

JOHN FITCH'S STEAMBOAT EXPERIMENT ON COLLECT POND.*

The population of New York city had nearly doubled in the ten years since 1786. Streets had been laid out, and habitations erected above the swampy fields in the region of Canal street. But although surveys had been made of the several streets about the Collect, or Fresh Water Pond, they were not graded, nor had building lots been found (for obvious reasons) marketable in that locality. The water of the pond was sixty feet deep, and the marshy ground to the northwest, as well as toward the East River, gave little signs of promise as to future value.

This beautiful pond, occupying the site of the present great gloomy pile of prison buildings known as the Tombs, was the scene, in the summer of 1796, of the trial of a boat propelled by steam. It was the invention of John Fitch. The boat was 18 feet in length and 6 feet beam, with square stern, round bows, and seats. The boiler was a ten or twelve gallon iron pot.

The little craft passed round the pond several times, and was believed capable of making six miles an hour.

The spectacle was watched

with critical interest by Chancellor Livingston, Nicholas Roosevelt, John Stevens, and others, who had in common with philosophers and inventors in England and Europe been for some time engaged in the speculative study of the steam engine and its prospective uses.† Fitch belonged to the prominent Connecticut family of that name, was born in the famous old town of Windsor, adjoining Hartford, and had been inventing and experimenting for a dozen or more years, hoping to succeed in the application of steam power to navigation. His genius, idiosyncrasies, and impecuniosity were in perpetual conflict; otherwise he might have achieved the triumph to which he aspired. He was a man of striking figure, six feet two inches in height, erect and full, his head slightly bald but not gray, although fifty-three years of age, and dignified and distant in his general behavior.

LEECH FARMING.
BY A. W. ROBERTS.

All leeches are not aquatic. In Ceylon there exists a small variety of leech that attaches itself to the brush and stones which it resembles in color. Here they hang on, in wait for any passing traveler, constantly reaching forth with their distended bodies in all directions, so great is their anxiety to attach themselves to any living animal. Hoffmeister, when collecting on the Island of Ceylon, discovered that his legs were covered with streaks of blood which flowed from hundreds of minute wounds produced by the bites of a terrestrial leech, *Hirudo ceylonica*. This same leech is found on the Himalaya Mountains, eleven thousand feet above the level of the sea. Several varieties of land leeches also exist in Japan, Chili, and Brazil.

Leeches drink the blood of their victims, and when gorged to the very lips fall off, and do not partake of food again for many weeks.

Leeches do not undergo any trans-

formations of form, but are developed directly from the egg as perfect leeches. The perfection of the organization of the leech is always in proportion to that of the natural "host" or victim on which they prey, as, for instance, our mollusks afford safe harbor and food to various marine leeches which are much lower in development than those found on fishes, reptiles, and mammals.

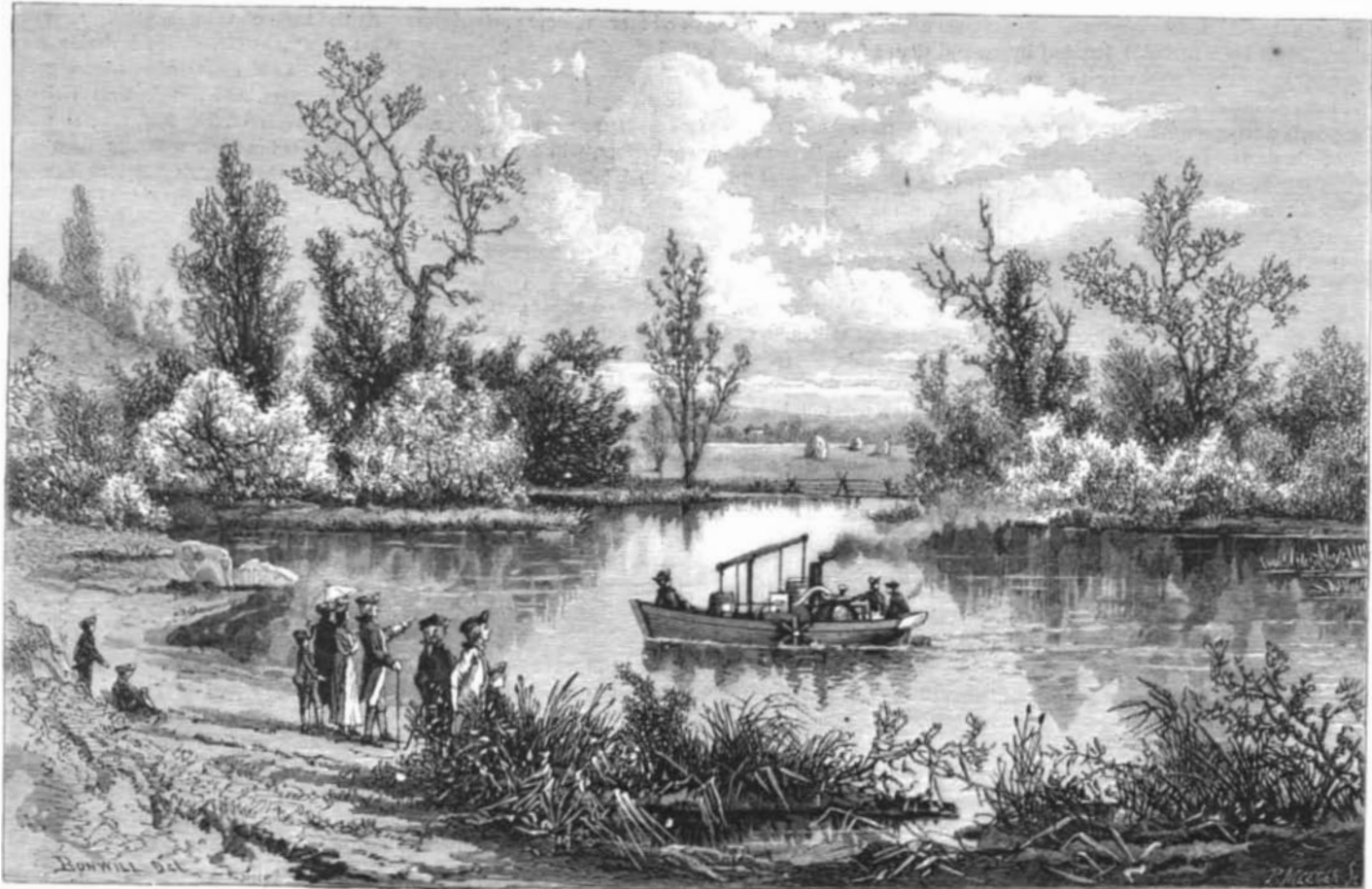
Some time ago, being anxious to obtain specimens of a leech common in our hard clams, I applied to the "opener" of one of the most fashionable oyster and clam saloons of

of these *Malacodellæ* alive, and being of an inquiring mind I determined to have a mess of them cooked, and am forced to admit that they were very nice, very palatable, and of the most desirable Little Neck clam flavor, from which highly prized brand of clams they were taken.

The Chinese eat both marine and fresh-water leeches.

That the leech is very sensitive to all atmospheric changes is proven beyond doubt, and the idea of utilizing this little creature as a sort of barometer is not new. The best leech storm-glass consists of a tall candy jar with tin top, in which

perforations are made; at the bottom of the jar a flooring of peat with two or three smooth stones is placed; the jar is then filled with soft water, into which, after it has settled and become quite clear, two or three of the medicinal leeches are placed; great care must be taken in summer time to keep the temperature of the water down by placing the jar in a cool and shady situation, as heat is fatal to leeches. When the weather continues serene and beautiful, the leeches remain motionless at the bottom. On the approach of a rain or snow storm the leeches will be found at the top of the water, where they will remain



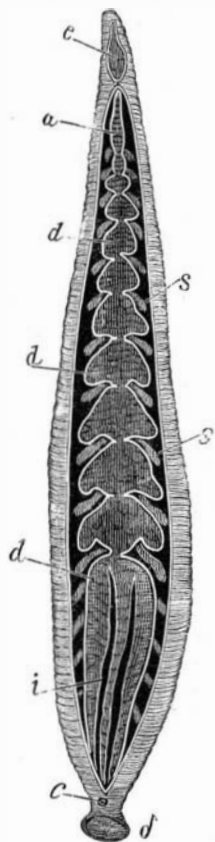
JOHN FITCH'S STEAMBOAT EXPERIMENT ON COLLECT POND NEW YORK CITY 1796.

Fulton Market to save me some, leaving a bottle of alcohol with him. Calling, after the expiration of two weeks, I was surprised to find not a single leech saved, but was smilingly referred to the proprietor, who, I found, had given instructions not to save any for me, as he feared I was one of those newspaper "sketchists," working up a sensational article on hard clam trichinae. These clam leeches are flat, an inch in length, and a quarter of an inch in breadth, and are attached to the outer wall of the stomach of the clam, which they resemble in color. Having great friendship for the hard clam, I must have swallowed alive many hundreds

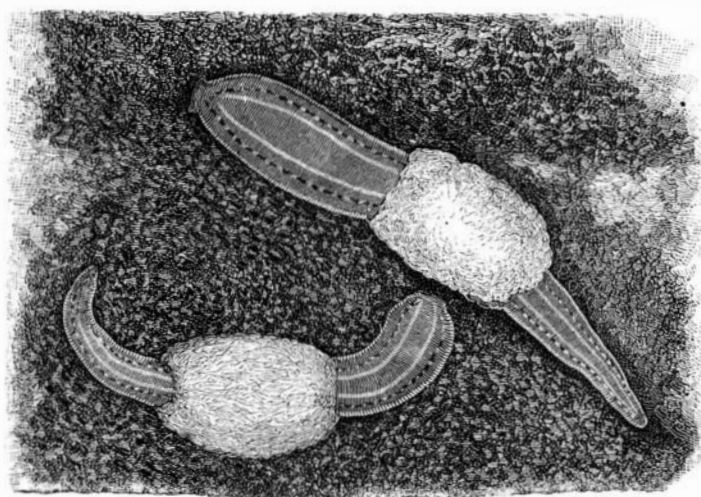
till the weather becomes settled. When a wind storm is approaching the leeches will gallop about with great liveliness, seldom resting until the wind becomes violent. When a thunderstorm is approaching the leeches will seek a lodgment above water, displaying great uneasiness, and moving in convulsive-like threads. In clear frosts, as in dry weather, the leeches remain constantly at the bottom. The water must be changed every two weeks. The leeches are fed twice a year on blood tied in a thin linen bag, or on a living frog. The best leeches in the market are Russian and Swedish, and are of a dark brown color. The Hungarian leech is green in color, with yellow stripes, closely resembling our horse leech. In Pennsylvania a native leech has been used to some extent among the Germans, but it is found to be very unreliable when taken out of water and applied, dropping off the patient when only half gorged, but when covered with water will gorge to its full extent. I believe that this is the only instance known of utilizing our native leeches. The German and French governments were the first to offer large premiums for the encouragement of leech culture, but many years elapsed until a French fisherman, named Berchade, met with entire success, and at the same time accumulated quite a fortune, as leeches were at that time in great demand and brought high prices.

In 1841 a Mr. H. Witte established a small leech farm in Kent avenue, Williamsburg, L. I. In course of time this small establishment was abandoned, and one of thirteen acres was established near Newtown, L. I., and to him I am indebted for the following information and description of the only leech farm in America. The breeding ponds consist of oblong squares of one and a half acres each. The bottoms of these ponds are of clay, the margins of peat. In June the leeches begin forming their cocoons

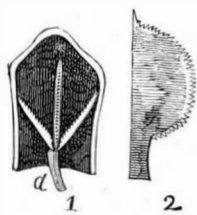
on the peat margins of the pond. These so called cocoons are very curious objects, consisting of a frothy mass of gelatin material of the size shown in the illustration. Through this mass the leech introduces his body and deposits the eggs. After the eggs are deposited the open ends of the



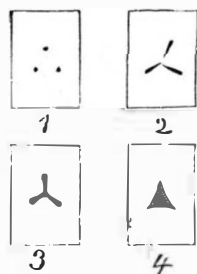
Leech in section—c, anus; a, posterior sucker; s, glands of the skin; i, intestine; a, oesophagus; d d, stomach; e, anterior sucker.



Leeches depositing eggs in cocoons, in section of peat.



1. Jaw of a leech.—2. Jaw magnified.



Different forms of the bite of a leech.



Cocoon of leech closed.

* By permission from the "History of New York," by Mrs. Martha J. Lamb. A. S. Barnes & Co., publishers: New York and Chicago.

† The statement that Robert Fulton was present at this trial of Fitch's steamboat on the Collect, in 1796, is an error, he being in England at that date, thoroughly absorbed in the study of Watt's steam engine and canals; he that year published in London a treatise on the improvement

of canal navigation, with numerous well executed plates from designs of his own. He also about the same time, in England, patented a mill for sawing marble, for which he received the thanks of the British Society for the Promotion of Arts and Commerce and an honorary medal. In 1797 he passed over to Paris, with the intention of bringing to the notice of the French Government a submarine torpedo and torpedo boat.

cocoon close, and the gelatinous material becomes more dense and glue like. From each cocoon from thirteen to twenty-seven young leeches are developed. The young are hatched out by the heat of the sun, and begin to issue from the cocoons early in September. At first they are no thicker than a pin, but at that early age are capable of cutting through the skin of a horse. At the end of three years these leeches are ready for the market.

The greatest enemies to young leeches are musk-rats, water rats, and water shrews, who dig the cocoons out of the soft peat breeding margins. Next to rats and shrews is overheating of the peat or the water of the pond. In fact, nothing is so fatal to leeches as a too high temperature. Mr. Witte says he has had leeches frozen in solid ice, but by slowly dissolving the ice and gradually increasing the temperature of the water the leeches sustained no injury. The depth of the water in the ponds during summer is three feet, in winter time the depth of the water is increased to avoid freezing.

The leeches are fed every six months on fresh blood placed in thin linen bags, which are suspended in the water. The leeches, as soon as they smell the blood, assemble from all parts of the pond, and attaching themselves to the outside of the bag suck the dissolving coagulated blood through the linen. Digestion proceeds very slowly in the leech, and more than a year will elapse before all the blood is digested in a fully gorged leech, during which time the blood remaining undigested in the stomach of the leech is in a fluid state, as if just taken in. The excremental deposits are of a grass-green color. The best substance for packing leeches in is the peat of their natural ponds made into a stiff mud. Water containing tannin, tannic acid, lime, salt, or brackish water must be guarded against always; iron is not objectionable, but is an advantage in small quantities.

The demand for leeches in the last few years has somewhat fallen off in the Eastern and Southern States. The Western States and California are now the heaviest buyers. Mr. Witte's sales alone average a thousand a day. The number of leeches imported to this country amounts to about thirty thousand yearly.

The custom of stripping and salting leeches, to cause them to disgorge after having been applied, has passed away, as many well established cases have occurred of infectious diseases having been communicated on the application of the same leech to a second party. A very popular error exists that a leech when applied takes only the bad blood (whatever that may be) and rejects the good; this is a mistake. With a leech blood is blood, be it the cold blood of a fish or the warm blood of a human being, no matter how diseased that human being may be. So long as blood is fresh and not tainted or putrid the leech will thrive on it. A friend of mine, who was the proprietor of a large leech-breeding establishment at the foot of the Harz Mountains, when wishing to feed his leeches was in the habit of hiring poor laborers, at six cents per day, to stand in the water for half an hour nearly up to their thighs that the leeches might obtain a full gorging of human blood.

In the marshy lands of Roumania the wild leeches are captured by means of men entering the water and allowing the wild leeches to fasten on to their naked bodies. The leech fishers then strip them off after reaching the shore.

How to Keep Leeches.

Take any wide mouth bottle that will admit the hands and fill it about two-thirds full of what is known as "Excelsior" (such as is sometimes used in upholstering and making cheap mattresses), wash the "Excelsior" with warm water and pour it off; then pour in cold, soft water enough to cover, and put in the leeches, tie a piece of thin cloth over the top, change the water once a month, and occasionally set the bottle and contents in the sun.

I have used this method for a number of years, and I do not remember ever finding a dead leech. It has certainly proved better than any jar, sponge, rusty nails, earth, or anything else I ever tried, and has the recommendation of being cheap and easily attended to.—James S. Talbot, in *New Remedies*.

Return of an Orchid Hunter.

On several occasions during the past year or two our readers have been indebted to Mr. Ernest Morris for curious and interesting information touching the natural history of the Amazonian forest regions communicated in his letters to the *World*. Mr. Morris lately returned to this city, bringing a large number of rare and valuable orchids, which he has collected for Mr. Erastus Corning, of Albany, N. Y., whose collection is valued at more than \$100,000, and is considered the finest in the United States. Mr. Morris expects to return to his orchid hunting in South America, probably in Columbia and Equador. With the genuine explorer's feeling he says: "The valley of the Amazon is too civilized for me, and I want to get off the beaten track. When I come across an empty beer bottle hung up as an ornament in an Indian hut it makes me feel as though I was too near home."

Although the Amazon has been well explored, people have no idea of the richness in gums, herbs, and rubber of the country through which its tributaries flow. In trading along these rivers the Americans are far behind the English and French, although goods of American manufacture are considered the best and are most expensive.

Besides the orchids Mr. Morris brought a great quantity of herbs used in making the poison Wourali, with which experiments are to be made, as it is thought to be valuable

as a cure for hydrophobia. Among other medicinal roots, he has some Macapa, which was once given to him by an Indian woman when he was very sick with fever and inflammation of the liver.

The business of orchid hunting may fairly rank among the most adventurous of the occupations of men, and the number of enthusiastic naturalists engaged in it is larger than is commonly suspected. As a contemporary points out, the owners of great floral establishments in Europe and America keep a regular staff of hardy botanists, who are to them what special correspondents are to a great newspaper. If the truth were known, it would probably be found that professional orchid hunters have explored more remote parts of the world than the foreign representatives of journals have ever done, but the world at large knows it not, because the orchid hunters are contented with the discovery of new specimens or filling their wallets and cases with rare specimens, and then returning quietly to their employers, while the special correspondent is bound to write and let everybody know where he is and what he is doing. A few years ago an orchid, *Cypripedium stonei*, variety *platinum*, was sold in London for over £150, or \$750. This is undoubtedly a tremendous sum to pay for a single plant, but the probability is that it had been brought from some distant part of the world at great risk and expense—perhaps from the Yunnan borders of China, the fever-stricken and chimpanzee-inhabited jungles of Borneo, the mysterious lands lying north of the head-waters of the Amazon, the forests of Madagascar, or the northern extremity of the Transvaal. Great orchid merchants pay enormous sums annually to support their emissaries abroad, and in their estimation the discovery of a new specimen is so invaluable that, if merely told of its whereabouts, they will send out expeditions in search of it. Fifteen years ago an eminent West End (London) firm of florists heard of a strange orchid in the interior of Jamaica, and, thanks to their expenditure of a large sum of money, and the patience and energy of their emissaries, they were in possession of the coveted specimen within a year's time. At present the lovely wax-like flowers of the orchid are luxuries only for rich men and the possessors of conservatories, and this must remain the case so long as orchid hunting is such a costly and dangerous employment.

The Mastodon in Recent Times.

Prof. John Collett, Ph.D., State Geologist of Indiana, gives some statistics in relation to the mastodon, that dispels the notion that these animals did not live in recent times. Archæologists who argue the great antiquity of man upon this planet, based upon the fact that his remains have been found with those of the mastodon, will be compelled to seek other lines of proof for their theory. We quote from page 385, Geological Report for 1880. Professor Collett says:

Of the thirty individual specimens of the remains of the mastodon (*Mastodon giganteus*) found in this State, in almost every case a very considerable part of the skeleton of each animal proved to be in a greater or less condition of decay. The remains have always been discovered in marshes, ponds, or other miry places, indicating, at once, the cause of the death of the animal and the reason of the preservation of the bones from decay. Spots of ground in this condition are found at the summit of the glacial drift or in "old beds" of rivers which have adopted a shorter route and lower level, consequently their date does not reach beyond the most recent changes of the earth's surface; in fact, their existence was so late that the only query is, Why did they become extinct?

A skeleton was discovered in excavating the bed of the canal a few miles north of Covington, Fountain County, bedded in wet peat. The teeth were in good preservation, and Mr. Perrin Kent states that when the larger bones were cut open the marrow, still preserved, was utilized by the bog cutters to "grease" their boots, and that chunks of sperm-like substance, 2½ to 3 inches in diameter (adipocere), occupied the place of the kidney fat of the monster. During the past summer of 1880, an almost complete skeleton of a mastodon was found six miles northwest from Hoopston, Iroquois County, Ill., which goes far to settle definitely that it was not only a recent animal, but that it survived until the life and vegetation of to-day prevailed. The tusks formed each a full quarter of a circle, were 9 feet long, 22 inches in circumference at the base, and in their water-soaked condition weighed 175 pounds. The lower jaw was well preserved with a full set of magnificent teeth, and is nearly 3 feet long. The teeth, as usual, were thickly enameled, and weighed each from 4 to 5 pounds. The leg bones, when joined at the knee, made a total length of 5½ feet, indicating that the animal was no less than 11 feet high, and from 15 to 16 feet from brow to rump. On inspecting the remains closely, a mass of fibrous, bark-like material was found between the ribs, filling the place of the animal's stomach; when carefully separated, it proved to be a crushed mass of herbs and grasses, similar to those which still grow in the vicinity. In the same bed of miry clay a multitude of small fresh water and land shells were observed and collected, which were kindly determined by Dr. F. Stein, as follows:

1. *Pisidium*, closely resembling *P. abditum*, Halderman.
2. *Valvata tricarinata*, Say. 3. *Valvata*, resembling *V. striata*. 4. *Planorbis parvus*, Say.

The shell bearing animals prevail all over the States of Illinois, Indiana, and parts of Michigan, and show conclusively that, however other conditions may differ, the ani-

mal and vegetable life, and consequently climate, are the same now as when this mastodon sank in his grave of mire and clay.—*Clinton (Wis.) Herald*.

How Cattle are Killed for New York Market.

In the city of New York there are two large abattoirs or slaughter houses. On the east side of the city there is a collection of several of these establishments, which occupy the blocks bounded by East Forty-third street, First avenue, East Forty-sixth street, and the river front. The total number of beef cattle slaughtered here last year amounted to about 100,000 head.

At the foot of West Fortieth street is what is called the West Side Abattoir, which is the largest establishment of the kind in the city. Its dimensions are 425 feet in length on Fortieth street, and 300 feet on Thirty-ninth street, with a uniform depth of 200 feet. The annual kill of beef cattle here is 2,200 head per week, or about 115,000 a year.

At Jersey City, across the river from New York, is situated another large establishment of this kind. It is not only a slaughter house, but the receiving point for the greater portion of the cattle coming into New York. It is very favorably situated, being not more than a mile by water from any of the European steamship wharves, and cattle for export can be shipped by boat from the abattoir direct to the side of the vessel. For this reason it is the principal place from which the live stock export traffic is done. The stock yard covers several acres, and is divided into large pens, partly roofed over, with water troughs and hay racks running along the sides. They afford accommodation for about 3,000 cattle, and the charge per head for each animal entering the yard, no matter how long or short may be the period of its stay, is 40 cents. During the time they are kept in the yard they are fed at the owner's expense. The slaughter house proper is a building 250 feet front by 300 deep, but with the offices and other additions the buildings cover an area of 270 by 390 feet.

When the company which controls this abattoir first started in business, in October, 1866, their establishment was at Communipaw, and in 1867 their receipts were 79,829 cattle, 456,939 hogs, 160,247 sheep, of which 16,791 cattle, 423,512 hogs, and 143,639 sheep were killed on the premises. The export trade in live stock brought a large increase in the receipts, and in 1875, the year after they took up their present location at Harsimus Cove, Jersey City, they received 258,550 cattle, 640,149 hogs, and 685,724 sheep; of these, 78,894 cattle, 543,919 hogs, and 431,241 sheep were slaughtered on the premises. From this time on the arrivals have continued to increase, until last year they reached 368,298 cattle, 952,371 hogs, and 634,191 sheep. The slaughter of beef cattle, however, had fallen to 43,758, while that of hogs was 940,200, and of sheep 630,700.

The cattle coming into New York average from 700 pounds to 800 pounds in weight, and at 10 cents per pound, about the usual figure, bring \$70 to \$80 each on the hoof. The method of killing is essentially the same in all the New York slaughter houses. A rope is fastened around the animal's hind legs, and he is lifted off his feet by means of a block and tackle, so that he hangs with his head downward, and just touching the floor. His throat is then cut with a large, sharp knife, and his death is speedy and comparatively free from pain. Three workmen, a dresser and two assistants, can kill, flay, cut up, and dress an animal in about twenty minutes, and they slaughter eighteen to twenty head daily, for which they get 59 cents per head.

After the slaughtering for the day is at an end all the buildings are flushed out with water pumped from the river by steam, and then carefully mopped over, so that no sign of refuse of any kind is perceptible—in fact, the floors, which are laid with an incline from the sides to a gutter in the middle of the houses, are as clean and white as the decks of a ship after they have been holystoned.—*Shoe and Leather Reporter*.

Source of Bad Taste in Croton Water.

Nearly every spring the users of our city Croton water are alarmed by an unpleasant "fishy" or "cucumbery" or "woody" taste, which lasts sometimes for weeks. This season it was particularly offensive. At a late meeting of the New York Microscopical Society, Mr. J. D. Hyatt called attention to the fact that in early spring the beds of all the mountain brooks which feed the lakes become covered with a gelatinous layer of minute vegetable organisms known as diatoms, sometimes to a thickness of a quarter of an inch. A very little of this jelly mass placed in a vessel of water will soon impart the same odor to the water as is observed in the Croton. Mr. Hyatt concludes that as soon as the jelly begins to disappear from the streams, which occurs when it attains a certain stage of growth, the same odor will be imparted to the entire body of water which flows to this city. If this is true no trace of the cause of the odor would be found by microscopical examination of the water in the city at such long distance from its source. Mr. Van Brunt said his observations confirmed this view.

The Ancient Cypress near Sparta.

The celebrated cypress tree that had stood near the city of Sparta, Greece, for over 2,800 years, and was described by Pausanias 400 years before the coming of Christ, has been destroyed by a band of strolling gypsies, who camped beneath it and left their fire burning. It was 75 feet high and 10 feet in diameter near the ground. The people of Sparta greatly mourn its loss.

The Mississippi River and the Grain Trade.

At the last meeting of the New York Board of Trade and Transportation some significant figures were given as to the relative cost of transporting grain from the West to Liverpool by rail to the Atlantic seaboard or by river to New Orleans. It was stated that grain can be shipped from St. Louis to Liverpool, by way of the river, for 17 cents a bushel; the rate by way of New York is 29½ cents. The rates from St. Paul, Minn., show a difference in favor of New Orleans of 15½ cents a bushel.

Under these conditions the increasing tendency of shippers of grain in the Mississippi valley to choose the southern route is not surprising. During the year ending August 31, 1879, the exports from New Orleans were 4,617,825 bushels of corn and 1,868,084 bushels of wheat. For the year ending August 31, 1880, the exports were 9,863,790 bushels of corn and 5,344,510 bushels of wheat. The total increase for the year was nearly nine million bushels. The increase for the coming year is likely to be still greater, as several barge lines and many new barges have been added to the grain fleet of the Mississippi River for this season's trade. By this plan one towing steamer is able to guide down the river a raft of barges carrying from eight to twelve hundred car loads of grain. The cheapness of the river route much more than compensates, as we have seen, for the increased length of the ocean trip. The passage from St. Louis to New Orleans is made in little over a week. The amount of the barge traffic already in progress may be estimated from the following figures given in the St. Louis *Republican* of April 8, with reference to the carrying capacity of barges then about to start for New Orleans:

"Steamer Iron Mountain and five barges with 220,000 bushels wheat and 50,000 bushels corn; Oakland and six barges, with 50,000 bushels wheat, 200,000 bushels corn, and 25,000 bushels oats; and the Bigley and four barges, with 40,000 bushels wheat and 100,000 bushels corn, making a total shipment for the week of 680,000 bushels grain, which by railway transportation, at 500 bushels to the car, would require 1,370 cars, and estimating 20 cars to the train, would make up 69 freight trains and employ about 400 train men. The amount of wheat carried will be 310,000 bushels, corn 350,000 bushels, and 25,000 bushels oats, to say nothing of the package freight, which will be large."

The reduction of the cost of transportation to Western Europe of ten or fifteen cents a bushel must have the effect of vastly increasing the power of our Western wheat growers to compete successfully with those of Hungary and Russia, and thereby largely increase the European demand for American grain. In this way the development of the river route (thanks to the successful working of the jetty improvements at the mouth of the Mississippi) cannot but prove advantageous to the farmers of the Mississippi Valley as well as to the merchants of New Orleans.

The effect upon the commerce of the Atlantic States is not at first so promising, unless by the improvement of railway, canal, and lake carriage the cost of transporting grain from the interior to the seaboard may be so reduced that the primary advantage of the river route can be overcome.

If it should prove that the East and West water and rail routes are unable to compete with the Mississippi in the transport of bulky and cheap agricultural products, it by no means follows that their profitableness will be seriously impaired in the long run. The prosperity which must come to the interior through the establishment of a cheaper way to market for its surplus products must tend to increase rapidly the purchasing power of its people and their disposition to purchase largely those commodities which compress more value into a little space and inevitably demand direct and rapid carriage. And the merchants and transporters of the seaboard may possibly find the farmers of the interior, owing to an increased though diverted grain trade, much more profitable as customers than they ever have been. Part of a great traffic may be worth more than the whole of a lesser traffic.

The Commerce of New York.

The twenty-third annual report of the New York Chamber of Commerce, just presented, covers the trade of the year 1880. In reviewing the imports of the year, the sugar trade is first considered, the course of this staple being regarded as a sure indication of the general condition of the country. The consumption of sugar was 819,000 tons, as against 743,000 tons in 1879. Of this quantity Louisiana furnished 89,000 tons, the remainder being drawn from foreign sources. If to this consumption be added that of sugars from beet root and maple groves the total is swollen to 900,000 tons. New York continues to be the chief port of receipt and distribution for this large trade, taking 570,000 tons against 506,000 tons the previous year.

The consumption of foreign molasses, owing to the falling off in the yield of the West India sugar crop, decreased from 34,500,000 gallons in 1879 to 33,100,000 gallons in 1880. The crops of Louisiana and Texas yielded 12,000,000 gallons, making the total consumption for the year about 45,000,000 gallons. The trade, like that of sugar, has been profitable. The history of the coffee trade for 1880 will be ever memorable for the lesson it has taught of the danger of attempting to force up the price of a great staple by monopolizing the supplies. Consumption, however, was not seriously disturbed by the speculation, the total amount being 176,000 tons, against 184,000 tons in 1879, a decrease of about 4½ per cent. The share of New York was 123,000 tons. The decrease in the receipts was from Brazil, the West Indies

Mexico, and Holland, while the importations from Java and Sumatra show a large increase. The tea trade of the year was especially unprofitable to those directly engaged in the importation of China teas. The unprecedented figures of 3,000,000 pieces were reached in the importation of foreign hides, exclusive of Calcutta hides, or an excess of 900,000 over the figures of 1879. The wine and liquor trade was remarkable for its prosperity and the few disasters reported.

Concerning the exports of this country, the report says that cotton continues to be the most important in value. The crop for the year ending September 1 reached the enormous figure of 5,757,397 bales, an increase of nearly 700,000 bales over that of 1879. Of this quantity, 3,865,621 bales were exported and 1,624,805 were taken by American spinners. New York and Baltimore are the only two seaboard cities which notably increased their exports of this staple. The export of American cotton manufactures has slightly decreased. The entire value of grains exported was \$288,000,000, against \$208,000,000 the year previous. The fresh beef shipments from New York have increased from 44,000,000 pounds to nearly 61,000,000 pounds in 1880. The entire value of the provision exports from all ports of the United States was \$61,000,000, against a value last year of \$58,000,000. Of live animals nearly 500,000 were exported, valued at nearly \$16,000,000. Of this trade New York had over \$7,000,000. The value of the entire export of lard was nearly \$28,000,000, an increase of \$5,000,000 over the previous year. Noticeable also is the export from New York of oysters to the value of \$400,000, out of a total exportation valued at \$550,000. Of the entire provision trade, exclusive of animals, of \$128,000,000 value exported, New York sent \$91,000,000. The shipments of crude and refined petroleum were 8,000,000 barrels, against 10,000,000 barrels in 1879. The production seems to be in excess of the demand about 20,000 barrels per diem. The tide of immigration brought to this country during the year 457,257 persons, of whom 327,371 were landed at this port. Of the latter, 104,000 were from Germany, 66,000 from Ireland, 35,000 from Sweden, and 34,000 from England.

The Shingle Product.

In recent issues the *Northwestern Lumberman* has given elaborate statistics of the shingle product of the Northwest, the amount of which is something stupendous, as will be seen in the following recapitulation of the output of the past eight years, allowing 5,000 shingles to each 1,000 feet of logs:

1873.....	2,277,433,550
1874.....	2,473,216,555
1875.....	2,515,838,240
1876.....	2,900,530,725
1877.....	2,668,856,755
1878.....	2,561,490,750
1879.....	2,859,112,750
1880.....	2,972,912,160
Total.....	21,229,391,485

It is estimated that something between 800,000,000 and 1,000,000,000 feet of logs are yearly made into shingles in this country.

Previous to 1845 the manufacture of shingles in the United States was almost, if not wholly, confined to the article of "rived" or "breasted," terms applied to shingles made by hand with a drawing knife, involving a waste of fully three-quarters of all the timber which it was intended to convert to this use. The shingles were 18 inches long, one-half inch at the butt, and one-eighth inch at the point, and were made only from the finest pine, cedar, or cypress, the latter being wholly manufactured in the swamps of Virginia and other Southern States. About that date steamed cut shingles had been introduced, but never attained a wide spread reputation or market, because of imperfections in the manufacture. Not far from 1845 sawed shingles were introduced, and their claim upon public favor was based upon the fact that coarser timber could be utilized in their manufacture and the cost of the product cheapened. They were not at first received with favor, but have rapidly grown in public estimation until they have almost wholly superseded all others. With the cheapening of the manufacture and in the use of coarser timber, hemlock was utilized for some time in the East, but has in late years been but little used.

The shingle cut of eastern Michigan and Huron shore is almost wholly confined to an 18-inch shingle, the product being shipped to the East and Southeast, where no smaller size is salable. A thousand feet of logs is calculated to yield from 4,000 to 5,000 marketable shingles, besides the coarser grades which have no market value to warrant their shipment. The cut of western Michigan, Wisconsin, and the Mississippi district is wholly of 16 inch, for the demands of the Western market and the less stringent inspection as to quality enable the manufacture of from 7,000 to 8,000 shingles from 1,000 feet of logs.

American Awards, International Fishery Exhibition.

The medals from the International Fishery Exhibition, Berlin, just received, are of gold, silver, and bronze, three inches in diameter and quarter of an inch thick. The gold medals are 20 carats fine, and weigh 7½ ounces. The diplomas accompanying the medals are handsomely lithographed. The list of American awards includes, in addition to the great prize of \$2,000, taken by the U. S. Commission of Fish and Fisheries, eight gold medals, sixteen silver medals, and twelve bronze medals; and fourteen other exhibitors received honorable mention.

The Water Power of the Atlantic Coast.

In his annual report, just submitted, Chief Engineer McFadden, of the Philadelphia Water Department, asserts that the available water power of the Schuylkill and of all the streams along the Atlantic coast has been highly over-rated. Eminent engineers have estimated the working force of the Schuylkill to be equal to the pumping of a daily average of 100,000,000 gallons. Mr. McFadden undertakes to show that the real power is not half as great, all the water being used all the time.

The amount pumped by the machinery at Fairmount, running 54 per cent of the time, was a daily average of 21,551,630 gallons. "Had there been power enough to drive the machinery 100 per cent, or all the time," he continues, "it could not possibly have pumped more than 40,000,000 gallons per day. With these facts as a basis we may safely state that the machinery at Fairmount would use and exhaust the power of the river if it was subjected to a steady and equable flow by impounding the storm waters. Of course duplicate water-power works at Roxborough, by using the power twice, first at Roxborough and a second time at Fairmount, could be made to double this amount."

The pumpage for last year amounted to 21,120,792,386 gallons, an increase of 6 per cent over that of the previous year.

The Utilization of Blood, Bones, etc.

In our city abattoirs very little of a slaughtered animal is allowed to go to waste. The hoofs are sold for glue stock, and bring about 40 cents a set. Pates, for the same purpose, bring 1 cent to 1½ cents per pound. The tallow is generally rendered at the abattoirs, and brings from 6¼ to 6½ cents per pound. What is called "hot fat," that is, fat taken from the breast and kidneys of the animal while it is yet warm, is sold to oleomargarine manufacturers at 4½ cents per pound. The bladder, wizen, reed, and bung gut are sold for about 8 cents a set, and made into skins for wrapping sausages in. The head brings 30 cents, and the meat is taken off it and canned, while the bones are used as fertilizers. The flesh tail, worth 5 cents, is made into soup, and the hair tail, which is used for making mattresses, or mixed with lime and sand for building purposes, is sold at 4 cents. Horns, which bring 10 cents per pair, are converted into bone buttons, handles for cutlery, etc. The blood is dried by steam, which separates the water from it, and then baked in a drying machine and sold for sugar refining and fertilizing purposes. Of late years it has also been manufactured into buttons by means of a chemical process. A number of consumptives come to the slaughter houses daily, and drink the warm blood from the freshly-killed animal with very beneficial results in many cases. The stomachs are used for tripe, and bring 12½ cents to 15 cents each. The tongue is worth 50 cents to 60 cents, and is usually smoked. The heart and liver together bring 30 cents, and although sometimes used for human food, are generally sold for cats' and dogs' meat.

Artesian Wells in New York.

The number of artesian wells in this city steadily and rapidly increases, something like forty having been sunk during the past year. Their depths range from 200 to 2,000 feet, and the flow ranges from 1,000 to 2,000 barrels a day. These wells are used mainly by brewers and other large manufacturers who require a large amount of water, and who find the artesian well water economical both from its cheapness and its coolness, which enables them to dispense with much ice. Usually the wells are vertical. In one instance seven holes were drilled in different directions and at different angles, only one being vertical. The boring was carried to a depth of about 260 feet on the average, the longest at an angle being 457 feet deep. Water was struck in all the borings, and an abundant supply has been obtained continuously.

Improving American Tea.

Recently on receiving a number of packages of American tea from the experimental tea farm in South Carolina, Commissioner Le Duc invited a number of tea dealers in Baltimore and Washington to test the quality of the crop. They pronounced it very good tea, and said it compared favorably with East Indian teas. Last year's receipts from the same place had a weedy flavor. This year the same defect is only barely perceptible, the result being due to cultivation. By next year it is thought it will have disappeared entirely. It is even now only perceptible to the taste of experts. Letters from Mr. Jackson, the gentleman in charge of the tea farm, comment in very favorable terms upon the healthy appearance of the plants and the prospect for excellent results.

The Value of Good Brakes.

Recently, while the steamer State of New York, from this city to Hartford, Conn., with about two hundred passengers, was passing the drawbridge across the Connecticut River, near Saybrook, a heavy freight train ran upon the bridge at considerable speed. The engineer had been misled, perhaps, by a confusion of lights, and very nearly ran his train into the draw to the destruction of the steamer. The engine when the train stopped was within 30 feet of the draw.

A HEAVY WOMAN.—Mrs. Charles Ballou, known as the Mammoth Queen, died April 8. Her weight had been given as high as 575 pounds. Just before her death it was 400 pounds. The coffin was 6½ feet long, 3 feet wide, and 20 inches deep.