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THE new year opens with a number of serious fires. One of these, the account of which has a certain air of grotesque inconsistency, occurred in Cleveland, where an "absolutely fire-proof" theatre was completely destroyed in three-quarters of an hour, blazing with such fury as to set fire to a "stone church" near by, which was also burned into a useless shell. The theatre was a new one, having been open only a little over two months, and is said to have been constructed with all the safeguards now regarded as necessary to complete security. The stage was separated from the auditorium by a thick proscenium-wall of brick, extending six feet above the roof; and the proscenium-arch was closed by a fire-proof curtain. Brick and asbestos were used in place of wood wherever possible, and all the staircases in the building were of stone or iron. Even the dome over the auditorium was made of sheet-iron, and, in accordance with the most recent and approved practice, an immense skylight was placed in the roof of the stage, so that in case of fire the glass would break, setting in motion a current of air from the auditorium into the stage, to carry smoke away from the audience.

IN addition to all these precautions, which it must be remembered are not less valuable because they have once failed of the entire effect hoped for from them, stand-pipes were provided at various places in the theatre and on the stage. The cause of the fire, according to the excellent account of the Boston *Herald*, seems to have been a leakage of gas from the meter or the pipes near it. A violent explosion took place when the janitor, carrying a lamp, opened the door of the meter room, and the flames poured out of the door and kindled some light wood-work near by. The engineer was standing close at hand, and immediately ran to the pumps and set them in motion, but in a few minutes the scenery and stage apparatus caught fire, driving every one out of the building. Although an alarm was promptly sounded, the utmost efforts of the whole city department were insufficient to control the progress of the conflagration, which raged until nothing was left of the building but the front and side walls, which, being of brick, may possibly be used again in re-building. The church, which was simply a combustible frame with a stone shell, suffered the usual fate of such structures under similar circumstances. This occurrence is the more interesting, as it is the first trial of the new principles of theatre-building which have found currency since the terrible warnings given by the catastrophes at Brooklyn, Nice and Vienna. It is very much to be hoped that we may have later an account of the fire written by the architect of the building, or by some other equally competent expert, which will serve to show the value, in time of actual trial, of the various precautions employed. Such an account would serve a most excellent purpose, not only in pointing out the way for further improvements in theatre construction, but in showing the real efficacy of the devices which at least deserve the credit of having probably saved the lives of the few persons who happened to be in the theatre.

THE fire next in importance so far as regards the instruction which the account of it conveys to architects, is one which consumed the Beaurivage apartment-house in Chicago, the finest building of the kind in the city. Although constructed with care, for the occupancy of the best class of tenants, the house seems to have possessed some of the worst faults common to structures of the kind, so that a small fire, originating in some way in the basement, was able to make its way to the shaft of the freight-elevator, and thence to the servant's staircase, which was of wood. The combination of a wooden staircase and an elevator-shaft is about the most favorable one for combustion ever invented, and the fire spread immediately through each story, driving the occupants of the building from their beds, to rush panic-stricken, many of them in their night-clothes, and with bare feet, into the street below, where the thermometer stood at twenty-nine degrees below zero. Fortunately, a hotel was close by, but several of the terrified fugitives had their feet frozen before they reached shelter.

A VALUABLE suggestion for the better suppression of conflagrations has been made by the New York Fire Commissioners, who, having observed the efficiency of the fire-boats hitherto used for service along the river fronts, propose that the same boats should be employed in case of an extensive fire in the dry-goods district, or any other part of the city within a mile or so of the water, to force salt water from the rivers into portable tanks, containing about four thousand gallons each, which could be drawn by horses to a convenient place near the scene of the fire. The power of the fire-boats is sufficient, it is thought, to force water into a tank nearly, or quite, four thousand feet away, and as each tank, supplied from the fire-boat engines, would furnish at least three ordinary steam fire-engines with all the water they needed for continuous operation, the resources of the Department might in this way be materially increased, at very small expense. No experiments have yet been tried to show how the plan will work in practice, but orders have been given for making actual tests as soon as possible, and if the result is favorable the necessary tanks and hose, with the other appliances necessary for stretching the long lines of hose in the shortest possible time from the river to the street tanks, will be at once provided.

BY the kindness of the architect concerned, we are put in possession of the report of a case of great importance to architects, which was decided in the Superior Court of Suffolk County, Massachusetts, some time ago. It appears from the evidence that the architect, who was the plaintiff in the case, was invited to enter into a limited competition for the selection of an architect to build a certain church; and that he made drawings and submitted them in accordance with the invitation. The church records showed that his plans received the largest number of votes, but the result of the voting was never communicated to him, and at the same meeting, after the voting upon the plans, it was resolved to employ that one of the three architects engaged in the competition with whom the most advantageous bargain could be made. In accordance, apparently, with this prudent suggestion, the plaintiff was approached by the committee, and an agreement made, under which he was to prepare the plans and specifications for the building, and give partial supervision to their execution, receiving in return the sum of one thousand dollars. The architect then presented the sketches previously submitted in competition, and the committee requested him to make some modifications in them, which he proceeded to do, but immediately after this the committee sent a request to the architect to resign his commission, and, upon his declining to comply with this invitation, notified him to go no farther with the work; and subsequently employed another architect to make the plans from which the building was actually constructed.

THE first architect then, on the ground that he had contracted with the church committee to furnish plans, specifications and partial superintendence for their building, and was still ready and willing to do so, but was prevented by the committee itself, brought suit to recover the compensation which the committee had agreed to pay him. The defendants replied that as the plaintiff had offered, under his special contract, the

same plans submitted by him in the competition, without modification, and had performed no additional service since his engagement, they owed him nothing, since he was not entitled to payment for the plans made under the competition. Moreover, as they said, "they had only accepted the style of the plans, and not the plans themselves," and the plaintiff had agreed to make the plans satisfactory, and had not done so. The court does not appear to have been particularly impressed with the nice distinction between "the style of the plans," and "the plans themselves," and this valuable point disappears with very brief mention from the record of the case. Evidence of the usual character was brought forward to show that there was a usage among architects in a competition to the effect that the one whose preliminary studies met the approval of the committee should be selected, and that he should be engaged for full professional service at the established scale of prices; this scale being the one familiar to all our readers. The court, however, ruled that although it was usual in a competition for one of the competing architects whose plans met the approval of the committee to be selected, it did not appear in this case that any one was accepted, and there was therefore no engagement under the competition. But whatever the rights of the plaintiff might be in a competition, the declaration in this case was on the special contract, which was apparently shown to be a special one by the fact that the price for services named in it was much less than that established by usage. On the point raised by the defendants, that the plans offered under the contract were the same as those submitted in competition, the court ruled that even if the plans were made previous to the special contract, this did not affect his right to recover payment. If, in fact, they were used in his work under the contract, they were his property, and were to be paid for by whomsoever they might be used. The jury, therefore, returned a verdict or the plaintiff in the sum of seven hundred and sixty-one dollars and twenty-four cents.

THE idea which we suggested as long ago as 1878, that the problem of burying telegraph and telephone wires beneath the surface of the ground in cities, might eventually be best met by the construction of sub-ways, which would be useful for many other important purposes, seems to have occurred to various other persons within a few months; and since the recent decision of the New York Board of Aldermen, requiring electric-light wires to be put underground within two years, a serious discussion has opened in that city as to the practicability of constructing such sub-ways at once, so as to have them ready for the wires before the limit of time expires. The New York *Times* contained a few days ago an article setting forth the advantages which would be presented by such subterraneous roads, in which gas and water mains, steam-pipes, pneumatic-tubes and electric wires of all kinds could be placed, under easy supervision, without further necessity for that tearing-up of pavements and obstruction to travel which has been so much complained of within the last three or four years. It seems that matters have gone so far in New York that a company has already been formed there to construct sub-ways of this kind under the principal streets; and the *Times* warns its readers against selling, or giving away, too hastily, to a corporation the privilege of doing what ought to be done at the public expense, and for the public benefit. As it says, the total annual expense incurred by gas and steam companies for tearing up pavements and excavating trenches, with that which will be thrown upon the electric-light companies when the new ordinance goes into effect, if converted into rental for the use of the sub-ways, would pay a reasonable interest on the cost of constructing them, if not a handsome profit.

TWO new sources of possible malarious emanations have been discovered which will add to the terrors of householders in a degree dependent less upon their importance than on the circumstance that they are unavoidable. The first of these is to be found in the sediment left by the melting snow in great cities, which cannot be removed by sweeping, and accumulates from day to day until the rain washes it away. Those who have waded through New York streets after a heavy fall of wet snow do not need to be told that the mass about their feet contains a large proportion of filth, but as even the liveliest bacteria must lose something of their activity while suspended in melting snow, and as the warmth which would restore their baneful qualities would also wash them into the sewers, the peril from this cause does not seem so immediate as to call for severe measures at present. The other miasmatic agency is, according to a correspondent of the New York *Times*, to be found in the deposits of rags, old boots, rotten timber, dead leaves and offal of all sorts which are to be found on the roofs of houses in the more thickly settled portions of the city. Mixed with the effluvium from the open soil and rain-water pipes, the stench from the noisome accumulations on many tenement-house roofs is offensive, if not injurious, to all those who live in the neighborhood, and especially to the inhabitants of houses higher than those of their slovenly neighbors.

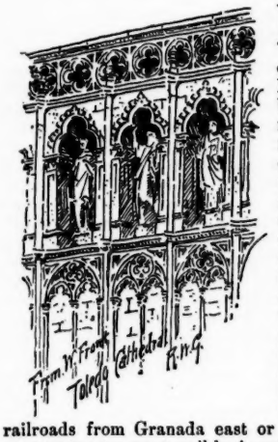
WE are informed by Col. Waring that our statement of his position with reference to the improvement of the Potomac Flats is not quite complete. As he states it himself it is this: The Flats, which are now covered by nearly every high tide, and which are in a constant state of saturation, are not in his judgment a source of malaria, such malaria as is developed in the lower parts of Washington being due to the imperfectly drained districts mainly south of Pennsylvania Avenue and between the White House and the Monument. If relief from malaria were the chief motive of the improvement proposed, the proper course would be to drain these low lands thoroughly, and this could be done only by pumping. The district occupied by the Flats when protected from the river by a sufficient embankment, whether filled or not, will probably become a farther source of malaria unless thoroughly drained, also by pumping. The cost of such drainage would be substantially the same whether they were drained at their present level or after being filled to such a height as to consume the earth to be dredged out in deepening the channel of the Potomac,—which is desirable,—or after being filled to the elevation of the present park about the Monument,—which is not necessary for any sanitary reason.

MOST of our readers have heard something of the theories which ascribe the recent red illumination of the sky after sunset on clear evenings to the effect of the clouds of dust diffused in the upper air by the great earthquake in the island of Java, which took place on the twenty-fifth of August last, and will be interested to learn that according to some of the correspondents of *Le Génie Civil*, the same earthquake, which is called by M. de Lesseps, one of the correspondents, the most frightful convulsion that history has ever recorded, was indicated at Aspinwall, on the opposite side of the globe, by marked oscillations of the sea, which were observed thirty hours after the time subsequently shown to have been that of the Java catastrophe. The earthquake was accompanied, on the shore of Java itself, by enormous waves, and there seems to be no doubt that the shocks were transmitted through the deep water of the ocean in all directions. At the harbor of Panama, on the Pacific side of the Isthmus, no variations of the sea-level were noticed, but M. de Lesseps accounts for this by remarking that the water communication with Java on this side, although a little more direct, is through seas comparatively shallow, and obstructed by numerous islands. The observations of the engineers in Central America are strikingly confirmed by a letter from M. Bouquet de la Grye, who, thinking that the immense waves which accompanied the earthquake might have shown some trace of their fury in the North Atlantic, inspected the curves of undulation automatically drawn by the recording "marégraphs," which are kept at the principal meteorological stations on the French coast, and found at Havre, Rochefort, Cherbourg and Socoa very distinct indications of extraordinary oscillations upon the twenty-sixth, twenty-seventh and twenty-eighth of August.

WE believe that our subscribers, as they turn over the pages of the *American Architect* for the year just closed, will agree with us in finding that the character and quality of the illustrations exhibit a marked advance in point of design and interest of subject over the average of the illustrations published in former years. But there is still room for improvement, and the largest part of the best and most important work is habitually, alas, unrepresented in our pages. Will not the architects who have charge of such work, by their contributions, enable us to make the record more complete, and relieve us from reproaches which are somewhat unjust?

SPANISH ARCHITECTURE.[1] — VII.

TOLEDO.



BY the time I had mastered sufficient resolution to fix a date for leaving Granada I found it desirable to reconsider a certain list of cities and villages which had been designed to be the skeleton of my plan of travels. Already one month (of the four allotted to this country) had slipped away since my first introduction to Spain, and, although that period had been crowded with charming experiences, yet a growing consciousness that I had not even begun that study which was the chief object of my tour, prompted two or three strokes of the pen, blotting out as many names of places. Reluctantly I changed my mind. The ride to Malaga by Alhama, or that to Murcia by Guadix and Lorca were temptations. There are no railroads from Granada east or south, and for a hardy student a greater treat cannot well be imagined than a journey thus, through scenes and places which Don Quixote might traverse in this day without noticing any change since his own. And then those two Mediterranean ports, and Cartagena and Alicante and Valencia besides, all on the shores of the great inland sea, promised such abundant recompense, in the novel and the picturesque, for a journey thither, that I do not presume to say to others: "Do as I did." It was only that the allurements of fantastic fisher folk and mariners and merchants, quaint *patios* and balconies by land, and "*chalupas*" and tanned lateen-sails and stained nets by sea, and all the other paraphernalia and accompaniments of life in these southern coast towns had not attractions for me just then equal to those invoked by the promising word "interior." I knew I could not find any of the sturdy monuments of mediæval Christian architectural skill until I went farther north. At Valencia there is a little good Gothic. Mr. Street says "Valencia, though not containing any building of remarkable interest, is nevertheless well worth a visit" for other things. Therefore I conned my chart for routes to the interior, to the centre of the country, almost, to the city of Toledo. Between Granada and Toledo there rises a long chain of mountains — the Sierra Susana, and the only railroad route yet constructed is that by Bobadilla and Cordova, which, besides the objection that it was doubling on part of the route already passed, involved a détour adding some hundred and fifty miles. The alternative is the diligence over the Sierras to the other end of the loop of railroad, which is re-encountered at Menjibar, and I chose this because it promised more interest and no loss of time. If it were not out of place in these special papers, I would add to my notes of what I saw a great many more of how I saw them; for let it be remembered a journey in Spain, by a foreigner, is not the mere uneventful getting over so much ground to change one's position. This is accomplished with, or rather in spite of, incidents and circumstances undreamed of by the highly civilized traveller from lands where railroads spread like vines. In parts of our Southern States one may sometimes have to make a journey after some such fashion, but it will probably be to or from an insignificant place, while in Spain a route from one big city to another will be full of all oddities of travel.

To be very brief, I rose at half-past four one morning, and without the breakfast promised over night (and forgotten over night, too) I started on this journey toward Toledo. It proved to be of about twenty-nine hours' duration, and about seven hours of these were spent in waiting at changing stations. I ate my lunch early in the day, and then had to trust to the resources of a country where travellers always carry their provisions. It was not so very bad, and it was novel, but one learns in these ways to do "as the Romans do." The diligence bowled along at a good rate, behind often-changed teams of eight mules and horses, harnessed together indiscriminately with the queerest tangle of straps and old ropes held together by bits of cord to replace broken buckles. It was a wonder that they held the animals and vehicles in the normal connection. Very few habitations — some five or six farms and *ventas* (wretched roadside inns), but a good hard road zigzagging up into the mountains; a panorama of crags and peaks in a clear, brisk atmosphere; a descent along the course of a mountain stream into cultivated lands lower down, and then a village, — Campillo de Arenas, — squalid and dirty, but picturesque of course. After a short halt, on through the valley, among precipices and cultivated hillsides, with here and there an enormous boulder lying where it had lately crashed down from above: these mountains seem to be crumbling while one gazes. All along and around the lower hills run little rivulets of water for irrigation, in three or four tiers high above the river level here, brought from pools dammed up far behind, trickling along in wooden troughs or clay channels, with here and there a hole or a handful of earth, to divert a little water to some favored plot or to a secondary channel. Then the country changes somewhat; rolling hills instead of rocky peaks are seen and passed, and we come to Jaen, a town of some importance, with an ancient extensive castle and a Renaissance cathedral. A change of coach, and on the road again through fields ravaged by locusts. It was spring-time, but the face of the earth was brown and sere, instead of green. Everything that locusts could eat was eaten, wheat-fields were just surrendering their last dead stalks, and the few trees struggling to put out a leaf or two to keep themselves alive. Then we sighted Menjibar, and by a suspension bridge of wire-rope and timber (a favorite style of light bridge here) we crossed a river, and after a few miles of dreadfully dusty road came to the station. It was a lonely, dreary, dirty, forsaken sort of place, leagues away from any village. Spanish stations are generally at a greater or less distance from the place whose name they bear; no one knows why, unless it is the coach-driver who profits by it. Patience, therefore. The train came at last, and soon we were in more mountains. It was bright, clear moonlight now, and the passes and torrents were mysteriously grand in the night, so solemn were the shadows and so weird the hard, cold shafts of light darting down into t.e cañons through which we crept. I dozed a little; when I looked ut again my first impression was that we were at sea. On both sides, as far as the level horizon, the earth lay as flat as the ocean; not a tree or even a stump to be seen, not a tinge of green or a sign of life. This is the scenery of the Castilian plains. Now and then a slight rise will break the dead level, and sometimes one lonely building is in sight, dotting the horizon as a ship might. Grain is cultivated on these plains by a peasantry more miserable than the Irish, except that they are industrious by habit. Formerly a high degree of fertility favored some parts, but now all is dried to brown and gray dust. Such is the fate of a country deprived of its forests.

At Castillejo I and two others bound for Toledo alighted, to wait the morning train thither, and we slept a little on the seats in the waiting-room; fortunately they had cushions, and there were just three of them. The description of Menjibar station will apply also to this one. Then such a queer, heathenish breakfast as I got! The two women who constituted the visible population of the two or three huts seemed to doubt that I was hungry; the fact that I ate some of what they supplied to me convinced them, however. I smoked cigarettes and watched one hen one hour. Then the train came and I departed without regret.

Toledo is romantically situated. Just at the base of the mountains (the Sierra de Toledo) where the granite crags stretch out spurs subsiding into the plains, the River Tagus, in some freak of its geological youth, managed to get around behind a part of the rocks and isolate it from the rest, and on this hill stands the city. To the north, steep slopes terraced with ancient walls dominate the fields below, whence the river enters a rugged gorge from the east, and foams and boils along its confined channel around three sides of Toledo. Not much walling or rampart is wanted here, for the bank is precipitous, and not in many places practicable of ascent. Here and there a little watch-tower or parapet tops a peak of the cliff as if it grew there, looking, too, as if a push would hurl it down into the torrent; but it has withstood siege and tempest for centuries, so one accepts the fact as it stands. On the top of these scarps of granite, high above the stream, the buildings jostle one another out of shape, and, for want of standing room, distort the streets into crooked alleys almost as eccentric as those of Cordova.

The city is entered from the station (which is of course on the plain) by a road skirting the rocks at the entrance of the gorge, and crossing the river by an ancient bridge still called Alcantara. Behind, a height is capped by the ruins of a castle, an outwork of the defences. In front, crenellated walls and bastions stand overlooking the approach, and behind them towers the enormous rectangular Alcazar, now devoted to the use of the Spanish military academy, the central feature in a wild confusion of houses, and rocks, and blank walls. Then, following the contour of the hill, the road winds in an ascending grade along the base of the city walls, and at last doubles back and mounts the walls, the top being the level of the streets at the famous Puerta del Sol, the grand old Moorish gate of Toledo. The modern approach passes around instead of through this castle, and finally turns abruptly into the city a little beyond it. Alighting from the omnibus in the little square, I secured the services of a native as porter and guide, and sought a certain "Casa de Huespedes" or boarding-house, which had been recommended as better than the hotel. We trudged along the narrow way, crossed the bare plaza under the shadow of the cathedral, and diving into another crooked lane entered a big arched doorway. Here my porter pulled an end of rope which dangled from a hole in the inner door, a little trap opened over our heads, and an aged señora demanded "Who is there?" At the answer "A stranger," bang dropped the trap, and a moment later the second door opened to admit us to the *patio* or inner court, just in time to see that the señora controlled the entrance by means of another old string stretching like a clothes-line from the gallery opposite. All the time I stayed here, and every time I came "home" it was a delight to take part in this performance with the quaint home-made apparatus of two strings and a trap-door; the latter I found to be in the floor of the dining-room, where one of our hostesses (they were two ancient sisters) usually sat. The court-yard too, with its few shrubs in tubs on the paved floor and its old columns supporting wooden galleries and tiled roofs was a venerable place; and the rooms and passages and all the domestic

[1] By Robert W. Gibson, Travelling Student of the Royal Academy. Continued from page 293, No. 417.

arrangements were charming in their queerness. The señoras were almost motherly in their ways. It was as if I had discovered some old friends or nurses of my babyhood, who took a personal interest in me on account of things I had forgotten. I had meals at my own times in an odd kind of parlor, decorated with pictures, almost as old as the house, of saints and martyrs; and an engraving of the Blessed Virgin, and other religious adornments mingled with painted earthenware statuettes of bull-fighters and peasants. The household staff included several small creatures whose personal appearances had been in many cases modified in the settlements of their differences. There were five cats, one with a hind leg twisted into grotesque uselessness; a dove, one of whose eyes had been readjusted by the lame cat; a canary, whose neck had apparently been wrung, and imperfectly replaced, and another fantastic bird without a tail, something like a lark, but who was good for nothing except for making most unaccountable noises at improper times. We all lived with two or three other guests on the second floor, the first being occupied by wash-houses, and store-rooms, and cellars, and as I have said we were a comparatively happy family.

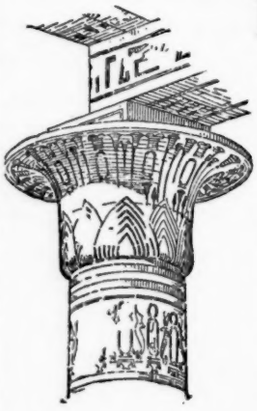
Toledo Cathedral is the metropolitan church of Spain, and is as grand and beautiful as an edifice of such distinction is expected to be. It is mainly in the noble style of the thirteenth century, strong, pure Gothic, of a period uninfluenced by those methods and adornments to which in later ages the pointed styles degenerated. This character is best seen in the interior. The outside has been more changed by additions and alterations of later dates, for although it was commenced in A. D., 1227, there have been a succession of different works upon it from that time to our own. The west front is of the fifteenth century in the main, but (as Mr. Street remarks) the upper part was completed at the close of that century, and was repaired and altered in the eighteenth. All this is easily traced in the different styles of the work as it stands (*See illustration*). First, the doors and the enormous buttresses rising between them were built in front of the fourteenth-century end of the nave already completed, and the towers were commenced. It seems that the northwest tower, the finished one, was erected with some reference to an earlier design, for it does not show exactly the true spirit of this age. A little later the niches and statuary were undertaken, and the parapets pierced with quatrefoils; later yet, the awkward second story of the southwest tower; and still later, in the Renaissance age, the inappropriate pediment over the centre, the octagonal dome on the low tower, and the upper open arcades above the side doors. As might be expected the whole façade is a medley likely to receive little in approbation from purists in regular Gothic. Judging it from this standpoint, Mr. Street says that "now it presents little if anything really worthy of notice;" but it struck me as being an extremely valuable subject for the student in modern architecture, as opposed to archæological art. The play of sunlight and shadow in the arcades contrasting with the heavier broader surfaces which show only attached arcading is very beautiful, irrespective of style of detail. And the little bit of composition of the side doors and parts over them is good; fit to be noted by a designer in any style. The treatment of the jambs of the three doors too, is suggestive. The curious pair of arches built out in front of the rose-window, although they are not beautiful as they exist, are extremely interesting. This feature was evidently intended to modify the glare of the sunlight upon the stained-glass. It is a late addition, probably of the same date with the octagonal story of the southwest tower. Below it there is a sculptured representation of the Last Supper cleverly conceived, but spoiled by a rather curious incongruity. The figures of Christ and the twelve apostles are seated at the table extending from buttress to buttress like a parapet. In fact it *is* a parapet, and not enough is done to it to withdraw it from the architecture, and group it with the sculpture; so that it carries a suggestion of the ludicrous idea that they are eating off the top of a wall. The table should be carved to look in some way like a table. The niches in which the figures are placed add to this unfortunate effect. The northwest tower is very dignified; it is simple to an unusual degree, the arcading on the walls is just a trifle monotonous; but its size (about 40 feet square at the base, and 170 feet high to the parapet just visible in the illustration) gives its simplicity considerable force. Above the parapet there comes an octagonal story crowned by a steeple, making a very consistent and good composition. Just at the base of this tower may be found a door leading directly into the cloisters: they appear to be of the fourteenth century, and are very richly carved, but a good deal damaged; as usual, a door gives access to the church from these cloisters. On the other side of the cathedral runs a little street, from which are two more doorways; the one generally used is a "Græco-Roman" excrescence, the other a Gothic arch of more interest but not striking. There is also another door on the north side of the building, reached by making a détour through the maze of streets, which is more worthy of note; it is elaborately sculptured with scenes from the life of Christ, and figures of saints and angels.

Entering the cathedral, the first impression, and a very strong one, is that made by the deep gloom, almost darkness, of the interior everywhere. Coming in from the glare of the sunlit streets one has to wait awhile to get accustomed to the obscurity; until then he cannot see enough to walk about with safety. At the best of times it is a most difficult task to sketch there, and photographing is out of the question. As soon as it is visible it reveals itself as a most magnificent interior. Its total dimensions (inside the outer walls) are about 350 feet in length, and 178 in breadth, the eastern end being circular on plan. The disposition of the parts is extremely simple. A middle nave about 50 feet wide (from centres of pillars) and seven bays or arches in length, is crossed by transepts of equal width, and terminated eastward by a "*capilla mayor*" (principal chapel — what would be called the choir in an English cathedral) of one straight bay and a circular end of five arches. All around this middle nave run double side-aisles of lesser heights. The nave is 116 feet high, the first aisles 60 feet, and the outer ones 35 feet. The pillars are all nearly alike, composed of a central round column with twelve smaller shafts clustered about it rising to support each its separate arch or vaulting rib.

The arrangement of the choir in this and in nearly all Spanish cathedrals demands special explanation. The *coro* is a part of the nave, usually about the eastern half, surrounded by high, elaborate screen-walls of stone, but open of course toward the east, except for the metal grilles usually placed at that end. Here the clergy and choir stalls are ranged along the sides, with the bishop's throne at the western end opposite the altar. The whole of the choir (as northern Europeans understand the word) is therefore used for the sanctuary, and the congregation have to accommodate themselves as best they can in the transepts. Curiously enough Westminster Abbey, in London, has a choir arranged in this way, but there the altar is brought forward so as to be seen from the transepts. The arrangement is essentially Spanish, and must be continually remembered to understand descriptions of Spanish cathedrals. Before noticing further the various parts a brief examination of the general style will be advisable, and this will be aided by reference to the view of the west end of the nave. (*See illustration.*)

Bold, simple shafts stand upon well-contrived bases, the lowest projection forming a seat. The main arches are richly moulded and rise from carved capitals. There is no triforium proper, but the idea is retained in the lower parts of the clerestory windows divided off by a transom, and with the mullions headed by pointed tracery. The tracery in the heads of the windows is simple geometrical, mostly of circles and all filled with stained-glass. The vaulting is quadripartite, simple and grand, with well-moulded ribs. The western rose-window although not of later date than that part of the nave is much richer. It is a most beautiful example of the exuberance possible in geometrical tracery, and the effect of the arch outside shading its rich stained-glass is charming. Beneath it a range of traceried arches stretches nearly across the church; very handsome, but receiving so little light, owing to the screen-walls outside it, that its stained-glass is almost as dark as the walls. The doors below are poor, but the wall tracery in the arch is rich. This drawing gives some idea of the character of the architecture in all the main structure; but of course there is a great deal in chapels and screens, etc., which is somewhat different.

A NEW HISTORY OF EGYPTIAN ART.[1]—I.



EVEN a person unacquainted with the foregoing literature of Egyptian art might easily see that this is a most valuable and important work, but only the student who knows the deficiencies of this literature will quite realize its worth. Only he who has tried to decipher the history of that art, to unravel its mysteries, and gauge its artistic worth from a mass of volumes all more or less confused, redundant, scrappy, ignorant, prejudiced or over-scientific, will fully appreciate what Messrs. Perrot and Chipiez have at last done for a world of puzzled, distracted and misled readers. In many former books on the subject we have had the nature of Egyptian art discussed from a purely isolated standpoint, its products judged by "ideal" or other extrinsic standards and rated by the measures of alien lands and epochs. No method could be more unsatisfactory; for the clear understanding of local history, manners, needs and religious beliefs is nowhere of such absolute importance as with this earliest, and, to us, strangest of developments. Those who, on the other hand, have attempted to paint the whole panorama of Egyptian life, and assign a place in the rich mosaic to artistic impulse and productions, have usually gone to the opposite extreme — have not seen how wide, and interesting, and important a place it was, and have not defined it in any clear, much less any adequately appreciative way. In short, while we have had many histories of Egypt and many books about Egyptian art, we have had no real *History of Egyptian Art* written for the sake of that art, but with wise understanding, and explanations of the thrice peculiar influences which gave it birth, and guided its advance. Thus much of the relative value of the book as compared with all those upon which the student had formerly to depend; but even were it to

[1] *A History of Art in Ancient Egypt*, from the French of Georges Perrot and Charles Chipiez. In two volumes; Illustrated. Translated and Edited by William Armstrong. London: Chapman & Hall. New York: A. C. Armstrong & Co. 1883.

be judged intrinsically — judged as though the same task had been often undertaken in the same way—our verdict upon its worth would be extremely high. It is not because they have done a new thing in a new way, but because they have done it with such perfect skill, such complete knowledge, such clear and unbiassed insight, such admirable taste, both in matters of judgment and of expression, that we greet Messrs. Perrot and Chipiez's book as the most valuable addition to the literature of art that has been made in any language for very many years. It not only is the first to fill a vacant place upon our shelves, but it fills it so satisfactorily and completely that we feel the work has been done once for all—that though future discoveries may lead to an expansion and development of the ideas therein presented, and though the archæologist will always wish to have his knowledge of details and examples brought down to the latest moment, the mere art-student may rest amply content with what is here presented to him.

The time when the authors undertook their task was, of course, very fortunate. A few years ago a philosophical history of Egyptian art could hardly have been written for want of data; but so great have been the discoveries made during the past twenty years, and so immense the progress in criticism led by Mariette and Maspéro that a more than sufficient mass of material was at hand, ready for the organizing, simplifying touch which has at last vivified it into life for the general reader. When I say that these authors were the first to formulate a real history of Egyptian art I do not mean that they have made new discoveries, or started many new theories, or founded a totally new philosophy of their own. Their work is founded step by step upon that of the recognized modern authorities; but while these have written in scattered essays, or in treatises too profound or too voluminous for ordinary readers, Messrs. Perrot and Chipiez have prepared for these last a book of moderate compass, in which is for the first time condensed the archæological information and critical wisdom of the great specialists. Of course, this is not to hint that their work has been merely that of selection and adaptation. Many men have many minds, even among savants, and our authors have often had to choose one hypothesis from others that conflict with it, and to follow with careful instinct and cautious taste the guide who, at the given point, seemed to them most trustworthy. It is only when one reads the long lists of references attached to almost every page, when one realizes the mass of literature from which they have culled their facts and drawn their opinions, that their selective, critical, organizing and formulating skill will be rated as it should be. The excellence of the work is perhaps the more remarkable when we know that it is merely the first one of a series destined to embrace the whole course of ancient art, that it was written not by professed Egyptologists, but by men whose main attention has been given to Greek remains, and to whose eyes this general history finds its culminating point in the age of Pericles. A history thus written as preparatory, chiefly, to another which must deal with a widely different type of work, might have been expected to show signs of narrowness, of limitation in taste, or at least of superficiality; but such is far from being the case. We are not given, it is true, the whole history of Egyptian work down to the time when art was no longer practised in any shape upon the borders of the Nile. Our account stops with the extinction of really native art, with the period when Egyptian work can no longer be looked upon as a forerunner of Greek developments, but as an art coming itself under the influence of Greek ideas. The loss is not great, however, and will probably be only for a time. For when the later days of classic art are themselves reached we may expect to find the authors returning again to Egypt, and describing the Grecized or Romanized relics of its final days. All that is truly national, all that is characteristic, all that is of really high artistic value is fully treated in the present volumes. In their preparation the two men whose names are given equal prominence on the title-page have borne a by no means equal share. The chief author is M. Perrot, M. Chipiez being an architect who has assisted the former in all portions relating to architecture, and has either drawn or superintended the architectural illustrations, which form no mean part of the value of the book.[2] It is said that the authors hesitated long as to whether they would publish their work in the folio shape so attractive to writers, because affording so much more room for satisfactory illustration, or in a smaller form which would bring it within reach of the general reader. We may, indeed, congratulate ourselves and them that the latter plan found favor in their eyes. To have such a book as this locked up in costly folios would have been a loss ill-balanced by the pleasure of a few score specialists.

It is difficult to do justice to such a book even in what may seem a disproportionately long review. It is all so excellent, all so interesting, and almost all so new to the popular eye that it is hard to fix upon any special portions for special praise. In its plan it shows the typically French power of arrangement at its very best. The subject is divided into its most essential branches, but not subdivided so as to produce confusion or scrappiness of treatment. After an excellent general introduction which runs over briefly the plan followed in former histories of art, and defines that here pursued, comes a chapter on the "General Character of Egyptian Civilization." Then architecture is taken up, at first in a general sketch and then in its different forms; sepulchral architecture being first treated throughout its successive periods, then temple architecture in the same way, and then civil and military building. When the reader has thus been familiarized with the main characteristics of Egyptian buildings at different epochs a more detailed analysis is made; its methods of construction, of ornamentation, etc., being inquired into with extreme clearness, good sense and critical acumen. Then we pass to sculpture, which is also treated according to successive historical periods, then to painting and the industrial arts, and finally, we get an admirable chapter on "The General Characteristics of Egyptian Art and the Place of Egypt in Art History."

I have already said that not the least attraction of the volumes lies in their wealth and beauty of illustration. We have here no repetition of the plan too often adopted in art books, and prompted by a desire to make as good a superficial showing as possible with the least amount of trouble and outlay. There are no worn plates of thrice-familiar objects to be found. Every cut is really and exactly illustrative of the most important ideas of the text, and where this illustrative function could be played with equal felicity by well known or novel objects it is always the latter that have been chosen, no matter at what expenditure of cost and labor. We have, therefore, not a repetition of pictures to be found in other books, but a multitude of new ones which enforce the lesson taught by those which are therein accessible. There are eighteen large colored plates in the two volumes, executed in the best style of French color-printing, many of them folded in and being of much larger size than the page. These are supplemented by more than six hundred wood-cuts, varying from the frequent full-page size down to small dimensions, but all executed with the utmost fidelity and artistic skill. We miss in them, it is true, those effects of tone and texture to which our own wood-engravers have educated our taste. They are merely fac-similes of careful yet spirited drawings, which had been prepared by excellent artists; but they are faithful and artistic fac-similes, and so, though they do not in themselves make pictures as charming or as ornamental to the page as those we might make in this country, their illustrative value is quite as great. Not only the museums of Europe, but the more remote and unfamiliar collections in Egypt itself have been drawn upon to furnish models, till in these pages we learn more of the famous treasures of Boulak than all we have read about them could possibly tell us. M. Chipiez furnishes many careful and scholarly reconstructions of architectural works, not elaborated out of his imagination or his private sense of what the fitness of such things ought to have been, nor arranged with deference to any preconceived theories, but always founded, down to the minutest particulars, on trustworthy and citable relics. In the very rare cases where he has to depend to any extent upon his divining powers, the fact is conscientiously pointed out. To study the cuts of these volumes alone would be an education in the true qualities of Egyptian art, even to many who think themselves well acquainted with its tendencies and forms.

If I were asked to point out the greatest excellence in this book, the point at least where it is likely to do the most good as correcting the most widespread and fatal misconception, I should say it lay in the pains taken by the authors to assert and to prove that Egyptian art was not a rigid, conventional, unprogressing, unvital thing, but a true and living growth, passing through all those stages of infancy, perfection and decay which are characteristic of other great developments. Its course was long involved in obscurity, owing to the paucity of its known remains and their strangeness to our canons of taste, this latter fact preventing our unused eyes from understanding those marks of growth or decadence which are so unmistakable when we grow familiar with the subject. We had, moreover, no sure history to guide us in distributing Egyptian relics, and our ignorance was further helped by the fact that the art of the Nile valley not only rose and fell once, but several times — had several, and not one single period of bloom. These things go far to excuse the confused ideas long held with regard to the nature and succession of the changes which it exhibits; but they can hardly be held to explain the blindness with which many writers have refused to acknowledge that there was any change, any growth, any variety at all. The latest book on ancient art which has attracted much attention is the history of Von Reber, which in its new translation was reviewed in these columns not long ago. Many faults were then pointed out among its many excellencies, but what seems to me the most glaring of all was not referred to. The chapter on Egyptian art is not only quite inadequate in scope, even considering the brief limits of the work, but utterly mistaken in theory. The chief points insisted upon are the immutability, the rigidity, the fixity of type, and conventionality of practice of Egyptian sculpture, and the inartistic, primitive, half-developed character of Egyptian architecture. Only ignorance of recent discoveries in the former branch, and a total want of personal acquaintance with existing monuments in the second, can explain, though hardly excuse, such an inadequate conception of so important a branch of ancient art. No one who follows M. Perrot through the proofs he gives of the rightness of exactly opposite views, will need to be warned against such writing in the future. The same is to be found, however, in only too many histories of art: not only insufficiency of treatment, but radical perversity of standpoint. Comparatively few writers on architecture, I must imagine, have visited Egypt until within very recent years, while there is no development of the art which so absolutely needs personal inspection for its proper understanding.

[2] M. Chipiez is, however, himself well known as an author. His "*Critical History of the Origins of Greek Orders*" was awarded in 1877 one of the highest prizes of the *Académie des Inscriptions*, and his essays toward the restoration of Greek temples are perhaps the most interesting that have ever been attempted.

The mere quality of mass — of size and weight — is one of the most important in every style of building, not only influencing so greatly the general impression made upon the mind, but regulating all other particular qualities, such as proportion, distribution, and ornamentation. This is just the characteristic which can least be appreciated from reproductions of any kind, and it plays a larger part in the impression made by Egyptian architecture than by any other. If we can only guess a little from pictures at the effect that would be produced upon the mind by an actual Greek or Roman or mediæval building, we cannot guess at all at that wrought by an Egyptian work. What looks like mere unnecessary bulk, like heaviness, baldness, rudeness in some places, and like redundancy of ornamentation in others, becomes, when the monument is before us, majesty and grandeur, immense and noble simplicity, or rich and not overwhelming decoration. More than this, the Egyptian temple seems to me of all buildings the one most intimately and peculiarly in accord with its natural surroundings. To transport a Greek temple or a Gothic minster into the scenery of another continent, to alter its conditions of site and surroundings and atmosphere — I do not speak at all of associations, but of material facts — would be to greatly lessen its artistic value; but not so greatly as to transport to any other spot upon the globe the buildings which grew up in the valley of the Nile, in answer to the demands of a peculiar civilization, but in marvellous harmony as well with the requirements of a landscape unique in form, in color, and in detail. If the elaboration of a Gothic church would look overdone and barbarous on the delicately moulded and tinted shores of Greece, if a Greek temple would be too refined and pure and simple to make itself properly felt on a German hillside or in a street of mediæval France, either of them would be far more out of place in the valley of the Nile, with its immense stretches of unmitigated sand and sky, its floods of brilliant light, its simple, endless, unbroken reaches of cliff and water. Only a building as immense, as powerful, as majestic in scale as those of Egypt could carry itself worthily as so visible, so palpable a point in so vast a panorama. Only such simplicity of outline, such a monumental style of sculpture could match the simplicity, the placid grandeur of the natural forms about it. Only such strength of applied color could sustain the impact of such a dazzling sun. Conversely, therefore, to attempt to judge the value, the artistic fitness and beauty of Egyptian building, while unacquainted with the surroundings amid which it rose, must be an essay hedged by peculiar difficulties. I have strayed a little too far from my ostensible task as a reviewer, perhaps, in dilating on this fact; but it is one which cannot be too strongly insisted upon if we would understandingly judge of Egyptian architecture, and it is one, moreover, which I think even M. Perrot does not sufficiently enforce. His reticence just here — not that it is anything more than reticence — is almost the only fault which it seems to me possible to find with his admirable volumes.

M. G. van Rensselaer.

TRANSVERSE STRENGTH OF TIMBER.[1] — V.

No. 27. — Spruce joist, 1 15-16″ x 10″; span = 14′; not many knots; loaded at centre.
Tested by Messrs. Tenney & Mansfield.
Moment of inertia = 161.4.

Loads in lbs.	Deflection in inches.	Differences.	Remarks.
485	.0000		
887	.1724	.1724	
1289	.3272	.1548	Beam tipped and braces were put in at ends beyond straight-edge.
1691	.5441	.2169	Wedge was used on west side to keep straight-edge close to the beam.
4306	—	—	Breaking load.

Modulus of rupture = 5601 pounds per square inch.
Mean deflection for 402 lbs. = .1814 inches.
Modulus of elasticity = 1355860 pounds per square inch.
Max. intensity of shear at neutral axis = 167 " " " "

No. 28 — Spruce joist, width, 4½″ at bottom; 4″ at top; depth = 12″; span = 18′; loaded at centre.
Tested by Messrs. Tenney & Mansfield.
Moment of inertia = 594.

Loads in lbs.	Deflection in inches.	Differences.	Remarks.
485	.0000		
887	.1049	.1049	
1691	.2999	.1950	
2495	.5030	.2031	
3299	.7033	.2003	
3701	.8136	.1103	
4103	—	—	
8829	—	—	Breaking load.

Modulus of rupture = 4816 pounds per square inch.
Mean deflection for 402 lbs. = .1017 inches.
Modulus of elasticity = 1397136 pounds per square inch.
Max. intensity of shear at neutral axis = 134 " " " "

No. 29. — Spruce joist, 4″ x 12¼″; span = 18′; loaded at centre.
Tested by Messrs. Scott & Foran.
Moment of inertia = 594.

Loads in lbs.	Deflection in inches.	Differences.	Remarks.
485	.0000		
887	.1048	.1048	
1289	.2169	.1121	
1691	.3267	.1098	
2093	.4424	.1157	
2495	.5488	.1064	
2696	.6227	.0739	
2897	.6768	.0541	
6917	—	—	Slight cracks heard.
8324	—	—	Breaking load.

Modulus of rupture = 4586 pounds per square inch.
Mean deflection for 402 lbs. = .1128 inches.
Modulus of elasticity = 1259224 pounds per square inch.
Max. intensity of shear at neutral axis = 129 " " " "

No. 30. — Hard-pine beam (Georgia), 3″ x 13¼″; span = 14′;
Tested by Messrs. Foran & Scott.
Moment of inertia = 667.78.

Loads in lbs.	Deflection in inches.	Differences.	Remarks.
485	.0000		
887	.0254	.0254	
1691	.0879	.0625	
2495	.1485	.0606	
3299	.2146	.0661	
7118	—	—	Cracked slightly.
15560	—	—	Beam badly canted, making it necessary to let off the load and brace more securely.
15158	—	—	Breaking load by shearing.

Modulus of rupture = 6614 pounds per square inch.
Mean deflection for 402 lbs. = .0307 inches.
Modulus of elasticity = 1937025 pounds per square inch.
Max. intensity of shear at neutral axis = 273 " " " "

No. 31. — Spruce joist, 3¼″ x 12″; span = 18′; loaded at centre.
Tested by Messrs Davis & Morse.
Moment of inertia = 450.

Loads in lbs.	Deflection in inches.	Differences.	Remarks.
485	.0000		
887	.1486	.1486	
1289	.3030	.1544	
1691	.4514	.1484	
2093	.6129	.1615	
2495	.7615	.1486	
3701	—	—	Cracking commenced.
7721	—	—	Breaking load: broke suddenly by compression of top fibres and shearing along neutral axis. Split showed several small pin-knots running vertically in the beam and apparently pinning the sides of the fracture together.

Modulus of rupture = 5559 pounds per square inch.
Mean deflection for 402 lbs. = .1523 inches.
Modulus of elasticity = 1231498 pounds per square inch.
Max. intensity of shear at neutral axis = 154 " " " "

[1] By Gaetano Lanza, Professor of Applied Mechanics, Massachusetts Institute of Technology. Continued from page 307, No. 418.

THE ILLUSTRATIONS.

PROPOSED CHURCH, BOSTON, MASS., MR. H. M. CONGDON, ARCHITECT, NEW YORK, N. Y.

THE ground plan shows a church, cruciform in plan, which will seat, including clergy and choir, fully one thousand people, and occupies, together with the Sunday-school and parish building, the full lot, measuring 100 feet by 236 feet.

To give dignity and the necessary light, the building is designed with a clerestory, and the objections to columns supporting the nave arcade under same are reduced to a minimum by making the north and south aisle serve as passages merely, thus giving ample means for entrance and exit, as also for processionals.

A morning chapel, 20 feet by 36 feet, for early celebrations, adjoins the choir on north side, and will seat about one hundred people, and has its own entrance from the north transept, with screen dividing it both from the church and chancel, with exterior entrances as shown.

The chancel is unusually roomy, affording stalls for thirty-two clergy and a choir of forty-eight men and boys, which may be increased to seventy.

A lofty rood-screen is intended to be placed under the chancel arch, and screens divide the chancel on each side from chapel and south aisle.

The choir and priests' robing-rooms are connected by an ambulatory around the apse, into which the arches open, though partially closed by open screens.

In the sanctuary, somewhat advanced from the east end, the altar stands on its platform of three steps, and is intended to have a reredos, and to be surmounted by a ciborium or canopy, making it the most prominent feature in the church.

The parish building is 39 feet by 60 feet, and is entered from an ample loggia, which connects also with the choir-vestry. On the ground floor is the principal school-room, accommodating about two hundred and seventy scholars, with an infant class-room at end, on raised platform, with room for forty to fifty infants. Wide sliding

and folding doors can be thrown open, connecting this with main room, affording a stage for Christmas entertainments, lectures, etc.

A library-room is provided with rector's study over, approached by stairs from the hall, which also give access to large rooms in second story, for guild-rooms, sewing-room, parish committee room, etc.

The parish building connects with the church by the ambulatory, as shown.

It is intended to heat both buildings by steam, and ventilation is provided for by making use of the angle turrets flanking the transepts and west end of nave, and by the central *flèche* on the crossing.

The roof will be open-timbered, with the square at the crossing, and perhaps the entire chancel, groined, with wooden ceiling as most favorable to sound.

The walls are intended to be of stone from the neighborhood, and the roof tiled. The western portal is deeply recessed and shafted with double doorway, the carved tympanum bearing a figure of Our Lord in attitude of blessing, with attendant angels. In niches above, on either side of the great west window, are figures of St. John the Baptist and St. John the Apostle.

TOLEDO CATHEDRAL, SPAIN.— THE WEST FRONT :— THE WEST END OF NAVE.

FOR description, see the article on "Spanish Architecture."

RESULTS OF TESTS OF THE TRANSVERSE STRENGTH OF BEAMS. PLATE V.

FOR explanation, see preceding article.

SANITARY PLUMBING.[1]—XIV.

[IT has occurred to us that before proceeding farther with these articles it would be well, for the authors' sakes and our own, to state some facts in connection with their present publication. Nearly two years ago we learned that a physician and an architect had determined to get to the bottom of the matter of the siphonage of traps and certain other details of sanitary plumbing, and had begun their researches. Knowing the architect for a patient, careful and conservative investigator we felt sure that the results, whatever they might be, would be worthy of publication, and would be acceptable as the conclusions of unbiassed investigators. The experiments have proceeded ever since, and though, as we once said (*American Architect*, December 16, 1882), we have several times believed that the results were ready to be given to the world, it is only lately that the authors felt assured they were approaching the end of their task. The results obtained were so unexpected and so interesting that they decided to extend their experiments in the same careful way to other branches of plumbing, which resulted as already so far detailed in these columns. But an unforeseen incident has attended these investigations. Having detected the various imperfections in existing apparatus it was not unnatural that an attempt should be made to remedy them or to devise other apparatus in which such defects did not exist, and the consequence of these attempts was the discovery of a form of water-closet and other fixtures which it was thought well to protect by patents, and the patentees propose to eventually perfect their discoveries, and put them in the market to win their places amongst the others. Knowing that the fact of such patenting might operate to throw distrust on the good faith of the writers in making unfavorable criticism of any species or class of fixture, and lay them open to the charge of mere self-seeking, and ourselves to the accusation that we are allowing our pages to be used to further the interests of a patentee, we have thought it well to make this explanation here, and to assure our readers that it is our belief that our authors' criticisms have been in no way affected by the invention of the fixtures they have patented.— EDS. AMERICAN ARCHITECT.]

CLASSIFICATION OF THE DIFFERENT KINDS OF TRAPS.

TRAPS may be divided into two principal classes :—

I. Mechanical traps.
II. Water-seal traps.

Each of these may be again subdivided as follows :—

I. *Mechanical Traps* may be subdivided into :
- (*a*) Hinged-valve traps.
- (*b*) Gravity-valve traps.
- (*c*) Floating-ball traps.
- (*d*) Gravity-ball traps.
- (*e*) Mercury-seal traps.

II. *Water-Seal Traps* may be subdivided into :
- (*a*) Sediment traps.
- (*b*) Self-cleansing traps.

These two classes may again be subdivided as follows :—

(*a*) *Sediment Traps* may be subdivided into :
- (1) Air-vent traps.
- (2) Reservoir traps.

(*b*) *Self-Cleansing Traps* may be subdivided into :
- (1) Siphonable traps.
- (2) Anti-siphon traps.

[1] Continued from page 295, No. 417.

MECHANICAL TRAPS.

Mechanical traps, like pan, valve, and plunger water-closets, have served their purpose and must now be laid aside in the general march of progress. Before the necessity of ventilating the main soil-pipe was felt, back-pressure in every trap was a thing to be guarded against, and balls, gates and valves in traps were invented to supply an actual want. Now, however, the universal custom of ventilating every stack of soil-pipes and a better understanding of the hydraulics and pneumatics of plumbing has done away with this requirement, and the mechanical-seal serves no longer any other purpose than to obstruct the proper flow of the waste-water through the pipe, and to collect sediment, beside causing a false sense of security in case of evaporation or siphonage of the water-seal. No such mechanical contrivance is reliable, and it soon becomes utterly useless so far as the retention of sewer-gas is concerned. It is evident that the mechanical-seal is entirely superfluous, since it can be shown that everything a trap is required to do can be done by other, better and simpler means.

It is claimed by some manufacturers of ball-traps that the rotary movement of the ball in the water scours the sides of the trap and prevents the collection of sediment. This is, however, not the fact, as both experience and theory have proved. Ball-traps which have for some time remained more than usually clear of sediment, owe their cleanliness not to the movement of the ball, but to the scouring of the water, which proves, to a certain extent, effective *in spite of* the ball. The ball breaks, more or less, the force of the water flowing through the trap, and by just so much diminishes its scouring effect. To claim the reverse is an evident absurdity, calculated only to mislead, and is easily disproved by practical experiment and by examining ball-traps which have been in use for a short time. Many make the mistake of supposing that, because shot or any similar substance will help cleanse a vessel when the vessel is shaken, the mere presence of the shot in the vessel will do the same under a current of water. This is a mistake. We cannot violently shake up the trap on a fixture as we do a detached bottle, and a current of water powerful enough to shake up the shot without such movement of the vessel would easily shake up and remove any other sediment which might pass into the trap. So it is with the ball. If the trap could be violently shaken up, the ball might possibly assist in scouring the inner surfaces; but where we depend for our external force entirely upon the power of the water-current, the ball serves only as an obstruction and impediment to the scouring. Sawdust, coffee-grounds, or similar sharp substances in the waste water are supposed to add to its scouring effect in removing grease from the pipes; but this is due to the momentum acquired in falling with the water from the fixture, and to the sharp, cutting edges of the substances. Thus tea-leaves, having no sharp edges, when admitted with the waste water, serve only to clog the pipes. A slimy filth, or a thick, matted coat composed of decomposing organic matter, collects around the ball or valve-chamber, in greater or less quantity, according to its size and the strength of the water-flow through the trap. Hairs and lint soon collect under and stick to the valve, and prevent its closing tightly, and the hinge corrodes in the vapor of the surrounding water, until the valve refuses to close at all beyond a certain point. The manufacturers of mechanical-seal traps often claim that they resist siphonic action better than those having only a water-seal. This is utterly false as these traps are made, for the action of siphonage takes place in the direction in which the mechanical obstructions open. The immunity from the effect of siphonage depends, as will hereafter be clearly shown, entirely upon the form and dimensions of the water-way of the trap.

It is sometimes claimed by the manufacturers that the presence of a hollow elastic ball in a trap would prevent bursting should the water in the trap freeze. If the ball extended from the top to the bottom of the trap and its sediment-chamber, it might protect it from the effects of frost. But this is not the case. Above and below the ball the freezing water is evidently no more affected by the ball than if the trap contained no water except in these places. Experience proves this to be the case, for the hollow ball-traps burst like other traps when exposed to frost severe enough to freeze suddenly the water beyond the parts protected by the ball, and to break a glass of the same form and size not containing a ball.

In the accompanying figures, all the traps have been drawn to the same scale and size of inlet-pipe, so that their relative sizes can at once be seen. This will prove very useful in enabling us to judge of their merits, especially as far as concerns the probable scouring effect of the water-current on their walls.

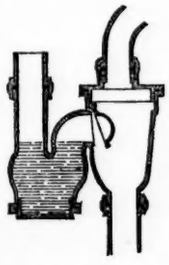


Fig. 36. — Hinged-Valve Trap.

(*a*) *Hinged-Valve Trap.*

In the trap shown in the accompanying drawing (Fig. 36), besides the faults common to its class already referred to, we observe here an undesirable enlargement and complication of form. The swelling below the inlet-pipe is useless, and the valve-chamber has all the objections described in connection with water-closet receivers. The joints above the valve are objectionable, because they are above the water-line, so that a leakage cannot be detected by the eye. The hinged valve is the worst kind of mechanical closure that can be used in the smaller house traps. This trap is very easily siphoned out when not ventilated.

(b) Gravity-Valve Trap.

Figure 37 shows a much better form of valve-trap. The valve-chamber is reduced to a minimum, and the trap in operation is, as a whole, more self-scouring than any mechanical seal-trap yet invented. The arrangement of the valve is such as to preserve the water-seal of the trap for a considerable time, even under a powerful ventilating current. When not ventilated, this trap will resist evaporation for a very long time, on account of its depth of seal; but siphonage will then unseal it quite easily. Unfortunately it is not entirely free from the defects of its class. The section of the valve is taken through one of its guide wings; hence it does not fill the outlet as much as it appears to in the drawing. This and other mechanical-seal traps would be useful on account of their power of resisting the back-pressure occasioned by water falling in the soil-pipe with which they are connected, were there no simpler means of accomplishing the same end. The writer has caused the water of an unventilated S-trap, having a seal of four inches, to be totally blown out and projected five feet into the air, by discharging rapidly a quantity of water through the soil-pipe having a horizontal run at its foot; and this though the soil-pipe was properly vented at its head and at the end of the run with four-inch ventilating openings. Such accidents may, however, be effectually guarded against and prevented by very simple means, as will hereafter be explained.

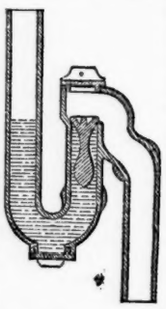


Fig. 37. — Gravity-Valve Trap.

(c) Floating-Ball Trap.

Figure 38 represents a trap which has enjoyed a greater popularity than any other mechanical trap made. But it possesses no important advantage over other mechanical traps. Under the ventilating current induced by special trap-ventilation, this trap suffers precisely as much as water-seal traps holding the same quantity of water. The ball affords, under such circumstances, absolutely no protection. The amount of water which it displaces more than offsets the delay to evaporation caused by the partial closing of the inlet-pipe. Without ventilation this trap loses its seal under the action of siphonage as easily as any bottle-trap of equal size having no mechanical obstruction. The chamber under the ball is rightly called by the makers the "sediment" chamber, since it soon collects sediment, though the trap claims, somewhat contradictorily, to be self-scouring. This trap is just as much of a cesspool as any pot or bottle trap of equal size.

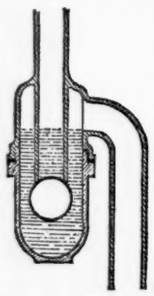


Fig. 38. — Floating-Ball Trap.

(d) Gravity-Ball Traps.

Figures 39, 40, 41, 42 and 43 represent different forms of gravity-ball traps, or traps in which the mechanical seal is formed by a ball resting on the top of a bend in the inlet-pipe, and partially closing the passage-way by its weighty bulk. The seal, as in all mechanical traps, is dependent upon the accuracy of the fit of the valve or ball and its seat. This fit is never absolutely air-tight, as is often claimed by the makers, even when new, as may be seen by emptying a new trap of its water, and, when quite dry, testing it for the passage of air or gas between the mechanical closure and its seat. However smooth and accurate their surfaces may appear to the eye, the particles forming them are colossal masses, as will be seen under a microscope, compared with the infinitesimal atoms forming the elements of air and gas, which defy the highest magnifying power to render them visible. These surfaces, rough as they are even when new, as compared with the substances they pretend to exclude, very soon become still rougher by the deposit of a sediment composed of all kinds of impurities carried by the waste water; so that the fit can never be tight, of whatever substances the valve and seat be made. The weight of the ball or valve cannot be sufficient to press out the irregularities of the surfaces; to accomplish this would require a pressure of tons. When the valve and seat are wet, a seal is formed against the passage of air, but the seal is due to the water and not to the valve, and the water-seal alone would be equally efficient, since, as we have already seen, we have to do with air and gases in their normal condition, and not under pressure.

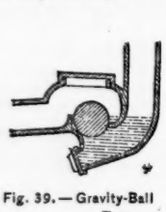


Fig. 39. — Gravity-Ball Trap.

Fig. 40.

Fig. 41.

Fig. 42.

Fig. 43.

None of these traps are siphon-proof unless ventilated. Like the gravity-valve, they resist evaporation under the ventilating current for a long time, and in this respect are incomparably better than the floating-ball trap; for the gravity-ball and valves, as will be seen by referring to the drawings, hinder the ventilating current from licking up the water-seal beneath the ball. The floating-ball offers no such resistance. Evaporation goes on as rapidly as if no ball existed. This is, under the present law requiring special trap-ventilation, a matter of great importance, though one which is generally overlooked in comparing mechanical-seal traps with one another.

Figure 44 represents a gravity-ball or valve trap designed for kitchen sinks. It is intended to take the place of the unfortunate bell-trap now so universally condemned. It consists of a lead receiver with a brass grating on top. The receiver holds about half an inch of water, into which the hollow valve or ball dips. The valve has a circular rim around its bottom, corresponding to the groove in the receiver which holds the few drops of water, and with it forms the feeble seal. The quantity of water is so small that evaporation easily destroys the seal in a short time, even without special vent. The trap is extremely liable to become clogged with the substances formed in kitchen sinks. This often leads to a removal, by ignorant servants, of both valve and strainer, which of course destroys the seal. Such a trap is little better than the ordinary bell-trap, and cannot be too emphatically condemned.

Fig. 44. — Gravity-Ball Bell-Trap.

A trap should always be independent of the fixture it serves, so that when the fixture, whether it be a wash-bowl, water-closet, sink, bath-tub or urinal, gets out of order, it can be removed and repaired without interfering with the trap or exposing the house to the untrapped drain. When the trap is formed in "one piece" with the fixture, as in Figure 45, the fixture cannot be removed without exposing the house to the waste-pipe. Moreover, while the junction of the trap to the fixture is comparatively unimportant, as being on the trapped side of the drain-pipe, that of the trap with the waste is of the utmost importance, as being on the untrapped side of the drain, and any defect here would allow of an escape of noxious air into the house. It is quite difficult to make a good joint with a trap made of the same material as and part of the fixture, especially when, as is usually the case with wash-bowls, the fixture is of earthenware. A rough cleansing of the apparatus, or a jarring or shrinkage of the stand or floor, is liable to crack the connection.

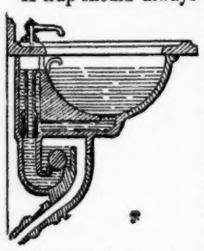


Fig. 45. — Trap in "one piece" with the Fixture.

(e) The Mercury-Seal Trap.

This trap (Fig. 46) is far too expensive and complicated ever to become practical, and is no less of a cesspool than the common round or pot trap, which is equally effective in excluding sewer-gas. The seal of this trap cannot be broken by siphonage; nor can that of a pot-trap if made large enough. Yet the law requires the ventilation of both of these traps, to protect them from siphonage. The mercury trap must be constructed of some material not easily corroded by mercury.

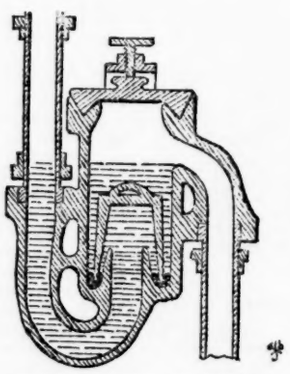
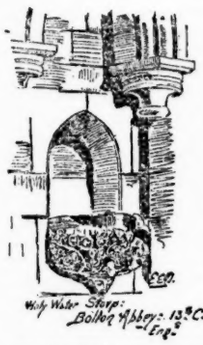


Fig. 46. — Mercury-Seal Trap.

Temporary Removal from the Louvre of the Venus of Milo. — The Venus of Milo will not be seen by visitors to the Louvre during the next twelve months. The dampness of the room which it of late occupied has necessitated alterations, and meanwhile the statue, in three fragments, is deposited on a bed of straw. A cast of it, however, has been placed in the Lacaze collection.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

TESTING-MACHINES.

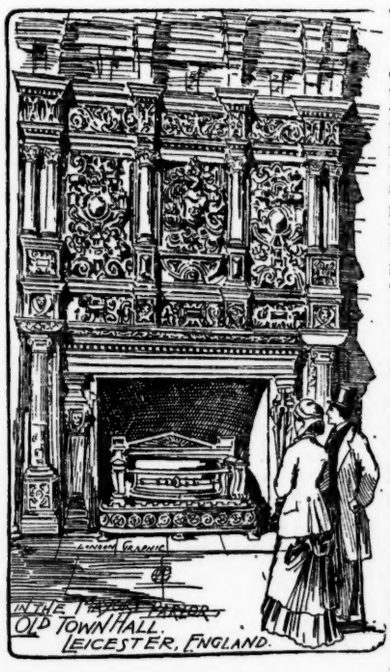


AT the meeting of the Society held January 2, 1884, a paper by Mr. A. V. Abbott, on "Some Improvements in Testing-Machines" was read by the author, and illustrated by a stereopticon. A 200,000-pound testing-machine was first described, its general construction providing for weighing the forces applied by means of platforms and levers somewhat similar to those used in ordinary scale work, with special arrangements to reduce friction. To secure the direction of the pressure upon the test-pieces in the axis of the machine, both ends of the piece are connected with segments of spheres moving freely in spherical sockets, which take the proper position upon the first application of the stress. Arrangements are also made by means of wedges, to grip and hold uniformly the ends of the test-pieces. The machine is arranged to test in tension, compression, for transverse stress, for shearing, bulging and torsion. In the machine illustrated, the action of applying stress is automatic, and at the same time the same power gives an autographic record of the stress applied, and of any variations which may occur during the continuance of the stress, and with an instantaneous autographic record of the result at the conclusion of the test. The stresses are applied by means of weights which slide upon two parallel lever beams, the one registering up to 10,000 pounds, and the other up to 200,000. By means of a remarkably ingenious electrical attachment connected with clock-work, the movement of these weights is continuous and automatic, and the registering apparatus is also controlled by the same electric current. It is impossible in this abstract, and without the aid of a diagram, to fairly describe the details of these movements, but they seem to be very complete and accurate. Diagrams automatically made by the machine were exhibited and described.

A number of broken pieces of steel were exhibited, and also specimens of woods which had been tested in various ways. Machines of smaller powers were also described, and a number of briquettes of cement were broken upon a small automatic machine which was exhibited.

The discussion of the paper was postponed to a subsequent meeting.

THE VENTILATION OF BUILDINGS.[1]



THE present age is one in which questions concerning the health of the people may be said to demand considerable attention; and it is certain that the more these matters are understood, the greater will be the importance attached to them. Recent investigation has shown most conclusively that improved health conditions mean increased length of life, and greater capacity for usefulness and enjoyment. It is generally admitted that sound food and pure water are essential to good health. To a much greater extent is this the case with the air we breathe. A deficient or impure supply means diminishing appetite, failing vigor of body and mind, and general incapacity for the due performance of the duties of life. Vitiated air also lowers the tone of the nerves, and creates an unnatural state of the moral and intellectual faculties. The extent of the injury caused by the breathing of an impure atmosphere may be gathered from the Registrar-General's Report, from which we learn that about one-fourth of the total deaths in this country are ascribed to diseases of the lungs, the majority of which are preventible. Vitiated air weakens the power of the lungs to resist changes of temperature, and so renders the person liable to disease and death.

Before proceeding to discuss the difficulties of ventilation, it will be well to consider briefly the laws which regulate the gases with which we have to deal. The atmosphere is composed of seventy-nine per cent by measure of nitrogen, and twenty-one per cent of oxygen, with one volume of carbonic acid in 3,500 volumes of atmospheric air. Oxygen is the most important gas, being the greater supporter of animal life, and of most forms of combustion, nitrogen, so far as is at present known, acting simply as a dilutant. Air having passed through the lungs is distinctly changed in its composition from what it was before; the nitrogen is unaltered, but the quantity of oxygen has been lessened by three and one-half to five per cent, and this has been replaced by the same quantity of carbonic acid. In its undiluted state the expired air cannot be rebreathed, and if tested with a lighted paper would extinguish it. As an ordinary person makes about twenty respirations in a minute, passing from a pint to a pint and a half of air through the lungs at each respiration, it will be readily seen how necessary it is that due provision should be made for changing the air by which we are surrounded. The air we breathe is warmed in its passage through the lungs; and, as it is a property of all gases when warmed to expand and become lighter, it consequently rises and passes away from us. It may be advisable at this point to correct a very prevalent error with regard to the carbonic acid. It is often stated that this gas, being heavier than others, separates from the vitiated air, and falls to the lower part of the room. so causing that part to be more impure than the top. Like most statements, there is a certain amount of truth in it, but the conclusions drawn from it are certainly wrong. Carbonic acid gas in its pure state is one and a half times heavier than ordinary air, and if generated in large quantities would accumulate in the lower part of an apartment; but when mixed with other gases, as in expired air, and especially when warmed as in that case, its property is decidedly to rise and not to fall. Further, instead of inclining to separate from the other gases, the carbonic acid, like all gases, has a tendency to further distribute itself, in accordance with the law of diffusion of gases. In fact, it cannot be separated except by chemical means. It has been calculated by Dr. Reid, who is a great authority on this subject, that one man during a life of fifty years inhales one hundred and sixty-six tons of air, discharging twenty tons of carbonic acid from his lungs. When we consider the enormous amount of carbonic acid given off in a populous country, not only from the human beings, but from all animal life, decomposition of vegetation, and combustion of fuel we are naturally led to ask the question, is not the atmosphere gradually deteriorating? Fortunately, the Great Architect of the Universe has foreseen this, and has wisely ordered that what is injurious to animal life shall be the very substance on which vegetable life subsists; so that a balance is set up, and the composition of the atmosphere remains about the same all over the globe.

The object of ventilation is to remove the vitiated air, and to replace it by a supply of fresh air. At first, this may seem a very easy matter; but to accomplish it without causing inconvenience to those occupying an apartment renders the task somewhat more difficult. It may be said that there are two methods of ventilation — the mechanical and the natural. The mechanical may be successfully carried out in factories, and buildings where power can be readily obtained; but for ordinary purposes, the natural is the one generally resorted to. The first principle to recognize in the natural method of ventilation is, that having two columns of air, one warmer and lighter than the other, the lighter column ascends, and the colder and heavier column descends. The second principle to note is, that air cannot be removed from a building unless an equal quantity is admitted to take its place. The mistake is often made of fixing an outlet ventilator without providing proper inlets; the outer ventilator is therefore of no use, unless it can draw sufficient air from badly-fitting doors and windows. When fixed over a room in which is a fire, it usually acts as an inlet, supplying the air required by the warm ascending column in the chimney. Bearing in mind that a warm column of air ascends not from any power of its own, but on account of the pressure exerted upon it by a denser column, we see that it is impossible for an outlet to work without an inlet, or for an inlet to admit air without there being some means for its escape; inlet and outlet are each essential to the proper working of the other. Much time has been spent in discussing the position of these openings, a good deal of which might have been saved had the fact been sooner recognized that it is easier to work in accordance with natural law than in opposition to it. Experiment shows conclusively that vitiated air invariably rises to the highest part of a building, and that when suitable inlets and outlets are provided, the rate at which the air passes through the building is increased in proportion to the height and difference of temperature of the internal column of air over that of the external. A long chimney has a greater draught than a short one, so the longer and warmer the shaft for carrying off vitiated air, the better it works. To obtain the full benefit of this motive power it is necessary that the air be taken from as low a point as convenient, and that it be discharged into the building as near the floor as shall be found expedient, the vitiated air being carried away from the highest point. Great difficulty has been experienced in introducing air at the lower part of the room in consequence of the nearness of the occupants to the openings and the liability of draught. To overcome this difficulty, the plan is often adopted of directing the air to the ceiling, as with the vertical tube. The objections to this arrangement are obvious. The fresh

[1] A paper read at the Technical School, Huddersfield, in connection with the Industrial and Fine Art Exhibition. By J. E. Ellison, of Leeds.

air either descends as an unbroken column upon those below, or, as is claimed for this plan, it mixes with the warmer air at the higher part of the room before descending to be breathed; in which case it must be evident that the air breathed is not fresh air, but a mixture of pure and vitiated, and that unless a large quantity is admitted to considerably dilute that in the room, the result cannot be satisfactory. On the other hand, a smaller quantity of fresh air admitted with the utmost diffusion below the zone of respiration, and below the point of combustion of gas and of lamps, reaches the occupants in its pure state; and as it becomes vitiated ascends and passes away, performing its work in an effectual and economical manner.

Opinions differ as to what constitutes a draught. It is very certain there cannot be any ventilation without movement of air; but when that movement is so reduced as not to force itself upon attention by the inconvenience or injury it causes, it may be justly said to be without draught. The more rapidly the air passes us, the greater is the cooling effect experienced; and the slower it passes us, the warmer we feel. We have a simple example of this when a lady fans herself; the cooling effect being caused not by any colder air, but by the same air being made to pass more rapidly over the lady's face. If the opening for the discharge of fresh air into a room be made straight, as is usually the case, the air will travel forward for some distance as a draught before becoming distributed; but if the opening be made of a conical or wedge form, the air will at once diverge in every direction, and so be quickly dispersed without causing inconvenience. Bricks and air grates with conical perforations have been used for some years back in a number of our infirmaries and other buildings, and it has been conclusively shown that by this means air may be admitted near the floor without causing that annoyance which was before experienced. Of course, it is well to bear in mind that however complete the distribution of air may be, there is the liability in severe weather of the cold being felt; so that it is advisable, where convenient, to fix the air grates behind hot-water pipes, and so raise the temperature of the incoming air. In many cases, the "Radiator" ventilator will be found best suited for thoroughly diffusing the air. It is made with wedge-shaped openings instead of the conical ones, and acts in the same way by radiating the air in all directions. It has the advantage of admitting in a neat, simple and inexpensive form a large quantity of air; discharging the fresh air in such a position as to prevent it from being mixed with the vitiated air before being breathed, and at the same time insuring its complete diffusion with the warmer air of the room before coming in contact with the occupants.

Having made due provision for admitting fresh air, it would be well to consider the essentials of a good outlet. For a sitting-room or office with open fire, the most convenient outlet is a mica ventilator, fixed in the smoke-flue, near the ceiling. In this instance advantage is taken of the draught of the chimney for removing the vitiated air at the highest point, the ventilator being so arranged as to prevent the smoke coming back into the room. In rooms of this class it is very difficult to get any opening in an external wall to work in opposition to the chimney. For large rooms, where it is necessary to remove a quantity of air, the usual plan is to fix a ventilating cowl, or a number of cowls, on the room. Unless the room is very large and low, one large outlet-ventilator is better than a number of smaller ones. Where mechanical power is not accessible, the object aimed at should be, — to provide a ventilator that shall keep out the rain and snow, and not only prevent the wind from blowing down, but be so arranged as to make use of that wind-power for assisting in drawing off the vitiated air from the building. Cowls with movable parts, such as the archimedean screw, are more liable to get out of order than fixed ventilators, and are in course of time the cause of much annoyance. The best fixed cowls are those made on the "deflecting" principle, and when carried out in a scientific manner give the most satisfactory results. The Stevens exhaust ventilator is constructed in such a manner that at whatever angle the wind strikes the cone there is a powerful up-draught produced, and it is impossible for the wind to blow down. In calm weather, the motive power in all these methods of ventilation is that obtained by the difference of temperature of the air within and without the building. When this motive power is not as great as is desirable, the quantity of air passing through may be increased by warming the air in the outlet-shaft by means of gas-jets or otherwise. When there is a space between the ceiling and the roof, the ventilator should be connected to the room by a shaft, which it is advisable to make tapering larger to the inside of the building. This prevents inconveniences in cases where the air is drawn into the room from the outlet, as the result of a deficient supply, or the suction of a fire or stove. The steaming of the windows or walls of a room may generally be taken as a sign of the want of ventilation, but not always, as in certain states of the weather this may arise from the moisture in the warm air becoming condensed by its contact with the cold windows or walls.

With regard to the size and number of ventilators for a building, this must to a large extent be a matter of experience. It is impossible to lay down any hard-and-fast line, depending, as it does, upon the size of the building, and the purpose for which it is about to be used, the number of persons likely to occupy it, the extent of the warming power, and a number of other considerations. The smaller the building, and the larger the number of persons occupying it, the greater is the necessity for ventilation. From what has been stated, it will be clear to most that the subject of ventilation is one of vital importance, and cannot be neglected without serious results. In drawing my remarks to a close, I cannot more fittingly do so than by quoting the words of the writer, Grindon: — "The air is the great physician of the world. Health confides in it as its most faithful friend. The weak it invigorates, the weary it refreshes. Under its genial stimulus we forget our vexations and disappointments, we become cheerful and vivacious, and thence — what without cheerfulness is impossible — more willing to 'refuse the evil and choose the good.'"

CONSTANTS.

Birmingham, Conn.

To the Editors of the American Architect:—

Dear Sirs,— There is one more question which I would like to ask, as follows: Does the note in Clark's "*Building Superintendence*," recommending the use of one-half of Trautwine's constant and factor of safety of four, apply to all kinds of woods? I believe Professor Lanza's experiments, as published, have been with spruce only.

Respectfully, Architect.

[Professor Lanza, since his experiments upon spruce, has made a considerable number of tests of hard-pine, and some of oak. These, like spruce, have given constants averaging something less than one-half those tabulated in Trautwine's book. Trautwine, it must be remembered, is a conservative authority, some books giving a constant, for hard-pine particularly, about one-half larger than his, or three times the actual constant for large beams, as ascertained by Professor Lanza's experiments.— Eds. American Architect.]

THE TEMPLE COMPETITION IN HISTORICAL PAINTING.

Philadelphia, January 7, 1883.

To the Editors of the American Architect:—

Dear Sirs,—The artists of Philadelphia have published the subjoined protest, signed by about forty of their number, against the verdict of the jury of awards in the recent competition in historical painting at the Pennsylvania Academy. Of the four prizes which were offered only one, the silver medal, was awarded, and the artists complain that the refusal to award the others was based upon a reason which was not mentioned in the circular inviting them to compete.

The reason given by the jury for their action was simply this: That none of the pictures were worth the three thousand dollars which constituted the first prize, nor possessed sufficient merit to deserve the honor which it was thought the Academy's gold medal ought to confer. The painters declare that by this decision the contest has been rendered "foolish and discreditable" to those who participated, and that the jury "are responsible for a breach of contract which is wholly unjust and certain to deter others from future competitions of a like nature."

The point on which the artists seem to lay most stress is the fact that the usual reservation of the right to reject any or all of the offered works was omitted from the circular. This was unbusinesslike, perhaps, but the merits of their case must be judged on very different grounds from this. Reasonable differences of opinion will continue to exist regarding the legal or even the moral obligation which the jury were under to distribute the prizes according to the relative merit of the works without regard to any standard of positive merit, but as for its chilling influence on future competitions there is likely to be no difference at all. As far as the competition meant an effort to get an important historical picture painted for three thousand dollars, its failure was readily foreseen and will hardly be regretted. As far as it was an effort to encourage, in even a very modest way, those painters who are desirous of doing something more important than the things by which they are obliged to live, its failure is even more complete and will occasion sincere regret.

X.

At a meeting of Philadelphia artists held Wednesday, December 12, Chas. Dana, Esq., Chairman, the following resolutions were adopted:—

Whereas, The Jury of Awards of the Temple Competition in Historical Painting, after admitting four pictures to that Competition, have refused to award three of the four prizes offered in their circular of August 31, 1882, for a reason not mentioned in that circular: and

Secondly: Whereas, This refusal is a deliberate disregard of the terms of invitation for this Competition, under which terms certain painters were led to expend time, labor and money in a contest now rendered foolish and discreditable by the action of this Jury of Awards; and

Thirdly: Whereas, The continued silence of the artistic community of Philadelphia, themselves closely interested, is likely to be taken for concurrence with said action;

Therefore it is Resolved, That the Jury of Awards of the Temple Competition in Historical Painting in withholding the first, second, and fourth prizes for reasons not published in their circular of invitation, are responsible for a breach of contract, wholly unjust to the painters competing, and certain to deter others from future competitions of a like nature;

Resolved, That a copy of these resolutions be respectfully presented to the Directors of the Pennsylvania Academy of Fine Arts, and that said resolutions be published in the principal art papers of this country.

Steam-Pipe Framing for Exhibition Buildings.— A southern engineer, Mr. William Golding, of New Orleans, suggests the idea of constructing the framework of large exhibition buildings which must be demolished after brief use, of wrought-iron steam-pipes of standard length, put together with standard fittings in such a manner that they can be taken apart without injury, and sold at small loss when the building is no longer needed.

SUMMARY OF THE WEEK.

Atlanta, Ga.

HOTEL. — The rubbish has been cleared away from the site of the H. I. Kimball House, burned in August last, and a new building of the same name is being erected in its place. The new hotel is to be fire-proof, seven stories in height, of brick, iron and stone, with terra-cotta finish, and to contain 436 rooms. It is expected that the hotel will be opened one year from the date of the burning of the old one; Kimball, Wheeler & Co., are the architects.

TENEMENT. — MRS. L. N. Angier, 5 four-st'y brick tenements on McDonough St.; cost, $12,000; P. J. Fallon, contractor.

HOUSES. — Dr. J. S. Lawton, two-st'y frame dwell.; cost, $3,500; Fay & Eichberg, architects.

W. S. Thompson, two-st'y frame dwell.; cost, $4,500; Gay & Eichberg, architects.

Jas. Auerbach, two-st'y frame dwell.; cost, $3,000; Fay & Eichberg, architects.

ALTERATIONS. — G. P. Dodd, remodelling two-st'y brick dwell. on Washington St.; cost, $4,000; E. G. Lind, architect.

A. J. McBride, remodelling dwell.; cost, $4,000; Fay & Eichberg, architects.

W. C. Dodson, remodelling dwell.; cost, $2,500; Fay & Eichberg, architects.

Dr. J. P. Crichton, remodelling dwell.; cost, $4,630; Fay & Eichberg, architects.

Baltimore.

COAL-SHED, STABLE, ETC. — George Archer, architect, has prepared drawings for the Brush Electric Company, for a two-st'y brick building, 45′ x 78′, to be erected on Constitution St., between Monument and Madison Sts.; cost, $5,500; John Waters, builder.

BUILDING PERMITS. — Since our last report five permits have been granted, the more important of which are the following: —

John G. Bramble, 3 three-st'y brick buildings, s s Pratt St., e of Washington St.

Chas. A. Carpenter, 12 three-st'y brick buildings (square), w s McCulloh St., e of Presstman St.

Moses Fox, two-st'y brick building, w s Caroline St., between Canton and Eastern Aves.

Moritz Hoyer, two-st'y brick building and two-st'y brick stable, e s Fremont St., between George and Clark Sts.

Boston.

BUILDING PERMITS. — *Brick.* — *Columbus Ave.*, Ward 11, for Boston & Providence R. R. Co., freight offices, 34′ x 39′, one-st'y pitch; L. D. Willcutt, builder.

Hereford St., cor. Columbus Ave., Ward 11, for Mrs. Nathaniel Thayer, dwelling-house, 32′ x 80′, four-st'y mansard; Woodbury & Leighton, builders; Peabody & Stearns, architects.

Myrtle St., No. 130, Ward 9, for Joseph Comer, tenement-house, 26′ 6″ x 41′ and 55′ 8″, four-st'y flat; J. Mack, Jr., and C. H. Blodgett, builders.

Wood. — Maxwell St., near Capen St., Ward 24, for M. J. Jackson, dwell., 21′ and 30′ x 27′, two-st'y pitch.

Prospect St., near Armandine St., Ward 24, for Chas. A. Hall, dwell., 15′ x 22′ and 22′ x 28′, two-st'y pitch; M. H. Jackson, builder.

Harvard St., nearly opposite Wales St., Ward 24, for Cheever Newhall, 2 dwells, 21′ and 26′ 6″ x 32′, two-st'y pitch; Geo. M. Fernald, builder.

Sigourney St., near Walnut Ave., Ward 23, for Samuel Hastings, dwell., 20′ and 21′ x 47′, two-st'y hip; Wm. J. Jobling, builder.

Blue Hill Ave., cor. Savin St., Ward 21, for Hugh Nawn, workshop, 30′ x 30′, one-st'y; James Edwards, builder.

Chicago.

THE YEAR'S WORK. — Commissioner Kirkland, of the Building Department, reports for the year ending December 31, 1883, that 3204 permits were issued for buildings, and 1602 for sheds. Number of buildings, 4,086; frontage, 85,588 feet; cost, $21,527,610; cost of sheds, $160,000; expended on city and county buildings, $475,00 ; total cost, $22,162,610.

BUILDING PERMITS. — D. Harry Hammer, two-st'y dwells., 3423-3425 Wabash Ave.; cost, $8,000; architect, Wm. Longhurst.

A. Williams, 2 two-st'y flats, 274 and 276 Idaho St.; cost, $6,000; architect, A. Williams.

Bartholomew Leight Co., 2 three-st'y dwells., 126 and 128 Lincoln Ave.; cost, $16,000; architect, Otto Matz.

K. Jessil, two-st'y dwell., 503 Marshfield Ave.; cost, $4,000; architect, A. Pressels.

Chicago Evening Journal Co., two-st'y additional, 159 and 161 Dearborn St.; cost, $24,000.

New York.

EXCHANGE. — Building on the New York Mercantile Exchange, n w cor. of Harrison and Hudson Streets, will commence May 1.

RAILROAD DEPOT. — The Third Ave. Railroad Depot, previously mentioned as to be built on the east side of Tenth Ave., from One Hundred and Twenty-eighth St. to One Hundred and Twenty-ninth St., will cover a lot 200′ x 200′, and will cost $175,000; Mr. Paul F. Schoen is the architect.

BUILDING IN 1883. — There were filed in the Building Department in 1883 plans for 2,748 buildings, estimated to cost $43,214,436, against 2,577 costing $44,793,186 in 1882, showing a slight increase in number of buildings, and a little less money laid out last year to the previous one.

Philadelphia.

BUILDING PERMITS. — *Allegheny Ave.*, between James and Witte Sts., one-st'y building, 36′ x 36′; Jno. Blood & Bro.

Pont Breeze, two-st'y warehouse, 23′ x 217′, pump-house, 30′ x 50′; Atlanta Refining Co., owners.

Johnson St., No. 24 (Germantown), two-st'y carpenter-shop, 21′ x 30′; W. Kohl & Co., contractors.

Charlotte St., n of Thompson St., three-st'y dwell., 14′ x 51′; Adam Sehwank, contractor.

Thirty-ninth St., cor. Locust St., by A. J. Drexel, dwelling-house, of brick and brownstone and tile roof, 40′ x 60′; cost, $25,000: plans by T. Roney Williamson, architect; A. A. Catanach, builder.

St. Louis.

BUILDING PERMITS. — Forty permits have been issued since our last report, twelve of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

Nicholas J. Tiernan, two-st'y brick dwell; cost, $7,000; Simmons, architect; Gundecker, contractor.

Hyde Park Brewery Co., two-st'y brick machine-house; cost, $3,000; E. Jungenfeld, architect; Hermann & Schumacher, contractors.

Ed. J. Gay, one-st'y addition to store-building; cost, $22,000; F. D. Lee, architect; Jos. Guedry, contractor.

Mrs. Laura J. Bell, two-st'y addition to brick dwell.; cost, $3,500; J. Cairns, architect; J. Schuster, contractor.

C. C. Murphy, two-st'y addition to 3 brick dwells.; cost, each, $3,800; C. C. Murphy, contractor.

William Druhe, 3 adjacent two-st'y brick dwells.; cost, $9,000; Goesse & Remmers, contractors.

Geo. M. Allen, two-st'y brick dwell.; cost, $20,000; Ed. E. Raht, New York, architect; contract sub-let.

M. Foster, 3 two-st'y brick dwells.; cost, $10,000; S. M. Ross, contractor.

Toledo.

ASYLUM. — Contractors are busy estimating, at the office of E. O. Fallis & Co., for the new asylum-buildings to be located here. The bids are announced to be received the 10th of January, 1884. As before stated, the asylum will be on the "cottage plan," and consist of about forty-six buildings, all of brick. The cost will probably be in the neighborhood of $600,000.

CONTRACT. — I. V. Saufleet has been awarded contract for enclosing the "Blade" Building, at $15,070.

HOUSES. — Two two-st'y and basement brick dwells., cor. Woodruff and Franklin Aves., for Mr. P. Poland, Cincinnati; cost, about $11,000; N. B. Bacon, architect; E. Malone, contractor.

PROSPECTS. — A large number of mechanics are now comparatively idle, and the outlook for the coming season seems only fair, though there is a healthy feeling concerning building interests.

THE PAST YEAR'S WORK. — The local papers summarize the building matters in Toledo for 1883 at a total of about 1,000 structures, at a cost of about $2,500,000.

General Notes.

ADRIAN, MICH. — Court-house, Lewanee Co.; cost, about $50,000; E. O. Fallis & Co., architects, Toledo, Ohio.

ATTLEBORO, MASS. — The Methodists will probably rebuild their burned church at once. They have $9,500 insurance money as a starter to carry out the enterprise.

BRIDGETON, ME. — Citizens of this town are subscribing liberally to build a large shoe-factory for any reliable manufacturer wishing to locate here.

CHESTNUT HILL, PA. — Three-st'y stone and tile hotel, tile roof, 320′ front, with wings at ends 40′ x 227′; cost, $170,000; plans by G. W. & W. D. Hewitt, architects, Philadelphia.

DEVON STATION, PHILADELPHIA R. R. — Devon Inn, built of brownstone and brick, length, 312′ with wing 42′ x 140′, four-st'y; cost, $152,000; plans by G. W. & W. D. Hewitt, architects, Philadelphia.

DULUTH, MINN. — The Board of Directors of the Lake Superior Elevator Company have resolved to increase the capital stock of the company to $6'0,000, and to commence construction of an additional elevator of 1,000,000 bushels capacity on the property of the Northern Pacific Railroad Company.

The Union Improvement and Elevator Company are going to build another elevator on the grounds of the St. Paul & Duluth Railroad, near their elevator A.

The Duluth & Western Elevator Company are now at work on an extensive elevator.

GERMANTOWN, PHILADELPHIA, PA. — George Crowell, Esq., proposes building a residence on Washington Lane, to be of stone; plans by T. Roney Williamson, architect.

HARTFORD, CONN. — Hartford contractors have put up $1,000,000 worth of buildings during the year, mostly in that city, the most expensive being the $230,000 high-school house, the $35,000 Connecticut Fire Insurance Building, and the $20,000 Old Folks' Home.

HAVERHILL, MASS. — A house is being built from plans of Mr. E. A. P. Newcomb, of Boston, for Jones Franklin, Esq.; cost, $4,500.

JACKSONVILLE, FLA. — A committee of citizens has been appointed to obtain plans and estimates for building a hospital for contagious diseases on Sands Hill. Dr. C. Drew, of City Board of Health, and Mr. P. McQuaid are the committee.

KASOTA, MINN. — The Omaha and Northwestern roads will join next spring and build a fine depot at Kasota; at least report says so.

LAWRENCE, L. I. — A cottage, to cost $8,500, is to be built for Miss Browning, from designs of Mr. H. Edwards-Ficken, of New York.

LONG BRANCH, N. J. — The First Presbyterian Society will build a church next season.

MACON, GA. — House for G. S. Obear, Jr.; cost, $3,500.

House for Walter Holmes; cost, $3,500.

Jail; cost, $30,000.

Market-house; cost, $40,000.

Plans for the last two have not yet been made.

Frank N. Wilcox is preparing plans for the State-House to be built in Atlanta. So also are D. B. Woodruff & Bro.

MAGNOLIA, MASS. — Mr. E. A. P. Newcomb, of Boston, is architect of a dwell. for Mr. James Freeland; cost, $6,500.

MANAYUNK, PA. — Thomas Schofield is building a large ice-house at Flat Rock, West Manayunk.

MILWAUKEE, WIS. — A building permit has been issued for Howard's new block, on the north side of Mason St., between Broadway and East Water St.

MINNEAPOLIS, MINN. — The Omaha Elevator Co. is to build a 500,000-bushel elevator, near the cor. of First St. and Seventh Ave.

MT. BOWDOIN. — Cottage for Gen. Hazard Stevens; E. A. P. Newcomb, architect; cost, $4,000.

NARRAGANSETT PIER, R. I. — Water-tower and windmill, stone base, upper portion framed; cost, $7,500; R. G. Drew, owner; J. M. Merrick, New York, architect; Jas. Thompson, builder.

Bowling-alley and billiard-room, two-st'y frame building, Roystone decorated shingles in gables; cost, $8,000; owner, architect and builder, same as last.

Open-air dining-room, one-st'y frame building, carbographic ceiling; cost, $3,500; owner, architect and builder, same as last.

NEW HAVEN, CONN. — Albert E. Kent, of San Francisco, a member of the Yale Class of 1853, who a year ago presented Yale $50,000 for the erection of a chemical laboratory, has added $25,000 to the original gift.

NEW ORLEANS, LA. — The Board of Managers of the World's Industrial and Cotton Centennial Exposition have adopted the designs proposed by G. M. Gorgensen, architect, of Meriden, Miss., for the main building. It is to be 1,500′ long, and 900′ wide, with 1,000,398 square feet of floor space, including the music hall in the centre, with seating capacity of 12,000. The design also provides for the main offices, telegraph office, newspaper department, fire-department, police, hospital, waiting rooms, and life-saving apparatus. Ten plans were offered, and three premiums awarded.

NEW PUBLIC BUILDINGS. — The Supervising Architect of the Treasury has completed the plans and drawings of the Government buildings to be erected at Quincy, Ill.; Peoria, Ill.; Columbus, Ohio, and Syracuse, N. Y., and will in a few days advertise for proposals for their construction.

Preparations are being made for the erection of the new public buildings at Pensacola, Terre Haute, and Concord, N. H.

NEWTON, MASS. — A house is being built on Mt. Ida, Newton, for James H. Barker, Esq.; cost, $15,000; Samuel D. Gary, contractor; Mr. E. A. P. Newcomb, of Boston, architect.

ST. DAVID'S STATION, PA. — H. A. Geisse, Esq., is building a stone house and stable, cost, $15,000, from plans by T. Roney Williamson, architect, Philadelphia.

ST. PAUL, MINN. — The St. Paul *Pioneer Press* says that 3,430 stores, residences and public buildings have been erected in St. Paul during the year, the total expenditure being $8,108,950.

TALLAPOOSA, GA. — Three-st'y frame hotel, 53′ x 72′; cost, $12,000; Fay & Eichberg, architects.

WASHINGTON, D. C. — Mr. Voorhees has introduced in the Senate the bill for the erection of a building for the Congressional Library, which was prepared after mature consideration and presented in the last Congress by the joint select committee on additional accommodations for the library. It directs that the building be located on the square just east of the Capitol grounds.

WEST PHILADELPHIA, PA. — Fifty-seven houses, of brownstone and brick, to cost from $3,000 to $7,000 each, from plans by G. W. & W. D. Hewitt, architects.

WILLIMANTIC, CONN. — The First National and Dime Savings Banks are erecting a three-st'y business building for themselves, offices and Masonic hall; material brick, stone, and terra-cotta, 50′ x 70′ 6″; cost, $25,000; Palliser, Palliser & Co., architects, Bridgeport, Conn., and New York.

COMPETITION.

PUBLIC LIBRARY BUILDING.
[At Boston, Mass.]

The Committee on Public Library, having been authorized to procure plans for a new public library building, to be erected on the lot bounded by Dartmouth Street, St. James Avenue and Boylston Street, and being desirous of interesting architects to produce the best plan for the same, hereby offer four premiums of $4,000, $3,000, $2,000, and $1,000, respectively, to the authors of the four best designs, according to the order of their merit.

The plans for which premiums are awarded will become the property of the city, with the right to use the whole or any part, or any modification thereof, without further claim from the authors for compensation or employment.

All designs must be sent to the Trustees of the Public Library on or **before June 1, 1884.**

Further particulars may be had by applying to William H. Lee, Clerk of Committees, City-Hall.

For the Committee,
CHARLES V. WHITTEN,
Chairman.

PROPOSALS.

SAFE DEPOSIT VAULTS.
[At Cincinnati, O.]

Sealed proposals will be received at my office **on or before 12 o'clock,** M., **January 15, 1884,** for the iron-work and brickwork required to construct the vault of the Fidelity Safe Deposit and Trust Company, Cincinnati, O.

Drawings and specifications on file at my office, Room 18, Bradford Block, corner Sixth and Vine Streets. SAMUEL HANNAFORD,
420 Architect.

IRON RESERVOIR.
[At North Attleboro, Mass.]

The North Attleboro Fire District will receive proposals **until January 15, 1884,** for the construction of a wrought-iron compensating reservoir for the North Attleboro Water-Works.

Blanks and specifications can be obtained of the undersigned, who reserve the right to reject any or all proposals.

F. G. PATE,
F. S. DRAPER,
E. G. PRATT,
} Water Commissioners.
420

PROPOSALS.

SEWER. [At Carthage, O.]

Bids will be received by the Committee on Public Improvements, Mr. Pedro Benner, Chairman, **until the 15th day of January, 1884,** for the building of a sewer under the C., H. & D. railroad track, at Second Street, in the village of Carthage, O., according to plans and specifications on file with Mr. Pedro Benner, at his drug store in Carthage.

The Council reserves the right to reject any or all bids. THEO. C. TROST,

420 Corp. Clerk.

ELEVATORS. [At Albany, N. Y.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., January 2, 1884.

Sealed proposals will be received at this office **until 12 M., on the 23d day of January, 1884,** for furnishing and erecting, complete, in the custom-house and post-office building at Albany, N. Y., one hydraulic passenger and two mail elevators, including boiler, pump, tanks, piping, etc., all in accordance with specification, copies of which and any additional information may be had on application at this office or the office of the Superintendent. M. E. BELL,

420 Supervising Architect.

SCHOOL-HOUSE. [At Piqua, O.]

PIQUA, O., December 29, 1883.

Bids will be received by the Board of Education of the city of Piqua, Miami County, O., for the erection of a High-School Building, **until 12 o'clock,** M., **Saturday, February 3, 1884.**

Plans and specifications for the above can be seen at the office of W. R. Brown, s w cor. Ninth St. and Broadway, Cincinnati, O., till January 1, 1884, after which time they can be seen at the office of the Clerk of Board of Education, in City-Hall Building, Piqua, Ohio.

The Board reserves the right to reject any or all bids.

By order of Board of Education.

422 R. A. HARDY, Clerk of Board.

COLLEGE-BUILDING. [At Lexington, Mo.]

Sealed proposals will be received by the undersigned at the office of E. Winsor & Son, Lexington, Mo., **until 12 o'clock, Tuesday, January 15, 1884,** for the erection and completion of additions to Central Female College, Lexington, Mo.

Bids will be received on part or on the whole; contractor to file an approved bond for full amount of contract.

The Board reserves the right to reject any or all bids.

Plans and specifications may be seen at the office of E. Winsor & Son, or at office of M. Fred. Bell, architect, Fulton, Mo.

The above work is to be completed by August 15, 1884.

WM. MORRISON, E. WINSOR, J. D. CONNOR, J. E. RYLAND, W. F. KERDOLFF. } Building Committee.

420

WATER-PIPE. [At Norfolk, Va.]

The Board of Water Commissioners of the City of Norfolk, Va., will receive bids **up to 12 o'clock,** M., **January 15, 1884,** for 10,800 lineal feet 20-inch cast-iron pipe, weight per 12 feet length, 2,023 pounds.

The above delivered in Norfolk by April 1, 1884.

Also, bids will be received for furnishing the material and laying the same. The whole work complete, as per specifications, which can be had at Water-Works office.

The Board reserves the right to reject any and all bids. WM. H. MORRIS, Chairman.

H. L. SMITH, Superintendent. 420

OFFICE-BUILDING. [At Fortress Monroe, Va.]

POST QUARTERMASTER'S OFFICE, FORT MONROE, VA., December 14, 1883.

Sealed proposals, in triplicate, subject to the usual conditions, will be received at this office **until 12 o'clock noon, on the 22d day of January, 1884,** at which time and place they will be opened in presence of bidders, for furnishing all materials and erecting one brick office-building at Fort Monroe, Va.

Plans and specifications for this work, with detailed information relating thereto, will be furnished on application to this office. Proposals exceeding the sum of $1,500 will not be considered. The Government reserves the right to reject any or all proposals. Envelopes containing proposals should be marked "Proposals for Office-Building at Fort Monroe, Va," and addressed to the undersigned.

D. D. WHEELER,

420 Captain and A. Q. M., U. S. A.

IRON BRIDGE. [Near Cleaves, O.]

COUNTY AUDITOR'S OFFICE, HAMILTON CO., O., CINCINNATI, December 28, 1883.

Sealed proposals will be received at the office of the Commissioners of Hamilton County, O., **until Saturday, January 26, 1884, at 12 M.,** for building a bridge across the Miami River, near Cleaves, O.

The superstructure will be of iron, and composed of three equal spans. Distance from face to face of abutments, 594 feet. Masonry will consist in building two piers and two abutments.

All work to be done according to the plans, specifications and profile now on file in the office of said County Commissioners.

Separate bids will be received for masonry, superstructure and piers, or the job complete.

The successful bidder only will be required to give security.

The Commissioners reserve the right to reject any or all bids. J. W. BREWSTER,

421 County Auditor.

PROPOSALS.

STONE-WORK AND BRICKWORK. [At Quincy, Ill.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., January 2, 1884.

Sealed proposals will be received at this office **until 12 M., on the 5th day of February, 1884,** for cutting, delivering and setting the stone-work, also for supplying and laying all the brick required for the court-house, etc., at Quincy, Ill., in accordance with drawings and specifications, which will be ready by January 15, 1884, and may then be obtained upon application at this office or the office of the local superintendent of the building.

M. E. BELL,

423 Supervising Architect.

CUT GRANITE. [At Washington, D. C.]

OFFICE OF PUBLIC BUILDINGS AND GROUNDS, WASHINGTON, D. C., January 7, 1884.

Proposals for furnishing and delivering at the Du Pont Circle, at the intersection of Nineteenth and P Streets, northwest, in this city, the cut granite required in the construction of a pedestal for a bronze statue of Rear Admiral Samuel Francis Du Pont, will be received at this office **until noon of January 28, 1884,** and opened immediately thereafter.

Plans, specifications, blank forms of proposal, and any desired information can be obtained by responsible dealers in granite, upon application to this office.

A. F. ROCKWELL,

420 Colonel U. S. Army, in charge.

CURB-STONES. [At Providence, R. I.]

OFFICE CITY HALL, PROVIDENCE, R. I., January 7, 1884.

Sealed proposals will be received at this office **until 11 o'clock,** A. M., **Wednesday, January 23, 1884,** for furnishing, delivered in this city: —

From 15,000 to 20,000 lineal feet of straight curbing.

1,700 lineal feet of straight curbing, extra depth.

From 500 to 1,000 lineal feet of circular curbing, 8-foot radius.

From 500 to 1,000 lineal feet of circular curbing, 10-foot radius.

200 curbstone corners, 2-foot radius.

10 curbstone corners, 3-foot radius.

2,500 lineal feet of 24-inch crosswalk stone.

From 3,000 to 5,000 lineal feet of 18-inch crosswalk stone.

From 3,000 to 5,000 lineal feet of 14-inch crosswalk stone.

10,000 square yards granite blocks for paving.

A bond satisfactory to the Board, in the sum of one-tenth of the estimated amount of the proposal, as liquidated damages for failure to execute the contract within ten days, if awarded, will be required of each bidder, and a satisfactory bond in the sum of one-quarter of the estimated amount of the contract, conditioned upon the faithful fulfilment of the contract, will be required of the successful bidder.

Specifications and forms of proposals may be obtained upon application at the office of the City Engineer.

The Board reserves the right to reject any or all proposals.

CHARLES ANTHONY, F. E. ANTHONY, SAMUEL M. GRAY, } Board of Public Works.

421 City Engineer.

TELEGRAPH POLES. [At Ottawa, Canada.]

DEPARTMENT OF PUBLIC WORKS, OTTAWA, December 28, 1883.

Sealed tenders, addressed to the undersigned and endorsed "Tenders for Telegraph-Poles," will be received at the Department of Public Works, Florida, **up to Saturday, the 19th day of January next,** for the supply of about 5,000 telegraph-poles, of the following dimensions, viz.: cedar poles, barked, 20 feet in length, and not less than 6 inches diameter at the small end, and 10 inches diameter five feet from the butt.

To be delivered on or before the first day of June, 1884, in lots of seventy poles, each lot being two miles apart, and to be landed in places of safety, above high-water mark along shore, between a point about twenty-five miles northeast of Pentecost River, to, and if necessary beyond Mingan Harbor, towards or to Point Esquimaux, on the north shore of the Gulf of St. Lawrence.

Each tender must be accompanied by an accepted bank check, made payable to the order of the Honorable the Minister of Public Works, equal to five per cent of the amount of the tender, which will be forfeited if the party decline to enter into a contract when called on to do so, or if he fail to complete the work contracted for. If the tender be not accepted, the check will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order, F. H. ENNIS,

420 Secretary.

FURNITURE. [At Philadelphia, Pa.]

OFFICE OF THE SECRETARY, TREASURY DEPARTMENT, WASHINGTON, D. C., January 5, 1884.

Sealed proposals will be received at this office **until 2 o'clock,** P. M., **of Monday, January 21, 1884,** for manufacturing, delivering, and placing in position in complete working order, certain furniture for the new United States court-house and post-office building at Philadelphia, Pa.

Upon application to this office, detailed information will be furnished to furniture manufacturers desiring to submit proposals.

The Department reserves the right to reject any or all bids or parts of any bid, and to waive defects.

CHAS. J. FOLGER,

420 Secretary.

STONE-WORK AND BRICKWORK. [At Peoria, Ill.]

OFFICE OF SUPERVISING ARCHITECT, TREASURY DEPARTMENT, WASHINGTON, D. C., January 2, 1884.

Sealed proposals will be received at this office **until 12 M., on the 25th day of February, 1884,** for cutting, delivering and setting the stone-work; also for supplying and laying all the brick-work required for the court-house, etc., at Peoria, Ill., in accordance with drawings and specifications, which will be ready by February 1, 1884, and may then be obtained upon application at this office or the office of the local superintendent of the building.

M. E. BELL,

425 Supervising Architect.

BRIDGE MASONRY. [At Anoka, Minn.]

Sealed proposals will be received by the building committee, at the office of the County Auditor, Anoka, Minn., **until 10 o'clock,** P. M., **of January 15, 1884,** for furnishing the materials, and building the pile and timber foundations, and stone piers and abutments, for the bridge over the Mississippi River at Anoka, Minn., said work to consist of three piers and two abutments.

The bidders receiving the contract will be required to furnish satisfactory bond to the amount of one-third of the contract price.

Plans and specifications may be obtained from either of the undersigned after January 3, 1884.

The building committee reserves the right to reject any or all bids. M. K. FROST,

Chairman Building Com., Anoka, Minn.

CHAS. F. LOWETH, Engineer,

420 42 Mannheimer Block, St. Paul, Minn.

IRON PIPE AND SPECIAL CASTINGS. [At St. Paul, Minn.]

OFFICE OF THE BOARD OF WATER COMMISSIONERS, ST. PAUL, December 12, 1883.

Sealed proposals will be received at the office of the Board of Water Commissioners of the City of St. Paul **until 12 M., January 14, 1884,** for furnishing said city with the following list of cast-iron water-pipe and special castings, in accordance with the plans and specifications on file in office of said Water Board: —

4,700 lin. feet of 4-inch pipe, with privilege of 4,000 feet additional.

19,150 lin. feet of 6-inch pipe, with privilege of 6,000 feet additional.

8,900 lin. feet of 12-inch pipe, with privilege of 1,000 feet additional.

8,500 lin. feet of 16-inch pipe, with privilege of 1,000 feet additional.

Special castings, 35 tons, with privilege of enough to lay above pipe.

All pipe to be shipped by rail and delivered free on board of cars at St. Paul. Freight to be prepaid.

Pipe and specials to be delivered in such quantities as may be ordered, and within thirty days from date of order, and all to be delivered by October 1, 1884.

Payments will be made by monthly estimates, but no payments will be made before July 1, 1884.

A bond with at least two sureties, in a sum of at least 20 per cent of the gross amount bid, must accompany each bid.

The Board reserves the right to reject any and all bids.

Endorse on envelope, "Proposals for Cast-Iron Pipe and Specials." JOHN CAULFIELD,

420 Secretary.