it? the answer would be: In order to preserve the work of Nature, to enable man the more readily to sustain himself, and to make him wealthier and better. It has become an indispensable condition for the existence of man, and his civilization. In all organic beings we meet with two processes—that of life and that of decomposition—the latter beginning its full activity after the former has achieved its end, at the moment when organic beings are dissolved into those constituents from which the plant was formed and nourished.

If, however, we intend to check, or, at least, delay decomposition, we must employ acids, for we know that the Creator formed of the sea-salt a mighty barrier against the immeasurable mass of water becoming putrid; we know that our stocks of flesh, grease, &c., are preserved by the application of salt; that cabbage-water, acids in general, and kitchen-salt are the means employed by the agriculturist against septic diseases in our domestic animals, and against diseases of the mouth and feet. The separation of milk and deposit of meat will be increased by the application of salt, thus forming an essential means for the promotion of cattle-raising. By the application of salt, the fruits, especially wine, will become much better; and even the ancients were in the habit of throwing salt on their grounds, their vineyards, and fruit trees. Agricultural chemistry informs us that the simplest combinations through which nourishment is conveyed to plants consist in acids, alkalies, and alkaline substances. Animal chemistry shows that free muriatic acid and kitchen-salt form the principal constituents of the contents of the stomach.

In a French prize paper, by Dr. Desaive, on the manifold advantages of the use of salt in agriculture, the following results have been laid down by the celebrated French veterinary surgeon, Grogniez:

Common salt serves as a preventive of the fermentation and heating of hay, which has been heaped up in large stacks during wet weather. Forty quintals of hay require fifteen pounds of salt, to be strewn among it in alternate layers.

This effect is much better shown in straw, which, if intended to be used as fodder, by being moistened with salt-water, may be preserved for a long time, when it can be given to cattle instead of hay—a method in use among the ancients.

Leaves of trees, when put in ditches with salt, may be prevented for a long time from putrefactive fermentation, and will even make good forage. Intelligent farmers of the Mont d' Orlyonais are in the habit of thus preserving their vine leaves as fodder for goats.

Fodder of inferior quality, for instance, straw, or other kinds, soaked and bleached by rain and sun, cured too late, or become woody, may be rendered more palatable and easy of digestion by being salted. A pound of salt in three quarts of water is required for a quintal of bad hay.

The sharp taste which the milk of cows usually assumes in consequence of beets, turnips, and white cabbage being continually fed to them, can be removed by salting those vegetables.

In Flanders, common salt is strewn on new and wet oats, to be fed to horses, and, thus prepared, will not be dangerous to the animals. The same application may also be made to hay newly harvested, to prevent injuries when it may become necessary to feed such hay, the moisture of which has not been fully evaporated.

Though the bad qualities of dusty, muddy, or moldy fodder, after having been washed and threshed, are not entirely removed, yet, by giving a sprinkling of salt-water, they will be diminished to a considerable degree. This fact will be of advantage to the farmer whenever he may be in want of appropriate fodder.

By means of salt, such water as otherwise could not be used for cattle for drinking, will be rendered proper.

The great advantages to be derived from common salt with regard to the health of cattle have been clearly shown by many experiments made by that learned and celebrated agriculturist of Alsace, M. Boussingault. Cattle, by being fed with salt, receive a soft and glossy skin, their digestion and appetite are in good order, and they increase in flesh and strength. Cows thus fed yield much milk, while those treated otherwise have dull skins, with rough hairs, exhibit less appetite, produce a smaller amount of flesh, and yield not only an inferior quantity, but also quality, of milk.

Manure from cattle fed with salted fodder is also of a better quality.

Finally, manuring with salt will banish mosses and hurtful parasitical plants from meadows.

SOME HINTS UPON FARM HOUSES.

(BY SAMUEL D. BACKUS, ARCHITECT, NEW YORK.)

An intelligent traveler, in passing through our country, will observe among neighboring agriculturists, a great similarity in the modes of cultivation adopted, in the cattle reared, the horses driven, the vehicles, and farm implements used, the machines employed, the crops raised, the barns erected, and the general means and manner of pursuing their avocations, each following what is shown to be a good example, and all agreeing in the course which their combined experience has shown to be advantageous. But it is a frequent occasion of wonder that a class so quick to perceive, so shrewd in judging, and so prompt to adopt any improvement which may lighten their labors, increase their profits, or permanently benefit their lands, should, in their own dwellings, exhibit so great a diversity of style, construction, and real value. There is not merely such a wholesome variety as would arise from peculiarity of situation or disposition, but sometimes a difference so entire as to show that neighboring builders, who, upon other matters seem to think alike, have either disagreed radically respecting the purposes for which their dwellings were to be erected, or have failed to give those purposes a due consideration.

With all this dissimilarity of design, there are very few American dwellings, except some of the log-houses reared for temporary use by

settlers in the forests, which do not afford more of physical comfort than the residences of the same class of people in any other country.

Within a few years past, the attention of the higher classes in Great Britain has been turned to the subject, and model cottages for agricultural laborers have been built, under the auspices of committees and societies, in various parts of the United Kingdom, the descriptions of which show that what are deemed essential conveniences in every house here are there regarded as rare improvements.*

But, notwithstanding this superiority, the residences of American farmers and planters are, as a class, far less valuable than, with information and facilities of construction, they might be made. Some of their best traits have been inherited from former generations, and little, if any, progress in the right direction has been made by the present. Indeed, it is doubtful whether, in view of the available means and opportunities of the people, the earliest houses on this continent were not better than the most recent ones. The men of our day have been drawn into the adoption of some improvements by the progress of invention and the arts, but in the exercise of a sound judgment, and in careful adaptation of their means to the ends desired, they cannot claim to be in advance of their grandfathers.

There are not many dwellings of the last century remaining without essential modifications. Occasionally, on some New England hill, far removed from the changes which railroads bring, a venerable farm-house may be found which tells a story of its builders well worth the reading. There is the kitchen, where:

> "Warm by the wide-mouthed fire-place, idly the farmer
> Sat in his elbow-chair, and watched how the flames and smoke struggled together."

That hearth was made to hold no compact cooking-stove, nor is the fire-place designed even to burn wood economically cut with a saw. Where wood is plentiful and labor scarce, the fire-place must be large. The room is capacious, for there the loom, and the spinning-wheel, and the broad settee had their places; there the family meals were taken; there all the household-work was done; and that was the family gathering place. At one end is the cheese-room, or buttery, in no danger of too great heat from proximity to the kitchen chimney; at the other was the "old folks" bed-room, in a position commanding all the approaches to the fortress; and near it the stair-case, by which the rest of the family ascended to the apartments where they shivered

*A "premium" row of twelve cottages was built, in 1848, in Berwickshire, all under one roof, each house having two small rooms, an entry, and a pantry, on the first floor, and a low loft, accessible by a ladder, above, the whole space inclosed being 25 feet by 17 feet. A permanent bedstead was built into a recess in the sitting room, which it entirely filled, somewhat like a ship's berth. There was a small out-building for each tenement, but not a porch, or shade, or shelter of any sort, outside the walls, though the windows were dressed with stone Gothic moldings. These cottages were specially praised for having brick floors, "a very great improvement upon the clay floors usually met with, and, also, that they were all raised a step above the exterior level."

The same meager accommodation is shown in dwellings of a higher class. In some farm establishments, furnished with steam engines, mills, feed boilers, and the most complete accommodations for the storage and preparation of provender, the housing of cattle, the sheltering of carts, and the protection of the manure heap, the farmer's own residence has but the two rooms and scullery below, and one, or at most two, low sleeping rooms in the garret.

through the winter nights. In front are two "square rooms," each with its fire-place connected with the great central chimney, one of which, devoted to tea-drinkings and other solemn occasions, was a sealed apartment on other days, while the other was used as a sleeping-room for guests, or an occasional sitting-room.

With some modifications, this, in its arrangement, was the type of most northern farm-houses. It was simple, certainly, neither requiring nor exhibiting much ingenuity in its design. The wants and habits of its builders were even rude, but it met them and did it well.

In outer form and construction the earliest houses were built with strict regard to the resources and necessities of the locality.

In New England, where timber was always abundant, and water-power everywhere available, saw-mills were early erected, and boards became the invariable material for covering the frames, formed of hewn timber, put together in all its huge dimensions, from sheer avoidance of the labor of reducing it. Men skillful in this mode of construction showed to less advantage when attempting to form the refractory granite into their clay-jointed chimneys, for lime was scarce and bricks were made only in widely-scattered localities.

On the banks of the Hudson, well supplied with clay and lime, and easily-broken stone, we find the walls of nearly all the old houses built of stone or brick, or both combined.

A similar construction prevailed on Long Island and Staten Island, the lime used being made from shells. Such parts of walls as were covered with wood were mostly shingled, there being little water-power for sawing boards on the islands. In each case there was the most judicious regard to the peculiar resources of the locality. As we come south, we find a change in the common arrangement. Heating the house in winter not being now the most essential consideration, the central chimney is dispensed with, and in its place an open, airy hall extends through the building. At each end of the house there is a chimney, sometimes built entirely outside the walls. Shelters become more common, too, the roof itself sometimes projecting over to exterior posts, forming long verandas.

The shape of the house was also adapted to its materials. The builders in stone for stability kept their walls low, and covered them with a broad roof, of moderate elevation, affording lighted rooms only in the gables, or obtained a second story by a double slope, (in what is sometimes called the "gambrel" form,) lighting it with dormer windows. The worker in wood could carry up his frame safely as high as he pleased, and thus two full stories. Frequently, in New England, this elevation only extended over the front rooms, the roof, having exalted itself for a little space, rapidly subsiding until it reached the rear, and modestly spread its shelter just over the kitchen door. Such houses certainly exhibited an ostentatious front, little consistent with the meagerness of their every-day appointments, and quite at variance with the stable, modest, hearty aspect of those which attained their highest position by a gradual and well-balanced rise upon a broad and firmly established basis. Whether in this respect any of them betrayed characteristics of their builders, we may not attempt to judge, as they have all passed away together. This is certain, that in all of them

the materials most suitable were selected, and used with judgment and thoughtfulness, to accomplish the end desired. There may have been an imperfect appreciation of the advantages to be sought in a home; and the mode of building may have been to a great degree the result of necessity, or to some extent influenced by recollections of the lands of their forefathers; but it was adapted as fully as possible to the purposes in view and to the means at hand.

While the general model was nearly the same, as the common wants were similar, there was all the variety called for by diversity of situation and circumstances. In this respect, the change to our times has been very great. With some noticeable exceptions, among all the numberless forms which are seen, there is little of that variety which is the proper result of peculiarities of location, circumstances, or personal character. With greater costliness, there is less care. With much less of uniformity, there is more of imitation. While each man seems to assert his freedom from antiquated customs, and his determination to build in his own way, as every American should, the greater number vindicate their privilege by adopting the way of some one else. The very abundance of our resources, and the freedom of our choice, instead of inciting to a wise discrimination, seem only to have developed an inconsiderate lawlessness.

We cannot in this connection trace the causes and manner of the change that has taken place, but it may be useful to consider some of the influences that have been, and still are, at work to prevent the improvement which we ought to see.

Chief among these has been a tendency to regard the mode of any novel procedure, rather than its reasons; leading to careless imitation of inappropriate patterns. As some thinking man has partially changed his mode of life, introducing new refinements, creating new wants, and modifying his house to meet them, his neighbors, compelled to acknowledge the improved aspect of his homestead, have copied the form of his house, but have not followed the new habits of living which occasioned its adoption. His family may have enjoyments and occupations not confined to the kitchen-hearth, and the house may cheerfully make the fact known by the more prominent and spacious front apartments. His imitators still make the kitchen their habitation, but it is smaller than their old one and less comfortable, and, with them, the rest of the structure is an ostentatious, superfluous, dreary waste.

Domestic habits must change among an active people. Threshing machines and reapers have revolutionized the out-door work of farming. The sewing machine has supplanted the spinning-wheel; newspapers, district libraries, and cheap burning fluids, have afforded opportunities for more rational occupation than smoking long pipes, or shelling corn on a shovel.

It would be folly not to meet these changes by corresponding modifications of the domicil, and it is no less so to adapt our houses to the habits of other people, in disregard of our own. All the fashions in building which, like waves, have successively swept over the country, have been productive of erroneous notions and false tastes, except so far as they have coincided with real changes in the mode of life, or improvements in material construction.

The departure of farm-houses from the simplicity of their true purpose is, in great part, owing to the attempt to make them "architectural." The rambling, capacious, and home-like residence, built with no object beyond the convenient, economical, and comfortable accommodation of the household, has often given place to some formal and pretentious structure, contributing little to either comfort or convenience, erected in fancied conformity to some ideal model of architectural correctness, with columns and pediments, capitals and architraves, frieze and cornice, all according to the books, as though it were one of a uniform lot, made by machinery, like Yankee clocks, and sold to make room for a new stock of different pattern. As extremes in fashion follow one another, the neighbor who builds next afterwards has, perhaps, a "Gothic" model:

> "All up and down, and here and there,
> With Lord-knows-what of round and square,
> Stuck on at random everywhere;
> Indeed, a house to make one stare,
> All corners and all gables."

Even the veterans are not left to wear out their days in peace, content in the enjoyment of their own homeliness, but the hand of "improvement" is laid upon them; they are stripped of their little acquisitions of stoops and sheds, and similar matters, which for pure convenience they have gathered round them, cramped and tortured into reluctant regularity, tricked out with vergeboards like ruffles, and then passed off as samples of a reformation effected by correct rules of art.

It is not strange that the independent, thinking man, accustomed to judge of everything by a reasonable consideration of its design and its results, should say: "Architecture may be very good in churches and court-houses, but it is out of place on a farm. We want houses to live in, and cannot afford to sacrifice our pantries, or bed-rooms, or the chief value of our more important apartments, for the sake of regular arrangement of windows, or an exact proportion of width, length, and height of the whole building. I have my own notions about my house, which I intend to carry out."

He does carry them out, but when he has occupied his new house awhile, he finds that new notions have been acquired by experience, which it would have been well if he possessed earlier. His doors, perhaps, are just where they ought not to be, or his stairs are not pleasant to climb, or in some other of the thousand things which experience would have taught him to provide against his house is not so desirable as it might have been.

Now, both of these classes err from a mistaken idea of the real meaning of architecture. It is supposed to be an inflexible set of rules, made by some infallible authority, invariable in their operation, and to be applied alike to all buildings, great or small, allowing a certain degree of liberty in the selection of the special order or style to be used, but beyond that giving no scope to ingenuity or originality. If the building is not one to which the rules seem applicable, that is considered the fault of the building, and the remedy is not in changing the architecture, but in using less of it. To builders of this way of

thinking, the classic orders are as well defined, and their limits as accurately marked, as the separate States on a map; and they will tell you the exact outline which must be adhered to in any Gothic arch or molding as readily as describe a circle with the compass.

Now, all this is not science, but conceited ignorance. No two Grecian buildings have been found to be alike. No one of those which have been measured and delineated agrees with what are considered the established proportions of Grecian architecture. Each separate edifice was designed for its own specific purpose, and with reference to its peculiar location and circumstances. So far as those purposes and circumstances coincide with ours, the buildings are as suitable for us as for their original possessors, and no further.

In the best Gothic, of all its many styles and periods, there is still greater variety. Not only do the buildings possess each its own character, but in the same structure the minor details show the peculiarities of the different artificers, so that, in some instances, scores of capitals in the same ranges of columns, all harmonizing in general form, show each a new design in the detail of decoration.

Says Ruskin:* "It is one of the chief virtues of the Gothic builders that they never suffered ideas of outside symmetries and consistencies to interfere with the real use and value of what they did. If they wanted a window, they opened one; a room they added one; a buttress they built one; utterly regardless of any established conventionalities of external appearance, knowing (as indeed it always happened) that such daring interruptions of the formal plan would rather give additional interest to its symmetry than injure it."

The original architecture of Egypt, Greece, Rome, Venice, and Northern Europe, differ widely from each other in regard to forms, materials, scientific construction, perfection of finish, and harmony and grandeur of effect. But they are all true to the one principle of faithfully employing all the means and skill possible for the very purposes which, in each single instance, were to be accomplished. This variety and adaptation, so far from being inconsistent with noble architecture, is its very life.

Correct architecture is not inconsistent with true economy. It demands it, as essential to all good building, although it condemns any penny-wise parsimony, which would withhold those things needed to give the house its greatest value, as well as the spreading of a limited amount of means over a great space for show, instead of concentrating it for utility. Nor is architecture proud, even in its noblest works, it modestly keeps itself subordinate to the great purpose, and without condescention it takes equal delight in the humblest dwelling.

What is it? The experience of others gathered for our use—thought. The construction of *our* buildings so as best to suit *us*, with the very best use of the means at hand. It is, in fact, doing what we have to do in building just as judicious men do any other important business; first determining exactly what we need, and the means and obstacles to its accomplishment, and then devising the best way to make our means accomplish our desires.

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*Stones of Venice, vol. 2, p. 179.

One great cause of poor building is the careless way in which it is undertaken. Long preparation is made for the materials, in some cases, and plans are early laid for meeting its cost, but to the purpose and character of the house itself no adequate care is given. Thought, the material more valuable than all others which enter into the structure, is scantily bestowed. How few enter into any deliberate study of their own mode of domestic life; what it is from month to month; what are its chief enjoyments; and what its inconveniences and annoyances, and the causes whence they arise; how it is affected by the form and peculiarities of their dwelling, and how its pleasures might be enhanced, or its labors and discomforts lessened, by a modification of the habitation! A still smaller number ever investigate their habits of thinking, the origin of their opinions and prejudices, or trace the influence of material objects, and especially of the scenes of home, in the formation of the characters of children. Yet, without having given this thought to it, no man can intelligently determine the first point of size, form, or appearance of his proposed dwelling.

The farmer says: "I can spend so many hundred dollars. I guess that will build me as good a house as Mr. Smith's." So he goes to a carpenter and bargains for his home as he would for a cart or a plow, though often with less deliberation. If anything like a plan is drawn it must be done at once, so that the work can be begun without delay; and crude and ill-digested, with little examination, and seldom any real test of its merits, it is adopted, and the household put to constant inconvenience for their whole lives, in order to hasten by a few days the erection of the domicil. The importance of thoroughly studied plans, before beginning to build, cannot be too strongly urged. Economy not only demands that the intended building should be so fully delineated in all its parts before its commencement, as to prevent mistakes, misunderstandings, or omissions, in its execution; but it also requires every part to be so carefully designed that, by no oversight or parsimony, shall there be an unnecessary debt of life-long labor imposed on its occupants. Such things as apartments separated which ought to be close together, or doors and pantries badly located, daily causing many needless steps to the housekeeper, year after year, in effect levy a perpetual tax upon the occupants for the heedlessness of the designer. If it is the time of servants which is thus consumed, the tax is paid in money; if of his own family, it is not less burdensome. But the case is worse when the health is endangered, or cheerfulness and home comfort driven off, by such thoughtlessness.

The first step in fixing upon a design, the determination of one's own wants, is the most difficult of all; the one requiring most time; the one adding most value to the house, and yet the one most neglected. Before a man can intelligently decide what kind of house he will build, he must know what he needs, why he needs it, and what of his necessities are most imperative; for planning of houses is but a choice of sacrifices. No one ever yet comprised all the advantages which were desired, some of which must, in any case, be given up. The owner ought always to have determined in what order they shall be yielded, before any idea of exterior size or form shall have been entertained by him. This is requisite also in order that we may rigidly exclude from

our plan everything that does not meet some useful purpose of our own, for whatever is superfluous is both wasteful and positively detrimental.

"But," says one, "that is too strict a rule. It would cut off everything that makes houses pleasant, or gives them beauty, and leave them bare, unsightly boxes." Not so, unless you take a very narrow view of the purposes consistent with the most perfect domestic enjoyment. Not unless all is superfluity and luxury beyond sustaining an animal subsistence and saving money. If, on the other hand, the enjoyment of thought and feeling, the cultivation and refinements of the intellect and tastes, are consistent with daily duty, then the house may with propriety be made to contribute its aid to those ends.

It is for each man about to build to determine for himself what purposes it is most desirable to accomplish. A few, however, of those common to all country residences may be profitably examined in detail.

All efforts to make a pleasant dwelling will be, in a great measure, thrown away unless its position is chosen wisely, and even then care must be taken to overcome whatever may be its natural defects, and to make all its advantages available.

It must, first, have a wholesome air. Observation shows that there are few large tracts of ground in any part of the country without unhealthy portions, and that the distance between a location where the residents shall enjoy perfect health and one quite the reverse is often very small. It may not be practicable to determine the reason of this, nor the probability of the existence of miasma at any special point, without the learning and skill of a medical man. If so, his counsel should certainly be had, for it is not prudent to fix upon a site until its perfect healthfulness is made sure.

To secure a good atmosphere, even where are no miasmatic influences, there must be ground near the house lower than that on which it stands, where the heavy vapors may gather by their own gravitation. Every one has seen the fogs filling a valley like a lake in an autumn night, completely enveloping the dwellings, and gradually ascending till they are dissipated by the rising sun, while the residents upon the hill-sides enjoy their customary dry and invigorating air. The same process goes on at all seasons, though the heavy and noxious vapors are only visible at certain times.

A site on rising ground is also desirable to secure dryness around the house. There may possibly be farms on which there is no spot that can be made dry and hard at all times, but it is difficult to believe that such a farm can be fit to live on. If there are any virtues in underdrainage, it certainly will pay to appropriate them in the fullest manner rather than suffer the inconvenience of mud, and ice, and filth constantly lying in the path. There are houses where the labor imposed on the housekeeper by muddy paths, in a single season, is more than would suffice to make them thoroughly and permanently dry.

The site for the homestead should be so chosen as to facilitate, as much as possible, the labors of the farm. Some houses seem to be located for the convenience of pedlars, so near the public highway as to receive the dust thrown up by every passing vehicle. As the farm-

house and the other buildings adjacent are the center of the farm operations, it would seem more reasonable to locate them with reference to the work to be done and their daily use, rather than their occasional access from abroad. A house standing a moderate distance from the public road certainly wears the appearance of independence and homelikeness, and indicates a family living comfortably by themselves, beyond public intrusion.

Nor should the builder overlook any advantages of prospect, or beauty of situation, which may be available, either to make his house pleasant to its occupants, or more agreeable to observers. There are many old residences, and not a few new ones, located in some low and unpleasant spot, where there is little to cheer the eye from within, and less to render the place attractive from without, for some half-considered and mistaken notion of money-saving, when near by a site offers the advantages of beauty which the other lacks. And generally it will be found that the most agreeable site will be the most economical one.

There is one consideration, in connection with the matter of prospect and appearance, that seems often to be neglected. If a railroad happens to pass in sight, its trains, as they flash by, showing nothing but the same black engine and yellow box-like cars, day after day, people seem to think that because they see no passengers there are none to see them, and so put the unsightly side of their houses toward the the track, to be seen by hundreds, and the best front toward the highway, traveled by a few scattering neighbors.

One of the first and most important things to be regarded in the selection of a situation, is the supply of water for the family use. To those who have enjoyed such advantages, it is unnecessary to suggest the increased value given to any plot by a living spring of pure water, in such a location that it may be readily conveyed into the house, or be driven there by the tireless energy of a hydraulic ram. Men, who have never known this comfort, often look with astonishment upon what they consider the extravagant expenditures made by their neighbors to accomplish this object; but a proper estimate of the labor wasted in carrying water from a distant spring in pails, or drawing it from wells with a clumsy sweep, and the losses resulting from the want of it in abundance, would show that their own course is less thrifty. If, however, there is no source from which a supply can be drawn, except by manual labor, there is no way so cheap as pumping; and the man who cannot have running water, is inexcusable if there is not a serviceable and easy iron pump by the side of his kitchen sink, unless the fountain on which he must depend is too distant or too low for the successful operation of a pump. The case is then, indeed, unfortunate; but, after all, not so bad as many contrive to make it.

If a well must be resorted to, it is worth some pains to make it a pleasant, safe, and comparatively easy source of water supply, nor is it a difficult task to accomplish. A well-house may be constructed so as not to be very burdensome in cost, though greatly superior to the arrangement of most wells. Let it be large enough to afford a protected space on the floor for the drawer. Let it have a safe curb, and a spout opening into a tray, where the pail may be placed, so arranged that any superfluous water shall be conducted off without covering a

considerable area around with mud in summer, or ice in winter. For raising the water, the best arrangement is a counterweighted windlass overhead, or a swivel-pulley, and two buckets. If not too far removed from the house, this seems to reduce the inconvenience of an open well to the smallest degree, and may be made a pleasing and ornamental feature of a homestead.

The use of rain water for all the purposes of a family is becoming more common throughout the country. It has the advantages of freedom from earthy impurities, and a supply irrespective of location. The roof on which it is collected must be of such material as not to injure the water. The cistern should be large enough to hold a store for times of drought, and the water should be filtered as it enters the cistern, and after it is drawn from it, though the latter filtering is often dispensed with.* Of course, with a rain-water cistern, it would be folly not to have a cast-iron kitchen pump.

The supply of water involves the necessity of drainage. There are hundreds of farm-houses whose back doors are passed in winter only at the risk of falls and bruises. The latest ice which departs in the spring is the solid mass formed by the accumulated waste of a whole season, poured from the threshold. In summer, instead of being fragrant with flowers, the place is redolent of evaporating soapsuds.

Now, if no other disposition can be made of this waste water than to let it soak into the earth, it is better that it should do so elsewhere than just under the kitchen windows, or before the entrance door. An underground drain can be formed to a cess-pool without any great cost or labor, if it cannot find an outlet where its contents shall enrich a hill-side. Into this drain should lead a pipe from the kitchen sink, and in some convenient place there should be an opening for emptying wash-tubs, &c., both protected by stench-traps, which are only such bends in a pipe that water sufficient to fill it shall be retained for a little space, preventing the passage of foul air.

Provision is also to be made for carrying off the rain water which falls on or around the house, so that it shall neither form gullies nor stand in pools. Except in rare cases, eave-gutters seem indispensable, even where the rain water is not conveyed to a cistern.

In many locations, the natural moisture of the soil is such that, unless otherwise drawn off, it will descend into the cellar, which, in that case, must itself be drained by some means to render it valuable. So obvious a fact it would be almost ridiculous to mention, if there were not so many cellars unnecessarily flooded year after year.

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*The filtering cistern may be made with a partition wall, (*a*,) pierced at the bottom with several apertures. A wall, (*b*,) on each side of the partition affords a space to be filled with pure, broken charcoal, alternating with clean gravel. The water first enters one compartment of the cistern, and is pumped out of the other. A level is, of course, maintained on both sides, without a violent current through the filter, or danger of overflow in heavy showers. But it is difficult to change the charcoal, or to restore it, if displaced, except when the water is low. A plan, better on some accounts, is to have the rain enter the cistern through a cask or box, sunk in the ground, having a pipe from its bottom, the orifice of which is covered by wire gauze, or a course sponge, with charcoal kept in place by gravel over it

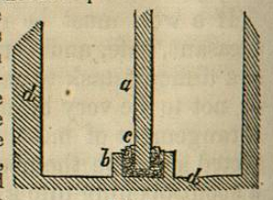

Fig. 1.

Another thing for which provision is to be made in every house is, a sure and constant supply of pure air throughout the building. The want of this is most obvious in cellars, where are naturally collected the heavy gases and vapors from the house, to which are added many noxious emanations from decaying vegetable matter, giving the air a peculiar cellar-like odor. But, though the air of the cellar is commonly dense and heavy, there may be light gases generated there, which, ascending through the house, may produce sickness, the cause of which shall not be understood. It is, therefore, important that every such place should be often cleansed, and that there should be means of thoroughly and frequently changing its atmosphere.

Whenever water is seen to stand on walls or windows, either as dampness or frost, it surely indicates a moist condition of the air of the room. With perfect ventilation, this evidence of vapors should never appear. It may not be practicable to attain to entire success, but, so far as possible, the air of every room should, by steady changes, be kept as pure as that outside the walls.

The steams of the kitchen and wash-room should be at once conducted off, and never allowed to penetrate any other portion of the house.

Especially is pure air needed in sleeping rooms. It is important for the farmer that this should be attended to in *all* the dormitories of his establishment, in such a way that the supply shall not depend on the judgment of the occupants. If he doubts this, let him spend a summer night at some road-side tavern, and when he wakes in the morning, dull and languid from sleeping in a close, hot room, let him say whether it *pays* to lodge the laborers who are to do his work in such places.

It is important, both for the maintenance of pure air and the preservation of the timbers from rot, that there should be a considerable space between the floor and the earth, under the whole extent of a house. Such portion of this area as is requisite will be used for a cellar, and the rest, in cold climates, should be so arranged that it may be entirely inclosed, or opened at places for a circulation of air at pleasure. In the Southern States it is found advantageous to have this space left as open as possible, by supporting the house on scattered piers, allowing

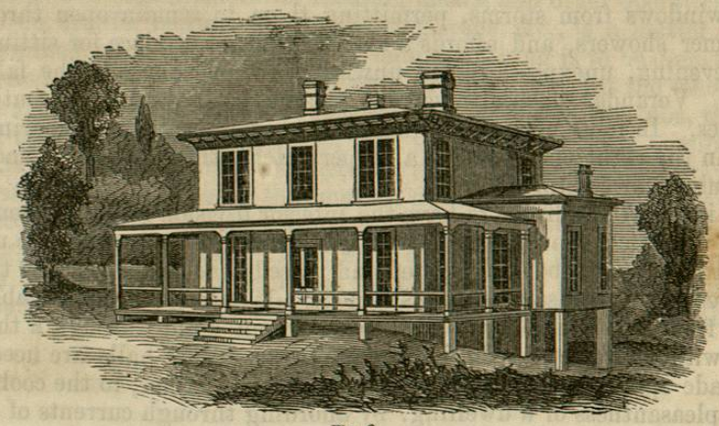

Fig 2