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OUR readers will remember the account of the falling of the Strauss building, in Denver, Colorado, by which a man was killed, and the vigorous efforts which were made by the local press to have the person or persons responsible for the accident brought to justice. It appeared that the front of the building above the first story was sustained by a timber truss, resting upon the side walls, and the theory generally adopted was that the brickwork on which one end of the truss rested gave way under the pressure, letting the front wall fall into the street, and bringing down with it a portion of the floor and of the side walls, which were anchored to it. The bricks commonly used at Denver are sandy and weak, and as those employed in the wall which gave way were proved to be of worse than average quality this seemed at least a plausible explanation of the catastrophe. Another circumstance relating to the accident, which would have perhaps more weight with professional architects than with the public generally, was that just previous to the failure of the side wall some workmen employed by the plumber had dug a trench for drain pipes close beside its foundation, and if the sandy subsoil had thus been allowed to escape from beneath the masonry, its collapse would of course be inevitable. Whether this was actually the case could not be subsequently ascertained, as the place was covered with débris, but if it had been, no further investigation would have been necessary.

AFTER a good deal of amateur discussion of the subject, an indictment was found against the architect, Mr. Eberly, the contractors for the stone and brick-work, Messrs. Hohenberger and Link, and the Municipal inspector of buildings, Mr. John I. Klock, charging them with having "in an unlawful and felonious manner so executed and performed their respective duties in and about the construction of the said building that a considerable portion of the said building then and there fell to the ground before the completion thereof and in so falling struck and instantly killed one Patrick J. Smith." As usually happens in such cases, the case was discontinued against the contractors, who furnished the inferior brick, built the defective wall, and pocketed the profits incident to that proceeding, but prosecuted against the architect, who, if guilty at all, was certainly not so through any selfish and reckless desire of gain. After a long and interesting trial the jury brought in a verdict of "not guilty," accompanying it, however, with an admonition to Mr. Eberly in regard to the manner in which his professional duties had been performed. In many respects the case was one of the most important that has ever been tried in this country, and it excited much interest among lawyers. The judge's charge to the jury, which we find reported at length in the Denver *Republican*, seems to have been an excellent one. Among other things it contained a definition of criminal negligence which is new to us, and of considerable importance. "Negligence," said the judge, "to be criminal must be so great as to indicate on the part of the person guilty of it an indifference as to the consequences which might result to others therefrom." This doctrine if generally accepted, would do much to relieve young and anxious but inexperienced architects of the great risk which they run in undertaking any important building in connection with cheap and unscrupulous contractors.

THE so-called Brattle Square Church, one of the more notable monuments in the new part of Boston, is to be demolished at once, and the ground cleared for the erection of other buildings. The history of this structure is a somewhat remarkable one. Many of our readers will remember the square brick tower which once rose above the houses at the North end of the city, forming a conspicuous feature in the view from the west bank of the river, and some have perhaps visited the ancient church to which it belonged, and inspected the cannon-ball, fired from General Washington's fortifications on the Cambridge side, which still remained imbedded in the wall. This was the house of the Brattle Square Society, and so great was its interest as a relic of Revolutionary times that it was not until within some fifteen years, when it had become isolated in a mass of commercial buildings, and the dwellings of those who were accustomed to worship in it had become inconveniently distant, that the resolution was taken to sell the ground on which it stood, and erect another building in a more suitable locality. This step once decided upon, however, preparations were made for securing a structure worthy of succeeding to the renown of the old church. Land was bought on the corner of Commonwealth Avenue and Clarendon Street, and a competition was instituted for designs, which resulted in the selection of that presented by Mr. Henry H. Richardson, then a young man, and except for his successful career at the Ecole des Beaux-Arts little known as an architect. Mr. Richardson's original and effective design has been repeatedly published, and is probably familiar to our readers. The most striking feature consisted in the tower, which was carried out nearly as designed, and has long formed one of the most interesting architectural objects in the city. In itself it is a plain, square mass, with well-studied openings, and treated in a style of subdued polychromy by the use of different shades in the stone, but it is surmounted by a frieze of colossal bas-reliefs, which not only give an extraordinary value to the design as a whole, but are themselves made more imposing and conspicuous by the height to which they are raised from the ground.

IN carrying out this original conception, Mr. Richardson secured the assistance of the sculptor Bartholdi, who, after some correspondence and an attentive study of the drawings which were sent him, forwarded from Paris four sketch models, on a small scale, but exhibiting all the best features of the actual work. These were accepted, and working designs ordered, at one-fourth the full size, and Mr. John Evans was engaged to reproduce them upon the huge slabs of freestone which were already in place. Two of the models arrived safely, and were faithfully carried into execution, but the remaining two were lost at sea, and as time pressed, Mr. Evans undertook to cut the panels which they represented from the small sketch designs. With the help of suggestions contained in M. Bartholdi's letters, and under the assiduous care of the architect, this was done, and it would be difficult to detect any variation in style between the panels cut under such different circumstances.

ABOUT this time one of the most active members of the building committee which had the new church in charge died, and for various reasons it was decided to make certain modifications in the interior arrangement. The galleries, with which it was proposed to break up the broad surfaces at the east end and in the north and south transepts, were omitted, with, as it proved, a most unfortunate effect upon the acoustic quality of the building. No sooner had it been completed and occupied than the existence of an annoying echo in the body of the auditorium became painfully manifest, and although some efforts were made to remedy the trouble by stretching wires and hanging cloths about the walls, the effect soon began to manifest itself in a diminished attendance at the regular services of the church. More troubles came upon the parish, and ultimately the society disbanded; the building was closed, and its owners dispersed themselves among the other congregations in the neighborhood. Repeated efforts were made to sell the structure, even at a large sacrifice, and finally it was put up at auction, and bid in by a private gentleman, without any particular purpose as to the use to which he should put it. Suggestions were made that it should be bought by public subscription and preserved as an architectural monument, but as the tower was the only portion of any extraordinary interest, the

expense of this step seemed disproportionate to the advantage gained. Now that it is finally determined to remove the whole, it might, however, be well to keep intact at least the noble bas-reliefs, to be exhibited permanently in some appropriate manner for the instruction of students and the public, who will not soon have another such opportunity for studying the principles of architectural sculpture on a colossal scale.

The project for a World's Fair in Boston has been brought again to public attention by a meeting of all the sub-committees assigned by the general citizens' committee to consider the various branches of the subject. Their reports upon the site, probable cost of buildings, the income which may be anticipated, the permanent organization of the enterprise and other particulars were presented, but no final decision is yet announced. Early in October another meeting will be held, and definite action is expected. The offers of coöperation from other cities of New England, and from local trade organizations, have been so warm, and made with such unanimity, as to make it quite probable that the committee will recommend the formal adoption of the enterprise. In this decision the great body of local sentiment would undoubtedly sympathize. Circumstances have for some years been very unfavorable to those citizens of Boston who would have liked to use their capital in enterprises which would promote the prosperity of their own city, and the resources which in New York, Philadelphia, or Baltimore would have found employment at home have gone to develop the South and South-west, the North-west and Mexico, until even among the Indians the name of Boston is a kind of symbol of the white man's innovations; and the activity incident to an international exposition, even without the extraordinary stimulus which it would give to manufactures, would do much to break the chain of narrow and short-sighted provincialism which has kept the city so far behind its rivals. Unquestionably there is money and enterprise enough in Boston to carry out a much greater undertaking with brilliant success; whether the advantage to accrue from it will be sufficient to attract money and energy into it will depend very much on the attitude which the State and City governments take toward it.

Some time ago a sewer was built in the Fifth Avenue, in New York, near Fifty-sixth Street, and the excavated earth was so carelessly returned to its place that its weight pressed down and broke a gas-main, causing a leak which soon allowed the gas to saturate the ground about it, and even to penetrate the neighboring cellars. A day or two ago it caught fire in some way, and a violent explosion was the result, causing some damage. The breaking of a gas-main is so common an accident that the public should be warned against the dangerous character of a mixture of illuminating gas and atmospheric air. According to some chemists the maximum of explosive energy is reached when the gas is mixed with eight times its volume of air, and a compound containing a far larger proportion of air may cause serious accidents. A break in a main conveying a thousand cubic feet of gas per minute may very quickly develop an enormous explosive force by admixture with the air contained in the interstices of the ground around it, and the first appearance of a leak should be followed immediately by measures of precaution.

The Steam Heating and Power Company of New York, which was organized two years ago, and went so far as to obtain authority for laying pipes in the streets, has been succeeded by the New York Steam Company, a large corporation, made up apparently, as such bodies often are, of private capitalists who use the corporate form in making investments, but without public announcement of their intentions. The capital of the new company is said to be seven and a half million dollars, but none of the stock is offered for sale, nor has any prospectus been issued. Vigorous operations are, however, now in progress, and in Greenwich Street, north of Cortlandt Street, the company is laying large pipes. Plans of the entire system have been filed with the Commissioner of Public Works, from which it appears that ten boiler stations are to be established between the Battery and the Central Park, from which steam will be distributed by means of mains, in the same way that gas is now delivered. Each consumer is to be furnished with a service-pipe and meter, and regulators are applied which will fix the pressure at the point desired for any purpose, from one or two pounds per square inch, which will be sufficient for heating purposes, to eighty pounds, which will answer the requirements of any ordinary engine. The main pipes are of rolled wrought-iron, from four to fifteen inches in diameter. All of them are carefully packed with mineral wool, and the larger ones are finally cased with brick, while the smaller run in wooden boxes, protected from dampness by wrapping with roofing-felt and tar. All the condensed water is returned to the boilers, at a great initial expense, but with ultimate advantage in point of economy in working. The practice of "hiring steam," even from long distances, is now so common in the business part of New York that the success of the new system in supplying power is almost assured; but whether its use for heating purposes will be found always compatible with a satisfactory service in other respects is perhaps doubtful, although the great resources of the company should in the end insure success.

Several cases of malarial disease have been reported in the vicinity of Boston, two being near the banks of Fresh Pond, a natural lake which furnishes the water-supply for the city of Cambridge. The others have been in river valleys at a somewhat greater distance. As in so many other instances, the infection is attributed to the neighborhood of mill-dams, which cause frequent fluctuations in the water-level, exposing the margins to the action of the sun. At Fresh Pond, although the circumstances are somewhat different, the large consumption of water in the city often exhausts the supply so far as to leave a considerable portion of the bottom bare. The outbreak is not to be attributed to any contamination of the water, for the pond is kept from pollution with great care, and it has before been observed that the rivers running through some of the most malarious valleys in the State are pure mountain torrents. That a change of level in the more stagnant portions is the most important factor in such cases is beyond doubt. Years ago it was a tradition among physicians that all the cases of ague which ever appeared in Massachusetts had occurred upon the draining of neighboring mill-ponds; and whether the relation is one of cause and effect or not, the connection of the two things still continues almost invariable. As usually happens toward the close of the summer season, typhoid fever, as we learn from the Boston *Herald*, has been very prevalent, particularly near the seashore. At Nahant, a rocky watering-place on the north shore of Boston Harbor, there have been some thirty cases. We have before pointed out that the summer villages which crowd the granite promontories of the coast of Massachusetts Bay are most unfavorably situated for permanent healthfulness. The impermeability of the subsoil prevents the diffusion of household wastes through it, and they escape by the narrow seams in the ledge, which are too apt to be also the water-bearing veins which supply the wells of the neighborhood. In this way the typhoid or choleraic infection, once introduced, may spread with fearful rapidity, as has been repeatedly demonstrated in England.

Speaking of the public improvements which are projected in the French colonies of Algeria, a correspondent of *Le Génie Civil* mentions some facts of great interest. It is well known that under the Romans and Carthaginians Algeria was a fertile and populous country, and the remains of important cities are found in the midst of what is now an uninhabited desert. This change in the character of the region must be attributed, M. Dehérain thinks, to the different climatic conditions following upon the gradual destruction of the forests which once covered it, and he believes it possible by assiduous tree-planting, to bring it back to its former fertility and prosperity. That the soil is not yet, like that of Arabia, for instance, destitute of the elements requisite for the growth of vegetation is shown by the circumstance that in the rainy years, which occur four or five times in a generation, plants spring up in great numbers, and grain ripens perfectly, but, as a rule, the rains are infrequent and violent, filling the ravines with torrents, which die away in a few hours, leaving the earth nearly as dry as before. That such conditions usually follow the denudation of an extensive district is now definitely known, but M. Dehérain was able to make an observation which would suggest that the effect may be produced on a smaller scale than is generally imagined. Riding one day, when appearances indicated rain, through the desert country, at some distance from the Boghari mountains he noticed as the clouds moved over the partially wooded mountain slopes the long gray streamers of rain descending upon the forests, but upon these alone: over the cleared portions there were none; and on the plain not a drop of rain fell.

THE DISPOSAL OF HOUSE DRAINAGE.

Although much has been written and said upon this subject of late, its great importance, arising from its intimate connection with the health of our families, may justify a further consideration of the general principles which should be observed in its treatment, as determined by the light of modern experience.

Much improvement is observed in the practice of the best plumbers in our large cities within a few years. The public has learned to demand certain things as essential, and local boards of health, wherever such work has come within their control, have aided much in the diffusion of information, as well as in advising improved methods. Among such items of better practice may be named the following: —

The substitution of metallic pipes, with metallic joints, for earthen pipes and cement joints for all drains inside of house-walls.

The extension of the waste-pipes through the house-roofs into the open air.

The provision of more adequate quantities of water for the flushing of water-closets, and its application by a sudden dash from tanks near at hand instead of dribbling streams from the opening of faucets or small valves attached to the supply-pipes.

There has also been more attention paid to improved forms of traps and their ventilation, although the old-fashioned D-trap and its variations are still advocated by certain plumbers who cling to deep ruts and ignore the reasons often publicly given for their condemnation.

I may add also a marked inclination to follow English examples by interrupting the flow of air from cesspools or sewers through the house-drains themselves. This is done by the construction of suitable disconnecting traps, with ample air-vents, outside of the houses. Although some difference of opinion exists as to the importance of this practice where good sewers are provided, arising from the supposed cleanness of the sewers themselves, there is no intelligent advocate of the omission of such traps wherever the drainage is collected in *cesspools*. Nevertheless, the construction of such traps in actual practice is the exception rather than the rule in most country houses, and if they are inserted at all, it is often done without sufficient provision for the ventilation of the lower end of the house-drain itself. This drain is deprived of its ordinary air-draught from below by the interposition of such traps, and if the connection with the open air at this point — directly above the trap — is not provided, the result is attended with much trouble.

But while rejoicing at the signs of improvement which I have here referred to, I can but lament at the sloth and apparent indifference with which the mass of our people regard the subject of the ultimate disposal of their house drainage or sewage, especially in suburban districts and isolated houses, where no sewers are found. This part of the question has received comparatively little attention, so that the same general practice is to be seen now, under the present conditions as to water-supply and the present demand for plumbing fixtures and conveniences, which existed twenty years ago, under circumstances which were far less likely to produce harmful results than the present modes of building and living are likely to do.

The ordinary method in constructing country houses, whether the villa, intended as a home for a family with ample means, or the village residence of a small tradesman and mechanic, is generally as follows: A pit is dug in the earth, often within a stone's-throw of the house, for the lot may not be large enough to go farther, and this pit is lined with a wall of loose stones or brick, without regard to tightness, into which all the house drainage is conducted. A cover is provided, of planks or stone, and this is often buried a few inches with earth, for fear of its "making a bad smell near the house." The theory of such pits is specious enough; viz., that the soil has unlimited powers of absorption, enabling such a pit to drink up and render neutral all the filth which the family discharge into it without the slightest further attention on their part. Sometimes, it must be confessed, the liquid is found to have filled the pit, and to be either oozing out upon the neighboring surface or backing up into the house through the drain; but the head of the family is by no means disconcerted by this apparent failure of his plans. He sends for a mason and constructs another pit like the first, a little below it, to take its overflow. In fact, sometimes three or four of these nests of pollution are made in a row, each one disgorging into the next, and the proprietor thinks he has an admirable arrangement, for the nastiness is all out of his sight, and generally beyond the reach of his other senses. If he knows enough, he will have provided a good running-trap just outside of his house, with an ample air-vent for the house-drain, so that the fermenting contents of this chain of retorts cannot so readily send their gases into his house.

Suppose this safeguard to be properly applied, which is rarely the fact, what is the result? Are one or more holes in the ground about a house capable of receiving, decomposing, and rendering harmless all the filth which a family throw out from their household? Experience has shown that when left to accumulate and ferment in such pits as I have described, the decomposition is very imperfect, and the accumulation of filth in the pores of the soil is constant and progressive. Any one can satisfy himself of this fact by emptying such a cesspool and digging out the surrounding material after it has been in use for a term of years. He will find the soil saturated with a black, slimy, stinking fluid, nauseous beyond description, and reaching beyond the cesspool-walls to an extent limited only by the want of pores in the material which happens to lie there. If this is loose gravel or sand, the fluid penetrates it readily at first, and its traces can be found for several feet, if not several rods from its origin; but the pores gradually become filled and refuse to take more, so that if not frequently emptied, the pit must be relieved by an overflow as above described. With small families, consisting of but six persons or less, where the soil is naturally porous, and if the family uses but little water, such as they pump for their daily wants, this arrangement may continue indefinitely without *apparent* harm. But the more porous the soil, the farther will the percolation extend from its centre, and the larger the mass of polluted earth will become. Even in clayey soils and rocks there are often found cracks and seams which serve as channels for such percolation for an indefinite period. Its course is naturally downward, in any direction where such cracks may lead it, and is by no means controlled by the direction of the slope of the surface. Such cracks and pores serve to absorb, and to lead into and through the soil, an enormous quantity of rain-water in this climate, at least fifty per cent of all that falls. In the neighborhood of Boston the annual fall of rain is about forty-four inches. This amounts to no less than five thousand tons per acre, so that at least twenty-five hundred tons per acre are absorbed here by the soil every year, most of which is again given up to the air by evaporation, either directly or through vegetation.

Now the class of houses I have just been considering derive their supply of drinking-water mostly from wells, which are merely holes in the ground in which the rainfall is caught or intercepted while so percolating through the soil. It is generally the same water which has fallen in the form of rain upon the surface immediately about the well: for, though underground springs or streams may sometimes bring it from a more remote point, such sources are purely fortuitous and always uncertain and obscure. It is easy to see that the more porous the soil the less trouble a cesspool will give its owner by getting filled up and needing frequent cleaning out. But such a state of things is pretty sure to poison the source of the family's water-supply sooner or later, if this be drawn from a well within a few rods of the cesspool. This result will follow, even though the latter be on lower ground than the top of the well, for the water is drawn from the bottom when the well is low, and this point is almost invariably a good deal below the cesspool.

It seems needless to enlarge upon the risks incurred by mixing the house-refuse with the drinking-water. Such a condition is repulsive enough to disgust the coarsest sensibilities. But a general belief prevails in the community that their wells are supplied from some mysterious sources — "living springs," as they call them — coming from some unknown depths, and bearing but little relation to the water falling on the surface near them. The fact is that even where such springs exist, they are not the *only* sources from which such wells are supplied, and almost any person can convince himself of the fallacy of this faith by a very simple experiment, viz.: Empty a bushel of common salt into the cesspool after testing the well-water for salt in a dry time, and then test it again at intervals of a few days for a month afterwards. There are but few soils in which a connection between the cesspool and the well could not be thus detected, if the distance between them were not much greater than the depth of the well.

In the report of the State Board of Health, Lunacy and Charity of the State of Massachusetts for 1880, an instance of this sort is related, which I quote, as follows: —

"If the risk is not in all cases great from the contamination of wells by vaults, etc., yet it is often unsuspected, so far as any taste, smell, or appearance of the water is concerned, and may be attended with the most serious results, a striking illustration of which is furnished by Dr. George Atwood, of Fairhaven, as having occurred in his experience.

"In the latter part of August, Mr. —— was ill with what seemed to be dysentery, but not so as to prevent his keeping about. On the 7th September he felt quite ill and sent for Dr. Atwood, who pronounced the disease typhoid fever. In the meantime his dejections had been passed freely in the privy vault, which was *one hundred feet distant* from the well (nearly twenty feet deep), and separated from it by a dry gravel and loam. After this date there were two heavy rains, presumably washing the fluid and soluble portion of the excrement from the vault, through the soil into the well by a channel already formed, or by soakage into the ground-water. The water in the well was very low at the time, and could be all pumped out in a few minutes. September 30, the wife became ill with typhoid fever. October 3, a daughter became ill with typhoid fever. October 6, another daughter became ill with typhoid fever. October 7, two sons became ill with typhoid fever. October 8, another daughter became ill with typhoid fever. October 12, another daughter became ill with typhoid fever.

"The youngest boy had the disease in a mild form, beginning about the middle of October. An examination of the well-water by Professor Nichols, October 17, showed that it contained in parts per one hundred thousand: —

Ammonia	0.001
Albuminoid Ammonia	0.013
Total Solids	20.03
Chlorine	3.3

"In order to ascertain whether there was a direct communication between the vault and well, a bushel of coarse salt was put in the vault October 24, and a bushel of fine salt October 31, and the subsequent chemical examination gave the following result: —

"Amount of chlorine in parts per 100,000.

Dates.		Dates.	
October 26	3.9	November 17	3.4
October 29	3.9	November 20, rain	3.3
November 2	4.0	November 23, water low in well	3.1
November 5	4.4	November 26	3.1
November 8	3.5	November 30	3.0
November 13	3.4	December 3, water low	2.9

While before putting in the salt the chlorine was, as stated above, only 3.3.

"It seems clear that the effect of the salt was directly felt in the well, and that there was abundant opportunity for the dejections of a man ill with typhoid fever to pass into the water which his family were in the habit of drinking. No other cases of typhoid fever were known to have occurred in the vicinity during the summer."

It must always be remembered that water which is drawn from a well in time of drought, when the supply is low, is drawn from the pores of the surrounding soil *in any direction*. So that if we lower the level of the water in the well by continued pumping, it will be partially restored by other water running in to replace it from one side as well as another. In short, a well thus pumped down in a dry time serves to drain an inverted cone of soil, of which the bottom of the well is the apex, and the base of which may be a large area of the surface around the top. The distance from which such water may soak through the pores or cracks of the ground is quite indeterminate, and may often be far greater than the dimensions of a house-lot of an acre or more, so that any store of pollution situated on the same acre may have constant and ready communication with the well through the pores of the soil.

But, it is often argued, the soil filters the water and renders it quite clear and pure, and "the well water is very cool and refreshing." This notion, too, is far from being founded upon facts, and contains a dangerous fallacy. Such a conviction probably arises from the known absorbent properties of humus, or garden loam, and from the practice in vogue among all civilized people of burying their dead in the ground. But the soil of cemeteries is well known to have accumulated vast quantities of organic matter which is only partly decomposed, if buried as usual at a depth below the reach of a constant circulation of air through the pores of the soil. In fact, few people would wish to drink water from a well dug in a cemetery.

The conditions surrounding the ordinary cesspool or privy vault are not very unlike those about a tomb. The air has but little access to the decomposing matter, and the process of decomposition is therefore necessarily very slow. The surface-soil, or humus, rarely extends far below the surface, and even if it does, as in the prairies of Iowa, the air does not circulate with much freedom more than a few inches below the surface. The absorbent powers of the best humus are chiefly dependent upon the *air* in its pores, and the active decomposing agent is the oxygen contained therein. Just as soon as these pores become once filled or saturated with the filth of a cesspool or privy, the efficiency of such humus as a deodorizing or purifying agent ceases at once. Its action is at first partly that of a mechanical filter, by which the solid particles held in suspension are separated from the fluid, and partly a chemical action wherein the oxygen of the air held in the pores decomposes and slowly burns up the organic matter, even when held in solution. The water of sewage, after passing through such a filter and clarifier, may be limpid and sparkling, and may be cool and refreshing to the taste, while yet holding in solution a quantity of organic matter liable to rapid change upon exposure to the air, and capable of communicating disease with certainty and rapidity. The transparency, coolness, and freedom from bad taste is no criterion for the fitness of such water for domestic uses. Those qualities are, unfortunately, common enough in many poisonous mixtures, so that we can never rely upon the healthfulness of any water which is drawn from sources where this sort of contamination is possible.

But, it may be argued, the method of supply from wells is fast being abandoned in our towns and larger villages. Whenever circumstances admit, a public water-supply is found and water distributed through the streets.

The possible advantages of such a method, when a proper and reliable source is found, are beyond question, but it must not be supposed that such an improvement renders the private cesspool and privy vault any more tolerable or less harmful. A community may, it is true, thereby escape the poisoning of its drinking water, but many other and new sources of trouble arise, as follows: —

As soon as water under pressure is introduced to houses in pipes, and the labor of pumping is saved, the consumption of water for domestic and laundry purposes, water-closets, bath-rooms, etc., is found to increase at least five-fold. Indeed, unless more perfect fixtures than the average of those now sold are demanded and paid for at their higher cost, the leakage through the ordinary cheap fixtures will soon bring the consumption up to ten or twenty times what it was when supplied by hand-pumping. The quantity of filth discharged from the houses may not be increased, except as dependent upon an increase of population, but the volume of the house drainage which is thus sent into the cesspool is soon found to be beyond its powers of absorption. Many cases have come to my notice within a few years, where this trouble has become apparent to the senses, and many hundreds, yes thousands of others must exist where the evil is going on in the hidden accumulation of filth beneath the surface, and though not apparent to the senses, it may exert an influence no less baneful to the health. Sometimes the cesspool overflows upon the surface, making a nasty, muddy place in the grass overgrown with rank herbage. Sometimes it oozes through the ground, following along the outside of the house-drain that brings it, and soon makes its appearance under or through the cellar wall. I remember one case where it soaked in under a pile of coal, out of which the half-filtered and foul liquid slowly worked its way about the cellar floor. It frequently covers the mouth of the inlet in the cesspool, by which the usual circulation of air through the drain is stopped and the foul gas is drawn out through the traps in the basement story. The undue pressure finds new leaks in the drain, and works an untold amount of mischief in the dark, where least thought of and never seen. But even where the workmanship is perfect, a rare case, so that the fluid cannot come back or leak out within the house walls, the result is far from a desirable one. New overflows and additional cesspools are made, one after another, till every available place is exhausted, and the pollution reaches the boundary-line of the owner's lot, and still no relief is found. The absorbent powers of the soil being soon overtaxed, the accumulation goes on, pressing into every available crack till the whole of the immediate vicinity of the house is a mass of corruption. The more water is used in the house, the worse is the nuisance. Repeated calls are made upon the apparatus provided for emptying cesspools and vaults by the public authorities, but as the soil becomes more and more saturated, these operations become so frequent that their cost is quite onerous, besides being a nuisance in themselves. Moreover, the soil about the house is becoming pestiferous. Emanations are going on constantly during the warm weather from soils in such condition, which are at least depressing to the vigor of the inmates of the house, if not actually poisonous. What is the rational remedy for this state of thing? I know of none but the removal, complete and thorough, of all house sewage, at once, constantly, and rapidly, from the immediate vicinity of the houses, and the abandonment of all vaults and cesspools or similar places where filth can be retained to putrify within the limits of small house-lots.

In cities and villages where a public water-supply is provided, the removal of filth should also be provided by the public authorities, by means of well constructed sewers. Hundreds of towns have recently found themselves in a dilemma by introducing a water-supply without sewerage. Sanitarians are all agreed that the former is no real advantage without the latter. The new complications arising as above explained will inevitably be followed by the penalties imposed by Nature through her fixed laws, and it is the part of folly for man to ignore them and attribute the terrible results to "mysterious dispensations of Providence." Unfortunately, such penalties often fall upon comparatively innocent parties. No man can trace the exact source of many individual cases of disease, which are, however, as a class clearly attributable to mistaken ways of living in the whole community.

It follows, therefore, that public authorities should more fully realize and study their responsibility before undertaking enterprises which may complicate rather than relieve the public needs. The subject is a broad one, deserving far more study and attention than it has hitherto received.

There are, however, a large number of cases where a public water-supply is not afforded, and where the construction of sewers would be a still more serious burden upon a scattered population. The remedy for them cannot, perhaps, be through combined action, but it should be governed by the same considerations as to speedy and thorough removal of all refuse from the neighborhood of houses, and the avoidance of all accumulations in cesspools or vaults. Wherever ample land surface is found, *i. e.*, where houses are surrounded by lots of an acre or more for each within their control, the question is a comparatively simple one. But it becomes more difficult on smaller house-lots and in villages, though of still greater importance in proportion to the nearness of the houses to one another, and the consequent crowding of wells, vaults, etc.

The most rational and approved methods of disposal of house-drainage, whether from large towns by combined action through sewers, or from small villages and detached houses, are as follows: —

First, where Nature provides deep and copious streams or deep tidal waters, to use these for such disposal, though this method is rarely applicable to a scattered population.

Second, to distribute the fresh sewage on or near the surface of the soil by irrigation, a process equally available whether upon a large or a small scale, though somewhat more costly in the latter case.

The exact methods to be pursued to accomplish this in detail must vary with local circumstances. The cardinal principles to be observed are these, viz.: —

Never allow a receptacle of fecal matter or liquid filth to accumulate any store of it for putrefaction, but keep it moving till it can be distributed upon or near the surface, and see that such distribution is so effected as to avoid the saturation of the soil or the collection of the liquid in pools.

Use if possible two fields alternately for the absorption of the fluid, allowing each in its turn to rest for such a period as may allow all the liquid to soak down a foot or more below the surface. This will ensure the entrance of fresh air into the pores of the soil as the water subsides, and this air is, as above explained, an important agent in the decomposition of the organic matter retained by the soil in the process of filtration. Grass is found to be one of the best crops for general use upon land used for sewage irrigation. Its

stubble prevents the surface from being washed, and assists in the uniform distribution of the fluid, while its roots readily absorb and appropriate a very large amount of the organic matter.

It has often been objected to the process of sewage irrigation that it must necessarily make a nuisance in itself, and that we therefore only transfer the trouble to another locality. But experience does not justify this objection. The process is now in use in a large number of English towns, as well as on the continent of Europe, with no such prejudicial results.

Dr. W. H. Corfield, at a recent meeting of the Sanitary Institute of Great Britain, in London, while alluding to the subject of sewage farms, stated that "the supposed dangers from the vicinity of such farms, or from the spread of entozoic disease, were found to be purely imaginary. It was, on the whole, a better solution of the question for a large number of places than any other, and if, as was very likely, we had a series of dry years, its adoption would receive a great impulse."

I would also invite attention to the practice of distributing sewage on the surface, which has been pursued for over a year at the Asylums for the Insane at Worcester and at Danvers, Massachusetts, and at Augusta, Maine. All of these instances, though rather crudely developed, and involving some objectionable details not essential to the process, have nevertheless been so far successful that they have not yet been followed by increase of disease, but rather the contrary.

In short, experience as well as theory has taught us that the processes of vegetable growth are the readiest and safest agents for the disposal of all our organic refuse. Nature provides that the animal and vegetable kingdoms shall each absorb and retain for its use the elements which are rejected as harmful by the other. Plants feed upon carbon contained in the carbonic acid which animals excrete from their blood in the lungs, and also feed upon the ammonia evolved by the decay of all kinds of fluid and solid animal excretions. On the other hand, man, like all other animals, absorbs oxygen as an essential agent in all the functions of his development and growth, an element which all plants reject, while absorbing the carbon from the carbonic acid of the air.

We have therefore only to avail ourselves of this universal law, and to conform our lives to it in detail, in order to attain the most healthful development that is possible. It is through our ignorance and our stupid violations of such laws that most of our suffering and disease is brought upon us. E. S. Philbrick.

THE SCIENCE AND ART OF ANCIENT EGYPT.

The subjects of this concluding paper, Egyptian Science and Art, may seem less attractive than those already discussed.[1] Yet when we consider the scanty resources of the Egyptians in mechanical appliances, and the astounding results which they achieved; and when we observe the imaginative quality of their noble art, our interest is aroused. Still more, when we find that the pedigree of modern science and art takes us up to Egypt as a principal source of science, and perhaps the only source of art, the desire to discover for ourselves is added to our first sentiment. The earliest science, and the first great school of art, have never been properly studied, because the materials have not been set in order, nor the comparative bearing discussed. This can here be done but very slightly. Still it will be well if more competent students are stimulated to explore a curious and fruitful field of research. The materials on the side of science are mostly accessible to all; those on the side of art are absolutely so. . . .

MECHANICS.

We know much of Egyptian mechanics, not in the theoretical but in the practical branch of the science. Unhappily no treatise has yet been discovered. The evidence of the sculptures, though valuable, is scanty. Our knowledge is due to the structures themselves, and the inferences they suggest. The whole process of building, from the cutting of the stone in the quarry to its final placing in the edifice, often involving transport across the desert or by the river, and elevation to great heights, shows a great mastery of practical mechanics; and besides this the constructive contrivances are ingenious.

The Pyramids are the most characteristic Egyptian buildings, and, at the same time, those which show the highest mechanical skill. Each pyramid, was, as a rule, the tomb of a king, usually begun at his accession, and continued so long as he reigned. It needed therefore to be built on a plan which should admit of constant enlargement and rapid completion when it was needed for a sepulchre. First of all, a suitable site had to be chosen on the low table-land of desert rising behind Memphis. Next a peg of rock was found to serve as a pivot for the structure. Within the rock, a sloping passage was cut from the north, large enough to admit of the lowering of the sarcophagus, to be placed in the sepulchral chamber at the end of the passage. The angle of the passage was, as Sir Henry James has shown, that known to mechanicians as the angle of rest, an inclination at which the weighty sarcophagus could be moved or stayed with the least application of force. Around the rock, a cubical mass of masonry with sloping sides was built, through which the sepulchral passage was continued. If the king died, all that his successor had to do was to fill in the sides and surmount the cube with a cap: the pyramid was then complete. But if the reign was prolonged, the king built around and above the original mass of masonry, so as to construct a pyramid of two, three, or more steps, of which the angles were filled in at last, and to which the cap was added.

The height of the Great Pyramid, the tomb of Khufu, or Cheops, of the Fourth Dynasty, was originally 480 feet 9 inches, and the base 764 feet. It is virtually a mass of solid masonry, for the rock must take up but a small proportion of the interior, and the chambers and passages have no appreciable relation to the whole bulk. The material chiefly employed is the limestone on which the structure stands, which was in part cleared away to make a level platform; but the finer quality, used for the casing-stones, and lining of passages, was quarried on the other side of the river, nearly ten miles away; and the red granite, also used for inner casing, and for the sarcophagus, was quarried at Syene, at the extreme south of Egypt, nearly 550 miles away by the course of the river. We must remember that the Third Pyramid, now 203 feet high, was cased in part, or wholly, with granite of Syene. How did the Egyptians contrive to transport and raise these vast blocks of stone? Let us look at the whole process.

First the labor of quarrying, without any of the modern aid of blasting, must have been enormous, especially when the hard red granite, which turns the edges of our modern steel tools, and yet was cut by bronze ones, had to be hewn out and shaped into accurate blocks. The transport to the river was not difficult, and the descent on rafts, during the high Nile, would have met no risk but from sandbanks. At this period of the year the rafts would have been brought by a canal very near the site of the Pyramid. A causeway, of which there are remains, would have made the land-transport less difficult. But it must be remembered that the only mode of moving great masses on land was by means of sledges drawn by men or oxen. So far we see only a vast expenditure of almost unaided labor; how vast we do not appreciate, for it is beyond imagination to master the tremendous work; we are constantly confused by our being unable to cast away the modern notions of facility to which we are accustomed.

All this preliminary labor was followed by the actual work of building. The Great Pyramid is not a mass of piled-up stone; it is a model of constructive skill. A sheet of paper cannot be placed between the casing-stones; and we can scarcely imagine that any mortar was spread on their sides. The passages present no roughness that could arrest the sarcophagus. Everything was exquisitely finished. Allowance was made for the pressure of the vast mass. The great chamber of the sarcophagus has no less than five small chambers above it to lighten the superincumbent weight; over the entrance of the first passage two great stones are placed in a vaulted position for the same purpose; in consequence nothing has given way.

Our real difficulty begins when we endeavor to explain any mode by which the great blocks of which the Pyramid is built were placed in position at their various heights, until the top-stone was put upon the summit, and the work of casing completed the wonder. It would be easy to find a method if it did not entail as much labor as the building of the Pyramid itself. Rejecting any such views, the most reasonable conjecture that can be offered is that inclined planes ran along the side of the giant steps in which the Pyramid was built, and that the stones were dragged up by the workmen.

It is necessary here to note that when the mummy of the king had been placed in the sepulchral chamber, the entrance passage was permanently closed, and heavy portcullises lowered at intervals; this needing great mechanical skill. The chapel attached to each pyramid for the sepulchral rites was built at a suitable distance in front of it, contrary to the practice in the tombs of the subjects around, in which the chapel was constructed in the mass of the masonry, or hewn in the rock.

The final closing of every pyramid, which was the universal custom, is an important fact, which is in itself enough to disprove a scientific heresy, according to which deep secrets were concealed in the heart of the Great Pyramid for the enlightenment of remote generations. Professor Piazzi Smyth does not consider the red granite sarcophagus a royal coffin, like every other sarcophagus in Egypt, but a divinely-appointed sacred standard, connecting the ancient measures with, for instance, the English inch. Yet more here, and in other parts of the Pyramid, he fancies that he sees the indications of profound astronomical truths, which were unknown to the old Egyptians. This phantasy has been pushed to the length of making the Pyramid, not alone a record of an ancient faith, but a stone prophecy of the ages to come. An Egyptologist may ridicule a theory which destroys the whole value of his labors; a logician may protest against the selection of one pyramid on which to found a hypothesis and the rejection of all others, and the choice of measurements which best suits the evolution of the fancies of the speculator; but the true answer can only be given by good mathematicians. They can explain the reasons of the proportions which have been interpreted away from their original purpose, and show how easy it is to prove anything to the uninitiated by those "dangerous playthings," numbers, which at last deceive the theorist himself. Sir Henry James, R. E., and Professor Wackerbarth of Upsala, have thus abundantly refuted the extraordinary fancies of Professor Piazzi Smyth.

It must not be forgotten that the splendid skill which has produced the mathematical exactness of the Great Pyramid, and, in a lower degree, of its fellows, is far less shown in the later monuments. The mechanical power they imply is that needed for the cutting out, transporting, finely sculpturing, and setting up the tall obelisks and massive colossi. The temples, thus adorned, were placed on the firm dry

[1] See papers in the *Contemporary Review* on "Ancient Egypt in its Comparative Relations," by Reginald Stuart Poole, correspondent of the Institut Français.

rocky surface of the desert, and the builders did not make any provision against the encroachments of the Nile, and the consequent danger to the stability of these edifices. Thus the Great Hall of Columns of El-Karnak is now in danger of destruction. The action of damp has undermined the huge pillars, and eaten into their bases; and it is to be feared that before long the splendid ruin will fall and become a shapeless heap. . . .

ARCHITECTURE.

Architecture, as already said, was the great art of Egypt; sculpture and painting were but its handmaids. The Egyptian statues were usually parts of architectural design; painting was used as wall decoration. In Greece, temples were built to contain statues; and the sculptures which were parts of the general design of an edifice had a higher interest than its architectural forms. Even painting advanced from serving as purely mural decoration to be an independent art. But the architecture of Egypt was complete in itself; its imaginative quality made it express in the fittest form the ideas which suggested it, and tell their stories to the succeeding ages. In all else the Egyptian genius having once attained its highest point of achievement in remote antiquity, remained stationary, or had but fitful movements. In architecture we see a sure advance; and what is still more noteworthy, a power of receiving and expressing foreign ideas in a fresh development that was yet truly native. It is worth while to trace the history and sum up the characteristics of this most ancient school of art.

Darkness overshadows the beginnings of Egyptian art. It has been thought that the earliest tombs of the age of the Third Dynasty show a primitive rudeness, yet the statues found in them are unexcelled by any later works of their kind: they are, indeed, rarely equalled. The signs of infancy are in the architecture and reliefs, while the separate sculptures show maturity. Such a contradiction needs explanation; but that which has been suggested cannot be the true one. Under the Fourth Dynasty we find a fully-developed art never afterwards excelled in its peculiar direction. Like the first mature school of every art it is the best manifestation of the national sentiment which, in later growth, loses its original directness of purpose and fullness of expression.

In the art of the Pyramid age we see the desire for enduring monuments which should typify the belief in immortality which awoke that desire. It is, before all things, an art to last while the world lasts, and to outlive all around it. The disappearance of the Great Pyramid would as much surprise us as the disappearance of a well-known mountain. It seems part of the landscape, free from the human heritage of decay which has crumbled all monuments of later ages within the vast scene we scan from the summit. The forms have no variations in line, or decorations of surface, which could perish with the wear of time. More than this their stern simplicity of geometrical shape suggests the idea of eternity, as if they were the embodiments of ideas such as the Platonists conceived. All around the great monuments is in severe harmony with them. The tombs have the same typical lines, the same typical forms. If they are decorated, the colors are primitive, green alone being added. These colors represent red and green jaspar, lapis lazuli, gold, ivory, and ebony; and it is interesting to note that the Phœnician craftsmen who decorated the gateway of Khorsabad, in colored tiles, actually represented on a larger scale work in these materials, precious stones set in borders of gold. The subjects are arranged in harmony with the main design, the only rich adornment being the imitation of wood-work, which again maintains a strict simplicity. If the so-called temple of the Sphinx be of this age, and not still earlier, it is even more in character with the Pyramids than are the lesser tombs. Its stern forms admit nothing of the facility with which those of the temples of the Empire suggested new adaptations. Its grand plainness is a marvelous contrast to their rich adornment.

The abandonment under the Theban Kings of vast royal tombs is coincident with the appearance of new architectural forms. The monuments are scanty, but they are all marked by a less massive form, and a greater tendency to variety. The square columns of the porticos of the earlier age are cut into the many faces that suggested the Doric shaft: a hall is supported by pillars which have both shaft and capital formed of a bundle of papyrus reeds, the capital taking the shape of the bud. In the same age obelisks appear. Had we more monuments we might be able to define better the art of this time. As we know it, it appears to mark a transition between the simple style of the Memphite Kings and the developed art of the Empire.

The new style, of which there are abundant monuments, may truly be called a development, for it proceeds strictly upon the old lines; but like all growth there is in it a departure from the clear expression of its predecessor. It was indeed due to a national movement, but that movement took its direction from the idea of imperial power. Therefore the expression of durability gave way, in some degree, to that of splendor. The varied forms necessary to the new direction not only failed to convey the old sentiment as simply as before, but in their very nature they could not enforce it by their indestructible quality. Yet had we never seen the Pyramids, the massive strength of the great temples of the Empire would make the same first impression. It is only by comparison that they lose, and we become sensible of the new idea.

Hence it is that we cannot judge of the monuments of the Empire without some analysis of their plan. A temple of this age is not always the same, as is a pyramid. New principles of art produce varied forms.

The main outlines of the temple, as seen in the entrance gateway of the outer court, the front of the building, and the face, or doorway of each successive court or chamber, preserve the sloping lines characterizing the modified pyramidal structures of the private tombs which surround the Pyramids. The sides and back, like the wall of enclosure, are perpendicular. The roofs are horizontal. Thus the ancient principle of the private tombs was maintained, and the mass of the exterior presented the same solid aspect. These severe outlines were only broken by a simple cornice. A pair of obelisks near the main entrance varied the monotony of the horizontal lines, and close to the front were attached towering flag-staffs: other obelisks were raised in the inner courts, especially when their portals were winged.

The details of the interior show a wide deviation from the simplicity of the oldest forms, in the direction suggested by the works of the Twelfth Dynasty. The courts are surrounded by single or double colonnades. The great Hall of Assembly is supported by a forest of massive columns, the higher central avenue with capitals in the shape of the papyrus flower, the lower lateral avenues with capitals of the bud of the same plant. The so-called Osiridean columns, in which a figure of the king as Osiris is sculptured on the outer of the four faces, now appear in the courts. These are the ordinary types. The old severity is obeyed in this limitation. The old desire to produce the sense of durability, and the immeasurable, is seen in three laws. Symmetrophobia, shown in the placing columns of different orders opposite one another, and a colonnade on one side only of a court, increases the sense of magnitude. Still more so does the gradual diminution in the area of the courts and halls, while the height is maintained. But the greatest effect is produced by the size and massive proportions of the columns, and in the Hall of Assembly by their nearness to one another, which, in most positions, forbids the spectator to see any end of the number of the mighty shafts which rise around him. He feels this now that the hall is roofless, and the glare of day reveals every corner. He can only guess what the impression would have been when but a faint light was admitted through the barred windows of the clerestory.

The decorations, sculptured and colored, filled every space of walls, columns, and ceiling. The severe antique scale was maintained, but a greater richness was produced by the more complete coloring, the blank ground being lessened, and the aim being to produce rather brilliancy than a subdued beauty.

Thus while the outer view recalls the old severity of form, with its noble associations, the splendor of the sight within displays the imperial magnificence that produced this new direction of Egyptian art. Yet there is no luxuriance of decay. The taste is uncorrupted. The beauty of line and curve shows that if this were an age of national decay, it was an age of the full beauty of national art in its most splendid phase.

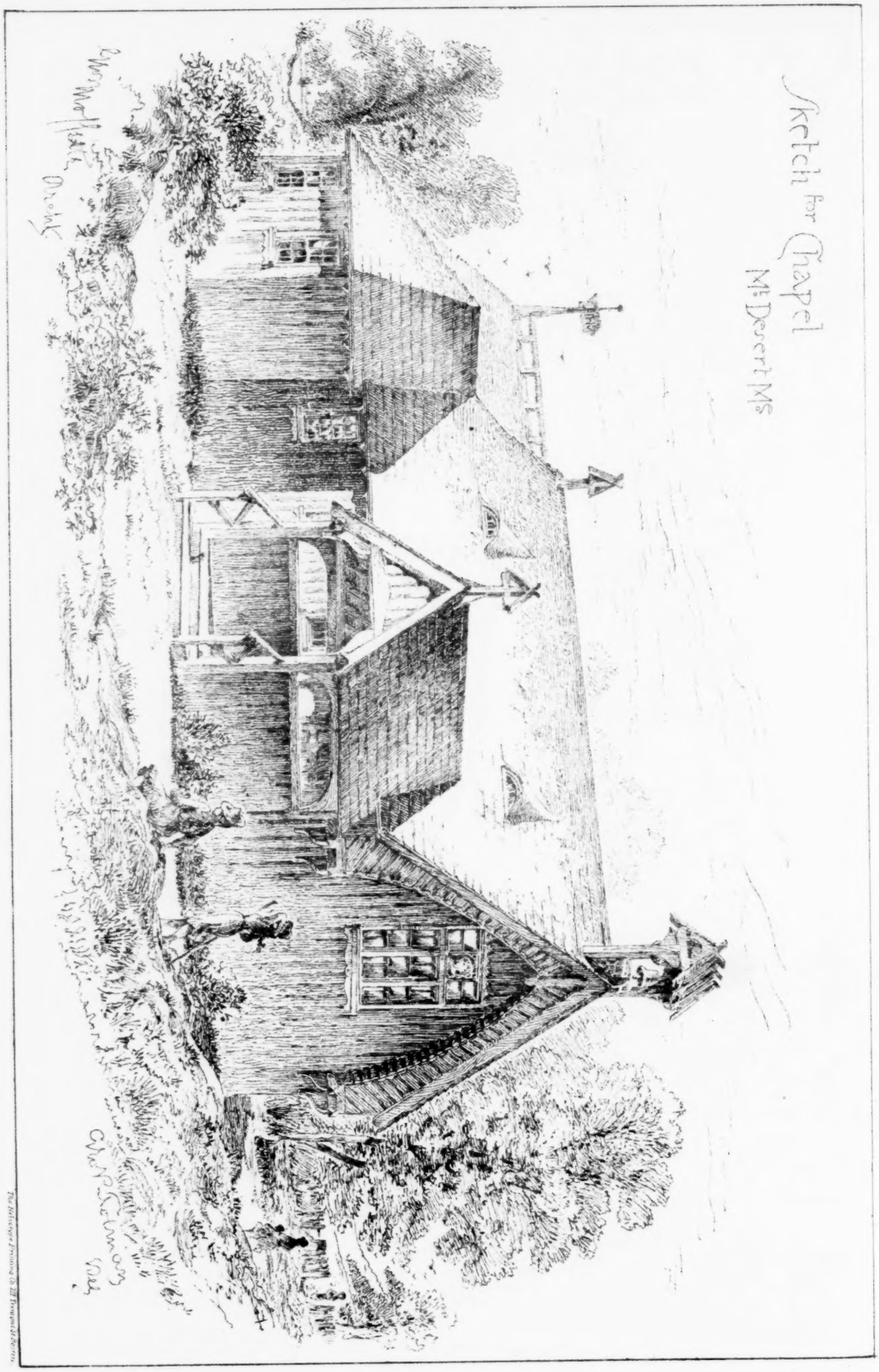
Thus far there is indeed change but not decay. The sense of proportion is not lost in the largest masses or in the smallest details. Fashion has changed more than twice in the art of the scenes which adorn the walls, yet it has not become corrupt.

The fall of the Ramessides was marked by the decline of art. We watch in the royal tombs the work of uncertain hands showing the gradual loss of skill. Dynasty after dynasty witnessed the slow decay that seems to presage a hopeless end. The sense of proportion and of form was in everything more and more lost, until we wonder in the temples at the tasteless work which never, save in some fragment of beauty, attained the excellence of the earlier originals which stood by its side.

The national revival which seated the Saïte kings of the Twenty-Sixth Dynasty upon the throne of Egypt produced a renaissance of national art. The architects and sculptors of this age discarded at once the traditions of the Empire, and returned to the severe elegance of the Twelfth Dynasty. Their buildings were small and simple, but most delicately sculptured. They delighted in little monolithic sanctuaries and sarcophagi of the finest and hardest materials, covered with the most delicate sculptures. It is a labor of copyists; but they are intelligent, and work with love. It is the return of the Egyptians with longing to the old types of the most truly national life. Hence its success. But the Saïte revival lacked the vital force which could maintain it through the troublous age of the Persian conquest and dominion; and though the last native kings strove again to revive the revival, their effort was but partly successful.

At the coming of the Greek rulers, who almost at once followed these Egyptian kings, native art seemed to have fallen to its lowest depth. All the strength and grace of form had disappeared. The hieratic rules were still obeyed; but the clear eye and firm hand of the ancient artist was gone, and the very sense of beauty seemed to have vanished.

Suddenly there came a new impulse. The earlier Ptolemies were national kings. They became Pharaohs among their Egyptian subjects, supporting the religion and the manners of their adopted country. The third of these politic sovereigns, Euergetes the Benefactor, won the affection of the people by restoring in his Syrian war the images which the Persians had carried away. Thus Egyptian and Greek met together to learn from one another, and so there arose a new and splendid art, influenced by Hellenic forms of architecture, still Egyptian indeed, yet having the distinct marks of foreign ideas.



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DESIGN FOR A DRY GOODS HOUSE
PHILADELPHIA.
W. BLODGETT POWELL
ARCHITECT

Here I can only notice the reaction which brought back to Egypt in new forms the gift she made ages before to the intelligence of Greece. One chief object of these papers is to show how Egypt affected other countries, not how they affected Egypt, but in this case I must deviate from my plan so far as to tell how in her seeming decrepitude the ancient country once more revived at the touch of genius, another proof of the flexible power of a race we are too much used to consider immovably conservative.

The discovery is due to the marvellous insight of Mariette. In his long and laborious study of the great temple of Dendaro, he was astonished to see that this edifice, built at the end of the Ptolemaic rule, expressed in its plan the doctrine of Plato, the master spirit of the university of Alexandria in the same age. The old want of system is here exchanged for method. Each part of the temple has its fit object in due sequence. The King presents himself as a suppliant at the great door which he alone could enter. He passes from rite to rite through the successive chambers, and at last, in the innermost sanctuary, before the golden instrument of music, the sistrum, which was the emblem of the goddess of beauty, Athor, he wins the knowledge of the three great ideas of Platonic philosophy, the Beautiful, the True, and the Good. The hymns which cover the walls, translating into Egyptian language the thoughts of Greek philosophy, may have an epicurean sound, but the Platonic theory rules the whole.

It was impossible that such a mental impulse should not find expression in form as well as in words. Though the old skill of hand and knowledge of proportion had departed, the feeling for beauty was not dead. Thus while the art of the details of a Ptolemaic temple wearies us, that of its masses delights us with a new splendor of form and color. The old capitals of the columns are discarded or modified. Instead of two main types, we have so many that no four capitals in a portico several rows in depth need be alike. And these forms though wanting the ancient sense of proportion, are beautiful in their fanciful variety, for they are suggested by the shapes of Greek architecture. The old scale of color is discarded and blended tones are introduced. The brilliant earlier Egyptian decoration was suited to full day or to artificial twilight. The Ptolemaic is exquisite in the clear light of the interior of a hall with open roof, the beautiful Hypæthral Hall of the Temple of Philæ. Had the artists of this age been as vigorous as those of the older times their work would have been the most beautiful in all Egypt. With its defects it has a splendid originality that gives it high rank among the great styles of the world.

The qualities of Egyptian art cannot be summed up in a few words yet some idea may be suggested. This art had an object, and having expressed it as fully as any human work has done, never wholly forgot its true function. Constructive skill it has. Imitation it shows in the power of following Nature and even other art, while still true to its principles of form. It displays fancy always in its decorative skill, but most of all when stimulated by Greek ideas. Above all, it shows imagination, for we never look at an Egyptian building without being startled by the force with which it expresses one great idea, simple or else complex, yet still strong in its unity. The true sense of proportion is here. The knowledge of color is never wanting to complete it.

Comparative Note.

No long comparison need be made between the art of the Egyptians and that of their Oriental rivals. The great temples of the Chaldæan cities were merely buildings of the most elementary kind. The Assyrian palaces have higher claims to art. Yet as compositions they are far inferior to the Egyptian temples. Instead of presenting a system of well-proportioned courts and halls, they are merely aggregates of rooms, the larger of which are without symmetry, from the desire to enclose a great space, while the architects were unable to span a wide roof. The merit of these palaces was in their wall-decorations. The lower part of the walls was covered with slabs, the sculptures of which often show much skill, and in the latest period excel those of Egypt. The upper part was covered with porcelain bricks of simple colors, arranged in patterns which have much merit, though they show a poverty of invention.

The Phœnicians again never rivalled the Egyptians. They were metal-workers, and not architects. Fergusson has well said that the artificers of Solomon's Temple were smiths not masons. Even as metal-workers they lacked originality. Serving every ruling fashion of commerce, they borrowed in succession Egyptian, Assyrian and Greek designs. Yet all they did shows a surprising faculty of adaptation, and a native skill which colored each phase of Phœnician work with an unmistakable hue of its own.

The debt the Phœnicians owed to Egypt opens a very curious inquiry. The Egyptian representations of tribute of works in gold, silver and bronze, the wonders of the great craftsmen of the fifteenth and sixteenth centuries before the Christian era, must be compared with the treasures of Mycenæ and the patterns at Orchomenos, if we would know the oldest Phœnician style. The origin is clearly Egyptian, yet even in this remote age we can discern the Phœnician characteristics. The next link is found in the description of Solomon's Temple, and the oldest metal-work from Assyria and Cyprus. Still we are in the presence of the Egyptian style. The Assyrian and the Cyprian metal-work then show us a mixed Egyptian and Assyrian style and treatment, in which Assyrian taste finally supersedes Egyptian. This history is an important element in our comparative view, for it shows the fruitfulness of Egyptian art. The inquiry might indeed be traced onward, and the elements which Greek art borrowed from Egypt might be explained, but as they came through a Phœnician medium, and, for the most part, after that medium had been colored by Assyrian influence, it is of less interest to follow the descent of style in this new direction.

To put any art by the side of that of Greece is the severest test. The sense of measure and form in the three great provinces of architecture, sculpture, and painting was never so fully given to any other people. Yet if, in imagination, we see an Egyptian temple or pyramid beside the Parthenon, we are conscious of a loftier idea and a more forcible expression in the older work. We can never say of the Great Pyramid that measure and form are wanting, or that it has not surpassed our conception of human limitations.

At the moment when the mummies of some of the great Pharaohs have been yielded up by their secret catacomb, and have revisited the upper air once more, what need is there to plead for the interest of ancient Egypt? The trivial questions of the day are put aside as we look across the vast space of time to the old civilization which has these lips eloquent, though dumb, for its advocates. France has done her duty to science nobly; Germany shares the glory; why should England refuse the appeal which Professor Maspero has made. — *Reginald Stuart Poole in the Contemporary Review.*

THE ILLUSTRATIONS.

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SKETCH FOR A CHAPEL. MR. GEORGE MOFFETTE, ARCHITECT, BOSTON, MASS.

DESIGN FOR A DRY-GOODS HOUSE, PHILADELPHIA, PA. MR. W. BLEDDYN POWELL, ARCHITECT, PHILADELPHIA, PA.

THE FAIR OF THE MASSACHUSETTS CHARITABLE MECHANIC ASSOCIATION. — III.

It is rather annoying to find that, just at the time we were regretting that at this exhibition there was only one example of paper used as a building material, there is an exhibition holding at Louisville, Ky., at which there are shown the very examples of the many ways in which paper can be used in building which ought to have been exhibited here. The Louisville *Courier-Journal* describes these articles at length, and says that the exhibitor, whoever he may be, declares himself able to build entirely of paper a printing-office, the types to be set in it, the press in which they are used, and the steam-engine which shall operate the press. The gentleman's enthusiasm possibly has overpowered his discretion, but he may speak within the limits of possibility. If a paper car-wheel, protected by a thin steel tire, can run 2,400,000 miles without wearing out, it may be possible to use paper successfully in the ways the inventor mentions.

Of the gross building materials there are not many samples displayed, although there was an opportunity for bringing together a very interesting and valuable collection of those materials, both raw and manufactured, which go to form the bulk of all buildings. To most visitors, a cube of granite or sandstone, a red brick, or a section of an iron beam would only offer food for a scoffing remark, but to the architect, such a comparative collection as might have been made would be of the utmost value. Many a moral, too, might have been pointed, as, for instance, by placing one of the cracked and crumbly sand-brick used in Denver, Col., by the side of one of the pressed brick made at Danvers, Mass.

There is hardly anything in which the art of building has changed more in the last fifteen years than in the use of brick. Then a plain, oblong, rectangular block was all that an architect could find, and with it he built plain walls and no more, now and then doing what he could to break the monotony of his work by introducing a plain string-course, or breaking the reveal of a window-jamb into two or three planes. If he ever chanced to come across some examples of moulded brick in the building of an earlier day, such as are to be seen in Hollis Hall at Harvard College, he could but regret that it was no longer the fashion to import bricks from England, and lament the apathy of our brick-yard masters. Now all is changed, and the brick-makers vie with each other as to who shall put on the market the greatest number of varied shapes or produce bricks of the greatest range of color.

Of the several makers of moulded brick who might have exhibited their wares, the only ones represented are the New England Pressed Brick Company, of Boston, who show some of their almost too perfect brick in plain and moulded forms, whose faces seem as if they were too smooth and hard to allow of satisfactory cohesion between them and the uniting mortar, and the makers of the moulded brick shown by Messrs. Waldo Brothers. Some of the forms shown seem to trench somewhat on the ground which should be left for the legitimate occupation of terra-cotta workers. What advance these, who may perhaps claim the title of artisan with better right than most other workmen, have made in the last few years is well shown by the terra-cotta details employed in the construction of the Exhibition Building itself, details which were made by the Boston Terra-cotta Company, who also make an exhibit in the basement. The memories of the Centennial are now dim enough, but the fascinating work in terra-cotta executed by Tinworth for the Messrs. Doulton must have made a lasting impression on many who saw it and had the opportunity of learning to what degree a real artist could overcome the many difficulties which attend the manufacture of terra-cotta. There is nothing in this exhibit that can be compared with Tinworth's work, but the specimens are very creditable, the designs are

good, the shrinkage evidently properly calculated, and the finished pieces are straight-edged and of good color.

Not far away from this is a little table bearing specimens of very porous brick, one side of which have been coated with the preparation of the St. Louis Water-proofing Company, to show how completely a brick wall may be made impervious to air and water. How long this waterproofing solution, which is evidently a preparation of parafine, will endure the action of sun and cold we do not know, but while it does last it must put an effective stop to the very objectionable saltpetring of brickwork so common in some places. So far as can be judged by the specimens shown, it rather adds to than detracts from the appearance of the brickwork, bringing out the color in much the same way as the oil used in Philadelphia and Baltimore. Although Mr. Huxley did not say so, he probably felt as we do that the labor of the "honest bricklayer" produces more satisfying results when it does not rely on the work of the house-painter to heighten its effects or to conceal its defects, and as the only legitimate excuse that can be offered for painting brick buildings in this bright and clean atmosphere of ours is the desirability of making their walls impenetrable to moisture, we may hope that the introduction of this and other waterproofing solutions may banish one more sham from among the building practices he, and we, finds so objectionable.

Near the entrance to the Main Hall the Hallowell Granite Company show how unwise it is to attempt monumental sculpture in granite. Doubtless in the present case the skill of the sculptor or stone-cutter is as much at fault as the intractability of the material, but in any case this thick-ankled, stubby-fingered angel, like the granite goddesses on Horticultural Hall, might well have slumbered longer in the quarry. But what does make this exhibit worthy of attention are the small specimens of the different granites which this company produces, and notably the two spheres of polished granite in front. It would be difficult to find a more beautiful stone than one of these spheroids, rose-tinted and dashed with green; it deserves to be called a picturesque material. It has not the strong, ruddy color of the Scotch or the Bay of Fundy granites, and therefore is not so well adapted, perhaps, for use in masses, but for interior work, columns, panels and pavements, or for those parts of the exterior which are within easy eyesight, it would be difficult to find a material whose varying play of color would yield a more satisfying effect.

Behind this exhibit, in the vestibule, Messrs. Bowker, Torrey & Company show a slab of Star Tennessee marble, which, with one exception, is the only thing that gives evidence of the unmeasured store of marble that lies buried in so many parts of this country, the innumerable varieties of which would worthily furnish forth a separate exhibition. The beauties of American marbles are, however, adequately displayed by Messrs. Wentworth, Roberts & Company, whose handsome exhibit deserved a better fate than was awarded to it by the space-committee. Had these mantel-pieces of Knoxville and Holston River marble been placed side by side with the wooden mantel-pieces of Messrs. Irving, Casson & Company, what the best American workmanship can accomplish when working with American materials would then have been very effectively exemplified. In the three panels which surmount the mantel-piece of veined black Belgian marble these exhibitors show how almost every one could have added to the interest of his display by adopting a similar scheme: in these panels are grouped small tiles of foreign and domestic marble, with which we may assume they are able to furnish their customers. Of the foreign marbles thirty varieties are shown, while forty different specimens of domestic marbles are placed on either side of them. Unfortunately, none of the specimens are labelled so the collection falls somewhat short of its possible usefulness. Beautiful as some of the American marbles unquestionably are, it is easy to perceive on looking at this little collection that the foreign marbles are still more beautiful. We believe that without exception where samples of American and foreign marbles of approximately the same color were shown, the foreign marble was found to be more brilliant and harmonious in tone, and more beautiful in texture.

If one passes from the examination of these mantel-pieces to those on the other side of the hall manufactured by J. W. Grigg, of Boston, he will perceive how closely Art pursues Nature. Even the most careful observer has to stoop and examine the underside of the mantel-shelf before he can decide whether this is the real thing or a sham. As most house-owners do not have the delicate stomachs in the matter of shams that some architects do, and as the relative cost of a mantel-piece of real marble and one of enamelled slate is probably five to one in favor of the latter, we do not wonder at the growth of the industry, and are gratified at the evidence before us of the great progress that has been made in perfecting it.

The fact that the mantel-piece exhibited by Mr. C. J. Soyard, not far away from the display of Mr. Grigg, is designed in a style with which we have no sympathy, does not close our eyes to the evidence it gives that his workmen are skilful carvers.

Only one other mantel-piece, we believe, is shown, and that one in the basement by the Erie (Pa.) Mantel Works, which can be best treated of in connection with our notice of the heating apparatus. A personal inspection alone can make evident its artistic merits.

THE STORY OF THE QUEEN'S PARK.

Only a few days have passed since the Park was gay with music and banners, and echoed to the shouts of a loyal multitude which had come to look upon their Queen and the tens of thousands of Scottish volunteers who marched before her in the pride of their patriotism.

In 1528, King James V. of Scotland, commenced to build the palace of Holyrood. Maitland, in his "History of Edinburgh," following earlier records, tells us that the king enclosed a large quantity of ground in the neighborhood of the palace "with a stone wall about three miles in circumference, which probably is nowhere to be paralleled; for, instead of trees and thickets for cover which other parks abound with, I could not after the strictest search discover a tree, in lieu whereof it is supplied with huge rocks and vast declivities which furnish the Edinburghers with the best of stones to pave their streets withal." A curious testimony to this statement, the existence of which was unknown to Maitland, is given in the Edinburgh Dean of Guild's Account Book for the year 1544, in which it is mentioned that the provost, bailies, and deacons of crafts, with a great part of the honest men of the burgh, consented to build at their own expense the whole of the breaches in the park wall that "circulit about Arthour Sett, Salisborie, and Duddingstone Crags, under protestation that their so doing prejudged not them concerning the causeway stones which they were accustomed to quarry from the said crags." In 1753, Maitland wrote, in continuation of the above statement, "I think it will not be amiss to observe that were they squared and sent to London, where they are in want of good stones to pave the footpaths or side of the streets withal, they would turn to good account." In 1788, Arnot, in his "History of Edinburgh," writes, — "Of these stones considerable quantities are sent for paving the streets of London."

Arthur Seat, whether named from the probably mythic British King, or from the Gaelic title Ard-na-Said, the Place of Arrows, is the loftiest of the eminences once surrounded by the park wall, of which a considerable portion still exists as its eastern boundary; it is mentioned by Kennedy, a Scottish poet, who wrote previously to the close of the fifteenth century, "Arthur Sate, or ony higher hill." The oldest remains of bygone ages are to be seen on the face of the hill near Duddingstone, probably the work of agriculturists in the age which followed that of the Cranoges and the Lake-dwellers. They take the form of a group of terraces, which consist of a flattish stripe, of varying breadth, from which rises a slope, at an easy inclination, to a similar stripe above, and so on to the highest of the series. It cannot be doubted that they are artificial, from the fact that they are in some cases sustained by a rude species of masonry. The late Dr. Robert Chambers, who inspected these and similar remains in other parts of Scotland, was of the opinion that "there was but one reasonable solution respecting the origin of these terraces, and that is that they were designed for horticultural or agricultural operations at a time when the low grounds were either marshy or covered with forests." These terraces, wherever found, are styled by the country people "deases," or seats, a name which has also been bestowed on the line of crags to the east of the Hunter's Bog, which is now used as a rifle-practice ground. On the cone of the hill to the south of the "Lion's Head," as the top of the Arthur Seat has been fancifully named, is a parallelogram of undressed boulder stones, which the late Mr. James Drummond, R. S. A., and secretary of the Royal Scottish Antiquarian Society, conjectured to have been the remains of a hunting-lodge erected when the Castle of Edinburgh and the town were one and the same, and the Forest of Drumselch, or Drumsheuch (the name is still attached to a portion of the western suburbs, and may be found in the Postal Directory of the city), covered the slopes of the Calton Hill and Arthur Seat. It was in this forest that David I. was miraculously rescued from the antlers of a furious stag by a cross which descended from the clouds, and his Majesty in gratitude erected the House of the Holy Rood, now known as the Holyrood Abbey.

The only other remnant of antiquity enclosed in the park is the chapel of St. Antony, of which, with the exception of a portion of the northern wall, not one stone remains above another. No records exist to tell of its erection or when it was allowed to fall into decay. It was in good preservation at the commencement of the sixteenth century. In 1522, as we learn from the Edinburgh Dean of Guild's Account Book, 24s, 6d., Scots, were expended on the purchase of "three panels of glass for Saint Antony's windows, containing new glass 12ft and old glass 18ft." Of the hermitage of St. Antony not a vestige now remains. The writer, in his boyhood, has often hidden from his companions in one of its cells, through which bubbled a spring of pure water. On the hill-side, immediately under the rock on which the ruined chapel stands, was a cairn of stones marking the locality of a murder in 1720. Nicol Mushet was a young man of some fortune, and had studied for the profession of a surgeon. For some time he led an irregular and dissipated life in Edinburgh. He was drawn into a marriage with a woman for whom he soon discovered he had neither affection nor respect, and he vainly tried by dishonorable means to obtain a divorce. At length the infatuated man borrowed a knife one day, hardly knowing what he wanted it for, and taking his wife with him towards nightfall, killed her at the spot once indicated by the cairn, which upwards of fifty years ago was removed to the gate leading into the old road to Portobello. Lockhart, in his "Life of Scott," speaking of the poet Crabbe's visit to Scotland, says, "But I shall ever regret that Crabbe did not see him (Scott) at Abbotsford, among his books, his trees, and his own good simple peasants. They had, I believe, but one quiet walk together, and it was to the ruins of St. Antony's Chapel and Mushet's Cairn, which the deep impression made on Crabbe by the 'Heart of Midlothian' had given him an earnest wish to see."

On the night of the 19th September, 1845, Charles Edward encamped his troops on the side of Arthur's Seat, close to the village of Duddingstone (to this day may be seen some of the remains of the entrenchments), and on the following morning he marched to meet the army of Sir John Cope. The guns of Edinburgh Castle fired upon the little army, which soon got behind the shelter of the hill. Little more than thirty years later, Arthur's Seat was the scene of a strange military exhibition. The Seaforth Highlanders had been raised during the early part of the American war, under the idea, on their part, of not being obliged to serve out of Europe. One morning, when at drill in the Leith Links, while in their ranks standing

at ease, a clamour arose on the subject of their going abroad. Suddenly the whole body shouldered their firelocks, set off at quick march, and halted not till they gained the ridges of the hills, and fixed their head-quarters on the summit of Arthur's Seat, which they knew cavalry could not approach, and foot soldiers would not dare to attack. At length, Lords Dunmore and McDonald were deputed to enter into parley with them, and matters were soon settled to the satisfaction of the mutineers. They had but one small favor to request, namely, "leave to shoot Finnie," the adjutant of the corps, which favor was politely declined.

Lord Mahon, in his "History of England," records that on the 17th of September 1745, "Charles, till then at the head of his advancing troops, set forth to take possession of the palace of his ancestors. He entered the King's Park by a breach which had been made in the wall, and approached Holyrood House by the Duke's Walk, so termed because it had been the favorite resort of his grandfather, as Duke of York, during his residence in Scotland." The Duke's Walk, as it is still called by old people, and the level ground on either side, form the arena on which her Majesty has twice reviewed her Northern volunteers.

On Salisbury Crags and St. Leonard's Hill there is but little to mention. On the latter, the Wizard of the North conjured up the cottage of David Deans and his two daughters, Effie and Jeanie, the shadow and sunshine of his life. The footpath round the base of the Crags, formed early in the last century to give work to the starving operatives of the city, and vulgarly termed the Radical-road, was a favorite resort of the inhabitants, as is shown by an extract from the *Gentleman's Magazine* of 1783:—"On the evening of the 26th of August, about seven o'clock, a considerable part of the rock called Salisbury Craigs fell down with a noise, which those who heard it at a distance mistook for thunder. Providentially from the badness of the weather, no person was within reach of the danger." This path, Sir Walter Scott writes, "used to be my favorite evening and morning resort when engaged with a favorite author or a new subject of study." The following is from the *Edinburgh Evening Courant* of October 29, 1728. "A person who frequents the King's Park having noticed a man to come from a cleft towards the north-west of Salisbury Rocks, had the curiosity some days ago to climb the precipice, if possible he might discover something that could invite him there. He found a shallow pit, which delivered him into a little snug room or vault hung with dressed leather, lighted from the roof, the window being covered with a bladder. It is thought to have been the cave of a hermit in ancient times, though now the hiding-place of a den of thieves." — *The Builder.*

THE INFLUENCE OF BAROMETRIC PRESSURE ON THE DISCHARGE OF WATER FROM SPRINGS.

This was the subject of a paper read before the British Association (Section C, Geology), by Mr. Baldwin Latham, M. Inst. C. E. He said that it was alleged by some of the long-established millers on the chalk streams that they were able to foretell the appearance of rainfall from a sensible increase in the volume of water flowing down the stream before the period of rainfall. He had, therefore, undertaken a series of observations to investigate the phenomena, and he found, in setting up gauges in the Bourne flow in the Caterham Valley, near Croydon, in the spring of this year (1881), and selecting periods when there was no rain to vitiate the results, that whenever there was a rapid fall in the barometer, there was a corresponding increase in the volume of water flowing, and with a rise of the barometer there was a diminution in the flow. The gaugings of deep wells also confirmed these observations; for where there was a large amount of water held by capillarity in the strata above the water-line at that period of the year when the wells became sensitive and the flow from the strata was sluggish, a fall in the barometer coincided with a rise in the water-line, and under conditions of high barometric pressure the water-line was lowered. Percolating gauges also gave similar evidence, for, after percolation had ceased and the filter was apparently dry, a rapid fall of the barometer occurring, a small quantity of water passed from the percolating gauges. The conclusion arrived at was that atmospheric pressure exercises a marked influence upon the escape of water from springs.

Professor J. Prestwich, who regarded the question as an exceedingly interesting and complicated one, took exception to some of the remarks of Mr. Latham as to the water zones. That gentleman, he said, had treated the subject in a very ingenious manner, but he (the speaker) did not feel they had sufficient evidence before them to determine the question, and he hoped that Mr. Latham would continue his inquiry, and that more importance would be attached to it.

Dr. J. Evans, F. R. S., who had given the subject much consideration, and had taken observations for some years, complimented the reader of the paper, who, he thought, had brought forward facts sufficient to establish his interesting theories. He gave an account of the results which had come under his own observation, and hoped that Mr. Latham would pursue his investigations, and endeavor to ascertain the amount of percolation in the chalk, and the quantity of water available from it for drinking and various other purposes.

Mr. Bateman, C. E., added his testimony to the remarks which had been made respecting the influence of barometric pressure, and spoke of the effects of rainfall upon the water-beds. He gave instances of the influences of the rainfall in different parts of England, and, in conclusion, said they were much indebted to Mr. Latham for his remarks, for they were the result of absolute observations, and might have an actual bearing in all cases where spring water is relied upon for the supply of towns. The observations were also of value as they were the record of facts which might be used in future for scientific purposes.

Mr. W. Topley stated that although they were indebted to Mr. Latham for his valuable paper, the subject was not a new one, it having been brought forward years ago by Mr. Bailey Denton, who had made interesting observations on the subject.

Professor Hughes asked the author of the paper whether he had taken into consideration the hygrometric conditions, as it appeared that he had observed that different flows coincided with the south-west and east winds. The difference in pressure on surface and subterranean waters due to evaporation of surface-water under the dry east wind or moist south-west wind, would be so great that it should not be neglected in considering such small differences of actual pressure as are to be referred to the atmosphere.

Mr. J. Lucas, as a resident in the neighborhood, Mr. Milne, and Mr. Scott, from the Meteorological Office, continued the discussion, the latter observing that Mr. Latham had distinctly proved his case in the paper he had read.

The chairman (Professor Ramsey) said he had listened to the paper with great interest. He had given the subject his careful consideration, and the result had been that he had been enabled to predict the state of the weather with tolerable accuracy.

Mr. Latham, in replying to what had been said, stated that, with regard to the remarks of Professor Hughes, he had considered the bearing of hygrometric influences. He had been led to make his observations a good deal as a sanitarian, on account of the knowledge that the town of Croydon was subject every few years to diseases, and which he believed arose from the water supply. There was no doubt that underground water had a wonderful bearing upon the public health of this country, and he hoped that in future more consideration would be given to the connection of wells with health, for this would be found of great value in relation to the sanitary condition of the country.

OBSERVATIONS ON BANKRUPT ARCHITECTS AND THE RIGHTS OF CREDITORS.

It is the lot of every profession for some of its members from time to time to find themselves involved in money difficulties, and architects are not an exception to this general rule. Sometimes an inability to meet in full the demands of creditors may arise from misfortune; sometimes, and more often, from carelessness in the conduct of business. Indeed, the larger does the experience of a man who mixes much among all classes of the community become, the more does it become evident that but few of the so-called pecuniary misfortunes which occur are the results of the inevitable. Want of foresight, a reckless independence of opinion, a desire to make money quickly and not surely, and a want of self-restraint, are the too general causes of pecuniary losses. However, be that as it may, we are now concerned chiefly with facts of a business-like character, and not with the causes of men's misfortunes, and it is in regard to certain facts of considerable importance to architects and their creditors that we now desire to say a word or two. The question, briefly put, to which we wish to direct our readers' attention, is the position of an uncertificated bankrupt architect in relation to his earnings, and this point has been brought somewhat prominently forward of late through the litigation arising out of the construction of a new theatre in the Strand, and especially by the recent case of Emden *vs.* Carte, which was tried before Mr. Justice Fry. The exact point arose in this case, and therefore it may be considered as the latest authority which bears on this question, and directly affects the architectural profession. Mr. Emden, an architect, to touch briefly on the facts, brought an action against Mr. Carte in respect of an agreement to employ him as an architect; the main claims were a sum for remuneration for work and damages for a wrongful dismissal, and at the time when the action was begun the architect was still an uncertificated bankrupt. The actual question was raised by an application on the part of the trustee to be substituted as plaintiff in the action in place of the architect.

Now, the legal rule upon this point is shortly this, that the trustee has not a right to the proceeds of a bankrupt's personal and daily labor, for that would be to deprive him of the means of existence. But though this rule is pretty clear on its face, when it comes to be more closely examined it will be seen not to be very easy of application. For what are the proceeds of a bankrupt's personal and daily labor, and what, strictly speaking, is this personal and daily labor? Thus, in one instance, a discussion arose in the courts as to whether a bankrupt or his trustee was entitled to the damages recovered by a newspaper editor for a wrongful dismissal, which certainly was money received in respect of the loss sustained from the breach of a contract in which the elements both of personal and daily labor were present. In the present instance, the claim of the trustee was also held to be good against that of the bankrupt architect; for, said Mr. Justice Fry, "The conclusion, therefore, at which I arrive is this, that although the personal services of the architect were an inducement to the contract, the fruit of that contract in the way of remuneration or the right to damages for wrongful dismissal would pass to the trustee." And it must be observed that in thus deliver-

ing his opinion the judge is careful to insert the words "in the way of remuneration," showing that it was clearly his intention to lay down the rule that whatever an architect might earn by his daily labor in his profession became the property of the creditors as long as he remained an uncertificated bankrupt. Indeed, so far as the creditors are concerned, it would be a hardship if it were otherwise; for the architect's knowledge and professional skill are his capital as much as the actual cash or bills of the merchant, and were it otherwise an architect might become a bankrupt with but small inconvenience to himself. We are not now concerned with other businesses or professions than that of an architect, and therefore it is needless to go through the cases which have decided this question in regard to other trades and professions. Of course, a trustee could not perform the contract into which an architect may have entered, but as soon as the remuneration is received then it becomes the property of the creditors. The tendency of the law now is to limit the privileges of a bankrupt as much as possible, and therefore the fruits of personal and daily labor can now seldom escape from the pockets of the creditors, or, more strictly speaking, of the trustee.—*The Builder.*

THE ABOLITION OF LONDON FOG.

The meeting convened lately by the Smoke Abatement Committee shows that one of the worst nuisances of London life, the blighting and suffocating fog, is now exciting serious attention. Although the fogs of last year were less memorable both in intensity and duration than those of the preceding year, the society which has undertaken the task of grappling with the evil has not relaxed its efforts. Other and more pressing ills, as frozen water-pipes and snow-invaded dwellings, have not been allowed to hide from view the recurring evil of our grimy and deleterious fogs. The meeting, which was ably supported by men of social and scientific eminence, gave expression to the conviction that the smoky atmosphere in which Londoners pass a good part of their lives is a fertile source of injury to our organisms as well as to our possessions. It disfigures our buildings and stunts our vegetation; and in this way, as well as by excluding the bright rays of the sun for a good part of the year, it gives to our city its unenviable distinction of being the most dismal and hideous of European capitals. It not only disfigures—it destroys. It eats into our textile fabrics, and slowly wears away the masonry of our buildings. Worse than all, it impedes the functions of the organism. An atmosphere charged with particles of unconsumed carbon and sulphur would not seem to be well adapted for the human lungs, and scientific investigation bears out the natural conjecture. The careful analysis of London smoke recently made by a scientific physician enables us to see the real nature of the mixture that we are inhaling, and physiological observation has fully confirmed the theory that the surface of the lungs may become coated with an incrustation deposited by the smoky vapor which is inhaled.

It is easy to treat such a meeting as that held at Grosvenor Place with a measure of ridicule, on the ground that it merely enounces a number of general propositions which no sane person would think of challenging. It seems to us, however, that such a feeling is here out of place. If people were all finely organized and practised in close observation, there would be but little need to insist on the magnitude of the smoke nuisance. But this is far from being the case. The effects of causes which are in pretty constant operation are only too easily overlooked. And as for the disfigurement of our surroundings occasioned by smoke, the familiar truth that what is habitually present to our organs of perception escapes attention here receives a striking illustration. It is not only the coarse, uncultivated mind which overlooks the manifold unlovelinesses of our smoke-covered city. Even a lover of the beautiful may cease in time to note the far-reaching æsthetic consequences of a smoky atmosphere out of which he rarely passes. With respect to the hygienic side of the subject, the same thing holds true. The average citizen, blessed with a vigorous organism, is little likely to trouble himself about the unhealthy character of his atmosphere. A constant stimulus acting on any part of the organism fails to excite a conscious sensation. And the trachea and lungs which are habitually bathed by the murky waves of London fog cease in time to be tormented by them. It may be demonstrable from physiological principles that even a robust organism must be less healthy in such impure surroundings, yet the loss in vital energy is easily overlooked when unaccompanied by positive sensations of discomfort. Now and again, perhaps, when the smoky mixture dignified by the name of air is unusually dense, as in the memorable winter already referred to, even such a hardy person becomes momentarily aware of the deleterious properties of fog; but when the slight feeling of irritation is past, he settles down to his customary proportion of impurities as to something perfectly natural and harmless. Even where these impurities tell upon the health of some more delicately organized member of his family, he is very likely to misapprehend the real cause of the evil. In order to refer things to their causes we must be able to compare circumstances in which they are present with those in which they are absent; and the ordinary Londoner who seldom goes out of town plainly wants the data for reasoning about the subject. It would seem to follow, then, that much remains to be done in arousing the public mind to a sense of the gravity of the evil of living in a smoke-weighted atmosphere.

There seems little good in calling attention to evils which we are unable to set right. It is natural for the mind that is only partially impressed with the hurtfulness of smoke to lapse into the comfortable belief that the evil is in its nature incurable. When we discover that we have all our lives been incurring risks of which we have been totally ignorant, we are at first disposed to acquiesce in the state of things as normal and necessary. A very little reflection, however, will suffice to suggest that as our smoky habitat is an artificial creation of our own, its permanence is a matter which lies with ourselves. In other words, we are led to reflect that this is not a case in which the organism has to adapt itself to a fixed environment, but one in which it is called on to modify its environment. The Smoke Abatement Committee show plainly enough that they take this view of the matter, and that they are bent on supplying a remedy for the evils which they seek to expose. Already, as a consequence of the growing interest in the subject, a considerable amount of ingenuity has been devoted to the practical solution of the question. For some time past we have heard of a number of inventions by which the effects of our smoke-emitting grates may be avoided. The Committee has wisely arranged for an exhibition of the various improved heating and smoke-preventing appliances which have been proposed of late. This exhibition, which will illustrate the proposed substitutes for our smoky grates in actual operation, may be expected to have a double effect. In the first place, people who are indifferent to the evil of smoke can hardly fail to be impressed with its existence and its gravity when they see how much thought and skill have been directed to its removal. And, secondly, if the exhibition is at all a success, it will teach Londoners that the evil is not one which ought to be quietly submitted to as a part of the permanent order of things, but one which lies altogether within our control. The evidence given by Sir Henry Thompson and others at the meeting referred to enables us to anticipate the result of the exhibition so far as to affirm that our houses may be heated, and adequately heated, by a process that is in the fullest sense smoke-preventing. In the face of such a body of authoritative opinion on this point, nobody is likely henceforth to contest the assertion that the smoke nuisance is one which we have the power of removing if we care to do so.

But though it is allowed that Londoners have the power of ridding themselves of their incubus of smoke, it may be doubted whether they will care to do so. The cloud of carbonaceous and sulphurous particles which each morning forms itself anew out of the discharges from our forest of chimneys is closely connected with our chosen way of heating our dwellings. In France or in Germany, where the use of stoves obviates the need of constant fires, and where wood is often substituted for coals, our darkening smoke-mists are unknown. We avowedly prefer our open grates, with their cheerful aspect, their socializing influence, their many venerable associations. We know very well that these firesides are costly luxuries, that a considerable fraction of the fuel for which we pay renders us no service whatever. And it may be thought that even when people have come to understand that their habits involve a good deal of injury to health, they will still persist in them. That is to say, they may deliberately prefer the advantages of the blazing hearth to those which would be secured by a smokeless mode of heating; or at least it may be supposed that the force of custom would turn the balance in favor of remaining as we are. In support of this view it has been alleged that the present agitation about smoke is by no means new; that as early as the close of the last century attempts were made to introduce a cleanly and healthy substitute for our open grates; and that since that time the subject has again and again come up for discussion, and then been allowed to drop out of sight.

This pessimistic view of the present attempt to carry a pressing sanitary reform is no doubt a plausible one. We are quite aware that Englishmen are often foolishly conservative, tenaciously clinging to their peculiar habits when they are at least dimly aware of their undesirability. Yet even Englishmen are ready to adopt a new fashion when they are thoroughly convinced of its superiority to the old one. When Londoners are fully alive to all the mischiefs wrought by their dirty atmosphere, they will not, one supposes, long hesitate to accept a more wholesome style of heating their houses. To imagine that they would knowingly set up the sentimental considerations already touched on, in opposition to the sentimental arguments of the man of science and the physician, seems to us to misunderstand the English mind. Compared with other nations we are but slightly governed by sentiment, and even the deeply-rooted feeling for the cheerful English fire would probably give way to a clear conviction that its indulgence involves injury to health. And this result will certainly be hastened by the fact that the proposed substitutes for our present thriftless grates are likely to be much more effective and much less costly. It is a part of the irony of the existing state of things that, with all the greater appearance of heat which we gain at the expense of our lungs, we are in reality much worse off than those who use the closed stove. The peculiarity of our English fireplace is that it heats one small portion of a room on the condition of making the other parts chill and draughty. And to this it may be added that we secure this curious result at a much greater pecuniary cost than is incurred by our neighbors. Should all this be fully understood and realized by the majority of Londoners, they would, we are convinced, soon consent to give up their cherished firesides.

It thus seems that the prospect of removing, or at least greatly reducing, the smoke nuisance really depends on the waking up of the public mind to the existence of the evil. That this will happen immediately, we are not sanguine enough to anticipate. The growth of an adequate sense of the loss and positive harm occasioned by the

artificial atmosphere with which we surround ourselves will pretty certainly be a slow process. The society which aims at enlightening the public mind on the subject will accordingly have to harp on the various ill consequences of smoke for a long time to come. Only after frequent reiteration are the salutary lessons which science has to teach fully seized and assimilated by the popular intelligence. At the same time, it is probable that there are forces working in the direction of the society's efforts. The increase of general information must, one conceives, have the effect of bringing home to Londoners to some extent the pestilential character of their smoke-laden atmosphere. Thus, for example, the publication of the varying death-rate in the metropolis is well calculated to call men's minds to the consideration of the disagreeable subject. It is probable that a good part of the present lively interest in the matter is due to the profound impression made by the announcement that an exceptionally severe form of fog which occurred the winter before last raised the proportion of deaths in the metropolis by a very appreciable interval. In addition to this, all the knowledge which goes to the comparative study of life is contributing to the same result. The more generally Englishmen travel and contrast the surroundings of life abroad with those at home, the more likely are they to become alive to the drawbacks of the latter. And even that large body of Londoners which does not go abroad is acquiring, through improved facilities in locomotion, the means of judging the true character of their daily environment. Perhaps nothing will more materially contribute to the growth of a powerful antipathy to London smoke than the rapidly spreading habit of living outside London. A man who, on an average winter morning, enters the city from a point twenty miles distant cannot fail to be struck by the contrast. His breathing organs will be irritated by the impurities to which they have not accustomed themselves; his eye will miss the gladdening rays of the sun and note the depressing hue which the dingy vapors cast on every object. The more frequently the Londoner emerges from his murky mists, the less indifferent is he likely to become to their existence. The present agitation of the subject is thus likely to be supported by the action of natural causes. And this fact should encourage the friends of the movement in the face of what are undoubtedly many and serious obstacles. — *The Saturday Review.*

THE FITCH INSTITUTE COMPETITION.

BUFFALO, N. Y., September 24, 1881.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — May we ask you to acknowledge, through the columns of the *American Architect and Building News*, the reception of designs for the Fitch Institute, for which we advertised in that paper some three months since. The designs are now under consideration. Yours truly, J. G. MUNRO, Sec'y.

NOTES AND CLIPPINGS.

THE VALUE OF CHANTREY'S SCULPTURE. — There was a somewhat striking commentary on the value of fame the other day, when a colossal Carrara marble bust of Nelson, by Chantrey, on a pedestal, was sold in a London auction-room for thirty guineas.

CANVAS ROOFING. — The Elm Spring Mill, Dedham, Mass., has a building with a cotton-duck roof which has been on about a year and a half, and gives perfect satisfaction. The canvas is sewed together and secured by tacks. A heavy coat of paint renders it perfectly waterproof, and prevents it from being affected by mildew.

A NEW JAPANESE TEMPLE. — Near Kioto, in Japan, was burned last spring a temple which had stood nearly seven hundred years. It was erected by a priest named Meikei, who first introduced tea into Japan. Tea merchants of Kioto and Osaka have resolved to rebuild it in his honor. In parts of Japan, where the culture of tea is now most prosperous, the plants were first brought there by Meikei.

A REMARKABLE CLOCK AT ROUEN. — An ancient and remarkable clock has been recently set up in the reading-room of the municipal library of Rouen. A single winding keeps it running for fourteen months and some odd days. It was constructed in 1782, underwent alterations in 1816, was bought by Rouen for one thousand francs in 1838, and has recently been repaired and just set going.

HIGH-PRICED LAND. — An English contractor lately stated that some frontage ground in the city of London had been sold at the rate of a million sterling the acre. Some ground has just been sold for the erection of the new Post-Office at 3,378 francs the square metre (about ten square feet,) the highest price which has yet been paid for ground in Paris. The ground which has just reached this price is at the corner of the Rue d'Argout, formerly the Rue des Vieux Augustins, part of the back slums of Paris.

SCULPTURED GLASS. — An exchange says that Signor Giovanni has undertaken to restore in England the lost art of engraving on glass, called by the ancients "the art sublime." But one specimen of this wondrous art exists in England — the Portland vase at the British Museum. Signor Giovanni has produced a drinking vessel of thick glass, out of which he has sculptured in bas-relief a group representing the training of young Bacchus. It has been purchased for the King of Italy for $25,000.

NOBEL'S BLASTING GELATINE. — Experiments with Nobel's blasting gelatine have lately been made in England. The blasting gelatine is composed of from 7 to 10 per cent of a special quality of nitro-cotton, with from 90 to 93 per cent of nitro-glycerine, which together form a compound that is more powerful as an explosive agent than even pure nitro-glycerine, its disruptive force being enormous, at least 50 per cent greater than dynamite. This fact has been most satisfactorily established by experiments carried out by Prof. F. A. Abel, and the recent tests fully bear out the testimony. In appearance this explosive resembles a thick jelly, of a brownish color, and in its normal state is a thick plastic mass, which makes it very convenient for charging bore-holes, as by squeezing the cartridges with a wooden rod they can be made to fill the holes completely. Another advantage claimed for this explosive is that it is more insensible to shocks than dynamite. Another recommendation claimed for the blasting gelatine is that the nitro-glycerine does not exude by its being exposed to water for any length of time, and it is, therefore, most valuable for sub-aqueous blasting, as no other explosive was able to withstand without injury the long immersion which blasting gelatine was subjected to by Prof. Abel. The rock in which the boring is now being carried on is a thick bed of strong flint, one of the toughest that can be imagined. The test was, therefore, a thorough one in every respect, and fully showed the strength and quality of blasting gelatine, and also its great superiority over dynamite, which had hitherto been used at the works where the experiment was tried. For the purpose of the test 15 holes were driven in a strong position in the face of the rock, averaging 3 feet in depth, and 1 1-2 inches in diameter. The weight of blasting gelatine used in the test was 18 pounds, and the results were perfectly astounding. The drift or level in which the experiments were made measured 7 feet high by 6 feet in width, and the quantity of blasting gelatine used was a little over one-half the dynamite used for similar borings. Each charge brought away the whole of the rock allotted to it, clearing away the face of the level for the depth of over a yard. —*Iron Age.*

THE REAL MODERN ATHENS. — A correspondent writes to the London *Times* under date of August 26: The population of Athens is generally the most orderly, peaceable and moral of all those among whom I have ever lived, and so little violation of public tranquillity is there that I can literally say that I have in all the time that I have lived in Athens never seen a disturbance in the streets. The slightest semblance of activity on the part of the police would be sufficient to secure the carrying out of all the regulations requisite to make Athens the cleanest, most healthy and most orderly capital in Europe. Yet at present we are in the midst of a great epidemic of typhoidal fevers, with a thermometer ranging by day through the nineties, and even at night never below 80° Fahrenheit. In my bedroom opening to the north-east, and from which the sun is excluded all day, it was yesterday, at 8 A. M., 87°, at mid-day, 90°, and at 4 P. M., still 89 1-2°, and at midnight 87°, and as I write at 11 A. M., it is at 90°, having risen gradually and slightly for the past fortnight; yet in certain parts of the city one can scarcely pass without suffocation. The butchers have been allowed to fling their offal into the streets, and dead cats and dogs are of not infrequent occurrence. Piles of fermenting rubbish lie in the vacant spaces and around the outskirts of the city. There is no system of drainage, and none of emptying the cesspools into which the house-drains pour, only one of the principal streets having a main drain, and this having no traps; and, though the police have full authority to examine the drainage of each house, no houses are ever examined, and the cesspools filter off into the surrounding earth. The law requires rigid inspection of the abattoirs and butchers' shops, but as the police have political duties and must be on good terms with the constituency, the shopkeepers are never annoyed nor are the shops inspected, and though to-day there is from the panic prevailing a cleaning of the outside of the platter, the inside is not, and in this intense heat cannot now safely be disturbed.

KAIRWAN, THE HOLY CITY. — Kairwan, about eighty miles south of Tunis, whose destruction by the French is possible, is looked upon by the Mussulmans as the holy city of Africa. It is surrounded by a well-kept wall and lies in a large sandy plain, but is not impregnable. It is said at one time to have contained between fifty and sixty thousand inhabitants. At present the number is only about twelve thousand, but there is still a great deal of wealth owing to the constant stream of pilgrims, and the fact that many rich people pass their last years here, so that they may die in a consecrated atmosphere. The city contains twenty-six mosques and many other costly and beautiful buildings erected by the various Mussulman dynasties that have reigned in North Africa. The tomb of Sidi-el-Ouaib, the barber of Mohammed, in the centre of the city, which is supposed to contain three hairs from the prophet's beard, is worshipped by the Tunisians, the inhabitants of Tripoli, Algiers, Morocco, and even of Egypt. The roof of the Akbar Mosque is supported by three hundred and twelve columns of marble, granite and porphyry. With the exception of some physicians, savans, and diplomats all infidels have hitherto been shut out from the city, all Christians and Jews who dared to enter having been either executed or obliged to change their religion. — *New York Evening Post.*

CREMATION STATISTICS. — Some curious statistics have been published of the cremation furnace erected at Gotha in the autumn of 1878. Thus far it has been in use 57 times — once in 1878, 17 times in 1879, and 16 times in 1880. For the present year, up to August 17 only, the number has been 23. Of the total of 57 cases, only 1 came from Berlin, 1 from Breslau, 7 from Dresden, 1 from Frankfort-on-the-Main, 1 from Hanover, one from Carlsruhe, 2 from Leipsic, 3 from Munich, 1 from Vienna, 1 from Paris, and 1 from Weimar. Gotha alone contributed 23. Only 10 cases were women. Of the 47 men, 19 belonged to learned professions, 4 to the army, and 4 to the nobility. There were 10 physicians.

BUILDING INTELLIGENCE.

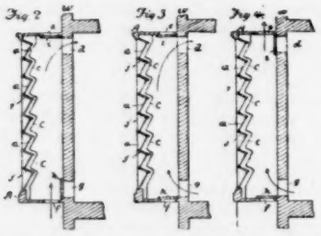
(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

246,626. Warming and Ventilating Apartments by the Sun's Rays. — Edward S. Morse, Salem, Mass. The invention consists in the employment of a casing attached to the outer wall of a building, and provided with a blackened surface of metal, earthenware, or other suitable material, having either a flat or corrugated surface protected by glass in front of the same, and so arranged as to allow the rays of the sun to fall as directly as practicable upon the blackened surface. Behind it is an inclosed air-space communicating by apertures at the upper and lower ends with corresponding openings of a room of a building, and also by separate openings with the outer atmosphere. The action of the sun's rays upon the blackened surface heats the air in the space, which heated air, as it ascends, may be directed into the room, so as to warm it, or it may serve to draw the air from the room, and thus ventilate it. A A represents a casing attached to the outside of a house, *w*, where it may be exposed to the sun's rays. *c c* represent a plate extending from the top to the bottom of the casing and presenting series of inclined surfaces, so arranged that the rays of the sun will fall upon them



to the greatest advantage. This plate has a blackened surface in front, and is composed of metal, earthenware, or other suitable material. In front of this blackened surface is arranged a series of glass strips, *a a*, parallel with the inclined portions *c c*, and set in sashes *j j*. At the top and bottom of the casing A, respectively, are openings *e* and *f*, and in the wall of the building, at the upper and lower ends of the casing, respectively, are apertures *d* and *g*. Between the opening *e* and apertures *d* above, and the opening *f* and aperture *g* below, are hinged the lids *i* and *h*, so arranged as to close either aperture above or below while the other is open. When a room is to be heated, the lid *h* at the bottom of the casing is opened, thus closing the aperture *g*, and the lid *i* at the top closes the opening *e*, leaving the aperture *d* open. The air-passage into *f* becomes warmed in its passage through the casing and enters the apartment at *d*. In Fig. 3 the openings *e* and *f* are shown as closed; the air entering the casing from the apartment, and passing through the casing, re-enters the apartment, and so continuing the circulation and adding to the supply of heated air in the apartment. When ventilation only is required, the bottom opening, *f*, is closed by lid *h*, leaving aperture *g* open. Aperture *d* is then closed by lid *i*, leaving *e* open, as shown in Fig. 4. As the air becomes heated it passes up and out of opening *e*, drawing air all the time from the apartment through aperture *g*.

247,149. Machine for Mortising Doors for Locks. — Tyre N. Andrews, San Francisco, Cal.

247,187. Sash-Balance. — Patrick H. Fox, Boston, Mass.

247,188. Wood-Working Tool-Handle. — James E. Green, Philadelphia, Pa.

247,192. — Well and Rock Drilling-Machine. — Elias J. Hill, Findlay, Ohio.

247,210. Water-Closet. — Edwin and Le Grand M. Norton, Chicago, Ill.

247,211. Screw-Clamp. — Elijah R. Osgood, Columbus, O.

247,226. — Man-Hole and Hand-Hole Stopper. — Daniel Sullivan, Central Falls, R. I.

247,229. Apparatus for Lighting Dwellings. — William Wheeler, Concord, Mass.

247,230. Holophote for Lighting Dwellings. — William Wheeler, Concord, Mass.

247,231. — Apparatus for Lighting Dwellings. — William Wheeler, Concord, Mass.

247,233. — Machine for Quarrying and Dressing Stone. — Jos. Williams, Commercial Road, Liverpool, County of Lancaster, England.

247,234. Composition for Preserving Wood. — Edward R. Andrews, New York, N. Y.

247,246. Window-Screen. — John Forhan, New York, N. Y.

247,253. Air-Cooling Apparatus. — Ralph S. Jennings, Baltimore, Md.

247,262. Artificial Stone, Tile, and Marble. — Jno. W. McKnight, Washington, D. C.

247,271. Method of Making Lime-Brick. — Jacob Reese, Pittsburg, Pa.

247,273. Drain-Pipe Connection and Plug for Baths, etc. — William Ricketts, Cincinnati, O.

247,282. Reflector. — William Wheeler, Concord, Mass.

247,297. Waste-Water Discharge for Portable Wash-Stands. — Nathan O. Bond, Fairfax Court-House, Va.

247,299. Heating-Furnace. — George R. Brown, Corning, N. Y.

247,310. Sash-Holder. — Charles B. Clark, Detroit, Mich.

247,328. Monkey-Wrench. — George T. Finagin, Pioche, Nev.

247,331. Sketching Apparatus. — Richard D. Gallagher, Omaha, Neb.

247,349. Shutter. — Alexander H. Hill, Oskaloosa, Iowa.

247,253. Carpenter's Square. — Jeremah C. K. Howard, Edgerton, Mont.

247,361. Pipe-Supporting Hanger. — Wm. Kane, Philadelphia, Pa.

247,370. Metal Lathing and Furring. — David W. Lloyd, Pittsburg, Pa.

247,372. Gas-Heating Apparatus. — Charles M. Lungren, New York, N. Y.

247,386. Dip-Pipe. — George A. McIlhenny, Washington, D. C.

247,402. Faucet. — John M. Peck, New Haven, Conn.

247,406. Pipe-Tongs. — Nathan Purdy, Fall Brook, Pa.

247,411-415. Electric Burglar-Alarm. — Henry C. Roome, Jersey City, N. J.

247,419. Ladder. — Edward Row, Indiana, Pa.

247,421. Concrete Pavement. — John J. Schillinger, New York, N. Y.

247,422. Process of Coloring and Graining Wood. — Charles Schneider, Jersey City, N. J.

247,438. Fire-Back for Mantel-Grates. — John L. Tressler and William H. Loomis, Alameda, Cal.

247,440. Sash-Fastener. — Isaac P. Turner, Troy, N. Y.

247,450. Stove-Pipe Thimble. — Elbridge D. West, Canandaigua, N. Y.

247,468. Sash-Fastener. — Willard D. Doremus, Washington, D. C.

SUMMARY OF THE WEEK.

Baltimore.

Building Permits. — Since our last report twenty-three permits have been granted, of which the following have been selected as worthy of mention: —

J. Magengast, three-st'y brick building, No. 370 Pennsylvania Ave., between Smith and Pitcher Sts.

Denny & Mitchell, three-st'y brick building, 812 Baltimore St., between Carey and Republican Sts.

Valentine Sultan, three-st'y brick building, n e cor. of Fayette and Amity Sts.

Congregational church, stone church-building, Eutaw St., between Dolphin and Hoffman Sts.

Albert K. Robins, 4 two-st'y brick buildings, John St., 78′ w of Eusor St.

John H. Morrow, 3 three-st'y brick buildings, York St., 105′ e of Sharp St.

Wilson Sanitarium, five-st'y brick warehouse, 56 Hanover St., between Pratt and Lombard Sts.

Stores. — The two large warehouses on the n e cor. of Howard and Mulberry Sts., are being demolished by Mr. William Ferguson, and will be immediately replaced by three 20′ front retail stores.

Houses. — Mr. Jacob Wahl has had drawings prepared for 2 three-st'y brick houses, 18′ 6″ x 50′ each, to be erected on Fairmount Ave.; cost, $4,000 each.

Also, 2 three-st'y brick houses, 16′ x 40′ each, to be built on Irwin Pl., and cost about $3,000 each; Mr. Wm. F. Weber, architect.

Boston.

Building Permits. — *Brick.* — *Commonwealth Ave., No.* 285, for Henry S. Whitcomb, dwell., 26′ x 62′; three-st'y and mansard; Keening & Fellows, builders.

Dartmouth St., rear of, near Columbus Ave., for Boston Tile Co., office, 40′ x 66′; Vinal & Dodge, builders.

Purchase St., Nos. 54, 56, 58 *and* 60, for John Bassett, 2 mercantile buildings, 19′ 2″ x 50′, three-st'y; Stevens & Barstow, builders.

Liverpool St., No. 152, for E. Hodges & Co., engine-house, 16′ x 20′; E. Hodges & Co.

Wood. — Rutherford Ave., near Allen St., for A. H. Allen, storage, 80′ x 50′, three-st'y.

South St., near Washington St., for Emma E. Gray, dwell., 23′ x 28′, two-st'y; Alexander Rogers, builder.

South St., opp. Walton St., for Arthur W. Roberts, dwell., 30′ x 31′, two-st'y; Alex. Rogers, builder.

Greene St., near Centre St., for Estate of Alex. Dickson, 2 dwells., 20′ x 40′, two-st'y; Jos. Hammerle, builder.

Warren Sq., for Estate Alex. Dickson, 2 dwells., 20′ x 40′, two-st'y; Jos. Hammerle, builder.

Dorchester Ave., rear of, near Blake St., for John Souther & Co., boiler-house, 30′ x 45′; Jerome B. Keene.

Trull St., near Hancock St., for Franklin King, dwell., 30′ x 39′ 7″, two-st'y; Edw. McKechnie, builder.

Riverview St., near Adams St., for Ella F. Lapham, dwell., 16′ x 25′; Elisha Lapham, builder.

Orchard Pl., near Boston St., for Wm. B. Trask, 2 dwells., 24′ x 34′; two-st'y and mansard; Wm. Eddie, builder.

Webster St., No. 259, for Mrs. Wm. D. Sheriffs, dwell., 21′ x 32′, two-st'y mansard; Frame & Patten, builders.

Elmore St., near Wilmont St., for New England Smelting Co., smelting-house, 25′ x 50′ and 25′ x 70′; Wm. F. Wood, builder.

Emerson St., near East Fourth St., for Thomas McDowell, greenhouse, 24′ x 60′; Henry M. Elliot, builder.

Bolton St., No. 304, for Chas. H. Parker, dwell., 19′ x 34′, three-st'y; D. R. Morrill, builder.

I St., near East Sixth St., for Locke & Nolan, 4 dwells., 19′ x 32′, two-st'y; Locke & Nolan, builders.

Savin St., near Tupelo St., for B. S. Dennett, dwell., 27′ x 30′, two-st'y; R. C. Dennett, builder.

Store. — A four-st'y building has just been started at the corner of Winter and Washington Sts. It will have stone fronts on both streets; owner, R. G. Richards, Esq.; Louis Weissbein, architect; cost, $17,000; J. W. Coburn & Co. and McKenzie & Campbell, builders.

Brooklyn.

Building Permits. — *Bleecker St.*, s s, 400′ e Evergreen Ave., two-st'y frame dwell.; cost, $2,300; owner, M. E. Goodwin; architect, F. Webber; builders, J. Graham and J. Kessell.

Sixth Ave., w s, cor. Carroll St., 5 four-st'y brownstone tenements; cost, $6,000 each; owner, etc., Geo. W. Brown, 728 Fulton St.

Bainbridge St., n s, 280′ w Patchen Ave., 3 two-st'y brownstone dwells.; cost, $2,500 each; owner, etc., Robert Given, 55 Canton St.; mason, Edward Mullin.

Kosciusko St., s e cor. Throop Ave., three-st'y brick store and dwell., and 3 two-st'y brick dwells.; total cost, $16,000; owner and builder, M. J. McLoughlin, 100 Kosciusko St.; architect, R. Ford.

Floyd St., n s, 250′ w Broadway, 4 two-st'y frame dwells.; cost, $2,500 each; owner, etc., Geo. Leoffler, 82 Tompkins Ave.

Meeker Ave., n s, 60′ e North Henry St., 2 three-st'y frame tenements; cost, $3,600; owner, H. Bindrim, Meeker Ave.; builder, John Hoepfer.

Jackson Ave., s e cor. Old Bushwick Ave., three-st'y brick store and tenement; cost, $5,580; owner, Franz Brendel, on premises; architect, George Hillenbrand; builder, Franz Brendel.

Fifth Ave., s w cor. Prospect Ave., three-st'y brick store and dwell.; cost, $5,000; owner, Harriet Ingram, 752 Fifth Ave.; architect, George Ingraham; builder, Wm. Corrigan.

Union Ave., cor. Ainslie St., 2 one-and-two-st'y brick factories; cost, $12,000; owner, Wm. Cabble Excelsior Wire Manufacturing Co., 43 Fulton St.; architects, Parfitt Bros.; builders, Stephen J. Burrows and Oscar H. Doolittle.

Meeker Ave., Nos. 675 *and* 679, 275′ e Marcy Ave., 3 two-st'y frame dwells.; total cost, $6,500; owner, F. Miller, cor. Lewis Ave. and Hart St.; architect, T. Engelhardt; builders, Sachs & Smendinger and John Rueger.

Chicago.

Building Permits. — F. Schneider, two-st'y brick dwell., 22′ x 46′, Seminary Ave., near Webster St.; cost, $2,500.

J. H. Little, two-st'y brick dwell., 25′ x 64′, 629 West Adams St.; cost, $8,000.

C. & N. W. Railway Co., two-st'y brick freight-house, 40′ x 410′, Kinzie and Water Sts.; cost, $30,000.

C. Seipp, ice-house, 84′ x 144′, 2229 Inglehart St.; cost, $30,000.

F. Kickter, two-st'y brick dwell., 20′ x 32′, 2814 Church St.; cost, $3,000.

Mrs. — Troost, two-st'y brick dwell., 20′ x 50′, 34 Montana St.; cost, $2,300.

J. W. Conray, 2 three-st'y brick stores and dwells., 40′ x 70′, 407 State St.; cost, $10,000.

E. A. Holroyd, two-st'y brick dwell., 22′ x 55′, 446 Warren Ave.; cost, $3,800.

Wordell & Hinkley, two-st'y brick factory, 60′ x 90′, Loomis and Taylor Sts.; cost, $5,500.

M. Kranz, two-st'y brick dwell., 22′ x 47′, 40 Evergreen St.; cost, $4,000.

Curran & Wolff, 8 two-st'y brick dwells., 65′ x 145′, Calumet Ave. and Twenty-second St.; cost, $20,000.

M. Bartodzieu, two-st'y brick dwell., 22′ x 60′, Eighteenth St., near Paulina St.; cost, $3,700

C. E. Baker, two-st'y brick dwell., 25′ x 57′, Indiana Ave., near Thirty-fifth St.; cost, $6,000.

Johanna Webber, two-st'y front addition, 20′ x 26′, 18 Wesson St.; cost, $12,000.

E. A. Lancaster, two-st'y dwell., 30′ x 60′, 2703 Parnell Ave.; cost, 10,000.

J. Kenny, one-st'y dwell., 20′ x 40′, Emerald Ave., near Thirty-third St.; cost, $8,000.

Addition. — The Moran Building, on Washington St., by Dearborn, is having two stories added to it, or rather inserted. It is already one of the highest buildings in the city.

Hotel. — A new hotel on the European plan is to be built by the owner of Burke's Hotel, Mr. William McCoy; on lots 8 and 9 in block 115, in the school section. It is on Clark St., east front, 100′ s of Jackson, and is 30′ x 213′, running through from Clark St. to Pacific Ave.

Louisville, Ky.

Building Permits. — Of the building permits issued since last report, the following are those of importance: —

L. & N. R. R. Co., foundation for brick depot; cost, $6,000; H. Wolters, architect.

Wiltelshoefer & Peakel, brick store and dwell.; cost, $7,250; W. H. Redin, architect.

Geo. Fretscheur, brick dwell.; cost, $9,000; C. D. Meyer, architect.

Catherine Keisker, brick store and dwell.; cost, $5,000; Chas. D. Meyer, architect.

H. Israel, brick dwell.; cost, $2,500; Charles D. Meyer, architect.

Edward Fulton, brick store and dwell.; cost, $7,500; C. A. Curtin, architect.

H. V. Loring, brick dwell.; cost, $6,000; H. P. McDonald & Bro., architects.

Thomas Shanks, brick office; cost, $2,700.

C. C. Maltingly, brick dwell.; cost, $3,000.

New York.

Building Permits. — *Sylvan Pl.*, s w cor. One Hundred and Twenty-first St., two-st'y brick stable and office; cost, $3,000; owner, Frank Beattie, 202 West Forty-third St.; architect, D. J. Marshall.

East Fifty-ninth St., Nos. 420 *and* 422, four-st'y brick tenement; cost, $12,000; owner, A. Kreielsheimer, 420 East Fiftieth St.; architect, F. T. Camp.

Alexander Ave., n e cor. One Hundred and Thirty-fifth St., four-st'y brick store and tenement; cost, $10,000; owner, Mary Dugan, 107 Alexander Ave.; architect, John Rogers; builder, Jas. O'Kane.

One Hundred and Nineteenth St., n s, 25′ w Lexington Ave., 2 four-st'y brick apartment-houses; cost, each $25,000; owner, Matthew Van de Water, 2328 Second Ave.; architect, Chas. Baxter.

(*Continued on next page.*)