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(Illustrated articles are marked with an asterisk.)

WANTED A SUBSTITUTE FOR EARTH AND PLASTER WALLS.

In the matter of external construction, the architecture of the civilized and semi-civilized races shows a very marked contrast to the rude habitations of savages; but so far as inside walls are concerned we are but little removed from them. We daub the insides of our dwellings with what if not exactly mud is but little removed from it. In this respect our civilization is but little above that of the beaver, the mason bee, or the mud wasp. It seems strange that in this age of improvement, the public is content with the rude plastering, the earliest date of which would be about as hard to fix as the date at which building began.

Mortar is ill adapted to the purpose in several respects. First, it is uncomely, unless covered with hard finish or paper, or frescoed in a much more artistic manner than most modern fresco painters seem capable of. Second, it is friable and inelastic. A slight inequality in the settling of buildings fills it with unsightly cracks, the repair of which fills a dwelling with dirt, ruining furniture and irritating temper. Third, a certain temperature must be maintained after it is applied until it is dry, to obtain a successful result. Fourth, it is liable to fall from the ceiling upon the heads of people quietly and unsuspiciously sitting beneath it, from the effects of jar or an undetected leak in the roof. Fifth, it is a porous and absorbent material, and forms, unless covered with hard finish, painted, or otherwise covered, a reservoir for the accumulation of noisome odors and pestilential effluvia, etc.

Standing opposite these objections it has the advantages of cheapness and easy application, which do not in our opinion balance the account.

It would seem that with all the resources now at command something much better than mortar may be found out of which to construct inside walls; something not so expensive as wooden wainscoting and ceiling, while at the same time it might be susceptible of a high degree of adornment, and free from the objections we have enumerated.

We believe an excellent, warm, and durable wall might be made of straw board, sized with glue, or some other permanent stiffening, and painted on the inside. This material has considerable strength and elasticity. It is a bad conductor of heat, and would not condense moisture from the air in cold weather, as is frequently the case with plastered walls, in churches and assembly rooms, when an audience assembles in them.

Nothing can be more unsightly than the streaks formed by condensed moisture on a frescoed wall, unless perhaps it may be the streaks of color sometimes seen on the cheeks of ladies in overheated assembly rooms.

It is even possible that a preparation of straw pulp could be made that might be applied in a plastic form; a sort of straw *papier mache*, capable of being molded into forms of beauty in cornices, center pieces, etc. Such a wall would seem to be inexpensive and easily put on, it would not be attended, in repairs, by the disagreeable and destructive lime dust. If varnished over the paint, it could be easily kept clean by washing, and any colors desirable might be used in its decoration.

There are other materials which will suggest themselves to inventors as being likely to prove available for the purpose, and there can scarcely be a question that the public would eagerly embrace any improvement that would secure immunity from the objectionable features of plastered walls. But perhaps the material which will soonest be thought of in this connection is sheet metal. We are informed that ceilings of corrugated metal have been manufactured, but we do not know the parties who make them, nor have we learned the success which has attended their use. It must be remembered however, that metallic bodies conduct and radiate heat with greater facility than other substances, and are therefore perhaps open to some objections on the score of economy in cold climates where a saving in fuel is a desirable attainment.

To find a substitute for mortar, every way answering the requirements of the case, will undoubtedly necessitate some experiment, but we believe the value of such an improvement would warrant the devotion of considerable effort toward its attainment.

WANTED---LIGHT IN DARK PLACES.

While the means of creating artificial light have received much attention, and have been greatly extended within a few years, we find city corporations still clinging to common illuminating gas for lighting streets, railroad companies using kerosene for lighting stations and tunnels, and the United States Government holding on to the lard oil lamps for lighthouses. We have seen only one indication that anything better than gas is sought by city governments in this country for street lighting. This indication is found in the annual message of Mayor Hall to the Common Council of New York, which contains a suggestion that the magnesium, or, more properly, magnesia light—for this must not be confounded with the light produced by the combustion of the metal magnesium—might prove cheaper and better than the gas now used. The light in question is produced by the combustion of two small jets of gas, one of ordinary illuminating gas and the other of oxygen, in contact with a pencil of magnesia. It is precisely similar in principle to the well-known lime light; the substitution of magnesia for lime on account of its superior durability, and common illuminating gas for pure hydrogen on account of its cheapness, being all the modifications made, if we except the improved burners intended for general use. The process of Du Motay has so cheapened the cost of obtaining oxygen that the light thus obtained is rendered cheap enough for general use.

The want of diffusiveness complained of in the lights of this kind, placed at the corners of Trafalgar Square, in London, does not appear to us an essential defect of this light, and we are of the opinion that proper adjustment would entirely obviate any such objection.

We are assured by Dr. Doremus that the city streets could be illuminated far more cheaply and efficiently by the magnesia light than is possible by the old method.

It is also demonstrable that the safety of life and property is enhanced by thoroughly lighted streets, while the comfort of the populace is greatly increased.

But while it needs no argument to show the superiority of the magnesia light over the ordinary gas, we think a suggestion in regard to the placing of lights, of whatever character they may be, is worthy of consideration.

In approaching one of the ordinary gas lamps the eyes are so dazzled by the direct rays from the burner, slightly elevated above the heads of foot passengers, that a person, although his face may be perfectly recognized by another coming from the light toward him, cannot recognize distinctly any one a few feet in advance.

A remedy for this occurred to us one evening during the past winter, when upon the occasion of a *fete*, held in the Academy of Music, on Fourteenth street, in this city, the street for several blocks was illuminated with the magnesia light. The light being placed at quite an elevation, there was considerable diffusion of the light through the atmosphere approximating the effect of daylight. The faces of people coming from the light were as readily recognizable, as—when we had passed it—were those of people approaching it. The light, although very dazzling to look at from a short distance, was above the line of ordinary vision, except at a considerable distance, which so tempered it that its dazzling effects were not felt. Our observations at the time convinced us that the elevation of street lights would not only add to their general illuminating power but would render their effect much more agreeable.

The adaptation of the magnesium light to the illumination of dark tunnels on railways, seems not only obvious, but, it appears to us, demands the attention of railroad managers, from its economy, efficiency, and the increased safety which would be secured by its adoption.

For example, the Bergen Tunnel, on the Erie Railroad, a short distance from the ferry in Jersey City, has trains passing and repassing nearly every half hour of the day. It is three quarters of a mile in length. It is the custom to light the lamps in the cars when a train is about to enter this tunnel and extinguish them after the tunnel has been passed. The rushing into this darkness from broad daylight, produces a very uncomfortable sensation. This annoyance to passengers might be obviated, and the trouble of lighting lamps be done away with, by a suitable disposal of a few magnesia lights, which would light up the entire tunnel. We are certain that the adoption of this suggestion would be hailed with satisfaction by the crowds of people who daily pass through the Bergen Tunnel.

What reasonable excuse can be given by the Government for neglecting the advantages of this light for lighthouses along the coast, we cannot conjecture. In power it is as much superior to the lard oil lamps as they are superior to total darkness. When it is reflected that the loss of a single loaded vessel would supply the lighthouses along the entire coast with the new light for a long time, it is hard to conceive why our Government should not at once gladly avail itself of a means whereby immensely greater efficiency could be at once secured.

Many of our city readers will remember the humorous and sarcastic manner in which Prof. Doremus spoke of some of the officials who have this matter in charge, at his lecture on the Photometer, before the American Institute last winter, and the hearty laugh which burst from the audience on that occasion, when after the hall had been flooded with the magnesia light, he made the simple announcement that the government officials above alluded to, thought on the whole, lard oil was the best thing for the lighthouses. We heartily wish Professor Henry, of the Smithsonian Institute, whose intensely old-fogy letter upon the subject was read by Dr. Doremus, could have been present on that occasion. He would have found the lard-oil party decidedly in the minority at the moment.

But we have said enough for our purpose at this time. The whole matter may be summed up by the plain assertion that the public want, and will have, better light than is at present provided by tardy officials.

SPONTANEOUS GENERATION.

Discussion upon this topic seems to have been revived in some quarters. Most of our readers will understand what is meant by spontaneous generation, but lest there should be any misapprehension in the minds of any we will state what we understand by the term.

It certainly does not mean the springing into existence of living beings without any cause or causes for such an event; but, as we understand it, it signifies the production of a living thing from the elements which enter into the composition of its tissues, without the previous existence of parents and the formation of a germ through the action of vital energy, which, in general, is the commencement of reproduction.

It is not to be denied that the tendency of modern science is to the belief that spontaneous generation is possible, though if so, rare, and occurring only in the lower forms of life, under circumstances very difficult to separate from those which tend to obscure, and defeat demonstration. Notwithstanding all attempts at positive demonstration have hitherto failed, there remain some stubborn facts very difficult to reconcile with the belief that spontaneous generation can never occur.

Our readers will recollect reading of the appearance of certain insects of the *acarus* tribe in a highly caustic solution upon which the celebrated English electrician, Andrew Crosse, was experimenting in 1836. A considerable sensation was caused by the discovery, and a sharp discussion followed as to whether the appearance of the *acari* was an example of spontaneous generation or otherwise. The wife of Mr. Crosse has testified since his death that he never so regarded the occurrence, although surprised and nonplussed by it. Professor Faraday and Mr. Weeks confirmed the experiment of Mr. Crosse, but it has since been repeated by Professor Schulze, of Germany, without the appearance of the *acari* or anything resembling a living germ.

Others, among whom the most prominent is perhaps M. Pouchet, have endeavored to demonstrate the possibility of spontaneous generation by actual experiment, but though they have performed their experiments with much care and have succeeded in finding in their solutions many new infusoria, they have not generally convinced the scientific world of the satisfactory nature of their experiments.

The views of Professor Fick are that every organ of living beings is formed of congeries of cells, that each of these cells has a separate and distinct existence, and that, could proper conditions be attained, these cells would preserve their individuality of existence, and continue to live though the body of which they form a part were dead.

Professor Clarke, in his investigations upon the origin of *vibrios* from decaying muscle, says that he was impressed with the thought "that the *vibrios* were neither more nor less than the fibrillæ of the muscle set free from the fibers," a suspicion which he says was eventually verified by actually witnessing the fibrillæ disentangling themselves. He concludes, however, that the *vibrios* are nothing but dead muscle, notwithstanding their active motions.

A writer in *Scientific Opinion* now takes the ground that these are or may be living organisms; and accounts for the organisms found in the infusions of M. Pouchet and others, by the assumption, that they are simply the re-arrangements, and re-combinations, of the liberated cells of the substances infused; basing his views on those of Professor Fick above alluded to.

Now it is certain that every germ is a living entity, and that it is composed of matters found in the inorganic world. These matters have been combined by some means, and the compounds blended in the tissues are of a chemical character, yet possess a certain undefined something which merely chemical compounds, so far as present knowledge extends, do not possess, but which has received the name of vital force.

This force is synthetic in its nature; it builds up tissue, or it enables tissue to build up other tissue like itself. Hence we have growth, and when the vital energy decreases, or ceases, we have decay of parts, or general death and decay. While it is not proved that vital energy is not identical with chemical affinity, there are many reasons for believing it to be a distinct property belonging only to living things, and capable of being imparted only by living things to combinations of dead matter which thus becomes quickened. There are, at present, too few data for determining the question at issue, and while the subject is one of intense interest, and presents a most captivating field for study and speculation, it is one upon which it is absurd to hazard an opinion at present.