Oil from Coal.

The manufacture of oil from rich bituminous shale and coal is now beginning to be a business of some consequence, and it will, we are confident, yet assume gigantic proportions. The materials for producing such oil exist in inexhaustible quantities within the bosom of mother earth, where they have been stored up for ages for the use and benefit of future generations. The discovery that oil could be manufactured from coal is one of the greatest made in the present century. Having had a number of inquiries made of us lately in reference to the processes for obtaining coal oils, the materials for making which are so abundant in our country, we publish the following description of the patent of W. Brown, granted in England, January 13, 1853, as containing valuable information for those who design to engage in this business:—

The first operation consists in distilling the coal, or other bituminous matter, in conjunction with steam, at a dull red heat; and, for this purpose, the coal or other bituminous matter is introduced into a retort fitted with a steam pipe passing through a furnace. The steam pipe terminates in the closed end of the retort, so that when the retort is charged with coal or other bituminous matter, and the furnace is in action, the steam pipe becomes red hot, and steam being then passed along it, in this state enters the end of the retort, and rapidly unites with and expels the volatile matters arising from the coal—by which means decomposition into gas is wholly or in great measure prevented, and the amount of oily or condensable product greatly increased.

The steam pipe may, if preferred, be passed through a furnace, distinct and separate from that which heats the retort, which arrangement admits of the withdrawal of the fire from the retort, or the diminishing of its intensity at pleasure, without altering the temperature of the steam pipe. By this means the distillation of the coal or bituminous matter can either be continued altogether or in part, with the retort at a temperature below that of a dull red heat. The steam pipe may be of cast iron, or it may be of clay or earthenware. In distilling, a condenser is employed, the temperature of which should not be lower than 50° Fah.

A quantity of volatile products having been thus obtained from coal or other bituminous matter, these are again subjected to distillation in a *still*, with or without the employment of a steam pipe, though the use of steam is preferred when a large amount of paraffine is required; but where the production of oil is the chief object, steam may be dispensed with. When steam is used, it is to be brought into the still, in a superheated state, by passing it through a red hot steam pipe, disposed in the furnace or flue of the furnace which heats the still. The steam enters through the upper part of the side of the still, and promotes, as before, the distillation of the volatile matters, whilst it retards their destruction or conversion into gaseous compounds. By this means the paraffine and heavy hydrocarbonaceous oils are preserved.

During the progress of the second distillation, the products vary at the different periods of the distillation; and these are therefore to be kept separate, or received in different vessels. At first a thin oil or impure eupione oil comes over to the extent of about one-eighth of the total fluid employed: after this a thicker and heavier oil, containing paraffine makes its appearance to the extent of from 40 to 50 per cent of the fluid employed; and lastly, a thick matter is evolved, consisting of paraffine, mixed with heavy oil; and this continues to the end of the operation, and constitutes about one-fourth of the bulk of the fluid originally used.

These three products are treated as follows The impure eupione oil is mixed with from 5 to 10 per cent. of its weight of oil of vitriol or sulphuric acid, to which an equal bulk of water is added; bichromate of potash is next thrown in, equal in weight to one-half of the sulphuric acid employed; the whole is then heated in any convenient vessel, of wood, lead or earthenware, and during the heating the materials are diligently stirred together. As soon as the temperature has reached 212° Fah., the heating means may be withdrawn, and the whole permitted to cool and settle.

The eupione oil is next to be decanted from the acid fluid, and treated with a warm solution of caustic soda, the whole being well mixed, and afterwards left at rest for some time to settle. Lastly, the eupione oil is decanted from the alkaline fluid, and distilled, either alone, or with water, or steam, as is practised with volatile oils generally. The heavy oil, containing paraffine, is next treated either with strong sulphuric acid and peroxyd of manganese, in the proportion of 10 per cent. of acid and 5 per cent. of peroxyd of manganese, or it is subjected, like the eupione oil, to the action of the sulphuric acid and bichromate of potash, in the same manner and proportion as indicated for the eupione oil; after which it is treated with soda ley, and allowed to settle. The heavy oil is then decanted and distilled in the usual way; the first portions being added to the eupione oil, as consisting chiefly of that substance; the second, and by far the larger portion of the whole, is received apart under the name "lubricating oil;" whilst the last portions, being thick and of the consistency of butter, are mixed with the impure paraffine, which results from the third stage of the second distillation of the crude products, which are next treated as follows:—Having allowed the impure paraffine to remain for twenty-four hours, or longer, in a cool place, to crystallize, the oily mixture is placed in a bag or filter, similar to those in use for the separation of spermaceti from sperm oil. When the oily fluid has drained away, the paraffine is removed to a press and subjected to severe pressure, as is practised with respect to stearic acid by the makers of that substance. It must then be melted, and when cold again pressed, the oil being in both cases added to the drainings, which are to be treated like "heavy or lubricating oil." The paraffine is then melted, and the heat raised to about 400° Fah., when strong sulphuric acid is to be carefully stirred into it in the proportion of from one-twentieth to one-tenth of the weight of paraffine operated upon. After boiling for a few minutes, the fire must be withdrawn, and the charred oil of the paraffine allowed to settle in the form of a black powder from the melted paraffine. This being separated, the paraffine must be boiled in water or in a weak solution of soda after which it may be cooled, and is fit for use.

This is a very clear description of the process. Considerable quantities of very beautiful oil for illumination and lubrication are now manufactured from Breckenridge coal in Kentucky, and sold in this city. A very large manufactory of mineral oil called kerosene is in operation a few miles from New York on Long Island, and large quantities of this oil are now sold and used. It is manufactured under three patents of Dr. Gesner, granted June 27, 1854.

A patent for making a lubricating oil from asphalt—like that obtained from the pitch lake of Trinidad—has recently been obtained in England by Dr. Simpson, (he who first applied chloroform as an anesthetic agent) of Edinburgh, and Prof. W. Thomson, of Belfast. The asphalt, according to their invention is first distilled at a temperature a little below that of a red heat. This produces a thick liquid, which is again distilled at the same temperature. The second distillation brings over a more limpid liquid—a fine residuum of charcoal being left in the retort. This oily liquid is subjected to stirring or agitation in a wooden vessel, with about one-tenth of its bulk of sulphuric acid. Much of the impurities unite with the acid, and when allowed to settle fall to the bottom of the vessel. The clear liquid is then drawn off, and agitated with a caustic alkali, or mixture of quicklime and chalk, allowed to settle, and the clear drawn off. The resultant oil is then agitated with sulphuric acid, as before, and again with the alkali or chalk, allowing time after each operation for the impurities to settle, and the oil has become a pale yellow color. It is then put into an iron retort and distilled at a moderate heat, when about one-third of the quantity comes over as naphtha. The heat is then elevated, when the remainder comes over (leaving but a small residuum of charcoal) and is an oil nearly limpid. It is not equal to many other oils for lubrication, but one part of sperm oil mixed with nine parts of it makes a cheap and good oil for machinery. As vast quantities of oils are now employed for lubrication, and as the demand for them must increase with the progress of machinery of all kinds, a knowledge of every new source from which a supply can be obtained is of no small importance.

A Cattle Plague.

In some of the northern parts of the continent of Europe a terrible plague has been raging for some time among the cattle, sweeping them off in hundreds. This disease is regarded as exceedingly infectious, as well as fatal, so that the most rigorous measures are adopted in every neighboring locality to guard against its approach, or to destroy the poison in the germ should it have made its appearance. It is recommended, as being the most effectual means, to destroy every affected animal, and to bury or otherwise destroy the carcasses—the hides being immediately tanned and the houses purified with chlorine. There appears to be two varieties of the disease, one called the Pulmonary Murrain, the other and more fatal, Steppe Murrain. The first stage of this disease is attended with a dry short cough, which may exist for several weeks. In the early stage the animals may be cured, but other stages follow, the symptoms of which resemble those of the Steppe Murrain, and end in a similar manner, the lungs exhibiting an indurated appearance and an entire change of structure. The fears excited that this disease might spread to England, has led to the issuing of a proclamation by government forbidding the importation into the United Kingdom of cattle, horns, hoofs, and raw or wet hides, or skins of cattle, which shall come from, or shall have been at any place within the territories of the Emperor of Russia, the King of Prussia, or of the Grand Duke of Mecklenburg-Schwerin, which respectively are in or border upon the Gulf of Finland, or any other part of the Baltic Sea between the Gulf of Finland and the Free City of Lubec. We hope this plague will not spread among the cattle of different countries, like the cholera among the human race.

National Hotel Disease.

One of the many intelligent sufferers by this disease, a distinguished patent attorney, writing us on the above subject, ascribes it to an effort on the part of the negroes to destroy the whites, a theory to which we attach no importance; but his sketch of his symptoms may be valuable, as he was not at the National Hotel at all, but only at Brown's, a building almost adjoining. He made two visits, the first of no importance in this respect, but the second, some six weeks after the National had been closed, was attacked in four days by sickness, so that he started at once for home. This was on Wednesday. He says:—

"I suffered very much on the way with pain in the intestines and limbs, nausea, violent headache, chilliness, a soreness of the throat, and soreness of the stomach—at times nearly fainted from prostration; on the next day diarrhea set in with soreness of the intestines, and by Sunday I found that the coating of my stomach and intestines were coming away with the diarrhea, my liver and chest began to pain; also seemed as if inflammation and swelling were going on. Not until this time did I suspect that I was poisoned, and on sending to my physician, Dr. C. Hering, he at once (and since) pronounced the symptoms those of poison by arsenic, and administered the antidotes for arsenic. On Tuesday, at noon, I began to feel better. Have continued taking homopathic preparations of iron, antidotes to arsenic ever since, now for more than a week, and I am slowly recovering.

My physician and his colleagues have had a number of cases in Philadelphia, all from the National Hotel, of the same symptoms of arsenic, though my case was the most violent of any."

With regard to the mystery of the matter, we may remark that Dr. T. C. Jackson, of Boston, in a letter published on the subject quite recently, ascribes the sickness, as do many others, to effluvia, arising from the drains. Persons who slept at the Hotel, but who took their meals elsewhere, were affected while others who took their meals at the Hotel were not affected. If the cause of the sickness was poison introduced into the food, how are we to account for these contradictory cases; or again, if it were due to anything connected with that house alone, how shall we account for the sickness of our correspondent, who has perhaps never been inside of the National, at least not for many months?

Shark and Whale Oil.

The Liverpool Chemists' Association have had under their examination some samples of shark oil, procured from sharks caught on the coast of Africa, and which was found to possess some characteristics of peculiar interest. Hitherto sperm oil possessed the lowest specific gravity, ·875, and was the lightest known; but shark oil is found to have a specific gravity of only ·866.

The following is a good method of purifying common whale oil—it is put into an iron still, with one ounce of sal-ammoniac and a pint of turpentine to each gallon, and heat is applied to the still, and the contents stirred by a rod passing tightly into it during the period the distillation is going on. The oil that passes over is stated to be peculiar in its character, and of a superior quality.

Water Hygiene.

"The tanks for water in India are covered with a green weed," says the India *Annals of Medical Science*, "and this, at the same time that it imparts a greenish hue to the water, possesses a remarkable power of filtering it, and rendering it wholesome, for where you have this green weed you also find small fish and infusoria, which preserve the water also. Sir Charles Napier, inspecting the hill districts of the Panjaub, observing the Bheestees drawing water from one of these tanks, ordered it to be immediately cleaned. The water soon became offensive, and was unfit for use until the same weed was replanted and had again covered the tanks."

Increase of English Factories.

During the past year, according to the Report of Inspectors of Factories, there has been a considerable increase in the number of such establishments. Altogether there are 2,210 cotton, 1,505 woollen, 525 worsted, 417 flax, and 460 silk factories in the three Kingdoms. The cotton factories had increased 1·42 per cent, silk factories not less than 66 per cent. 33,503,580 spindles were in operation, and 369,205 power looms, for all the factories. In 1836 there were only 115,801 power looms running; thus in twenty years they have tripled in number. There are employed in these factories 46,071 children above ten years of age and under thirteen, 460,646 women, and 176,400 men; total, 682,517 persons. That country is certainly progressing of late.

Patent Cases.

India Rubber.—No less than four cases of this elastic article came up before Judge Grier, Philadelphia, on the 7th inst. These were applications for injunctions by the Congress India Rubber Co., located in New York, to restrain four mercantile firms in Philadelphia from selling shirred goods, which, they claim, is an infringement of Goodyear's patent, owned by them. All the motions for injunctions were postponed. One of the firms sold English shirred goods, which, it seems, are cheaper than the same kind of American-made goods. We had supposed that our manufacturers were able to undersell those of England.

Strychnine in Whiskey.

The use of strychnine in the manufacture of whiskey is henceforth to be punished as a felony in Ohio. By means of this drug, used in connection with tobacco, some distillers were making five gallons of whiskey from a a bushel of grain, whereas the quantity obtained by the old process was but two and a half gallons. So it is said.

The Pacific railroad through Texas will be eight hundred and eighty-three miles long and has a grant of eight millions and seventeen thousand acres of land, and a loan of six thousand dollars per mile from the State.