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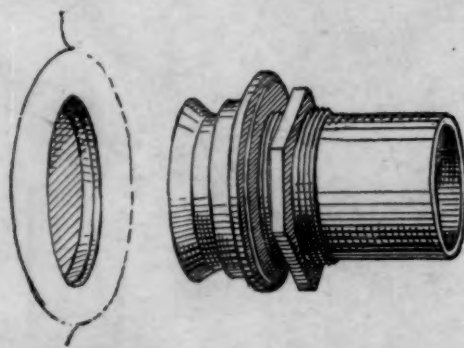
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JANUARY 25, 1890.



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EVERY one will be sorry to hear that Mr. Ruskin is now suffering from what is probably his last illness. It is some years since transient symptoms of disease of the brain made it necessary for him to give up a part of his work, and similar symptoms have from time to time recurred, with increasing violence. Now, however, as foreign advices inform us, a severe attack, not, perhaps, so acute as some of the previous ones, but acting on a body already enfeebled by the progress of the disease, has completely prostrated him, and his physicians can give no hope of his recovery. Erratic as his later course has been, Mr. Ruskin must always be regarded as one of the greatest, we are inclined to say, the greatest man of his time. It has been the fashion for several years past to decry him, to laugh at his political economy, and to speak of his influence as having vanished, but this does not alter the fact that forty years ago he was the intellectual leader of England, and of a large part of the population of this country. Through him was opened a way of thinking, not about painting and architecture merely, but about human duties and responsibility, which has left an ineffaceable impression on the English-speaking world; and few reading-men of middle age can forget the noble thoughts and purposes with which Mr. Ruskin's works inspired them in their youth. We should be glad, as a tribute to the greatness of one of the noblest souls that ever lived and suffered on this earth, if some of our younger readers would try for themselves the quality of the teacher who is now passing away from them. Let them read, if they can get it, the "*Two Paths*"; or, if this is not available, the "*King of the Golden River*," or the "*Ethics of the Dust*," followed by the "*Lamp of Memory*," in the "*Seven Lamps*," and as much of the "*Stones of Venice*" as they have time for, and all of the "*Modern Painters*" that they can understand. We do not say that they will find the safest architectural criticism in these books, but they will get a lesson in pure and noble morality that will last them the rest of their lives. Then, if they wish for something less inspiring, perhaps, but thoroughly practical, let them get the "*Elements of Drawing*" and "*Aratra Pentelici*," and keep them where they can look at them and practise from them constantly.

THE *Spectator*, which may be supposed to reflect the sentiments of insurance men pretty accurately, has something to say about the relations of underwriters to building which curiously, though unintentionally, confirms what we have often maintained, that if underwriters chose, they could revolutionize the present system of building; and that the main reason why they do not do so is that the companies are afraid of losing city customers if they show themselves strict in adapting rates to actual risk, and they consequently wink at cheap and dangerous methods of construction, and protect themselves against the almost certain losses which these will cause them by charging unreasonably high rates upon good risks. For these reasons we think, as do a good many other people, that the present practice of underwriting encourages bad building; and when the insurance magnates, after a serious fire, declaim against architects, as being persons devoid of skill or conscience in the construction of buildings, the latter are quite justified in calling attention to the hypocrisy and injustice which extol the man who builds solidly, and condemn him who erects fire-traps, at the same time that they demand enormous premium rates from the former, for the avowed purpose of being able to sell a policy to the latter for a price which, as they confess, does not pay for the risk. "There is no particular reason," the *Spectator* says, "why underwriters should assume all these duties [of seeing that new buildings are well constructed, and so on] any more than any other class of citizens, but when nobody else is found upon whom to shoulder the responsibility, the tendency is to shove it on to the underwriters." "As a matter of fact," it continues, "they are not interested in building construction, in fire-protection or fire-prevention to any greater extent than are other property-owners. *It is their business to insure property as they find it, and at rates proportionate to the hazards to which it is exposed.*" We italicize this last clause, which contains the whole matter in a nutshell. If the underwriters would do what the *Spectator* here says it is their business to do, construction would be reformed at once, and it is exactly because they do not do this that it is not reformed, and that conscientious policy-holders are openly plundered, to enable the insurance companies to retain the patronage of the reckless cheats who degrade the art of building with their cheap shams, and are supported and abetted by the underwriters in doing so. Three lines below the exposition of what it is "the business of the underwriters" to do, the *Spectator* tells us that they actually do, whatever their business may be. "The trouble is," it informs us, "that they do not charge adequate rates because of the great competition for business existing among them," and, a little farther on, speaking of insurance methods in New York, it says: "As a rule, the companies lose money on the metropolitan business." "They go on paying out more money for the privilege of doing this business than it brings in, and *depending upon the rest of the country to make up the deficiency.*" A more explicit acknowledgment of the fact that the underwriters directly encourage bad building by subsidizing it at the expense of people who build securely, it would be difficult to make, and, as the concern of most persons is with insurance as it is practised, not as it ought to be, we shall continue to believe, until the companies carry out their own alleged maxim of insuring all property "at rates proportionate to the hazards to which it is exposed," that they are the principal agents in promoting the very methods of construction against which they preach so loudly.

THE same paper furnishes us this week with another illustration of the fact that building construction is controlled almost entirely by the insurance companies. Speaking of the Boston fire, it deploras the fact that so few buildings in the Eastern cities are protected by stand-pipes. It describes the stand-pipes which, as it says, are in general use in Chicago, by which a three and one-half inch pipe is attached to the outside of the building, near a vertical row of windows, having a "Siamese" connection at the bottom, to which the hose from an engine can be coupled, and an opening in each story, near the window and on the roof, to which a hose can be attached, and a stream of water thrown from this point directly into the window, without the loss which results from friction, and the dissipation of the stream, where water is thrown from an engine on the ground. It seems to have forgotten that ten years or so ago such stand-pipes were put on nearly all the new buildings

in New York. The insurance companies, or rather, the Underwriters' Association, made a discount from the regular premium rates on buildings and goods where they were used, and, although the reduction was a small one, it amounted to more than the interest on the cost of the equipment of pipes in most cases, and owners of new buildings put them on as a matter-of-course. After this rule had been in force a few years, the Underwriters' Association met, and, among other things, voted to discontinue the reduction from regular rates allowed for stand-pipes; and we venture to say that not a dozen stand-pipes have been put up on buildings in New York since. Nearly all architects, those ignorant and reckless beings who come in for so large a share of underwriters' maledictions, know all about stand-pipes, how they ought to be put up and used, but they know also that the owners of their buildings simply laugh at them when they convey to them warning and suggestions, either inspired by travelling insurance inspectors, or deduced from their own experience, with which a modification of premium rates is not connected.

THE *Engineering and Building Record* gives an account of the arrangement and administration of Messrs. Burnham & Root's great office in Chicago, which is not only interesting, but contains some very valuable hints for all architects. Reference should be made for full particulars and for a plan of the office to the article itself, which appears in the issue of the *Engineering and Building Record* for January 11, but it may be permitted us to comment upon some points. As with most architects who carry on a large business, the arrangement of the office is such as to subdivide the space into a number of compartments, nine in this case, each of which is occupied by two or more draughtsmen, as the case may be, who are thus isolated to a certain extent from the others, and from the bustle and traffic of the main office, experience showing that more and better work is done in this way in a given space of time than under the old system of having all the work done in one large room. Besides the compartments for draughtsmen, each partner has his private room, and there are separate apartments for the chief engineer, the book-keepers, the superintendent and the librarian; the library forming also the public reception-room. There are also several storage-vaults, a stock-room with table for cutting paper, a contractors' reception-room, a printing-room, a lavatory, with bath-room, and gymnasium. The last is a rather novel appendage to an architect's office, but experience has shown that the men work better and more efficiently if they are encouraged to take recreation in physical exercise during their spare moments. In the same way, the bath-room has been found to be perceptibly beneficial in increasing what we may call the output of the office. With true business prudence, fireproof vaults are provided for all drawings and records, and before the office is closed at night, even the drawings on the boards, as well as every letter or paper relating to the business of the firm, is locked up out of reach of fire or smoke. Next to the partners, the management of the office is in the hands of an official known as the chief engineer, who takes the sketches and instructions from the hands of his principals, and sees to the proper development of them into working-drawings. This gentleman is really a highly-trained engineer, but he is assisted by a consulting engineer, Mr. Strobel, of the Keystone Bridge Company, one of the most skilful constructors in iron in the country, and by a sanitary engineer who spends four days in each week in preparing the drawings and specifications for the drainage, heating and ventilation of the buildings designed in the office. It may be imagined that in an office so large and so systematically arranged, a good deal of space is devoted to book-keeping, and a special room, with desks for head-book-keeper, clerks and type-writers, is provided near the entrance. Besides these, there is a large room for the accommodation of the superintendents and clerks-of-works, who are employed on all large buildings designed by the firm. These clerks-of-works, although paid by their clients, are appointed by the firm, and are usually skilled engineers, who have had positions in the office. Besides the clerks-of-works, however, the firm itself employs a large force of superintendents, who travel from Maine to California in the firm's interest, reporting regularly to the chief engineer and sending photographs of buildings in various stages of erection. Large as is the force employed, the draughtsmen sometimes numbering sixty, in addition to the host of clerks, book-keepers and superintendents, a great deal of labor, particularly of cheap draughtsmen and

tracing-boys, is saved by a most admirable invention of the present chief engineer, Mr. Ewen. Finding that the cost of making tracings was, in the aggregate, very large, and that the work of the tracing-clerks needed a great deal of supervision to prevent disastrous mistakes, Mr. Ewen utilized the blue-printing room attached to the office for setting up an enormous hektograph apparatus, capable of taking in a large drawing. He then had colors prepared with aniline, in such a way that all the coloring and inking-in, lettering and figuring of the drawings could be done with them, and now all the drawings intended to be duplicated, which, of course, includes nearly all the drawings made in the office, are inked-in, figured and colored with the aniline pigments, and are then transferred to the hektograph slab, and as many copies as may be needed are taken off, all in the exact colors of the original, and reproducing every line, dot and shade. The value of this ingenious invention to architects engaged in important work can be best appreciated by those who have had most experience of the stupidity and carelessness of tracing-boys, and who have had to foot the bills incurred through their mistakes. It may be imagined that an office like this is not carried on for nothing, notwithstanding the elimination of the costly and unsatisfactory tracing-clerks. We have been told that Messrs. Burnham and Root pay their chief engineer a salary of six thousand dollars a year, and as it is their uniform policy to employ only the best assistance, no matter what it costs, their expenses, when the office is full, are probably at the rate of more than a hundred thousand dollars a year.

A VERY novel device has just been put in operation in the cars of the District Underground Railway in London. The line runs mostly underground, and the cars are dark and cheerless by day as well as by night. In this country they would be made so bright and cheerful as to invite instead of repelling passengers, but such things are managed differently abroad, especially where there is no competition. However, in railway matters, what is one company's neglect is another company's opportunity, and a scheme has been perfected by which a box, open in front, is placed behind each passenger's head. The box is provided with a slot, and, on dropping a penny into this slot, a bright light immediately issues from the box, in a convenient position for illuminating a newspaper held in the passenger's hands, and continues to shine for a quarter of an hour. At the expiration of that period it is extinguished, but can be immediately relighted for another quarter of an hour by dropping another penny into the slot. As the light is placed far back in the box, it will shine only on the newspaper of the person who pays for it, and, as the District trains are usually crowded at all hours of the day, with twenty-four passengers in each car, all, probably, interested in newspapers, the income of the company owning the light-boxes must be very considerable. The mechanism of the boxes is tolerably complicated; besides the apparatus for switching on the electric-light on the dropping of the penny, each box contains clockwork, which is set in motion as the penny drops, runs for fifteen minutes, and then switches off the current, and, as this may be repeated forty times a day, the duty of winding up all the boxes must be a heavy one.

FOR the Achille Leclère prize this year in Paris, the programme announced is a rather startling one, the competitors having, as Mr. Pecksniff would say, to exhibit their "ideas" of an arena for bull-fights. What Mr. Henry Bergh would have said to such a barefaced attempt to corrupt the minds of young architects by inducing them to fix their imagination on so horrible a topic, we cannot imagine, but Paris seems to have, as yet, no zealous defender of the feelings of brutes, and the programme, with all its shocking details, has been published without protest. The structure is to be situated "not far from the fashionable quarter," and is to be furnished with all the paraphernalia of the bull-ring, including the wooden fence over which the picadors vault when the bull gets too near them, boxes for the "authorities," "bars and buffets" and so on; and among the "dépendances" are to be stalls for ten bulls, and accommodations for thirty horses, including boxes for wounded animals. In addition to all these comforts for the quadrupeds, a peculiarly Parisian one is specified for the bipeds, in the shape of a foyer, where "the privileged public" can have the inestimable happiness of conversing with the matadors and stable-men.

CIVIL AND DOMESTIC ARCHITECTURE.¹—III.

Fig. 12. Hôtel de Ville at Saint-Antonin.

The stage, on the contrary, was enlarged. As for the seats, they were not cut in the flank of a hill, but were supported on vaulted substructures; the vaults formed galleries and passages. The exterior of the theatres showed one or several series of

arches, with pilasters or columns, and surmounted by an attic story. Remains of theatres are found wherever Roman civilization pushed its way.

The Romans, however, took still more pleasure in chariot-races and horse-races than in theatrical performances. These races were the predominant sports of the circuses, though combats of gladiators and of wild beasts were joined to them. The Circus Maximus, which occupied the space between the Aventine and Palatine hills, was at first laid out in a very elementary fashion, but it was completely remodelled in the time of Caesar and under the emperors.

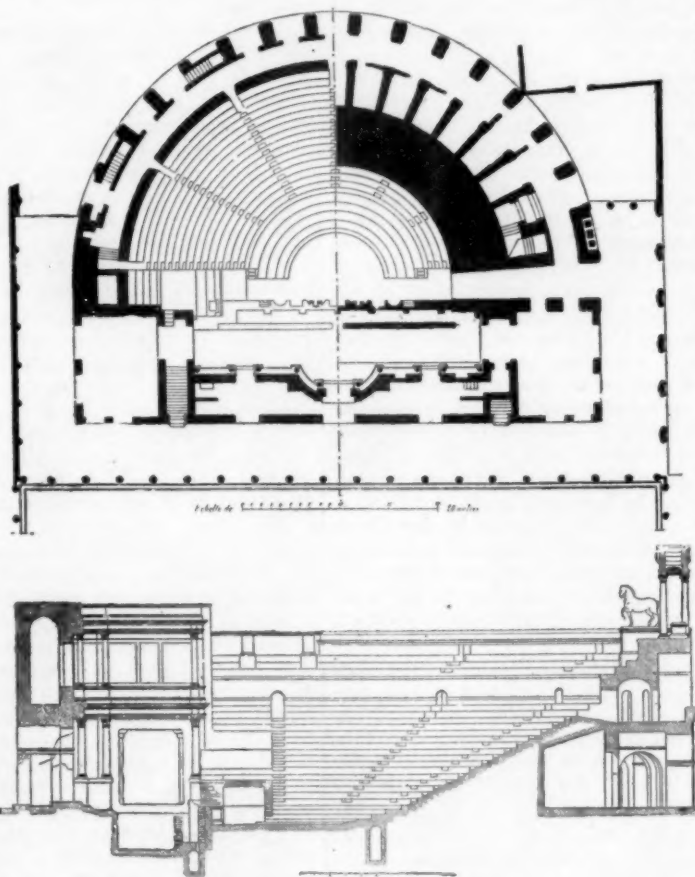
There were about fifteen of these constructions at Rome and in the vicinity. They were in the form of an oblong parallelogram, terminating at one extremity in a semi-circle, and at the other in an oblique and slightly concave building, in which, on the ground-floor, were the chariot-houses, and above these the galleries of honor and the musicians' stand. The arena, which was marked off by a canal filled with water, was divided through its longest axis into two sections by a broad wall (*spina*), raised breast-high, and terminating at each end by three goals called *metae*.

Around the arena there were seats supported on porticos.

The amphitheatres were more especially designed for the combats of gladiators and of wild beasts. They comprised two principal parts, the arena and the spectators' seats, which were

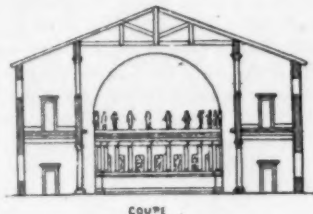
THE Romans were likewise fond of theatrical representations. These were at first simple dances, but they were later transformed into mimes and comedies. They formed a part of all festivals, and were primitively enacted on movable stages. It was Pompey who founded the first stone theatre at Rome.

The Roman theatre, like the Greek, included semi-circular rows of seats for the spectators, an orchestra and a stage. But as theatrical performances at Rome did not, as in Greece, possess a religious character, there was no call for the altar to Bacchus nor for the space around the altar reserved for the execution of the sacred hymn. The orchestra became, therefore, merely a section appropriated to the aristocracy.



Figs. 8 and 9. Plan and Section of the Theatre of Herculaneum.

ranged in retreating rows one above the other. The wild beasts were kept under the lower line of seats, around the arena. The Romans took great pleasure in these bloody contests which became, as it were, a State institution. They erected great numbers of amphitheatres in the provinces, as well as in Rome. The largest of all these was the Colosseum of Rome, a remarkable structure of elliptical form, which could



COUPE



PLAN

Figs. 10 and 11. Section and Plan of a Roman Basilica.

never have been built except under an architectural system like that of the Romans. They displayed an extraordinary degree of skill and practical sense in the execution of this stupendous work.

We must not infer, however, that games had from earliest times occupied the highest place in the thoughts of the Roman people. The forums, or public squares, where this same people assemble as the Greeks assembled in the agora, for their elections and for the discussion of State affairs, prove the contrary. Sometimes the forum was enclosed by long porticos and rows of shops, sometimes it was surrounded by temples, basilicas and triumphal arches; prisons and the curia were also found there. All the public life centred in these squares, which were generally quite limited in area, and which served at the same time as markets, assembling places and places where justice was dispensed.

All these matters were for a long time treated in the open air. Cato (185 B. C.) was the first to conceive the idea of erecting a structure in the forum which should be open to every one. This was the origin of the basilica, which was at once a court-house and a stock-exchange. There were eighteen basilicas at Rome.

Later, the primitive Christians modelled their churches after the plan of the basilica. It was very simple in design, being merely a large rectangular hall divided in its longest direction by two rows of pillars, thus forming three naves. At

the extremity of the central nave, which was broader than the other two, the wall curved in a hemicycle. It was in this recess that the sittings of the court were held (Figs. 10, 11).

We have spoken of the triumphal arches which were erected in the forums. The Romans were the first, except perhaps the Chinese, to rear monuments of this kind. When a victorious general made his entry into Rome at the head of the triumphal procession, the wildest enthusiasm must have prevailed among the people. All along the route which he was to traverse in order to reach the Capitol, leafy bowers were raised, with

¹ From the French of G. Guicestre, in "Encyclopédie de l'Architecture et de la Construction." Continued from No. 734, page 37.

garlands and streamers. These temporary decorations were long the only ones in use in the celebration of victories. In time it became the custom to honor the conqueror by setting up at the entrance to the cities huge wooden gates adorned with the trophies and spoils of conquest. Finally, under the Empire, stone, marble and bronze began to take the place of wood in these constructions. The simplest triumphal arches consisted of a single opening, the arch being semicircular [the Arch of Titus at Rome, the Arch of Saint Remy in France]. There were others with two arches [those of Verona, Langres and Saintes]. Others still were made with three openings, the two lateral ones being usually smaller than the central one [Arch of Constantine, Arch at Orange]. The arches were accompanied by columns raised on pedestals and surmounted by an attic. Wherever the Romans penetrated, these structures, reared in memory of their conquests, are to be found.

They made use of isolated columns to commemorate remarkable events, to mark important spots, and to honor their distinguished men. The column of Duilius at Rome, the oldest one of the kind, was erected after the first naval triumph over the Carthaginians (260 B. C.). The shaft was decorated with beaks of ships. Under Augustus columns were also reared to celebrate the victory won at Actium. But the most beautiful and the best known example of these monuments is that raised in honor of Trajan's defeat of the Dacians.

We will pass over the Roman tombs, monuments designed to perpetuate the memory of the dead. Enough has already been said to show the extent and variety of Roman architecture. The political organization of this eminently practical people was such that they attached especial importance to works which the more art-loving Greeks had neglected. Roman civil architecture, which always bore the imprint of grandeur, invariably responded to the utilitarian demands of the times.

In the East, after the transfer of the seat of the Empire to Byzantium, the erection of civil edifices continued as before. The emperor Constantine was anxious that the new capital should rival Rome in grandeur and magnificence. Great roads were constructed; palaces, triumphal arches and public baths sprang up on all sides; a forum was laid out; porticos, a circus and a hippodrome were built. Though different forms were introduced, the essential features of the structures did not differ from those of the Romans. The fresh impulse given to architectural activity by Constantine was strengthened by his successors, especially by Justinian, who sprinkled the cities of the Empire with monuments of all kinds. With the eleventh century, however, there came a decline. Already Roman rule in the East was threatened with ruin. The successive hostile invasions to which it was subjected, necessarily led to a neglect of the arts. At length, in 1453, Mohammed II entered Constantinople and established there the throne of the Ottoman Empire. Mussulman architecture then superseded the Byzantine.

The Mussulmans had already bestowed much attention on certain structures which are to be found to-day, by the side of the mosques and minarets, in all countries subjected to Islamite rule; whether these people be Africans or Hindoos, Persians, Arabs or Turks, these buildings have to minister to the same religious needs, and to meet the demands of domestic, commercial and public life.

These are, first, bathing-establishments, in the construction of which the general arrangement of the ancient *thermae* was preserved; then fountains (*sebil*) and public watering-places (*hod*), built on a semi-circular or polygonal design, with a dome-shaped covering. Usually these have an upper story, where a primary school is kept: the colleges were largely attached to religious edifices. Cisterns, too, are of great importance in Moslem towns; the vault of the subterranean portion almost always rests on a large number of columns. Then there are hospitals, the rooms of which are disposed around a court adorned with porticos and *okels*, or immense constructions designed for commercial purposes. These, as is the case with most public edifices in Asia, exhibit a vast court encircled by porticos; in the rear of the columns are the vaulted store-houses and the shops, the latter surmounted by a pent-house. The story above contains rooms with balconies, the apartments where the merchants sleep. A fountain and a small oratory occupy the centre of the court. There are also caravansaries, or *khans*, a species of inn situated either within the cities or along the great caravan routes. Their general design differs but little from that adopted for the hospitals and *okels*: there is invariably a court surrounded by halls.

The Mussulmans' houses consist of two distinct parts, each part built around a court, as in the Roman and Greek houses; the first section, the *selamlık*, is used for the reception of strangers and for guests; the other part, the *harem*, is reserved for the family; in both the apartments are more or less numerous, more or less important, according to the rank and means of the proprietor. The walls are usually covered with colored faience, the floors are paved with marble, and the ceilings are vaulted or flat, with the joists exposed and painted.

The palaces have the same general arrangement, but they are built in a more costly style, with halls surrounded by colonnades and decorated with marble basins, with gilded ceilings and slender galleries, and, connected with them, are gardens, baths, a library, kiosks, aviaries and sparkling fountains.

If, quitting the Orient, we retrace our steps and once more enter ancient Gaul, we shall find that even down to the feudal period the inhabitants made use of the structures raised by the Romans. Before the Roman Conquest, with the exception of religious monuments [Druidic or Celtic stones] which do not concern us, there was nothing but huts and fortified camps in the country. So long as the customs of the conquerors obtained, no essential changes in architectural design were demanded. The private dwellings differed but little from the Roman villas. They were nearly always simple buildings arranged around two courts. It was not until the time of Charlemagne that the seigneurial villa became transformed into a strong castle, and it was only after the great movement of the communes in the eleventh and twelfth centuries that civil edifices began to be erected in the cities. Until that time the only monuments were churches, fortresses and walls of defence.

When the first concessions of public rights were made, the cities built for themselves a common house or town-hall, a *hôtel de ville* in which they could discuss their affairs; a belfry was always included in the design. But these communes experienced so many vicissitudes that there remain but few city-halls of earlier date than the fourteenth century. The only one standing in France belonging to the twelfth century is that of Saint Antonin (Tarn-et-Garonne, Fig. 12.) The cities of the South, like those of the North, of Flanders and Brabant, knew how to guard their franchises, while those included in the domain of the crown were not able to erect any municipal edifice before the fifteenth century.

The town-hall generally stood in the public square. It comprised, on the ground-floor, open porticos, used as public markets, and, above, a large hall, which served as an assembling room; the belfry-tower rose in the centre of the façade. These belfries were at first isolated; they contained the alarm-bells, which announced afar all franchises won. Compiègne, Arras, Béthune, Bergues, Auxerre, Beaume, Évreux and some other French cities still possess their belfries, either isolated structures or an appendage of the town-halls.

Exchanges and markets were also built, as well as great numbers of hospitals. The founding of hospitals dates from the establishment of Christianity. These new institutions introduced architectural needs unknown to the ancients. True, it may be urged that there were annexes to certain temples of *Æsculapius* whose purposes were not unlike those of hospitals; they were designed for the care of the sick and of women in childbirth, but they were of only rare occurrence. It was the Christian sentiment which led to the opening in the East, from the third century, of places of refuge for the sick and for travellers. It was this same sentiment that caused such houses to be attached to the convents during the Middle Ages, and that roused the cities to imitate the clergy. The Hôtel Dieu, at Lyons, goes back to the days of Childebert (542), and the one at Paris was founded by St. Landry about 660. Charlemagne, Philip Augustus, and St. Louis set the example of benevolence; public and private charity followed in their steps; but the inroads of leprosy, a disease brought back from the Crusades, necessitated a considerable increase in the number of hospitals. There were two thousand leprosy hospitals (*léproseries, ladreries or maladreries*) in France under Louis VIII. There were also asylums for the insane and for the indigent and aged; there were lying-in hospitals, and in 1254 St. Louis established an asylum for the blind in Paris, the hospice of *Quinze Vingts*.

The rooms in the hospitals, which were always vaulted, were often divided into two or more naves by one or several rows of columns. They were high and airy, with a vestibule at one

extremity and a chapel at the other. In the wings were the cells of the monks and nuns, a medicine laboratory, a refectory and a kitchen. Wherever it was possible, there were gardens connected with these institutions.

Cemeteries surrounded by enclosures with porticos, like that of the Holy Innocents at Paris, and of Saint Denis at Amiens, were also laid out: at first they were located about the churches, within which distinguished persons were interred; later, when the increase of epidemics had rendered such burial-places not only inadequate but dangerous, they were placed *extra muros*.

The establishment of exchanges, dates really from the twelfth century. However, an exchange encircled by trenches already existed in Paris in the eleventh century. In 1183, Philip Augustus had two others constructed in the same capital. The merchants could sell their goods there in safety, protected, as they were, by stone walls closed by gates; there was even a sort of shed-like gallery which enabled them to continue their business during storms. Saint Louis built several other exchanges, two of which were for the sale of cloths. These edifices were like huge barns. They were, naturally, enlarged and modified in various ways to meet the demands of the times. Scarcely anything but debris remains of them to-day, and this only in cities of inferior rank.

While provision was thus carefully made to guard the commercial interests of the country, letters, the arts and sciences were not neglected; learning was at first fostered in the monasteries. Saint Louis founded a large number of colleges, among others the Sorbonne, and he opened several public schools. The work begun by him was carried forward by his successors. The Law School was built in 1415, and the School of Medicine in 1472.

During the Middle Ages fountains were also considered of prime importance. They were constructed not only in the cities, but along the highways. Examples of the latter are to be found to-day in Brittany, in Poitou and in Normandy. The spring of water was usually covered by an arch of masonry, and benches were placed on either side of the basin for the comfort of travellers. In the cities the fountains were generally on the squares or *carrefours*; the water was carried through several pipes and fell into a large basin. Fountains of this kind still exist in a more or less perfect state of preservation in Brou, Provins and Rouen. The earliest public fountains of Paris were erected under Philip Augustus.

As for bridges, the people of the Gallic provinces long made use of those thrown across their rivers by the Romans. These were gradually destroyed during the wars, and others were built, doubtless of wood. There are no remains of stone bridges dating earlier than the twelfth century, but from that period large numbers were constructed. A corporation even was formed called the *frères des ponts*, or *frères pontifes*, whose members devoted themselves to bridge-building. These bridges, which were narrow and defended by castellets or fortresses, showed a series of pointed or semi-circular arches diminishing in diameter from the centre toward the banks. The piers were set with an angle to the current.

The famous bridge at Avignon was built in the twelfth century (1177). The one at Orléans had a castellet on the city side, a bastille dedicated to Saint Anthony in the centre, while at the other extremity rose the turreted stronghold, the *fort des tourelles*. The ancient bridge at Rouen, like the bridges at Vernon, Pont-de-l'Arche and Cahors, was fortified in the same way. In Paris the bridges have suffered numberless vicissitudes; moreover, most of them were originally of wood with houses built along them. The oldest were the Pont au Change and the Petit Pont, each having a bastille (*le grand et le petit châtelet*). The Pont Notre Dame and Pont Saint Michel may also be mentioned.

The cities of the Middle Ages were protected by walls flanked with towers and pierced by several gates. They were usually situated on rivers, the banks of which were connected by fortified bridges. On the side opposite the city, houses were gradually grouped around the defences, thus forming the faubourgs.

In the interior of the cities a surprising number of churches were to be seen, and also a cathedral that was always readily distinguished from the other houses of worship. Then there were walled monasteries occupying immense tracts of land and the dwellings of the higher clergy. But, facing the strongholds of the spiritual power, and representing the temporal, stood the castle, erected either on an eminence or on the bank of the

stream. Later, a third power, springing from the enfranchisement of the communes, manifested itself. It entrenched itself in the hôtel de ville, which lifted its belfry in defiance of the towers of the cathedral and the donjons of the castle. The dwellings of the different classes of citizens clustered around the bulwarks of these three powers.

The houses opened on the streets, and not on interior courts, as was the case with the ancient Greek and Roman dwellings and with more modern Oriental edifices. They included a family-room on the ground-floor and other apartments in the stories above. If the proprietor was a craftsman his shop was on the lower floor, and the common room was relegated to the second story, where it was used not only for social intercourse, but for other purposes. The shop was lighted by a large opening, and was entered through a side-door several steps up from the street. The large room above had one continuous window, which was divided by columns into several compartments. These houses were constructed partly of stone and partly of wood. Wholly wooden ones are not found in any considerable number before the thirteenth century, and then they were chiefly in the North. The gable-end of the dwelling was toward the street, and the roofs were high and projecting. In the South, a great number of new cities were built up at one stroke and on a regular plan; they were walled, and were termed *bastides*.

[To be continued.]

THE ART OF THE VIKINGS.¹—II.



Fig. 1291.—Bracteate with runic alphabet.—Vadstena, Sweden. Real size.

THE Vikings carried the art of working in gold and silver to a high degree of perfection. The use made of these metals in decorating objects of bronze and iron has already been mentioned, and they were not less skilful in executing articles composed of them exclusively. Sometimes the gold or silver is plated on another metal, as gold on silver, or silver on bronze; sometimes the object is without any alloy at all, but is nearly pure. Both niello and filigree work were used, and a favorite style of decoration was with garnets *enchassés*. All sorts of jewelry were made, such as any lady or gentleman of rank might be supposed to need. There were buckles, bracelets, rings, necklaces, beads, diadems, fibulae, charms, ear-rings and many other objects of use and beauty. All were fashioned with great skill, and presented a remarkable variety of design. Spiral bracelets seem to have been fashionable, judging from the large number found, but other forms were used as well. Numerous fibulae have been preserved to the present day. They were used to fasten the ends of the cloak together onto the right shoulder. They present an almost endless variety of shapes, from a simple pin to a large and costly ornament. A very elaborate one is of silver-gilt, and in shape not unlike a cross with a base, the whole turned upside down. It is highly ornamented with a geometric design; the most elevated flat parts are *neilles*, and there are many blue stones scattered all over the surface, some of them fastened with gold.

Bracteates are another form of ornament that have been found in large quantities. They are of gold, and seem to have been worn hanging from the neck, and were probably looked upon as protective amulets, or they may have been used by the priests in religious ceremonies. They were circular in form, and resembled large medals or coins with a loop attached, through which a cord or chain could be passed on which to suspend them. A general system of ornamentation was followed, consisting of concentric circles with geometrical designs, the innermost space filled with some symbol or mystic sign. The symbolic signs were never absent, though what may have been their meaning is in no case understood. Explanations have, indeed, been put forth at various times, but the best of them are not more than conjectures, and are, therefore, wanting in certainty. No uniformity is to be found in these symbols: sometimes their form is geometric; at others human heads and strange animals are represented. The geometrical designs included the cross with four arms of equal length, the *svastika*, or hooked cross, in various forms, the *triskele*, or three-armed cross, the triad in the form of three dots, and the letter "S." All of these unquestionably had their special significance, now long lost. The decoration of human forms varied considerably, and, like the geometrical designs, undoubtedly had a peculiar meaning, which has also been lost in the course of ages. Sometimes a human head only is represented, at others it was in conjunction with a strange beast, while again a whole scene is enacted. Thus, on a bracteate found at Gudbrandsdal, Norway, a warrior is depicted fighting a dragon. Sometimes animals alone were represented, while a union of all three systems of symbols seems to have been frequent. A beautiful bracteate from Lyngby, Jutland, shows in the

¹"The Viking Age" by Paul B. du Chaillu. New York: Charles Scribner's Sons. 1890. 2 Vols. 8vo. \$7.50. Continued from No. 734, page 40.

centre a man with a two-horned animal surrounded by the *svastika*, the *triskele* and four dots forming a cross. The remaining surface is filled with three concentric rows of ornament, that nearest the centre being a conventional design, the next a circle of men's heads, and the outer row a circle of animals. A very remarkable bracteate was found near the small town of Vadstend, in Sweden, which contains, in the border, a Runic inscription, comprising, with the exception of the first division of eight, the earliest form of the Runic alphabet, all the letters save D being present. It frequently happened that the outer circles of ornaments were omitted from the bracteate, the entire surface being occupied by the symbols. These were usually small ones. When the reverse of the bracteate was ornamented it was with a different design from that on the obverse.

The subject of working in gold cannot be dismissed without reference to two golden horns found at Mogeltonder, in Jutland, in the

at all complete that does not include some consideration of the runes and rock-tracings. Runic inscriptions do not, indeed, belong properly to the subject of art-history, but they are of interest as showing the skill employed in cutting them on the rocks, and because they are sometimes to be found with drawings of human and animal forms. These last are, however, rare and unimportant, being chiefly in outline. Rock-tracings are of considerable importance. These are rude, rough carvings in the rock of the outlines of various objects, men, vessels, weapons, etc., and in their general style and appearance closely resemble the rock-tracings of the North American Indians. Unfortunately, like many other Viking productions, their origin and purpose are unknown, and as yet no definite clue has been found as to their real intention. These tracings frequently cover large surfaces, and are to be found in all parts of Sweden and Norway. Sometimes actual scenes, as groups of warriors on horseback, are



Fig. 1246.—Fibula of silver gilt. The most elevated flat parts are niellée. There are many blue stones here and there, some fastened with gold. 4 size. Found in a mound, with three gold bracteates, a spiral ring of gold, three small fibulae of silver gilt of the same type, a bronze key, pieces of a two-edged sword, a small spear-head, &c., &c., unburnt bones and teeth of a cow and other animals, &c., and a quantity of burnt grain (rye).

seventeenth century, but which were stolen in 1802 from the Museum of Modern Antiquities in Copenhagen, and melted down by the thief. Even the casts have been lost, and only drawings remain to show what splendid works the Vikings were capable of producing. One of these horns was perfect, and measured 2 feet, 9 inches in length, and weighed over seven pounds; of the other only a fragment was recovered, but it is estimated to have been over 20 inches long. Both were ornamented with rings covered with scenes in *repoussé*-work, which included both men and animals. They unquestionably told some story, but no satisfactory attempt has yet been made to unravel it.

No description of the products of Viking art can be considered as



Fig. 1295.—Bracteate found at Rastunda, Scania. Triangle of heads. Real size.



Fig. 1292.—Bracteate, Lyngby, Jutland, representing a man with a two-horned animal, surrounded by the *svastika*, the *triskele*, and four dots forming a cross, a circle of men's heads, and a circle of animals. Real size.

represented; at others the various figures are thrown together in an apparently unintelligible arrangement. All sorts of animals are introduced, including a number belonging to the South, as ostriches and camels, showing that the makers of these strange designs must at one time have been in active intercourse with the South. Ships and boats of various kinds are of frequent occurrence in the rock-tracings, and, in fact, they furnish the most valuable information as to the progress of naval architecture in the North.

Mention should also be made of the cloths and stuffs used by the Vikings. We have already seen that gorgeous and costly materials were used for the sails of vessels and in decorating the great halls. The ravages of time have not permitted more than the veriest fragments of the actual materials used in clothing to come down to us, but such as have survived show many elaborate designs. The ancient writings tell marvellous tales of the gay raiment with which

the gentry were wont to bedeck themselves, and there is every reason to believe that the luxury to be found in other parts of the Viking existence was reflected in the dresses of the men and women.

Embroidery was a common occupation of the women of a household, and, though the Bayeux tapestry belongs to a later time than what may conveniently be termed the "Viking Age," it is probably

were probably the fruits of some expedition to the South. It is an interesting fact that the Viking artificers were apparently able themselves to produce everything needful not only for ordinary existence, but for occasions of state as well. They, at least, made almost everything in an unmistakably Northern manner, and they were, apparently, not dependent on the South for any object of household



Fig. 513.—Golden horn discovered at Møgeltønder, 1639, with thirteen broad rings round it. Length, 2 feet 9 inches; weight over 7 lbs.



Fig. 514.—Golden horn discovered at Møgeltønder, 1734. The exact length of this horn, which had round its broadest end an inscription in earlier runes, has not been stated, but, judging from a facsimile in silver gilt made by command of Frederick VII. from the old drawing, and presented by him to the old Northern Museum, it must have been over 20 inches long. Though the lower part was broken off and lost, it still weighed more than 8 lbs.



Fig. 293.—Red quartz stone, with earlier runes and warrior on horseback. Height, 8 feet 3 inches, but only 6 feet above ground; greatest breadth, 5 feet. Hagby, Upland.

not widely different from that made by the Viking lady and her maids.

The Vikings, however, were not always satisfied with the products of their own artistic toil, but brought objects of beauty and utility from other climes. Roman coins are common among the "finds," and specimens of both Greek and Roman work are of frequent occurrence. These objects included almost every imaginable article, and



Fig. 695.—Rock-tracing—men fighting with spears; a man apparently lying dead in front of a boat, and a large number of domestic animals.—Tanum parish, Bohuslän.

or personal use. Glass they did, indeed, seem unable to make, but glass objects of Roman manufacture have been found in various places, showing that they were not unacquainted with its use.

It would be going too far to characterize the Viking life as an artistic one; on the contrary, it was rough and rugged, and the men were more intent on accumulating wealth by their voyages than on the adornment of their homes or their persons. Yet, notwithstanding

this, they brought a large amount of art into their daily existence. We see, of course, the better side, for the rude and ungainly articles have perished, and only the best have been preserved. Be this as it may, however, the Vikings possessed a very considerable artistic spirit, and their art products are worthy of better attention than

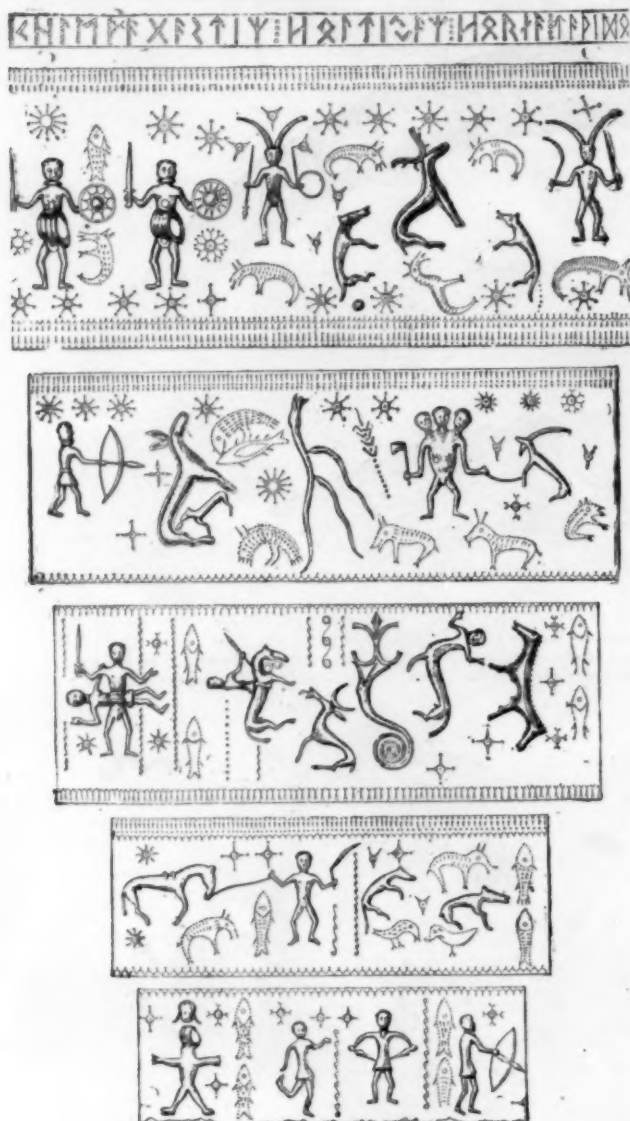


Fig. 516.—Facsimile of each ring of the damaged horn (Fig. 514).

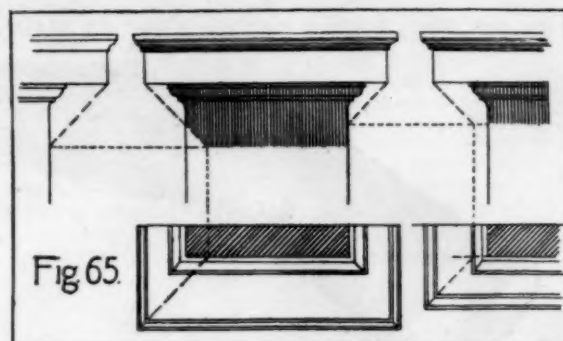
they have hitherto received. They contain lessons of art-industry which this inartistic and utilitarian age may well take to heart, for they show that even the roughest and busiest people may produce beautiful and successful works of art. BARR FERREE.

[We desire to acknowledge the courtesy of the Messrs. Scribner which has enabled us to illustrate this paper with electrotypes from the original blocks. — Eds.]

PEABODY HOMES IN PARIS.—Workmen's dwellings on the Peabody principle have now been opened in Paris under the auspices of the Prince d'Arenberg and the members of the Philanthropic Society. The funds for the purpose come from a legacy of £22,000 bequeathed to the "poor of Paris" by the banker M. Armand Heine, who died a few years ago. The Philanthropic Society has already built a house with the money in the Rue Jeanne d'Arc, and the dwellings opened recently are on the Boulevard de Grenelle, the apartments or "rooms" being rented at from £10 to £14 a year, whereas some in the other tenements may be had at a rental of a little over £3. The sanitary arrangements in these *cités ouvrières* are much better than in other parts of Paris, where the working-classes and the utterly indigent live almost side by side; and in this important matter many hints have been borrowed from the London dwellings erected under the terms of the Peabody Trust. It is, in the meantime, devoutly to be hoped that the Société Philanthropique will extend its operations to other malodorous metropolitan districts besides Grenelle, for such places as the Heights of Montmartre, Belleville and Ménilmontant undoubtedly would derive much hygienic benefit by the destruction of the "jerry-built" and fever-haunted tenements which are numerous in these localities and by the erection of more old and salubrious dwellings in their stead. — *London Daily Telegraph*.

ARCHITECTURAL SHADES AND SHADOWS.¹—VII.

CHAPTER VI.—PRACTICAL APPLICATIONS OF FOREGOING PRINCIPLES (Continued.)

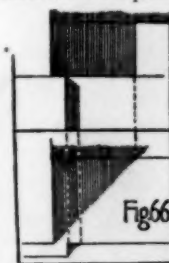


THE first part of this chapter, already published, was occupied with a résumé of general principles of shadow-casting as applied in the draughtsman's practical work, and with the solution of two or three particular problems suggested by certain parts of Plate III. The remaining portion of this chapter will take up *seriatim* the operations involved in the construction of that plate.

75. The shadows of the different parts of the porch divide themselves at once into two main divisions; one comprising those which fall upon the several plane-surfaces of the porch itself, and the other, those which are cast upon the main wall of the building. The former are nearly all cast by lines parallel to the plane of incidence, and present no difficulty whatever. Such are the shadow of the corona cast upon the front of the porch above the arch, of the fillet upon the corona, of the archivolt upon the face of the porch, of belt-courses, impost, etc., upon the piers to which they belong. The most important of these may be taken first, and the shadow of each part of the broken line forming the edge of the corona drawn upon the front of the porch parallel to the edge that casts it. It is worth noticing that when a projecting member like a cornice or belt-course truly mitres around the corner of a building standing in what we have called a "principal" position, the shadow of its left-hand lower corner falls precisely on the left-hand corner of the frieze or wall below it. But whenever the forward and the lateral overhang are not the same, the plan or the side-elevation must be used to find the shadow of that corner (that is of the left-hand end of its front lower edge) and the width of the shadow of the cornice or member upon the wall. This is illustrated in Figure 65, where the forward projection is in one case greater, in the other less than the lateral. It is not always safe to assume a true mitering in the case of all cornices and mouldings, without referring to the side-elevation.

76. Next come the shadows of minor members — of the fillet of the cornice cast upon the corona, and of the fillet of each impost, cast upon the fascia immediately below it. We may then find the centre of the shadows of the extrados and intrados of the archivolt-mouldings, which will be on a line drawn at 45° through the centre of the arch, and at a distance from that centre horizontally and vertically equal to the projection of the archivolt from the face of the wall. (See 42.)

77. The right vertical corner of the left stair-parapet (disregarding the cap and base) casts a vertical shadow on each riser at a distance to the right equal to its own distance in front of it, as ascertained from the plan. But the shadow of the upper right horizontal edge of the parapet is a line at 45° crossing the risers, and limits the shadow of the vertical corner between the third and fourth riser. Upon the lowest riser falls the shadow of the vertical corner of the base, and the shadow at 45° of the short upper horizontal edge of the base that returns in to this step. This is made clearer by the detail on a larger scale in Figure 66. Upon the top riser falls the shadow of the right corner of the left pier of the porch, its distance to the right ($z'y$) being found from the point y in the plan.



78. We now come to the shadows on the main wall and draw the simplest of these first. The shadow of the right-hand front corner of the porch may be drawn as an indefinite vertical line (disregarding the impost and cornice), its position being determined either by the point x on the plan, or by laying off its distance to the right equal to

¹ By A. D. F. Hamlin, Assistant Professor of Architecture in the School of Mines, Columbia College. Continued from page 149, No. 718.

NOTE.—[In view of the inconvenience of having to refer to back-numbers for explanations of the notation used in these papers, the following memorandum will be found of service.]

HP=horizontal plane of projection; VP=vertical plane of projection; GL=ground-line or horizon. Capital letters designate points and lines in space, small italics their horizontal projections, and the same accented or "primed," their vertical projections. Subscript figures indicate points of shadow: small figures above the line indicate points of shade. Greek letters ($\alpha, \beta, \gamma, \theta, \delta$) designate angles. The diagonal of a line or dimension is its length multiplied by $\sqrt{2}$.

the depth of the porch as shown by the plan or section. The shadows of the left further corner of this pier and of the corresponding corners of the left-hand pier can also be located in the same manner as indefinite vertical lines, and the shadow of the upper right-hand receding edge of the cornice drawn as an indefinite line at 45° .

79. Let us now observe that the point a_1 is the last point of the line of shade of the right-hand pier to cast any shadow, a_1 being its

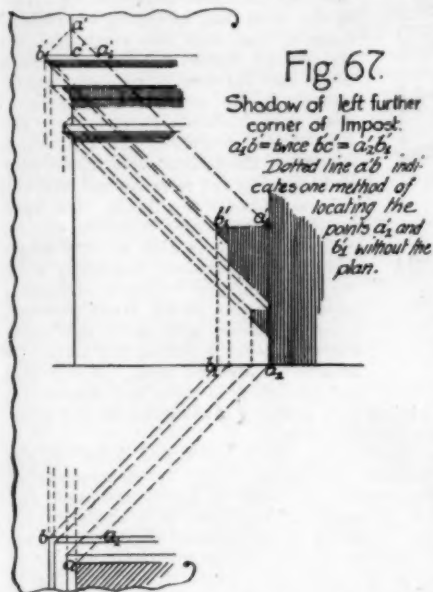


Fig. 67.

Shadow of left further corner of impost $a_1b_1 = \text{twice } bc = a_2b_2$. Dotted line $a'b'$ indicates one method of locating the points a_1 and b_1 without the plan.

shadow and also the shadow of a' on the edge of the corona. We, therefore, have a case like that described in 67, and proceed to draw a_2b_2 , the horizontal shadow of $a'b'$, which is that portion of the line of shade of the corona whose shadow does not fall on the face of the porch, and, therefore, does fall on the main wall. The next portion of the line of shade is the right vertical corner of the corona whose vertical shadow is b_1c_1 . But c_1 is again the common shadow of two points c_1 and c' , the latter on the

edge of the upper fillet being a point on the next portion of line of shade to be accounted for. This portion is evidently that to the right of c' , since all the fillet to the left of this point casts its shadow on the corona. The shadow of this short line on the main wall is the horizontal line c_2d_2 ; and the next shadow is that of the vertical corner of the same fillet, which must be d_1e_1 , and as this brings us to the shadow already drawn of the receding upper edge of the fillet, which is the next and final part of the line of shade, this part of our work is complete.

80. We next treat the right-hand corner of the impost in the same way. The plate shows by dotted lines the complete or theoretical shadow of both the upper and lower edges of this impost-fascia with its fillet, which enables us to draw the shadow of its left-hand further corner, the treatment of which is made clearer by Figure 67. The same operation is performed for the corresponding corner of the left-hand pier. The shadow of the right corner of the further pier is hidden behind the wider front pier, but the shadow of the right-hand end of the lower front edge of its impost reaches exactly to the corner of the doorway (at f') across the narrow bit of wall left visible by the wide front pier.

81. The shadow of the front edge of the arch of the porch on the main wall is, of course, a semicircle, drawn from the shadow of the centre of the front edge of the arch. A small arc of this semicircle is seen at the left of the right-hand pier, near the bottom. The rest of the shadow of the arch on the same plane, completed by casting in the same way the semicircular shadow of its further or inner edge, comes to view at the right of the porch. It reveals the fact that the right-hand side-arch must be all in shadow, since the dotted lines, which show the shadows of its two edges (drawn as explained in 74), are swallowed up in the shadow of the porch itself. It not infrequently happens (as would have been the case had we cast the shadows of these side-arches before drawing that of the front-arch) that shadows carefully drawn out in the earlier part of the work prove superfluous, being swallowed up by other shadows drawn at a later stage of the work. This fact, of course, proves the lines casting the former shadows to have been no lines of shade at all, being themselves in shadow; and such superfluous work can be avoided only by carefully considering the relative positions of the different parts of the building, and observing which among them are in the shadows cast by others. Nor can this always be determined by inspection; a certain amount of seemingly superfluous work must be done in such cases; but its amount may be much lessened by a careful study of the relations of the different parts of the edifice.

82. The shadow of the left-hand side-arch is drawn as explained in 74, and need not be further dwelt upon. So also the shadows cast by the railings under these arches have been already sufficiently explained to require no further notice here. There remains only the plan to be studied.

83. The shadows on a plan are cast upon the supposition that the plan is taken at a comparatively short distance above the main floor; this distance being arbitrarily assumed within certain limits, and the building supposed to terminate at that level. A plan is, in other words, a horizontal section taken at such a level as to show all the principal doors, windows and other openings. The shadows appear on the floor of the buildings, on the treads of stairs, sills of windows

and other horizontal surfaces, and on the ground. The outlines of the plan, being horizontal figures, cast upon these horizontal surfaces shadows equal and parallel to themselves, and the vertical corners and lines cast their shadows at 45° across whatever surfaces they fall upon, so that the height of the plan being once assumed, the drawing of its shadows is relatively much simpler than of the shadows of an elevation. This explanation, with the general instructions already given, should suffice to enable the student to cast all the shadows shown on the plan in Plate III, especially if he bear in mind that for all those portions of the building below the plane of horizontal section, the shadows of the plan and of the elevation supplement each other. Whatever portion of the shadow of any line of shade does not appear in the elevation, must come into view in the plan, and vice versa, as already explained.

84. The section of the porch is nearly all in its own shadow, and need not now engage our attention. It was made a part of the plate in order to make clear such details of the porch as could not be inferred from the plan and elevation, as for example, the railings under the side-arches.

We are now ready to resume the discussion of the properties, relations and forms of the shadows of geometrical solids, the cube and parallelepiped, the prism, especially the octagonal prism, the square and the octagonal pyramid, the cylinder and the cone; these will constitute the next chapter, and will be followed by illustrations of their practical application to the draughtsman's actual work.

(To be continued.)

THE LEAGUE EXHIBITION. — II.



LEAVING the Cathedral designs, we find in the next room a rather small collection of drawings of various sorts, not so striking, as a whole, as the usual League assortment. Glancing over the room, we notice, for the first time at a League show, a considerable number of students' designs from the Architectural Department of Columbia College. These are all compositions on two programmes, and, naturally enough, are very much alike, since originality is a quality

which the instructors in design in an architectural school find it best not to encourage much; but they are well studied, some of them showing particularly good and careful drawing of detail, and are rendered with a uniformity of excellence which speaks well for the thoroughness of the teaching in the Department. Next to these, the most interesting objects in the room are the groups of sketches by travelling architects and draughtsmen. Mr. Randall has some more of his pretty and careful water-colors, and Mr. George F. Newton, a recent Rotch scholar, shows a large number of admirable drawings. So far, all the Rotch scholars have been good draughtsmen, and some of them have done work in black-and-white which is rarely surpassed anywhere, but Mr. Newton seems to have had either a special gift or unusually good training in color. One of the best shown is a drawing of the well-known portal of the Cathedral of Le Puy, but there is a very pretty one of a house at Pompeii, a subject which we do not remember having seen drawn before. Besides these, Mr. Stewardson and Mr. Cope, of Philadelphia, Mr. Rotch, of Boston, Mr. Cary, of Buffalo, Mr. Brunner and Mr. Howard, of New York, have extremely pretty sketches, mostly in color, of interesting foreign subjects, and in addition, Mr. Van Straaten, of Boston, shows some beautiful colored sketches of old Dutch town buildings, which merit special mention, not only for the skill with which they are executed, but for the novelty and interest of their subjects. In a conspicuous place in the room are hung two frames of sketches, mostly in pencil, by Mr. Whitney Warren, of New York, one of which is marked, with an unmistakable French label, "Mention Honorable," as if they had been found worthy of special distinction in some exhibition in France. The sketches are well enough, being painstaking, though feeble and stiff; but it is a gratification to find that a lot of sketches which are far surpassed by many others in the room should have been found deserving of public honors by a French jury.

Turning to the subjects in which the design as well as the drawing is an American product, our attention is immediately attracted by several interiors, in full color, designed by Mr. Arthur Little, of Boston, and drawn by Mr. Fernald. The design in these is of the delicate, quiet sort which we have learned to expect from Mr. Little, but the drawings are studies of still-life in water-color, of remarkable merit. In one, particularly, the scene contains a dining-table, spread, and

Continued from page 41, No. 734.

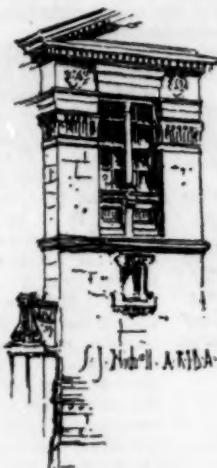
each saucer and decanter is studied, apparently from nature, with the same care and success as the flowers in the wall-paper pattern. Another one, the difficulty of which is not so apparent to the ordinary observer, shows a room decorated in blue-and-white, the blue being mainly supplied by a wall-covering of what seems to be Japanese cretonne, in a characteristic Japanese pattern of blue on a white ground. The rendering of one of these delicate and intricate patterns would be troublesome enough, but with Japanese work of the kind the ground is never, or very rarely, really white, and the representation of the subtle tint by which the peculiar tone of the original is given forms about as trying a problem as a water-colorist can set himself. Among the other things which we have particularly marked for commendation in this room are a sketch for a country hotel, by Messrs. Mason & Rice, of Detroit, which is one of the prettiest and most picturesque things in shingles that we have ever seen; a design for a soldiers' monument, by Mr. E. R. Tilton, of New York, a pure and beautiful classic composition, thoroughly well studied and well proportioned, and beautifully drawn; and a drawing of an entrance court in an insurance building in Minnesota, by Messrs. Babb, Cook & Willard, of New York. This last was to a certain extent a revelation to us. We had never been able to understand why Messrs. Babb, Cook & Willard, skilful as they are, should be employed to build huge insurance buildings all over the country, to the exclusion of native talent, but this drawing shows an interior filled with an amount of beautiful and original design which would have sufficed to spread out over a thousand buildings of the sort which has hitherto been generally thought good enough for life-insurance offices; and it may well be that insurance officials, who have plenty of money to spend on handsome offices, have come to the conclusion that they like something better than the old commonplaces, and have begun to go to the architects whom they believe to be best able to give them what they want.

With these are some designs interesting for various reasons. Messrs. Rossiter & Wright have three or four sketches, two of which, at least, are in their best vein, which is about the highest praise that could be given them. Messrs. Brunner & Tryon have also several pretty designs and drawings, one of which is a curious sketch for the "Norumbega" tower lately built near Boston in commemoration of the settlement of the Norsemen in that vicinity. Our readers probably know that Professor Horsford, of Cambridge, has long interested himself in tracing the indications of the Norse occupation of Eastern Massachusetts in the thirteenth century. The old Indian traditions showed, at the time of the landing of the Pilgrims, that a colony of white men, called by the Indians "Norumbega," had existed ages before in the neighborhood of what is now Boston. It did not require any remarkable philological insight to arrive at the conclusion that the word "Norumbega" was a corruption of "Norway," or "Norgé," to use the present Norwegian spelling, softened by the Indians into "Normgé," and improved by the Puritans, who liked to give a neat turn to the barbarous words which they found, into "Norumbega." Acting on this hint, Professor Horsford compared the present topography of the Charles River valley with that described in the accounts of "Norumbega," and came to the conclusion that the confluence of the Charles River and Stony Brook had formed the site of a large and flourishing settlement, extending as far as Newton, where canals and other works, built, as he thinks, by the Norse settlers, are still to be seen. Having become convinced of the importance of his discovery, Professor Horsford determined to commemorate it by a permanent memorial, and this design of Messrs. Brunner & Tryon is the result. They have obviously taken the "Stone Mill" at Newport for a model, but they could hardly have had a better one, and the result is very pleasing.

We keep for the last a group of designs by Messrs. Mellen, Westell & Kirby, which affords us all the pleasure that we anticipated from them. The best, to our mind, is a "Sketch for a Club-house," which is simply enchanting in its picturesqueness, its sunny wall-surfaces, unaffected window-grouping and its rich and lovely detail. The style is the French Transition, which Mr. Kirby loves and understands so well, but no real example that we know of has half the expression and variety of Mr. Kirby's composition. Near this is a design for a hotel in Colorado, very noble as well as picturesque, and next to this a study for an interior, a novelty from Mr. Kirby, but as full of ideas and architectural feeling as his exterior groups. Besides these, there are some sketches for country houses, interesting, but not always as successful as the ones just mentioned.

JEWELS IN BURMESE TEMPLES.—The Buddhists in Burmah do not consider the question of expense in beautifying their temples. Here is the description of the new vane of the pagoda at Rangoon: The vane is about three by one and a half feet broad, and thickly crusted with precious stones and lovely fans of the red Burmese gold. One ruby alone is worth 6,000 rupees, and there are several hundred rubies alone on this beautiful thing. On the tip of the iron rod on which works the vane is a richly-carved and perforated gold ornament called the Sembo. It is somewhat egg-shaped and a foot in height, tipped by an enormous diamond encircled by many smaller ones, crusted on like barnacles. All over this exquisite oval object are similar clumps of diamonds, no other stones being used for this part. — *Exchange.*

THE PREHISTORIC RUINS AND WORKS OF ART OF YUCATAN.



which the principal edifices are profusely ornamented of any references to any real or mythological deluge.

Comparisons have furthermore been attempted between the pictorial and hieroglyphical inscriptions upon the monuments of these Spanish-American States and those of Egypt and Asia, and here the same absence of important requisites to a similarity are found. Except in the pyramidal forms of some of the structures and the massive stone cornices of others, that are characteristic of all the ancient edifices of the prehistoric world, there is nothing in the American structures to indicate that their principles of construction were derived from any other land. The peculiarities of the American structures, furthermore, seem to demonstrate the unqualified originality of their designs and principles of construction. The law of continuity, that in all other matters of history proves the relationship of things to each other, and demonstrates the theory of evolution, seems to avail nothing in solving the mystery of this ancient and extinct civilization. Perhaps the discoveries have not yet been carried far enough. Perhaps when the probes of science shall have been diligently and exhaustively applied to these ruins there may be disclosed some remains of the tools and machines with which these richly-sculptured monoliths were taken from their distant quarries, put in shape, transported and raised to their places in the vast temples and strongholds where they still exist. Perhaps, then, there may be discovered some traces of the implements of weaving, grinding, enamelling, compounding of pigments and metal-work, the fruits of which are illustrated in the carvings and moldings with which the walls of these vast structures and the monolithic idols are ornamented. These and such implements of domestic use—even possible literary remains—as may still be hidden in the ancient and now subterranean chambers and halls of this extra-historic race may, when found, establish the connection, between that race and the rest of mankind and solve the question of priority of origin.

There are, at least, thirty extensive sites of ancient centres of population, with their architectural remains in more or less dilapidation and ruin, some differing greatly from others in their main characteristics; besides continuous chains of improved roadways and remains of once inhabited villages, connecting the principal ruins, and demonstrating beyond doubt a vast population of great antiquity and of greater intelligence and energy by far than the natives found not in but about these ruins by the Spanish conquerors. Nor do these take into account the ancient ruins of old Mexico and the border lands of the United States lying to the northward. These were diligently explored by Lord Kingsborough in the early part of this century, later by Humboldt, and still later by Désiré Charnay, a Frenchman who spent many years of his life among the Mexicans, and who, under the patronage of Pierre Lorillard, made a further tour of exploration into a mountainous region in the southwestern parts of Yucatan, and demonstrated the fact that this hitherto unexplored region was also rich in material for the archaeologist.

For the rest of his travels in Yucatan, Charnay seems to have taken Stephens for his guide, and after visiting some of the easiest accessible of the ruined cities described by him, has incorporated Stephens's descriptions and Catherwood's pictures into his own handsome volume, giving the Americans proper credit for their work. Charnay's work, "*Les Anciennes Villes du Nouveau Monde*," was published in Paris in 1886. To the facts respecting Guatemala and Yucatan before revealed by Stephens, he adds a description of an extensive ruin which, in honor of his patron, he called Lorillard, and of some pottery found there. Lorillard is in the mountains, in latitude 17° north and longitude 94° west of Paris. It is about midway between the fields of Stephens's explorations and occupies a central point in a still unexplored region, the dense forests and mountainous character of which have balked the intentions of all these and some other would-be explorers. Others have followed in the wake of

these explorers, but have added little but cumulative information to the knowledge given of these ruins by the persons named.

Copan, an ancient ruin occupying the left bank of the Copan River, in the State of Honduras, was the first of these important sites visited by Stephens and Catherwood. Once only before had they been explored by a civilized man. In 1836 they were visited by Colonel Galindo under a commission from the Central American Government, and his report was published in the *Proceedings of the Royal Geographical Society of Paris* and in the *Literary Gazette of London*. "He is the only man in that country," Stephens says, "who has given any attention at all to the subject of antiquities, or who has ever presented Copan to the consideration of Europe and our own country. Not being an artist, his account is necessarily unsatisfactory and imperfect, but it is not exaggerated. No plans or drawings have ever been published, nor anything that can give any idea of that valley of romance and wonders, where, as has been remarked, the geni who attended on King Solomon seem to have been the artists."

The ruins are about three hundred miles from the sea, up the Motagua River to the Copan, and a short distance up that changeable stream. The Copan is not navigable, except for canoes, and then only in the rainy season, for short distances between falls. The valley is one of the most fertile in Central America. The ruins run for two miles along the river's bank, as is clearly established by monuments and remnants of stone walls and buildings still in existence above the surface of the ground. "Cortez in his terrible journey from Mexico to Honduras, of the hardships of which even now, when the country is comparatively open and free from masses of enemies, it is difficult to form a conception," Stephens says, "must have passed within two days' march of this city. There is one monument on the opposite side of the river at the distance of a mile, on the top of a mountain 2,000 feet high. Whether the city ever crossed the river and extended to that monument, it is impossible to say. I believe not. At the rear is an unexplored forest in which there may be ruins. There are no remains of palaces or private buildings, and the principal part is that which stands on the banks of the river, and may, with propriety, be called the temple. This temple is an oblong inclosure. The front or inner wall extends on a right line north and south 624 feet and it is from sixty to ninety feet in height. It is made of cut stones from three to six feet in length and one and one-half feet in breadth. The other three sides consist of ranges of steps and pyramidal structures rising from 30 to 140 feet in height on the slope. The whole line of survey is 2,866 feet."

Fourteen stone statues of heroic size, with altars, several gigantic heads and beautifully-carved figures, some only partially emerging from the ground, were found in and about the temple on the pyramidal mounds and walls, indicating that this wonderful ruin was in all probability the Mount Olympus of the numerous and exceptionally cultured people who erected and bowed in worship before these monolithic gods—waiting only for some later Paul to come and declare unto them the God whom they worshipped in their barbarous symbols.

Stephens in frequent paragraphs declares his conviction that the secrets of this interesting race still lie entombed in their monuments and hidden in the accumulations of the centuries that have year by year covered the handiwork of man with verdure, only to have it decay and leave a constantly-deepening mold, as if determined to hold those secrets sacred from the unworthy, and only to be revealed to that later generation that comes equipped with the implements of science and a thirst for the knowledge of the truths these monuments are willing to reveal when faithfully courted.

All about Copan are evidences of greater and more interesting facts than even were so wonderfully apparent in the ruins still surviving the conflict with that marvellously luxuriant vegetable kingdom that seems destined to hide the whole great revelation deep in the bosom of earth, an everlasting secret of the centuries, unless man, in power of numbers and implements, comes to the rescue.

Stephens's account of Copan is replete with references to diagrams and illustrations, the text alone filling thirty pages of his quarto volumes. It is one of the most important of the entire number of ruined cities visited and explored by him, confounding and making ridiculous as it does certain dilettanti in archæology, who have endeavored to minimize the importance of the discoveries and ascribe to the race of builders ethnic identity with the semi-barbarous Aztecs, Moquis, and North American Indians.

Near the southwest corner are two small pyramidal structures, the larger attached to the wall skirting the west bank of the river, with, between the pyramids, what seems to have been a gateway or principal entrance from the water. The south wall is at right angles from the river, beginning with a range of steps thirty feet high, each step about eighteen inches wide. "At the southeast corner is a massive pyramidal structure 120 feet high on the slope. On the right are other remains of terraces and pyramids; and here also was probably a gateway opening by a passage about twenty feet wide into a quadrangular area 250 feet square, two sides of which are massive pyramids 120 feet high on the slope. At the foot of these structures, and in different parts of the quadrangular area, are numerous remains of sculpture. At one point (indicated) is a colossal monument, richly sculptured, fallen and ruined. Behind it, fragments of sculpture, thrown from their places by trees, are strewn and lying loose on the side of the pyramid, from the base to the top." Colossal heads of monkeys, enshrined alto-relievo portraits

of heroes, and one image of an ape, like those worshipped at Thebes, were among the cumuli on the sides of these pyramids. At a point on the eastern slope of the terrace stands one of the monolithic "idols" which give the peculiar character to the ruins of Copan. It stands with its face to the east, about six feet from the base of the pyramidal wall. It is thirteen feet in height, four feet in front and three deep, sculptured on all four of its sides from the base to the top, and is one of the richest and most elaborate specimens in the whole extent of the ruins. "Originally it was painted, the marks of red color being still distinctly visible. Before it, at a distance of about eight feet, stands a large block of sculptured stone, which the Indians call an altar." A full-page engraving of this monolith forms the frontispiece of Stephens's volume. It shows on the face a full-length figure without beard, and of a feminine cast, though the dress seems that of a man. Here and there on the front of the figure forming part of the gorgeous trappings of the image, are small engraved medallion portraits, some of male, some of female faces. The heroic figure is gorgeously arrayed and the sides and rear of the shafts are covered with hieroglyphs, that probably recite the history of the mysterious personages.

Diagonally across the angle of the wall and facing south is another monument or idol of the same size and in many respects similar. "The character of this image, as it stands at the foot of the pyramidal wall, with masses of fallen stone resting against its base, is grand, and it would be difficult to exceed the richness of the ornament and sharpness of the sculpture. This, too, was painted, and the red is distinctly visible. The whole quadrangle is overgrown with trees and interspersed with fragments of fine sculpture, particularly on the east side, and at the northeast corner is a narrow passage which was probably a third gateway. On the right is a confused range of terraces, running off into the forest, ornamented with death's heads [subsequently understood by Mr. Stephens to be gigantic figures of monkey's heads], some of which are still in position and others lying about as they have fallen or been thrown down. Turning northward, the range on the left hand continues a high, massive, pyramidal structure, with trees growing out of it to the very top. At a short distance is a detached pyramid, tolerably perfect, about fifty feet square and thirty feet high. The range continues for a distance of about 400 feet decreasing somewhat in height, and along this there are but few remains of sculpture.

"The range of structures turns at right angles to the left and runs to the river, joining the other extremity of the wall, at which we began our survey. The bank was elevated about thirty feet above the river, and had been protected by a wall of stone, most of which had fallen down." Among the fragments lying on the ground on this (north) side was a large medallion portrait, the serene and majestic expression and noble outlines of which betoken a monarch or a deity. "The plan [of the entire ruins] was complicated, and, the whole ground being overgrown with trees, difficult to make out. There was no entire pyramid, but, at most, two or three pyramidal sides, and these joined onto terraces or other structures of the same kind. Beyond the wall of enclosure were walls, terraces and pyramidal elevations running off into the forest, which sometimes confused us."

Among the many monuments and sculptured shafts found within the walls was an altar presenting, perhaps, as curious a subject of speculation as anything in Copan. "It stands on four globes cut out of the same stone; the sculpture is in bas-relief, and is the only specimen of that kind of sculpture found at Copan, all the rest being in bold alto-relievo. It is six feet square and four feet high, and the top is divided into thirty-six tablets of hieroglyphics, which, beyond doubt, record some event in the history of the mysterious people who once inhabited the city." The sides of this altar are engraved with figures of individuals. "Each side represents four individuals. On the west side are the two principal personages, chiefs or warriors, with their faces opposite each other, and apparently engaged in argument or negotiation. The other fourteen are divided into two equal parties, and seem to be following their leaders. Each of the two principal figures are sitting cross-legged, in the Oriental fashion, on a hieroglyphic, which probably designates his name and office or character, and on three of which the serpent forms part. Between the two principal personages is a remarkable cartouche, containing two hieroglyphics well preserved."

On the side of the court toward the river there is an opening about half-way up the steps, forming "a pit seventeen feet deep and five feet square, cased with a stone. At the bottom is an opening two feet four inches high, with a wall one foot nine inches thick, which leads into a chamber ten feet long, five feet eight inches wide and four feet high. At each end is a niche one foot nine inches high, one foot eight inches deep and two feet five inches long. Colonel Galindo first broke into this sepulchral vault and found the niches and the ground full of red earthenware dishes and pots, more than fifty of which, he says, were full of human bones, packed in lime. Also several sharp-edged and pointed knives of chaya, a small death's head carved in a fine green stone, its eyes nearly closed, the lower features distorted, and the back symmetrically perforated by holes, the whole of exquisite workmanship. Immediately above the pit which leads to this vault is a passage through the terrace to the river," barely large enough for a man to crawl through on his face. "There were no remains of buildings. In regard to the stone hammock mentioned by Fuentes, and which, in fact, was our great inducement to visit

these ruins, we made special inquiry and search for it, but saw nothing of it. Colonel Galindo does not mention it. Still, it may have existed, and may be there still, broken and buried. The *padre* of Gualan told us that he had seen it, and in our inquiries among the Indians we met with one who told us that he had heard his father say that his father, two generations back, had spoken of such a monument."

Some of the monuments were with infinite patience and perseverance dug out of the ground from under the very roots of giant forest trees by these American explorers, and their inferences are plainly made, that by no means all the stones upon which the history of the builders is inscribed in everlasting characters were found. "Of the moral effect of the monuments themselves," Stephens says, "standing, as they do, in the depths of a tropical forest, silent and solemn, strange in design, excellent in sculpture, rich in ornament, different from the works of any other people, their uses and purposes, their whole history so entirely unknown, with hieroglyphics explaining all, but perfectly unintelligible, I shall not pretend to convey any idea. Often the imagination was pained in looking at them." This and the important revelations the archaeological emblems hold in store for the coming of the proper day the explorer properly leaves to the skill of the scientist. — *New York Times*.

SOME FURTHER NOTES ON THE PAINTING AT TZINTZUNTZAN.¹



THE surprise of the art-loving world over the existence of a supposed Titian in an obscure Indian village of Provincial Mexico might be somewhat mitigated by directing attention to the relations existing between Spain and Mexico in the sixteenth century. The Spanish sovereigns Charles V and Philip II were devoted to the cause of evangelization in their possessions in the New World, and they and others of Spain did much towards the enrichment of the magnificent churches built in Mexico, by contributing works of art. So that prior to 1860 the churches of the city of Mexico were said to contain many art treasures derived from European sources. The

chapter-room of the Cathedral still contains a Murillo and a Pietro de Cortona. When the so-called "Reform" laid its heavy hand upon the churches of the capital in 1860, many of these paintings went into the Academy of San Carlos, as the property of the government. Upon the walls of the Academy are now to be seen, a "San Juan de Dios," by Murillo (a replica of one of his paintings for the Charity Hospital in Seville), besides two pictures attributed to him, — a "San Rafael" and a "San Juan del Desierto." Rubens is represented in the Academy by a portrait of himself and a "Christ tormented." There is also a "San Sebastian" attributed to Van Dyke, together with quite a number of paintings from the Seville school. It is sometimes said under the breath in the Mexican capital, that some of the greater art treasures of the churches were secreted by ecclesiastics in anticipation of the destruction and robbery that went on in the execution of the "Reform" laws, and have not yet emerged from their hiding-places.

The relations of the Spanish sovereigns to the missionary work in New Spain in general and to that which went on in and about Tzintzuntzan in particular, render it quite reasonable to suppose that the picture in the dilapidated church in that decayed Indian village is a veritable Titian, not the work of an inferior painter, represented to be by that great master, nor a copy by one of his pupils.

In 1528, Charles V (of Netherlands, I of Spain), being the Emperor of Spain and vast possessions in the New World, it was deemed advisable to establish some sort of a check upon the military government of New Spain or Mexico; and with that intent a Royal Audience was created. It consisted of a certain number of Auditors clothed with judicial powers, and in default of any other governing power the President of the Audience was to assume the duties of Colonial Governor. The first to fill this important post was Nuño de Guzman, who is described as a man of great cruelty and of equal dishonesty. His conspicuous place in history is principally due to his treatment of the Tarascan Indians of Michoacan, who had their chief pueblo at Tzintzuntzan. The pueblo is said to have had a population at that time of 40,000 and the Tarascans had been prior to the Spanish conquest of the country, the only successful opposers in the North of the advancing arms of the Aztecs. Nuño de Guzman's conquest of the country of the Tarascans was attended with treachery of the basest sort and culminated in the burning to death of the last Tarascan chief, the Catzontzin Sinzicha, who had, previous to the advance

of Guzman, established amicable relations with the Spaniards and urged his subjects to embrace Christianity.

To counteract the evil done by the first Audience, especial care was taken in the selection of the members of the second, which arrived in Mexico in 1529. The last man on the list of members of this second Audience was Dom Vasco de Quiroga, a Spanish advocate of considerable prominence. He gave his especial attention to righting the wrongs done the Tarascans, fixed his residence at Tzintzuntzan, won the confidence and affection of the Indians and restored to the pueblo much of its former prosperity and importance. In 1530 New Spain was divided into four Bishoprics, one of them being Michoacan. The first ecclesiastic appointed to the See declined, and the Emperor, Charles V, at once urged Quiroga to take orders in the church and to accept the new Bishopric. The result is very suggestive of the history of St. Ambrose and the Archbishopric of Milan in the fourth century. Quiroga, as Bishop of Michoacan, still further won the affection and veneration of the Indians, and his name is revered and his memory loved to this day throughout that region.

By imperial grant in 1534, a City of Michoacan was founded consisting of Patzcuaro and Tzintzuntzan, — the preëminence being however given to the latter town. Thus every effort was made to compensate for the wrongs done by Nuño de Guzman in the name of Spain.

It was in 1538 that the "Illmo. ac. V. D. D. Bascus de Quiroga, Primus Michoacanensium Antistes" took possession of his See in the Church of the Franciscan monastery in Tzintzuntzan, and for two years that church was his pro-cathedral. In 1540 the Episcopal residence was removed to Patzcuaro, which as we have seen was another part of the same municipality, though five leagues distant. In 1579 the See city was removed to Valladolid (the present city of Morelia). The importance of Tzintzuntzan continued to be recognized, and in 1593 it began, with royal permission, the use of its particular coat-of-arms and seal — an elaborate design, minutely described by Beaumont ("Cronica," part I, Book II, chap. xx). It bore the title "*Armas del Señorío de la Ciudad de Tzintzuntzan*."

Charles V abdicated in 1557 and Philip II ascended the Spanish throne. The venerable Bishop Quiroga died in 1565 at the age of ninety-five. He was sixty-seven when consecrated Bishop. Philip II inherited his father's love for Quiroga and interest in the mission work conducted by him among the Tarascans. Tzintzuntzan had scarcely begun to decline before his reign ended. May it not have been to compensate for the removal of the Episcopal residence from Tzintzuntzan that the Spanish court sent one of its art-treasures to that city?

What are now the *parroquia* (the building containing the painting) and the chapel, both dilapidated and decaying, were in the sixteenth and seventeenth centuries portions of the Franciscan monastery. The monastery was closed about the middle of the last century. Patzcuaro has maintained its own, and Valladolid (Morelia) has grown to considerable size, while Tzintzuntzan has decreased in importance and now numbers only about 2,500 inhabitants, all poor Indians. But the Indians of Mexico are careful custodians of documents and pictures, exhibiting an almost superstitious regard for them. It is thoroughly in keeping with the Indian character that all offers made for this painting, even those made by the Archbishop of Mexico, should have been refused. And it is safe to predict that any future effort to take it from its present place will be resisted.

But its authenticity must rest upon internal evidence chiefly, and the object of this paper is merely to show the reasonableness of the existence of an original Titian in such a place. In 1888 the artist and writer, F. Hopkinson Smith, visited Tzintzuntzan and saw the painting, and in "*A White Umbrella in Mexico*" gives a somewhat humorous account of the visit. He gives, also, from Janvier's "*Mexican Guide*" the facts above recited concerning the history of Tzintzuntzan. Janvier obtained the facts from various ancient sources, and the present writer has taken pains to verify them. Mr. Smith embellishes his book (and there has never been a more charming book of travels in Mexico published) with exquisite drawings, one of them being a sketch of the room in which the painting hangs. Whether or not he succeeded in completing his "rough outline of the position of the figures on the canvas" he does not state, but his comments on the picture are valuable.

"The picture is an 'entombment,' sixteen feet long by seven feet high. Surrounding the dead Christ wrapped in a winding-sheet, one end of which is held in the teeth of a disciple, stand the Virgin, Magdalen, Saint John and nine other figures, all life-size. In the upper left-hand corner is a bit of blue sky, against which is relieved an Italian villa — the painter's own — a caprice of Titian's often seen in his later works.

"The high lights fall upon the arm of the Saviour drooping from the hammock-shaped sheet in which He is carried, and upon the head-covering of the Virgin bending over him. A secondary light is found in the patch of blue sky. To the right and behind the group of disciples the shadows are intensely dark, relieving the rich tones of the browns and blues in the draperies, and the flesh tones for which the painter is famous. The exquisite drawing of each figure, the gradation of light and shade, the marvellous composition, the relief and modelling of the Christ, the low but luminous tones in which it is painted, the superb harmony of these tones, all pronounce it the work of a master.

"The questions naturally arise, Is it by Titian? and if so, how came it here in an Indian village in the centre of Mexico, and why

¹ The addition of the consonant "e" to each syllable of this name (Tzintzuntzan) by some American writers is unauthorized and certainly unnecessary.

has it been lost all these years to the art world? To the first I answer, if not by Titian, who then of his time could paint it? The second is easier: until the railroads of the last few years opened up the country, Mexico's isolation was complete. . . .

"Another distinguishing feature, and by far the most conclusive, is its handling. Without strong contrasting tones of color Titian worked out a peculiar golden mellow tone — which of itself exercises a magical charm — and divided it into innumerable small but significant shades, producing thereby a most complete illusion of life. This Titianesque quality is particularly marked in the nude body of the Christ, the flesh appearing to glow with a hidden light."

ARTHUR HOWARD NOLL.



[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSE OF MRS. S. T. EVERETT, CLEVELAND, O. MR. C. F. SCHWEINFURTH, ARCHITECT, CLEVELAND, O.

[Gelatin Print issued only with the International and Imperial Editions.]

GROUP OF BUILDINGS FOR POTTER PALMER, ESQ., CHICAGO, ILL. MR. C. M. PALMER, ARCHITECT, CHICAGO, ILL.

OAK STREET SCHOOL-HOUSE, LEWISTON, ME. MR. GEORGE F. COOMBS, ARCHITECT, LEWISTON, ME.

HOUSE OF ALBERT WILL, ESQ., ROCHESTER, N. Y. MR. OTTO BLOCK, ARCHITECT, ROCHESTER, N. Y.

SKETCH OF STABLE FOR HENRY DOHERTY, ESQ., PATERSON, N. J. MR. CHARLES EDWARDS, ARCHITECT, PATERSON, N. J.

BALVENY CASTLE, SCOTLAND.¹

"THIS massive and quaint ruin stands on a high bank overlooking the Fiddoch — a stream unknown to fame, which tumbles from the mountains down to the lowlands of Banffshire. The parish of Marnoch, in which it stands, has many curious antiquities, traditionally connected with the Danish wars. These ancient and mostly fabulous legends, have even embraced the object of these remarks, though the oldest portion of the building can be no older than the fifteenth century. A writer of the early part of the eighteenth century says: 'Balvanie (in Irish Bal-Beni-Mor, the house of St. Beyne the Great, the first bishop of Murchlath), the old castle of which (though rebuilt by the Stewarts, Earls of Atholl, Lords of Balvenie), having been built (tis said) by the Danes, has a large parlour in it now called the Danes Hall.'² In the plate, and between two of the quaint projecting windows, can be read the motto of the Atholl family, which, in its modernized shape, is 'Furth fortune and fill the fetters.'

"When this estate came, as it must have done very soon after the castle was built, into the hands of a branch of the family of Innes, they took first the territorial title of Innermarkie from a portion of the territory acquired from the Atholl family, and subsequently changed it for Balveny.³ From their alliances and their acquisitions, the Balveny branch of the family of Innes became so powerful that they aspired to the chiefship of the house. The method adopted for the accomplishment of this object involves a complex tragic history, worthy to be told at fuller length than these pages admit of. The Laird of Innes was advanced in years, and childless. He had executed an entail of his estates in favor of the nearest hereditary branch of the family — Innes of Cromy. Robert Innes, of Innermarkie and Balveny, endeavored to make a party among his kindred in opposition to this project; but they all approved of the entail; and the intriguer, sent back disappointed and baffled, in the bitterness of his heart resolved to revenge himself, and accomplish his original end by murdering Cromy, and getting possession of the deed of entail. A person situated as Cromy was had to keep his eyes about him, and when he left his fortress seldom did so without an ample armed retinue. It chanced, however, that having a son attending college in Aberdeen, the youth fell sick and his father went thither affectionately to attend his couch. In the sick-chamber the murderer resolved to accomplish his intention. He entered the town with his followers at dead of night. Cromy's house was within a close or court, the gate of which had been carelessly left open. When the murderers entered the *cul-de-sac*, however, they found that the house itself was shut up, and pretty strongly barred, so that

they could not have stormed it without a more serious disturbance than it was expedient to raise in the heart of a town. There were then great feuds between the Gordons and their hereditary enemies, and as Cromy was a partisan of the Gordons, Balveny adopted the device of shouting their war-cry. The trick succeeded: the victim descended half-dressed, with his sword in his hand, and opened the door, when he was immediately shot by his enemy. There were some kinsmen of the assassin present who, probably, did not anticipate this tragical conclusion of the proceedings, for he took the brutal precaution of compelling them to bury their dirks in the body, that they, too, might be partners to the transaction. The efforts made to recover possession of the entail are another chapter in the romance. It can only be here said that the plotter succeeded in being, for a short time, the ostensible head of the house; but the son of the murdered man pursued him with hereditary hatred. He was forced to conceal himself; but his lurking-place was discovered. He was put to death without trial, and his head was cut off and sent to court.

"Nearly a century later, the descendant of the murderer had a contest with the head of his family conducted in the courts of law, which had then begun to supersede the old methods of 'speedy justice.' The devices he adopted to strengthen his hands were, however, curious enough of their kind. The plan for the creation of Baronets of Nova Scotia having been started, Balveny endeavored to obtain one of the patents, that he might have higher rank, and consequently greater influence than his chief; or, as the family historian expresses it, 'having law for it, he would baffle his chief, and take the door of him, or put him to the necessity of being lord, which his circumstances could ill bear.'⁴ He was, however, defeated by the equal, if not superior cunning of his rival, and became what was generally called a broken man — the ruiner of his house. 'And to follow it out to the close,' says the historian, 'Sir Robert Innes of Balveny, who broke his own estate, had a son, Sir Walter, who succeeded him to the name, but not the land. Sir Walter's circumstances were but mean, he left no heirs, and in his death the family extinguished, he being the eighth generation from the first Walter who founded it.' And, mentioning some cadets of the family, he says, — 'The last come of the house of Balveny, and nearest that family, (were there anything to represent) is Mr. George Innes, a priest, who possesses a small interest in Angus, called Dunnoine: what lawful heirs-male he can have I know not.'⁵

[Additional Illustrations in the International Edition.]

INTERIOR OF THE RECOLETU CHURCH, SANTIAGO, CHILI.

[Gelatin Plate.]

THIS interior is finished entirely in marble.

INTERIOR OF THE HOF KIRCHE, INNSBRUCK, TYROL.

[Gelatin Print.]

This church was built 1553-63 and contains the famous tomb of Maximilian I, whose kneeling figure, crowning the tomb itself, faces the high altar. The body of Maximilian is not, however, here entombed although both church and tomb were erected in consonance with the provisions of his will. Upon each side of the nave stand fourteen bronze figures of heroic size which represent, mainly, members of the House of Austria, to which have been added effigies of several notabilities who cannot be claimed as even remote connections. These statues stand in the following order, beginning on the right as the church is entered: 1, Clovis, King of France; 2, Philip I of Spain, son of Maximilian; 3, Rudolph of Hapsburg, founder of the Austrian dynasty; 4, Albert the Wise, Duke of Austria, the Emperor's great-grandfather; 5, Theodoric, King of the Ostrogoths; 6, Ernest the Iron-hearted, Archduke of Austria and the Emperor's grandfather; 7, Theobert, Duke of Burgundy; 8, Arthur, King of England; 9, Sigismund, Count of Tyrol; 10, Bianca Maria Sforza, second wife of Maximilian; 11, Margaret, his daughter; 12, Cymburgis, wife of Ernest the Iron-hearted; 13, Charles the Bold, Duke of Burgundy; 14, Philip the Good, father of Charles the Bold.

On the opposite side are: 1, Joanna, wife of Philip I and mother of Charles V; 2, Ferdinand the Catholic, King of Aragon and father of Joanna; 3, Kunigunde, sister of Maximilian; 4, Eleonora of Portugal, mother of Maximilian; 5, Mary of Burgundy, first wife of Maximilian; 6, Elizabeth, wife of the Emperor Albert II; 7, Godefroy de Bouillon; 8, Albert I, Duke of Austria; 9, Frederick of the Empty Purse; 10, Leopold, the Pious; 11, Rudolph IV, Count of Hapsburg; 12, St. Leopold; 13, Frederic III, Emperor of Austria and father of Maximilian; 14, the Emperor Albert II. These figures are mainly the work of Gregory Löffler and the brothers Godl. The sides of the tomb itself are decorated with twenty-four bas-reliefs of great beauty and delicacy, most of which are the work of the sculptor Alexander Colin of Mecklinberg.

¹ It should always be kept in mind that these illustrations from the "Baronial and Ecclesiastical Antiquities of Scotland," by R. W. Billings, are republished very largely for the sake of giving instruction in one manner of the rendering of architectural drawings.

² View of the Diocese of Aberdeen, p. 649.

³ Historical Account of the Origine and Succession of the Family of Innes, collected from Authentick Writs in the Chartor Chist of the Samen. — From an original manuscript in the possession of His Grace the Duke of Roxburgh, p. 47.

⁴ Historical Account of the Origine and Succession of the Family of Innes, collected from Authentick Writs in the Chartor Chist of the Samen. — From an original manuscript in the possession of His Grace the Duke of Roxburgh, p. 62.

⁵ Ibid. p. 63, 64.

A WAREHOUSE, STOCKHOLM, SWEDEN. A. EGENDOMEN, ARCHITECT.

REPRODUCED from *Teknisk Tidskrift*.

ALL SAINTS' CHURCH, LEEK, ENGLAND. MR. R. NORMAN SHAW, R. A., ARCHITECT.

INTERIOR OF ALL SAINTS' CHURCH, LEEK, ENGLAND. MR. R. NORMAN SHAW, R. A., ARCHITECT.

GARDEN FRONT, HOLCOMBE, CHATHAM, ENGLAND. MR. JOHN BELCHER, ARCHITECT.

THE NEW BOURSE DE COMMERCE, PARIS, FRANCE. M. H. BLONDEL, ARCHITECT.

THIS building faces the Rues du Louvre, de Viarmes and Coquillière. Because of the shape of the lot the wings of this structure partly mask the colonnade and dome of the main building, therefore in this illustration, reproduced from *La Construction Moderne*, these accessory buildings are omitted. These wings are used for shops in the lower story while a hotel and apartments occupy the upper floors.

A NEW YEAR'S DAY IN THE OLDEN TIME.

AMONG the artists who prefer to devote themselves to the illustration of books and periodicals the foremost places must be assigned to Messrs. Jellicoe and Railton. One is as successful as a figure-draughtsman as his companion is with architectural subjects. For the large plate which we publish this week we have been fortunate to obtain the combined ability of the two artists. The scene they have produced is thoroughly English in character. The village green appears surrounded with picturesque houses, but the introduction of the smith's forge suggests how, in the old days, convenience was preferred to the establishment of an exclusive quarter. The picture also suggests that among the English there were various ways to level the distinctions between classes and masses. Winter was a successful operator in that way; and, as we see in the picture, the venerable gentleman, with eyes severe and beard of formal cut, is given an opportunity to utter his wise saws and modern instances on the philosophy of accommodating oneself to circumstances. He takes his punishment with good humor, and in a little time may become the aggressor. It is not often a wintry aspect is so successfully rendered by black-and-white. The whole scene bears not only evidence that snow has fallen, but from the peculiar haze which surrounds the place we know that more is to come. We do not often praise the illustrations we publish, but as Messrs. Jellicoe and Railton's plate differs so widely from those which appear at this season, it may be well to draw attention to the innovation.

BEDROOM AND KITCHEN, CASTELLO DI VINCIGLIATA, NEAR FLORENCE.

THIS most interesting castle presents an imposing aspect with its crowning towers, encircling walls and battlements, standing as it does on the summit of a hill some two and a half miles from Florence. A splendid view can be had from its ramparts, and a journey out to see the place should not fail to be made by the excursionist. Tickets to view may be obtained at No. 14, Piazza Pitti, from the proprietor, Mr. Temple Leader. This gentleman, who is an Englishman, bought the property in 1855, and has since restored it, the architect being Sig. Giuseppe Fancelli. Considerable skill and ability have been shown in the work of reconstruction, and the rooms contain a vast collection of works of art and antique furniture, some of which may be seen in the drawing accompanying these notes. The history of the Castle of Vincigliata commences soon after A.D. 1000. Its successive owners were the Visdomini, the Usimbardi, the Accordi da Figline, the Buonaccorsi, the Albizzi, and the Alessandri. These last, who had the property in their possession for several centuries, sold the castle in a greatly ruined condition in 1827. As a Mediæval revival, the building certainly possesses an interest peculiarly its own, and the remains of the ancient structure were carefully retained in the rebuilding, which Fancelli carried out. The interior accords with the outside; but to the English architect probably the most interesting portions of the castle will be found inside, where the furniture, lamps, weapons, armor, clocks, and ornaments are arranged *in situ*. The walls of the "Sala del Consiglio" are enriched with frescoes above a panelled dado, and the ceiling is vaulted like the Armory and Salotto da Colazione, where heraldic bearings enrich the spandrels. Our view of the brick-groined kitchen is taken looking out of "La Dispensa," which is level with it, and contains some fine chairs and a cabinet of rich detail. The sink and the kitchen fireplace, with the old spit apparatus, are also to be seen. The illustration is reproduced from *Building News*.

FONT AND CANOPY: ST. PETER, MANCROFT, NORWICH, ENG. MR. FRANK T. BAGGALLAY, ARCHITECT.

THE restoration of this well-known font-canopy was undertaken at the expense of a Norwich gentleman (who, unfortunately, did not live to see the completion of the work) as a memorial of her Majesty's Jubilee. The lower part of the structure, consisting of the octag-

onal platform, as well as its cresting and the four posts and four corresponding pendants, are original. Before the restoration they were thickly covered with black paint, and the figures in the niches had been hacked out. A slight structure of no interest, which had once taken the place of the original font-cover, had long been out of use, and was roughly propped upon the platform, over the octagon opening through which the original cover must have slid up and down. Although a careful search was made, no drawing or description of the original upper part of the canopy could be found, and the restoration of the upper part and of the font-cover, which can be slid up into it when the font is in use, is purely conjectural, although founded upon the canopy at Trunch Church in the same county, which is believed to be the only similar structure in the county. The material is oak, and when the black paint was cleaned off it was found that the wood had been at one time colored, though apparently very roughly, in red, green, and white, with gilt crockets, finials, etc., as is usual in late Mediæval woodwork. The old font had lost—evidently by violence—every trace of ornament or moulding, and was replaced by a new one.

THE HOUSE OF SAINT SIMON, ANGOULEME, FRANCE.

DURING the first half of the sixteenth century it appears that there was but little building in the interior towns in Angoumois. The capital of the province itself only offers us the Maison St. Simon, Rue de la Cloche-verte, at the bottom of a court. This house is so called from the name of the family which built it and inhabited it to the middle of the eighteenth century. Some armorial stained-glass, which formerly decorated the windows of the lower story has recently been placed in the Museum of Angoulême. As the plate shows, the façade, although possessing much movement, is a rather heavy specimen of the architecture held in honor about 1535 to 1540. This fact is especially due to the bold relief of the discs and lozenges which overload the pilasters, and in both cases they have the effect of pieces tacked on rather than actually worked out from the substance of the pilaster. To find anything of a similar kind, we must go as far as Perigord, which shows that this building was probably designed by an outsider. Similar houses can be found at Sarlat, at Ruffec, one which has a very curious inscription and, near Ruelle, quite an elegant little building which is built over the fountain. — *Moniteur des Architectes*.

PALAIS DES ARTS LIBERAUX, PARIS, FRANCE.

FOR a description of this building, which is reproduced from *La Semaine des Constructeurs*, see our issue for January 11.



[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

THE CATHEDRAL DRAWINGS AT THE LEAGUE EXHIBITION.

NEW YORK, January 18, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—In your number of the 18th instant under the heading of "League Exhibition—I," you say "Even among the pen-and-ink perspectives many are fully rendered, and the shadows cast, while a few, only a minority of the whole, keep strictly to the pure line-work required." I would say that all my plans were sent to the "Trustees of the Cathedral" entirely plain and without a shadow exactly according to their requirements. For the League Exhibition—no stipulation from them prohibiting rendering or shadows, also having been authoritatively informed that some of the designs in the League Exhibition had been sent in to the "Cathedral Trustees" completely rendered and shaded as you had published them—I concluded that I would have my elevations rendered and shaded so that they should not be at the great disadvantage they had been in the exhibition that they were made for—the Cathedral Trustees'. Hoping to have relieved myself from the stigma of not being "conscientious" in this regard, I remain Yours truly, R. M. UPJOHN.

NEW YORK, N. Y., January 21, 1890.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs,—In the *American Architect*—No. 734—the notice of the League Exhibition includes some interesting remarks about the New York Cathedral competition.

You have official information from the Trustees, that the instructions to competitors distinctly excluded shading on the drawings and even the blacking of the windows.

Inasmuch as some architects, including myself, are said to have failed to comply with these instructions, will you allow me the necessary space to quote the clauses referred to, as follows:

Clause 2. "There shall be a front and side elevation and a longitudinal section, drawn without shading in pen-and-ink on above scale."

This is clear. These drawings are required without shading; but if rigidly interpreted it would also exclude the use of two shades of black ink.

Clause 3. "A perspective, etc. This perspective to be in pen-and-ink without painting or shading other than black lining."

Now, if shading had been simply prohibited, as in clause 2, there could have been no doubt; but it seems to me only fair to allow the reading of the last clause to permit such shading as is done in black lines.

This was the interpretation which was put upon it in perfect good faith by several competitors.

I ask your indulgence for this explanation, because I consider it a matter of professional honor to comply with the conditions in all competitions. They are framed in the interests of the profession at large, as well as of their clients, and my purpose now is to show how the mistake arose, rather than to challenge the ruling in regard to it.

Yours truly, R. W. GIBSON.

MR. CONGDON, also, has asked us to call attention to a mistake in the first notice of the League Exhibition which attributed to him a full water-color perspective of the Cathedral of St. John, whereas his drawing, as there shown and as submitted in the competition, was rendered in pen-and-ink after the manner of the illustrations in Wickes's "Spires." We learn further that the perspective of Messrs. J. C. Cady & Company was worked up in color after its return by the Cathedral Trustees. — EDS. AMERICAN ARCHITECT.

THE QUEBEC CITY-HALL COMPETITION.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — It is no doubt due in great part to the vigorous preaching of your journal that we begin to see, now and then, properly conducted architectural competitions in this country. People are getting to appreciate the absurdity of expecting our best architects to give time and money to the making of elaborate drawings without some assurance that competitions shall be judged by competent persons, and that the best work shall be duly recognized and fitly recompensed. Believing that the good influence of the *American Architect* is not confined to our country alone, I beg leave to call your attention to a competition which is offered by the City of Quebec. I quote the following extracts from its printed advertisement for "Competitive Plans for a City-hall."

"A prize of \$1,500, will be paid for the best plan, \$1,000, for the second best, and \$500, for the third in value.

"The city reserves the right of proprietorship to any of the other plans submitted on payment to the authors thereof a sum of \$100.

"The city does not bind itself to the execution of any of the designs submitted, nor does it bind itself to confide the direction of the work to the architect, to whom the first prize may be awarded."

"The competitors to supply ground-plans, sections and elevations or façades, and the details of the principal apartments, such as the council-chamber and recorder's court. They shall, moreover, supply specification, bills of quantities and estimates of cost of the several works and materials. The total cost of the building inclusive of the heating-apparatus, water and gas service shall not exceed \$200,000.

I have not seen many curiosities in this line, but the clause above quoted, requiring competitors to surrender their three or four month's work, if it pleases the committee to offer \$100 for it, is certainly a novelty.

[The City of Quebec has a perfect right to impose any conditions it may choose, however absurd and unfair, and until architects learn to "boycott" such competitions vigorously and unanimously there will never be an end to such invitations — a word which is by far too decent to apply to such cases. — EDS. AMERICAN ARCHITECT.]

WHAT ARE WORKING-DRAWINGS?

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — What is to be understood by the term "working-drawings" in a specification or contract? Does it cover all necessary detailed drawings, as well as general plans? S. K.

[WORKING-DRAWINGS are generally understood to include general plans, at 1-4 or 1-8 scale, and details. The distinction is, we suppose, between these and the preliminary sketches. — EDS. AMERICAN ARCHITECT.]



ARCHAEOLOGICAL DISCOVERIES IN SCANDINAVIA. — Of late several interesting archaeological discoveries have been made in Scandinavia. In Norway a burial chamber of the early iron age has been discovered at Gloppen, on the west coast. It contained the remains of a large man, who had evidently, judging from hair and claws beside him, been laid on a bear skin. There were also traces of woollen clothes, and the lining of the neck, woven with ornaments of animals, was well preserved. The most interesting find was the remains of a glass beaker, green and blue in color, with fluted ornamentations. The man had evidently worn a leather belt, with two red stones of quartzite set in bronze, in which had hung a pair of scissors in a wooden sheaf, the latter being carved — a rare discovery. Between the two belt stones lay a curious object, consisting of three pieces of wood linked together, which Norwegian arch-

aeologists can only compare to the modern "mind" puzzle. This must have laid between the man's hands. The latter, the beaker, and particularly the ornamental dress lining, are unique finds. All the objects are now in the Bergen museum. An interesting work has just appeared in Norway upon the swords of the later iron age, by Dr. A. Lorange, of the Bergen museum, who, having carefully cleaned these swords in that institution, has found upon them Latin letters and certain marks. One of the commonest names upon them is that of Ulfberht, and Dr. Lorange comes to the conclusion that these swords were not, as hitherto supposed by Norwegian archaeologists, made in Norway, but that they were imported from the land of the Franks, on the northwest coast of France. He is further of opinion that several other objects said to be Norse, are of Frankish origin. In Sweden, too, interesting discoveries have been made, viz., at the Igelsta Bay, near Södertelje, where a place has been discovered, which is declared by the celebrated antiquarian, Professor Hildebrand, to have been a kind of manufactory of stone implements during the stone age. This is the more remarkable as the spot is the northernmost in Sweden where flint implements have been found. A little south of the Göta canal, in the province of Skaraborg, a Runic stone, ten feet high, has lain for years, which has been raised. The front bears a cross engraved somewhat like a Maltese cross, below which is the following Runic inscription: Duar, Hatjkr, Haruadr, Rajstu, Stain, Iftjr, Kunar, Fadur, Sin. The translation being: They, Hating and Harvard, raised (this) stone after (in memory of) Gunas their father (lit. father theirs). On the back are cut the figures of three animals, two being a lion and a dog and the third indistinguishable. — *London Globe*.

THE PUEBLO INDIANS AND THE WORKS OF THE RIO GRANDE IRRIGATION COMPANY. — A despatch was sent all over the country recently to the effect that the Pueblo Indians in Bernalillo county had stopped the work on the big ditch of the Rio Grande Irrigation and Colonization Company by threatening to fight if the work was continued. This statement does injustice to the Pueblo Indians. The facts are that two months ago capitalists of Boston, New York and New Mexico purchased a great deal of land near the Rio Grande River. The lands are now valuable only for grazing purposes, but with irrigation their value would at once increase many fold. The syndicate purchased the charter of the Rio Grande Irrigation and Colonization Company and prepared to issue \$3,000,000 first mortgage bonds on their property, to run twenty years at five per cent interest, the proceeds to be applied to building 200 miles of canals sufficient to irrigate over 2,000,000 acres. The company announced their intention to give the citizens along the line, including the native Mexicans and Indians, the refusal of all contracts and labor on the big canal at the same price at which the work could be done by other labor. But by some misconception of orders the superintendent ignored the claims of the natives and employed railroad graders to commence the work, and this is the only reason for the opposition of the Indians. All the company has to do to conciliate the Indians and go on with the work peacefully and successfully is simply to do as they promised by the Indians. There is no question about the success of the scheme if honestly and intelligently managed. It is well known that the Pueblo Indians have ever been friends of the whites, and that they have been making their living for hundreds of years by stock-raising and cultivating the soil. — *New York Sun*.

THE LATE GEORGE CLARK, ARCHITECT. — Mr. George Clark, a native of Bristol, England, died yesterday morning of old age at the Church Home, North Broadway, aged eighty-nine years. He was an architect and was for forty-three years with Sir Gilbert Scott, the most famous ecclesiastical architect of his day. Mr. Clark superintended the decorations and arrangements of St. James's Palace on the occasion of the first ball ever attended by Queen Victoria. As superintendent of construction for Sir Gilbert Scott he had charge of work on the royal palaces at Windsor, Frogmore, Buckingham and St. James. He rebuilt the cathedrals at Chester, Lichfield, Ripon and abbey churches in Yorkshire, at Croydon in Surrey, New Castle in Staffordshire, St. Johns, Leicestershire and over forty churches elsewhere. Among the many private residences he built were those of the duke of Buccleugh, the duke of Cadogan in Pall Mall and of Sir Asheton Smith in Hyde Park Gardens. The old gentleman took much pride in speaking of his architectural work and of his contact with and rubbing against royalty and the peerage. Among the pleasant incidents he related was an occurrence at Frogmore, the royal residence of the Queen and Prince Consort in their early married life. When work on the palace was completed "rearing" flags were hoisted and displayed from the tops of all the chimneys of the palace. Prince Albert sent for Mr. Clark and inquired what it meant. He was informed that it was a signal that work on the palace had been completed and the workmen expected a treat, whereupon the prince instructed Mr. Clark to have the foreman allow his men a holiday and gave all a bountiful English dinner. He leaves one daughter, the wife of Mr. Crook, late organist at St. Paul's Episcopal Church in this city. — *Baltimore Sun*.

MUD DOCKS AT VIZAGAPATAM. — When a ship is to be docked at the port of Vizagapatam, she is, says *Indian Engineering*, towed up the river from her moorings to near the dock-yard. A large ditch of a little more than the ship's length and breadth, and deep enough to contain water of the depth of the ship's draught is dug in the mud at right angles to the river. At high tide the water flows into this ditch and forms a basin into which the ship is floated or dragged. Two rows of strong stakes are now driven in across the entrance to the ditch and common palmyra, date or bamboo mats tied to them. The space between these is filled up with sand and silt, and thus communication is cut off between the dock and the river. The basin in which the vessel is now floating being surrounded by a high mud bank formed by the mud excavated from the dock, the level of the water in the basin is raised by coolies throwing some of the mud of this bank into the basin, and thus raising the bottom of the basin which must in consequence elevate the water in the basin and the vessel floating on it. The vessel

is by this process elevated considerably higher than the level of the water in the river or inlet. If the bottom of the ship requires much repair and has, therefore, to be elevated more than usual more earth is dug up and heaped high against the sides of the vessel leaving two or three yards of space in the dock unfilled fore and aft, and then water conveyed thither through a small channel is baled into the aforesaid spaces. This water also enters under the vessel and elevates it to the height of the mud heaped against it on either side. Strong beams of wood are by the following process next placed transversely under the ship at two, three or four different places varying according to the length of the vessel. At the spot where the beams are to be placed, what is called a mine (ghanee) is dug under the vessel from side to side, coolies working from either side of the ship at the same time until they meet each other under the ship's keel. Three beams, one after the other, are then dragged by a rope tied to the end of each under the keel and laid there one by the side of the other. The same thing is done fore, aft and midships or in more places if necessary. The mud on the sides of the vessel is then dug away to the level of the surrounding ground and the sides of the vessel caulked or otherwise repaired. After this is done—or simultaneously, if the vessel is to be repaired quickly—the mud under the bottom of the vessel is excavated except near the beams and the ship's bottom repaired; and the beams also if necessary are removed from one place to another to allow repairs where they were originally placed. When the ship's bottom is under repair, several props consisting of the stumps of palmyra trees are placed against or slightly under the vessel to prevent her from rolling to a side. Ordinarily four sets of hawsers are used for undocking the ship after repair, each being coiled into the shape of a cone, the diameter of which at the base is about five or six feet, and where it touches the vessel a foot or two less. As the coiling is going on the cone is made solid by filling it in with mud. One cone is placed under the starboard bulge forward, another under the same bulge aft, and a third and fourth in corresponding positions on the larboard side. Four cones are ordinarily used at this port unless the ship is of more than 300 tons burthen—when their number is increased according to the length and size of the ship. After this is done the transverse beams are one by one withdrawn, the dock having been first dug to the required depth, and then the vessel, which now entirely rests on these cones, is gradually lowered by withdrawing simultaneously from the base of each cone a coil or fake by which the four cones supporting the vessel bodily subside at a low speed and the vessel along with them. The crossbund being now removed the water from the inlet flows into the dock and floats the vessel at high tide. The docking and undocking of a vessel of 200 tons ordinarily cost about 50 rupees [\$350.] including the rent of the dock and the props and beams; and the cost increases in proportion to the size of the vessel and its draught. Vessels of 400 or 500 tons burden have been built and undocked at Vizagapatam in the manner set forth above, such as the "Gallant Neil," the "Lady Sale," etc. If on account of any extraordinary season a sufficient quantity of water does not flow into the dock, which is very rare, four or five large casks rented or belonging to the vessel are tied fore and aft at low water, or if large casks are not procurable a large boat or canoe is tied on, when filled with mud, and this mud being gradually removed the rising of the canoe or boat helps in setting the vessel afloat.

ELECTRIC RAILWAYS.—We are in receipt of information showing that there are now in operation in the United States and Canada 102 electric railways, the total mileage of which is 552 miles, and the total number of motor cars 839. This, says the *New York Electrical Review*, shows an average of about five and a half miles and eight cars for each road. But the list referred to gives in detail the cities and towns in which all the roads are run, and the number of single-track miles and the cars employed in each. The following analysis of the list will furnish an interesting exhibit of the present situation of this important matter:

ROADS IN CITIES OVER 100,000 POPULATION.

	Miles.	Cars.
New York ..	18.5	10
Boston ..	14	31
Albany ..	15.5	16
Cincinnati ..	12	31
Cleveland ..	30	60
Louisville ..	10	10
Detroit ..	7.5	6
St. Louis ..	5.5	12
Washington ..	3	10
Baltimore ..	2	4
New Orleans ..	—	1
	118	191

CITIES OVER 25,000 AND UNDER 100,000.

	Miles.	Cars.
Rochester ..	7	9
Syracuse ..	4	8
Troy ..	5	12
Columbus ..	2	2
Dayton ..	9	12
Nashville ..	3	6
Harrisburg ..	7.5	10
Lynn ..	6.8	9
Plymouth ..	4.5	3
Wilkesbarre ..	3	8
Wilmington ..	3	8
Omaha ..	26	72
Richmond ..	13	41
Wheeling ..	10	5
Erie ..	12	5
Reading ..	2	4
Seranton ..	20.5	37
Davenport ..	3.5	6
Des Moines ..	10	8
Salem, Mass ..	2	6
Atlanta ..	4.5	4
Allegheny ..	3.7	6
	162	261

THE PALACE DI SAN GIORGIO, GENOA.—The local Archaeological Committee of Genoa has decided to preserve the historic and artistic Palace di San Giorgio, or del Capitani del Popolo, threatened with demolition. The palace was built in 1260 by the Capitano del Popolo, William Boccanegra, under the direction of the Monk Oliviero. It is a rare example of the Lombard architecture in Liguria in the thirteenth century.—*Exchange*.

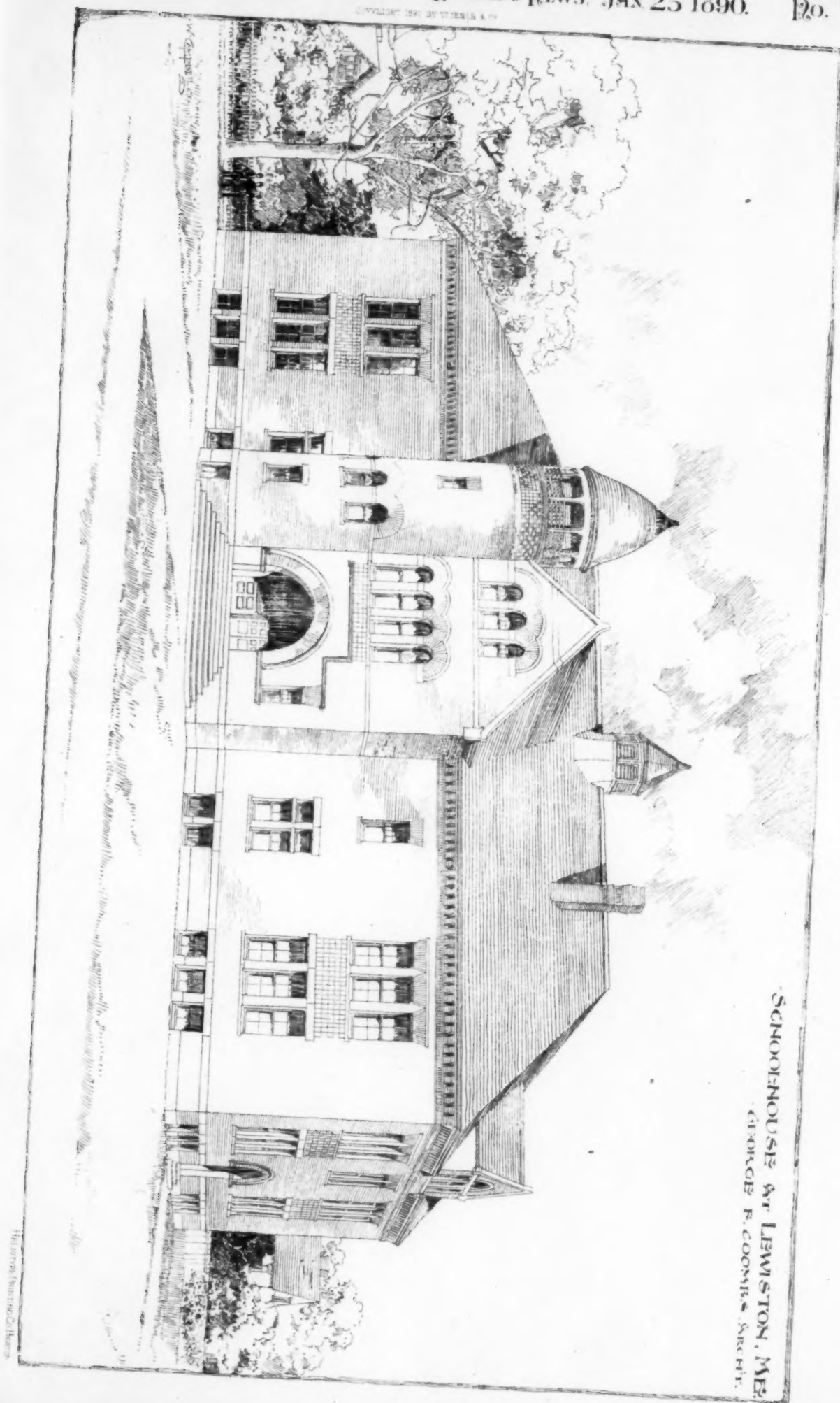
TRADE SURVEYS

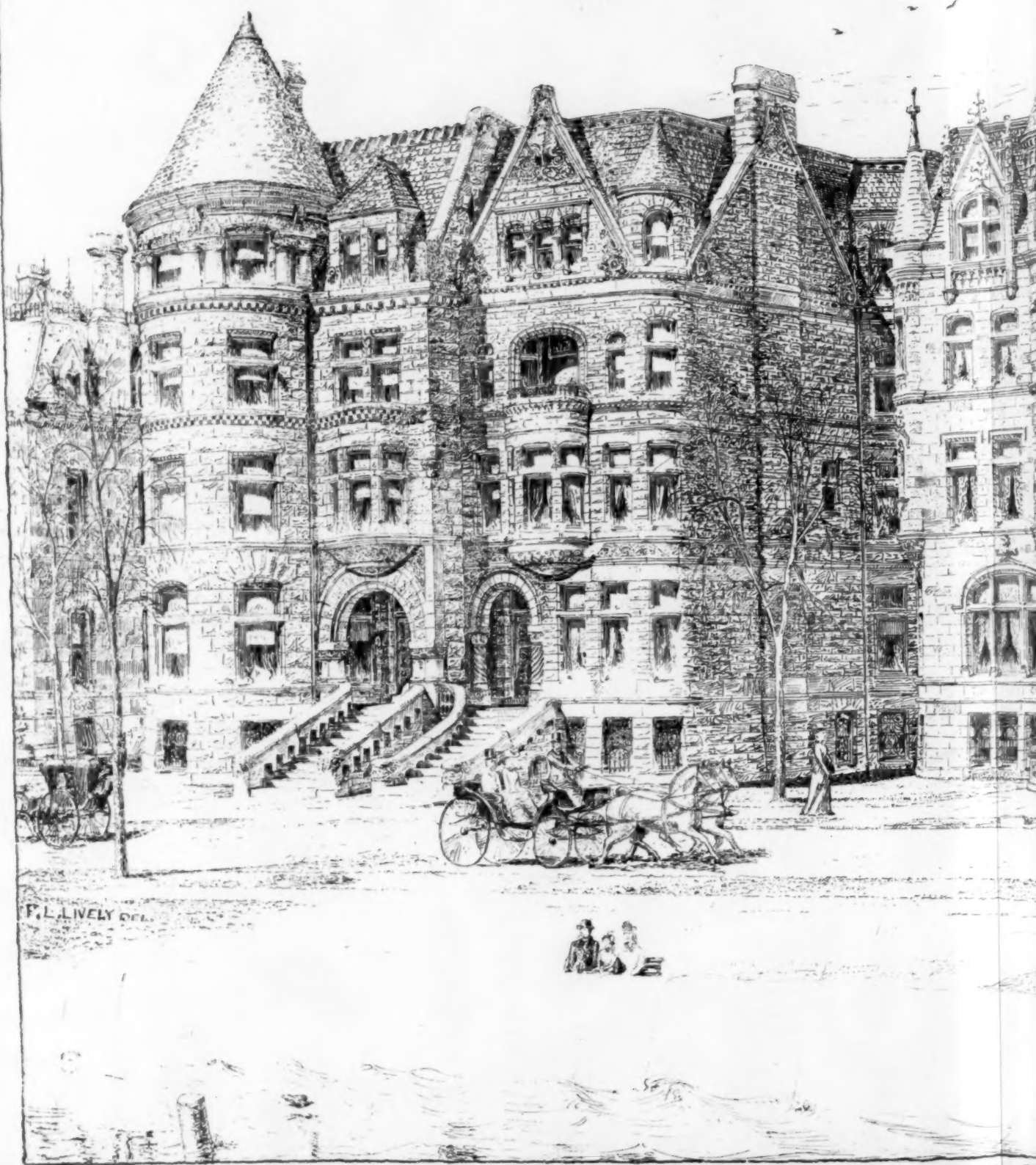
REPORTS from 100 railroads for eleven months last year show an increase in net earnings amounting to \$25,000,000 in round figures over the same mileage for 1888. The earnings of railroads for November also show an extraordinary increase. December earnings, so far as reported, show up remarkably well. Railway managers everywhere count upon a very heavy traffic throughout this year. It is said that there is no danger of damaging rate-wars, but the people doubt. Cutting is already going on on several Northwestern roads on some classes of freight; but at the trunk-line meetings recently held, the disposition to make necessary concessions has been manifested. The stock-markets in the leading cities of the country are, from a stock standpoint, very unsatisfactory. Speculation is dormant, but the controlling spirits are making all the preparation they know how to make for a general upward movement. The future of railway-building in this country is still clouded in doubt; but even if so the projection of new roads continues, and when the time comes—whenever that may be—there will be a great revival in railroad-building. A recent estimate of projected railway mileage places the paper-built roads at over 20,000 miles. Some of these enterprises are two or three years old. The fact that one-fourth of the railway mileage of the country has passed under the hammer within twelve or fifteen years acts as a check upon enterprise; but with all the discouragements which railway builders and managers have encountered, there is a reckless anxiety to begin construction on a large scale and upon a very small pretence. The railroad-building situation is somewhat contradictory. Control is gradually passing into fewer hands. Years ago, when feudalism in railway management prevailed, much ill-considered work was done, and the foundation laid for a great deal of subsequent quarrelling. With the elimination of this element of evil a foundation is being laid for future harmony. The managers of the larger systems throughout the country are endeavoring to quietly and indirectly check the promotion and inauguration of new enterprises, with a view of, at the proper time, supplying all needed facilities within their respective territory, and the legislatures of the Western States and the railway commissions are also unintentionally and unwittingly maintaining a great deal of opposition to new railway enterprises. The Nebraska railroads have been told to reduce freights on corn, in order that the farmers may have more margin. The Iowa railroads expect similar instructions. The agricultural interests generally throughout the West manifest a determination to keep railroad managers under close surveillance. The condition of banks in Eastern cities is improving. At New York the reserves are \$8,000,000. Financial interests anticipate a demand for gold from London. The export of provisions, cotton, etc., for 1889 was \$101,000,000 in excess of 1888. There is an extraordinary demand for money in British and Continental centres owing to the legitimate expansion of trade in all directions. The present weekly output of pig-iron in the United States is 175,000 tons, an increase of 40,000 tons per week as compared to six months ago, or about at the rate of 2,000,000 tons per year. The expansion of pig-iron-making capacity was never pushed as rapidly. Soft steel is in urgent demand.

The agitation in favor of the inauguration of an eight-hour strike has received considerable encouragement among workmen in a few of the larger cities of the country, and it is stated that Pittsburgh will be made the battleground for the movement next spring. This indicates weakness upon the part of the workers. Pittsburgh has won many labor strikes, but they were fought by iron-workers, who possessed exceptional advantages for the maintenance of the contest. The master-builders will boldly meet their workmen in this and any other contest which may be made. Manufacturing interests are straining capacity in every branch of production to meet accumulating demand. Late advices from machine-shop managers in most of the Northern States throw light upon trade conditions in the smaller industries. The extraordinary demand for machinery, tools and equipments is spoken of by nearly all engaged in these branches. In the mining of the coal there is fair activity in all excepting anthracite, and in that branch there are from 10,000 to 12,000 cars now loaded in Eastern Pennsylvania, besides unprecedented supplies at all distributing points. In the far Western States, the local demand for fuel is enabling the small mine-owners to run their mines full time. The lumber interests are unable to prosecute lumbering operations to the usual extent at this season, owing to unfavorable weather. The supply of lath is low, and the over-stock of shingles is not heavy. The extraordinary demand for lumber in the South points to stronger prices for Southern lumber in Northern markets next spring; but, to protect themselves against such a possibility, many Northern dealers have already made contracts with Southern mills at current rates for ample supplies. In the smaller industries there is great activity and full prices. Our boot and shoe manufacturers are quite busy. Our paper manufacturers complain of weakening prices in some lines, but capacity has been so greatly increased within the past few years that such a result is not surprising. In writing-papers, capacity is being restricted. Shelf-hardware manufacturers in the New England States have been successful in maintaining almost unshaded quotations for months past. Barbed-wire is very active; wire and cut nails are selling well, and all lines of goods coming under the general head of hardware are meeting with good sale. The stove-moulders have had a very good season. The builders of gas-engines find the demand for their specialties increasing. The manufacturers of small machinery and small engines are sold up for two or three months. Quite as favorable reports come from the largest manufacturing concerns, employing from 1,000 to 2,000 hands. Whatever latent evils may threaten industrial activity, there are no symptoms at present which are calculated to disturb the serenity of manufacturers. The possibility of labor agitations is the most prominent of the undesirable possibilities; but employing interests have had sufficient notice of the contemplated disturbance, and much preparation is being quietly made to ward off the danger where fair dealing and conciliatory measures are likely to avail. Strong and stronger prices are likely to prevail in nearly all lines of trade during 1890, and special inducements to enter trade and manufacturing will entice in thousands whose experience will probably be brief.

S. J. PARKHILL & Co., Printers, Boston.





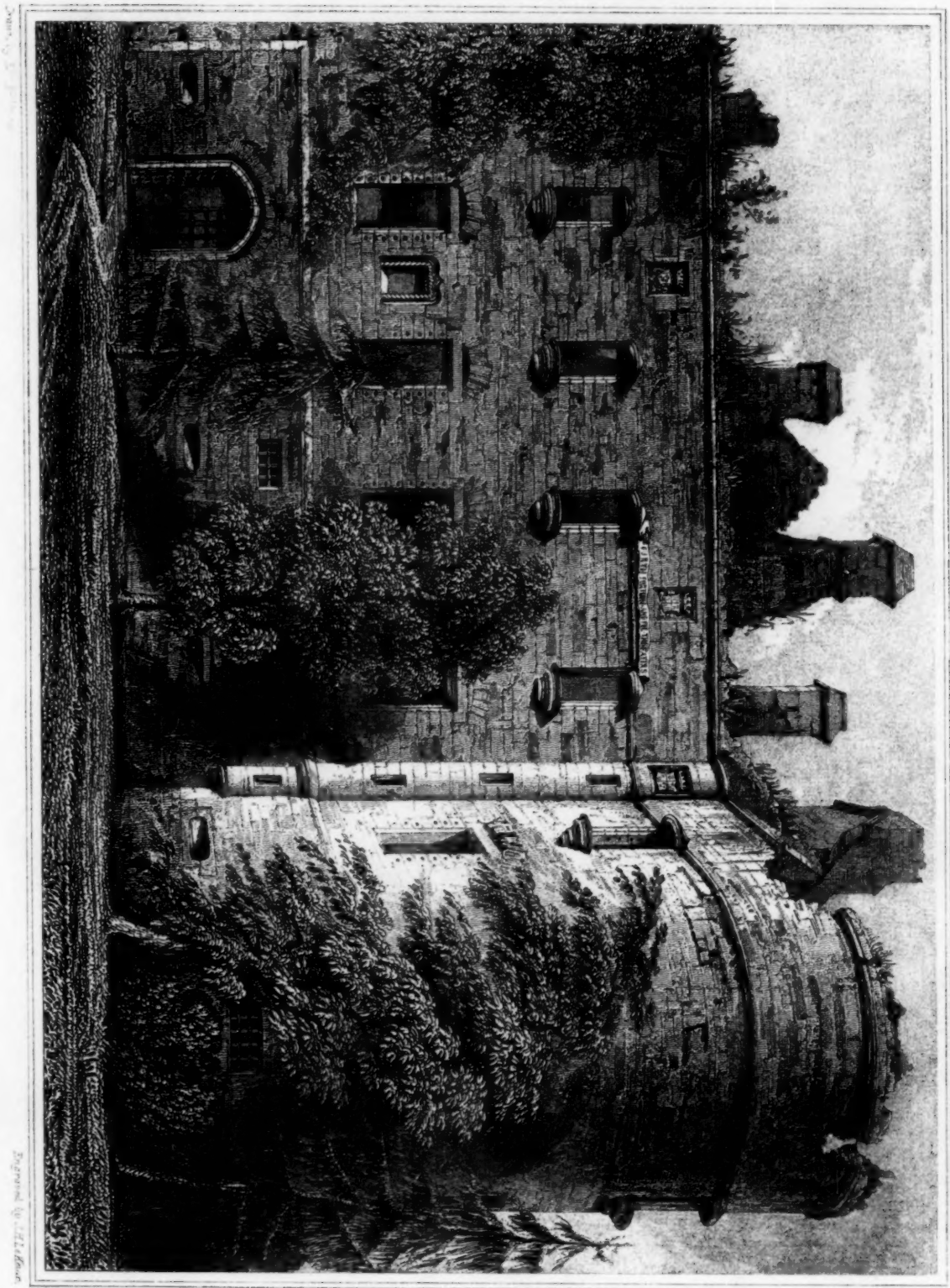


1889.

GROUP OF BUILDINGS ERECTED FOR POTTER F.



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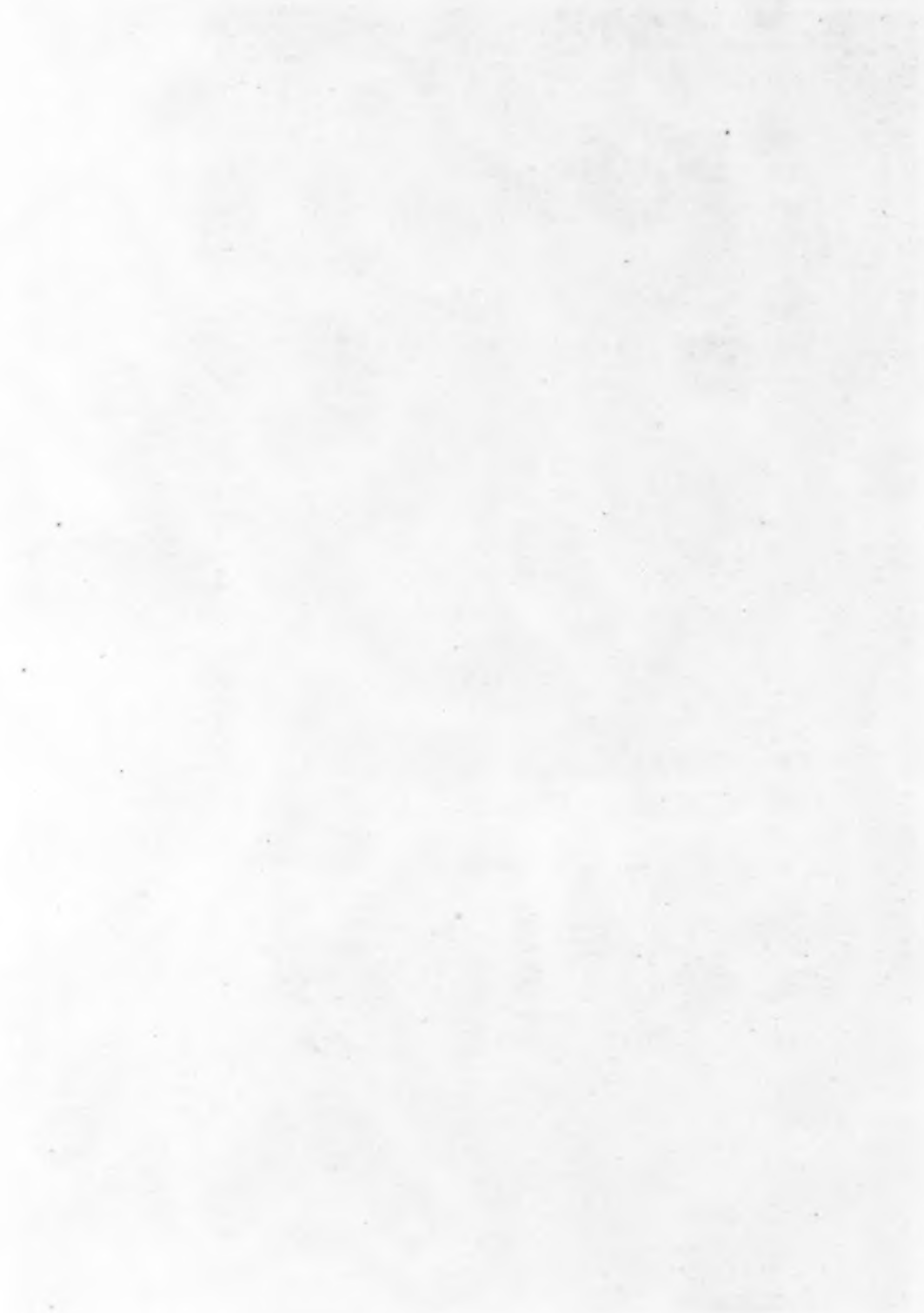


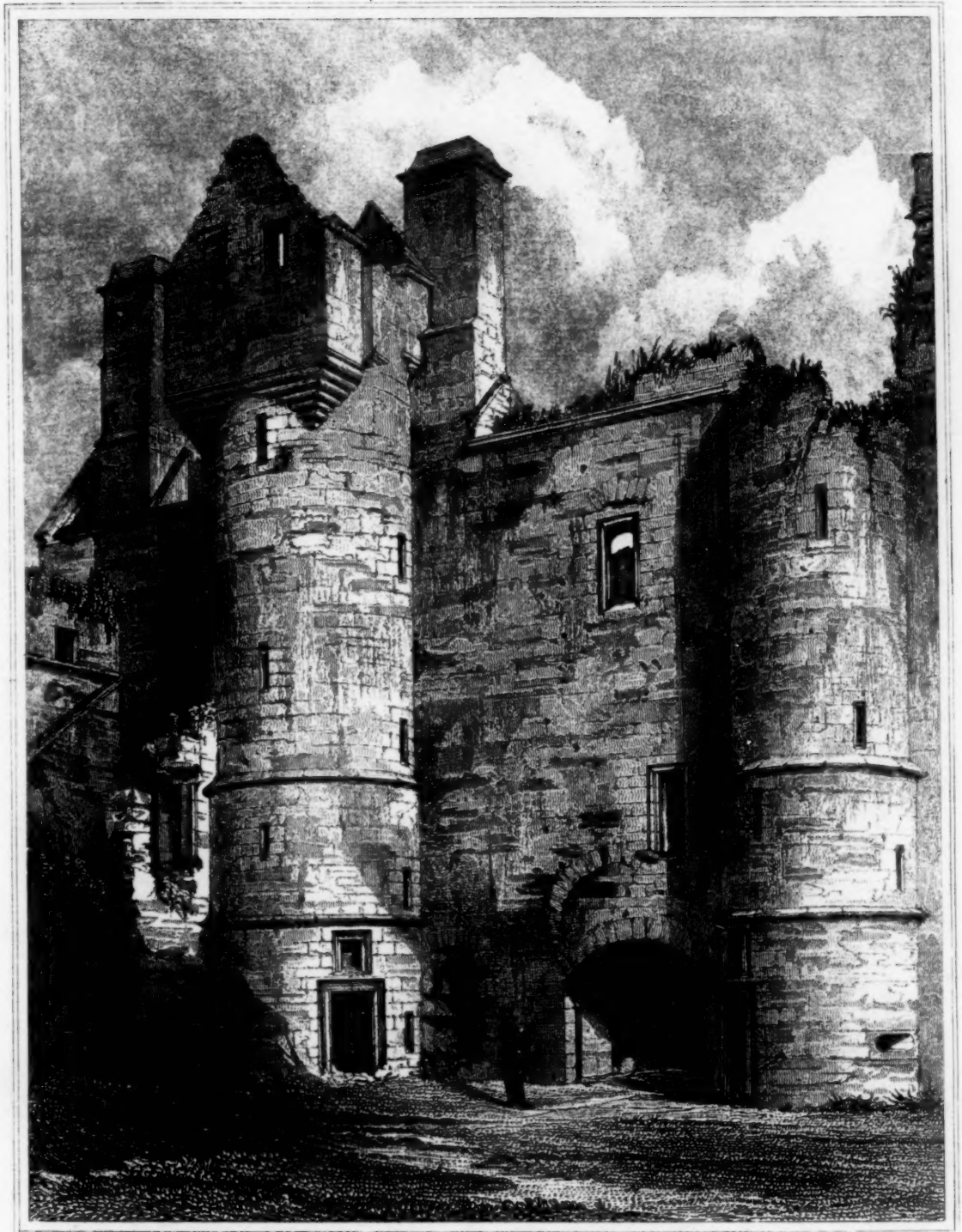
EXTERIOR OF TALLEY CASTLE.

HENRY PIERCE & SONS.

Engraved by J. H. Brown.

THE HISTORY OF THE UNITED STATES OF AMERICA





Drawn by R. H. W. Lings

Engraved by J. H. W. Lings

THE COURT YARD OF MALVERN CASTLE.

HELIO TYPE PRINTING CO. BOSTON.