COTTAGES FOR LABORING CLASSES.

We herewith reproduce from *Sloan's Architectural Review and Builders' Journal,* published by Claxton, Remsen & Haffelfinger, 819 and 821 Market St. Phila., elevations, plans, and descriptions of designs of cottages for workingmen.

It is the first duty of society, for its own sake, to entertain every practical proposition for the amelioration of that great section of the community whose necessity it is to live in large cities. It will be found always, that the want of an orderly and comfortable house is among the chief evils of the poor.

On the outskirts of our cities are always to be found cheap lands suitable for cottages, such as we would desire to see our suburbs embellished with. Those lands might be secured, in the whole tract, by coöperative joint-stock companies, of which we are glad to see there are many now in active existenec in New York, and we hope to see them in every one of our large cities. Such blocks of land could be conveniently and elegantly laid out in lots having, uniformly, gardens in front all of one depth. This plan has been carried out in many of the avenues in Detroit, and adds breadth and beauty to their appearance.

Efficient drainage, dryness, and general healthiness should be the chief objects in the selection of a site for the erection of a cottage; and where a number are to be built, on an entirely new site, they should be so placed as not to interfere with, or injure the effect of the surrounding scenery.

The cottage should be so placed that the sun may shine on the most frequented sides of the house, or, if possible, let all the windows have a certain proportion of sunshine through the day. The design and its features should be so arranged as to have that effect. And every cottage should have a garden attached to it, of not less than about one-sixth of an acre, to be cultivated by the cottager. It should be neatly fenced, on the front especially, so as to add as much as possible to the landscape effect; and if a hedge-row be introduced, so much the better.

The division of lots should be marked by an evergreen hedge; and, until such hedges can be grown, a neat wiro fence might be used to advantage.

The first thing to be done, in laying out the foundations, is to see to the *drainage;* and this is a point of the utmost importance, as upon it mainly depend the health and comfort of its inmates. And not only is it requisite that the drainage be perfect, but it must be as little liable as possible to get out of order; and when disturbed for the purpose of cleaning, should be capable of reinstatement with the materials at first used.

Although a complete system of drainage would seem to have but little to do with cottage building, the general use of a tank for the common cesspool is most desirable—and the more especially, as in cases where a number of cottages are erected, one tank might serve the purpose of the whole.

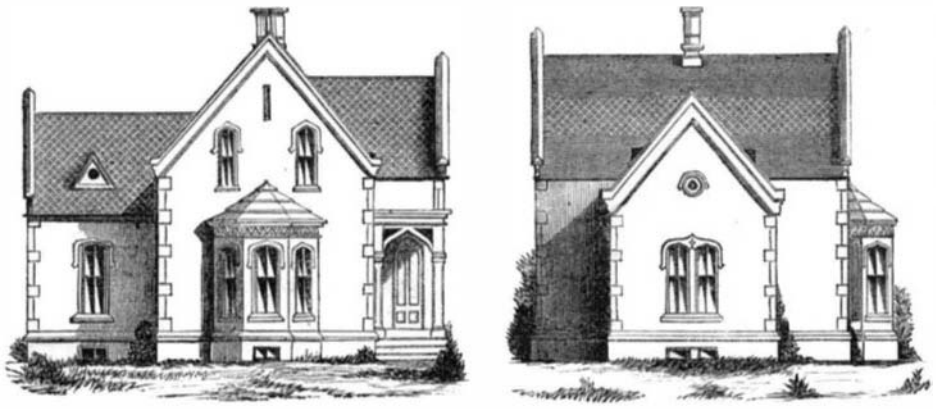
The most essential points to be attended to, in the drainage of buildings generally, are the following: All *main sewers* should be formed with concave bottoms, to allow the water, however small in quantity, passing along with solid matter, to act with the utmost possible effect; and they should be evenly built. They should have arched tops, although flags, well laid, make a good cover. Sewers should have a *fall* of not less than one inch in every ten feet in length, and more than this, in all cases, where the flow of water is variable. They should have a constant flow of water through them, or powerful flushes at stated intervals; and particular care taken to ventilate them.

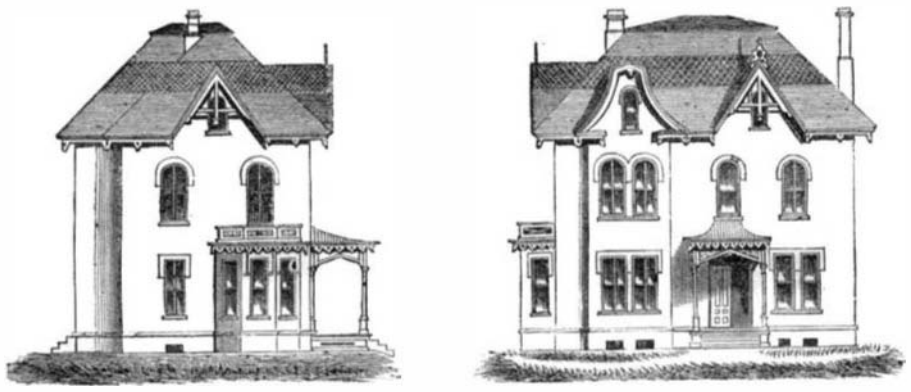
To prevent the foul air generated in, or returning by the drains, the waste-ways should be double-trapped, by a bell-trap at the sink, where the waste water enters; and by a well-trap short of the inlet to the drain.

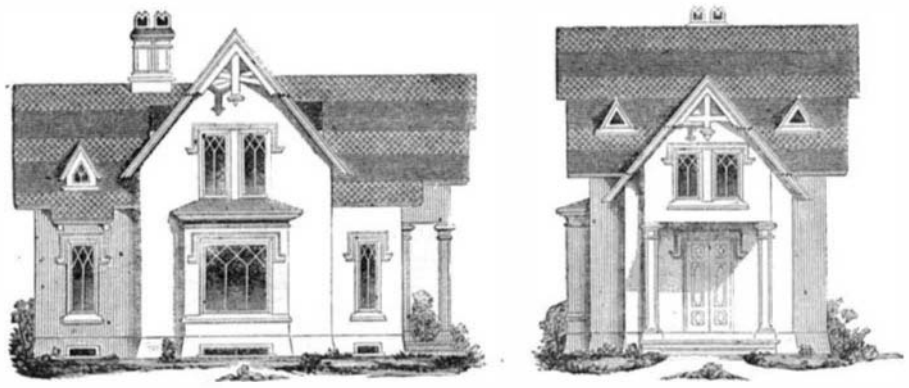
All drains should be so constructed, as to admit of being opened for the purpose of cleansing, without breaking them, and of the displaced portion being afterwards replaced.

Each cottage should be provided with the means of collecting and filtering the rain water from the roof; and thus be independent of any other supply, the more especially, as rain water is the purest of all water.

The walls of cottages may be formed of a great variety of materials, and the nature of the material used is a fertile source of variety and beauty.







ELEVATIONS OF COTTAGES FOR MECHANICS.

Wood is the most susceptible of architectural ornamentation at the least expense. Some persons object to it, as requiring frequent painting, being combustible and perishable.

Stone or brick foundations are always to be recommended, even where cellars are not to be used; and by keeping the wooden frame well up from the ground, the objection as to perishability may be greatly lessened.

The walls are either *clap-boarded or vertical-boarded.* A very tasty effect may be produced by clap-boarding, say two feet six inches high, and shingling the remainder, up to the eaves; the shingles to have the corners cut off, to any desired shape; or slate can be very advantageously substituted, and so arranged, as to produce a very pleasing effect, and at about the same cost.

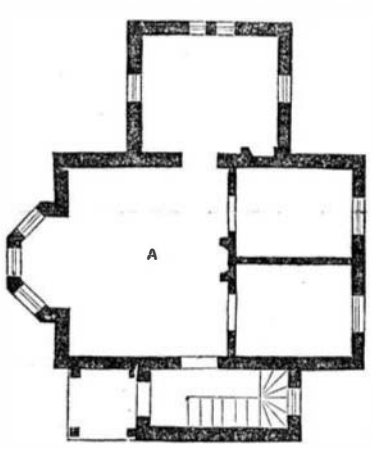
The accompanying designs may be constructed in either stone or brick. The walls, if of stone, should be fourteen inches thick; and, if of brick, eight inches.

The plan is arranged thus: The living-room, marked A has two bedrooms at its rear, kitchen on the left, and hall entrance on the right. The second, or half story, gives bedrooms over each of these.

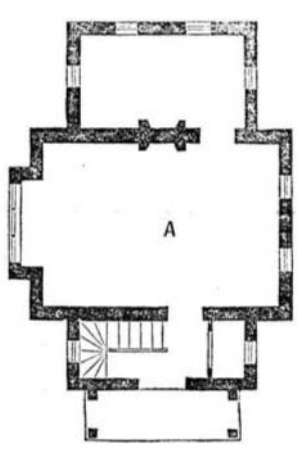
The other plan makes the living-room, A, the whole size omitting the two bedrooms. The house is smaller than the preceding one.

The illustrations following those are of a superior class of dwelling, suitable for a merchant, shopkeeper, artisan, or clerk. A is the parlor, with its bay-window, J; B, the dining-room; C, the kitchen with its shelved pantry, H; D, the hall; E, the vestibule; F, staircase; G, chamber; I, porch.

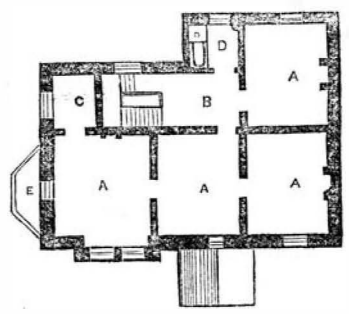
The second story: A A A A, bedrooms; B, hall; C, dressing-room; D, bath-room and water-closet; E, roof of bay-window.



GROUND PLAN OF UPPER COTTAGE.



PLAN OF MIDDLE COTTAGE.



PLANS OF LOWER COTTAGE.

Social Clubs for Mechanics.

A writer in the *Atlantic Monthly* gives a description of one of the workingmen's clubs which have in the last few years been established in many of the large towns of England. These clubs are not political, but simply of a social character. In fact, they are places where the workingman may pass an evening in a comfortable, well-lighted, well-warmed room, smoke his pipe, obtain certain refreshments, read the daily journals and periodicals, avail himself of a small library of amusing and useful books, amuse himself with all sorts of innocent games, and have free intercourse with his friends and acquaintances, without subjecting himself to the evil influences inseparable from the public-house. On Saturday the clubs hold what is termed a free-and-easy; that is to say, all reading and games are put aside, everyone draws around the fire with his pipe, and each one in his turn has to sing a song, tell a story, or otherwise contribute to the general amusement. Once a month the club gives an entertainment to the wives and daughters of its members, either in the shape of popular lectures, readings from "Pickwick," and other amusing works, dissolving views, conjurers, or music; and once a year the members of the club have a grand supper.

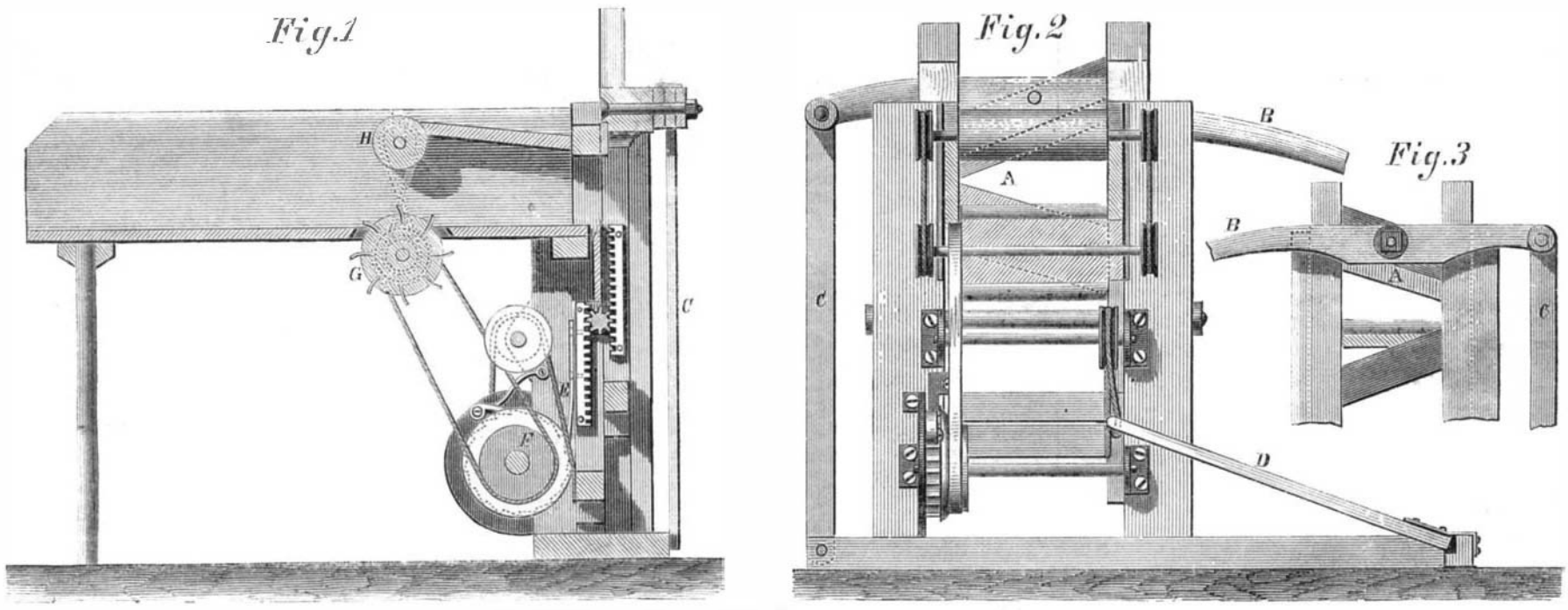
The writer asserts that these clubs have been productive of great good, and in no case have failed of success. The *Sun* says: "We take an especial interest in anything that contributes to the well-being and happiness of workingmen, and should certainly like to see the experiment of a club of a similar description tried in this city. Some people will no doubt say that such an institution is apt to drawn men away from their homes. To these we would reply, that there are occasions when it is just as well that a workingman should be away from home, and that it is more conducive to his happiness and respectability that he should pass his evenings in some such places as these, where he can have innocent amusement or improving occupation, rather than that he should spend his time in some smoky liquor shop. Moreover, there is a large portion of our working population which consists of young unmarried men. To these such a place of resort would be exceedingly beneficial. At all events, the experiment might be tried. We have every reason to suppose that our workingmen are as capable of appreciating the benefits of such an institution as their compeers across the water; and if the experiment should fail of success, its promoters would, nevertheless, have the satisfaction of feeling that they had failed in a good cause. An expenditure of $2,000 would start such a club as this on a firm basis, and the monthly payments of the members would be ample to keep it going."

PROF. LIEBIG states that 1,460 quarts of the best Bavarian beer contain exactly the nourishment of a two and a half pound loaf of bread. This beer is similar to the famous English Allsop's, and our more popular American beer.

Improvement in Straw Cutting Machines.

The accompanying engravings represent in section the parts of a new style of machine designed for cutting straw and hay for the feeding of stock. Instead of rotary knives the edges of which meet each other and thus sever the straw, or one rotating cutter bearing on a yielding roller, or even a reciprocating knife passing by a fixed knife, this machine has two reciprocating cutters, each moving in opposite directions simultaneously, and so set as to cut like shears and with a drawing motion. The feeding of the material is also automatic, thus obviating the danger of severed or lacerated fingers. The machine is quite simple in construction, and, as seen from the foregoing statement, easy and exact in operation.

Fig. 1 is a vertical longitudinal section; Fig. 2, a transverse vertical section; and Fig. 3, a view of the knife and hand lever. The two front uprights are double grooved to receive the



AMBRUN'S PATENT DOUBLE ACTING STRAW CUTTER.

frames that carry the knives. These are fixed rigidly, at opposite angles, in their frames. Each of these frames has on its inner surface a toothed rack, as seen in Fig. 1, the teeth of which mesh with those of a pinion, thus insuring simultaneous reciprocating motion to the knives, seen plainly in Figs. 2 and 3 at A. The hand lever, B, is pivoted to the upper knife, its end connecting with the top of an upright oscillating bar, C, pivoted to the base of the frame. A treadle, D, pivoted at the end of the base has a cord, or band, attached to its free end that passes over a truck or pulley, and having its other end secured to the lower or rising frame. In cutting, the operator uses the hand lever and also this treadle, thereby giving great impetus, or force, to the ascending, as well as the descending knife.

The ascending knife has attached to its framing a spring, E, Fig. 1, that on its descent engages with the teeth of a ratchet, having fixed on the same shaft a pulley, F, from which a band, or belt, connects with the feed roller, G, which is either toothed or corrugated. From this feed roller, or from a pulley on its shaft, an elastic band passes to a similar pulley on a roller, H, suspended on the end of a pivoted lever.

This roller is intended to compress the straw to be cut on the surface of the feed roller. This is operated automatically by the spring strap, E, the ratchet, F, and its pawl. These appliances constitute the feed of the machine.

Invented by Julius Ambrun, Leavenworth City, Kansas, and patented through the Scientific American Patent Agency, Nov. 3, 1868. To the inventor all communications for further information should be addressed, as above.

Correspondence.

The Editors are not responsible for the Opinion expressed by their Correspondents.

Lightning Rods.

MESSRS. EDITORS:—I notice an article in your paper (No. 3 current volume,) headed, "Are Pointed Lightning Rods any Protection?" Allow me to ask the question. Is a lightning rod, as commonly erected, any protection at all? I wrote an elaborate article on this question, founded upon experience and observation, ten or twelve years ago, for the New York *Tribune*, showing that they were not only of no use but really a dangerous contrivance, often bringing the thunderbolt (electrical explosion) upon the building, when it would have gone some other place, had not the rod attracted it to the building. I had a personal conversation with Prof. Henry soon afterwards on this subject, and he expressed the same opinion you quote, to wit: "The office of a lightning rod is to protect a building from a discharge from the heavens. As a general thing its effect upon a distant cloud must be too small to silently discharge its redundant electricity, though in some rare instances it is possible that it may so reduce the intensity of the cloud as to prevent a discharge, when, without such reduction, a discharge would take place."

That was the ground I had taken in my article, and upon that showed that the lightning rod did not fulfill its intended duty when it received electrical explosions, but in such cases frequently caused the shattering of buildings and setting barns on fire. In a five years' record I kept of lightning strokes in Lancaster county, over two-thirds of the cases had lightning rods mounted, and six barns out of ten were burned to the ground with lightning rods mounted; that is, ten barns burned up, six of which were provided with rods and four had none. About that time a large number of buildings in New York and Boston suffered from electrical explosions, although surmounted by rods, and it was these stubborn facts that induced me to give to a widely published paper the science and facts in the case. The only counter article on the subject that I learned of was from Mr. Quimby, who simply stated that the cases I made reference to "were not surmounted with rods of his construction!" Now for the facts of the science. The discharge generally comes from the cloud to the earth. When it passes within tractive distance of a tractor, which may be a lightning rod or other metallic prominence, or any projecting pointed wood or stone, it will fly to that, at an angle to its previous course. When in such case it strikes the lightning rod it is like trying to knock the discharged cannon ball away from your person with the bayonet of your musket instead of drawing the charge from the cannon with the screw-rammer, or plugging up the prime-hole with a rat-tail file.

The legitimate office of the lightning rod is to draw the electrical surcharge from the cloud *silently*. That is the only scientific efficiency of the lightning rod, and the question is, how far from its point will the rod disarm this pending surcharge of the electrical cloud? Clouds rarely come within fifty or one hundred feet of the tops of houses and barns, oftener over one thousand to fifteen hundred feet. Will any electrician or lightning-rod maker claim for his rod the power of disarming a cloud one thousand feet above it. Prof. Henry said it *may* disarm it by induction. I will not dispute this theory as applied within reasonable distance, say within fifty feet of the point of the rod. Mr. A. George, of Philadelphia, a philosophical instrument maker, and myself saw a lightning rod illuminated at its point for several seconds at a time, one night when a thunder storm was passing over the city, but it was a remarkable condition of the atmosphere—hot and sultry, and the clouds appeared to be brushing the chimney tops. That rod was performing its legitimate office. Prof. Henry mentioned to me a similar instance he witnessed on the rod of the Smithsonian Institution, nevertheless that building has been twice struck by electrical explosions, and the rods on it are put up in the most approved scientific order. With the point of a penknife, or a cambric needle, you can draw the charge from the prime conductor of an electrical machine silently at a distance of ten or fifteen inches, but not that many feet, hence there is a very limited distance allotted to the withdrawing power of a lightning rod in drawing off a surcharge of electricity silently.

Tall trees near a building are better protectors to it than a rod surmounting the building. The top points of the tree, when elevated above the top of the building, will draw a "bolt" to the tree, though that bolt is moving toward the roof of the building. I examined one case where the bolt dashed into the top of a button wood tree standing in front of a one-story house: the house had a shingle roof, with a sheet of tin about four feet from the eaves, stuck in to replace a rotten shingle. The electricity run down a main branch of the tree to its crotch, and tore off the bark there, and thence jumped over about fifteen feet and right on the sheet of tin above-mentioned, made a hole in the tin as if a chestnut burr had been fired through, turning down eight points of tin into spiral coils or burrs around the hole, and from there jumped four or five feet down to the tin water conductor, perforating that a dozen or more places about the size of No. 6 shot—running right and left on the water conductor, and at the closed end jumped to the cornice of the house, tearing off splinters and expending itself on the corner bricks; while at the other end it ran down the spout, jumping from its end eighteen inches on to an iron water pan, displacing that and burrowing into the earth under the pan to a depth of a foot. There was no lightning rod on, nor within two hundred feet of the building. I examined a number of cases where tall trees drew the explosions away from the tops of buildings, as the directions of the bolts and the impact upon the trees plainly indicated.

After a five years' investigation of the subject, I took the lightning rods down from two houses I owned, looking upon them as decoy ducks to the errant thunderbolts that might chance to happen in that direction.

A lightning rod, or protector from lightning, either from a pending surcharged cloud, or a bolt, to be efficient, should be elevated on a mast or pole as high as possible—better 150 feet high than 75 feet—and it ought to stand a little distance from the building or buildings, surmounted with a metallic ball and finely-pointed gold or platinum point; it will then silently draw off the surcharge from a proximate cloud, and will also draw a stray bolt to the ball and rod, that may be moving in the direction of the building. By bolt or thunderbolt the intelligent reader will understand me to mean electrical explosions, in distinction from surcharges or surcharged cloud. A bolt is exploded electricity; that is to say, the cannon ball shot out of Jupiter's gun: surcharges or surcharged cloud is the cannon ball lying quietly within the cavity of Jupiter's cannon, but ready to go off at any moment that the match of electrical traction comes within its reach.

As regards the interruption of conduction by paints or other substances on the surface of a rod, I would say that I have often discharged an electrical battery with a pair of fire-tongs in my bare hand, and never felt the least effect upon my hand. A rough piece of iron would, no doubt, let some pass off laterally—the fire-tongs being smooth conducted it all.

Such are the stubborn facts, and science of the facts of electrical forces, as exhibited in thunderbolts and lightning rods, and if I have stated any controvertible points, they thould be pointed out for the benefit of mankind by some one better acquainted with the subject than your correspondent.

Lancaster, Pa. JOHN WISE.

Influence of Sunflowers upon Miasms.

MESSRS. EDITORS:—Concerning the influence of sunflowers upon miasms, treated in the leading article of your issue of Jan. 9, I beg to call your attention to page 154 of "Man and Nature," by Hon. George P. Marsh.

Mr. Marsh, supported by Lieut. Maury and certain Italian philosophers (whose writings have probably been read by the Belgian farmer of whom you make mention), asserts that sunflowers as well as forests are a protection against malaria.

As to swamp vegetation you take issue as follows:

"But it is specially noted that in low, swampy lands, covered with dense rank vegetation, they [miasms] are more numerous than in localities of opposite character."—*Scientific American.*

"It is at all events well known that the great swamps of Virginia and the Carolinas, in climates nearly similar to that of Italy, are healthy even to the white man, so long as the forests in and around them remain, but become very insalubrious when the woods are felled."—*Marsh.*

These are high authorities, Messrs. Editors.

Butler, Pa. E. LYON.

[With all due deference to authority upon this subject, we submit that we are not disputing facts, but a theory. The theory which we felt called upon to dispute in the article referred to by our correspondent, and for which we yet see no foundation, is, that the sunflower possesses a peculiar absorptive power, which, so to speak, soaks up malaria, or, more properly speaking, purges the atmosphere from miasms. We cannot admit this of the sunflower or any other plant from any light yet shed upon the subject. If the theory has foundation, the microscope ought to detect the germs which give rise to malarial fevers, etc., in the structure and circulation of the plants themselves, as it detects them in the human circulation. Nay, it should not only show their presence but should show that they accumulate there and do not again pass out to breed pestilence.

We are well aware that the presence of forests may act either to retard the production of malaria or to check its progress. One of the conditions required for its development is heat, which is greatly tempered by the shade of large forests over moist vegetation, the rapid decay of which is thus retarded. It is well known, also, that many malarial poisons do not rise but a few feet above the surface of the earth. This fact is so well recognized that it is a common practice with Europeans in India to avoid sleeping upon the ground floors of houses. Sleeping upon top floors to avoid malarial influ-