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VOL. XXX.

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ARCHITECTURE

ENGINEERING

DECORATION

TICKNOR & COMPANY

CONSTRUCTION

BOSTON MASS.

L.S. Spier

CONTENTS.

EDITORIAL SUMMARY.
AUSTRIAN ARCHITECTURE.—I.
ARCHITECTURE UNDER NATIONALISM.—VII.
THE IRON PROCESS FOR DISINFECTING SEWAGE.
ANCIENT ARCHITECTURE FOR STUDENTS.—II.
FIRE PROTECTION OF PUBLIC LIBRARIES.
THE TOPOLOBAMPO COLONY.
TOWNS SEWERED ON THE FRANCHISE PLAN.
COMMUNICATIONS.
NOTES AND CLIPPINGS.
TRADE SURVEYS.

STORE AND OFFICE-BUILDING, WILKES-BARRE, PA.
COMPETITIVE DESIGN FOR A HOTEL AT KEARNEY, NEB.
HOUSE AT ROCHESTER, N. Y.
SIDEBOARD AND MANTEL IN SAME.
AEROPLANE OF DR. DE BAUSSET.

Additional Illustrations in the International Edition.

HOUSE IN NIMES, FRANCE.
[Photogravure.]
VILLA AT FRANKFORT-ON-THAINE, GERMANY.
[Gelatine Print.]
BATHING ESTABLISHMENTS, DRESDEN, GERMANY.
[Gelatine Print.]
THE ARRIVAL OF THE BRIDE.
NORTH DOOR, WEST FRONT, CORK CATHEDRAL.
CENTRE DOOR, WEST FRONT OF SAME.
ST. JUDE'S CHURCH, KENSAL GREEN, LONDON, ENG.

ILLUSTRATIONS.

MOSAIC CAPITAL IN THE CATHEDRAL AT MONREALE.
[Gelatine Print issued with the Imperial and International Editions only.]
DESIGN FOR AN OFFICE-BUILDING AT WASHINGTON, D. C.

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OCTOBER 11, 1890.



SUMMARY:—

Death of Mr. J. C. Bucklin, of Providence.—The End of the Brick Boycott in New York.—The Indictment of the Walking-Delegates.—Discipline in the Unions.—The McKinley Tariff and the Building Business.—New Duties on Paints, Glass, etc.—Duties on Iron, Timber, etc.—Dr. de Bausset's "Aéroplane."—The Responsibility of a French Architect for Certificates.—The Eight-hour Day in Gas-works.	17
AUSTRIAN ARCHITECTURE.—I.	19
ARCHITECTURE UNDER NATIONALISM.—VII.	20
THE IRON PROCESS FOR DISINFECTING SEWAGE.	23
ANCIENT ARCHITECTURE FOR STUDENTS.—II.	23
FIRE PROTECTION OF PUBLIC LIBRARIES.	26
THE TOPOLOBAMPO COLONY.	26
TOWNS SEWERED ON THE FRANCHISE PLAN.	27
ILLUSTRATIONS:—	
Mosaic Capital in the Cathedral at Monreale.—Design for Office-building on F St., Washington, D. C.—Store and Office-building at Wilkes-barre, Pa.—Competitive Design for the Midway Hotel, Kearney, Neb.—House at Rochester, N. Y.—Sideboard and Mantel in the Same House.—Aeroplane of Dr. De Bausset.—A House in Nimes, France.—A Villa at Frankfort-on-the-Main, Germany.—Bathing Establishments, Dresden, Germany.—The Arrival of the Bride.—North Door, West Front, Cork Cathedral.—Centre Door, West Front, Cork Cathedral.—St. Jude's Church, Kensal Green, London, Eng.	27
COMMUNICATION:—	
A Problem for Architectural Students.	28
NOTES AND CLIPPINGS.	28
TRADE SURVEYS.	28

WE are informed of the death of one of the oldest practising architects in the country, Mr. James C. Bucklin, of Providence, R. I., who died last week in that city, at the age of eighty-nine. Mr. Bucklin began life as a builder at a time when the profession of architecture was hardly known in this country, but devoted himself particularly, as many builders did then, to planning and designing, and the well-known Providence Arcade was built from his designs in 1828. After this, he was extensively employed to design public and private buildings, and continued in practice until within a year of his death.

THE struggle between the brick manufacturers and the walking-delegates in New York has ended in the complete defeat of the delegates, who have declared the boycott against the Verplanck's Point manufacturers at an end. As usual, the delegates claim that they have taken this action because they have "a sufficient guarantee" that "the main points for which they were contending would be conceded." What this guarantee consists in, they do not specify, and the manufacturers' committee says that no conference has been held, no guarantee or promise of any kind given, and that the only proposition communicated to them from the delegates was immediately rejected. Meanwhile, an immense sum of money has been lost to the workmen in the building trades in New York and Brooklyn. It is estimated that two hundred million brick, which would have been shipped, except for the boycott, have been held back, and the laying of these alone would have put at least a million dollars into the pockets of the journeymen bricklayers, while the carpenters, plumbers, painters, plasterers and so on, who would have had a chance to work upon the buildings which would have been built with these brick, must have lost at least an equal sum. It is possible that, if the walking-delegates can be kept quiet next season, many of these buildings will be erected next year, instead of this; but many more will be given up altogether. People with money to spend in building are not at all disposed to expose themselves to the danger of heavy loss at the whim of an irresponsible board of walking-delegates, and the people who get their living by doing building work have no worse enemies than the men who find constant pretexts for throwing the whole building business into disorder.

A CURIOUS incident of the boycott against the Verplanck's Point brick manufacturers was the finding of an indictment by the Grand Jury against the walking-delegates, for conspiracy "to interfere with and harass" the Verplanck's Point manufacturers, on the evidence contained in a circular, a copy of which was delivered to Messrs. Peck, Martin & Co., dealers in building materials in New York, notifying them that the Board of Delegates had ordered the brick-handlers and others to cease handling brick from these manufacturers. Both the judge of the court, and the District Attorney, informed the Grand Jury that there was not evidence enough for conviction, and the indictment was dismissed as soon as it was presented; but the fact that a majority of the jurors were disposed, on this evidence, to endeavor to bring the delegates to punishment, is important. It is said that Mr. Martin, of the firm of Peck, Martin & Co., was one of the jurors, and he would probably have sympathized with the manufacturers, rather than the delegates; but he could not have an indictment presented without finding a majority of the jurors to agree with him, and, sooner or later, not only jurors, but the public, will come to the conclusion that the boycotting of any person, whether a non-union journeyman or a manufacturer, is a crime which should be quickly and severely punished.

THE question is often asked, why union men should be so reluctant to work with non-union men, or to use boycotted materials. The answer is, at least with regard to non-union men, that the unions impose heavy fines on those of their members who work on a job with men not belonging to the union, and there is no alternative left to those who acknowledge the authority of the walking delegates, but to avoid non-union men, or pay the fines.

ARCHITECTS and builders will be interested to know how the McKinley tariff, which goes into operation this week, is likely to affect the cost of building, and some idea may be formed by comparing the new duties on building materials with the previous ones, since, for a long time, at least, the price of such materials, even where they are manufactured in this country, is likely to be kept at about the cost of imported materials of the same sort. On the whole, it may be said that the cost of the cheaper class of buildings will be enhanced, while, as the duty on structural iron is considerably reduced, the cost of expensive fireproof buildings, where a great deal of iron is used, will probably not be materially changed.

MAKING the schedules in their order, we find that the duty on linseed oil is raised from twenty-five to thirty-two cents per gallon, an increase of twenty-eight per cent. The tariff on other materials for house-painting is not seriously changed, but that on the water-colors used by artists is raised from twenty-five to thirty per cent. On ordinary brick, the duty is unchanged, but glazed or ornamented brick pay forty-five per cent, instead of twenty, and tiles pay forty-five per cent in place of thirty-five. Portland and other hydraulic cements pay a specific duty of eight cents per hundred pounds, instead of an *ad valorem* duty of twenty per cent, the change constituting probably an advance, but not a very serious one. Lime pays six cents per hundred pounds, instead of ten per cent *ad valorem*, which is a very large advance. Stained or decorated glass pays sixty per cent, in place of forty-five, an increase of one-third. On window-glass sheets under ten square feet in area the duty is unchanged, but on larger sheets the duty is doubled. The rates on plate-glass, rough, polished and silvered, are unchanged. Freestone, limestone, granite, sandstone and other building or monumental stone, except marble, pay, if dressed or wrought, forty per cent *ad valorem*, instead of twenty per cent; if undressed, they pay a specific duty of eleven cents per cubic foot, which will, in most cases, be a considerable advance over the former duty of one dollar per ton.

IN iron, beams, girders, joists, angles, channels, wrought-iron columns and all other structural shapes of iron or steel, whether plain or punched, or fitted for use, pay, per pound, nine-tenths of one cent, a very welcome reduction from the old

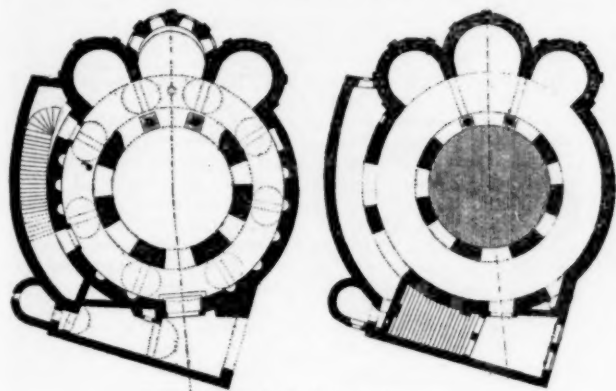
duty of one and one-quarter cents. The duty of the cheaper grades of plate-iron is considerably reduced, while that on the higher grades is increased, being more than doubled in some cases. The duty on small wood-screws is increased, while that on large ones is diminished. Timber, hewn and sawed, pays ten per cent *ad valorem*, instead of twenty; sawed boards, plank and lumber are unchanged. On cedar posts, a new duty of twenty per cent is imposed; but on pine clapboards the duty is reduced from two dollars to one dollar per thousand, and on all shingles, except those of white pine, from thirty-five cents to thirty. Spruce clapboards remain unchanged. The lumber tariff is modified by a provision that planed boards shall pay fifty cents per thousand feet additional for each side planed, and that lumber coming from countries which impose an export duty shall pay the old rates. The duty on lead pipes and sheet-lead is reduced from three cents per pound to two and one-half. Another part of the new law ought to increase the cost of labor, and will probably do so. This is the schedule of rates upon clothing materials and food-products. It would take too long to examine in detail the duties on the former, which are increased in various proportions, according to the value of the material, being in some cases more than doubled. Among the food-products, eggs, which were formerly free, now pay a duty of five cents a dozen. Potatoes pay twenty-five cents a bushel, instead of fifteen cents; and hay four dollars a ton, in place of two dollars.

WE publish this week a drawing, showing the construction of Dr. de Bausset's "Aéroplane," which will have an interest for engineers and architects. As our readers know, we have repeatedly mentioned this scheme with favor, because it is the first that has been presented to the public which has nothing to do with "abaron," or "anthexis," or "molecular vibrations," or any other mysterious substance or manifestation of nature, over which the promoter has in some way acquired control; but depends simply upon the buoyancy obtained by displacing a given bulk of air by a body lighter than the air displaced, and the impulse produced by well-known means of acting upon the air. Starting from these elements Dr. de Bausset has devised a system of so bracing a steel cylinder that it will resist the exterior atmospheric pressure when nearly exhausted of air; and which, when exhausted of two-thirds of the air naturally contained in it, will float in the atmosphere, and hold up not only its own weight, but a large additional load. All these things have been demonstrated, with the clearness of the multiplication table, and the design of the propelling and directing machinery is simply a matter of detail, the important point being the plan for making a body which will float in air, out of a strong, tenacious substance like steel. The successful construction of such an object will be the most important step yet taken in the art of navigating the air. Hitherto, we have contented ourselves with filling a silk bag with gas, suspending a little basket, with a passenger or two, from it with cords, and letting the whole affair blow about through the air. This is exactly as sensible and scientific as it would be to set out on a feather-bed to navigate the ocean; and the air-ship of the future, to be of any practical use, must surpass the balloons of the present in strength and power as much as a modern ship surpasses a child's raft.

A RATHER important decision has been published in France, as to the responsibility of an architect for his certificates. We have often had occasion to say that an architect's certificate is simply an expression of his opinion that a contractor's work is done in a satisfactory manner, or that a certain sum is due him, and is not in any way binding upon the owner, if the latter has reason to believe it erroneous. The French decision affirms this doctrine in the strongest manner. It seems that B, architect for G, after certifying the accounts of E, the contractor for the mason-work of G's house, received a claim from E for a further sum. He returned it to E without comment, and E presented it to G, and as G declined to pay it, brought suit for the amount. The claim was referred by the court to an expert auditor, and G notified B that if the auditor awarded the mason a larger sum than B had certified to, he should hold him responsible for the difference, and desired him to attend the auditor during his examination of the building. This he declined to do. The auditor made a verbal report, advising the parties to come to a settlement; and in the

end, G paid E an additional sum of five hundred dollars, and the costs of the suit and the expert's services. He then attacked the architect for reimbursement, but was signally defeated. The court said that "a certificate is an opinion, an estimate, things in their essence variable according to the character of the person making them"; that "the certificate prepared by the architect for the owner is a piece of advice, which the owner is at liberty to follow or not, as he wishes"; that it is not only his privilege, but his duty, to examine it, to see whether it is correct, particularly if a claim has been made by the contractor which is not covered by it. "Moreover," the court said, "it is settled that an opinion, a piece of advice, or an estimate, carry with them no responsibility unless they are tainted by fraud or collusion, or show negligence, carelessness, or gross and obvious errors." As to the claim made by E, it appeared to the court that it related solely to delays, to little details of execution, and matters which could not be verified by examination of the work; and that, in advising a further payment to E, on such grounds, the expert apparently had in view the expediency of making a concession to avoid a lawsuit, rather than any definite conviction; and that an opinion of this sort could not be used to discredit the opinion of B, who had supervised the execution of the building, and was familiar with the details. G, therefore, having chosen, between two differing opinions, to follow the one which he deemed best for his interest, could not base upon his free choice a claim of responsibility against the author of the other opinion, and should be non-suited, and condemned to pay the costs.

A CONGRESS of Trades-Unions was held a few weeks ago in Liverpool, and, among other things, it was resolved, by a vote of one hundred and ninety-three to one hundred and fifty-five, that it was advisable that the number of working hours in the day should be reduced to eight for all kinds of trade and manufacture, and that the standing committee appointed to represent the Trades-Unions before Parliament should take steps immediately to urge the establishment by statute of an eight-hour day. Singularly enough, not long before this convention, another convention was held, of gas-engineers, at which the experience was related of many engineers who had tried the experiment of reducing the hours of labor in their works to eight. With a few exceptions, those who tried it were pleased with the results. As one of them said, a gas-works laborer who carried on his hard work for twelve hours a day was a dull machine, while the same man, working eight hours a day, became an intelligent and observant assistant, anxious to increase the efficiency of his efforts, and apt at learning ways to improve his methods of work. Another engineer, from Nottingham, called attention to the important consideration that, whereas in London a man working only eight hours a day might not spend his spare time judiciously, men in smaller towns almost always had gardens to cultivate, or some other means for utilizing their idle hours for the advantage of their families. Most of the engineers thought that, owing to the greater zeal and intelligence with which the men worked, they accomplished nearly or quite as much in eight as in twelve hours, but a member said that in certain gas-works in London it was found that the men charged only from six-sevenths to eight-ninths as many retorts in eight hours as in twelve. He did not say, however, whether the charging was better or worse done, so we are still left free to believe, as one engineer said, that the eight-hour men charged their retorts so much more carefully and skilfully than the others that the yield of gas was greater from the same amount of coal. Whether similar results would be obtained in other branches of industry, it would be curious to know. It is hardly necessary to say that no dependence can be placed on the assertions of demagogues in regard to the matter; but employers are not likely to be deceived, or to wish to deceive others, as to the relative efficiency of eight-hour labor, and it is much to be wished that they would give the public the results of their experience. Nothing could be pleasanter than the thought of having every man at liberty to spend sixteen hours out of each day at home with his family, if it were proved that he would earn for them in this way as much as by working twelve hours; but our modern industries are so dependent upon machinery that the task of devising a system by which boilers, engines and other machines can, without loss, be idle for two-thirds of every day is likely to be a difficult one. Possibly some system of electric motors and accumulators is destined to solve the problem.

AUSTRIAN ARCHITECTURE.¹—I.

Figs. 1 and 2. Plans of San Donato, Zara.

AS the subject races of the empire of Austria and the kingdom of Hungary do not constitute a homogeneous nation, but merely form a political union of divers German, Slavic, Hungarian and Italian elements, there can be no Austrian architecture properly so-called, that is, no organic architectural expression of the development of the manners and the civilization of a separate people. It is rather the art evolutions of the chief western nations, several detached branches of which are incorporated in Austro-Hungary, which have for

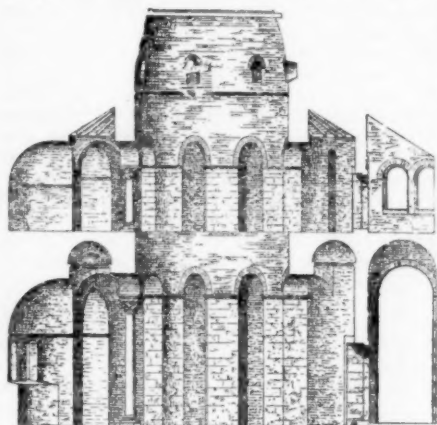


Fig. 3. Section of San Donato.

centuries determined the direction and the characteristics of her architecture.

We may add that it is especially the German, Italian and French schools which, at different periods, have exercised the greatest influence in Austria and Hungary, while the Byzantine

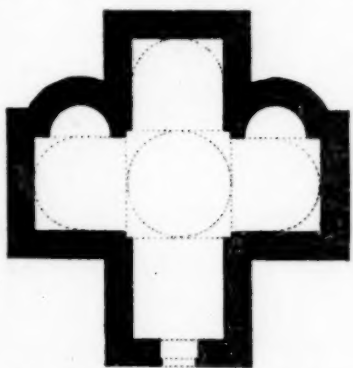


Fig. 4. Plan of the Church of the Holy Cross, Nona.

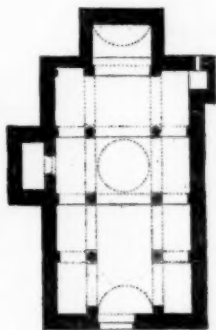


Fig. 5. Plan of St. Euphemia, Spalato.

style is found more or less relegated to one side, even in Slavic centres where the Roman Catholic faith prevailed.

In the Istrian and Dalmatian districts alone, which early in the present era shared the political destinies and the civilization of Italy and Greece, the Latin and Byzantine architectural styles of primitive Christian times have left their traces on a few well preserved monuments. And here too, Byzantine art was able to exert some influence at a still later epoch.

¹ From the French of H. Semper, in Planat's "Encyclopédie de l'Architecture et de la Construction."

PERIOD OF THE EARLY LATIN BYZANTINE CHRISTIAN STYLE.

It was the Byzantine school of Ravenna which chiefly determined the style of the oldest Christian monuments in the provinces lying along the eastern shores of the Adriatic. Both circular churches and basilicas are found there belonging to this early period, which may be considered as extending from the fifth to the seventh century.

Among the circular churches, that of S. Donato at Zara, deserves especial notice. The central portion forms a lofty cylindrical nave, supported by pillars and two columns, and surmounted with a dome. A circular aisle covered by a barrel vault surrounds this nave, and opens into three apses on the east. The gallery above likewise communicates with three apses, but these are distinct from the lower ones (Figures 1, 2, 3). This church, as well as the circular churches of S. Lorenzo and S. Domenico at Zara, exhibit in their details examples of the pure Byzantine style of Ravenna; they were probably built at the time when the Gothic kings resided at Ravenna. The Baptistry of Capo d'Istria is also of the same period.

The basilican type of Ravenna is exemplified in the cathedrals of Parenzo and Grado. The first was founded under Gothic domination by the Bishop Euphrasius, in the time of Pope John II (532-535). In 570, under Byzantine rule, it was partially remodelled. It underwent another restoration after having been devastated by the Slavs in 950. But the atrium, the three aisles, and the apses are of the sixth century. In many respects it is one of the most interesting basilicas of primitive Christian times; its general plan is as noteworthy as are the mosaic and sculptural decorations. The bases and capitals of the columns are exact reproductions of those in S. Vitale and S. Martino at Ravenna; the geometric patterns of the incrustations in colored stones resemble those in S. Sabina at Rome and St. Sophia at Constantinople.

The cathedral of Grado was erected toward the close of the sixth century by the patriarchs of Aquileja, who fled thither from the invasion of the Lombards. It is a basilica comprising a porch, three aisles without a transept, and a single apse on the east. It contains twenty columns, part of which are antique; the others are of the Ravenna type. The rich marble furniture is, for the most part, of the eleventh century, the period when the church was restored; the patriarch's seat however, seems to belong to the Lombard era.

It must be added that a few domed churches in the Neo-Greek style of the ninth to the twelfth century still exist in these regions.

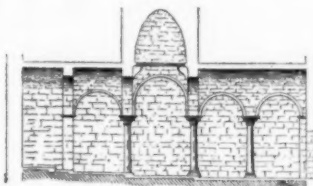


Fig. 6. Section of St. Euphemia.

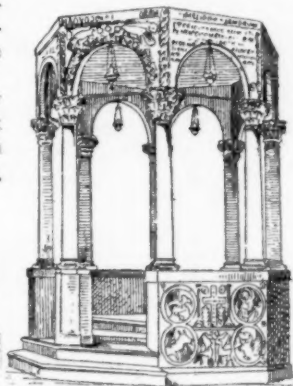


Fig. 7. Baptistry at Cividale.

These are the small churches of St. Vitus at Zara, the Holy Cross (Figure 4) and St. Nicolas at Nona, St. Euphemia at Spalato (Figures 5, 6), and some others which have the form of a Greek cross with a central dome; sometimes three arms of the cross terminate in apses.

At Cividale in Friuli, near the Austrian border, we find in the cathedral, which was reconstructed in 1457, some interesting remains of the furniture of the old cathedral of the Lombard duke Pemmo (eighth century). These comprise a marble ciborium ornamented with barbarous bas-reliefs in the Byzantine-Lombard style, and a small octagonal baptistry (Figure 7) with eight columns supporting an attic, sculptured likewise in bas-relief.

ROMANESQUE PERIOD.

Passing to the Romanesque constructions in Austria and Hungary, our horizon widens; specimens of the style are met with in all the provinces.

We will begin the study of this part of our subject in the Adriatic districts where the only remarkable monuments antedating the year 1000 have been encountered. In the period

following, that is, during Venetian supremacy in Dalmatia, Italian influence still predominated. This was mainly through Lombard, Venetian and, in certain sections, Tuscan elements; the ancient tradition of Ravenna was not wholly lost, however. It manifests itself chiefly in the simplicity of the basilican plans, while the Italian influences are recognized in the isolation of the bell-towers, in the solid construction of the freestone walls, in the lavish use of marble or limestone for wall-facings, columns and various details, and in the rich ornamentation of the exteriors with imitation arches and arcades.

The basilica of St. John at Arbe, built in the eleventh century, is supported by fourteen columns, dividing it into three aisles; the central one of these is double the others in breadth and is roofed with wood. The transept is wanting. The choir is raised on a single step. The formation of the broad apse is very curious; it contains an aisle, covered with semicircular vaulting and encircling the sanctuary, which is surrounded by seven isolated columns (Figures 1, 2).

The cathedral of Arbe, founded in 1237, is simpler still; it is a three-aisled basilica, without transept, but with three apses, the outer walls of which are polygonal. The plan resembles that of the basilica of Parenzo. The façade, which was restored in the fifteenth century, bears traces yet of the ancient imitation arches. But the most interesting Romanesque survival in this church is a beautiful ciborium with six columns. The isolated four-storied bell-tower is also remarkable.

The church of St. Chrysogonus at Zara, founded by the Benedictines in 908 and restored in the fourteenth century, still preserves the original plan; and a part of the walls as well as some of the details belong to the early period of its construction. The plan is like that of the cathedrals of Arbe and Parenzo. At St. Chrysogonus, however, a change was introduced by alternating the columns and pillars; this innovation is attributed to the restoration in the fourteenth century. The exterior wall of the central apse is richly adorned with arcades and with an open colonnade. On the sides and façade there are also blind arches and arcades.

The cathedral of Zara, which was begun in the thirteenth century, consecrated in 1285, and completed in 1334, is on a plan similar to that just described, but the side-aisles are without apses. The nave has twice the width of the aisles; here also as at St. Chrysogonus, the arches are borne on alternating pillars and columns; it was formerly covered in wood (Figures 3, 4). There is a beautiful four-columned ciborium in the

some resemblance also to Tuscan façades with their galleries of colonnades.

[To be continued.]

ARCHITECTURE UNDER NATIONALISM.¹—VII.



MEN who would resent the slightest imputation of injustice, dishonor or cruelty in their private dealings, yet participate in a great injustice and cruelty towards their poorer or less gifted fellow beings, simply because their attention has not been called to the fact. Their opinions on all great moral and social questions are hereditary and conservative rather than independent and progressive, and the obvious and inevitable result of this is that these opinions do not keep pace with the progress of events.

The tremendous advances in science, invention and concentration of capital made within the last twenty years, have created a veritable revolution in industrial and social conditions. But there has been no corresponding revolution in ideas.

There is no longer free competition as formerly. Monopoly, its logical offspring, has almost strangled its progenitor, and the result is that a few men have obtained such absolute control over the rest that they are able to exact from them a very large percentage of the product of their labor for the privilege of existing, the machinery of production being held in the grasp of the few. This is a fact which is disputed by no one and which admits of no dispute. The simple question then, is, whether this condition of things is right or wrong. If it is right, then Nationalism has no other justification than that of good policy. If it is wrong then it becomes the duty of every one as participating in that wrong to aid in uprooting it, and in substituting for it a system founded upon justice, irrespective of any selfish feelings of indifference or imaginary personal injury, which may stand in his way. But since modern civilization has admitted slavery to be wrong, the modern social system is proved to be wrong the moment we prove its inevitable consequence to be industrial and moral slavery, and the magnitude of the wrong becomes evident when we realize the magnitude of the evils such slavery induces.

Returning to our previous illustration, the descendants of the patriotic citizen, A, reduced to poverty, are able to obtain only a limited education. There are thousands of families to-day in this



Fig. 1. Plan of St. John's, Arbe.



Fig. 2. Section of St. John's, Arbe.

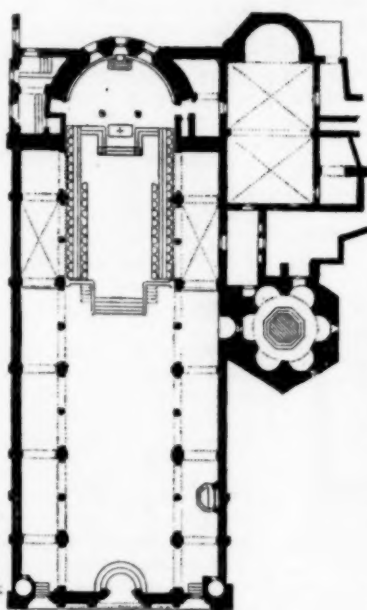


Fig. 3. Plan of the Cathedral of Zara.



Fig. 4. Façade of Zara Cathedral.

church which belongs to the fourteenth century. The great crypt has three aisles and is broader than the cathedral itself.

The sumptuous exterior decorations, consisting of arcades, blind arches, galleries and colonnades are mostly of a pure Lombard-Romanesque style; but we can trace on the fine façade, in addition to the Lombard elements of the round windows,

country who are too poor to give their children a common school education. The product of their labor is necessary for the support of the family. Thus the descendants of our citizen A are predestined to earn a miserable pittance in the street or factory, subjected to a thousand evil influences, which their overworked parents are incapable, through ignorance and want of leisure, of counteracting.

¹ Continued from page 202, No. 770.

The tendency is inevitably downward because the aggregate of influence resulting from extreme ignorance and poverty is evil. Living from hand to mouth, they are bound to accept any conditions imposed upon them by their employers, simply because they have no reserve funds to sustain them while seeking employment elsewhere. Misfortune leads to discouragement, and discouragement to intemperance, suicide and crime.

The descendants of B, on the other hand, are subjected to other evils influences likewise, tending to degradation through precisely the opposite causes. Extreme wealth tempts to indolence, arrogance, selfishness, and general moral and physical degeneracy.

The contact of these two extremes of society breeds every form of ill feeling and stirs up the lowest passions of which human nature is capable; and if the causes which brought these extremes into existence and which foster their growth are allowed to exist very much longer, the disease in the social state will pass beyond government control and culminate in general disaster.

Nationalists believe that justice and wisdom alike point to the necessity of meeting the inevitable in a manly and straightforward manner; of admitting the injustice of the present conditions and endeavoring to effect a cure by peaceful means.

There is nothing more certain than that every individual is entitled to the full value of his labor whether mental or manual. This

an individual member thereof. Every invention or production of any kind made nominally by an individual is really the production of the individual aided by the community, by civilization, and that part of it which is due to civilization, by far the greater part, should clearly become the property of the community. Hence the justice of Nationalism.

Is it also wise?

All recognize the fact that a wide-spread discontent now exists among the working-classes throughout the entire civilized world, a discontent which has assumed unprecedented proportions, and is yet daily increasing; which shows itself in the formation everywhere of labor unions, and combinations of all kinds for mutual protection and concerted action; in the appearance of hundreds of books, papers and periodicals published in the interest of labor, and devoted solely to the discussion of the condition of the laborer and social wrongs; in the general agitation of the labor question in all the leading magazines and periodicals of the day; in strikes, lockouts and all kinds of labor troubles, and finally in many forms of violent insubordination, disorder, and riot.

Those who refuse to shut their eyes upon these facts, recognize that the causes for them are daily increasing, and that intelligent and prompt action should be taken to direct the great popular movement in the right channels. Leaving it to itself is equivalent to leaving it



Ground Plan.

Scale 0 2 4 6 8 10 FEET



BILL MEMORIAL LIBRARY AT GROTON, CONN.
STEPHEN C. EARLE ARCHT
WORCESTER

is only possible when the people themselves own the whole machinery of production, because so long as society sanctions the private monopoly of machinery, its owners are expected to appropriate a part of the labor of their employes as a return for the use of that machinery.

By what process did the machinery become the exclusive property of certain individuals rather than of the community as a whole?

C, D and E are scientific investigators and philosophers having a passion for the study of natural laws, purely for the knowledge itself, without reference to the application of these laws to the industrial arts, nor to their own material welfare, and, accordingly, they freely publish their discoveries for the benefit of the whole community. F is a practical mechanic quick in turning the discoveries of others to practical uses and shrewd in directing these uses to his own emolument. He closely follows the researches of C, D and E, and seizes upon the most important results which they obtain, producing by means thereof a patentable labor-saving machine whereby he is enabled to monopolize the fruit not only of his own labor, but of that of C, D and E as well, although the latter may have formed nine-tenths of the value of the machine. But the labor of C, D and E was given by them in their publications to the community, and F had no intrinsic right to that part of the machine which was due thereto. Custom has, however, given him this right in disregard of justice.

Now C, D and E represent the whole civilized community and F

to those who are most interested in the change, and least fitted to direct it—the wage-earners. This course was tried in France a hundred years ago, and it is the part of wisdom to profit by that lesson and avoid the possibility of its repetition. Strikes and riots are expensive to the strikers as well as to the public, and had the money spent in them during the last twenty years been devoted to the wiser service of educating the people in the principles of Nationalism, our Coöperative Commonwealth might have been realized to-day.

Much as has been said by critics as to the impossibility of attaining a speedy realization of such an ideal, yet the moment we begin to reflect upon the vast economies effected by coöperation, the difficulties which at first thought appeared overwhelming begin one by one to vanish. We are dealing, moreover, it must be remembered, not with a system in which every individual, or small body of individuals, is engaged independently in a constant conflict with all the rest, to regulate which, even partially, requires the ablest statesmanship, but rather with a system of coöperation so simple as to resemble a beautiful piece of machinery, having a thousand parts moving in perfect harmony and with irresistible power, but which can yet be guided by the simplest mechanism.

I have stated as my belief that over nine-tenths of the energy now exerted is wasted. To speak more accurately I should have said that in seven of the nine items enumerated, the waste seemed to amount to as many tenths, while in the remaining two, namely, the

fourth and fifth, a greater productiveness would have been possible under Nationalism sufficient to multiply our wealth many fold. This would have given the same result without the apparent *reductio ad absurdum* of making the sum of the parts greater than the whole. I should also have stated that my authority for the wastes due to the item of travelling salesmen was the United States Census for 1880 and the following calculations by Mr. Edward H. Sanborn, of the United States Census Staff: "Careful estimates from a variety of reliable sources, place the number of commercial travellers in this country at 250,000. Their railroad fares, express or freight upon baggage, hotel-bills, and incidental expenses range from \$4 to \$12 and more a day, averaging about \$6 daily. Salaries range upwards from \$900 a year. Thousands of men earn \$2,000 and \$2,500 a year; a smaller number receive salaries between \$3,000 and \$5,000, while a comparative few are paid from \$5,000 to \$15,000, and in rare instances even more. Of course, as in every field of employment, the lower salaries are vastly in the majority, and \$1,800 a year is a fair average. Let us see what these figures will give us for the cost of this single element in competition. The expenses of 250,000 travelling men at \$6 a day amount to \$1,500,000 daily, or \$547,500-000 in 365 days. Then the salaries of 250,000 men averaged at \$1,800 a year aggregate \$450,000,000, so that the two items of salaries and travelling expenses to be charged against the commercial

travelling salesmen the wants of the people will be supplied. The travelling salesman influences the aggregate volume of business but little, one way or the other. His only accomplishment is to enhance the cost of needful commodities and to cultivate extravagance, by forcing the sale of goods not actually needed by the purchasers. But so long as one firm sends out its travellers, others and all must do likewise."

Accordingly, taking into consideration all these great wastes of the competitive system and all the possible gains in productiveness which general coöperation will permit as suggested in these pages, I believe that the increase of National wealth through Nationalism will be nearer *twenty* than *ten fold*. Should a more exhaustive study in this direction aided by more accurate and comprehensive census reports prove that this belief is well founded, then will it follow that a *single year's production under Nationalism will be more than sufficient to pay for all the plant needed by the Nation for conducting its own business*. The problem of the practical introduction of Nationalism will then be viewed in a new light. The substitution of a different system of industry will be no longer a question of possibility or advisability, but will become a question of method.

Since the work must be done without disturbing the wheels of industry, severing social ties, or doing injustice to any individual, it will be necessary to make use of the existing industrial ma-



traveller mount up to the astonishing total of \$997,500,000 a year. Nor is this all. In nearly every branch of business each man must be provided with his outfit of trunks, sample cases, and his more or less complete line of samples. To give accurate figures or even approximate estimates in this direction is a hopeless task and I shall not attempt it; but here are a few facts to stimulate speculation. A salesman who handles a general line of dry goods, 'notions' and 'small wares,' requires an outfit costing from \$50 to \$200, in addition to which the samples that he carries in a single year cost from \$1,000 to \$2,000. Some of these samples are sold subsequently, while others become worthless, or are lost altogether. To cover losses of this character, it is customary to make an allowance of thirty-three and one-third per cent, of the actual cost of the samples. Now it may readily be seen that a concern employing fifty to a hundred travelling salesmen — and there are many at the latter figure — is under an enormous expense in reaching its customers, not to mention such minor matters as store expenses, interest upon capital, etc. This item of over \$1,000,000,000 charged annually to the account of the travelling man, is paid by the purchaser at retail, or consumer. And the expensive luxury of this form of competition brings neither advantage to the purchaser, nor profit to the merchant, in the long run. Were there not a travelling salesman upon the road to-day, the aggregate sales of merchandise would be likely as large as at present, and at lower prices the merchant would reap even greater profits than he now makes. The aggregate volume of business represents what is necessary to supply the people's wants, and with or without

chinery at first, gradually supplanting this by better as convenience and experience dictate.

The acquisition by the people of the means of production can be accomplished by existing methods, by purchase at assessed valuation or by right of eminent domain, payment being made in bonds, the details of the transaction being regulated somewhat after the manner of the formation of the great combinations and trusts of to-day. In the purchase of railroad and other stock and bonds which rest on Government franchise, the value of the grants and franchise will be included in the amount paid, since these franchises, once granted by the Government and included in the market value of such stock, and afterwards purchased in good faith by the public, have become as fairly the property of these purchasers as any other objects of value connected with the property, and a gift or promise made by our Government should be held sacred even though such gift or promise may have, in the opinion of some, been unwisely made.

In the same way such land as may be required, will be purchased at its actual market value, proved by careful appraisal.

Factories and mercantile buildings will evidently at once become useless to their present owners, since no one could compete with a Government capable of paying the large dividend to its employes, which we have shown to result from so gigantic a combination, and these buildings will be gladly turned over to the new administration for their value. But dwellings and improved estates held for personal use and not for speculation, with which the owners are

without beauty, except as the ponderosity of the mass produces an effect that may as a whole, contain a certain beauty of its own. No, it is all cold, dull and formal, conventional and rigid—nothing beautiful in its proportions, its details huge and clumsy in appearance and having an air of exaggeration which, indeed, pervades the whole atmosphere.

The stolidity of the Egyptian character is fully displayed in the Egyptian architecture. The people inhabited a dry and arid country of intense heat and suffocating winds, surrounded by a glaring desert, greatly aggravating the heat of the sun by radiation from the sand,—they naturally enjoyed the deep cool retreats of their massive constructions in which the space for occupation bore but the smallest proportion to the mass of material employed in its construction. Marvellous as their constructive science and skill was, they had no idea of the real science of construction which was not developed till the more enlightened days of the Christian era, and which consists in the employment of the least quantity of material consistent with security, so disposed that every part and fragment is of particular use and cannot be done without.

There was no difficulty in securing laborers. The rulers autocratic, tyrannical, despotic and cruel, forced their subjects to work out their own great schemes. Prisoners of war were always plentiful, slaves were cheap, and a bold and reckless ruler, playing upon the natural effeminate cowardice of his subjects, found it a comparatively easy matter to get his mandate executed. The country was rich in stone and granite although excessive labor was required to transport the enormous blocks from the quarries; but time and labor was not taken into account and with the intention of preserving their dead bodies until a time of future awakening, they built for eternity rather than for time.

Thus it was with the earlier Egyptians; later on, when the temple became the object of their constructive energies they were far less particular in their methods, and were also careless about the sites they chose, as we shall see later on.

But it is the earlier examples of their singular and indomitable persistency, the excavated tombs, that first require our attention. Not that we can apply to them the adjective architectural, for in no sense is it applicable, but in them we find the rudiments of mural decoration, the first attempts at an art which did so much towards the discovery of forms afterwards to be constructed and which ultimately pervaded the whole world.

Each of these tombs excavated in the solid rock was apparently commenced by a monarch as soon as he ascended the throne and the work of excavation was carried on uninterruptedly as long as he lived, the walls being decorated with representations of his deeds and attainments as each occurred. The work appears to have been carried out under no special system or plan, but pretty much as fancy dictated and from the general forms of rooms and galleries it would seem to have been the intention to have a smaller, rather than a larger chamber for burial, each chamber being completed with despatch and if the king was still in good health another chamber was commenced and soon, until several chambers connected with short narrow passages is the form they all present now.

The excavations all tended in a downward direction: some few chambers would have horizontal floors, others would make a rapid descent by means of flights of steps. The plan is always intricate and designed with an object of concealing the actual position of the final sepulchral chamber; the direction of the passages would be suddenly changed and the entrance to another set of chambers would be by means of a trap in the floor of some middle chamber only to be discovered by chance; all kinds of arrangements were made so as to elude and puzzle any intruder—sudden pits, blind passages and such schemes being of common occurrence. At the entrance of some of the largest chambers the germ of the column is formed, pillars of rock having been left by the excavators which take the place of columns but really do no duty as such.

Now, as to the dates at which these sepulchral excavations were made. So far back before the Christian era are they, that naturally considerable difficulty is experienced in solving this problem. There is no doubt that the majority of them were executed before the notion of constructing a tomb had been conceived, but discoveries go to prove that those who put the date down according to ancient authorities are apt to be misled by generalities. It is all very well to set down as a general statement that the first ten dynasties were the old Kingdom of Pyramid Builders dating from about 3906 B. C., but it must be remembered that it was not until the first three dynasties had passed away that the Pyramids were erected, not until at least 600 years from that date had elapsed.

The Pyramids were begun about the year 3300 B. C., the work of excavating the tombs being carried on previously, so we may safely say that they date prior to 3300 B. C. and probably for a couple of hundred years earlier (to 3500 B. C.).

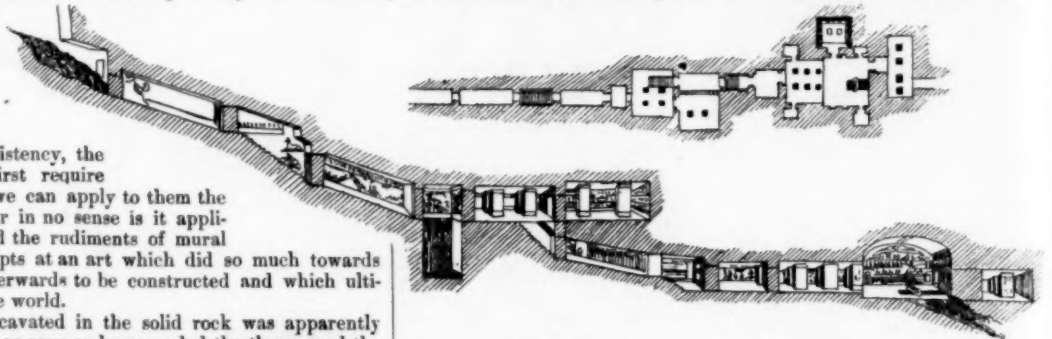
The form of the earliest, the constructed or pyramidal tombs was that of a truncated pyramid. They are called "Mastaba" from the Arabic word signifying sloping-sided tombs and they were nearly all built at an angle of 76°. The so-called "pyramid" of Meydoun is

the one to take as an example. According to Mr. Ferguson the form is of a tower with two small towers rising from its summit. Professor Rawlinson gives as its dimensions a square base 200 feet each way, the sides rising at an angle of 74° 10' in three stages, the first 70 feet high, the second 32 feet, and the third 22 feet 6 inches, built of compact limestone put together with great skill and brought from a great distance. But Mr. Petrie remarks that there are no such things as "step pyramids," "those that appear to take this form are



The Mastaba.—Pyramids of Saccarah and Meydoun.

few in number and are merely unfinished, left rough without the smooth sloping surface of casing-stones; the steps being simply the working platforms, the sides of each tier above the platform being at a far steeper angle than the usual one," and in support of this theory he says, that at the base of the one most step-like of them all, casing-stones may be picked up and actually found *in situ* under the sand. Instead of the pyramid of Meydoun having three stories or working stages, it had five; the present first stage of 70 feet high being the third really, for "not only may the places where the steps joined the existing surface be seen but the lower part of each step-face may be found standing in the rubbish at the base." An historical proof of the existence of these steps formed by the lower faces, is given by Abu-Abdallah Mohammed, quoted by Mikrisi 1400 B. C., who men-



Plan and Section of (excavated) Tomb of Manepthah at Thebes.

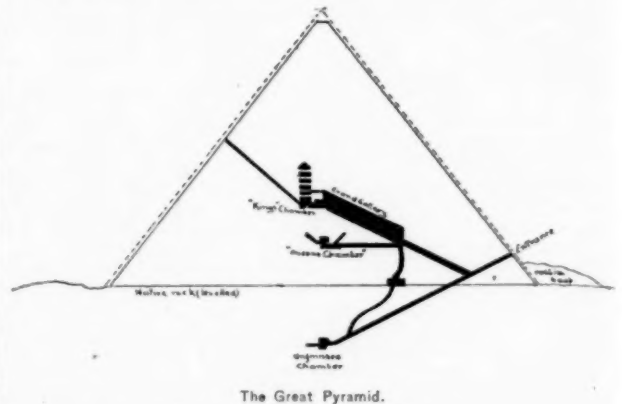
tions a pyramid built with five steps or terraces and called "Meydoun."

There is another of these so-called step-pyramids, or pyramids in process of decay, of which the following are the dimensions (taken from Rawlinson).

First stage	37 ft. 8 in.	Fourth stage	32 ft. 7 in.
Second stage	35 ft. 11 in.	Fifth stage	30 ft. 10 in.
Third stage	34 ft. 3 in.	Sixth stage	29 ft. 2 in.

Making a total height of 200 feet 5 inches. It is much larger than the one at Meydoun being a square of about 375 feet each way, and it is roughly constructed of rubble cased with hewn limestone quarried on the spot.

These pyramids contain several chambers but never have more than one doorway which is always carefully concealed. The pyramid at Saccarah is interesting on two particular counts: First, it is the only pyramid whose sides do not face the cardinal points, and



The Great Pyramid.

secondly, in the interior of one of the doorways leading from one chamber to another, it is ornamented with "green cubes of baked clay enamelled, alternating with limestone blocks."

Of the three great and principal pyramids the largest is the oldest,

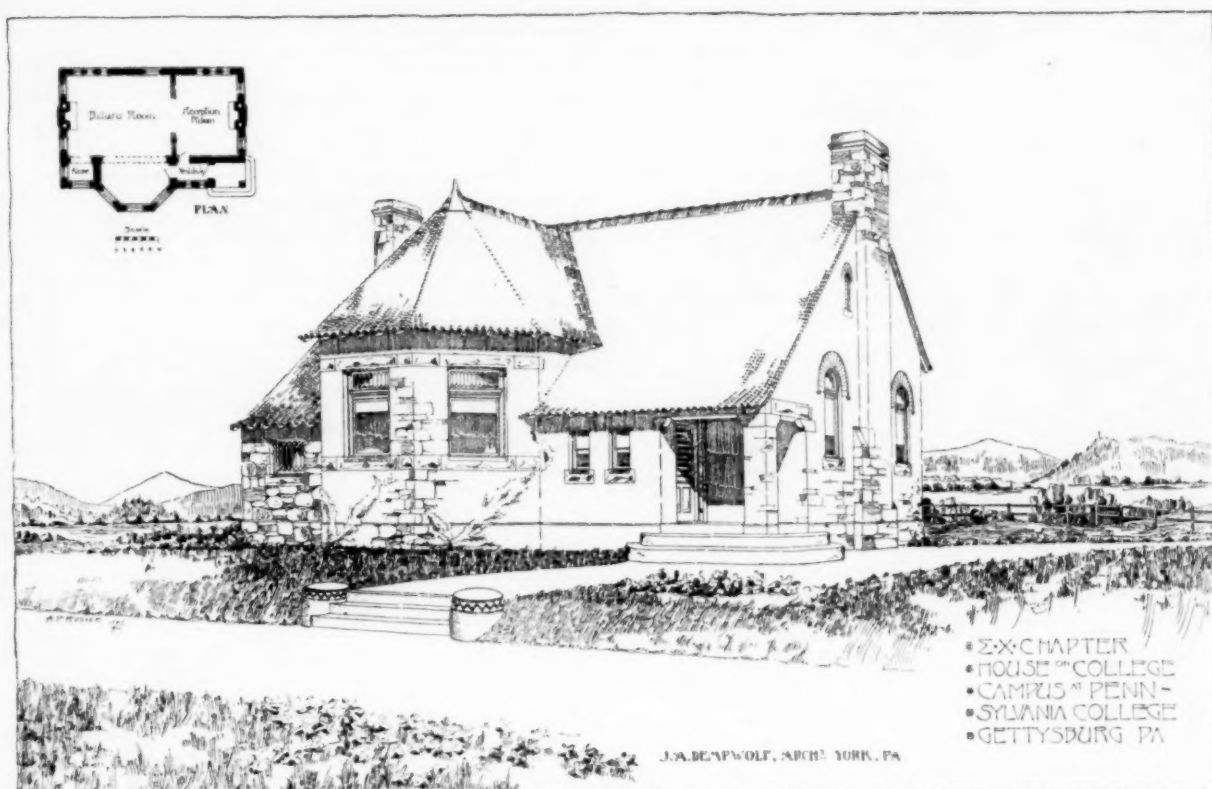
and for a complete description of this wonderful building I must refer the reader to Mr. Piazza Smyth's book entitled, "*Our Inheritance in the Great Pyramid*." This is the fullest work on the subject and enters into the most minute particulars of all the operations conducted by explorers upon and about the building.

The Great Pyramid. This building ever has been and will continue to the end of the world to be the greatest wonder of the world. Its immense size, huge bulk and marvellous construction and the mystery concerning its date and object have given to it an interest that amounts almost to awe. Most people content themselves with the assertion that it was erected for a tomb and designate Cheops as the founder, but there is nothing to prove that he had anything to do with it, and a great deal to prove that it never was a tomb. That it was taken as a model for subsequent tombs does not at all prove that it was a tomb itself. But let us see what the pyramid is so far as can be seen by the eye.

Externally it presents an appearance of a huge, rough pyramid¹ formed of great steps rising to a total vertical height of about 440 feet abruptly terminating in a tolerably level platform. But this is the ruin. Originally it rose to the height of 484 feet and over the rough steps was a perfectly smooth casing of the hardest limestone, polished till it shone brilliantly in the sun, so put together that it was hardly possible to insert a pin's point between the stones. The pyramid stands upon the edge of a cliff over which were thrown the

hanging the one below it, but although the passage narrows in consequence towards the ceiling, it is finished with large and wide flat stones and does not in any way approach the construction of a wide arch. The ceiling stones, too, are unusual in their arrangement; each stone is relieved from any pressure of the stone above it in the sloping ceiling, by its being let into a notch in the side walls whereon all its weight comes, and the ceiling instead of being flat or smooth is made up of a series of "jogs." Half the width of the floor is taken up by "ramps" or as we may perhaps describe them, dwarf walls, forming a dado on each side with curious square sinkings in the upper surface. At the north or lower end of this gallery just where the visitor emerges from the low ascending passage, the floor of the gallery has been removed although the sinking in the floor and the "joist-holes" show clearly that there was originally a floor here that entirely concealed the entrances, first to a "well" that connects with the lower end of the descending entrance passage and having a "grotto" excavated in the natural rock just below the basement stones of the pyramid; and secondly, to a horizontal passage of a little over 100 feet in length that terminates in the "Queen's Chamber" as it is called, and about which we shall have something to say further on.

Almost at the end (the upper end) of the grand gallery the floor abruptly stops against a vertical step three feet high, from the top of which the floor runs horizontally, still southward, through a low



chippings of the stone which themselves amount to a huge bulk. An entrance to the pyramid was discovered high up on the north side, but not before the greatest and almost incomprehensible amount of labor had been expended in forcing an entrance, when by apparently the merest chance the inner end of the entrance passage was struck and the discovery of the entrance itself soon followed. The entrance passage slopes downwards for a distance of 82 feet through the solid masonry of the pyramid, continuing in the same direction for another 288 feet 6 inches cut in the native rock, at which point it turns in a horizontal direction still going south for a short distance, when it terminates in an unfinished subterranean chamber, with a short and smaller passage outlet at the further side. At the point where the sloping entrance passage cuts into the rock, an ascending passage starts from the ceiling of the entrance passage, its mouth blocked by huge blocks of granite, cut exactly to fit the passage, so that as one is taken away another slides down into its place. So hard and enormous are these blocks that a way has been blasted round them and this forced entrance admits to a long ascending passage of about 129 feet. At the end of this first ascending passage, which, like the other passages, runs south, an immense "grand gallery" is entered which rises at the same angle, the floor of which is a continuation of the floor of the first ascending passage. The length of this grand gallery is 157 feet and it is of very peculiar construction and form. The first ascending passage has a height of only 2 feet 6 inches, whereas this grand gallery has a height seven times as great. The side walls are composed of courses of fine masonry, each course over-

passage, the "ante-chamber," another low passage, and finally the "King's Chamber" is reached.

It is quite impossible to describe minutely the singular and interesting details of these chambers, their description would be beyond the scope of this paper and the reader must study these for himself in the works of the author already referred to. In the ante-chamber one feature must be noticed, a sort of portcullis of granite called the "granite-leaf," with a "boss" upon it. The object of this is not known, for there are no grooves by which it might slide down to the floor, although above it is a space into which it might be raised if sufficient force could be brought to bear upon it, and the "boss" would seem to be a projection left on the block of granite under which a prop might be placed to keep up the "portcullis" in its position when raised, but what particular object would be gained by this achievement cannot now be ascertained. Beneath the "granite-leaf" the limestone of the whole pyramid changes for granite, which forms the floor, walls and ceilings of the King's Chamber. This room measures in round figures, thirty-four feet eight inches long by sixteen feet eight inches wide and nearly nineteen feet high. Instead of a coffin it contains only a coffer, seven feet six inches long, three feet four inches wide and three feet six inches high without a lid (outside measure). The ceiling is formed of great blocks of granite over which are piled four tiers of granite blocks with spaces between them, over which are set inclined blocks to relieve them of the superincumbent weight. From the lowest of these spaces a rough passage-way runs horizontally to the top of the higher end of the "grand gallery." This and also the Queen's Chamber are ventilated by means of air

¹ Originally 761 feet 8 inches square or 9,140 Brit inches (see Piazza Smyth).

channels cut or left while building, in the solid masonry; they ascend at a steep incline but their exits have not been discovered.

The "Queen's Chamber" differs materially in form from the "King's Chamber." Its dimensions are eighteen feet two inches long, sixteen feet six inches wide and fifteen feet five inches high to the top of the walls and twenty-one feet to the apex, for the ceiling is formed by inclined stones. We have mentioned the unfinished floor and the blocked exit passage, the entrance and the ventilators; the only other feature is a niche roughly hollowed in the east wall but with the sides cut sharply and the courses overhanging like those of the grand gallery. This concludes the catalogue of the interior apartments of the Great Pyramid, but so marvellous are its constructive arrangements, its measurements, forms, workmanship, that the theory of Divine intervention in its design and execution seems to be well borne out. The immense bulk, the quantity of material, the time expended upon it, the labor of cutting and fitting and setting the huge blocks of granite and limestone, the number of men employed, all these items, as we think of them, cannot but fill us with amazement and call to our minds the text "The Lord of Hosts" . . . "which has set signs and wonders in the land of Egypt, even unto this day." (Jer. xxx: 18-20.) We have but to read Professor Piazzi Smyth's book to perceive there is something more in this great pyramid than appears upon the surface of what we can see. The astronomical conclusions to be drawn from it, the geometrical problems that are worked out by it, the standard of weights, measures and capacity contained in it, all prove or go to prove that man was but an agent in the building of this wonderful pile.

R. W. GAMBIER-BOUSFIELD.

[To be continued.]

FIRE PROTECTION OF PUBLIC LIBRARIES.



"All the Modern Improvements"—No. 20.

IF there is one place more than another in which the results of a fire are irreparable, and therefore ought to be guarded against with the greatest care, it is a public library. We mean, of course, more especially such national collections of books as those at the British Museum or the Bodleian at Oxford, of which several exist in every civilized country and not the small libraries which are springing up here under the recent act in all parts like mushrooms. The loss of the latter, if adequately insured, would not be at present a greater calamity than the loss of equal monetary value in any other shape, though in process of time, as donations of valuable books, etc., are made to these institutions, each one will possess what could not be easily replaced in the event of its destruction. Our remarks apply more particularly to national collections which, once destroyed, could never be reinstated as far as the greater part of their most valuable contents is concerned. It is unfortunate that manuscripts and printed books fall so easily a prey to fire as they do. A blaze once started amongst them is almost certain to involve the whole of the contents of the room in which it breaks out in a very short time, and very likely, ultimately, the whole building.

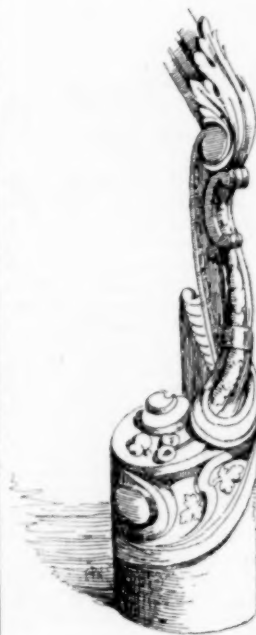
It is important to note how many valuable libraries have been destroyed. We will not go back as far as the burning of the great library at Alexandria, but only to the invention of printing. In 1440 the library of the Greek Monastery of Megaspilæon was totally destroyed, and after its restoration was again burned in 1600. The Augustinian Library at Mainz suffered the same fate in 1649, and 1671 a part of the great library of the Escorial at Madrid was destroyed. The library of the Canons of St. Antonio at Venice was burned in 1685, and the Royal Library of Stockholm in 1697. In October, 1781, King's and Cottonian Libraries were partly burned at Ashburnham House, Westminster, whither they had been removed in 1730 for greater safety. These libraries were the original nucleus of the British Museum collection. Out of 958 manuscripts 97 were burnt outright, 105 were partly charred and many more scorched. In the same year, also, the Archducal Library at Brussels and all the State records in the Royal Chapel were burnt. At Bonn the Electoral Library, which was formerly at Köln, was involved in a fire in 1777 and in 1812 the great library of Moscow was licked up by the conflagration which destroyed almost the whole city. A big blaze in 1827

destroyed the University and Cathedral Library of Abo (Finland) and its 40,000 volumes. In 1873 the Manchester Athenæum Library and the collection of 19,000 books was destroyed. The Birmingham Free Library was utterly destroyed on January 11, 1879. Of this the reference part contained over 50,000 volumes. With it went the great Shakespeare Memorial Library, the Staunton and the Cervantes Libraries, making altogether the most mournful and irreparable loss the literature of modern times has ever experienced. The sale value of the contents was estimated at £60,000. In 1879, also, the great Geographical Library at Irkutsk was totally destroyed. A fire which resulted in the loss of every volume in the collection, which was the most valuable in Wales, occurred in 1885 at the Aberystwith Welch University Library. During the present year there have been two fires which involved the total demolition of the contents of the great Art Library of Laeken and of the University of Toronto. This list does not include valuable collections belonging to private individuals, amongst the large number of which might be mentioned Lord Mansfield's, burned during the Gordon riots, Lord Chancellor Somers' collection of manuscripts, which was lost at Lincoln's Inn in 1752, and many others.

A few very simple precautions would place, at least, all the more valuable manuscripts and printed books beyond danger, even in cases where the whole of a large collection could not be adequately protected without great expense. But if a collection is worth anything at all surely it is worth placing in a fire-resisting building in which it is certain that no fire can spread from one apartment to the other. The various rooms should be as small as is consistent with convenience, and each should have a small fire-hydrant and a hand-pump, and buckets which should never be removed from it. No part of the main block of the institution ought to be occupied as a dwelling-house or used as offices. With these precautions there would be no reason to restrict the opening of the libraries to the period of daylight only; they could be with safety opened in the evenings, at least those rooms could be in which ordinary books are kept. But all unique or costly works should be kept in apartments in which no artificial light is allowed under any circumstance. This is really the one and only way in which their complete safety can be assured. A regulation of the kind is in force, we believe, at the Bodleian, which we may remark in passing, is housed in a building that could not be considered fireproof or reasonably fire-resisting by the greatest stretch of imagination possible.

Several attempts have been made from time to time to devise a method of treating paper for the purpose of rendering it capable of defying up to a certain point the attacks of fire. This does not appear in itself to present any very great features of difficulty, but somehow, either because of the effect upon the printing qualities of the paper, or its appearance, or because of the expense, or the prejudice of the trade, paper so treated has never been used, that we are aware of, in any printed book. If it could be generally introduced it might reduce the damage caused by small fires. He would be a sanguine man indeed who hoped to invent a paper which would resist the effects of a conflagration.—*The Fireman (London).*

THE TOPOLOBAMPO COLONY.



Hand-rail.

SOME six years ago Mr. A. K. Owens wrote a book, out of which grew a coöperative movement to found a colony and city at Topolobampo, on the Pacific Coast, in the province of Sinaloa, Mexico. Mr. Napoleon Hoagland, who has just returned from a visit to Topolobampo, has this to say about the colony as it is at present:

During the entire time that the colony has been on the ground, now nearly four years, it has had no home or permanent abiding place of its own. Strictly speaking, the history of the Credit Foncier Company's attempt is neither for nor against the successful working of "integral coöperation," the original and basic principles of the company. Mr. Owens has himself declared that no part of his plan had yet been tried. Director Wilber, Chairman of the Resident Board of Directors, tells me that the original plan of coöperation "had neither been tested nor marred." The colony has been an exemplification, not of integral or entire coöperation, but of a mild or partial form of communism. For instance, they have had equal wages for equal numbers of hours' work. The ox-driver and the skilled cabinet-maker receive equal pay for a day's work. The pay consists in labor checks or company credits, and are on the basis of \$3, or three "units of account," for eight hours' work. These are

exchangeable only through the company for the labor or the labor products commended by the company. The colony is not in debt, but it has very little money. At present there are only about 130 people in the colony. This includes women, children and invalids. There are perhaps thirty or forty able-bodied productive workers. In such a small community it is impossible for it to become self-supporting without exchanging products with the outside world. Consequently, for the purchase of such commodities as are not produced by the colony, the labor checks are worthless, for the colony has produced very little to sell to outside markets. It has been estimated that from \$100,000 to \$300,000 worth of labor "credits" have already been issued. Nevertheless, I am told that their value, once very low, is now on the increase. The "credits" have always paid for food either at the company's store, at the public restaurant, or at the private tables. They have always been receivable for wash-bills, and have paid educational and school expenses. They are "legal tender" for printing, subscription to the colony newspaper, and photographs in limited quantities. They pay for making or mending clothes, boots and shoes, for jewelry work, for a physician's care and medicine, for music for social occasions, and in fact for any services that one member can do for another, from the making of a loaf of bread to the building of a house. The people have no house-rent to pay. They own their own houses. They pay for them in their own labor, where they do not build themselves; then, too, they have no taxes to pay. The company, by special concession, is not taxed for a period of ten years, but after that time the individual member has no tax to pay, for the company pays the taxes. The social life of the colony has been its chief beauty and charm. The morals of the community have been quite superior. The people did not advertise themselves as "saints." They declared on the other hand that they meant to get along without priests and churches. The leaders do not mean by this that they intend to get along without paying any attention to religion. Lawyers and secret societies are also tabooed. They hire their doctor by the year. He is at least expensive when people are the healthiest. It is not to his pecuniary interest that any one should be sick. It is to his financial interest that all the colonists should keep well. There has been no police, no jail, no calaboose, no exchange of blows, no theft or robbery, no seductions, no wife-beating, no drunkenness to speak of. Drinking intoxicating beverages, smoking or chewing tobacco, cruelty to animals, profanity and indecent language are unpopular, among the men as well as among the women; hence one sees as little of any of those vices as he would find at a well-regulated Sunday-school picnic. The life in the colony resembles nothing so much as a long-drawn picnic where excesses have been avoided, but where the ice-cream and cake have all been consumed. The grounds where the houses stand at La Loggia with their thickets and bowers of fragrant flowering vines, bushes and trees and winding paths and open spaces, seem not unlike a park run wild. Fully one-half or two-thirds of the people on the ground came during the first year. They came to stay. Very few would return to remain if their expenses to the States were free to them. They like the climate, the country, and the life, though they have suffered many privations. The coming year will decide the fate of the colony, whether "it is to be or not to be." During that time there is every reason to hope that a permanent organization will be effected, on a solid basis, the organization now in force being but a temporary makeshift, with but little authority and little to support it. — *Globe-Democrat*.

TOWNS SEWERED ON THE FRANCHISE PLAN.

JAMES A. BRADLEY, of Asbury Park, N. J., writes to the *Engineering and Building Record* in regard to private sewerage of towns, referring to a recent editorial in which it was said: "Let us take the case of a small city, not closely built, but having a large proportion of its houses standing each in its own separate yard, a cesspool city where kitchen and laundry wastes are largely disposed of in the gutters, and the excreta in leaky cesspools and privy vaults; a city, moreover, which is more or less in debt, and in which it is almost, or entirely, impossible to secure the passage of the necessary laws to provide by taxation for the construction of a proper system of sewerage on account of the opposition of certain property holders, the exigencies of 'practical politics,' so-called, etc." Mr. Bradley says that Asbury Park was situated much in this way, and continues:

The writer of the article in your paper grasped the situation exactly. As you are no doubt aware, I was the founder of Asbury Park. In an unfortunate hour I was seized with an ambition to become the founder of a town. The enterprise became a grand success, so far as the growth of a town was concerned. I knew very little about sewerage or disposal of house waste, but, as a practical man, I soon learned to my discomfort the terrible effects of the deadly cesspool, with its adaptability to contaminate air and water. The people were not prepared to go to the expense of sewerage, and the Borough government was as ignorant as the people on the subject. One of two things had to be; either have the town recede from its rapid progress or put in sewers at private expense.

I chose the latter plan, and so commenced a system of sewers that have effectually made our town, with the addition of an abundant supply of water, one of the most desirable seaside resorts in the country. I invested in sewers between \$50,000 and \$70,000. I paid nothing for the franchise. I was opposed by the people, especially

those who were afraid they would be compelled to connect their premises with the street-mains. I met from the ignorant all sorts of opposition, but as soon as the worst opponent found it necessary to connect with the sewer to enable him to get good tenants, he became a sewer champion, and then was ready to abuse his neighbor for retaining the cesspool.

I charge about \$6 for an ordinary house connection; next year the price will be \$5. We discharge into the sea about 400 feet from the shore. Our pipe is carried out under what is known as the "Fishing Pier." We have a large brick receptacle under the beach, properly ventilated, to enable us to withhold the flow for a short time if it is necessary. It is on the beach where we suffer much damage every winter; our pipe is damaged, joints opened, etc. In May, usually, our men, clad in bathing suits, battle with the breakers, readjust the pipe, and get everything ready for summer business. (The outflow when the pipe is broken is close to the beach, which in winter gives very little trouble.)

Allow me to say, in closing, that not more than 5 per cent of the 850 houses in Asbury Park still use the (now) water-tight cesspools as per health ordinance. All franchises for sewerage, in my opinion, should contain a clause that the town may, upon due notice, purchase the works. My ownership does not pay because of our annual seasonal outflow damage. The same investment in an interior town, discharging into a river, might pay; but I would like very much to close out my sewer interest at a loss.



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

MOSAIC CAPITAL IN THE CATHEDRAL AT MONREAL.

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

DESIGN FOR OFFICE-BUILDING ON F ST., WASHINGTON, D. C. MR. LEON E. DESSEZ, ARCHITECT, WASHINGTON, D. C.

It is the intention to build the front of granite; the structure to be fireproof throughout. The estimates for the building complete run in the neighborhood of \$110,000.

STORE AND OFFICE-BUILDING FOR B. BURGUNDER, ESQ., WILKES-BARRE, PA. MR. M. B. HOUP, ARCHITECT, WILKES-BARRE, PA.

COMPETITIVE DESIGN FOR THE MIDWAY HOTEL, KEARNEY, NEB. MESSRS. FOSTER & PULIS, ARCHITECTS, KEARNEY, NEB.

HOUSE FOR FREDERICK GOETZMANN, ESQ., ROCHESTER, N. Y. MR. OTTO BLOCK, ARCHITECT, ROCHESTER, N. Y.

SIDEBOARD AND MANTEL IN THE SAME HOUSE.

AEROPLANE OF DR. DE BAUSSET.

[Additional Illustrations in the International Edition.]

A HOUSE IN NIMES, FRANCE. M. CHARLES GARNIER, ARCHITECT.

[Photogravure.]

As this building has been designed by its author for his own use and habitation, this plate and the others of the series which will follow, will have a special interest for architects.

A VILLA AT FRANKFORT-ON-THE-MAIN, GERMANY. MESSRS. CHYLIUS & BLUNTSCHLI, ARCHITECTS.

[Gelatin Print.]

BATHING ESTABLISHMENTS, 14-15 KURFÜRSTEN ST., DRESDEN, GERMANY.

[Gelatin Print.]

THE ARRIVAL OF THE BRIDE.

FRENCH artists, when they paint marriage scenes like those we have so often illustrated, are obliged to avoid everything which might suggest that they had adopted aristocrats for subjects. In Belgium there is no such restriction. M. Dell'Acqua of Brussels, has been allowed to realize incidents of the marriage of a Venetian nobleman. In the painting we illustrate this week, the bride is

brought to her husband's house on the mainland, and in the companion work she is shown as presented to his friends and retainers. The author is one of the best known of Belgian painters, and he has gained reputation by the refinement and skilful composition which is seen in all his pictures.

NORTH DOOR, WEST FRONT, CORK CATHEDRAL. THE LATE
W. BURGESS, A. R. A., ARCHITECT.

CENTRE DOOR, WEST FRONT, CORK CATHEDRAL. THE LATE
W. BURGESS, A. R. A., ARCHITECT.

ST. JUDE'S CHURCH, KENSAL GREEN, LONDON, ENG. MR. JOHN T.
LEE, ARCHITECT.

This church has been erected as a memorial to the late Mr. Benjamin Shaw, and consists of a nave 40 feet wide, the side aisles being used only as passages, the north transept forming an organ-chamber, with a south transept for children, and vestry adjoining. The chancel has an apsidal termination, which forms the sacristy. A large mission-room is built abutting on the south side of the church, and is arranged so as to be divided into class-rooms. The materials used consist of red brick facings with Bath stone dressings, the roofs being covered with tiles. The work has been carried out with a total cost of £6,500.



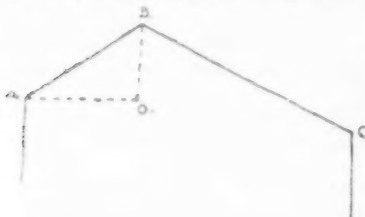
[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

A PROBLEM FOR ARCHITECTURAL STUDENTS.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — Allow me to suggest a problem for architectural students, the geometrical solution of which may be a useful exercise.

It is one that occurs often in practice — to outline a gable with equal slopes, but with eaves of unequal height, thus:



Probably it is oftenest done by laying off lines of equal pitch from A and C, and letting the intersection B come where it will. But we may want to give the ridge B a given height, and then it is susceptible

of a simpler and more precise determination. The points are two:

- 1st. To find graphical construction where the height of B is given.
- 2d. Is the horizontal distance A O the same for different heights? and if so, where is O? If not, the distance A O becomes a possible condition of the construction.

W. P. P. L.



THE AMERICAN CHURCH AT ROME. — It is typical of our provincialism, and especially of the weakness of Americans resident abroad, that the Protestant Church of the Holy Trinity erected in Rome by Americans should have been designed by an Englishman, the mosaics supplied by an Italian, and the cartoons for the mosaics made by Burne Jones of London. It need hardly be said that the church is an ugly one, for Street, the architect, though he had great fame in his own country, was a man of education and industry without a spark of genius. The cartoons by Burne Jones resemble in many respects the art of the Middle Ages, particularly the formality and stiffness in mosaics, stained-glass and early paintings of the Byzantine school. The figures do not stand on their feet, but are pinned up, with legs hanging straight down and unnaturally small feet brought close together. This intentional medievalism is greatly admired by those who delight in Burne Jones; others detect it as affectation and consider that very remarkable painter a weak artist. The Salviati mosaic in which these cartoons are wrought is not very satisfactory as regards color, which should be its strongest point. Altogether, it would have been far better had the architect been chosen in the United States. As to stained-glass and mosaic, we have artists here whose work in these materials cannot be approached by Europeans. When Meissonier was taken to see the stained-glass which very imperfectly represented our best men at the Universal Exposition, he testified before the committee on awards that it was finer than he believed possible, that there was nothing so good to be seen anywhere. Not wishing to hurt the feelings of the French glassmakers, the most eminent of American exhibitors of glass,

John La Farge, was not awarded the high medal his work deserved, but received the Legion of Honor. Yet the church which represents American art in Rome is built and decorated by foreigners. Why not sell it to the English congregation and have a building that is American for better or for worse? — *N. Y. Times*.

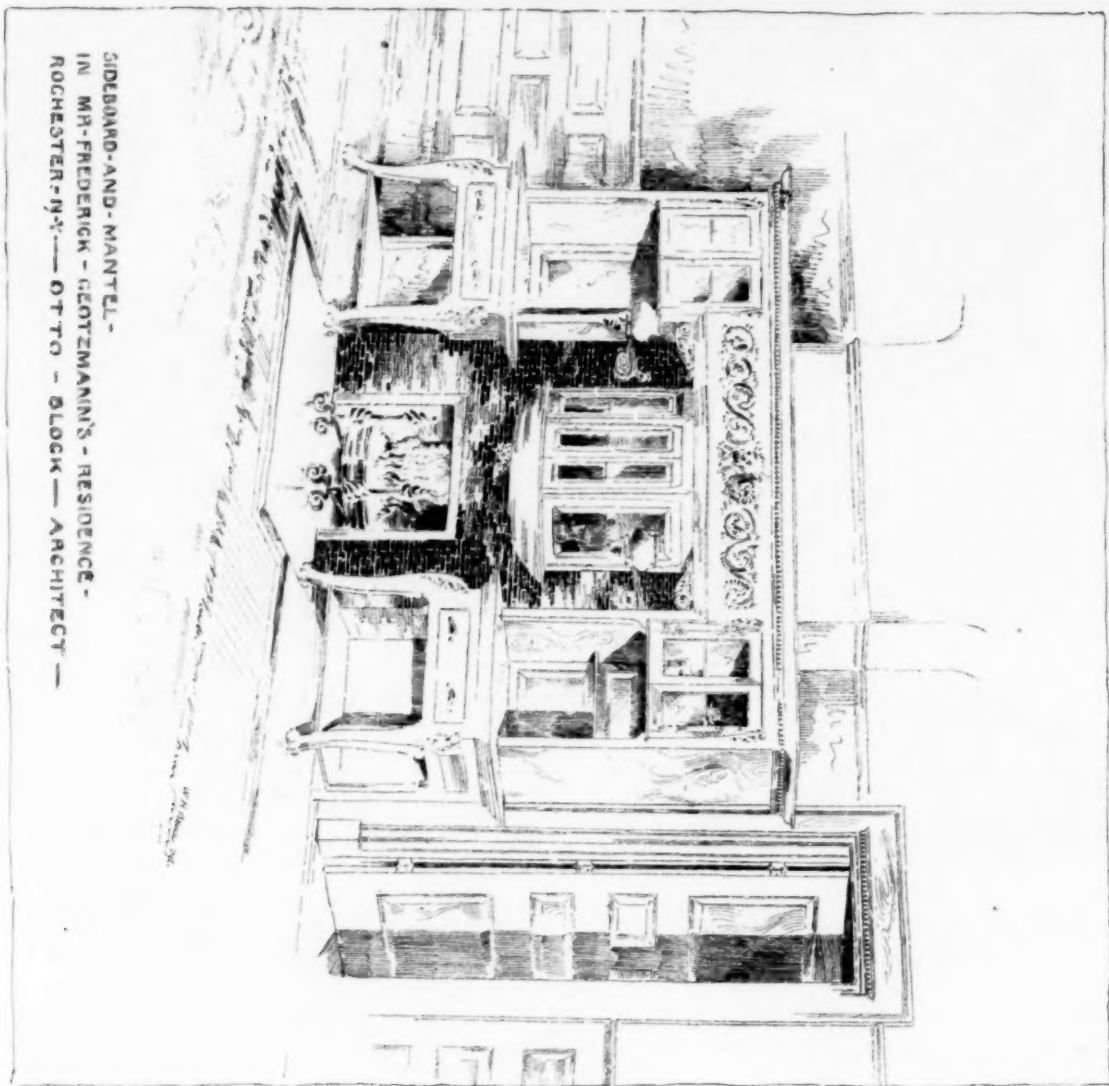
THE WATCH AS A COMPASS. — A few days ago I was standing by an American gentleman, when I expressed a wish to know which point was the north. He at once pulled out his watch, looked at it and pointed to the north. I asked him whether he had a compass attached to his watch. "All watches," he replied, "are compasses." Then he explained to me how this was. Point the hour-hand to the sun, and the south is exactly half-way between the hour and the figure XII on the watch. For instance, suppose that it is four o'clock. Point the hand indicating four to the sun, and II on the watch is exactly south. Suppose that it is eight o'clock, point the hand indicating eight to the sun, and the figure X on the watch is due south. My American friend was quite surprised that I did not know this. Thinking that very possibly I was ignorant of a thing that every one else knew, and happening to meet Mr. Stanley, I asked that eminent traveller whether he was aware of this simple mode of discovering the points of the compass? He said that he had never heard of it. I presume, therefore, that the world is in the same state of ignorance. Amalfi is proud of having been the home of the inventor of the compass? I do not know what town boasts of my American friend as a citizen. — *Labouchere in London Truth*.

TO TEST THE CONTRACT-LABOR LAW. — District-Attorney Milchrist, of Chicago, on behalf of the United States, has filed an information in the United States Circuit Court against Moreland & Beaton, builders and contractors, to recover \$1,000 damages under the law prohibiting the importation of laborers from foreign countries. The firm is accused of importing one Phelan, a carpenter, from Canada during the recent big strike of carpenters in Chicago. This is to be a test-case, it is understood, many other aliens having, it is alleged, been imported during the strike. — *N. Y. Evening Post*.

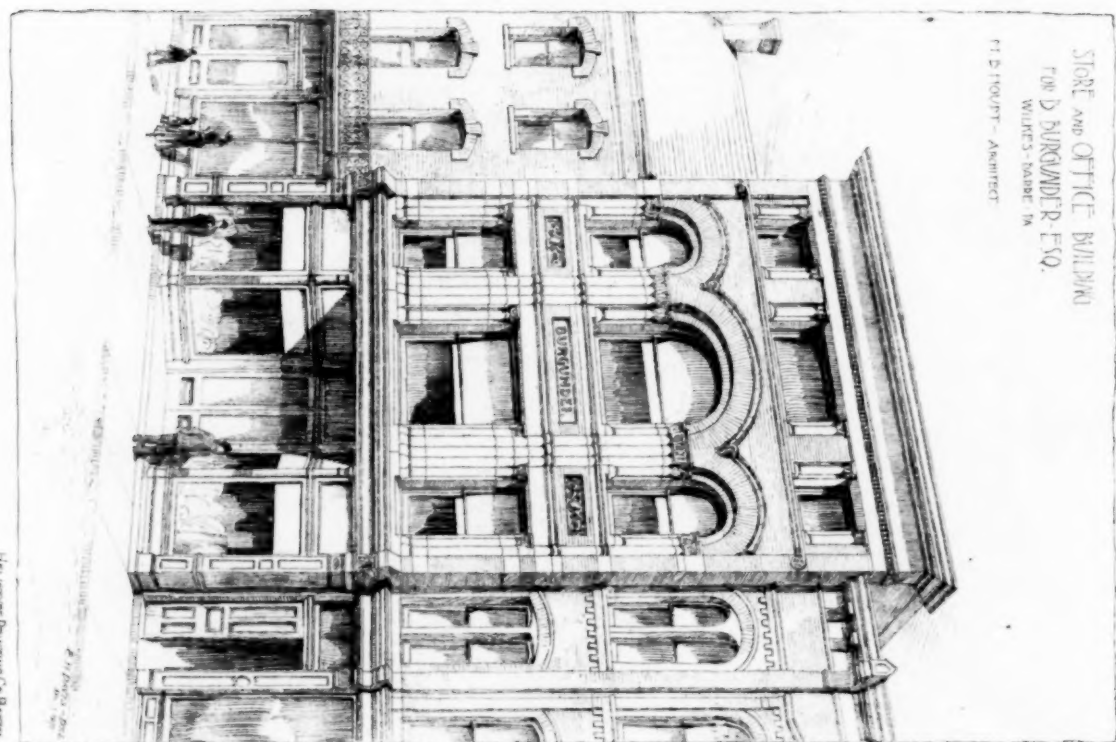


A MULTITUDE of facts and statistics, railway, commercial, manufacturing, financial and otherwise, have recently been gathered and presented to the public, with the view of strengthening confidence in the future course and character of business. Much of the material gathered is quite interesting, and it is valuable because it is exact and correct, being based on facts and the unbiased judgment of experts. It is very well that such an investigation has been made just at this time, when men's minds are not very clear as to the merits of recent tariff legislation, and when confidence in freedom from future stringencies is not very sound. The results arrived at are, in brief, these: that fully ninety per cent of the investments of the past three years either are at present productive, or are on the right road; that there is a rapid decline in the mileage of non-dividend paying railroads; that while there is an extraordinary increase in listed and non-listed stocks and securities the safe limit has not yet been exceeded, although it is not intended to convey the impression that losses will not occur. The great bulk of investments are safe and wise. There is a steady and gradual appreciation in the value and productivity of agricultural land. It is also ascertained that a very large area of land will be reduced to cultivation within the next two or three years, which is due largely to the fact that railway development has recently many times multiplied the amount of land whose products are within reach of profitable markets. For a while it was thought farming lands in the New England and Middle States would decline to extremely low limits in value, but a reaction has already set in. The fact is dwelt upon with satisfaction that there is a rapid growth in the volume of business transacted without the use or aid of currency. Another result reached, at least to the satisfaction of the financial inquirers, is that the added supply of other than gold money is producing good fruits, and is helping to open up newer fields. These conclusions have been arrived at by persons who have no desire to drag the public into a speculative movement, but whose only aim is to calmly survey the field for their own benefit, having extraordinary interests to serve and subserve. The railroads are doing a heavy business, and already there is a cry of a scarcity of cars. Manufacturers are generally very busy, and that, too, on orders for immediate rather than remote delivery. Shops, especially in the West, are crowded with work. Interests engaged in supplying farmers' wants have all they can do. New England hardware and machinery interests have no fault to find with the volume of business nor with prices. There is not that destructive competition that in times past has characterized trade when it was subjected to ups and downs. The growth of powerful combinations is a necessity of the hour, much as we may preach against it. That evils should manifest themselves in the infantile efforts of a new system to establish and develop itself is not to be wondered at. The iron and steel makers are expanding capacity. Pipe-line and bridge-builders are two of the busiest users of iron. The coal trade has taken a fresh start, and buyers everywhere are anticipating for the winter. Steps are being taken to utilize the vast lignite deposits of the Northwest for both domestic and manufacturing purposes. Architects, especially those coöperating with civil engineers, report an increase of enterprises calling for very large investments. As a result of much investigation of those at the head of the great interests throughout the country, it may be confidently asserted, as it has been heretofore intimated, that the coming season will mark the opening of an era of extraordinary operations and investments. Whether this is a development to be heartily welcomed is to be doubted. Gradual development is safer. Many things have arisen during the past seven or eight years to check enterprise and make men think before forging ahead. Too rapid growth on a narrow financial basis is dangerous. But, if there are dangers, they are being studied, or rather, sought out. The moneyed interests of the country will not tolerate periodical upheavals in the interests of politicians if they can help it. A mighty public sentiment is arising that will act as a bulwark against this evil. Two years ago the bankers took the granger railroad managers by the throat and shook them, and a similar power is gathering itself together to act as a vigilance committee in other directions.

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SIDBOARD-AND-MANTEL-
IN MR-FREDERICK'S-RESIDENCE-
ROCHESTER-N.Y.—OTTO—GLOCK—ARCHITECT—

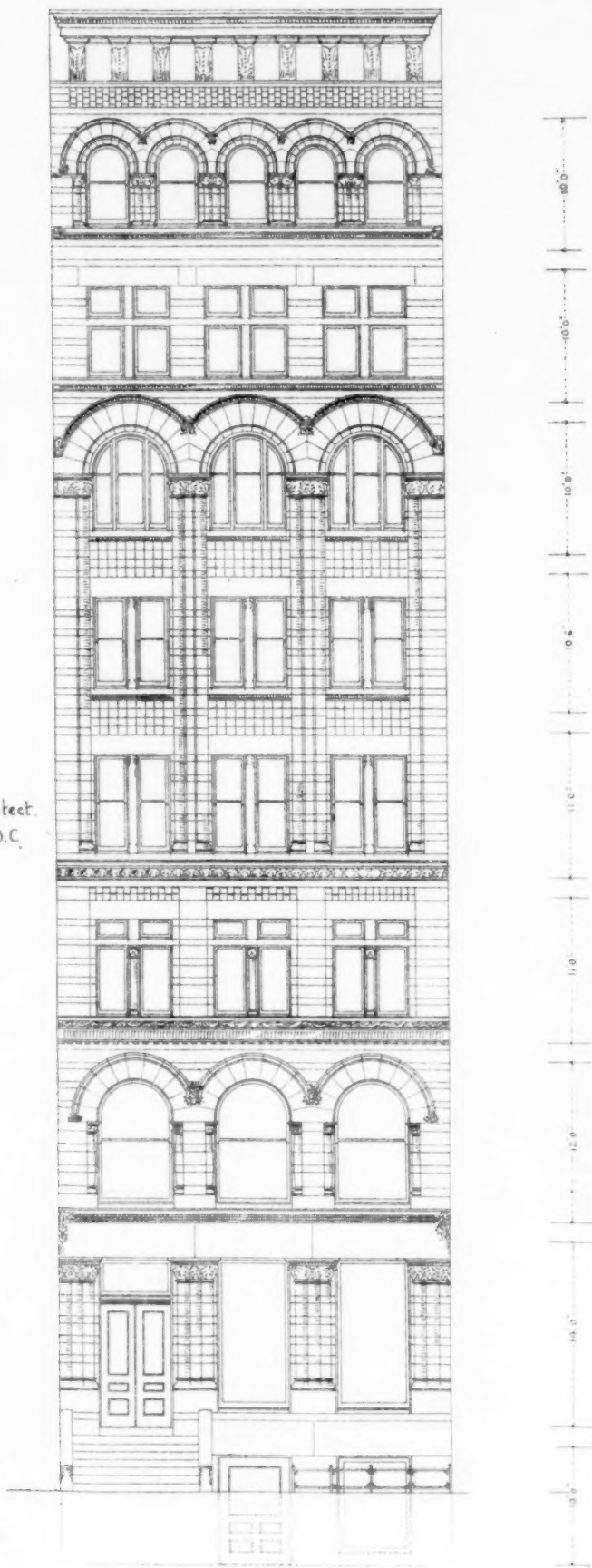


STORE AND OFFICE BUILDING
FOR D. BURDETTE & CO.
WILKES-BARRE, PA.
F. D. FROST—ARCHITECT

Helwig & Pottmann Co. Boston.

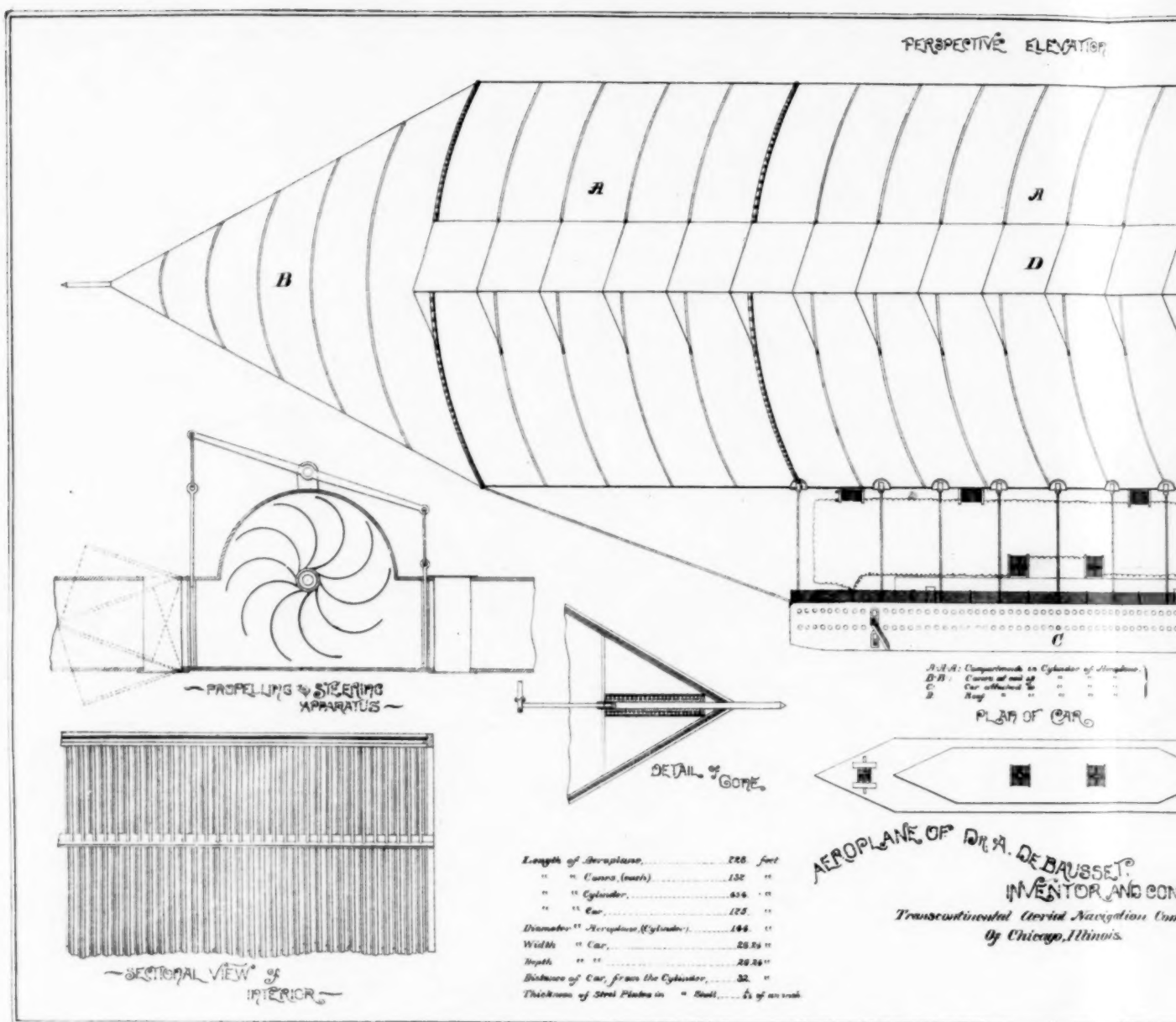
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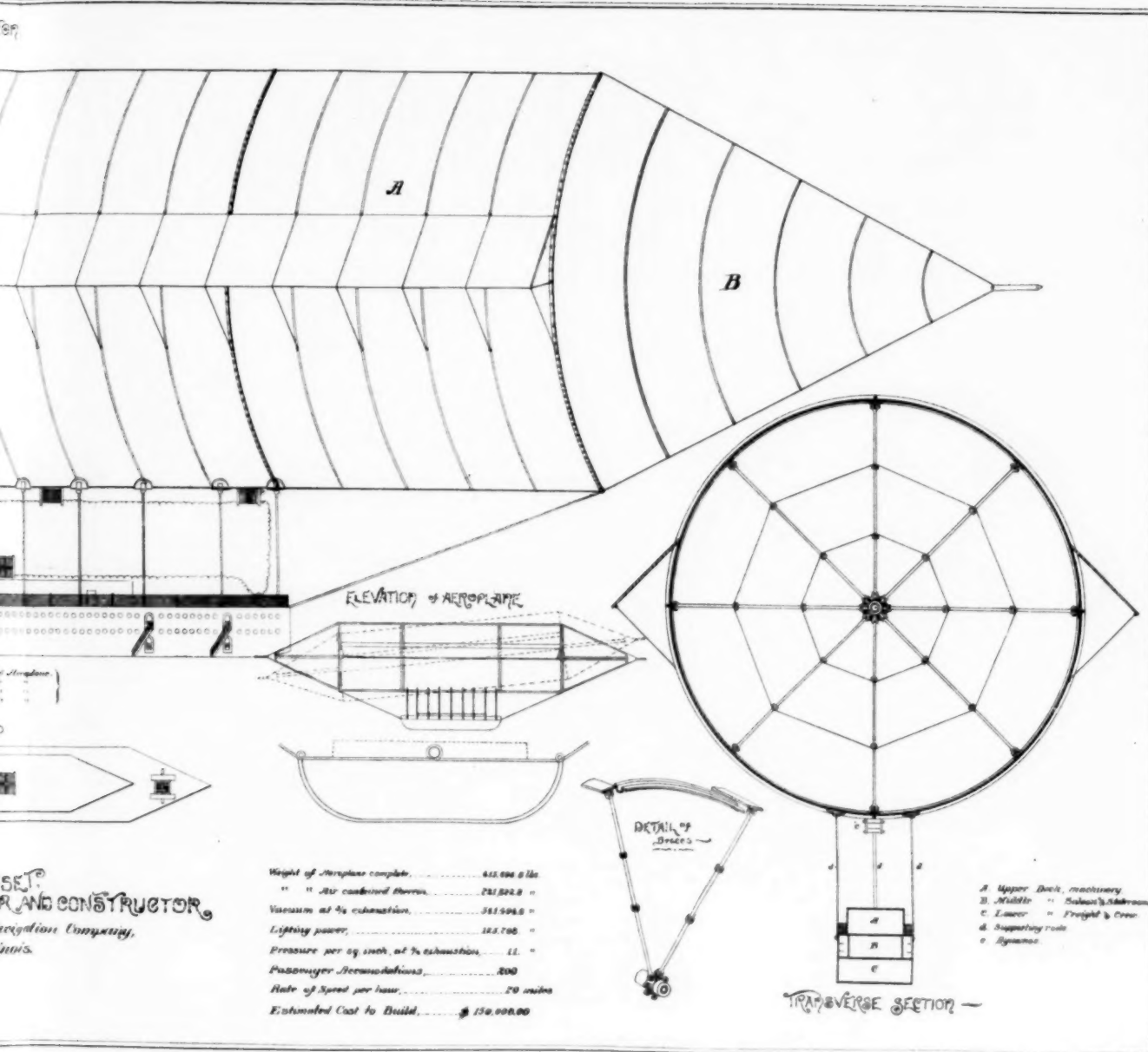
Léon Edesze,
Architect.
Washington D.C.



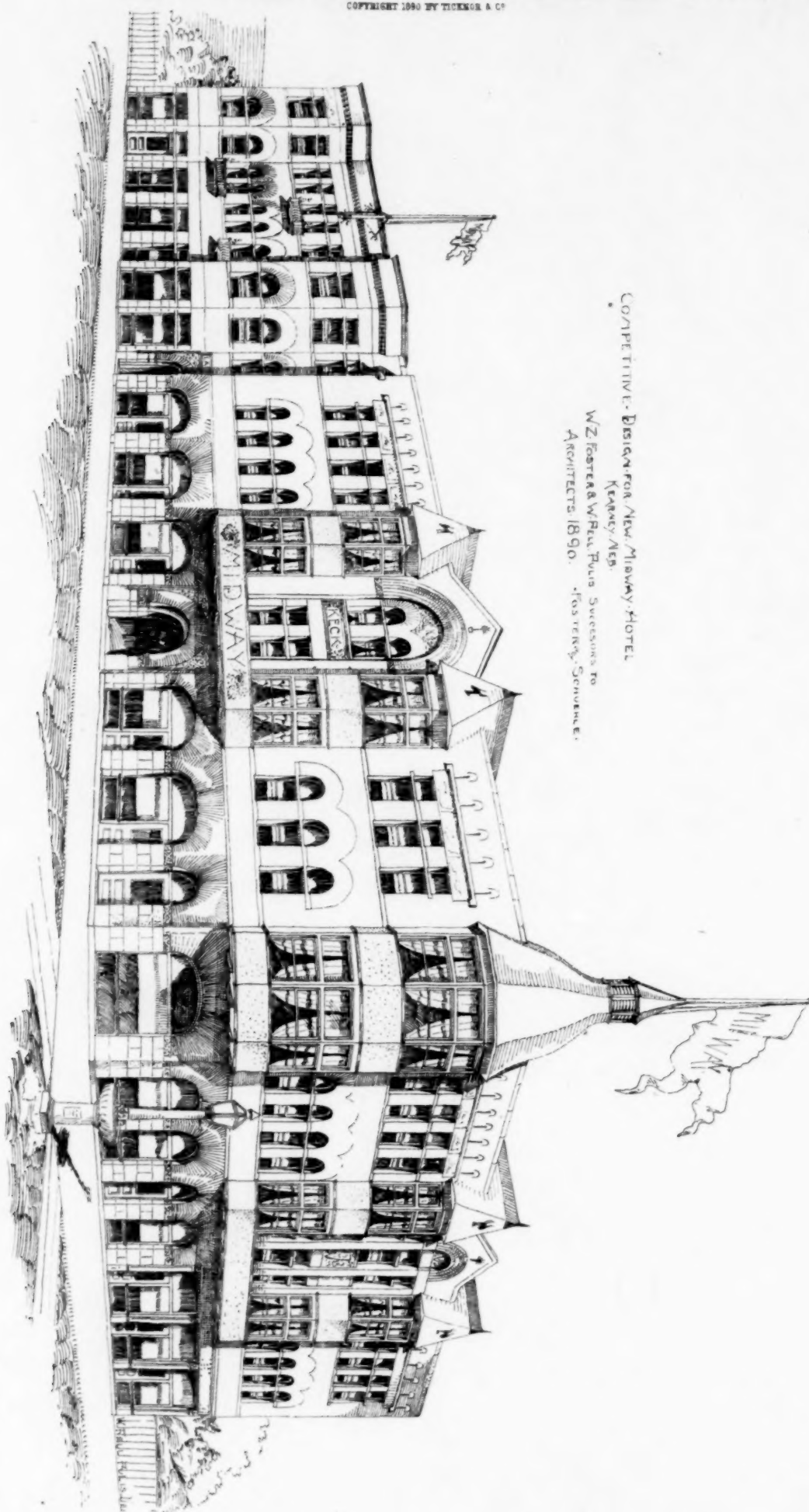
Design of a Proposed Office Building on F Street N.W. Washington D.C.

HELIOTYPE PRINTING CO. BOSTON.





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COMPETITIVE DESIGN FOR NEW MIDWAY HOTEL
 KEANEY, N.Y.
 W. Z. FOSTER & W. R. FULTON, SUCCESSORS TO
 ARCHITECTS 1890. FOSTER & FULTON, SEVERANCE.

RESIDENCE ON HYDE PARK, ROCHESTER, N.Y.
FOR MR. FRANK GOETZMANN.
OTTO BLOCK,
ARCHITECT.

