Preserving Meat and Fish with Pyroligneous Acid.

MESSRS. EDITORS—In *Harper's Weekly* for the 20th ult. I observed the following paragraph under the heading of "Domestic Intelligence":—

"The Secretary of War and the Chiefs of the Bureaus attended, last week, a very interesting and successful experiment, made at the War Department, by Mons. J. B. Richer, formerly of the French army. M. Richer is the inventor of a process to restore putrid meats or fish to a perfectly sound and healthy state. The experiment was tried on a putrid beefsteak and a shad, which were at first so offensive that one could hardly stay in the room. By a hocus-pocus preparation, and sousing the beef and fish in a bucket of water, they came out perfectly fresh. M. Richer, who has made this discovery in New York proposes to sell his invention to our government, and to France and England. For our ships of war and our army it might be of great service when provisions become spoiled and none other was to be had. At Sevastopol, it is said, 17,000 men died of cholera from eating spoiled meat."

Although I may be mistaken, it appears to me that this invention of M. Richer consists in the use of pyroligneous acid, or as it was once called, "acid spirit of wood." However it may be, it is well known that this acid has the same properties as the above mentioned discovery, and the *modus operandi* equally as simple.

It was Monge who originally discovered that pyroligneous acid possessed not only the property of impeding the putrefaction of animal substances, but also of returning such substances to their original freshness *after* decomposition or putrefaction. Mr. William Dinsdale, of Colchester, Eng., made an unsuccessful proposal to the Lords of the Admirality to apply this acid to preserve animal food for the use of the navy in any climate, however warm it may be.

Meat can be preserved any length of time by merely plunging it in pyroligneous acid for a few moments, and drying it in the shade. This effect is partly ascribed to the empyreumatic oil or tar contained in the liquid, and this would account for the use of smoke for preserving hams, fish, tongues, &c., as pyroligneous acid is obtained by the destructive distillation of wood. The harder woods, such as oak, beech, ash, and birch are used.

Dr. Jarg, of Leipsic, has made numerous experiments with this acid, and recovered quite a number of anatomical preparations from incipient corruption by simply pouring it over them. By smearing pieces of flesh (already in a state of corruption) with empyreumatic oil or tar, he succeeded in restoring them dry and sound. Vauquelin proved that this acid was simply an acetic contamination with empyreumatic oil and bitumen

Pyroligneous acid is a brown transparent vinegar, and has a strong smell. Its acid powers are said to be superior to those of the best wine or malt vinegar, in the proportion of three to two. It has been in use with calico printers for a long time.

By perusing an article on this acid in Pilkington's Mechanics' Own Book, I was led to make several experiments with a view to test the truth of its property of preserving flesh from putrefaction, and the result of my experiments was to prove it beyond doubt.

Whether pyroligneous acid is the basis of M. Richer's invention or not, it is well worth the attention of government, and I believe that any enterprising man would do well to invest a moderate capital in such a business with a view of furnishing our merchant seamen with so necessary an article as fresh meat, especially during long voyages and in warm climates. GEO. W. BANCROFT.

Providence, R. I., June, 1857.

[We have witnessed a number of experiments with tainted meat, in order to restore it to an agreeable flavor, but none of them were fully successful. We have seen tainted pork and beef boiled in water containing wood charcoal, also in water containing some wood vinegar; but while the process did render some specimens that were very slightly decayed fit to be eaten in the war camp, when horse flesh is at a premium, we never saw a single specimen that had proceeded in decay as far as those described in *Harper's* that was fit for use. It is our opinion that the value of Mr. Richer's process, as described, is greatly exaggerated. The preservation of meat by the use of wood vinegar, as described by our correspondent, Mr. Bancroft, deserves attention. The smoking of meat is an antiseptic process, in which the crude pyroligneous acid in the smoke plays a similar part to the liquid acid, but in our climate it does not prevent exposed meat from decaying; the use of the liquid acid, instead of the gas in smoke, may be more effectual.

(For the Scientific American.)

Ants.—Their Senses and Habits.

"Go to the ant, thou sluggard," is advice not only against sluggishness, but is applicable to other things, particularly as it relates to what may be accomplished by the combination of individuals under great disadvantages.

The only medium which ants possess for acquiring and imparting information appears to be their antennæ, or feelers, having neither of the two most useful senses for learning which larger animals possess—seeing nor hearing—and if they have the sense of smelling it is very limited. I have placed sugar within half an inch of their trail to a sugar barrel, and they would pass without noticing it until one of them accidentally strayed within touch of it, when others would soon follow by feeling their way. I have placed a thin strip of wood not wider than the length of an ant, across their trail, and it embarrassed them; they would turn towards each end of it and return, until some bold fellow ventured across it, when the rest followed. I caught a number of them on a chip with sugar on it, placed near their trail, and gently removed it to the opposite side, about a foot off; when they finished their repast they went feeling around in every direction, and often returned even when they had got within two inches of the great thoroughfare where the multitude was passing; they neither saw nor heard them; but as soon as they struck the trail they took the homeward course, and ceased to return.

The above experiments were made with the small red ants. When they first discovered the sugar those returning from it would extend their antennæ to those they met, make one or two short jumps, and the latter would quicken their pace, as if satisfied with the information.

Whenever ants discover the trail of another tribe in rather suspicious proximity to their own dwellings, if they are of equal size with themselves, they sally out in a body to attack them; but if they are a size or two smaller—the very small ones they never notice—one or two guards take possession of the trail, and cross and recross it with the most unwearied diligence for hours and days together, and wo to all they catch. But scores will pass within one or two inches of a guard without either being aware of the others' presence.

Notwithstanding the want of these senses a community of large ants will explore an area of ten to fifteen acres, and if one of them makes a discovery of food, intelligence of it will be circulated so rapidly that they will form a trail to it in one night, though it be one hundred and fifty yards off. Their sense of feeling is extremely delicate, for by it they can spread an alarm, distinguish a friend from a foe, follow a trail over a smooth floor, and convey any intelligence which may be necessary for them to know. In their wars they are very destructive, and this appears to be a provision of nature to prevent their increase. Two ants of about equal size will fight to the death without yielding. In a regular battle between two tribes it is their custom to carry off the dead and wounded from the field.

H. POLLARD.

Lexington, Mo., June, 1857.

[Of all insects, ants seem to have the most perfect powers of communicating with each other, yet they emit no sound, like bees, but only use signs and motions, employing their attenæ for such purposes; and, as our correspondent states, if they have the power of vision, it must be very feeble. Still, "if they see not" it is not for want of eyes—these they possess.

New Motive Agent.

The Baltimore *Patriot* contains an account of the operation—said to be very successful—of an engine propelled by gas generated from bi-sulphuret of carbon and some other ingredients submitted to heat in a boiler. The *Patriot* says:—

"We called yesterday afternoon, much to our gratification, and saw the engine in full, successful operation, where it has been working without intermission several days, in Cypress alley, between Pratt and Lombard streets. The engine being merely a model or experimental one has, of course, some imperfections and may be greatly improved, but it worked with remarkable precision and regularity. It is calculated for four-horse power, being a common rectilineal or reciprocating steam engine, differing in no material feature from those in general use. The patent novelty consists in the motive power and its application, which wholly supersedes steam. This motor is produced by a compound of de sulphurated bi-sulphuret of carbon, coal tar, and volatile or fixed oil, which, under certain influences of heat, becomes powerfully expansive, and thus gives momentum. Though only a four-horse engine, it was performing the estimated duty of ten horses, and has been so doing since put into operation, nearly a a fortnight ago."

After the gas actuates the piston, it is exhausted into an outside or surface condenser, in which it is reduced into liquid condition, and is pumped back into the boiler, being used over and over again. It is the invention of J. C. fr. Salomon, who has devoted years of study and labor in making experiments with gas engines.

Preserving American Grain.

The results of some experiments made in France in the preservation of grain have but very recently been published. A year ago, exactly 2175 bushels of American wheat were, by way of trial, enclosed in two *silos* of sheet iron—large cylinders sunk into the ground—and were carefully closed, sealed and covered.

The seals were removed in the first week of last month in presence of two delegates from the War Office, and of several members of the Commission for Military Stores. The grain was then subjected to a strict examination, and unanimously declared to be exactly the same as it was when sealed up. The cost of preserving corn by means of these silos does not exceed 16 cents per 2 3-4 bushels, while all danger of loss by fire or vermin is entirely obviated.

Notes on Science and Foreign Inventions.

A TUNNEL BORING MACHINE.—A new steam boring machine for tunnelling through rock has been invented and put into operation by Captain Penrice, of the Royal Engineers, England. It consists of a strong cross head of wrought iron, secured to the outer extremity of the piston road of a horizontal steam engine, and on this cross head there are twenty-four short arms studded with diamond-pointed steel cutters. By the forward stroke of the piston these cutters strike against the rock, and by a self-acting device are then partially rotated, and the piston returns; on the succeeding stroke or blow, the cutters strike a new part of the rock, and so on bore into the rock by an intermittant rotary motion of repeated blows, similar to that given to the chisel in rock drilling by hand. The steam cylinder is so managed as to keep a cushion of steam behind the return movement of the piston. On the forward motion, the mass is stopped by the blow on the rock and a recoil takes place, a differential pressure of steam is then brought to bear upon the reverse face of the piston, and the moving mass is thus to a certain extent balanced between two steam cushions. The engine is secured on a truck, and moves forward to its work on rails. An experimental machine has cut its way into sandstone rock at the rate of twenty inches per hour, making a hole five feet in diameter. An English engineer is having one constructed to complete a contract in tunnellin through the Alps. In its construction and operation it differs from Wilson's American tunnelling machine, which cuts into the rock by a series of rotating cutters, and is not subject to the violent concussions attendant on this English one.

THE MEDITERRANEAN SUBMARINE TELEGRAPH.—An attempt to join Europe with Africa by a telegraph across the Mediterranean was made a short time ago, and as our readers will remember failed either from a lack of sufficient cable at the start, or from its having been laid in wavy lines. The steamer laying it was compelled to stop, and hold the end in deep water for four days, while its attendant steamer was hurrying up a fresh supply. The steamer holding on paddled slowly against the wind or current to relieve the delicate cable as much as possible from strain, but after remaining as nearly stationary as possible for four days and nights, keeping up a constant communication by telegraph with the manufacturers in England, the cable parted, and the whole investment was lost. But this accident has not been allowed to defeat the enterprise; another cable is now being made, which is 920 miles long, and is to be completed on the 30th of October. Before that period arrives, we hope the Atlantic cable will have been successfully laid, and that messages will be flying along it, under the waters of "the great deep."

COBALT WIRE.—In an article in *Comptes Rendus*, by M. Sainte Claire Deville, he says: "Cobalt is a metal, the most ductile and certainly the most tenacious known. A wire made of it will support twice the weight of one made of iron."

ELECTRIC CLOCKS.—A paper was recently read on this subject before the Royal Scottish Society of Arts, by Mr. Henry Kerr, watchmaker, Edinburgh, who exhibited an improved electric clock in action, and explained why such clocks, although they had been made to operate well for a short period, yet as a whole, had hitherto proven failures. This was attributed to the want of a proper mode of breaking and closing the electric circuit, in order to secure permanent action. The improvements in the clock he exhibited were stated to consist in there being a secure electric contact made, without friction, between the conducting surfaces; in the pendulum being impelled by a lever acting upon it without friction, by the simple force of its gravity; in the pendulum not acting directly upon the contact spring, but by the intervention of a delicate lever; in the pendulum being free as it approaches the extremity of its arc of vibration, and during a large part of it; and in the uniform nature of the resistance which the pendulum has to encounter in the making and breaking of the electric circuit.

NEW ELECTRIC LIGHT.—In a letter to the editor of the Paris *Cosmos*, Professor Tyndall says, "Mr. Faraday, I am happy to say, is quite well; he has made known to me a new application of magneto-electricity—the electricity generated by electro-magnetic machines. It consists in the production of electric light which is truly splendid, and which can be immediately employed for illuminating lighthouses."

WONDERFUL DISCOVERIES.—At the meeting of the French Academy of Sciences, on the 25th of May, M. Elie De Beaumont announced the following novelties; viz., a method of reproducing animal life; a complete solution of the problem of aerial navigation; a project for a universal language; and the discovery of the cause, nature, and an infallible cure for cholera! M. E. de B. is great on the impossible.

AN ANTIQUE STEAMBOAT ENGINE.—An engine employed in 1788 to propel a boat at Dalswinton, Scotland, has lately been placed in the museum of the British Patent Office, through the exertions of Mr. Bennett Woodcroft, Superintendent of Specifications. It has two cylinders, four inches in diameter each, and the valves are operated and closed by the old hand gear. It was applied to a double boat in the year mentioned, the paddle wheel of which was placed in the center, and it attained to a speed of five miles per hour.