THE NEW STERN-WHEEL GUNBOATS OF THE FRENCH NAVY.

Our engraving gives a general view of one of the new stern-wheel gunboats that the Minister of the Navy and Colonies has lately had built for service on the rivers Tonkin and Gaboon. These vessels, five in number, were constructed by the Societe des Anciens Etablissements Clarapede. They bear the names of Henry Riviera, Carreau, Garnier, Berthe de Villers, and Pionnier. As they are designed to run upon Chinese and African rivers, whose waters are often very low, their maximum draught is 0·70 m., and their minimum speed is 9 knots. They are provided with a 250 H. P. motor.

Each vessel consists of a flat-bottomed float of Bessemer or Siemens-Martin steel, of the first quality, thoroughly zincked. It is provided with three false keels, and the deck is surrounded with a rail. Upon the deck, and under a roofing, are established cabins for the commander and crew. Above the roofing there is a platform arranged in such a way as to receive all the vessel's armament. This latter consists of two 90 mm. guns, one fore and one aft, and four Hotchkiss revolving guns. There are six places provided on the platform for three of these revolving guns, the fourth being stationed at the top of a hollow steel mast located amidship.

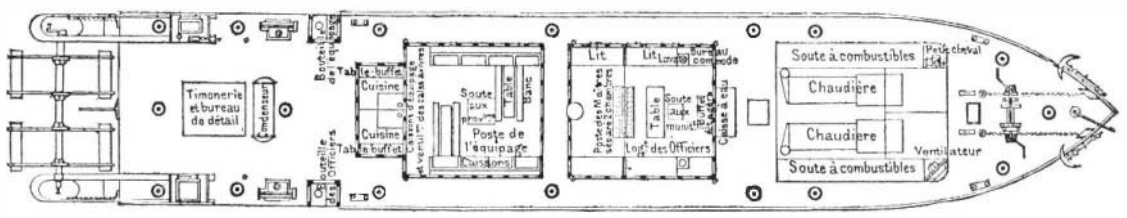

Fig. 2.—PLAN OF THE VESSEL.

The interior of the float is divided into twenty-eight compartments that contain the various storerooms and magazines, as shown in the plan in Fig. 2.

The length of each vessel between perpendiculars at the load water line is 37·2 meters; the width amidship is 7·4 meters; and the depth is 1·3 meters.

The engine, which is of the compound type, is a surface condensing one, without expansion apparatus. It has two horizontal cylinders and direct connecting rods, and develops, at a minimum, a 250 indicated horse power, at a velocity of 55 revolutions per minute. Four of these gunboats are designed for the Tonkin and one for the Gaboon. —*La Nature.*

Millions of Dollars in the Treasury Await Owners.

A curious fact shown by the United States Treasury's balance sheet at the close of the year's business is that there is nearly $20,000,000 of outstanding government securities on which the money is due and uncalled for, writes the Washington correspondent of the Louisville *Commercial*. On all of these interest has been closed, and there can be no possible reasons for the holders to delay presenting them for redemption. Some of them have been due for many years. On some of them there are due large sums of interest, which have not been called for, so that the interest on these alone amounts to $347,000. What has become of these documents and why they are not presented is something no one can find out. Some of them matured a half a century ago, and are still unheard from and unpresented.

Of the old debt, which matured prior to January 1, 1837, there is still outstanding $57,665 of principal, and $64,174 of interest. Of the Texan indemnity stock, which matured 20 years ago, there is $20,000 yet outstanding not presented. Of the 5-20s of '62, which matured more than 10 years ago, and on which interest ceased at that time, there is still outstanding $355,250. Of the 10-40s of '64, which matured 5 years ago, there is yet unpresented $178,850, with interest of $15,460 also due and unpaid. Of the 6 per cent consols, which matured 2 years earlier, there was $276,600 yet unpresented, and of the 6 per cent consols matured in 1879 there is over half a million dollars yet uncalled for, with interest matured, $56,990.

Of the 5 per cents, which matured in 1881–82, there is still nearly $800,000 unpresented, though the interest ceased at maturity. Of the compound interest notes of 1864, which bear 6 per cent interest, and which matured in 1867 and '68, over $200,000 are still out and uncalled for, while of the 7-30s of the same year, which matured more than 15 years ago, $133,800 has never yet been called for, nor has some $20,000 of interest on them been demanded. What has become of these bonds, which represent so much money, is hard to understand.

Some of them have probably been destroyed, perhaps the majority of them, though it is proper to add that the bulk of the $19,000,000 due and unpresented is of that which has fallen due within the past year, and which will doubtless be presented when the well-fed and leisurely coupon clippers realize that there are no more coupons to be clipped upon them, or that, if so clipped, they will not be honored because of the fact that the bonds have been called. There are, however, large sums which have been due many years, and have not been paid simply because they have not been presented. Some of these have doubtless been lost by fire and flood, others laid away as permanent investments of some fund, or perhaps forgotten in some dusty safe or mouldy pigeonhole. Why or how it is that such large sums are still outstanding and liable to continue so, is not even within the comprehension of the most experienced Treasury official to answer.

A Wonderful Railroad.

The Leadville *Democrat* thus describes one of the wonderful railways that penetrate the mining regions of Colorado:

Much has been written about the construction of the mountain divisions of the Rio Grande; travelers have marveled at the 4 per cent grades and the 15 degree curvatures of the remarkable narrow-gauge railroad which penetrates the most rugged canyons and climbs the most lofty mountain ranges of the Rockies. But nobody has ever well described the wonderful little feeder of the Leadville division, which modestly leaves the main line in Brown's canyon and ascends the mountain gulches to the east with the steepest grades and the heaviest curves in the world that are overcome with the ordinary drive-wheel locomotive. Afar up in this range of mountains, seven miles away, and nearly 3,000 feet higher than the bed of the canyon, is the famous Calumet mine, from which is extracted the hematite iron ore that keeps in blast the furnaces of the Bessemer works at Pueblo. Every morning of the year a ponderous locomotive and a small train of cars toils up this steep, and every afternoon they make the perilous descent to the valley loaded with iron, with steam brakes on the cars, the water pressure on the locomotive drivers, and a man standing at the brake wheel of each car.

This is the most wonderful piece of railroading in the universe. The maximum grade is 406 feet to the mile, or nearly 8 per cent., and the maximum curvature 25 degrees. The terminal of the branch is half a mile higher than the commencement. Imagine then the difficulty in ascending with empty cars, and the danger of descending with loaded ones. Still, strange though it may seem, a locomotive cannot make the descent unless at least five cars are attached. The latter are essential to provide the resisting power for the steam brakes. The trip up is snailish, the return is rapid, in spite of the steam pressure, which cuts the car wheels into sparks that fly out in a constant stream from the brakes, in spite of the reversed action, in spite of the lavish use of the sand pipe, and in spite of the water brake on the locomotive drive wheels.

Some few years ago, when the operation of the line was commenced, runaway accidents were almost of daily occurrence. The seven miles were, within a brief period, strewn with the wrecks of cars and locomotives, and iron ore. The most discouraging results attended the persistent efforts to make the line serve the purpose for which it was constructed. Day after day control over the descending train would be lost; some defect would interfere with the working of the steam brake, and even with the brake in successful operation the train would take a crazy notion and go flying down the mountain sides, along the brinks of fearful precipices, through the rock-bound gullies, and around the acute curves, like a bolt of lightning. The train hands would leap for life, and then the locomotive and cars would be dashed into fragments. In all these accidents, however, says the *Democrat*, nobody was hurt. Thousands and thousand of dollars' worth of rolling stock is said to have been destroyed before a successful system of operation was established. Only very few of the higher officials of the Rio Grande realize how terrible was the experience of these rides, and it is told of two of them who once summoned up sufficient curiosity and courage to make the journey, they were so frightened that they hung on the steps of the caboose, expecting every moment to have to leap for life.

Finally extremely heavy locomotives were built, and a force of exceptionally brave train men were secured. The latter were instructed to cling to their post at every hazard, and to never flinch in the moment of danger. Not a serious accident has been recorded since. Starting from the mine every brake is manned, so that in case the steam should fail the train could be checked. While there have been several runaways, in two years there has not been a wreck. The sight of one of these trains descending is one of thrilling interest, the sparks from the car wheels cutting a pathway of light down the mountains, which can best be described as having the appearance of a molten stream of fire rushing down to the river bed of the canyon.

In Switzerland there are grades as steep as these of the Calumet branch, but they are equipped for operation with the cable and cog wheels.

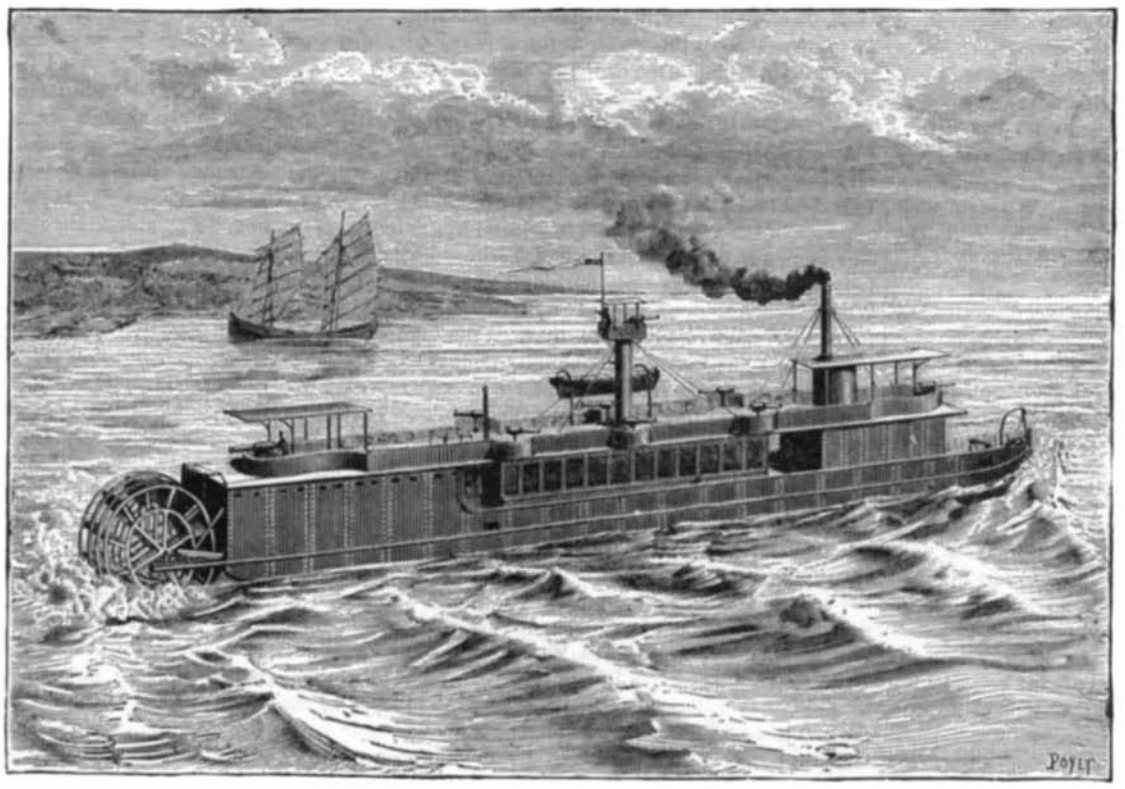

Fig. 1.—NEW FRENCH STERN-WHEEL GUNBOAT.

A New Gas Light.

For the past three weeks the York departure platform at Euston Station has been lighted upon a novel principle—namely, with an incandescent gas light. This light was invented by Mr. Lewis some two years since, and was described by us at the time, but the present is its first public application on a commercial scale. Before, however, it was applied at Euston the system underwent careful trial at the company's works at Crewe, and if it answers expectation at Euston—which so far it has—it will no doubt be widely adopted by the London and Northwestern Company. The principle of the burner is the mixing of air under pressure with common gas, the light being produced by the incandescence of a platinum wire gauze cap which forms the apex of the burner. The air and gas are mingled at the burner in such proportions that perfect combustion takes place, so that it is impossible for any unconsumed carbon to escape. The power used at Euston for compressing the air is simply that of a Bisschop gas engine of two-man power, which is sufficient to supply the air to a much greater number of burners than are at present in use there. The platform is 900 feet long, and it is very effectively lighted by 20 Lewis burners, which have taken the place of 50 ordinary burners previously in use.

No lanterns or glasses are used, and the light is perfectly steady, there being no flame. It is, moreover, quite unaffected by wind or rain. The burners are constructed to consume 18 feet of gas per hour, but they are actually consuming only 12½ feet, so that if necessary a very much more brilliant light could be given than is. It is stated that the quantity of gas consumed is 17 per cent less than with the ordinary system, but that fully double the candle power is obtained.

Then again, the expense of the glass lanterns is obviated, as well as the labor of keeping them in order. An arrangement of this system has also been perfected for house lighting which gives the same results without the necessity of using power to compress the air. On the whole, the invention appears to be a practical success, and in view of its value as avoiding the formation of noxious vapors by combustion, and not less of its apparent economy, it would seem to have a good future before it, now that it has been practically started.—*London Times.*

HAY water is a great sweetener of tin, wooden, and iron ware. In Irish dairies everything used for milk is scalded with hay water. Boil a handful of sweet hay in water and put in the vessel when hot.

Cholera.*

We have at our command, if we are diligent in using them, the means of rendering cholera comparatively a harmless disease. What are these means? Manifestly all such as tend to produce a perfectly pure state of the atmosphere which surrounds us. In an atmosphere divested of impurities, imparted to it by the presence of man, cholera, cheated of its victims, will soon be compelled to look for some other abiding place. Where men are congregated in large numbers, during indefinite periods of time and under circumstances not favorable to cleanliness, we find all the hot-beds of the disease. Death from cholera is of very rare occurrence in the country, while the densely populated and filthy districts of large cities are oftentimes decimated. If, then, we are to have immunity from a disastrous epidemic, it can only be procured by a thorough cleansing of all our cities and towns. Not the ordinary cleansing, by sweeping the streets and washing out the great sewers, but *a cleansing which shall extend to every man's premises, on every street and alley, in the heart as well as in the suburbs of the city.* The demands of health will be satisfied with nothing short of a complete and thorough cleansing of every Augean stable. *This work cannot be commenced too soon, nor can it be continued too long,* or prosecuted with too much energy and industry. Should it be neglected in any locality until too late to prove effectual, let no physician subject himself to the reproach of having neglected to point out and urge its importance upon the public authorities. Let us urge it *in season and out of season*, and if death must come in the shape of aggravated cholera, we can at least meet it with the consciousness of having discharged our duty.

The best means for purifying the atmosphere must be familiar to all, and do not require repetition. The removal of all filth, and every source of filth, and the subsequent free use of disinfectants, are plainly indicated.

There can be no doubt that by strict attention to the general laws relating to health, many persons may pass through the worst epidemic without an attack of the disease who, by neglecting such precautions, would equally suffer with others. The object of each individual should be to preserve himself in the best possible state of general health. For this purpose, it is not necessary or proper that he should make any great change from his ordinary habits of life. All those causes which are known to make extraordinary draughts on the nerve-centers of organic life should be carefully avoided, while all means adapted to impart increased vigor to those centers should be equally cultivated.

Such attention to personal cleanliness is as much a necessity, with individuals, as purification of the atmosphere is with communities. Bathing, of whatever kind, if an habitual practice, should not be discontinued, though it might not be safe for any one unaccustomed to such luxuries to astonish himself with a cold or shower bath as a preventive of cholera. All confirmed habits should be continued, though they may be often moderated with advantage. The continuance of wine to those accustomed to its use should always be recommended. Old topers who suddenly leave off their drams are almost invariably attacked, and generally die. Their usual habits should be kept up, though their ordinary allowance ought, in no case, to be exceeded. The strictly temperate will derive no increased immunity from a resort to stimulants of any kind.

Nostrums and medicines of all kinds, unless prescribed by a judicious physician, should be carefully avoided.

In former epidemics, particularly the first, much harm was done by a rigid system of abstemiousness, amounting, in some cases, almost to starvation. Wholesome, nutritious food, in sufficient quantities and at regular intervals, is essential to the maintenance of a healthy organic sensibility. All excesses or all articles of food which, under ordinary circumstances, are known to produce even slight discomfort should be carefully avoided. Those accustomed to their use may eat ripe fruits, fresh from the tree or vine, in moderation, with impunity and even with advantage. Light meats, wholesome, fresh vegetables, and the ordinary beverages of milk, tea, and coffee are what the healthy appetite calls for, and nature will be found not only to tolerate but to profit by them. The clothing should be such as to preserve the uniform temperature of the surface. Flannel next the skin has been universally recommended, and there can be no doubt of its utility. The clothing generally should be accommodated to varying conditions of the temperature; all sudden transitions should be carefully guarded against, and the body, when heated by exercise, should be permitted to cool under some slight addition to the covering. The laws regulating the diffusion and concentration of atmospheric poisons should be borne in mind, and our advice given in accordance with them. As the sun gains power in the morning such poisons are gradually expanded and lifted into a higher regions of the atmosphere; so in the evening, as the sun goes down, and the shadows of night gather around us, they are rapidly concentrated near the surface of the earth. During this period of condensation is to be found the greatest danger of exposure; hence the morning, the late evening, and the early night air should be avoided. For the same reason, chambers should be selected on the second or third floor in preference to the first—cholera having always found a favorite abode in cellars and basements. During these hours the windows and doors of houses should be closed, even though it become necessary to open them at a later period. It has been recommended to wear a veil of some kind over the face, when persons are compelled to go out at unseasonable hours, and there can be no objection to the adoption of such a recommendation.

Fear, acting through the animal, makes heavy draughts on the organic sensibilities, hence tranquillity of mind furnishes an important safeguard against an attack of the disease. To secure this, persons should be advised to attend to their ordinary occupations, or encouraged to spend their time in administering to the wants of the sick. The sooner any individual rids his mind of the fear of contagion, the sooner he familiarizes himself with the presence of the disease, so much the sooner will he occupy a position of comparative security. Distance, as it "lends enchantment to the view," also increases the apparent magnitude of all dangers. One of the worst effects of a belief in the doctrine of contagion is, that while it gives no protection to the individual it deprives the sick of ordinary offices of humanity. Humanity in all its beneficent warmth often shrinks from a visit to the bedside of contagion. Once satisfy the mind that the disease is not contagious, and that increased security is to be found in benevolent ministration, and we will no longer witness the shocking scenes of neglect which disgraced the epidemic of 1832–33.

When the epidemic influence is developed in any locality, persons should be especially cautioned not to leave their houses in search of places of safety. They already carry with them a full load of the poison, and the exertion incident to hasty preparation and rapid traveling has the effect of impairing their powers of resistance. A large proportion of those who left Wheeling, after the epidemic was fully pronounced, were attacked with the disease before reaching their destination. Under such circumstances, home is the place of greatest safety.

One paramount duty of every physician, both before and during an epidemic, is to impress upon all who depend upon him for advice the *vital fact that diarrhœa, in whatever form it commences, is the first stage of cholera*, and the sooner it changes to the characteristic rice water appearance, the more speedy is the descent to the last and fatal stages. From ignorance or willful disregard of this fact, thousands and tens of thousands of lives have been sacrificed. He who neglects this symptom fails to put an extinguisher on the burning train which conducts to the explosive mine on which he stands. It is asserted by some writers, that cases occur in which the violent symptoms of the second stage set in without a precedent diarrhœa. Without denying the truth of these statements, I must be permitted to say that no such case fell under my observation, or under the observation of those physicians with whom I was immediately associated in practice. In some cases it was certainly of very short duration, and in others it was at first denied, but in all, on close inquiry, its existence was clearly ascertained. The importance of this stage, as the only one generally curable, cannot be too often or too forcibly inculcated.

* By Dr. M. H. Houston, published in 1866. Atlantic Journal of Medicine.

Nature's Wonderful Gas Works.*

A correspondent of the N. Y. *Sun* sends to that paper a very interesting account of the gas wells at Pittsburg, Pa. This community, says the writer, is awakening to the importance of the vast reservoirs of natural hydrocarbon gases now known to exist under a belt of territory extending from Lake Ontario southwesterly to this city, and thence through West Virginia to east Kentucky and Tennessee. Gas is now frequently discovered where there is no sign of oil. In some of the gas wells in this vicinity the gas is almost pure hydrogen, perfectly free from odor; in others further removed it has a strong scent of petroleum. The gas shows little variation in its heat producing power, but varies greatly in gravity, being comparatively heavy as it comes from gas wells in the petroleum regions, and lighter than air elsewhere.

The first recorded discovery of natural gas was made at Pittsburg between 1830 and 1840, when in drilling a well on the bank of the Ohio River, almost opposite old Fort Duquesne, a heavy vein of gas was opened. About the same time another gas well was struck under similar circumstances nine miles above Pittsburg. No attempt was made at the time to utilize the gas. In 1860–65 the people of the pottery town of East Liverpool, O., thinking their lands were on the oil belt, sunk a considerable number of wells, and at an average depth of 450 feet tapped a vein of gas, which put an end to further drilling. Some shrewd Yankee conceived the idea that the gas could be utilized as an illuminant and as fuel, and here was put down the first pipe line for carrying natural gas to consumers. It was not a satisfactory illuminant, however, being very smoky. The charge for its use was merely nominal, however, and it is still in use for lighting the streets, the lamps not being extinguished for months at a time.

Gas was first used as a fuel in the oil regions in 1862, in the Dunkard district, near the West Virginia line. William Rogerson, while developing petroleum territory, struck a vein of gas. He tried an experiment with it as fuel for his steam engine, and burned it with satisfactory results.

The first use of natural gas in the manufacture of iron was made at the Siberian Iron Works at Leechburg, Pa., in 1874. Mr. William Rodgers, one of the proprietors, conducted the gas to the furnaces by means of pipes, and found that the quantity of the iron produced was greatly superior to that made with coal. These works are still operated with natural gas, and the saving in fuel bills, as compared with the cost of coal, is $15,000 to $20,000 per year.

Since the laying of pipe lines to the city from the wells at Murrysville, Westmoreland County, and those in Washington County, natural gas has been in use in a large number of iron, steel, and glass works here. At the plate glass works the saving in the cost of fuel is estimated at $30,000 to $50,000 per year. The company, however, own their own gas well, which makes a large difference in their favor. Pittsburg has for several years been surrounded by large gas wells, most of the product from which was allowed to go to waste. About two months ago George Westinghouse, Jr., the owner of the air brake patents, struck a big gas well on his residence property in the Twenty-first ward, the flow from which he estimates to be worth $500 per day. This, too, is going to waste while the city legislators are deliberating upon what rules to adopt in regard to piping the gas through the city streets to consumers. Meanwhile, Mr. Westinghouse is sinking three other wells on his place, and there are in all some eighteen gas wells under way within the city limits.

Within a year at least one hundred wells will have been sunk in that part of the city lying between the Homewood Driving Park and the Monongahela River. Many of these may of course be dry. The property of the district likely to be thus perforated is residence property, owned in small lots, and is very valuable. An experienced operator gives it as his opinion that a well is not worth the cost of drilling unless put down on a sufficiently large tract of land to insure permanency. The striking of a well on a small piece of ground at once induces the neighbors to drill on their property, and thus the supply, that flowing through one well would last for twenty or thirty years, is divided up among many, which necessarily must lose head or pressure within a short time. Outside of the city limits and all along the line of the belt, a great many wells are being drilled.

The piping of natural gas from any considerable distance is accompanied by many obstacles. The friction in the pipes creates a back pressure which reacts on the well, and in time works its destruction. Thus a fine well in Butler County, which supplied the Natural Gas Company, of Butler, was in a comparatively short time destroyed.

One thousand feet of gas is the equivalent in heat units of four bushels of bituminous coal, plus the cost of labor saved in handling the coal and firing and getting rid of the refuse remaining in the furnace. Its economy in domestic use remains to be demonstrated.

Negotiations are now in progress for the consolidation of the natural gas interests in one great corporation. Mr. Ford of the Pittsburg Plate Glass Company, which paid $50,000 for the McGuigan well in Washington County, has within a few days been solicited to go into such a combination, which is intended to include Mr. Westinghouse, the Penn Fuel Company, and the Fuel Gas Company. Should this be consummated, the manufacturers can bid farewell to the prospects of cheap fuel.

Gas wells are 5⅝ in. inside diameter, and average 1,600 ft. in depth. It costs $3,000 to $6,000 to drill and case a well. The pressure at the mouth of the well varies from 40 pounds to 1,238 pounds to the square inch, and with this range furnishes sufficient carbon to take the place of 50 tons to 1,000 tons of coal daily. The duration of wells is not yet known.

Wells opened 24 years ago are yet flowing with undiminished pressure, and those which are apparently exhausted renew their full flow after being cleaned out. The combustion of natural gas is perfect. It burns with a pure rose color, and makes a tremendous heat. It is exceedingly penetrating, and this, combined with its odorless nature, renders it a dangerous agent. It is proposed to odorize it by passing it over a tank containing the refuse from coal tar or ammonia. It is so subtle that it will pass through paper or gold and silver leaf. It is destructive to animal life when inhaled for a short time.

The most generally accepted theory as to the origin of the gas is that the water from the earth's surface, penetrating to the inner fires, is decomposed into hydrogen, and this, gathering into large bodies, is freed by the drill and rushes to the surface. According to this theory, the supply can never be exhausted so long as the processes of nature continue as at present.

* The report, in part, of the committee appointed by the Western Pennsylvania Engineers' Society to investigate the properties of this natural gas may be found in the SCIENTIFIC AMERICAN of July 12.

The Source of Bile Acids.

According to Dr. Jensen (*Philadelphia Medical World*), Pettenkofer's test for bile also holds good for peptones. It had long been surmised that the slight bitterness of the true peptones is due to the presence of bile in one of its initial stages, as manufactured by the process of digestion. Experiments have been made on boiled albumen, flesh, and a solution of gelatine, after being converted into peptones in separate bottles by a minute proportion of Dr. Jensen's pepsin. The albumen peptone gave a much stronger reaction with the bile test than did the peptone from flesh; and the gelatine peptone was almost unaltered by the test. It is thus thought that the albumen of food furnishes the chief elements for the bile. And the natural inference of a layman would be—too much bile, too much albumen.

BOILED lettuce makes a good salad and furnishes an excellent substitute for spinach. It is said to possess soporific properties, and not to contain the quantity of oxalates to be found in spinach, rhubarb, sorrel, and some other vegetable products used for salads.

The Muskrat (*Fiber Zibethicus*).*

About two years ago Mr. Cristiani published an article extolling the fragrant properties of the "American musk," and saying at the conclusion that it can be substituted for the more expensive Russian or Tonquin musk. As the musk he alluded to is taken from the so-called muskrat or muskwash, which abounds in Canadian waters, and is very common in the numerous lakes and streams near which I reside, it seemed to me desirable that I should collect all the information I could obtain about the habits of this little animal, and about the properties and probable utility of the musk it produces.

In front of me as I write are the beautiful waters of Sturgeon Lake, stirred into life and motion by a strong southwest wind. The shore on which I have camped is low, but covered with hardwood to the water's edge. Sturdy oaks predominate, but not far off is a magnificent grove of maple. The lovers of fruit will also find in the neighborhood choke cherries, wild plums, gooseberries, raspberries, blackberries, and also a few whortleberries and cranberries. The opposite shore, about three miles off, is also low, dotted with farm houses and clearings, and having a stony beach covered with drift wood. Down this lovely water, some two hundred years ago, swept Count Champlain, leading a band of Indians to attack a settlement of their brethren of a different tribe, who lived on the shores of the lake which now bears his name. Into Sturgeon Lake run several small streams and rivers.

About forty years ago, for the purpose of navigation, and to give water power, a dam was built at the outlet, which, raising the water, had the effect of covering a great deal of low land on each side of the creeks and rivers. The trees were all killed by the excess of moisture, and their dead trunks and branches left standing give the place so weird a look that it has been named the "drowned land." This and kindred localities are favorite haunts of the muskrat, and here in some pool among the dead and decaying logs he builds his nest. It is two and sometimes three feet high, of a roundish, conical shape, something like an earthen bowl inverted, and is composed of pieces of stick, weeds, and dried leaves. The inside is commodious, and is warm, comfortable, and soft. There are two apertures, an entrance and an exit, and they are differently built. Both terminate under the water, so that the animal has to dive both in leaving and returning to his nest. The entrance is built as a gradual slope up to the floor of the lodge, so that he can easily run up it, but the exit is a precipitous descent down which he must jump into the water. In this nest he stays all day long, leaving it to search for food in the night or early gray of the morning. In summer he sometimes burrows the bank. Occasionally a rat more venturesome than his fellows may be seen swimming a stream in broad daylight, but this is not common.

The muskrat is amphibious, and spends a great deal of his time in the water, but commonly has only one method of leaving or returning to the bank. At the edge of the water are numerous fallen trees, the ends of which rest on the bank, and the other extremities under water. He chooses one of these as his pathway, swims to it, runs up to the bank, gets what he needs, and returns down the same log again. This habit is taken advantage of for his destruction. Some time in the early evening the trapper goes in his canoe with his ax and his traps, and, having discovered by marks best known to himself which log his prey has chosen, he cuts out a chip just below the water's edge, and in its place puts a trap, with two murderous steel jaws, but no teeth, for fear of injuring the fur. Over this trap the poor rat must go both in leaving or returning to the water, and he is thus nearly sure to step into it. These traps are visited night and morning.

The fur is the part of the animal desired, and the rest of the carcass is thrown away as a general rule, but is sometimes eaten. The hunter gets from eight to fifteen cents for each skin, according to the scarcity of the commodity or the demands of fashion, and many a fine sealskin set is in reality nothing but dyed muskrat. I said that the carcass was eaten occasionally. This occurs principally in winter, the flesh being out of season in the summer. I have myself eaten it in the latter part of September, but the dish was insipid. With the Indians, however, it forms a constant article of diet at their winter feasts. The musk sacs are placed in pairs, one on each side of the genital organs, and connected by a cord passing in front. They are underneath the external skin. All summer long and far into the fall the sacs are very small, but toward spring they increase in size, and about the months of February and March they attain their largest size and strongest odor. I have indeed been shown some, very small and useless, said to be the product of the female, but other trappers have contradicted this, and so the matter is doubtful.

About a year and a half ago, in the latter part of March, I obtained from a hunter half a dozen of the recent sacs. They ranged from three-quarters of an inch to two inches in length, by about an inch in breadth, were similar in shape to the well known sacs of beaver castor, but were of a light color, somewhat like the white meat of a chicken. They were filled apparently with an oily fluid, of a strong musky odor, but which had a putrid smell. Being very busy, I hung them in the sunny window of a wareroom to dry, where they were allowed to remain about two months, but though they filled the room with their musky odor, the putrid smell remained, and they never completely dried. At the end of that time they were cut up, and found still to contain an oily fluid, and much membrane, but nothing at all approaching in appearance to grain musk. The putrid smell never left them. Maceration in diluted alcohol extracted the odor, and a passable perfume was obtained. But the putrid taint still lingered, and I scarcely considered the experiment a success. Perhaps it would be possible, by a more careful method of drying, to avoid the odor of the decay, and if that can be managed, I think a very agreeable perfume can be extracted.

The little animal from which this product is obtained is not truly a rat, nor does it belong to the same family—*Muridæ*—but is more nearly allied to the beaver—Castor fiber—while the muskrat is Fiber zibethicus. It is much larger than the common rat, and its fur is reddish brown, and quite long. Its tail is round, but slightly flattened at the end, and it is said that he steers with it. Its two hind feet are webbed, and its front ones partially so. It lives on the roots and young bark of trees and shrubs, being very fond of the root of water lily. It is capable of being tamed. A friend some years ago had three or four running about the house like kittens, completely domesticated. Trappers describe them as a very clean animal.

There are three other animals also going by the name of muskrat, and which might possibly furnish a fragrant musk. These belong to the family of the Shrews, and have the upper lip elongated into the snout or short proboscis. Two species of the Mygale—one a native of the Pyrenees and the other of the south of Russia—and a third called the Sondeli, a native of India, which often utterly spoils provisions, through the persistency and strength of its odor.

Some portion of the foregoing is from personal observation, but a great deal from conversation with trappers. But as I have taken some pains in comparing different statements, I think I have not been deceived.

*By E. Gregory, in *Canadian Pharmaceutical Journal.*

Timely Advice about the Cholera by Florence Nightingale.

In view of the possible invasion of this country by the cholera during the present summer, the following letter by Miss Nightingale to the New York *Herald* will be read with interest. Her extensive practical experience in dealing with the disease gives peculiar value to her words of advice.

Sir: I beg to reply to your note asking for "practical advice in view of the rapid spread of cholera."

That our whole experience in India, where cholera is never wholly absent, tends to prove—nay, actually does prove—that cholera is not communicable from person to person.

That the disease cannot be ascribed to "somebody else," that is, that the sick do not manufacture a "special poison" which causes the disease.

That cholera is a local disease—an epidemic affecting localities, and there depending on pollution of earth, air, and water and buildings.

That the isolation of the sick cannot stop the disease, nor quarantine, nor cordons, nor the like. These, indeed, may tend fatally to aggravate the disease, directly and indirectly, by turning away our attention from the only measures which can stop it.

That the only preventive is to put the earth, air, and water and buildings into a healthy state by scavenging, limewashing, and every kind of sanitary work, and if cholera does come to move the people from the places where the disease has broken out and then to cleanse.

Persons about cholera patients do not "catch" the disease from the sick any more than cases of poisoning "infect" others. If a number of persons have been poisoned, say by arsenic put by mistake into food, it is because they have each swallowed the arsenic. It is not because they have taken "it," the "mysterious influence," of one another.

In looking sadly at Egypt—Egypt, where cholera did not begin anywhere along the route from India to Europe, but at Damietta, where no ship and no passenger ever stops, and where the dreadful insanitary condition of the place fully accounts for any outbreak of cholera—in sorrowfully looking at Egypt and at Europe now, one might almost say that it is this doctrine of a special poison emanating from the sick, and which it is thought can be carried in a package, that has (mentally) "poisoned" us. People will soon believe that you can take cholera by taking a railway ticket. They speak as if the only reason against enforcing quarantine were, not that it is an impossibility and an absurdity to stop disease in this way, but that is impossible to enforce quarantine. "If only we could," they say, "all would be well."

Vigorously enforce sanitary measures, but with judgment, *e. g.*, scavenge, scavenge, scavenge; wash, cleanse, and limewash; remove all putrid human refuse from privies and cesspits and cesspools and dust bins; look to stables and cowsheds and pigsties; look to common lodging houses and crowded places, dirty houses and yards. "Set your house in order" in all ways sanitary and hygienic, according to the conditions of the place, and "all will be well."

I beg to send you the best thing that has been written upon the subject—where also what can be said about quarantine is fully stated in the best manner—the lecture by Dr. Cunningham, Sanitary Commissioner with the government of India, on the "Sanitary Lessons of Indian Epidemics," at the beginning of the *Medical Times*, which I inclose.

The real danger to be feared is in blaming somebody else and not our own selves for such an epidemic visitation. As a matter of fact, if the disease attacks our neighbors we ourselves are already liable to it. To trust for protection to stopping intercourse would be just as rational as to try to sweep back an incoming flood instead of getting out of its way.

With the most earnest wish that America, as well as England, may "set her house in order," and so defy cholera and turn its appearance elsewhere into a blessing, pray believe me,

Ever her and your faithful servant,

FLORENCE NIGHTINGALE.

Facts worth Knowing around the Laundry.

That by adding two parts of cream of tartar to one part of oxalic acid ground fine and kept dry, in a bottle, you will find, by applying a little of the powder to rust stains while the article is wet, that the result is much quicker and better. Wash out in clear warm water to prevent injury to the goods.

That cold rain water and soap will take out machine grease, where other means would not be advisable on account of colors running, etc.

That turpentine in small quantities may be used in boiling white goods to a great advantage, as it improves the color, and the boiling drives off all odor. Resin in soap is quite another thing; it injures and discolors some goods, and shrinks woolens. Soap men argue that on account of the turpentine in the resin it assists in the washing. It is used for a filler and to make the soap hard and cheap. It is a fraud on the consumer.

That kerosene will soften leather belts or boots that have become hard from exposure or use around the wash room. Good for the harness when hard from rain or dampness. Wash with warm water, then grease with good animal oil or dressing like the following.

That the government harness dressing is as follows: One gallon of neatsfoot oil, two pounds of Bayberry tallow, two pounds beeswax, two pounds of beef tallow. Put the above in a pan over a moderate fire. When thoroughly dissolved add two quarts of castor oil, then while on the fire stir in one ounce of lampblack. Mix well and strain through a fine cloth to remove sediment, let cool, and you have as fine a dressing for harness or leather of any kind as can be had.

That baking soda gives instant relief to a burn or scald. Applied either dry or wet to the burned part *immediately*, the sense of relief is magical. It seems to withdraw the heat and with it the pain. Keep it in the ironing room.

That Javelle water, often met with in works or articles on cleaning and dyeing, is made of one gallon of water and four pounds of ordinary washing soda. Boil for five or ten minutes, then add one pound of chloride of lime. Let cool, and keep corked in a jug or tight vessel.

That when acid has been dropped on any article of clothing, liquid ammonia will kill the acid, and then by applying chloroform you will restore the color in most cases.

That "cyanide of potassium" will remove all indelible inks whose base is nitrate of silver. Being a deadly poison, it will be hard to get from the druggist in most cities. Turpentine or alcohol rubbed in hot removes the new inks, using soda and soap freely in hot water afterward.—*National Laundry Journal.*

The British Patent Office Report.

The first report of the Comptroller General of Patents, etc., under the new law has been issued. The most striking fact of the report is the record of the sudden pressure thrown upon the Patent Office during the first month of the year, when cheap patents became available. The applications during January numbered 2,499; whereas the previous average for the month was about 500. Not only was the number of applications increased fivefold, but the work on them was much heavier; for the provisional specifications were not merely pigeonholed, as formerly, but were all examined, and in many instances amendments were introduced at the suggestion or by the requirement of the examiners. During the four months covered by the report the total number of applications made was 7,060. The expectations of those who imagined that the new law would dispense with agents are not justified by the facts; for 72 per cent of the applications still pass through the hands of patent agents. The preparation for the publication of an illustrated official journal is progressing, but owing to a difficulty experienced by the officials in selecting from the inventors' drawings appropriate views for publication, and the opposition of the solicitors to furnishing special drawings on a reduced scale for the publication, the Patent Office has not yet commenced the publication of illustrations in the official journal, and thus the most interesting portion of our *Official Gazette* is omitted in the English publication.

M. Pasteur's Hydrophobia Experiments.

The experiments which M. Pasteur is reported thus far to have made are said to be an unbroken success. Fifty-seven dogs have been the subjects of investigation. Of these nineteen were rabid, and by these thirty-eight healthy animals were bitten under uniform conditions. Of the thirty-eight, one-half the number had been previously inoculated or "vaccinated" with attenuated virus; the other half had not. The latter, without a single exception, died with unequivocal signs of rabies, whereas the nineteen others remain as well as ever. They will be watched for a year by veterinary surgeons to see whether the inoculation holds good permanently or only temporarily. If rabies be not spontaneous in its origin, and if the experiments of Pasteur all turn out successful, there seems no reason why canine madness should not be extirpated from our midst.—*Lancet.*