop, a band and circular saw, a planer, moulding machine, and a plug and wedge machine. The waste steam is used in bending timber. A plant for the construction of iron ships is now under way, and it is expected that the first iron vessel will be begun in May.

An Asbestos Balloon.

A fire-balloon has been made, in which the lower part is constructed of asbestos cloth, while the upper part is covered with a fire-proof solution. A spirit-lamp is used to supply the hot air for inflating it, and, being fire-proof, there is no risk as with ordinary hot-air balloons. The system is said to be specially valuable for war balloons, as a supply of spirit can be easily carried where it would be difficult to take the appliances for preparing gas.