

CONTENTS.

SUMMARY:—

The Boston Building Laws as affecting the building of Tenement-houses.—Some of the remediable Inequalities of the present Laws.—Fall of a Concrete Floor at Trenton, N. J.—The Unreliability of Cinder Concrete.—Union Strikers employ Dynamite on New York Buildings.—The Kansas Eight-hour Law declared to be not Unconstitutional.—The Usefulness in the Arbitration Agreement between New York Employers and the Unions.—More Apartment Buildings for Women in Paris.	80
TECHNICAL TRAINING AS A PART OF EDUCATION.	91
FOUNDATIONS.	92
THE PRESERVATION OF MATERIALS.	93
BOOKS AND PAPERS.	94

ILLUSTRATIONS:—

A Competitive Design for the Rhode Island State Hospital for Consumptives.—Plan and Section of the Same.—Memorial Gates, Class of 1883, Rutgers College, New Brunswick, N. J.—Chamber of the House of Representatives: Rhode Island State-house, Providence, R. I.	
Additional: Interior of Dome: Rhode Island State-house, Providence, R. I.—Bridges at the Royal Villa, Poggio a Cajano, Italy.—Courtyard Entrance of the Rolandhaus, Berlin, Prussia.—Detail of the Rolandhaus, Berlin, Prussia.—Bronze and Marble Fountain, Piazza della SS. Annunziata, Florence, Italy.—Tribunal in the Collegio del Cambio, Perugia, Italy.—The Frederick Adams Library, Kingston, Mass.	95
COMMUNICATION:—	
Tenement-house: Apartment-house.	95
NOTES AND CLIPPINGS.	95

A SERIOUS problem confronts the people of Boston, in the apparent necessity for remodelling the portions of the building laws relating to the construction of tenement-houses. Under the present law, every new tenement-house more than three stories in height must be of fireproof construction throughout. This regulation has, naturally, checked the building of tenements in the older part of the city, where land is too valuable to be covered with three-story structures, and not valuable enough to warrant the erection of four or five story fireproof buildings, and has driven tenement-house construction to the newer portions of the city, where immense tracts, which were well on the way toward becoming beautiful and desirable residential quarters, have been irretrievably ruined by the invasion of miserable three-story flats, of the cheapest possible construction. Many attempts have been made to secure the modification of the law, so as to permit the erection of non-fireproof tenements to a height of four stories, which, except in the most crowded quarters, is the limit to which it is prudent to carry such houses without putting in a passenger elevator; but the insurance companies have steadily resisted such change, and their influence is too strong to be overcome. Now, a new problem has presented itself, in the question of utilizing the houses, built fifty or sixty years ago, at the South and West Ends. These houses were once the dwellings of the rich, but the change of fashion, or, rather, the invasion of the territory by the foreign element which is so large in Boston, has driven out the original inhabitants, and the houses are rented to such tenants as offer themselves. Many of the houses are large, and could be altered into excellent tenements, but the law, which forbids any such alteration of a four-story building, unless it is made fireproof throughout, stands in the way of this, and, in consequence, most of the houses are utilized for lodgings, to the disadvantage of the owner, who could get a better rent for them as tenements, and not much to the advantage of the lodgers. The new Tenement-house Commission of Boston intends, it is said, to take up this matter, not in the interest of the landlords, but in that of poor families, who are seriously inconvenienced by having to go two or three miles away from their work to find cheap tenements, and could, except for the law, be conveniently, cheaply and safely accommodated in the heart of the city.

WHILE we deplore tenement-house life generally, and believe that, in Boston, the great development of electric roads, opening up a vast area of beautiful and healthful suburban territory for settlement, should remove the necessity for it, there is, undoubtedly, a demand at present for cheap tenements in the heart of the city which it is desirable to satisfy. The South End streets are mostly wide, and the house-lots deep, so that an immense amount of light and air is available

around them. It seems a pity to sacrifice these advantages, which mean so much to the poor, without necessity, and there seems to be no real necessity for doing so. We should wish to be quite as strict in the requirement of light and air, and in regard to the provision of plumbing, in a remodelled tenement-house as in one built new, but for fire-resisting quality, in a four or five-story building, iron beams and terra-cotta arches are not necessary, plastering on metal lath being a sufficient substitute. City dwelling-houses, however built, are a very good risk, destructive fires rarely occurring in them. With plaster on metal lath on all ceilings, and carried to the floor on all partitions, wooden furring removed from party-walls, fire-stops judiciously placed, and an adequate provision of stairs, plastered underneath on metal and enclosed in channel-iron partitions, a destructive or fatal fire would be made impossible, and it is an injustice to the poor, much more than to the rich land-owners, to demand for a four-story tenement-house exactly the same construction that would be required for a cotton warehouse, or a department-store, while a three-story apartment may be built with wooden beams, wooden partitions and wooden laths, the last-named being the most efficient means known to the art of construction for spreading fires in dwelling-houses, and making them as destructive as possible. As our readers know, we have often advocated the total prohibition of the use of wooden laths in city buildings of all kinds. It would probably be impracticable, at present, to secure this, but the permission to build well-planned four-story tenement-houses, thoroughly protected with metal lath, would really constitute an important advance in the protection of the city against conflagrations, as such houses, in which it would hardly be possible for a fire to get beyond the room in which it originated, would, being more profitable as investments, at once take the place of the miserable three-story fire-traps which are now erected by hundreds, at the same time that they would offer to poor people what cannot now be found in Boston, safe, as well as pleasant, dwellings, at a rent which they could afford to pay.

A SERIOUS accident took place in Trenton, New Jersey, the other day, during the test of a concrete floor. The floor, which was in the third story of a new building, had just been completed, and was being tested by loading with bags of sand. About two hundred and fifty tons of sand had been piled upon the floor when it was seen to sink, and in another moment a large section of it fell to the basement, carrying with it the ironwork by which it was strengthened, and killing two men who happened, without authority, to be in the building. There have been several serious accidents with concrete construction within a few months, and a prejudice, which is much to be deplored, is undoubtedly forming in the minds of the public in regard to such construction in general. As architects know, but as contractors and workmen seem too frequently to forget, concrete construction, whether reinforced with iron or not, is excellent if the materials and workmanship are thoroughly good, but, if there is any question about either of these, it is practically worthless, and is all the more dangerous from the fact that its defects cannot be discovered by inspection. A moment's carelessness in allowing the water to run too freely into the mixer, or in admitting a few shovelfuls of dirty sand, or in making a joint in a floor, between two successive days' work, without wetting the old work, or in neglecting to tamp properly a place not easily reached, while it would leave no trace on the finished work, may be the cause of a frightful catastrophe. So long as Portland cement was an unfamiliar and costly material here, there was some excuse for not using it properly; but we have at command now unlimited quantities of the best cement, of perfectly uniform quality, and it is time that our contractors and workmen knew how to deal with the most valuable material of construction that invention has ever given us. So far as our observation goes, defects in concrete work are due more frequently to the carelessness and indifference of workmen than to any other cause; and we may repeat what we have often said before, that the conviction and sentence for manslaughter of the actual man guilty, either from carelessness, or, as too often happens, from malice, of the bad workmanship which leads to a fatal accident, would do a great deal to prevent such accidents.

IN view of the fact that architects look upon cinder concrete with increasing distrust as a material to be put in contact with steel, or depended upon for strength, it seems to us that it would be worth while for some one to try to devise a substitute. The principal reason for using cinder concrete in place of that made with broken stone or gravel is that it is light, and comparatively dry, so that fireproof floors levelled up with it are much less heavily burdened than they would be with stone concrete, and dry out, ready for the flooring, much more quickly, to say nothing of the advantage, concerning which architects are not wholly convinced, that wooden floors can readily be nailed to cinder concrete, while it is impossible to drive nails into stone concrete. On the other hand, cinder concrete is unreliable in strength, and is often acid, so as to corrode steel in contact with it. Although the experiment, so far as we know, has never yet been made, it seems as if a concrete having all the advantages of that made with cinders, without its disadvantages, might be made by employing bits of porous terra-cotta in place of cinders. The ordinary porous terra-cotta, as used for floor arches and furrings, is apt to be either too soft-burned or too brittle to take the place of cinders, but there seems to be no reason why a more suitable material of a similar kind should not be made, which would be at once light and tough. It would probably not be so cheap as cinders, but good fire-box cinders, free from dust, are not very cheap, and the manufacturers of fireproofing material could, perhaps, utilize waste clay and broken pieces in this way to advantage, without making the product too expensive. It is certain that, at a reasonable price, architects would prefer it to cinders, even where the use of the latter is not forbidden by law.

DYNAMITE, as a means of "expostulation" in labor discussions, has appeared in New York, as well as in Chicago. In the former city the housesmiths of the old Parks union, who held out longest against the Employers' agreement, and now find themselves without work, are said to have been for some time practising murderous tricks. One of their favorite methods of maintaining the dignity of labor is reported to be to place themselves near the guy-rope of a derrick, and slyly drop acid on it. As these guy-ropes extend long distances to their anchorages, there is no difficulty in getting access to them, and a few drops of acid, soaking in among the wires, will, in a few hours, corrode them entirely through. Meanwhile, the operator has ample time to make his escape. After the wires have been acted upon for a short time, a sudden strain, such as is produced by swinging around the boom of the derrick, with a heavy load suspended to it, will snap the guy-rope, bringing the derrick and its load down with a crash. Scores of men are killed every year in this way by the parting of guy-ropes too weak for their work, or insufficiently anchored, and the trick of weakening them artificially would readily occur to a malicious building-workman. A quicker way of arriving at the same result, which is also said to be popular with the Parks gang, is to insert a sharp knife between the outside wires of a guy-rope, so as to cut the hemp core which is usually found in the ropes employed in building. As much of the strength of the rope lies in the hemp or Manilla core, it is likely, after this has been cut, to give way at once under a strain. According to Mr. C. L. Eidlitz, of the Employers' Association, many guy-ropes have been thus treated since the Parks men undertook to give trouble, and the consequent falling of the derricks has nearly caused serious accidents. Now, apparently, this amusement has become too tame for the high spirits of the Parks men, and in two buildings in process of erection there have been explosions. In one case the explosion was very severe, and the manner in which it was arranged to destroy a hoisting-engine, and thus cripple work on the building, indicated that the persons concerned in the affair were familiar, not only with building work in general, but with the particular building attacked.

A GOOD deal of interest has been excited among lawyers, as well as in labor circles, by a decision of the Supreme Court of the United States, upholding decisions of the courts of Kansas, inflicting a penalty upon a contractor who, in violation of a contract made by him with the municipality of Kansas City, employed a laborer for ten hours a day in laying a pavement, paying him by the hour. It appears that this conduct, although commendable from the taxpayers' point of view, constitutes a misdemeanor under the statutes of Kansas, and the contractor was brought into court and fined; and the

highest United States Court now decides that the fine was rightfully and legally imposed. The interesting feature of this decision is that, not long ago, the New York Court of Appeals decided that a statute of the State of New York, forbidding contractors for public work to keep their men employed more than eight hours a day, was in violation of the State Constitution, and therefore void. Whether the present decision of the United States Court conflicts with that of the New York Court of Appeals probably no one but a very skilful lawyer can say, but the tendency of courts is now to examine rather closely the legislation by which the walking-delegates and the politicians have bound employers and employed, municipalities and taxpayers, hand and foot for their own profit, and the more judicial study the matter receives the better.

THE value of the arbitration agreement in the new contract between the New York unions and the Employers' Association was illustrated the other day. It seems that there are, or were, two unions of plasterers' laborers in the city, one consisting of Italians, and the other mostly of Irishmen. The latter struck, earlier in the season, for wages of three dollars and a half a day, but were unsuccessful, their places being immediately filled by members of the Italian union, who worked for three dollars a day. The journeymen plasterers, who were disposed to strike in sympathy with the Irish laborers, were restrained by the arbitration agreement, which they had signed, and the employing plasterers, in order to smooth the matter over, finally agreed to take back the Irish laborers on the same footing as the Italians, and to make the wages for all three dollars and a quarter a day. For a time all went well, the Irish and Italians working side by side; but, a few days ago, some dispute arose, and the Irishmen struck again. This time the journeymen struck in sympathy, but were recalled to their duty by a notice from the Employers' Association that if the sympathetic strike were not at once terminated, all plastering-work in New York and Brooklyn would be suspended. The men were not disposed to shut themselves out of employment again at this season, to say nothing of the fact that the sympathetic strike was a clear violation of their written contract, so it was voted to abandon it.

A VERY commendable undertaking is to be carried out in Paris. A year or more ago, as our readers will remember, a competition was instituted for a building to be devoted to rooms for young women, obliged to live in Paris, and without relatives or friends there. This building was erected by a charitable society, and proved very successful. Now, the Government Administrator of Telegraphs and Telephones has arranged to follow this example, and, with the aid of generous private subscriptions, is about to erect a similar building, midway between the two principal post-office and telegraph buildings of the city, to be devoted exclusively to the use of telephone and telegraph girls. In this country, telephone girls are appointed practically at random, and usually come from families living in the neighborhood of the place where they are employed; but, in France, appointments in telegraph and telephone offices are subject to civil service regulations, and are obtained through competitive examination; so that, as the candidates come from all parts of France, the lists of successful ones include many girls of excellent education and good family, who are total strangers in the great city to which they are assigned. The French are very considerate of cases of this kind. Every one who has been in Paris knows what pains are taken to receive young girls arriving alone at the railway stations from the country, and see that they are conducted safely to their destination; and girls of a higher class are still more in need of protection than young peasants. As soon, therefore, as M. Bérard's project was known, financial aid was offered him from all sides. The Board of Brokers made a liberal subscription, as did also the great banking house of Rothschild, and other banking and industrial establishments; so that, without having to wait for an appropriation of public money, M. Bérard finds himself in a position to erect and equip at once a building which will accommodate about one hundred of these young ladies in single rooms, or more, if two are willing to share a room. As in the earlier "Hôtel pour Dames Seules," the new building will not provide individual kitchens for its tenants, but offers them chambers, baths, and a "salle de réunion," or parlor, with a library, and a refectory, or house-restaurant, with its own kitchen and other appurtenances.

TECHNICAL TRAINING AS A PART OF EDUCATION.

AT the dedication of the Memorial Hall of the Rhode Island School of Design at Providence, on November 24, Dr. Denman W. Ross said in part:—

"We are here to see this Memorial Hall, to give our thanks to those who have so generously made it a gift to the Rhode Island School of Design, and to consider the purposes of the School so greatly benefited; to think of the good services which the School will certainly render to your city of Providence and to our country as a whole. The School is dedicated to design. Design is the subject of interest here. It is of that I am going to speak, of its place in education and in life, its importance everywhere; of this, however, very briefly.

"Look at anything that any one has done, any piece of work, no matter what it is; there are two elements in it which should be distinguished and separately considered. There is the motive of it, its intention or purpose, and there is the execution of it, the performance.

"It is in the performance we see the design of it, the art of it. We see in the performance what materials have been used, what terms, how the materials or terms have been combined and arranged. We see in the performance the plan or system of the work, the ways, means and methods which have been followed in bringing it to completion. We see in the performance the correlation of the parts, the fitness of the parts to the whole, the organic and perfect unity of the whole and, lastly, the appropriateness of the whole to its motive or purpose. Give this motive or purpose to a hundred men. Let them work it out, each one in his own way, and no two of them will achieve the same result. When you consider the results you observe that in some cases the materials are well chosen and properly used, suitably combined, well handled; the work is done in a simple, systematic, orderly, direct way; in other cases not. In some cases the motive is well followed, the purpose well served; in other cases not. The difference is a difference of design, a difference of art. The design of any work, the art of it, is seen, not in its motive or purpose, not in its usefulness, not in its truth, not in its righteousness, but in its execution, in what I have called the performance.

"The problem of life seems to resolve itself into two questions: What to do and how to do it. How to do it? That is a question of design. To do what is necessary or useful, to do what is true, beautiful, or what is right. There are no new motives. People have been following them for ages. In the art of the past we see what success they have had. Begin by reproducing the best things that have been done. Then improve upon them if you can. Bring in new elements, make new combinations and arrangements, not for the sake of change or novelty, but for the sake of the motive of the work. The end is your motive. 'Art for art's sake!' That is nonsense! Do we talk for the sake of talking? No; we talk because we have something to say.

"How few people are able to bring this power of design into their work! They think that art is making things pretty. They don't at all understand how art is possible to all men at all times and everywhere.

"The habit of finding your life in your work, that is the first requisite for the artist. There is another; that is, a ceaseless and insatiable love of order, whether it takes the forms of logic and reason, which appeal to the mind, or the forms of balance, rhythm and harmony, which appeal to the senses. As artists, it is your ceaseless endeavor to create harmony where there is discord. What to do? There lies the wisdom of life. How to do it? There lies the power and the joy of life.

"Learning how to do it means in all cases technical exercises, technical practice, leading to technical skill and ability. I know that it has been argued that technical exercises have no place in elementary and preparatory schools, nor in the college and the university. But in the last few years we see a change of opinion. The importance of technical exercises and practices, not only as a means of attaining skill or ability, but as a means of appreciating work when it is well done by others is now, at last, being recognized, so that, along with the history of music, of literature, of architecture, sculpture and painting, we are getting courses of technical exercises, and they are already doing great service. That means that we shall be able not merely to talk and write about works of art, but be able to take the point-of-view of the designer, the artist, which is always a technical point-of-view.

"Technique is only another word for design, and design and art are one and the same thing. The artist says, I will do this or that. Having decided what to do, he no longer thinks in the abstract terms of language. Unless he proposes to speak or to write, he thinks in the materials and terms, in the forms of effort or exertion, belonging to the art in which his work is to be achieved. He thinks what he is going to do, how he is going to do it, and then he does it. He does not talk about it, or write about it; he does it, using all the technical skill and ability he has. To appreciate what he has done, what he has achieved, you must also be able to think in the terms of his art. You must also be able to consider materials used and methods followed, you must also have tried to do that sort of thing to know whether it is well done or not.

"But it will be argued: it is impossible to bring all the many and various arts of life into the schools, all the varieties of technical exercises. It is not proposed to bring all the arts into the schools, but

only those which are most important, those which are principal or typical, gymnastics, music, speech, architecture, sculpture and painting, which includes drawing. Surely it is not too much to propose that these principal and typical arts shall have a place in our schools and colleges, if our object is to teach people not merely what to do, but how to do it.

"You will find certain old fogies, who have never done anything, except in the terms and in the forms of language, who will tell you that all thought lies in these terms, that all thought is expressed by talking and writing.

"They will tell you that the only art which is appropriate to the purposes of school and college work is that of language. If you propose to make music, to paint pictures or produce statues, you can go to an art school or to a music teacher, but if you want an education keep away from such places. That is what they say. Dear old fogies! they do not know what it is to think in terms of physical effort and movement. They don't know what it is to have strength and agility, the power of it, the joy of it. I wish I had some. They don't know what it is to think in the sounds of music, in the forms of architecture, of sculpture or painting. They have no idea of it. They cannot tell you what it is, because it cannot be told. Those things can only be done.

"There is a scholarship in gymnastics, in music, in construction, modelling, carving, drawing and painting, a scholarship those old fogies cannot at all understand or appreciate, for it lies altogether outside of their experience. The history of art. They know something about that, because it lies in the terms of language, but of works of art, except as they exist in the forms of language or literature, of these they know nothing. Dear old fogies! they will pass away with their generation and men with a larger experience, a wider knowledge, a more varied training and ability, will come to take their places; but I have a tender feeling for that old-fashioned, now obsolete, scholarship, so definite within its limits, so finished, so fine.

"I cannot let it pass without a word of affection, a word of regret. It will never come back to us. But we shall have something better, and what a difference it will make everywhere and right here in this Rhode Island School of Design, when all the principal and typical arts have the place they ought to have in the preparatory schools. You would like to have here a school for advanced and professional practice in the arts, but that is impossible under existing conditions. Your pupils come to you with no training, no knowledge of the arts which they propose to follow, no definite conception of what art is.

"They have no knowledge of its methods, no appreciation of its masterpieces. Instead of leading your pupil into advanced and professional work, you are obliged to teach them the A, B, C's, and they leave you long before they have reached the X, Y, Z's. Out they go into the world, with very imperfect notions of what to do and very little technical knowledge or skill to do anything. You cannot bring them up to advanced or professional work in two or three years. It is impossible. They must begin to be exercised and trained in the arts when they are children.

"They must begin discriminating, criticising and judging works of art when they are still young. They must be exercised in every faculty they have. They must acquire rare judgment and power in many directions. The arts first, pure learning and science afterward, then all together. That is the programme of the new education, which is going to give us the wisdom of life, with the power of art; the education which is going to teach us what to do and also how to do it. The boy or girl, the boy, let us say, who leaves school at the age of fifteen, ought to have had some technical training in all of the principal arts, consequently some technical knowledge and skill to serve him in whatever work he undertakes to do.

"Those who can go to college ought to acquire a very considerable training in the principal arts, and knowledge of the best thought that has been put into them. The "A. B." degree ought to mean familiarity with the best work of all kinds that has been done; judgment in regard to it, and considerable technical ability in many directions, and the "A. M." degree ought to mean something more than that. You will then have men and women really prepared, properly prepared, for the professional schools, and if they come here to the Rhode Island School of Design they will come knowing what they want, knowing definitely what they want to do and having already some technical knowledge, some skill, some ability to do it.

"They will be ready and well prepared for advanced and professional work. As it is, the only technical training that a man can get, except in the terms of language, he gets in schools of special training, like this, and he comes here, as a rule, when it is too late in life for technical training. He might get it, perhaps, if he could spend ten years in the School, but he cannot get it in two or three; but that is all the time he can afford to give to it. He is already getting along in years and must be doing the work he has to do.

"We must insist upon technical training as a part of education, not for some of us, but for all of us. We must get that training put into the schools of every grade everywhere. It must become a part of college and university work. If it takes the place of other things no matter, nothing is of more consequence. Pure learning and the sciences must be brought into connection with technical training in the arts. It is the destiny of pure learning, of science, to serve these arts, contributing motives and purposes, ways and means and methods, and the sooner pure learning and science take their part in the work of life the better. We look to them for both wisdom and

power. Work is ennobled by the learning, by the science that is put into it, and science and learning find their highest and finest expression in the work of the world, in the process and in the progress of our civilization, and we see the glory of that civilization in its works of art."

FOUNDATIONS.¹

THE foundation is that part of a structure which supports the part built to fulfil an intended purpose. It is not always clear where the foundation ends and the superstructure begins, for instance, when foundations are utilized for cellars. As a rule, the foundations are below the level of the surrounding ground. The need of foundations indicates that the soil to be built upon is too soft or untrustworthy to carry, unprepared, the weight of the building, for on rock or other incompressible surfaces no foundation is needed. On compact, but still ductile, clays the total estimated weight of the structure gives the measure for the required width of the footings. But soils like clay in level strata, sand, gravel and stiff loam, where there is no danger of disturbance by running water, may be left out of consideration. Foundations obtain their greatest importance in alluvial soils, where their cost is sometimes equal to that of the superimposed structure. If alluvial soils consisted solely of the inorganic deposits of rivers and streams that formed them, a sufficiently hard bed to carry weights might, in most instances, be found but little below the surface; but this is seldom the case. This is easily understood if the mode of formation of a delta is considered. The growth of a delta at the mouth of a river flowing into a tidal sea is a very complex proceeding, and subject to continual changes. The first effect is the formation of shallows on each side of the mouth and parallel to the direction of the river current, as it leaves the unsubmerged coast-line. These banks consist of matter precipitated from the volumes of river-water flowing sideways, and losing their acquired velocity on meeting the heavier sea-water. The centre of the fresh-water current continues seaward for some distance, and deposits its silt in the deeper water, forming a bar, from whence part of it is either carried sideways by littoral currents or up river again by the incoming floods, and eventually to side shallows. As these warp up more and more, the real river mouth is displaced seaward, the surface gradient of the river becomes flatter, the current slower, the deposit in the river-bed increases, and the bar shallows. The river at last, finding its outlet insufficient, breaks through one of the side banks and makes a new mouth. The old bed, being left without sufficient current shallows, and the bar at its mouth, no longer eroded, is raised by the surf acting on it, and overlaid with sea-sand pushed up by the ground-swell from the sea bottom. As soon as this sand reaches the surface, the sea-wind dries and blows it into dunes high enough to keep out high tides; the old river-bed is turned into a lake, at first brackish and then fresh. The salt and other constituents of sea-water are precipitated or absorbed by plants, reeds, or floating water-lilies that soon begin to appear in the stagnant water, first round the edge. This green band broadens, and at last covers the whole surface, and as the plants decay grasses and morass plants cover the floating mass, thickening it; then trees with widespread roots begin to grow on it till their weight becomes too great for the floating soil. They either sink through to the bottom, or, a gale assisting, are thrown sideways, and so increase the thickness of the now tangled mass of vegetation. So the process goes on for some time, till river-mouth number two undergoes a similar fate to the first, and the river, seeking a new outlet, breaks into the lagoon, and covers the vegetation with layers of silt or sand. The sea in flood finds its way into it as soon as the river breaks through the side banks, kills what remains of plants, and turns the whole into a putrid, festering slough, till through another change by the river it is again cut off from salt-water. Then, as soon as the lagoon loses its salt, fresh-water vegetation, marsh plants, reeds, trees follow one another in covering the surface. But below it the hollows and depressions above harder inorganic strata are still filled-in with the remains of the former growth, intermingled with layers of sea-clay or sand, river-clays and gravel, or other deposits. In each successively abandoned river-mouth the same goes on, and the delta spreads out fan-wise and seaward, composed of numerous compartments filled with mixed organic and inorganic stuff, and divided by ridges of clay, loam, or sand. Through all these different marshes and lagoons the river continually changes its course, dividing into two or more arms, abandoning an old outlet, or revisiting another old one.

It is the mixture of all sorts of stuff in alluvial soils, inorganic and organic, in layers of varying thicknesses, and divided off into areas of irregular form and size, which causes such sites to be the most untrustworthy and difficult to be built upon, and where human ingenuity in the matter of foundations is most called forth. In the early days, when in these swamps and marshes constructions of any weight are wanted, the first idea to suggest itself would be to distribute the load over as great a surface as possible, and this could be obtained by means of a raft. Where timber was abundant, beams could be used; if heavier material were lacking, smaller trees and branches intertwined served the same purpose. Such old raft foundations may still be found under ancient buildings. On the alluvial plains of British Guiana, first brought under cultivation by Dutch settlers, some still exist at the present day. Even old brick

windmills, chimney-shafts on sugar estates, and the brick lighthouse at Georgetown stand on rafts made of two or three tiers of heavy greenheart or miva barks. In the fens of the Netherlands and of Northern Germany are still some old farmhouses resting on an even less coherent bed than a thick matting of branches and faggots afford. Probably for the want of better material in the vicinity, layers of dried peat, cut in long pieces and in several tiers at right angles to each other, served as foundations. Not only for buildings were these spread-out supports used, as is proved by part of an old Roman road through a peat bog, discovered some years ago, constructed almost entirely of logs lying close together in two layers, the lowest parallel to the axis of the road, the other across it, and the interstices filled in with small branches, — a regular corduroy road, like some in the swampy districts of the United States at the present day. With the same idea, that of spreading the load over the support sand-foundations accord, sand compressed in a confined space gives as hard a bed as can be desired for most purposes. In old alluvial soils the different strata, as a rule, increase in compactness as they are lower down, and although the first few feet from the top may be so soft that cattle in wet weather get bogged in it, yet after this nearly liquid mud is removed, layers may be found which, although yielding, are capable of supporting some weight. What this may be must be ascertained by experiment, conditions being so variable that a hard-and-fast rule does not exist. On the green surface, a galloping hare may shake the ground for thirty yards round; a few feet below it the soil will support a ton per square foot; while, again, a few rods off, a quarter-of-a-ton per square foot will settle down more than is convenient. Particularly in soils of such varying compactness, sand gives a very good support, provided that it is not scoured away by running water or blown away by the wind. The sand may be piled up on the surface by its weight compressing the mud underneath it; but a more workmanlike way is to remove the upper mud by digging a trench or a pit many feet wider than the footings of the buildings are to be, and going down to a harder layer. This trench or pit is then filled in with sand, which will settle downwards and sideways till an equilibrium is obtained. As the top of the sand descends, the soil round it heaves up in a sort of billow, often higher than the sand mound. Sometimes the sand not only compresses the layers below it, but pierces them and sinks down to a considerable depth. If, then, borings are taken, they show that the sand made a way for itself in a very irregular way, very different at different cross-sections, mostly in the form of a rounded body, bulging out here and there. This bulging out sideways may go on after there is no settling down observed, and then more sand should be supplied to fill up the space. It is curious to note that these after-workings most often occur at night, and not seldom after the ground has been violently shaken by pile-driving or otherwise. When once stability is obtained, and neither sand nor surrounding ground is moving, the top side of the sand can be levelled off and the footings laid on it. The peaty, boggy soils owe their character to the great quantity of water they contain. The trench or pit, therefore, will be filled by it, and the sand tipped in should reach to high above the surface of the surrounding subsoil water, or else it will, for an inconveniently long time, be more like a quicksand than a sand plate. It is even advisable to heap a mound of an extra 5 feet or 6 feet over it to press the submerged bottom layer down, and then, if possible, to lower the water-level. Even then the sand will remain compressible, and it is as well to give it a good ramming-down before laying down the footings, or else the eventual settling will be more than convenient.

In the present day concrete is the best material for the footings, laid down in slabs. Where it is to carry a tower or chimney, a few layers of cement-mortar will be enough; but where it concerns long walls, iron rods running lengthwise, bedded a couple of inches above the bottom in the concrete of the lower slab, and also a couple of inches from the top of the upper slab, will give greater security against unequal settling and fissures in the wall. The width of the footings and their thickness, and the sectional area of the trench, must be determined by experiment on the spot. A trial pit filled with sand, on which is placed a load of some heavy substance, is not expensive. It should, however, be of sufficient area to give a stable base to the load to be imposed on it, or else this will topple over, or settle sideways, leading to erroneous conclusions. Sand-foundations are a very ancient device. Some Egyptian temples in the Lower Nile delta are built on them. The builders placed little images of their gods and holy animals in their foundations, which seems to have answered very well, as most of these temples still stand; but nowadays iron rods, as described, will perhaps inspire more confidence. In recent times sand-foundations have again been used; for instance, under railway buildings and workshops on the north coast of Java, and for lines of railway in Holland; for the Law Courts at Georgetown, British Guiana, and so forth.

Another system is that of piles. The lake dwellings were built on them; driven mainly vertically or nearly so, into the lake bottom, and united at the top by heavy timbers, forming a floor for the huts. The same type may still be met with in the Tropics in some coast villages, that stand several feet above the surrounding water or land. The white man's practice at present is to drive the piles down out of sight. It is curious to observe how erroneous ideas have crept in about the usefulness of a pile foundation. It is thought by many that the driving of a sufficient number of piles consolidates the soil, whereas it is just the reverse. The piles themselves, and the shaking during the driving, destroy such cohesion between the

¹ A paper by Baron H. T. H. Siccama, M. I. C. E., read before the Civil and Mechanical Engineers' Society on Thursday, November 5, and printed in the *Building News*.

different strata as may exist, and churn the whole up into a quagmire. If driven in great numbers they really act like a raft of which the beams are placed vertically instead of horizontally. This applies specially where the piles do not reach a layer hard enough to support them and their eventual load, in which case they miss their purpose, namely, that of supporting a platform, like a table on its legs. Many buildings stand out of plumb, because the whole mass below piles and mud is bodily pushed over through a lateral thrust or inadequate support, a heavy load on one side or an excavation. Some thirty years ago a dock-wall in the Isle of Dogs slide sideways in this way. Besides, by their buoyancy the piles counteract the action of gravity by the friction of the surrounding matter, however porous and soapy. In driving a long pile, the first few feet may go down rapidly by its own weight, and the rate of sinking after that becomes less at every subsequent blow, and then remains stationary. If in the end a hard stratum is not reached, and the pile is left alone for twenty-four hours, then it takes several blows before any impression is made, owing to the adherence of the soil to the surface of the pile, and should ramming be stopped after a few knocks only, the idea is given that the pile stands in firm ground. This leads to grave misapprehension, for when the full permanent weight of the building is at last superimposed, a considerable and slowly progressive settling is observed going on for years, till at last the platform over the piles compresses the subsoil sufficiently, and acts, more or less, like a raft. Where piles are not driven down into holding ground, another inconvenience may be suffered, most of the piles already driven being pushed up again, while others are put down nearly even after they have already been fastened to the sleepers or stringers that are to support the wall footings. Where piles remain in this way, so to say, floating, it is useless to try to obtain increased stability by driving some in a slanting direction. But in every case the construction of the timber platform is of great importance, not only because it must be able to carry the weight of the walls between the piles, but it must bind these together so as to distribute the load evenly, and also prevent the upper parts of the long masts from bending sideways. Another error is the use of a pile-foundation where a hard sand-plate is met with at little depth beneath the surface. An old sand stratum is very difficult to pierce; and where this succeeds, and the piles are not shivered and split before they are half-way down, the sand is all around disturbed and broken up. Not much harm is done where the timbers are constantly submerged in fresh water; but when *Teredo navalis* can get at it, disaster is sure to follow, for the sand disturbed during the operations ultimately settles down again, and leaves space filled with clear water, where the sinister worm soon enters. Where a foundation is intended to support a lock, and the hard sand-plate is not too far down, it is preferable to tip the concrete in it on to the sand bottom, if covered by water, in hard lumps of stale or half-set mortar. In this way a watertight dam is obtained, whereas in the other case some leak is sure to ensue between the sand surface and the lower face of the lock or sluice bottom. Where a sufficiently hard stratum is overlaid by soft stuff to such a depth that the longest procurable masts cannot reach it, wells can be used. This, in a way, is not a new invention either. In India wells have been known since time immemorial, under weirs in rows close together, under bridges in clusters. In this way the movable sand or other untrustworthy material is traversed, and the solid or rock bottom underneath is reached. The work is similar to that of sinking a shaft. A wall is built on a circular shoe, the inside is excavated, and as the wall sinks down other sections are built on top. There are instances in Europe, in Venice, where a wooden cooped well-barrel was used, hooped by iron bands, and driven down by the weight of sand bags arranged round the top. There, as in India, when the well had gone down to the required depth, it was filled with stones or other material. If this filling is not of itself cohesive, there is danger that, when the wooden barrel-staves decay, the inclosed substance may spread and the building come down. The cast-iron cylinders filled with concrete of our time are a vast improvement on the older methods, as screw-piles are much superior to driven ones, where, for some reason or other, they have to stand in sand, as in the case of a lighthouse or landing-pier, for the sake of economy. The methods by which cylinders can be sunk are manifold, and the choice depends upon the nature of the soil and the depth to which they are to go down. In clay or stiff loam a bucket and chain or a grab and crane must be used. In sand or soft stuff suction-pumps are preferable. The great bother is to keep the cylinders plumb while going down, which is not always a very simple thing, especially where big stones, or more often old half-decayed logs are met with. If they do not prevent the cylinder going down altogether, until they are removed, they are apt to drive them sideways as is sometimes the case with a bore hole. If very large cylinders or caissons have to be put down to a considerable depth, the soil is excavated through compressed air-chambers. On the so-called Potts system, which is costly and rather risky, it is on the whole a favorite device of engineers who need not themselves work in the air-chambers. If possible it is always preferable to work in the open air. Even divers should be employed sparingly. Their work cannot always be depended upon; it is slow, dear, and not easily controlled. Any one who has ever been down in a diving-dress, will understand this well enough. Dressed in a suit of plate harness, and picking up pins out of the mud during a thick fog, would be something like a diver's work, and yet not half so tiring or dangerous. A new kind of foundation is that of the sand pile. For this a hollow iron-shaft is tipped at one end with a loose-fitting

pointed shoe, and driven down to the proper depth. The shaft is withdrawn, and dry sand run down it. This fills the space left by the shaft as it is raised. The shoe abandoned, very bad ground may be improved and rendered more compact in this way, but under locks, sluices or weirs, it is not of much use. Whether "pierre perdue" or rip-rap is a good foundation depends on circumstances. In a breakwater it is part of the useful construction which begins at the bottom. The slope under which a rip-rap mould will stand depends on the size of the stones, and on the exposure of the site. The smaller stones should be tipped in for the centre, the biggest on the outside. Mostly, rip-rap mounds are used in the construction of breakwaters; but the building of a breakwater is another story, and lies outside our present subject. For quay walls in deep water, such stone mounds will give good foundations, unless the bottom is too soft, and then the stones will go to unknown depths and be lost, as was the case in New Orleans once, also in Rotterdam. In the construction of docks and navigation works it is a mistake to make them too permanent and costly. Nothing changes so continually as the needs of traffic by water, and the best policy is to provide what is needed at the moment, at the least cost, and nasty, if you like, which, in this case, may be called "business." Granite quay-walls, Gothic warehouses, director's names in golden letters on marble slabs, festive opening lunches, with plenty of speeches and lots of champagne, is art, and lies outside the scope of this paper. It would be indiscreet to frivel away more time on this occasion, and, therefore, it is better to wind up with this remark, that the best foundation is the one which serves its end at the least cost.

THE PRESERVATION OF MATERIALS.

DURING a recent discussion on the Preservation of Materials before the American Society of Civil Engineers, Mr. George Hill, C. E., said:—

"The speaker has thought of this subject under certain headings:—

"*First.*—The preservation of materials of construction against atmospheric deterioration, a branch which can be dismissed, because, in general, the use of such materials as will be safe against the action of frost or the elements is always attempted.

"*Second.*—The preservation from injury due to soot or dirt from the atmosphere, a branch of the subject with which the speaker has had very little experience. Many handsome buildings are spoiled by reason of the soot, and attempts have been made, by the use of glazes on terra-cotta, and by various forms of materials supposed to be impervious, or by paraffine compounds applied to the exposed surfaces, to prevent this, and it is claimed that this has been done successfully.

"*Third.*—Protection from dampness striking through. In that particular line, the speaker has had some experience with certain walls made of patent plaster, Portland cement and sand, 2 inches in thickness, and used as external walls of manufacturing buildings, coated with some of the compounds which are on the market, and has found that they were efficient. He has also had experience with brick walls, coated on the inside with similar compounds, and has found that the dampness was excluded. In general, it may be said that there are certainly half a dozen different compounds, which can be obtained at a reasonable cost, which will protect buildings from deterioration through the striking in or the transmission of dampness.

"*Fourth.*—When it comes to the preservation of metallic structures, the speaker thinks that this discussion should be in the nature of an experience meeting, and, in general, the failures rather than the successes should be described. For instance, during the last five years the speaker has erected quite a number of buildings with external curtain-walls composed of hard plaster, Portland cement and sand in equal parts, the scratch coat being applied to uncoated metallic lath, making the thickness of the scratch coat about 1 inch, then a surfacing coat of Portland cement, $\frac{1}{2}$ inch thick, was applied on each side, making the curtain-walls a total thickness of about 2 inches. These buildings have been put up at various times, the latest one being about four years old. All are in first-class condition at present, with the exception of one.

"This building is one of four, and was erected in the winter. The scratch coat was alternately frozen and thawed several times. Two years after the building was finished it was found that the outer surfacing of cement was cracking and falling off. Sheets having an area of 8 or 10 square feet came off, leaving the scratch coat bare. This was left alone, and the deterioration or destruction of this wall has been going on for about two years. The entire wall now is in rather bad shape, and it is proposed to put it in good order. In every case there was a separation between the finishing coat and the scratch coat, and, in general, the wire lath, where it was on the surface of the scratch coat, or where the scratch coat came very close to the surface of the lath, was very badly rusted; but, in places, this was little more than a discoloration. In other places, the wire lath, while rusted, was probably in exactly the same condition as when the plaster was first applied to it; because sometimes several days elapsed after the bare lath was erected before it could be covered, and there is no doubt that during that time it rusted.

"The adjoining building, erected in the following spring, is in absolutely perfect order to-day, and all the other buildings are in equally good condition, so that this failure was due to the alternate thawing and freezing of the scratch coat, which prevented the

formation of a proper bond between it and the surfacing coat. It may be that the surfacing coat, which was of undue thickness, reaching in places as much as 1 inch, was too thick, and that that was responsible for a small part of the trouble.

"Fifth. — In the protection from oxidation of such a metallic structure as Mr. Miller has described, the speaker has observed a few cases where the paint on the steel has been protected with metal lath and Portland cement, and in every case has found that it afforded a sufficient protection.

"In the matter of painting, although personally interested in one paint concern and very well satisfied as an individual with its product for forming a preservative coating, it is the speaker's belief that there are several paints or preservative coatings for metallic structures to be had at the present time, which will give satisfactory surfaces when applied properly; in fact, the intelligent application of the covering, in accordance with the manufacturer's directions, has almost as much to do with a satisfactory service as the composition of the paint.

"Sixth. — In protection against fire the speaker had one experience which is instructive. The building was of the ordinary steel-skeleton type, and a fire occurred on the fifth floor, the heat being sufficiently intense to soften the steel steam-pipe risers, so that the deflection in some cases was as much as 6 inches. It also melted the brass air-valves on the radiators. The flames passing out of the windows melted the solder in the copper cornice, five stories above. The fire-department was able to erect a water-tower and direct the stream from it horizontally into the building, and the fire was put out by drowning; that is, the entire floor was filled until the water flowed out over the window-sills. This stream struck several of the columns, all of which were wrapped with wire-lath and plastered with Portland cement and sand, with a thickness of about $\frac{3}{4}$ inch, on which the white coating was applied. This covering resisted the effects of the heat and the hose stream in every case except one, where a portion of the covering, about 18 inches long and 12 inches wide, was torn off; but, evidently, that did not occur until the fire was practically out, because the paint on the column — the building had been erected about a year and a half — was intact and not blistered by the heat.

"Some years ago the speaker made a series of experiments for the representatives of the System Mélan, using stone concrete with Portland cement surrounding T-bars of steel bent into the segment of an arch. He found that in every case, although the steel sections had been exposed to the weather for from sixty to ninety days unprotected, wherever the concrete had been in contact with the steel, no rust showed at all. The steel was not painted, and showed bright; but wherever there were voids in the concrete, due to the use of rather dry concrete with a stone aggregate, rust had set in.

"In the test made, for the expanded-metal companies, in Long Island City, the slabs were generally made of very wet cinder concrete, and, during December and January, for from thirty to forty-five days, were exposed to atmospheric conditions. The steel which was embedded in the cinder concrete, or in the gravel concrete, as the case might be, was absolutely unchanged after the destruction of the slabs. A chunk of cinder concrete, in which expanded-metal was imbedded, and which, when it came to the speaker, was reputed to have been exposed to atmospheric conditions for five years, was kept for about a year on his window-sill, where it was exposed to atmospheric conditions until the expanded-metal which projected was rusted about half off. It was then split, and it was found that the expanded-metal embedded in the concrete was clean and bright.

"Nearly two years ago the speaker lined a very bad shaft, for the Lackawanna Railroad Company, at Scranton, Pa., with cinder concrete and expanded-metal. The shaft was through quicksand, about 60 feet to rock, and was notorious for its bad character. The wood lining put in previously had been in place about six years, and was generally rotted through. It was necessary to replace it either with wood or masonry. Expanded-metal was used, with Atlas Portland cement and furnace cinders, taken from the ash pile at the power-house operating the breaker in connection with the mine. The cinders were taken from this pile without any selection, and without screening. A few days ago an examination of the lining was made, and it was found to be in as good condition as when put in. The condition of the expanded-metal could not be ascertained very well, but if there had been any deterioration, if the Portland cement and the cinder concrete had not been an absolute protection to the iron, the character of the water surrounding that shaft and constantly flowing through it was such that it would have eaten up every portion of the iron within a year. It is believed that under such conditions the cinder concrete acts as an absolute protection to the steel.

"It seems to the speaker that it would be of great interest, and a great benefit to the Society, if the Special Committee on Uniform Tests of Cement should have its scope extended, so that an investigation could be made of the effect of neat Portland cement, Portland cement used with various aggregates and Portland cement adulterated with various lime or patent materials, in respect to the preservation of steel. The Society can certainly do very useful work along this line, and if such tests were extended to cover the use of cement in the way in which it is actually used, so that some analogy could be drawn between the test as made and the use to which the cement is put, its utility would be increased still further.

"Among the practical builders in New York City, there are a good many curious notions. Some of them have told the speaker,

with great seriousness, that it was very dangerous to embed a steel grillage in neat Portland cement; that the cement burned the steel, and that this effect was entirely overcome if a little lime were added. Others have said that it was not possible to grout a cast-iron base with pure Portland cement, because it invariably swelled, and so on, through the whole list. Every one who has done any work has undoubtedly heard the various peculiar notions of the "practical" men, those who have a certain amount of hand knowledge, and who do not use their heads in connection with it.

"As far as the speaker's observation goes, steel which has been properly embedded in concrete remains absolutely unimpaired and perfect in its condition. The effect of painting or oiling the steel before the application of concrete does not seem to be injurious in view of the fact that the steel cannot always be covered immediately. In the protection of relatively large sections, with the exception, perhaps, of the steel which goes into the grillages, where a most perfect covering is desirable, it would be well to give the steel one or two coats of paint; but, for the grillages, especial care should be taken to cover them thoroughly, and, in such cases, as intimate a contact as possible should be secured between the concrete and steel.

"In the application of steel for the reinforcement of concrete, the fundamental principles are that the steel should be used in small sections and of such form that it will retain its position in the mass of concrete by reason of the form rather than by reason of the adhesion between the concrete and the steel; so that a preservative coating would have only a small influence on the strength of the combination; but, as the preservative coating is expensive, and makes the steel unpleasant to handle, and as the steel can always be embedded in the concrete promptly and thus preserved from initial rusting, the speaker thinks it well that the smaller sections should not be coated.

"In the mixing of concrete, the usual practice, or, at least, the practice that the speaker was taught, is wrong. It is very much easier to make concrete too dry than too wet. The concrete in the Pabst Building, described by Mr. Miller, was mixed so wet as to be really muck, and was deposited practically without tamping.

"In the last few years the speaker has used a great many thousands of barrels of Portland cement in concrete, almost all of which has been deposited without tamping, and all of it so wet that the natural slope was about thirty degrees from the horizontal. His theory of the matter is that the very fine portions of the cement are washed down in that way, and coat the steel perfectly and fully, and that the excess of water renders any extensive tamping unnecessary and thereby effects a material economy in the cost of making and depositing the concrete. The speaker's observation of a great deal of concrete deposited, usually in thin sections, sections of from 4 to 8 inches in thickness, is that this excess of moisture does not result in a porous concrete, nor does any noticeable shrinkage result; but that, on the contrary, it saves time.

"One serious danger in concrete deposited during warm weather is that of an insufficient quantity of water, and a consequent drying of the concrete. The following experience is an illustration of this danger. Some twelve years ago, when the speaker was designing engineer for a firm of architects, it was decided that a certain windmill tower, with a heavy stone base, should contain a steel tank 50 feet high and 14 feet in diameter, the stone base being about 25 feet in diameter. This stone base was to enclose a small engine-room, so that the tower had to be supported directly over the engine-room. A steel angle-iron skewback was put in and a Guastavino arch formed. Then, to make a levelling for the tower, a contract was made with a certain party to fill the haunches, to a minimum thickness of 1 foot over the crown, with Portland-cement-and-broken-stone concrete. The men were careful to do what they called a good job. The concrete was mixed very dry, not quite as moist as brown sugar. It was thoroughly well tamped, and then exposed to the sun and wind, and dried out very quickly. The tower was put on before the speaker had an opportunity to inspect it. That concrete was just about as good as so much dried mud, and all of it had to be scraped out with shovels, with the occasional assistance of a pick and crowbar."

BOOKS AND PAPERS

M. DE LA SIZERANNE justly points out that each new essay¹ in art is a return to Nature. Each new genius extracts from Nature something which his forerunners have not noticed. The true artist transposes Nature; the decadent forgets her; but the transposition is unconscious. "They think themselves, these painters, realists, as all of us think ourselves ever young. They all think in good faith they are painting the pebble lying at their feet, or the puddle on the roadside, and one and all paint you a precious stone which no one can observe at his feet, and a sky such as no one has ever seen above his head." This, says the essayist, is true of all art from the Renaissance down to our own Impressionists — of the work of Corot, of Ingres, of Millet, of Watteau, of Rembrandt, of Michel Angelo and of Turner.

¹ "The Genius of Turner." Special number of the *Studio Series*. Essays by Robert de la Sizeranne, Walter S. Sparrow and C. F. Bell.

M. de la Sizeranne considers Turner to have had almost as many "manners" as pictures. He used every medium in every way, and, when he could not get what he wanted otherwise, he did not scruple to work in water-color upon oil canvases. In Corot we see two manners, his Roman style and his Ville d'Avray style. Turner began as a Wilsonian — "his 'French' manner" — then he took up a realistic English manner, and, lastly, his fantastic or pure Turner manner." In other words: "Nature as the masters saw it; Nature as he saw it himself; Nature as he wished to see it." Should we not rather say, as he thought he saw it?

M. de la Sizeranne's is a brilliant essay. He is not blind to the great painter's faults, but he feels that Turner is the grand impressionist. His mountains are higher than Nature, the rivers rush by through bridges twice as large as the real ones; all is exaggerated, much is sacrificed to make a fine composition. But no one can say that these exaggerated fantasies are false, because you not only recognize a scene, but you get the true impression of how that scene impressed you on the day you watched similar storm-clouds. Thus, "a town seems to be floating on the water, Venice; or to be built of jewels, proof against the assault of the seasons, Florence; or sleepily crouching over still waters, Bruges." These characteristics of the towns Turner caught and portrayed — and yet there is much in common in most towns.

One objection to M. de la Sizeranne's remarks we must make. He asserts that no musician has ever tried to transfer the sounds of a town, a port or a forest into musical sound and phrase. Surely Berlioz, Wagner and Tchaikowsky have done this — we need only instance echoes, shepherds' pipes, church bells, and other sounds which have been drafted into music, as well as thunder, a stormy sea, and the singing of birds. But it is ungrateful to find fault with this brilliant essayist, this sympathetic critic who felt as the great painter felt. Turner's birthplace was gloomy, but as a boy he probably revelled in the color he found in Covent Garden Market. He saw the beauty of mist — was he not close to the Thames, where he could gaze on the glorious red-sailed barges, with their bright emerald-green prows? May it not have been the proximity of the Thames which trained his eye to so correct a knowledge of values?

Every word of the essay is worth pondering, and the translation is good. The other two essays are interesting; but we cannot praise the colored reproductions highly — the black-and-white are vastly superior.

MR. SELWYN BRINTON introduces a new series of convenient art-monographs, which he is to edit, with a charming little volume¹ written by himself, and devoted to Bartolozzi and his works. Bartolozzi, we need not say, was one of the shining lights of that period of English art in which flourished Sir Joshua Reynolds, Angelica Kauffman, William Hogarth and others, whose works are so beautiful, so simple, and yet so touching to all Anglo-Saxon hearts that the admiration with which we contemplate them is equalled only by our wonder at the distance which separates them from those of the modern school. Bartolozzi, although he spent about half his life in England, and ranks as an English engraver, was a Florentine by birth, and a pupil, first of the Florentine Academy, and afterwards of a very clever engraver in Venice. At the end of his apprenticeship in Venice, which lasted from his eighteenth to his twenty-fourth year, he married a Venetian girl of good family, and removed to Rome, where he gained a high reputation. Returning to Venice, he was engaged by the Librarian of the King of England, who was travelling in Italy in search of works of art, to come to London, by the promise of an appointment as engraver to the King, and a good salary. He was welcomed in London as his talent and his amiable personal character merited, and it was not until forty years later that he returned to spend the last years of his life in the more congenial climate of Portugal. During his residence in London he engraved about 4,500 plates, all admirable in drawing and execution, and remarkable for the sweetness and softness which was so characteristic of the best English painting of the time, and which Bartolozzi interpreted so sympathetically. Mr. Brinton gives many reproductions of Bartolozzi plates, which show sufficiently well the manner of the artist, and the plates are well supplemented by the text, which has a charming quality of enthusiasm for its subject, tempered by discretion and knowledge.

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

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PLAN AND SECTION OF THE SAME.

¹ "Bartolozzi and his Pupils in England." Being Volume I of the Langham Series of Art-monographs. By Selwyn Brinton, M.A. Published by A. Siegle, 2 Langham Place, London, W. 1903. Price 1s. 6d. Net.

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BRIDGES AT THE ROYAL VILLA, POGGIO A CAJANO, ITALY.

COURTYARD ENTRANCE OF THE ROLANDHAUS, BERLIN, PRUSSIA. HERR W. WALTHER, ARCHITECT.

This and the following subject are copied from *Blätter für Architektur*.

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TENEMENT-HOUSE: APARTMENT-HOUSE.

NEW YORK, N. Y.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—The law regarding the distinction between a Tenement and an Apartment seems to many to be so burdensome and ill-formed that a change in this law seems desirable. Can the *American Architect* start any profitable discussion on this question?

First, should there be any difference between a tenement and an apartment, and if so what proper definition could be formed that would seem equitable to both?

ARCHITECT.

[This question is discussed in Messrs. DeForest and Veiller's work on the Tenement-house Problem, but the conclusion is that no real distinction is practicable, the two classes merging gradually into each other.—EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS

A COLOSSAL QUAGMIRE.—The Southern Pacific Railway Company is constructing a new line through a portion of Utah which involves some engineering work of an unusually difficult character, owing to the obstacles which must be overcome. The improvement is known as the "Lucin cut-off," and is being built to avoid the present circuitous route around Great Salt Lake. For several years past the company has been considering a new line which would shorten the distance between the Mississippi River and the Pacific Coast, and at the same time avoid some of the heavy grades which are encountered in this section of the West. The present line extends from Ogden to Lucin by way of Belfour, Kolmar and Promontory, a distance of about 150 miles. On the route is what is known as Promontory Hill, which is one of the steepest ascents of the entire system, and which trains have been unable to ascend at a speed of over twelve miles an hour. The surveys made by the railroad engineers provided for a line about 105 miles in length, with a maximum grade of not over 21 feet in a mile, but they found it was necessary to cross the lake, and the plans included one of the longest trestling systems in the world, if not the longest, for the total distance across the lake is about twenty-eight miles. By far the most serious difficulty, however, has been encountered in the deeper part of the lake. Here the water ranges in depth from 20 to 30 feet, and it was determined to lay the track upon the trestle-work. For this purpose, piles of the largest size were secured to be driven in for posts to support the framework, some of the piles being over 40 feet in length. Pile-drivers built on rafts were towed to several points along the line, and the work of driving the foundation was begun. In some places the bottom was so hard that but a few inches could be driven at

a time. This led the engineers to believe that they had a substantial foundation for the structure. After being driven a few feet, however, it was discovered that most of the piles had apparently pierced what seemed to be a mere crust, and in some cases a few blows of the driver forced them out of sight. An examination was made at several points, which disclosed the fact that a bed of soft material underlay the bottom, being covered by the crust referred to, which seemed to be composed principally of silt and sand. Where the piles held and the trestle was completed several mishaps occurred which showed that it would not be practicable to operate trains over the structure unless it rested upon something more substantial than the natural base. In one instance the engine and two gravel cars, which were moved over the trestle, so weakened the work that the train crew had just time to detach the locomotive before the piling collapsed and fell into the water, carrying the cars with it. Acting on the theory that this section of the line could be filled-in with rock, it was decided to form what might be called an enormous jetty, connecting the rock-work at each end and terminating at the promontory; but, in spite of the fact that several thousand train-loads of material have been dumped along the right-of-way, most of it seems to be swallowed up in the mysterious depression. The engineers have finally determined upon another plan, which they think will be more successful. Cradles of heavy timber are being constructed, which are towed to deep water, then filled with stone and sunk, thus forming cribwork, which, it is believed, will support the superstructure without difficulty. This plan, however, has been but recently carried into execution, and its success as yet is a problem. The magnitude of the task can be appreciated when it is stated that the deep-water sections, where the principal trouble is being encountered, comprise nearly ten miles in all. In this distance two very large depressions have been encountered, which the engineers term quagmires. In one of these over 2,500 tons of rock were emptied daily for more than a month, but the soundings indicated that the material sank about as fast as it was thrown in. — *Scientific American*.

THE TALE OF A GRANITE QUARRY. — A peculiar story is behind the selection of building material for the great Union Depot to be constructed in Washington. Granite will be used, but it will be granite of a kind that has never been used for the construction of any other building erected upon earth. Years ago, a stone man up in Vermont discovered a quarry of unusual promise at Bethel. The granite from this quarry had peculiar beauties and qualities of its own, not found in any other granite yet excavated or carved or laid. It was a sort of *édition de luxe* in the granite line, and he saw profits of an unusual order pouring in from the development of his find. He opened his quarry and prepared to fill orders, when his son was killed on the property. Thereupon he issued the fiat that this valuable stone should never be used for any other purpose than tombstones or monuments. And it never has been. But the stone man who erected this peculiar memorial to his deceased boy has passed away. Heirs have not the same scruples about its use for common building construction. So a sample of the stone was forwarded to the men in charge of the construction of the great Union Depot, in the erection of which the Government has become a partner, after a fashion. The samples of this one stone decided them. They would have no other. And the Union Depot will be constructed of it. — *Washington Correspondence Omaha Bee*.

INSULATING ELECTRIC WIRES. — A company furnishing electric power, the Supreme Court of Arizona holds, in the case of Phoenix Light and Fuel Company vs. Bennett (74 Pacific Reporter 48), is not guilty of negligence because in carrying its wires into a building it fails to insulate against electricity having its origin in the clouds or atmosphere. "An essential ingredient to any conception of negligence," says the court, "is that it involves the violation of some legal duty which one person owes another — a duty to take care for the safety of the person or property of the other. This duty may be assumed by contract, or it may be imposed by implication of law. Where a person, proceeding in a lawful business, exercises a reasonable care, the law does not make him an insurer against those consequences of his actions which reasonable care and foresight could not have prevented. The law justly ascribes such consequences to inevitable misfortune or to 'the act of God,' and leaves the harm resulting from them to be borne by him on whom it falls." If the electric light company, the court concludes, insulated the wires in such a way as to protect the house against injury from the ordinary current carried on those wires, it did all that it could be required to do. Its duty did not call for the insulation of the wires "in a manner to protect against injurious consequences of a lightning stroke, for the evidence shows that it was not practicable to insulate them against lightning, and there is nothing in the record which indicates any assumed or implied obligation of this character." — *N. Y. Times*.

THE DEPOT DES MARBRES. — There are some streets in Paris which appear to be interminable. One is the Rue Lafayette; another is the Rue de l'Université. The former is animated for its entire length; the latter for a great part seems to belong to a dead or abandoned city. It has, in consequence, been a favorite place for official *dépôts*. At one time there were in it storehouses of charts, artillery, weapons, and, on a site which had been assigned for archives, was a *dépôt* of Government marbles, or, in other words, the statuary which has to be purchased, but for which there is no room in the Luxembourg or elsewhere. The latter *dépôt* will probably come up for consideration if ministers can be found courageous enough to grapple with an onerous difficulty. For years there has been an outcry about the danger impending over the invaluable collections of the Louvre, owing to the presence of the Ministry of the Colonies in a part of the adjoining premises. It is from time to time announced, in order to quiet the misgivings of the public, that the Minister, with his clerks and documents, are about to be evicted. But it is not possible to discover even a temporary shelter

for them. It is now proposed to erect a big building on the site of the *Dépôt des Marbres*. The question then arises, What is to be done with the examples of the sculptor's art which are there stranded? The collection has been growing for at least sixty years. It would be disadvantageous to modern sculptors if the statues were sold by auction, for it may safely be affirmed that the majority of the figures would have to be got rid of for less sums than were paid for the stones. Any course which would bring down the value of sculpture would be dangerous. Many of the examples can be considered as official art, and the glories of one régime are distasteful to another. They cannot all be sent to provincial museums. Probably the wisest proceeding would be to despatch the majority to French colonies. The utilization of the *dépôt* as a site will cause another inconvenience. Some of the sheds used to be assigned to painters and sculptors who were executing enormous works for public buildings, and it will be difficult to discover ateliers as roomy which can be obtained gratuitously. — *The Architect*.

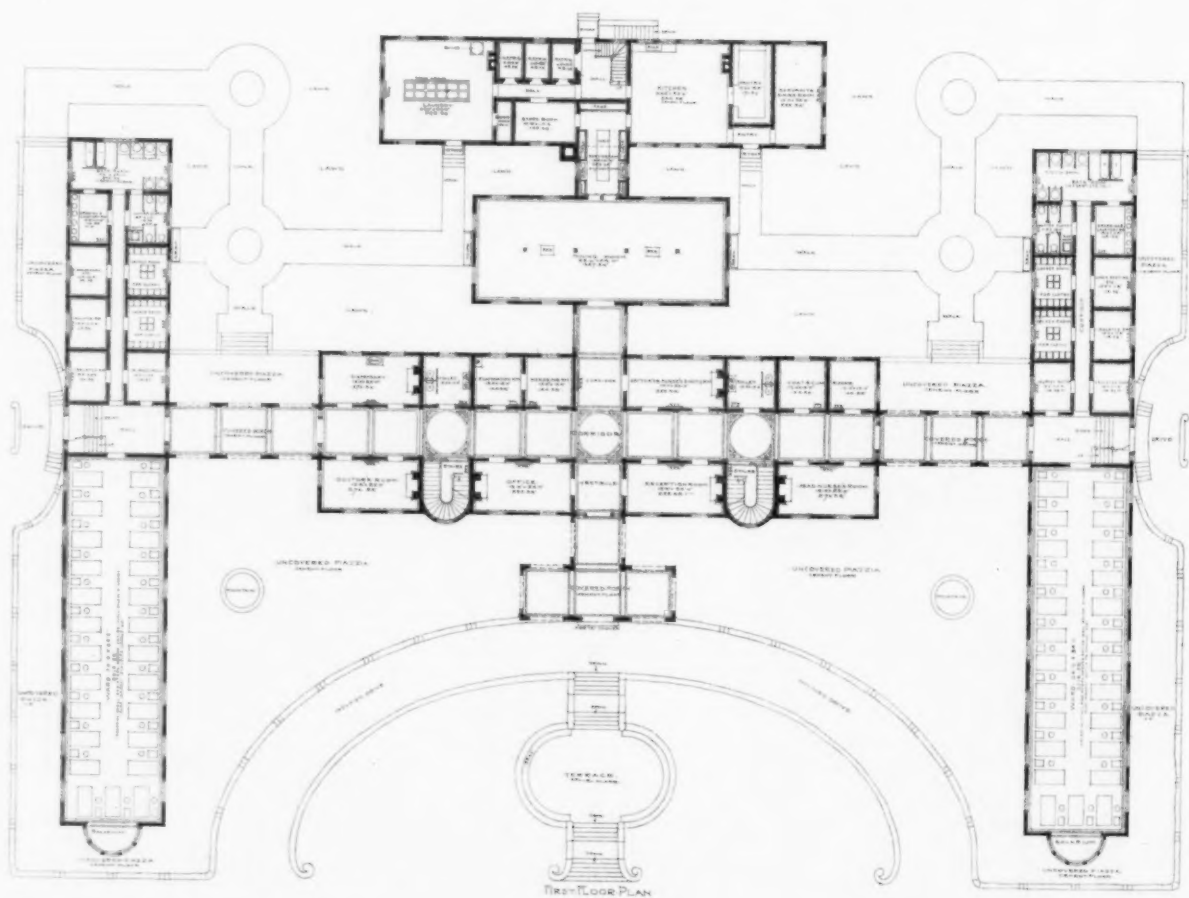
FIXING MARBLE VENEER. — In veneering brick walls with marble, the slabs used are rarely less than $\frac{1}{4}$ -inch thickness, although the Romans are said to have veneered the walls in the Baths of Caracalla with slabs of only $\frac{1}{8}$ -inch thickness. It is usual to leave a clear space of $\frac{1}{4}$ -inch between the marble and the wall to include the plaster backing, and any slight irregularities in the wall surface. Polished marble suffers from the disintegrating influence of damp, so that the slabs should not be fixed until the walls are fairly dry. If there is any doubt about the walls being dry, it is best to leave open joints in the marble-work for some time, so as to admit of free circulation of air behind and prevent condensation. It is best to leave open space where possible between the marble and the wall, and, with this object, it is better for the backing to be laid in narrow vertical strips so placed that each slab may rest against at least two of them. The best fixing is obtained when a slab can be inserted between two projecting string-courses of solid marble built into the wall. Grooves or rebates may be cut in the upper and under side of the string-course to receive the slabs, and the groove receiving the upper edge of each slab, to allow sufficient "play," so that the slabs may not be crushed or injured in the event of a settlement of the wall behind. It will be understood that extremely careful workmanship is necessary in fixing marble lining, so as to avoid injuring the edges of the slabs; great care is requisite in cutting them to the proper size, and in setting out the work before it is fixed. The hooks and staples used in fixing should be of copper or gun-metal, and so arranged as to afford a support for the slabs, and so prevent them from being subjected to any undue pressure. Beads and ovolos are frequently worked upon the arrises, or else the slabs are finished square at the edges, so as to make a simple arris, no attempt being made to deceive the eye by an invisible angle joint. The angles are usually strengthened by means of gusset-shaped blocks of freestone or terra-cotta, fixed inside with plaster or cement. — *Stone Trades Journal*.

THE RISE OF ELEVATORS. — Richard T. Crane, of Chicago, whose name is intimately associated with the building of elevators, lately said to a reporter: "The first elevators for use as passenger-lifts, of which I have any knowledge, were the screw-elevators built by Otis Tuft, of Boston, in 1859, one of which was installed in the Continental Hotel, in Philadelphia, and another in the Fifth Avenue Hotel, in New York. Only the two of this type were ever built. They cost \$80,000 each, and were failures. It was erroneously supposed at the time they were built that they involved the essential quality of safety. The elevator was fitted around a huge screw shaft, in such a manner that the revolutions of the screw, engaging a corresponding spiral section on the elevator, raised or lowered it, depending upon the direction the screw was turning. The maximum of speed was about 30 feet a minute. Modern elevators make 400 to 500 feet a minute, and can be installed for from \$5,000 to \$10,000 each. The first real advance in elevator construction was made by Otis, of New York, who began the construction of the type controlled by the drum and cable, with the engines that operated them. The first elevator of this sort was placed in the old St. Nicholas Hotel. The spur cogs that were used in the construction at that time worked fairly well when first installed, but they would soon get into a condition that sent the elevators jiggling up and down. My experience in elevator-building began in 1869, and my company had a few in operation when the fire destroyed Chicago in 1871. We adopted the worm cog, that imparted smoothness to the operation of the elevator, and embarked in the building of hydraulic equipments, which are by all odds the most generally efficient and satisfactory. It is six years since I retired from the business of elevator-building, but I have seen the demand increase and the business develop from nothing, until there are now from \$12,000,000 to \$15,000,000 worth of elevators turned out annually." — *N. Y. Tribune*.

ST. MARTIN AND THE DICTIONARY. — St. Martin, whose festival was celebrated lately, when he divided his cape with a naked beggar at the gate of Amiens, gave also two words to the English language. The oratory in which this torn cape was preserved as a sacred banner acquired the name of "chapelle" — from the French "chape" — the custodian being termed "chaplain"; and thus our English words "chapel" and "chaplain" are derived. — *Westminster Gazette*.

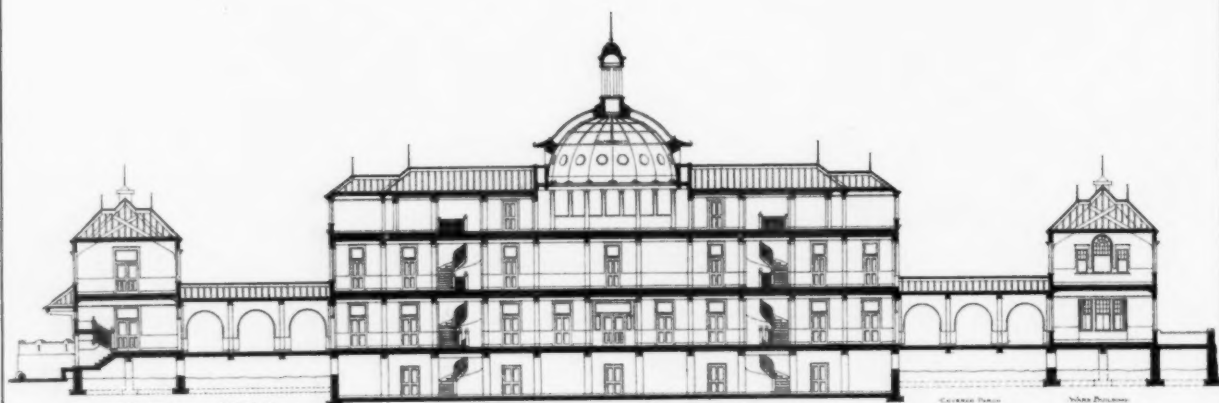
POPULATION OF GERMANY. — The growth of the population of Germany in 1902, regarding which statistics have just been tabulated, was the greatest ever known, amounting to 902,312, or 15.81 per 1,000, compared with 15.09 in 1901, and 14.63, the average for the last ten years. The number of births during the decade increased only slightly, remaining just above 2,000,000 yearly. The gain, therefore, is due exclusively to the diminished death rate, which was 20.56 in 1902, compared with 22.68 for the previous decade. — *Exchange*.



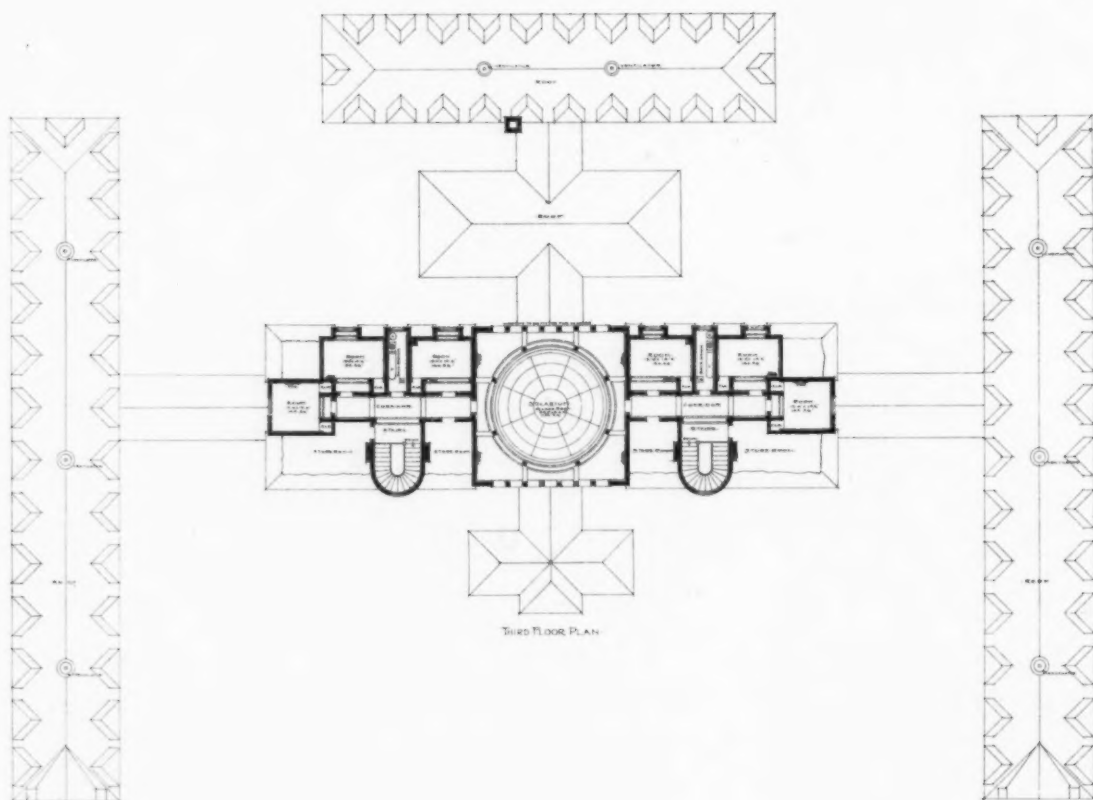


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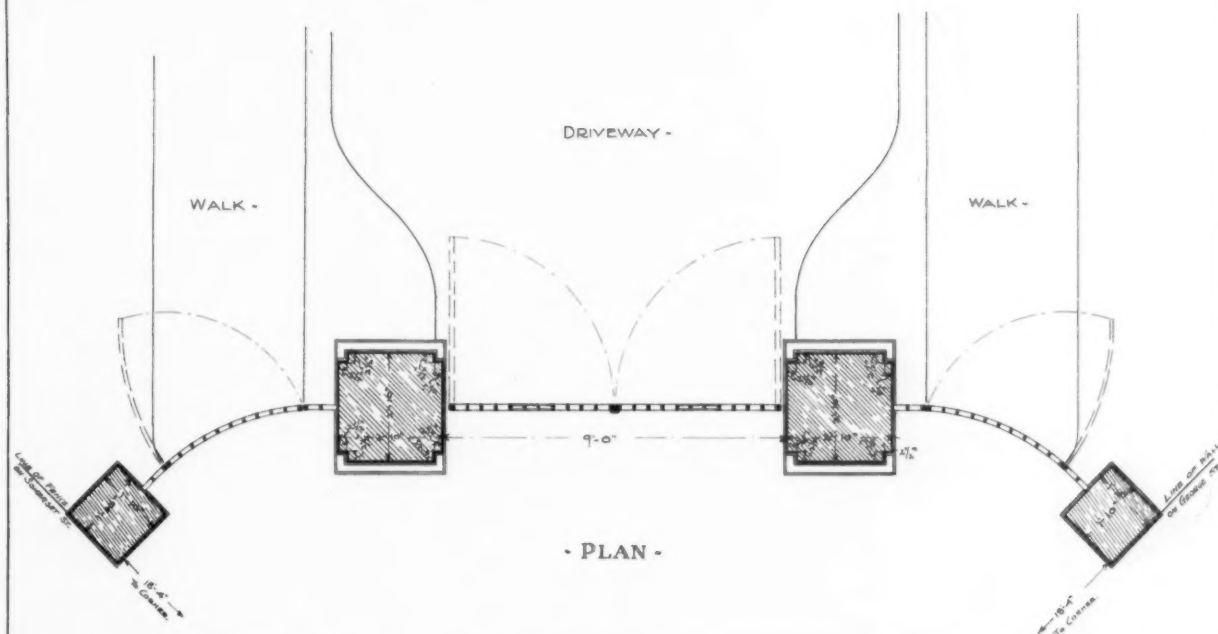
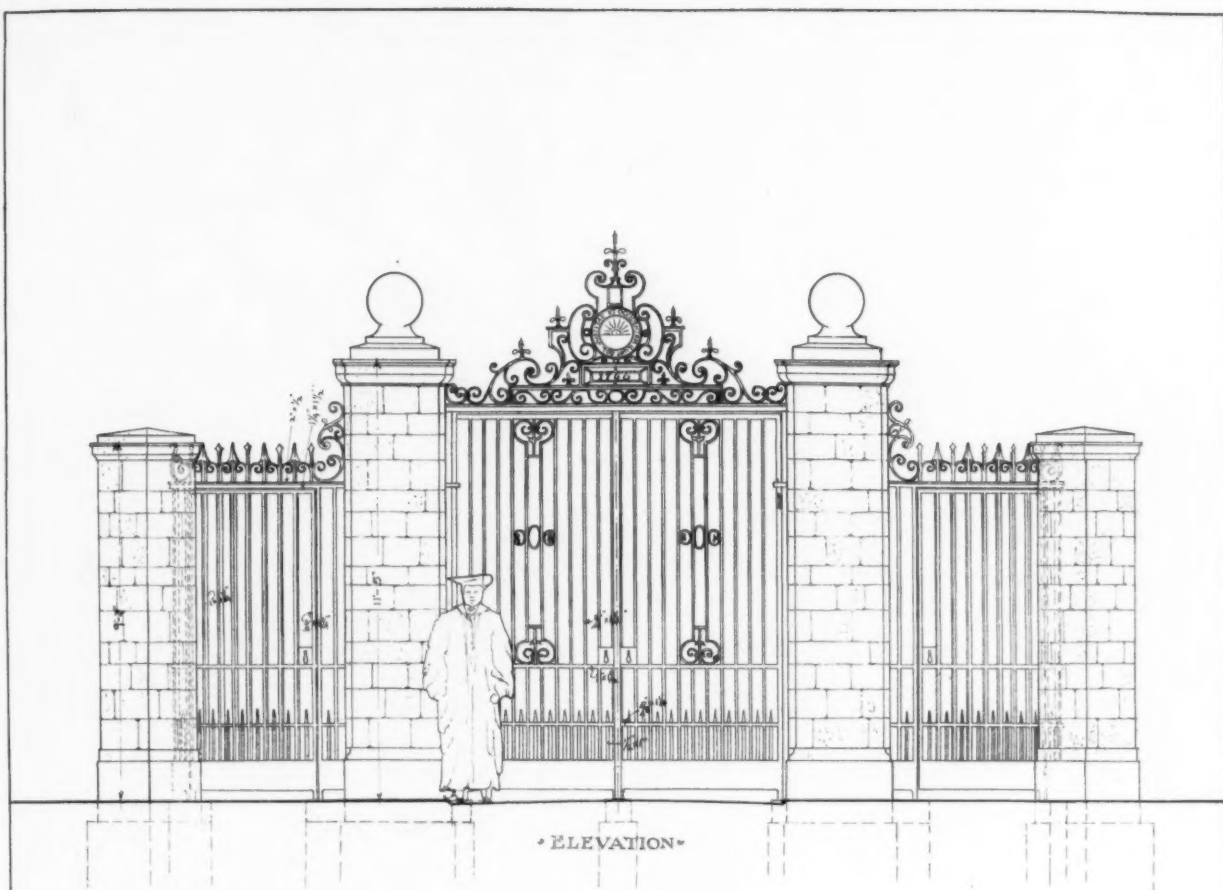
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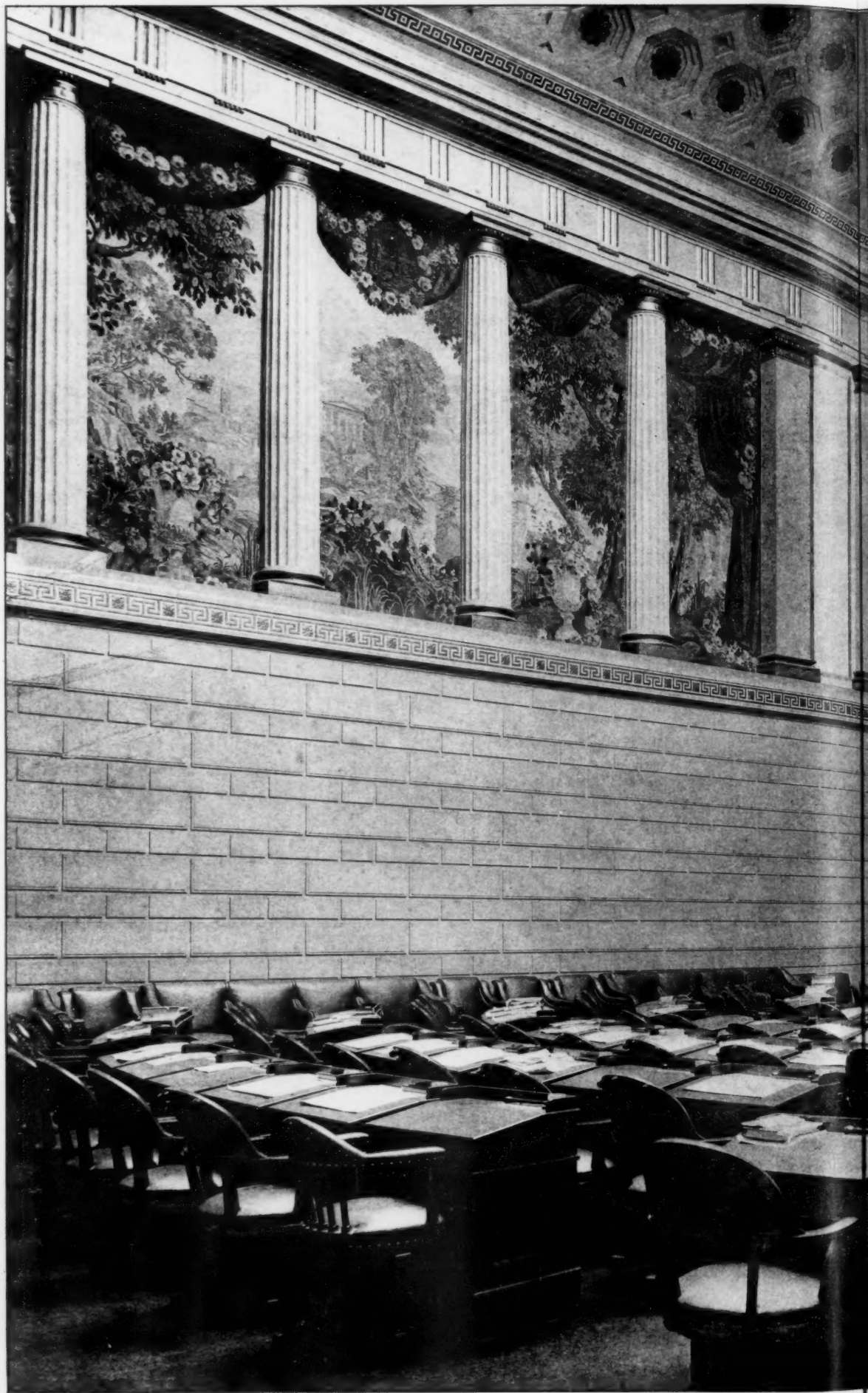


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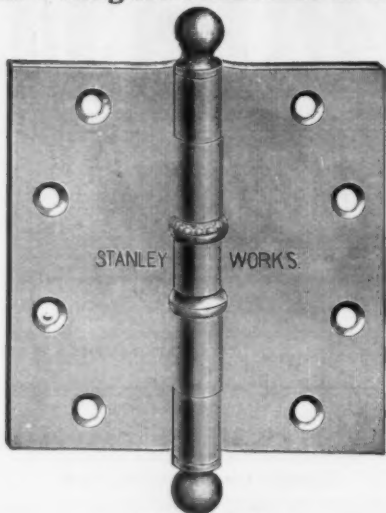
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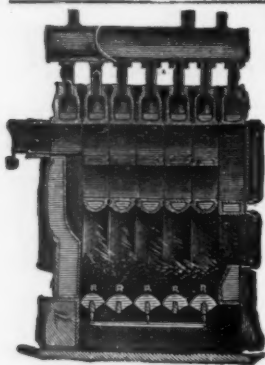
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CODE OF PRACTICE FOR SUB-ESTIMATING AND SUB-CONTRACTING

Adopted by the Master Builders' Association of the City of Boston, Aug. 2, 1894.

ARTICLE I.

Obligation of Principal Contractor to Sub-Contractor.

A principal contractor is under obligation to treat upon an equal basis all estimates which he "receives" prior to putting in his own bid. Estimates must be considered as "received" when they come into a principal contractor's possession, either by his direct solicitation or by being accepted by him. The opening of a bid, knowing it to be such, constitutes receipt of the same.

A principal contractor is under no obligation to use a bid which he has not solicited, accepted, or received, but if he does not wish to use the estimate of a sub-bidder he should decline it, if proffered personally, or should return it unopened if sent to him by mail or otherwise. The retention of a bid should be construed as a receipt of the same.

A principal contractor, when making up his estimate, is not entitled to receive bids from sub-contractors if he is at the same time making himself their competitor by figuring their portion of the contemplated work. It is legitimate for a principal contractor to figure all portions of work, depending upon no one for what are usually known as sub-estimates, but it is not legitimate for him to receive bids from others for sub-work if he is himself figuring those portions independently.

ARTICLE II.

Award of Sub-Contracts.

The principal contractor having been awarded a general contract should immediately award the sub-contracts to the lowest bidder in each branch.

ARTICLE III.

Penalty for not Awarding Contract to Lowest Sub-Bidder.

A principal contractor failing to award a sub-contract to the lowest sub-bidder to whom he is under obligation as previously provided should be liable to pay damages to the said lowest bidder, in amount not less than ten per cent of the amount of the estimate.

Payment of such damages will not relieve the principal contractor from liability to discipline under provisions of Article X of the By-Laws of this Association.

ARTICLE V.

Payments to Sub-Contractors.

Unless the contracts made with sub-contractors otherwise provide, payments during the progress of the work should be made by the principal contractor to the sub-contractors upon the same basis of payment, in relation to amount of work performed, as is prescribed in the contract made by the principal contractor with the owner.

Final payment to a sub-contractor should be considered as due at the expiration of thirty days after the completion of his work and its approval by the architect or owner, unless otherwise provided by the sub-contract or agreement.

ARTICLE VII.

Obligation of Sub-Contractor to Principal Contractor.

Should a sub-contractor refuse to contract at the amount of the estimate he has given to a principal contractor who has used the said estimate in good faith, he then should be liable to the said principal contractor for damages in amount not less than the difference between the amount of the estimate which was submitted by him and the amount at which the principal contractor may be obliged to contract the work.

Payment of such damages will not relieve the sub-contractor from liability to discipline under provisions of Article X of the By-Laws of this Association.

ARTICLE X.

Bids to Architects or Owners.

When bids for separate departments of work on a building are solicited by the architect or the owner, they should be submitted with the understanding that they are direct estimates, for which direct contracts are to be made by the owner with the lowest bidder, and no other disposition of such bids should be permitted without consent of the bidder submitting the same.

Sub-bids should be given only to the principal contractors who are estimating the work in question, and should not be left with architects or owners for the inspection and information of principal contractors. Sub-contractors must understand that bids thus left with architects or owners are in great danger of losing their confidential character, and that if they so leave them they cannot claim protection or redress under the first article of this Code.

SUGGESTIONS.

Members of this Association having sub-contracts to let, or material to buy, should, as far as may be consistent with business principles, deal only with members of the Association, or at all events give their fellow-members an opportunity to compete, and then give them the preference, other things being equal.

All bidders should take cognizance of the danger they may be subjected to through the practice, so prevalent in some architects' offices, of making change in plans or specifications, or in both, during the progress of estimating. Correction of this pernicious practice can only be obtained through refusal by contractors to estimate under such conditions.

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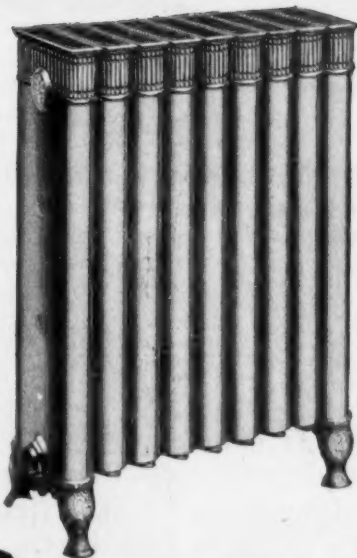
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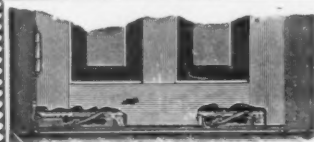
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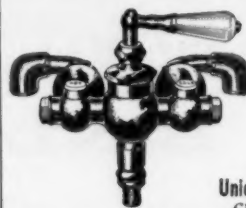
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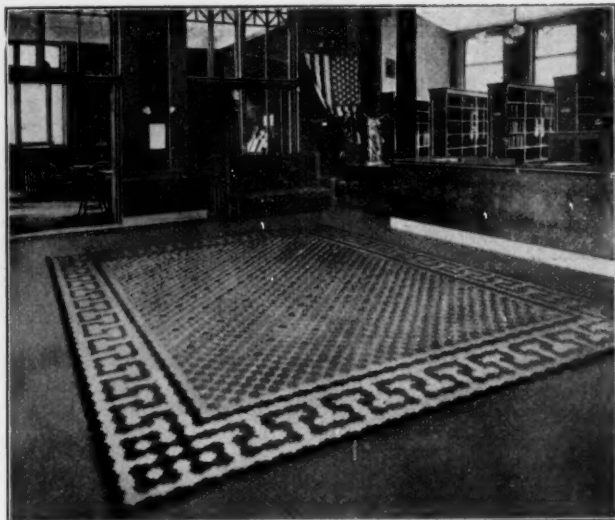
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

block bounded by 41st and 42d Sts., Broadway and 7th Ave. The deal would mean the razing of the hotel Metropole at the 42d St. corner.

The City Real Estate Co. has acquired a large plot of land at Nos. 225 to 241 W. 34th St. There is a rumor that Col. John Jacob Astor is the real owner of the property, or that he is the City Real Estate Company's prospective buyer. It is admitted by officers of the company that the plot is intended for an important improvement, possibly a hotel.

Plans have been filed with the Building Bureau for a new laboratory building and dormitory for Willard Parker Hospital, to be erected on 16th St., east of Avenue C. It is to be of six stories with a basement, 42' x 81', and is to cost \$100,000.

A new hotel is to be erected by L. G. Forgotson at Nos. 4, 6 and 8 E. 28th St. The plans will be by A. N. Allen, the same architect who is planning the adjoining hotel to be erected at Nos. 10 and 12 E. 28th St. and Nos. 11 to 15 E. 27th St. The striking feature of the construction is that Mr. Allen will not only have both hotels of equal height, each being twelve and a half stories high, but will design them to use a joint air court in the centre, and will construct them with the same floor levels. Though each hotel is to be separate and completely equipped, it will be possible to throw them into one structure at any time if it is found desirable to lease them to a single tenant.

Northampton, Mass.—Congress has been asked to appropriate \$42,500 to complete public building here.

North Tarrytown, N. Y.—John D. Rockefeller has decided to build a large country place on the Bedford Road. It will be of brick, spreading over the highest point of the hills overlooking the Hudson River.

Oakland, Cal.—Architects Fuller & Pitcher, of New York, have been engaged to prepare plans for a \$200,000 building for the Young Men's Christian Association.

Oak Park, Ill.—Congress has been asked for \$26,000 to continue work on the post-office building.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Oberlin, O.—The Trustees of Oberlin College have decided to erect the Finney Memorial Chapel. Probable cost, \$356,000.

Omaha, Neb.—Early in the spring will begin the erection of a large Catholic cathedral here. The building, which is to be located at 40th and Burt Sts., will be of the Spanish Renaissance style of architecture and will be built of buff stone. Thos. R. Kimball is drawing the plans. Cost is estimated at \$135,000.

Ottawa, Ont.—A site has been purchased on which to erect the Victoria Natural Museum, for which Parliament recently appropriated \$150,000.

Peshtigo, Wis.—The proposed \$100,000 county asylum will be erected here.

Philadelphia, Pa.—The home for female orphans of Masons, provided for in the codicil in the will of the late William L. Elkins, will be built in spite of the fact that the bequest was made within 30 days of the death of the testator, and hence under the laws of Pennsylvania is inoperative. The heirs agree to make such personal contributions as may be needed to fulfil the bequest.

Ballinger & Perrot have drawn plans for a two-story dispensary building at the Methodist Hospital, Broad and Wolf Sts.

Pittsburgh, Pa.—The first contract for the new Carnegie Institute was let recently. It is for the excavation, the footing courses and the foundation for the steel piers of the extension, and stipulates that the work must be completed by February 15 next. A. S. Wilson were the lowest bidders and were awarded the contract for \$66,000.

Portland, Me.—A commission has been appointed by the Government to look over the sites for which bids have been received for the establishment of a quarantine station at this port. A recent act of Congress appropriated \$50,000 for new station, land and buildings. This will enable one to be built that will be first class in every way, with all proper buildings, out-houses, wards and offices.

Providence, R. I.—From a large number of bids

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

for the construction of the proposed eight-story Lapham brick business block on Westminster and Mathewson Sts., adjoining the property of Tilden-Thurber Co. Hartwell, Williams & Kingston have been awarded the contract. Hoppin & Ely are the architects of the building, which will be an imposing business structure with 40 feet frontage on Westminster St. and 45 feet frontage on Mathewson St. The buildings now located upon the site of the proposed new one are being vacated and will be torn down, the work to commence immediately, after which the work upon the new building will be started in hope of having it completed by the first of next September.

Congress has been asked to appropriate \$100,000 to complete public building here.

Quincy, Ill.—It is reported that the Business Men's Association will soon construct a coliseum.

Racine, Wis.—The corner-stone of the new German Baptist Church was laid a short time ago with an impressive ceremony. The church is to cost \$15,000 and takes the place of one sold to the Case Threshing Machine Co.

Rankin, Pa.—The Italian Congregation of St. Mary of Caremalo's R. C. Church has purchased a site on Holland and Swissvale Aves. and will erect an edifice in the spring costing \$25,000.

Richmond, Va.—The contract for the erection of the proposed office-building of the Mutual Assurance Society of Virginia at the southeast corner of 9th and Main Sts. will not be awarded until a meeting to be held January 15. The structure is to be nine stories on the Main Street front and ten stories at the alley end. It will have a frontage on Main St. of 100 feet, and will be one of the most imposing structures in the South.

J. T. Wilson & Co. have received the contract for the erection of the new nine-story Mutual Assurance Society building, which will be erected at the southeast corner of 9th and Main Sts. Former estimates place the cost at about \$350,000, but the figures are now said to be in the neighborhood of \$700,000.



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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Riverhead, L. I., N. Y.—M. E. Montgomery has sold 38,000 feet of land here to G. F. Raymond. The price paid was \$10,000. The purchaser will improve by building a cottage.

Rock Island, Ill.—The Board of Directors of the Modern Woodmen has awarded the contract for the erection of the addition to the head office to John Volk & Co., of Rock Island. The building is to be completed by July 1 of next year and is to be erected at a cost of \$114,480.

Salt Lake City, Utah.—The Westminster Presbyterian Church of this city has purchased a vacant lot at 1st S. and 1st W. Sts. On the site a church building will be erected at a cost of \$30,000. Plans for its construction are being prepared and will be submitted by the architects in a few days to the building committee. It is announced that the building will be completed and occupied within a year.

San Diego, Cal.—Governor Pardee has approved plans and specifications for erecting a wing to the State Normal School. The cost is reported to be \$50,000.

San Francisco, Cal.—The Dominican Sisters will soon erect a school-house at the corner of Pierce and Pine Sts. The architect's plans have already been accepted and the building, which will be four stories high, will cost about \$100,000.

It is reported that Albert Farr and Geo. E. McCrea, of this city, have completed plans for a six-story hotel to be erected on Stockton and Pine Sts., by Herbert E. Law. Cost, \$1,000,000.

Santa Monica, Cal.—The Continental Construction Co., of Los Angeles, has the contract to erect here the Carnegie Library building. The lot is at the corner of 5th and Oregon Sts. The building will be one story, of white brick, and in the Corinthian style.

Savannah, Ga.—It is said that the Masonic Temple Association will build a Masonic Temple on Charlton and Bull Sts.

Scranton, Pa.—It is said that the Directors of the Lackawanna Hospital are having plans prepared by E. W. Langley, Cornell Building, for a four-story brick fireproof addition to the hospital, to cost \$100,000.

Seattle, Wash.—The Mutual Life Insurance Co., of New York, will put up a new building immediately adjoining the structure now owned by that company at the corner of 1st Ave. and Yesler Way. The new building is to be erected on Yesler Way, and when completed the rear walls of the present building will be cut through and the two structures joined to make one building. It will be six stories high, fireproof, costing \$100,000.

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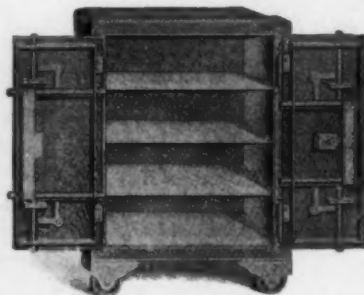
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

carried out, the plant there will consist of 70 pot mills, giving employment to nearly 6,000 hands. The present plant consists of 20 mills, and 50 more are to be added.

Sneyten Duvvill, N. Y.—A site has been purchased here for the union station which will be used with the rapid transit subway. Properties bought include the T. W. Thorne, Rodgers, Farin and Hugh Camp tracts around here.

St. Clare, Neb.—A building permit has been taken out by the Franciscan Monastery of St. Clare for the erection of a two-story brick convent and church at 29th and Hamilton. It is to be 120' x 165' and the cost is estimated at \$30,000.

St. Joseph, Mo.—Plans for the new federal building are expected here by December. Bids will be sent to Washington, in all probability, by December 15th. The furnishings will be most elaborate, and the cost to the government close to \$200,000.

St. Louis, Mo.—Members of the Missouri Grand Lodge of the Negro Knights of Pythias have decided to erect a building here to cost \$50,000.

The proposed building for St. Ann's Foundling Asylum will be erected at the northwest corner of Page Ave. and Union Boulevard upon a piece of property which the Sisters of Charity have owned for many years. The total cost of the building will be about \$300,000, and it will be one of the largest institutions of its kind in the United States. The plans for the new building have been drawn by Barnett, Hay & Barnett, architects.

Toronto, Ont.—The plans for the twelve-story office building, opposite the King Edward Hotel, on King St., have been prepared. The architect, Mr. E. J. Lennox, says that tenders will probably be asked for in January.

Torrington, Conn.—Congress has been asked to appropriate \$22,500 to complete public building here.

Utica, N. Y.—The bids received by the Utica Court-house Commission for the erection of the building planned show that the structure will cost nearly a million dollars. The lowest bid for the bare building was \$746,321. It may be that changes in the plans and revised bids will reduce this figure somewhat.

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Warrensburg, Mo.—The contract for erecting the State Normal School has been awarded to Moore Bros., of Kansas City, for \$47,400.

Washington, D. C.—Plans for the construction of three laboratory buildings for the Department of Agriculture, at a maximum cost of \$1,500,000, have been approved by the Secretary of Agriculture. The actual operations will begin soon. These structures form part of the general scheme of ten new buildings for the department.

Plans have been prepared for a six-story Y. M. C. A. building to be erected on 18th and G Sts., at a cost of about \$300,000.

Waterbury, Conn.—Congress has been asked to appropriate \$56,250 to complete public building here.

York, Pa.—Hamme & Leber are stated to have prepared plans for the school to be erected in the 10th Ward. Approximate cost, \$45,000.

Youngstown, O.—The residences of Mrs. J. M. Bonnell and W. Scott Bonnell, located at the corner of Wick and Rayen Aves., may be removed and the sites, combined, used as the site for a new county court-house.

Congress has been asked to appropriate \$150,000 for an addition to the post-office building.

APARTMENT-HOUSES.

Chicago, Ill.—Clark St., No. 134, three-story bk. apart., 75' x 100', steam; \$85,000; o. Frank G. Gustafson; a. A. Sandgren, 134 Clark St.

PROPOSALS.

Treasury Department, Office of the Supervising Architect, Washington, D. C., December 12, 1903. Sealed proposals will be received at this office until 3 o'clock P. M. on the 25th day of January, 1904, and then opened, for the construction (except heating apparatus, electric conduits and wiring), of the U. S. Post-office and Court-house at Athens, Ga., in accordance with the drawings and specification, copies of which may be had at this office, or at the office of the Postmaster at Athens, Georgia, at the discretion of the Supervising Architect. **JAMES KNOX TAYLOR, Supervising Architect.**

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PROPOSALS.

COURT-HOUSE.

[At Camden, N. J.]

Office of the Camden County Building Committee Court-house, Camden, N. J., December 15, 1903. Sealed proposals will be received at the office of the Camden County Building Committee until 2 o'clock P. M., on Monday, the 1st day of February, 1904, and then opened, for the general construction (except heating apparatus, elevators and electric wiring and conduits) of the Camden County Court-house, at Camden, N. J., in accordance with the drawings and specifications, copies of which may be had on and after December 18, 1903, by application at the office of the architects, Rankin, Kellogg & Crane, 1012 Walnut St., Philadelphia, Pa. All applications must be accompanied by a certified check, in amount \$125, which will be held by the architects until return of the drawings and specifications, upon receipt of which the amount of certified check will be returned less the sum of \$15, which will be retained as a charge to cover cost of duplication and printing. Copies of the drawings and specifications may be seen also in the present Court-house, Camden, N. J. Camden County Building Committee, IRVING BUCKLE, Chairman. 1461

LABORATORY.

[At New York, N. Y.]

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until January 5, 1904, for the construction of a laboratory on the grounds of the U. S. Naval Hospital, New York, N. Y. Plans can be obtained upon application to the architect, Mr. Ernest Flagg, 35 Wall St., New York, N. Y., and specifications upon application to the naval laboratory, Brooklyn, N. Y., or the bureau of supplies and accounts, Navy Department, Washington, D. C. Blank proposals will be furnished upon application to the navy pay office, New York, N. Y. H. T. B. HARRIS, paym. gen. U. S. N. 1460

SEWERS, CAST-IRON PIPE, HYDRANTS AND VALVES.

[At New Orleans, La.]

Office of the Sewerage and Water Board, 602 Carondelet St., New Orleans, La. Sealed proposals will be received until February 2, 1904, for the construction of approximately 60 miles of sewers and appurtenances and the laying of 2.7 miles of water mains. After December 20, 1903, specifications, general plans and blank forms of proposals may be obtained at the office of the Board, and plans and specifications can also be seen at the office of Hering & Fuller, Consulting Engineers, 170 Broadway, New York. F. S. SHIELDS, Secretary. GEO. G. EARL, General Superintendent. 1460

PITCH HOUSE.

[At League Island, Pa.]

Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until January 9, 1904, for constructing a brick building at the Navy Yard, League Island, Pa. Funds available \$3,300. Plans and specifications can be seen at the Bureau or will be furnished by the Commandant of the navy yard named. MORDECAI T. ENDICOTT, Chief of Bureau. 1461

PROPOSALS.

Treasury Department, Office Supervising Architect, Washington, D. C., December 11, 1903. Notice is hereby given that the time for opening the bids for the construction (except heating apparatus) of the U. S. Post-office and Court-house at Harrison, Arkansas, has been extended from January 7, 1904, to January 21, 1904. JAMES KNOX TAYLOR, Supervising Architect. 1461

CEMENT.

[At Globe, A. T.]

Department of the Interior, Washington, D. C. Sealed proposals will be received at the department until January 4, 1904, for furnishing 1,000 barrels, or more, of first-class Portland cement, delivered at Globe, A. T. Bidders will also state price at which they will furnish one carload only of such cement. Specifications may be obtained upon application to Arthur P. Davis, supervising engineer, Phoenix, A. T. E. A. HITCHCOCK, Secretary. 1460

PROPOSALS.

HEATING.

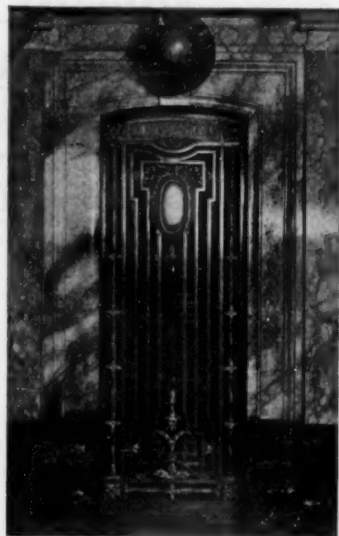
[At Washington Barracks, D. C.]

U. S. Engineer Office, Washington Barracks, D. C. Sealed proposals will be received here until December 26, 1903, for steam heating plant at Washington Barracks, D. C. Information on application. JOHN STEPHEN SEWELL, capt., engr. 1460

CITY-HALL.

[At Savannah, Ga.]

Sealed bids will be received until January 14, 1904, for the erection of a city-hall for the City of Savannah, Ga., according to plans and specifications prepared by H. W. Witcover, architect, Savannah, Ga. Bid to be accompanied by certified check for 3% of amount of bid. Copies of plans and specifications may be obtained upon application to the architect, and a deposit of twenty-five (\$25) dollars, which deposit to be returned to the bidder upon return of the plans and specifications. HERMAN MYERS, Mayor. 1460



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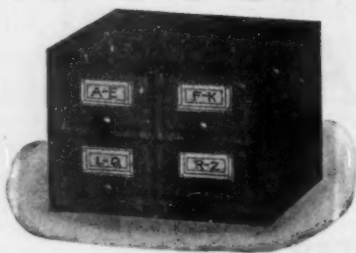
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Professional Ethics.

The following . . .

. . . CODE OF ETHICS . . .

Prepared in Conformity with the
Best Standards of Practice, and
Recommended to its Members by
the Boston Society of Architects,
was . . .

ADOPTED BY THE SOCIETY, FEBRUARY 1,
. . . 1895. . .

SECTION 1. No Member should enter into
partnership, in any form or degree, with any
builder, contractor, or manufacturer.

SECTION 2. A Member having any ownership
in any building material, device or invention,
proposed to be used on work for which he is
architect, should inform his employer of the
fact of such ownership.

SECTION 3. No Member should be a party to
a building contract except as "owner."

SECTION 4. No Member should guarantee an
estimate or contract by personal bond.

SECTION 5. It is unprofessional to offer draw-
ings or other services "on approval" and
without adequate pecuniary compensation.

SECTION 6. It is unprofessional to advertise in
any other way than by a notice giving name,
address, profession, and office hours, and
special branch (if such) of practice.

SECTION 7. It is unprofessional to make altera-
tions of a building designed by another archi-
tect, within ten years of its completion,
without ascertaining that the owner refuses
to employ the original designer, or, in event
of the property having changed hands, with-
out due notice to the said designer.

SECTION 8. It is unprofessional to attempt
to supplant an architect after definite steps
have been taken toward his employment.

SECTION 9. It is unprofessional for a Member
to criticize in the public prints the professional
conduct or work of another architect except
over his own name or under the authority of
a professional journal.

SECTION 10. It is unprofessional to furnish de-
signs in competition for private work or for
public work, unless for proper compensation,
and unless a competent professional adviser
is employed to draw up the "conditions" and
assist in the award.

SECTION 11. No Member should submit draw-
ings except as an original contributor in any
duly instituted competition, or attempt to
secure any work for which such a competition
remains undecided.

SECTION 12. The American Institute of Archi-
tects' "schedule of charges" represents mini-
mum rates for full, faithful and competent
service. It is the duty of every architect to
charge higher rates whenever the demand for
his services will justify the increase, rather
than to accept work to which he cannot give
proper personal attention.

SECTION 13. No Member shall compete in
amount of commission, or offer to work for
less than another, in order to secure the work.

SECTION 14. It is unprofessional to enter into
competition with or to consult with an archi-
tect who has been dishonorably expelled from
the "Institute" or "Society."

SECTION 15. The assumption of the title of
"Architect" should be held to mean that the
bearer has the professional knowledge and
natural ability needed for the proper invention,
illustration and supervision of all building
operations which he may undertake.

SECTION 16. A Member should so conduct his
practice as to forward the cause of profes-
sional education and render all possible help
to juniors, draughtsmen and students.

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