Dust and Disease.

Mr. Horace Waller, F.R.G.S., writes to *Nature* as follows:

The extremely important discoveries brought to light by Professor Tyndall will call forth great exertions on the part of thinking persons to carry his plans into operation, and I have no doubt, when due precautions are taken to sift infected air as it passes into the lungs of those whose duties take them where contagion abounds, we shall have the happiest results.

So great will be the tide of interest in this direction, that I am anxious to cast into it a theory I have long held, in hopes that it may drift in some one's way to be turned to use; I commend it to the traveling portion of your readers especially.

While traveling in some very unhealthy parts of Africa, more particularly among the marshes bordering on the Shiré and Zambesi rivers, it was often necessary to camp at night just where the canoe happened to be moored when daylight failed us. Reeds, rushes, and mud were never many feet off, and the accumulation of scum, decaying vegetation, etc., lodged in the sedge, made the situation as delightful to mosquitoes as it was trying to the constitution of the European.

Still, with all this, as long as it was possible to rig up a mosquito curtain, I am convinced that really less danger existed in thus sleeping in the midst of miasma than in other places where less of it was supposed to be present, but where the traveler felt no necessity to stretch this thin covering over him.

I have in this way done canoe journeys of twenty to twenty-five days in length without a day's illness from fever, and I could instance similar experiences on the part of others.

Now the reason I assign is this: the mosquito curtain is to miasma, what the Professor's cotton-wood respirator is to the poison of scarlatina, we will say.

The curtain, after being used once or twice, saturated with dew, folded up while damp and crammed into the limited space generally provided for it in the safest place, becomes just so much affected by this treatment that each thread loses its smooth glaze, and is soon fluffy and fuzzy for want of a better expression.

The little honeycomb holes in the fine "net" are now a series of small six-sided sieves, each covered over with the fine filaments of cotton which have got disturbed and frayed up. Dew, falling upon a surface of this kind, quickly turns it into an exquisitely fine strainer—in fact almost a film of water—through which all the air has to pass which is breathed by the person reposing beneath it.

Now, it is an old notion that the miasma which produces the bilious remittent fever (the pest of this part of Africa in question) and various other diseases of the tropics, cannot pass across water.

I believe that acting upon this theory, the Admiralty provides that boats' crews shall sleep in their boats anchored off shore in malarious rivers. However, be this as it may, I have a strong belief that the "wet sieve" *does* stop the poison in some way or other, and that it is a great safeguard to the voyager in these places.

The whole subject of miasm is in the dark; it is lawless as a cause of disease; it baffles the most astute, but the day may be coming when such hints as those of Prof. Tyndall's shall fit into an organized attack upon it, and we shall be able to overcome it in a measure.

A curtain, properly made, and taken care of with that instinct which alone is begotten by the buzz of mosquitoes, is perhaps the most valuable possession a man can have against deadly attacks in the night while men are asleep; were its merits studied more, we should not find men stuffing their companions so perpetually with quinine, to the keeping up an unhealthy tone by this abuse alone, and to the confusion of this most invaluable medicine when it is really called in to do its duty upon the fever-stricken patient.

The Bulging of Walls---Cause and Prevention.

The ugly protruding curvature commonly called a bulge, to which external and front walls seem especially subject, may frequently be traced to original defects of construction. Bulges very often occur at about the level of a floor, and where there is a floor, the brick work of outer walls is commonly weakest. To avoid running the floor-timbers into party walls, they are generally made to rest on the front and back, and the party-wall will often appear in better condition than the front. Immediately below the level of the intended floor, a timber scantling about 4½ in. by 3 in. is laid along the wall flush with its inner face, to receive the ends of the joists. The joists, let it be assumed, are about ten inches deep, notched to nine inches at the ends, so as to rise the hight of three courses of brick work. Here, then, bond-timber and joists together make a hight of 12 in., or four courses of brick work. The joists will have a bearing of 6 in. on the wall, and the wall may be supposed to be a brick and a half thick. Now wherever the joists occur, there is a complete interruption of the bond on the inner side of the work, while externally it appears unbroken, the outer face, in fact, being carried up half a brick in thickness, and looking as though the whole wall were perfectly solid and uniform; but the backing between the timbers too often consists of bats and small pieces put together in a mysterious though incongruous way. So long as the timber remains sound and of its full dimensions, all is well, but this is seldom very long. The manner of converting balk timber into scantlings precludes the permanent retention of its original form. When felled and squared in its native forests, it is thrown into the first lake or river, formed into rafts, and navigated to some port of shipment, where it is formed into cargoes for conveyance across the ocean. The sea voyage over, it may be assumed to the port of London, the timber is again immersed in the water, which usually constitutes its only place of storage till wanted for actual application to some building. As to deals, an architect may specify dryness as a necessary quality, but he must not expect it in timber. He may say that it shall be sound and well seasoned, but water seasoning is all that takes place previous to conversion, and this fact is noteworthy, because as the subsequent shrinkage may be estimated at three quarters of an inch in the foot, it becomes obvious that so far as the bond timber and joists are to be regarded as forming the inner material of the wall, a subsidence equal to the shrinkage must take place. But the wall does not depend on the woodwork alone, and the irregular filling up between the joists will receive the weight, and so the evil will be deferred. For the time there may be no other visible result than the dropping of the floor from the skirting, and when the latter is of wood, the simultaneous rising of the skirting from the floor. It is when the wooden bond, having shrunk to the minimum dimension of perfect dryness, enters upon its course of decay that the worst consequences of inserting timber constructionally in walls are developed. The inner face then sinks, and the statical conditions are disturbed, and bulging is inevitable.

It was a custom of by-gone days to insert timber very freely in walls. Foundations were fortified, as it was thought by the introduction of a "chain-bond" of large scantling, and many a goodly edifice has suffered from the practice. Great, therefore, have been the improvements adopted in the modern construction of walls. A solid basis is formed by the use of concrete; wrought iron hooping has advantageously displaced wooden bond, and the joists are kept as much as possible out of the walls, their ends being supported by brick or iron corbels. Thus all rapidly perishable matters are excluded, and a lasting character imparted to work so executed. Skirtings also are made of stucco instead of wood, and shrinkage in that quarter got rid of. Thus experience and science are gradually removing one of the old defects and disfigurements of buildings—the bulging of walls.—*Building News.*

DAVIS' PATENT FENCE.—We call attention to the advertisement published in another column of P. Davis' patent wire and picket fence, an illustrated description of which appeared in a recent number of this journal. We are informed that since that publication the demand for this excellent fence has so exceeded Mr. Davis' facilities, that he finds it necessary to dispose of more territory than was at first anticipated.

JOHN LA MOUNTAIN, the celebrated aeronaut, is dead.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1·00 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

N. K., of Ohio.—You can bleach broom corn brush as follows: Construct at some distance from your other buildings a small building of boards and batten the joints. Hang your brush on suitable frames within this building and make your door to shut pretty tight. At one end of the building and at the top construct a shelf with an outside door so that the shelf may be reached from the outside with a ladder. When the brush is placed in the building, place on the shelf in an open earthen pan, a mixture of four parts by weight of hydrochloric (muriatic) acid and one part black oxide of manganese with two parts of water. Set the vessel—which should be three or four times as large as will contain the mixture, and also broad and shallow—upon bricks, so that you can put under it a bit of candle capable of burning about five minutes before it goes out, the heat of which will start the reaction, then close the door leading to the shelf and leave the whole for twenty-four hours. The bleaching agent developed here is chlorine, and as it is poisonous when inhaled, the building should be ventilated before anyone enters it by opening the upper and lower doors, and removing the vessel from the shelf. The quantity of the mixture will depend on the size of the building, and this you must learn by experience. Too much bleaching will rot the brush.

T. K., of La.—A cistern wall laid up with a putty made of ground white lead with as much red lead as will make it of the proper consistence will probably remain tight under the circumstances you mention, if bricks or square stones are employed. It is only necessary to use it for an inch or two next the water; the rest of the joints may be filled with good water cement. If the water is used for drinking, we are informed that this cement may be used as above, and that no contamination of the water will occur if after the putty is perfectly dry the inside of the cistern be plastered.

C. G. B., of Pa.—If you will lay a cellar wall with the cement recommended in answer to T. K., of La., in this column, we think you will be able to keep it tolerably dry. You can ceil over with boards for an out-door cellar, leaving a foot or so of space to be filled in with dry moss, or a couple of feet filled in with shavings pressed in gently but not packed hard. If kept dry by a suitable roof this will keep out frost. Carry up the walls sufficiently high to prevent surface water from running in.

F. G. G., of Conn.—An excellent cement for broken glass and porcelain is shellac melted and run into small sticks. The broken edges must be warmed so that they will melt the cement, and the latter is then thinly spread over them. This cement resists moisture, but of course remelts when sufficient heat is applied. A cement that will resist heat but does not withstand moisture, is made of white of egg mixed with finely-powdered quicklime.

F. W. E., of N. Y.—We know of no roofing material that is without a fault of some kind, and it is too much to expect perfection in any human device. We think a flat roof can hardly be made to remain perfectly tight fifty years by any material now known. With sufficient inclination of roof we prefer slate to any other kind of roofing material.

D. F., of Mass.—The tensile strength of aluminum bronze is 73,000 pounds per square inch of section; that of steel in bars is 100,000 to 130,000. These figures are from Rankine's tables. Aluminum bronze is more ductile than steel, but its modulus of elasticity has, we believe, not yet been determined.

W. M. M.—You can use a thin wash of glue or isinglass before painting, into which small articles may be dipped and afterwards allowed to drain; but for articles to be exposed to wet, no sizing, but good linseed oil with red lead, messicot or litharge, will stand long without peeling off.

J. K., of Pa.—An inch of water will make 1,696 cubic inches of steam. Two volumes of hydrogen combine with one of oxygen to form water.

A. W. A., of N. Y.—With the best constructed hydraulic ram, and a fall of four feet, about two and four tenths per cent of the falling water can be elevated one hundred feet.

L. B., of Wis.—It would be impossible to give you a good idea of the shapes of different turning tools without engravings. Watson's "Manual of the Hand-Lathe" gives all necessary information. It is published by Henry Carey Baird, 406 Walnut street, Philadelphia, Pa.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.