

Foreign Inventions and Scientific Notes.

A patent has been issued to C. G. Preler, of London, for unhairing and preparing hides for tanning by the employment of fatty or greasy substances in combination with lime and soda, or other alkali, for the purpose of unhairing skins; also for the employment of fatty or greasy substances in combination with soda or other alkali, and the usual materials containing tannic acid (such as oak bark, mimosa bark, terra japonica, cutch, divi divi, sumach, &c.) for the purpose of tanning. Warm water is employed for making the solutions and extracts of these materials, and the skins are agitated while immersed in the liquid, either in cylinders with projections or pegs on their inner surface, and kept rotating; or in open vessels or pits, or by manual labor, or by any other suitable means. For the purpose of preparing the skins, oil or other fatty substances is added to a solution of lime and water; and for tanning the patentee uses extracts of the materials containing tannic acid, made with warm water, and carbonates of soda and oil, or grease.

The Manchester papers give the result of some experiments with the method of smoke consumption, patented by Mr. Woodcock, of London. The steam in the boiler was allowed to subside considerably below the ordinary pressure, in order that the fires might be supplied with coal more freely, and also to show whether, and in what proportion, an increase of steam could be generated. When the steam was reduced to 30 lbs. pressure, coals were applied liberally, and in seven minutes the steam gauge indicated 35 lbs., the smoke during this period being simply of a vaporous transparent character. There were two 60-horse boilers in use, each having two flues and furnaces. The usual plan was to coal the furnaces under each boiler alternately, but in this instance it was done simultaneously, yet the smoke was so trivial that the observers expressed themselves fully satisfied with the result. In the second trial the steam was raised to a high pressure more rapidly, the smoke still being suppressed. The plan has been tried for several months in connection with one of the boilers, and with such satisfaction that two others have now been similarly treated.

The method consists in the admission of heated air, to promote combustion, at a point where an inverted bridge forces the unconsumed smoke down upon the red fire. The smoke is thus brought into contact with the fire, and supplied with the requisite amount of oxygen—in a heated state—to facilitate its combustion. The precise arrangement varies with the length of the boiler and other circumstances, sometimes an extra inverted bridge—iron plate affixed to the top of the flue—being attached. The heated air is introduced through a sort of hollow bridge, the front of which is of brick, and the back of perforated plate iron. The supply reaches it either under the furnace, in the ordinary way, or through a tube on either side of the furnace. Sawdust and other materials were thrown upon the furnace, and dense smoke produced, but it was so effectually consumed behind the perforated bridge that the top of the chimney scarcely indicated the existence of a fire.

C. M'Clean, C. E., in order to encourage the staff employed by him, as lessee of the South Staffordshire, (Eng.) railway, to insure their lives in case of accident, for weekly allowances in case of injuries, and for allowances for medical expenses, has undertaken himself to pay one-half of the premiums required by the insurance company. Other employers similarly circumstanced might well follow Mr. M'Clean's example.

E. Talbot, of Spring Vale, Eng., has invented some improvements in rails, which consist in a peculiar construction of split or compound rails, enabling him to manufacture half or split bars with perfect bearings or flanges, and which, when combined, have the required strength and structure of ordinary rails. The compound rails are somewhat similar to two bars of T-iron, placed side by side in reversed position, and may be bolted at suitable intervals along their sides for security, and they may be connected by fish-joints or otherwise.

The French engineers who were sent some time since to Upper Arragon, to examine the question of carrying a railway across the Pyrenees, to effect a communication between France and Spain, have terminated their surveys, and the result has been arrived at, that the line should start from Tarbes and end at the city of Huesca, passing by the bridge of Gavarni. In the neighborhood of Huesca, not fewer than 3,000 men are employed in the preliminary works. It appears, from the surveys, that the passage across the Pyrenees is not so difficult as was believed. The great drawback to the uninterrupted working of the line will arise, it is thought, from the great quantity of snow which is to be found in these districts during four months of the year.

Layard's (the traveler's) project for 350 miles of railway, to commence at Rustchuk or Silistria, and pass by Shumla and Adrianople to Suez, or some other approximate point in the Archipelago, is proceeding satisfactorily. His railway project, connecting the Danube with the Archipelago, has passed all the series of councils, has the consent of the Grand Viziers, and the charter, which is already drawn up, has only to be signed by the Sultan.

The Italian correspondent of the Newark *Daily Advertiser*, an enterprising individual, by the way, who has been the means of publishing several previous discoveries of varying degrees of merit, claims for one M. Colleagues the honors of inventing a little steel ear-trumpet, which reports to the practiced ear the organic action and actual condition of the entire body at any given moment—gauges its vital force, its age, health, and temperature, and indicates the course and event of diseases, &c. It is claimed to be the result of a series of experiments in auscultation which led to the discovery that all vital organization gives out an audible sound—a low hum, accompanied by very distinct crepitation or crackling. These sounds may be discerned, we are told, by an acute ear, but more distinctly with the aid of a steel or cork conductor; and they are said to vary in a measurable manner with the age, temperament, health, and seasons, to indicate the difference between the effects of fatigue and disease, apparent and real death, &c. In complete paralysis, epilepsy, and the like, they entirely disappear, though they continue for ten or fifteen minutes after the cessation of pulsation and respiration in death. They are also heard in amputated limbs for some minutes after the operation—as some creatures appear to be alive after losing their heads. "The humming (*bourdonnement*) appears in every part of the body to which the instrument may be applied, but the crepitation only at the extremities of the fingers and toes, when one of them is placed in its level. I am not aware that any theory has been deduced from these singular results of this new course of physiological inquiry."

Iron and Earth Walls for Buildings.

The great fault with iron, and that which has prevented the adoption of this material still more rapidly for building purposes, is its too ready transmission of heat, making iron buildings insufferably hot on summer days and intensely cold when the sun leaves them in winter. An exchange describes the new Marine Hospital at New Orleans as being constructed on a plan which bids fair to obviate this difficulty:—

"One of our Washington correspondents, in alluding to the contract just executed by the Secretary of the Treasury with Vancluse & Co., for the erection of the new "pise" iron Marine Hospital at New Orleans, states the following interesting fact in connection with the proposed edifice:—It is believed that this building will combine several essential improvements, necessitated by the peculiarities of the soil and climate of New Orleans. While it will probably be the lightest architectural structure, in proportion to its dimensions, to be found on the delta of the Mississippi or the Gulf of Mexico, it will be equally as substantial, and more comfortable for a domestic habitation than many others with double the thickness of the exterior walls. It will probably be the only completely fire-proof specimen of architecture, so far as the external walls and floors are concerned, ever erected

on the continent. These results are attained by constructing the external walls of iron columns and veneering, insulated by non-conductors, with a filling in of common earth or pise from nine to twelve inches deep. By this simple arrangement, the inconveniences and dangers resulting from the great conducting and expansive qualities of iron are completely obviated. The conduction of heat from the surface of the external plates through the columns to the interior of the building is intercepted at all the points of contact by non-conductors, and thus discharging from the plates into the atmosphere instead of penetrating the interior of the building. The fact intended to be demonstrated in the construction of this building is that iron can be combined with a cheap non-conducting material for filling in, so as to make the structure of the walls of a building with greater economy, strength, durability, and capacity of resistance of heat, cold, and moisture than can be attained by the use of any other material. A cheap non-conducting material for filling in is indispensable to render the iron cheaper than the brick structure, for the iron plates may be attached to the brick walls as well as to the iron columns. It is clear, therefore, that the simple and inexpensive preparation of common clay, water, and straw, to be found everywhere, known to civil engineers as pise, is the only material suitable for the purpose sufficiently cheap to be used with advantage for the filling in of the iron building."

Deep Sea Soundings.

An apparently well-informed correspondent of the New York *Tribune*, writing on the relative claims of Lieutenants Maury, Strain, and Berryman to the discovery of the telegraphic plateau, forcibly remarks that deep sea soundings have, up to the present time, been of about as much interest to us as the distance of the moon or the density of Saturn. But with the soundings on this route is connected the question whether we will get our European news "with the sun lagging half a day behind," for on the accuracy of these deep sea soundings, he adds, depends the feasibility of the European Telegraph.

The steamer *Arctic*, placed at the service of the telegraph company during this last season, sailed from here July 18, under command of Lieut. Berryman for St. Johns, Newfoundland, from which point to Valentia in the southwest of Ireland, two lines of soundings were made, on the outward and return voyage.—This vessel was furnished with a steam-reel, a most material point, and every appliance which modern science has yet devised for fathoming the depth of the ocean, and each sounding was made under the care of Lieut. Strain, so well known to the world of science by his Darien expedition.

Massy's patent log, attached to the sounding line in nearly every instance, has been in use as a ship's log for several years. Its principle has been long known, it being a mechanical contrivance for registering its own progress through the water. To the lead is attached, upon the principle of the screw propeller, a small piece of clock-work, for registering the number of revolutions made by the little screw during the descent, and it having been ascertained by experiment in shoal water that the apparatus in descending would cause the propeller to make one revolution for every fathom of perpendicular descent, hands provided with the power of self-registration were attached to a dial, and the instrument was complete. It worked beautifully in shoal depths, but was always previously objectionable in deep water, from the difficulty in hauling it up. A 150-pound weight sinks this little self-registering machine to the bottom, Brooks' patent relieves it of the weight, and a steam reel brings it to the surface. With a simple line and shot, one sees miles and miles of his line running away, indicating an almost bottomless sea. The shock of the ball striking bottom cannot be conveyed through two or three miles of line, while long after the sinker has reached its destination, the line is still carried out by the currents and counter-currents that intervene. The line thus forms an immense curve, or perhaps a series of curves, according as there are one or more currents that affect it. The force of these cur-

rents will break any but the strongest line. Now, under these circumstances, to give the length of the line paid out as the depth is folly, while all calculations for drifting, &c., are more or less guess work.

On board the *Arctic* both systems were in use, the line out being always a check on the depth indicated by Massy's instrument. All soundings made with Massy's patent agree exactly, and it is only when resort is had to the small line and shot that discrepancies discover themselves, which can be reasonably charged on these inevitable defects of this method just described.

There appears to be, in many, a strong feeling of jealousy and dislike of Lieutenant Maury, with which, of course, we have nothing to do. But we hope, though not over sanguinely, for the success of the telegraph project, and cannot see how the soundings are to affect it materially. It is claimed by the parties engineering the enterprise that the pressure of the water has no effect other than somewhat to consolidate the material of the cable, and if this be so, it is idle to dispute about the depths. At the depth of 2,072 fathoms, the pressure of the water is about 6,000 lbs. on each square inch. If half this is not sufficient to compel the water to penetrate the pores of the gum and destroy the insulation, we see no reason to suppose a greater pressure will very seriously affect it.

Sounds Produced in all Living Tissues.

Our knowledge of physiology is progressing very rapidly. It is but little more than a hundred years since Harvey discovered the circulation of the blood, and overthrew the abominably crude notions previously entertained. The arteries are always found emptied of blood in dissections, except in case of death by lightning, as the powerful action of the heart and of the vessels themselves tends to this result; but the ancients had always taught that these passages were made to convey air only, or a certain imaginable fluid corresponding to the spirit. Discoveries have followed each other rapidly since the foundation was laid, and now, by the aid of chemistry, man has attained to a very tolerable degree of knowledge of himself.

Prof. Matteucci—we think that is the name, but the paragraph is not at hand at this moment—has recently announced the discovery that animal muscles actually burn and disappear while working—a fact long suspected and theoretically acknowledged. The animal organization is analogous to a steam engine, the food being the fuel and the lungs the furnace in which the oxygen of the air is united with carbon, producing carbonic acid to be expelled, like the same material from a chimney. This is known to be the source of animal heat, and of all the dynamic power or working energy of the animal organization; but it had not been previously proved that each individual part, each limb, for example, lost a portion of its substance with each muscular movement it performed, and that in proportion as each part, or the whole muscular system is worked, the particles become worn out, or burned, and are removed, to be replaced, of course, by others, and in greater abundance and vigor, in case the exercise has been just sufficient for health, and the stomach and accompanying organs are in good condition, and supplied with material. We have not learned that Prof. M., who is represented to be a foreign *savant* of some note, has yet proved that the nervous matter of the brain is consumed in the same manner by head work, but infer that this is presumed; and as we write this we imagine our brain to be burning up by inches, as well as the muscles of our fingers, but both in a state of healthful action, we hope.

The Atlantic

This splendid steamship has not yet made a trial trip. Workmen are engaged on her constantly, but the valves and valve motions, the parts now at fault, are yet unsuccessful in practice.

Coal and iron of inexhaustible abundance and of several or all varieties of each of the finest quality, are found throughout the whole valley of the Mississippi, from the Allegheny Mountains to the base of the Rocky Mountains.