Health of Cities.

Longevity and premature decay are doubtless influenced by the food and general habits of the people, and by temperature and other local atmospheric conditions, although all these may be largely modified and brought under control by attention to sanitary laws and appliances. Artificial atmospheres are, in fact, created in large cities according to the character of the buildings, the air space allotted in them to each inmate, and the mode of ventilation and warming, as well as by the width of the streets, the sewerage, and other sanitary arrangements. Moreover, the hereditary constitutions of the citizens become in after generations affected by the condition of the cities in which they and their forefathers have lived.

The facts and figures before us point to many of the causes for so great a variation in the death rate as has been shown to exist in different cities. A high death rate will in most cases be found to be the companion of defective house accommodation, ventilation, water supply, sewerage, or scavenging. Thus, for instance, St. Petersburg, with a population of nearly a million, and the high death rate of 35·2 per 1,000, is without sewerage, and its water supply is taken from the river Neva, more or less contaminated by percolation from the subsoil. Cairo, with a death rate of 37 per 1,000, is supplied with water from the Nile, having no sewers, and the sewerage filtering through the subsoil into the Nile above the water intake. Vienna, with a death rate of 29·2 per 1,000, has an average of 60 people in each house, or twice as many as in Paris, while the ratable value of the houses in Vienna is only one sixth more than those in Paris. Pekin, with a death rate of 50 per 1,000, is without proper sewerage, water supply, street cleansing, or other proper sanitary arrangements.

Snake Bites and Hydrophobia.

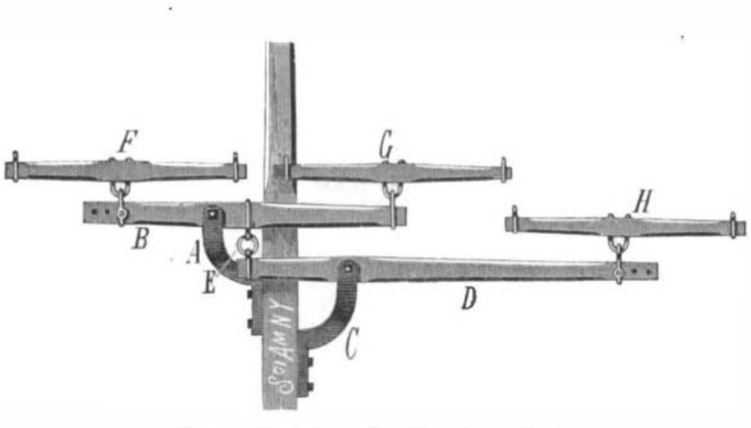
In a recent lecture in New York, Dr. Woodbridge said: "In case of a bite of a venomous serpent, the old historic method of sucking the wound with the lips is one of the first things to be resorted to. If the poison is in the circulation, the use of strong brandy or whisky, in quantities powerful enough to produce intoxication, must be resorted to. The bite of a mad dog should be cauterized at once, by a pencil of lunar caustic or by application of irons heated white. The peculiarity of hydrophobic poison is that it remains in the spot where the bite occurs for several days or weeks, and not until this poison ferments does it become dangerous. Dr. Hewett, a surgeon of London, allowed himself to be bitten no less than eighty times by rabid dogs, each time successfully cauterizing the wound. He fell a victim to his temerity, however, for one day he was found dead with a pistol shot from his own hand. A statement was left in his papers that he had neglected the cauterization too long, and feeling the first symptoms of hydrophobia, he preferred to die without the long agony."

IMPROVED DRAUGHT EQUALIZER.

The engraving represents a draught equalizer for three horses, so constructed that the draught is direct, and each horse exerts a like draught. The arms, A C, are fastened to opposite sides of the tongue, and the pivots in their ends are at equal distances from the tongue. To the free end of the arm, A, is pivoted a double tree, B, to one end of which a single tree, G, is held permanently, and to the opposite end a single tree, F, is held adjustably by a pin which is passed through a clip on the single tree and through one of a series of holes in the end of the double tree. The double tree is pivoted about two-fifths of its length from the outer end. To the free end of the arm, C, is pivoted a double tree, D, on the outer end of which a single tree, H, is held by a pin passing through a clip and one of a row of holes on the end of the tree, D. The inner end of this double tree is connected by loops, E, with the middle of the double tree, B. The double tree, D, is pivoted about one-third of its length from its inner end. The middle horse may have a leverage of two-thirds over the horse on the other side of the tongue, while the horse attached to the tree, H, will have a compound leverage over the middle horse.

By means of the holes in the ends of the two double trees the leverage can be varied to suit conditions. The direct draught of the tongue is in the center of the two draught points. To turn, the horse at F eases up while the horse at H pulls, and the turning in this direction is accomplished without the aid of the neck yoke. The device is simple in construction, and can be quickly and easily adjusted to varying conditions.

This invention has been patented by Mr. John Bowers, of Brookville, Illinois.



BOWERS' DRAUGHT EQUALIZER

Paint for Iron.

The *Neueste Erfinderung* describes an anti-corrosion paint for iron. It states that if 10 per cent of burnt magnesia (or even baryta or strontia) is mixed cold with ordinary linseed-oil paint, and then enough mineral oil to envelop the alkaline earth, the free acid of the paint will be neutralized, while the iron will be protected by the permanent alkaline action of the paint. Iron to be buried in damp earth may be painted with a mixture of 100 parts of resin (colophony), 25 parts of gutta-percha, and 50 parts of paraffin, to which 20 parts of magnesia and some mineral oil have been added.

IMPROVED TRUSS.

The principal feature of the improved truss, hereby illustrated, is the insertion of a "universal joint" into the back pad. This gives an *even, self-adjusting* pressure upon the back of the wearer, thus enabling him to wear the truss for long periods of time without discomfort.

While applicable to all kinds of trusses, it is especially valuable in connection with a direct acting, one side, single rupture truss, as distinguished from a truss which reaches

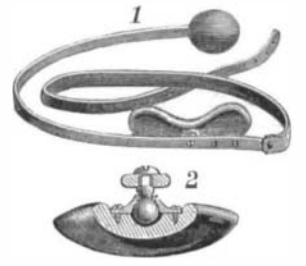


Fig. 1.—BACK PAD.

across and around the body. Such one side, single trusses have heretofore never had any back pad, and the pressure and pain produced upon the muscles of the hips have often obliged the patient to cease wearing his truss when he, perhaps, needed it most. With this device all pressure upon the hips is avoided.

No. 1 shows the back pad attached to the ordinary truss, and No. 2 the universal joint inserted in the back pad.

An improvement in front pads is shown in the accompanying engraving, Fig. 2. This pad gives an inward and upward pressure, similar to that produced by holding one's fingers over the rupture. It also furnishes a gradual resistance to all motions of the abdomen; following the abdomen inward at a mild pressure, when it is drawn in, and

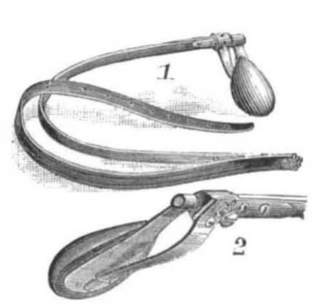


Fig. 2.—FRONT PAD.

giving a very strong resistance when the abdomen, through any variation in the position of the body, is pressed outward. This pad can, therefore, be depended upon to hold a rupture securely under almost any circumstances, and with comfort.

The pad is retained in the same place on the abdomen, and throws any change of bearing from any possible movement of the body upon the variable motions of the spring.

This spring is attached to the end of the hoop over a slanting plate, which gives it a forward direction, and is held in place and guided by a guard on the back of the pad. In the upper end of the pad is a ring fitting loosely on to the end of the hoop, thus allowing the spring to throw the pad easily forward and backward, according to the pressure applied.

No. 1 is a rear view and No. 2 a front view of the device.

These improvements are covered by two patents, and are, therefore, separately applicable to different kinds of trusses. The inventors are Messrs. Darling & Schulz, care of H. A. Schulz, corner De Kalb and Central Avenues, Brooklyn, N. Y.

Catching the "Ai."

The peculiar manner in which this celebrated Japanese fish, which belongs to the Salmonidæ (the Salmo altivelis of authors), is caught is thus described by Mr. Pierre Louis Jouy: After whipping the stream with flies, as for trout, and securing a fish, a fine gut line is passed through the nostrils and fastened to a line held in the hand; trailing behind the fish thus fastened, which is simply a decoy, are several bright hooks which flash in the sunlight and attract other fish. The decoy is now gently led up stream, and the fish, in darting after it, get snagged on the hooks. Horse hoof parings, used as lures, are said to be successful with "ai"; they are also caught with weirs.

Objections to Light Draught for Vessels.

Having stated a few of the apparent advantages of light draught, it is but reasonable to give consideration to the objections as well which may be urged against such a mode of construction.

One is, that such a craft will not hold her wind; she takes such slight hold of the water that when close hauled she will slide off to leeward and lose more than she makes, and in fact with a wind any way but dead aft she will go nobody knows where. For a sailing vessel this would be a fatal difficulty, and even for a steamer one not to be disregarded. But it is surely one easily surmounted. A movable keel is entirely within power of management. Our vessel of 160 feet, drawing five feet loaded with 2,500 tons, can readily add five feet to that draught when in free water. That keel may be, for ease of action, in three or more divisions, each corresponding to our present center board.

The small height of free board, and the consequent liability to be swept by the seas in rough weather were incidentally mentioned in our former article. We have no idea that in working against such a sea as we must expect to encounter at times, especially if we are driving a steamer with speed, dead to windward, we can carry dry decks. We cannot do it with our present models, high out of the water as they are built. But what we contend is this: that the greatly increased buoyancy which we have secured will more than compensate us for the diminution of height. That which causes a sea to break on board is the resistance which it encounters. An air filled globe, like a balloon, could never ship a sea; it would rise instantly over it. That, in its degree, is our full belief concerning the model we have ventured to propose.

Rushing down from a sea, and striking the next one ahead of her, she will from her breadth and lightness begin to rise with the instant, instead of cutting in and down, deeper and deeper, as is now the case. Her bow is buried, as we plan that it should be, but as it buoys itself quickly it shakes off the load and goes over the wave which it has struck, while the real deck, commencing fifty feet aft, even with its slight elevation, sees less salt water than at present.

But the greatest objection which can be urged against the form which is to give us such light draught is the extent of surface which we present to the water for friction, and its consequent resistance. It cannot be denied that the proportion of "skin area" to amount of tonnage capacity is largely increased. It is safe to say that the increase is at least sixty per cent as compared with vessels of a present average model. And if by means of this we have lost speed in the same degree, our plan can expect to find but little favor. We must "make time" at whatever cost. But it is by no means certain that we are going to lose any time. Two important points demand our consideration.

The degree of friction encountered by one of our present deep draught ships is to be measured in part by the amount of her "skin area," but only in part. For a chief factor is the amount of pressure under which that surface acts. The water which she displaces in her progress offers resistance according to the depth at which she acts upon it. That which she is crowding away, fifteen to twenty-five feet down, cannot yield as that does at her water line. Here is where we have in our new form a very great advantage; we are floating, so to speak, on the very surface of the water. We go over the seas, and not through them. The problem involves so many complex factors and relations that no exact results can be worked out except by actual trial. But it is certainly reasonable to consider it.

The second point is this: It is now very well settled as a law of hydrodynamics that a large part of the resistance to a ship's progress is due to the production of waves, from the difference in pressure at the bow and stern as compared with the sides. At a high rate of speed this is reckoned at 30 to 40 per cent of the total amount. Now, as this element resistance becomes necessarily much less in our "skimming dish," we have made a gain which may fairly pass to our credit as against the increase of friction. And it is our own belief that not only equal, but actually superior, speed can be obtained by the surface floating craft. This, however, can be determined only by trials faithfully and patiently made. We hope to see this done. A.

Bridge Receipts for Two Months.

The gross receipts of the Brooklyn Bridge were $76,420 for December and January. Upon the last Wednesday of January, a day of dense fog, the receipts were as follows:

Cars, $1,476; roadways, $286; promenade, $147; total, $1,909. On Thursday they were: Total, $1,697; cars, $1,367; roadways, $218; promenade, $112. On Friday they were: Total, $1,624; cars, $1,294; roadways, $228; promenade, $102. The receipts for the same three days of the previous week were as follows: Wednesday. $1,432; Thursday, $1,207; Friday, $1,385—making a total for the three days of $4,024. The total receipts for the three busy days of last week were $5,230, an increase of $1,206 over the same days of the previous week.

The receipts for December and January were as follows: December—cars, $30,022; roadways, $4,545; promenade, $2,506; total, $37,073. January—cars, $33,192; roadways, $4,246; promenade, $1,909. The increase for cars in January over December was $3,170; decrease for roadways, $299; for promenade, $597; total increase for January, $2,274.