THE HARBOR OF NEW YORK.

At this particular juncture of our commercial affairs, when the carrying trade of the Atlantic ocean is being successfully monopolized by immense iron screw steam vessels of great tunnage and draft of water, some apprehension justly exists among the merchants of this city as to the present condition of the harbor of New York and the maintenance of the requisite depth of water on the bar at Sandy Hook. Their serious attention has been called to the wash of earth from the streets and sewers of New York and Brooklyn into the slips bordering thereon, by which not only this harbor is being injuriously affected but the width of the channel inside of the bar at Sandy Hook is becoming seriously narrowed, and ultimately the depth of water on the bar will become greatly lessened. It is certainly time that the above class should be thoroughly awakened as to the importance of this subject; for it is pregnant with much evil if remedial measures are not at once applied. In this matter we should follow the example of the merchants of Boston, who, some time ago—awake to the great importance of the preservation of their harbor, and alarmed regarding the moderate depth of water in it—had an interview with the President of the United States, and solicited a commission to thoroughly examine it and duly report thereon with all possible dispatch.

Now, in view of the great interests that would be affected by any reduction of the depth of water on the bar at Sandy Hook, it has been deemed proper that some investigation should be made as to the extent of the deposit of *silt* into the rivers bordering npon New York, for the purpose of placing the results before the public, in order that its attention might be directed to the consideration of an element in our commercial position, secondary to none others, namely, the maintenance of a depth of water at the entrance of our harbor equal to the full requirements of our commerce , and with this object in contemplation, some time ago, Mr. Charles H. Haswell, marine engineer, of this city, proceeded to make such observations as he thought best calculated to furnish the essential elements in ths case, restricting himself to the subject of deposits in our harbor; he did not propose to consider the encroachment upon the boundaries thereof, by the extension of bulkheads and piers, and the injurious effects therefrom, for the two-fold fact that the necessity of restraining these encroachments had become so manifest to the public at that particular time that not only had the attention of our Legislature been called to the subject, but it was then receiving the consideration of a committee appointed for the purpose of investigating and reporting thereon ; and secondly, that the operation of such encroachment was so similar to that he proposed to investigate, viz: the reduction of the tidal volume of our harbor, that the deductions in one case would be equally applicable to the other. Accordingly, in a communication to the Board of Underwriters of New York, he thus lucidly and elaborately reports:—"As a prelude to my task, I assumed it to be indisputable that the bar at Sandy Hook was, in its general features, like the bars of all tidal rivers, and that it presented a series of irregular obstructions stretching across the entrance into the lower bay, with a varying and less depth of water upon it than in the channels within it. The causes admitted to produce this general result are numerous, but the following apply, in my opinion, peculiarly to the locality under consideration:—

"1st. The arrest of the current of the last of the ebb tide from the bay, where it meets the first of the sea flood when it surrenders the *detritus* it holds in suspension.

"2d. The difference of the flood aud ebb currents in their directions.

"3d. The action of ground swells from the sea, which, if heavy and flowing from the southward and eastward, deposit sand and gravel upon the bar, and at all times, when aided by the current of the flood, within the entrance thereof.

"4th. The occasional diminution of the back water of the bays and rivers leading thereto from drouth, and the reduction of the tidal volume by the presence of ice upon flats and the shores

"5th. A reduction of the tidal area by the constant accretion of *detritus* upon the shores.

"The first three positions are similar, in a great degree to those entertained by E. K. Calver, R. N.; the fifth one, by Sir Henry de la Beche.

"In the prosecution of my observations, I selected sixteen locations which I thought best suited to furnish me with the elements desired, and providing myself with an equal number of bottles of like capacity (30 cubic inches), I repeatedly filled one of them with water from each of these localities at half-tide (both ebb and flow), both in dry and wet weather and at different seasons of the year; such water was then filtered, and the residuum weighed and noted in grains, the average results of which, deduced from the operations of five years, furnish the following:—

Weight, in Grains, of Deposits in 30 Cubic Inches of Water taken from the undermentioned Localities:—

Sandy Hook	.109	Manhattanville	.578
Narrows	.265	Harlem Bridge	1.031
Robbins' Reef	.367	Hell Gate	1.093
Ellis' Island	.811	Thirtieth-street, E.	1.265
Battery	1.687	Twenty-third st., E.	2.968
Liberty-street	6.927	Grand-street	4.000
Canal-street	8.531	Wall-street	5.187
Thirtieth-street, W	.937	Broad-street	6.375
			42.131

"The mean weight of deposits is thus found to be 2.633 grains in every 30 cubic inches of water examined. (42.131÷16=2.633). Excluding therefrom all the city localities, except one upon each side of it, for the purpose of arriving at a mean of the average presence of *silt* in the water of our harbor above the Narrows, the following result is obtained:—

Narrows	.265	Manhattanville	.578
Robbins' Reef	.367	Harlem Bridge	1.031
Ellis' Island	.811	Grand-street	4.000
Battery	1.687	Thirtieth-st., W.	.937
			9.676

"From which it appears that the average annual flow of *silt* in the rivers bordering this city reaches the enormous rate of 1.209 grains in every 30 cubic inches of water (9.676÷8=1.209); and assuming the quantity of the former to be equal to 125 lbs. per cubic foot, a cubic inch of it will weigh .072 lb. The volume of this deposit compared with water, is, therefore, as 1 to 12,565

"Confining my observations to the city of New York alone, and taking the deposits shown in the water from the several localities around the city, the mean amount of *silt* in every 30 cubic inches of water is as follows:—

Battery	1.687	Grand-street	4.000
Liberty-street	6.937	Wall-street	5.187
Canal-street	8.531	Broad-street	6.375
Thirtieth-st., E.	1.265	Thirtieth-st., W.	.937
Twenty-third-st., E.	2.968		
			37.887

"The average of these deposits is 37.887÷9=4.209; and hence, by the elements before given, it appears that the volume of the deposit from the water in the slips of this city between Thirtieth-street (east and west) and the Battery, when compared with that of the water (at half tide), is as 1 to 3,610. Startling as these results appear, it must be borne in mind that they do not give a full exhibition of the facts of the case, for the observations made were necessarily confined to the presence of *silt*, and embraced only that portion which was retained in suspension by the flow of currents; whilst the deposit of *detritus* from the flow of gravel, sand, &c., could not be arrived at, unless by a different system of observation, and it is, consequently, not embraced in the above results."

[To be continued.]

APPLICATIONS FOR THE EXTENSION OF PATENTS.

Lantern to destroy Bee Moths.—Samuel C. Witt, of Hartleton, Pa., has applied for the extension of a patent granted to him on the 7th of October, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 10th of September next, and the petition will be heard at the Patent Office on the 24th of that month.

Buoyant Carriage.—Alexandrine Stanton, executrix of Henry Stanton, late of Kings county, N. Y., deceased, has applied for the extension of a patent granted to him on the 27th of February, 1847, for an improvement in the above-named class of inventions. The testimony will close on the 28th of January next, and the petition will be heard at the Patent Office on the 11th of February.

PLEURO-PNEUMONIA IN CATTLE.

As this "cattle disease" is still exciting a great deal of attention among all who are interested in agricultural objects, and as it is stated to have broken out in this city, and that two oxen died with it last week in the Central Park, every new fact thrown into the stock of useful knowledge respecting its nature and treatment is of inestimable value. We therefore condense the following, on the subject, from the *Irish Agricultural Review*, of the 22d of June; and its value will be more highly appreciated when we state that its author is G. S. Brown, Professor of Veterinary Therapeutics in the Royal Agricultural College at Cirencester, England:—

Taking into account the length of time during which the disease has existed, it seems curious that a perfect unanimity of opinion respecting its nature and treatment should not prevail. So far from this being the case, most opposite notions are entertained on both these points; and, of course, the advocates for each do not lack evidence in support of their own theory. That the lungs are, in some degree, suffering from inflammation is the general belief, as we gather from the positive statements. That common inflammation is frequently confounded with the epizootic disease we cannot doubt; and hence may arise the occasional success of measures which would be especially destructive in the actual presence of what they are meant to cure.

If in this article we shall advance ideas not at present current, we pray our readers not to be startled out of faith by their mere novelty; we claim only credit for having carefully looked into the subject, and drawn our own conclusions.

As anatomy must ever be the foundation of a correct system of medicine, a slight sketch of the organs mainly effected will not be out of place.

The organs of respiration, or the apparatus concerned in the process of breathing, are contained partly in the cavity of the chest formed by the ribs on each side, having the intermediate spaces filled with muscle. The whole interior of the cavity is lined by a fine transparent membrane, which also covers the various organs and parts contained. This membrane is called the "pleura." In the cavity are placed the "lungs" or "lights," the principal breathing organs, connected to the nostrils and mouth by a long tube composed of rings of cartilage, and termed the "wind-pipe." With the lungs we have mostly to concern ourselves. These organs, whose external appearance is familiar enough to everyone, are composed of several structures, to wit, the various minute branches of the wind-pipe, forming the "bronchial tubes," terminating in fine air cells, blood vessels in large numbers, with accompanying nerves, all bound together by a quantity of fine thread-like fiber, and covered with the before-mentioned "pleura." Between the two lungs are placed the heart and its large vessels proceeding to and from. As the disease we are about to describe is nearly confined to the lungs, this short description of their situation and structure is necessary to enable the reader to follow our remarks on the effects produced by the malady.

Our inquiry into the nature of the disease under discussion leads to the following conclusions, founded on observation of phenomena presented in the various aspects which the malady assumes. 1st, That pleuro-pneumonia is essentially and primarily a disease of the blood, consisting in a rheumatic condition of that fluid, evidenced by an excess of fibrin, with a tendency to its deposit. 2d, That owing to some obscure causes, probably atmospheric, the lungs receive an undue share of this diseased fluid, the viscid character of which prevents free circulation and promotes a sluggish condition, ultimately amounting to absolute rest. During this process the fibrin is deposited first at the lower part, and gradually over the whole organ, coating its membrane, compressing its air cells and tubes, and interfering with the respiratory function. A general derangement of the system is easily understood; when we start with a bad condition of blood, and under the combined influences of emaciation and loss of breathing surface, the animal dies. We repeat, the grand distinctions of pleuro-pneumonia are the absence of any inflammation or active determination of blood to the lungs, and the presence of a diseased fluid supplying slowly and certainly the material which will block up and obliterate the vessels and air cells. The symptoms from the first are suggestive of primary disturbance too dull, the muzzle is dry, or the milk is lessened, or rumination is irregular, or there is a fondness for remote corners of the field or yard—little things, we admit, but wonderfully significant when taken in connection with the prevalence of the disease in the neighborhood. All this time the breathing remains undisturbed.

After a while, the deposit advances sufficiently far to diminish the respiratory surface, and then, as a natural consequence, the animal is compelled to breath more quickly: and be it observed that the frequency of the respirations will be in proportion to the amount of obstruction. From the irritation and oppression the pulse becomes now excited, the digestive functions are impaired, the blood in the lungs is only partially purified, and general emaciation follows, until, at last, the animal is a living skeleton.

During the whole career of the affection, we find no sudden changes—everything is gradual, the breathing and pulse are gradually quickened, the body gradually wastes; in short, nothing like acute disease can be perceived, and one is unwittingly lead to wonder how it could have been confounded with inflammation for so long a time after its appearance.

Passing from these considerations to the question of liability, we discover that the subjects are very diverse. Animals in weak condition, milking cows, and fatting oxen, seem alike its victims; and, in one county or other, either of these classes is occasionally specially selected. The animal most secure is, without doubt, the one in the highest state of health. Working animals that have been well fed, and possess what is called hard condition, are the most exempt. On the other side, all those exposed to debilitating influences, whether referring to food in excess or defect, to disproportionate work or bad stable management, are in a condition favorable for the attack, should the specific cause reach their neighborhood.

An important question occurs as to the contagious nature of the malady. Much difference of opinion exists on this point; but, certainly, no exact evidence can be advanced to show that it can be transmitted from one person to another, in any way, not even by direct inoculation. Still, we would be understood as advocates for precaution; no good can result from allowing the contact of healthy and diseased subjects. So should the farmer act, as though every affection among his stock was infectious in its nature.

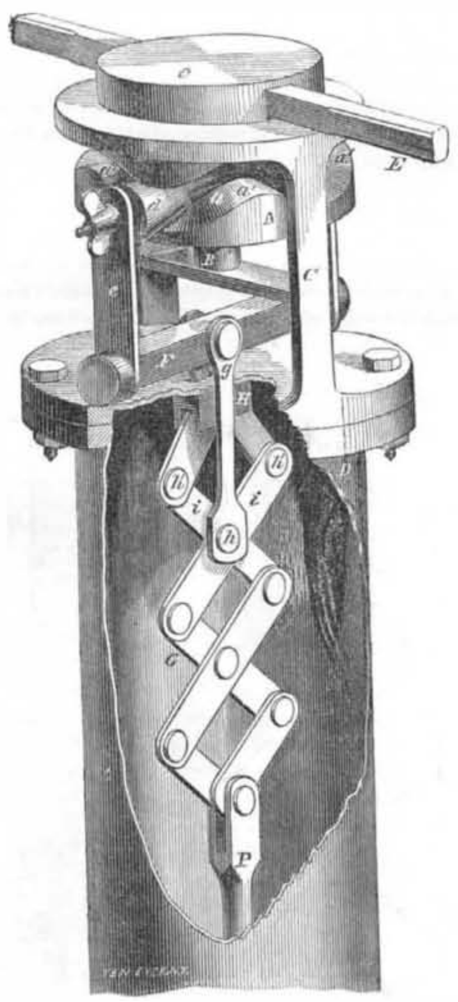
Treatment: On this point we must of necessity be concise. Confining ourselves to the consideration of the principles, and leaving the practice to the discrimination of the attendant, our conclusion as to the positive nature of the affection will decide our system. We have admitted the presence of a highly fibrinous blood, with a sluggish circulation through the lungs, as the principal evils. The indications obviously are, then, suggestive of measures calculated to dissolve and lessen the fibrin; and, to keep the blood in motion, any agents which, alone or in combination, will do this, recommend themselves. Ammonia in any of its active forms is among the best; it seems to have a particular power to keep the blood fluid, and combines the property of a stimulant. The use of this drug externally and internally we have found most successful; we do not suggest it as a universal cure, but we claim for it the importance belonging to it as an alkali and stimulant. Fancy may be allowed some play, and any plan which shall include the use of alkalines, stimulants and tonics, with counter-irritants externally, is, at least, founded on correct principles.

Prevention is proverbially to be sought before even cure; but, unhappily, we can only have recourse to generals in speaking of it as applied to this disease. At one time inoculation was thought to be as valuable as the vacine disease in its preventive influence. Among the Germans the belief even now obtains in its favor, but more extended experiments have demonstrated that pleuro-pneumonia cannot be transmitted by inoculation, nor any immunity obtained by the performance of the operation. As we have hinted, attention to the general health, the use of every measure calculated to promote good condition, will do much; beyond this it seems we possess no control over the attacks of the malady or the susceptibility of the system.

The *Atlas* steamship, belonging to Messrs. Burns & McIver, of Liverpool (England), has all her interior iron-work, even to her tanks, coated with zinc.

IMPROVED PUMP MOTION.

The most common motion that is applied to the pistons of upright cylindrical pumps is a vertical reciprocating one—up and down alternately. The engraving illustrates an entirely different motion applied as the first effort, although the piston has the usual up-and-down action. The invention consists in the arrangement of a horizontally rotating cam disk in combination with a rising and descending yoke, and with a series of lazy-tongs (expanding and contracting cross levers), in such a manner that, by rotating the disk, a rapid reciprocating motion is imparted to the piston.



A represents a disk provided with a cam groove, *a*, and it is attached to a vertical shaft, B, which has its bearing in a frame, C, that is firmly secured to the top of the pump barrel, D. The shaft is rotated by the levers, E, and they are inserted into proper sockets, as represented. The cam groove, *a*, forms the guide for friction rollers, *d*, which are secured to the upper ends of arms, *e*, and project from the yoke, F. The shape of the cam groove is such that, on rotating the disk, the yoke is made to rise and descend several times during each revolution of the shaft. The cam groove has four projections, *a′* forming a uniform wave line, causing the friction rollers, *b b*, to rise and descend. Any number of such elevations and depressions may be employed to give such a number of strokes as may be required during each revolution. The yoke, F, connects by rods, *g*, at the side, with the second pair of links, *i*, of the lazy-tongs, G, through a pivot, *h*. The ends of the first links of the lazy-tongs pass through a bracket, H, and the ends of the lower links are embraced in the fork of the piston rod, P, and held with a pin, as shown in the open section of the pump barrel. By moving the yoke, F, up and down by the horizontal rotation of the plate, c, of shaft, B, the whole series of lazy-tongs are extended and contracted alternately, and this moves the piston rod, P, up and down in the barrel, and also the piston which is attached to the lower end of it.

It is believed by the inventor that pumps can be operated in this manner with much greater ease than by the common up-and-down lifting motion that is usually applied.

A patent was granted for this invention on June 12, 1860, and further information may be obtained by addressing the inventor, Edward Wade, of Norwich, Conn.

NATURAL PRODUCTS AND MANUFACTURES OF VIRGINIA.

Messrs. Editors:—I ask a small space in your columns, as I am otherwise unable to answer the numerous inquiries of your readers in relation to the minerals of this State, since the publication of my note on "American Manganese" (page 338, Vol. II, Scientific American), and this letter, I propose, shall give such information as most of them seek.

I am as much surprised at the present manifestation of interest and inquiry in relation to our minerals and their development as I have been surprised that the most promising mineral, mining and manufacturing portion of this State or, in fact, this continent, has been so long neglected, and its great value and importance so little known. I will not pretend to give a geological description of Virginia. I will only say, in a few words, no State or no country in the world can be richer than this in the useful minerals, and particularly coal and iron. Even the great manufacturing State of Pennsylvania is behind us in natural resources. Your readers need no other proof of this than a reference to a map of this State or the country, with such geological knowledge as we must suppose most of your readers to possess. We see the great Appalachian chain of mountains rising from the lakes of the North and disappearing below the alluvial of the Gulf States. This great mineral range reaches its climax in the heart of Virginia, and her rivers, running from the summit of the Alleghanies, cut a geological section from the highest or latest formations down to the lowest and oldest. We may say all the strata of every geological formation lie opened like the leaves of a tablet, and the riches of the mineral kingdom lie temptingly exposed. Every mineral peculiar to this country must here exist. I cannot point out the many coal fields and mineral deposits; but I wish to call attention to one magnificent region where the mineral wealth of Virginia seems centered, and where all the lavish gifts of bountiful Nature are represented. See where the great Kanawha enters the Ohio; trace it up through those vast deposits of coal and salt. More fuel and oil and gas lie beneath the mountains that cast their vast shadows over its dark waters than would supply the world for hundreds of ages. But do not be satisfied with these small items; further up it cuts the mighty Alleghanies to their base, with all the lower ranges of accompanying mountains that rise like steps on either side. Here we have the coal, iron, limestone, lead, manganese and most of the minerals from the carbonaceous down to the lowest silurian. Above this, we enter the great limestone formation peculiar to the valley of Virginia, and which extends, with the same characteristics, from Tennessee to New York. But here it is higher than at any other point, and is surrounded by resources of natural wealth not found in such close proximity at any other spot known.

Where the Virginia and Tennessee Railroad crosses this river (here known as the New River) seem centered all the availabilities that the miner and manufacturer could desire. The river descends from the mountains of North Carolina and Virginia through inexhaustible deposits of iron, copper and lead. The iron ores are almost as plentiful and profuse as the common rocks, and are not now more noticed or valued. The copper has recently attracted much attention and has been extensively developed in quantity and quality beyond doubt or speculation. Lead has been mined in the neighboring county of Wythe for one hundred years, and still the "Old Wythe Lead Mines" are actively worked with a profit of over fifty per cent to the operators!

Limestone is the most plentiful rock and forms the bed of the river for some sixty miles, and the bed or grade of the railroad, crossing the river, between two and three hundred miles; altogether forming one of the richest agricultural regions in the world, I believe, without exception. A coal field of considerable extent crosses the river some ten miles below "Central," or the point of reference where the railroad crosses the river. It has been sufficiently developed to demonstrate its great practical value, and contains anthracite, semi-anthracite and bituminous coal. It is now used extensively on the line of the railroad and found to be pure and durable in character.

In the center of a rich agricultural district we find the richest mineral deposits—coal, iron ores and limestone