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THE official engineers of the city of Paris have been considering the best means for abating the pestilential odors which have now for three summers afflicted the inhabitants of the town; and with true French thoroughness and caution, a "commission d'hygiène" has been appointed to criticise the suggestions of the official body. The recommendations of the latter, though simple enough when compared with the measures adopted in other large European communities, seem very radical to the Parisians, wedded as they are to the idea that their sewerage system possesses merits proportionate to its enormous costliness, and it is likely that the "commission d'hygiène" expresses the feeling of a large part of the population. The municipal experts, in brief, propose to abolish all the house cesspools and vaults in the city, with their unpleasant accompaniments of open shafts, ventilation pipes, extraction doors, and cleansing service, with the auxiliary manufactories of fertilizers which surround the city, and receive all house-wastes of every kind into the sewers, which at present convey little else than street-washings; supplementing the increased discharge by a copious flushing, and providing for the final purification of the outflow by irrigation. The objections raised to this scheme are much the same as those with which the early irrigation schemes were received in England a dozen years ago. Typhoid germs, say the defenders of the present system, may be carried through the sewers from a single infected house throughout the whole city; or if the drains are tight enough to prevent their escape, they are liable to be disseminated through the soil of the irrigated fields, and perhaps carried by earth-worms over the vegetables grown in it, to be conveyed back again to the town. *La Semaine des Constructeurs* indulges in a little ridicule of this notion, but it is only fair to say that notwithstanding the complete absence of any evidence that disease has ever been conveyed by such means, the great Pasteur, if the accounts in the scientific journals are to be credited, not only believes that such conveyance is possible, but asserts that in the case of some extremely malignant diseases of cattle, the corpses of dead animals, buried with all precautions, may so infect the soil that the grass grown over their graves a year afterward will communicate the same contagion to healthy individuals. However that may be, *La Semaine* is at least right in saying that no more danger, at the worst, is to be feared from this source than from the kind of manuring which is universally used in the market-gardens which surround Paris, as well as in those supplying all the other large cities of the world. To the objection that the present sewers have too small a pitch to carry off the increased flow, the municipal authorities return the unanswerable reply that their lowest gradient is steeper than that of some London sewers, while the average is much more than sufficient to give all the velocity required. That the sewers are too large to do their work to the best advantage is, according to our ideas, certain, and frequent cleansing will be needed as soon as the *fosses* of the crowded city are replaced by drains, so that it is not impossible, during the delay caused by the conflict of expert opinion, that a better scheme than any yet proposed may find an opportunity for serious consideration. Especially where irrigation is to be the final disposition of the

wastes, the advantage of reducing their bulk and increasing their rate of flow, by confining them in small tubes, is very great, and the eminent European engineers who advocate the adoption of small pipe drains for city house-service will not fail to call the attention of the French authorities to the facts of the case.

OUR readers will remember the competition for the new Municipal Buildings of the city of Glasgow, which ended in so unsatisfactory a manner, the assessor finally reporting, not only that none of the designs which he regarded as possessing the highest artistic merit could be built for the specified sum, but that this sum itself was inadequate for the construction of buildings such as the city needed. After much discussion, the town authorities seem to have come to much the same conclusion, and have ordered a new competition, upon terms which may be commended as very nearly perfect in fairness toward all parties. Following the method now coming into general favor where the attempt to secure the best possible design for an important building is seriously made, two trials are to be held. For the first, or preliminary competition, sketches only are invited, drawn to a scale of twenty feet to the inch, and including only three floor-plans, four elevations, two sections, and a perspective view. This preliminary competition is open to all persons. Before any drawings are received, the magistrates and council will appoint one or more architects, not competitors, as assessors, and the preliminary sketches will be submitted to the sole judgment of these assessors, no other persons being allowed to see them at any time, before or after the competition. Their office will be to select out of the whole number not less than six nor more than ten designs, and to return the remainder to their owners. The authors of the selected designs will then be invited to enter the second and final competition. To each of those who accept, and comply with the prescribed conditions, one hundred and fifty pounds will be paid toward defraying the expense of making further drawings, at a larger scale, but in strict accordance with the preliminary sketch; and from the plans so elaborated the magistrates and council, with the advice of the assessors, will make a selection of four designs, placing them in order of merit. Unless some insuperable obstacle should prevent, the author of the design placed first will be commissioned to carry it into execution on the usual terms of professional remuneration. If such an obstacle should appear, the second in order will receive the commission, or failing him, the third. The cost of the building, exclusive of internal decoration, is limited to two hundred and fifty thousand pounds, and sketch-plans will be received until the thirtieth day of November next. Our readers who may be familiar with American competitions for public buildings of this class will notice several points in which the British method is different, and perhaps inferior to ours. For instance, nothing is said about requiring the successful competitor to give bonds or otherwise put himself in personal pledge that the cost of the structure shall not exceed the established limit; an omission which may have been due to forgetfulness on the part of the magistrates, or, more probably, to their conviction that no one in Great Britain, above the rank of an office-boy, would take part in a competition under such a condition. Another oversight, as we may suppose, is the offering of a remuneration to the successful competitor about fifty times larger than that needed to secure all the artistic beauty and majesty of construction which some of our Governors and Legislatures think necessary in the buildings of their State. It is true that censorious critics regard the merit of the best foreign buildings as surpassing in an even larger proportion that of the average American public structure, but a single flap of the wing from the national spread-eagle should dispel all such doubts.

THE city of Liverpool has at last begun to put in execution a scheme which has been discussed for many years,—the construction of a storage-basin and aqueduct for conveying water to the town from the mountains of Wales. The valley which is now in process of being converted into a storage-basin lies forty-six miles south-west from Liverpool, at an elevation of seven hundred and eighty feet above the sea, and receives a number of mountain brooks, which unite at the outlet to form the river Vyrnwy. The river escapes through a gorge only

three hundred yards wide, and a dam is to be built across the narrowest part, to a height of eighty-four feet above the present soil of the valley, giving a reservoir of ample capacity for all probable needs. So high a dam must be of immense strength to resist the hydrostatic pressure at its base, — three or four tons to the square foot, — and the foundation, which extends forty feet below the soil, is spread out to a width of more than a hundred feet, the wall "battering" upward, until the width at the top is reduced to seventeen feet. As it is not permitted to cut off entirely the flow of the river, culverts, controlled by gates, are left in the lower portions of the dam, which will serve to divide the supply as required. The country is very mountainous, so that the aqueduct will necessarily follow a circuitous course, requiring sixty-seven miles of conduit to reach Liverpool, and even then tunnels will be necessary, of which one, just at the outlet of the lake, is to be two and a half miles long. The water is said to be of excellent quality, although the quantity which will be furnished, fifty-two millions of gallons per day, is, according to our lavish notions, rather a small allowance for a city of nearly three-quarters of a million inhabitants.

A PARTIALLY successful experiment in obtaining telephonic communication at long distances has been made between Buffalo, N. Y., and Paterson, N. J., a distance of three hundred and fifty miles. Mr. J. F. Noonan, the manager of the Metropolitan Telephone and Telegraph Company at Paterson, has discovered a mode of adjusting batteries so as to improve the distinctness of the signals at great distances, and by the courtesy of the Western Union Telegraph Company a continuous connection to Buffalo was placed at his service for experiment. The sound of the voice was plainly heard at the end of the line, but the snapping and crackling noise, caused probably by induced currents from the neighboring telegraph-wires, made the words indistinct. This annoyance, which is the main obstacle in the way of long-distance telephoning, will probably be overcome before long. After the first successful application of a new principle to practical uses, improvements quickly follow, until the original invention, left far behind, becomes by comparison a curiosity of antiquated inefficiency. The steam-engine was helpless without the aid of an attendant to open and shut the valves, until a lazy boy, to get himself more time to sleep, invented the automatic movement which immediately brought it into universal use; and many persons can remember when photographic prints, for want of any mode of fixing them, were kept in close portfolios, and shown only by candle-light. In its capacity for almost unlimited improvement, the telephone much resembles these two great inventions, and it is safe to predict that we have as yet seen only the beginning of its usefulness.

THE question of subterranean telegraphs has become an important one in American cities, particularly since the vast increase of the telephone service has quadrupled the number of wires which must be disposed of in some way. Experiments have been made by the telegraph companies in a small way in Philadelphia, in Camden, N. J., and in New York, to determine the feasibility of running all their wires through terracotta or concrete pipes, buried in the streets, but although the absence of very serious obstacles to the change has been demonstrated, the expense is so great that they naturally prefer to carry their lines through the air as long as the public will endure the annoyance. With telephone-wires the case is different. The greatest difficulty in the use of the instruments consists in the confused crackling and rumbling sounds which drown the sound of the voice, and are due to induced currents occasioned by the vicinity of telegraph or other telephone wires. If the lines, instead of being separated as far as possible, were to be twisted together in the form of a cable, even with a film of non-conducting substance between them, there is reason to suppose that the violence of the induced currents would entirely overpower the very delicate impulses between the diaphragms of the instruments. The Boston Telephone Company has made some experiments with cables, but the results have not yet been made public, and can hardly be expected to be favorable.

THE Philadelphia *Bulletin* gives an account of what it calls a "singular" accident, which occurred at the Friends' Asylum for the Insane, in that city. It seems that new heating appa-

ratus was to be placed in the building, and excavations had been made along the front wall, extending below the foundations. The soil is sandy, and, as the *Bulletin* says, the weight of the "superabundant mass" very naturally forced the sand out into the new trenches, causing a mass of masonry sixty feet long and three stories high to fall forward with a tremendous crash. Happily, the inmates were in another part of the building, so that no lives were lost. Such accidents are sometimes inevitable, and under present conditions it would hardly be possible to hold any one responsible for them. The proper way would be to place all such operations in charge of the architect, who would of course see that the foundations of the building were not undermined, upon any pretext. If this precaution is omitted, and permission given to persons interested only in their own work, and ignorant of the danger to which they may expose the structure, to excavate at random around it, they cannot always be blamed if catastrophes occur which they were not qualified to foresee.

THE famous Bedford Park enterprise has assumed a new phase. Its very success has caused it to develop into an undertaking of such magnitude that the original projector hesitates to bear the responsibility of it alone, and a joint stock company has been formed to take the property and continue the improvements. The history of the scheme is an interesting one. Bedford Park was formerly, as its name implies, the pleasure-ground of a princely residence, and had been laid out and planted with trees by the best landscape-gardeners of the last century. By degrees it had been allowed to fall into decay, and until the advance of London into the country began to make of Chiswick a somewhat remote suburb of the metropolis, no more interest attached to it than to many other neglected estates. Six or seven years ago, however, it attracted the attention of Mr. Jonathan T. Carr, a wealthy gentleman, already distinguished for his taste, who conceived the idea of converting it into a model village of middle-class residences. The beauty of the grounds offered an important advantage for his purpose, and after having the territory put in order, and divided judiciously into lots, streets built, and city conveniences introduced, he undertook the erection of dwelling-houses which should be in keeping with his conception of what he wished the place to be. Mr. E. W. Godwin, Mr. Norman Shaw, and other architects were commissioned to furnish designs, Mr. Shaw having, however, had the principal charge of the improvements. His reputation alone would have been sufficient to attract attention to the work, and as the houses on the estate were thoroughly constructed and moderate in price, as well as picturesque, they came immediately into demand. Up to the present time, three hundred and fifty dwellings have been built, besides the "Tabard" inn, the village club-house, and the beautiful little church, all of which are probably familiar to most of our readers by the drawings published in the English architectural journals. Under the new arrangement, Mr. Shaw will still continue to act as architect to the estate, and Mr. Carr will retain a very large interest in the company, and act as managing director, so that this memorable enterprise, one of the most interesting in the history of art, will, we hope, be carried to full and successful completion.

ANNOUNCEMENTS of new canal enterprises follow each other in rapid succession. One of these, which may be politically the most important, is projected to connect the North Sea with the Baltic Seas, by way of Brunsbattel, at the mouth of the Elbe, and Holtena on the Baltic. The control which Denmark exercises over the narrow passage at Elsinore is very naturally irksome to the more powerful neighboring nations, although the Sound dues are no longer exacted for the privilege of passage, and it may be safely assumed that the German Government will look with favor upon a ship-canal entirely within its territory, although with its customary prudence it has allowed private enterprise to take the first steps toward the accomplishment of the desired end. Another private undertaking, of less magnitude, and no political importance, is the ship-canal between the Chesapeake and Delaware Bays, which has been discussed for a century or more, but now, the requisite capital having been subscribed, is to be immediately constructed. The saving in distance and time for vessels of all kinds bound to and from Baltimore will be considerable, and the aggregate, to a city so favorably situated in other respects for commerce, will amount to a large yearly sum.

COLONIAL ARCHITECTURE.¹—I.

NEWPORT, R. I., November 1, 1880.

TO THE AMERICAN INSTITUTE OF ARCHITECTS:—

YOUR committee have thought it best to preface their report on the "Practice of American Architects and Builders during the Colonial Period and the first Fifty Years of our Independence" with a brief account of the rise of so-called Queen Anne or Free Classic architecture; together with the causes which have led architects to apply to modern buildings the details and principles of construction employed by their predecessors of the last century. It, moreover, seems necessary, in order to understand the principles involved, to study the analogy, if any, between the thoughts and manners of life of the two periods, and thus be prepared to judge how much of the revival is due to our honest convictions of the superior excellencies of colonial building, and how much to an affected longing for novelty and sensational effects.

The revival in England of late seventeenth and early eighteenth century architecture owes its conception and development to the efforts of a few prominent architects of the Victorian Gothic school, who, becoming dissatisfied with pointed arcuation when applied to domestic edifices, endeavored to obtain by the use of the lintel, while still clinging to mediæval principles of construction, such dispositions of interior and exterior details as should harmonize with the complex and artificial life of large cities. Like the Athenians, we are all anxious to discuss some new thing, and the ranks of the reformers, rapidly increasing in numbers, developed an eclectic school of designers, who claimed that all systems and details bearing the stamp of precedent were applicable to their uses, and might be employed without question wherever they appeared to harmonize with

The construction of the Governor Bull house (Fig. 1), (1639), the so-called, Captain Kidd house (Fig. 2) on Conanicut Island (no date), the arch'd chimney² (Fig. 3) in the Sueton Grant house (Fig. 14) and the same feature (Fig. 4) in the "Old Mill," herein illustrated, bear evidence of the solidity which characterized



Fig. 1.—Governor Henry Bull's House, Newport, R. I. (1639.)

the buildings erected by the early colonists. The similarity displayed in the constructive features of these buildings seems the more remarkable, when we consider that the history of the dwelling-houses can be well authenticated, while the origin of the "Old Mill" remains veiled in mystery.

For a more detailed account of the stone and timber construction employed in the seventeenth century I will here quote from an article on the "Old Stone Mill," which I prepared in 1879 for the *Magazine of American History*.

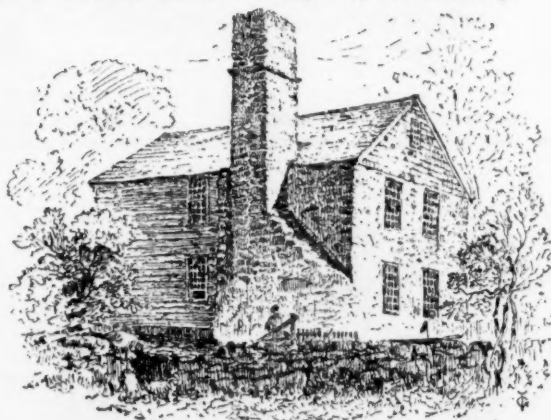


Fig. 2.—Captain Kidd's House, on Conanicut Island, R. I.

"Specimens of mortar taken from the 'Old Mill' and other structures of the period—the house built by Governor Henry Bull in 1639, the tombs of Governor Arnold and his wife, and their dwelling-house—have been analyzed, and found to be of the same quality, and composed of shell-lime, sand and gravel, with flakes of broken slate pounded fine." The destruction of Governor Arnold's house is thus described by an eye-witness: "The chimney and the whole south end were

¹ A preliminary report presented to the last Annual Convention of the American Institute of Architects.

² The private stairs are built in between the chimney-backs and run up to the upper floor. In the attic the three chimneys are brought together on stone arches and form one stack of flues. The character of the stone-work and arches is identical with those in the "Old Stone Mill."

practical requirements; symmetry was no longer deemed a necessity of correct architecture, picturesqueness was aimed at, while utility and convenience were too often sacrificed to whims and quaint conceits. So radical a change in opinions could not long thrive in England, among men trained to bow before an unwritten but absolute law of conservatism; the better-trained eclectics gradually framed for their use a new code of architectural rules, basing their ideas on the later phases of English Renaissance, and more particularly on the domestic edifices erected during the reigns of William and Mary, Queen Anne and the first two Georges. To the nondescript style thus founded, they gave the name of Free Classic.

The passage of the "Elementary Education Act" by Parliament, in the year 1870, gave a great impetus to building enterprises, and greatly advantaged the new school of designers. By this act the formation of local school-boards was peremptorily ordered; thus calling for the erection of many buildings of a class hitherto but little known. The natural desire was to mark the period as an architectural epoch; to give to the school-buildings a character distinctively their own, simple in plan and thorough in construction, with but little architectural display, and built of the vernacular constructive material of English cities, red brick.

Such was the beginning of the modern Queen Anne or Free Classic school. From small beginnings it has developed into an harmonious and well-defined style of domestic building very different in its better phases from the stiff and starched appearance of its prototypes, being marked by breadth and freedom of treatment, and in many cases by great richness of detail.

The results of the first efforts of the English reformers had scarcely been given to the world, and their theories set forth in well-written

built of rough stone and coarse mortar, and plastered on the outside with the same. The rough stone and coarse mortar were so strongly cemented together

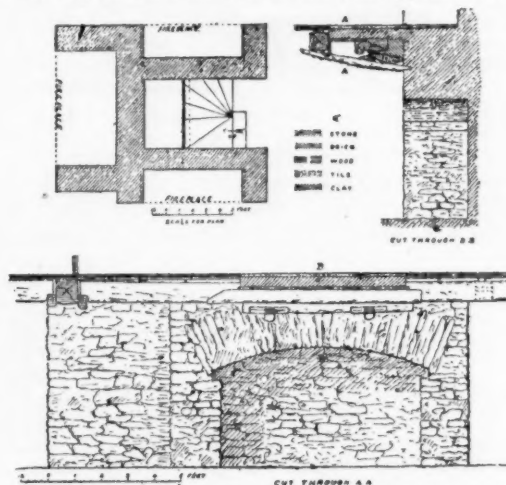


Fig. 3.—Fireplace in Sueton Grant House, Newport, R. I.

that they could not take it down by commencing at the top, without great labor; for that reason the house was first pulled down, then guys were made fast to the top of the chimney, and set tight, by means of tackles, to trees at a distance, to

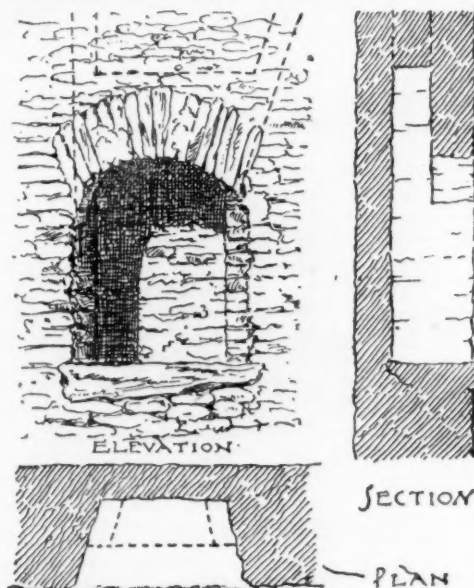


Fig. 4.—Fireplace in the "Old Mill," Newport, R. I.

cause it to fall in a direction from the building near, when it was undermined and fell in one mass, and was afterwards broken up with sledges, etc. . . . The

essays, when the year 1876, with its centennial recollections, wrapped us round as with a mantle of enthusiasm. Suddenly we realized that we were born of a line of heroes who had founded a nation; our cupboards and attics were ransacked for relics of the past; Chippendale furniture and Dutch clocks resumed their sway; Delft plates adorned our walls, and houses were built and restored with every attempt to render them as much like those of the last century as possible. To this end the architectural publications of England were closely studied, filled as they were with prints and descriptions of edifices of analogous construction and detail. Queen Anne once more claimed our allegiance, and was cheerfully obeyed.

In the progress of this renaissance, much that is good has been recalled from oblivion, while our houses are gradually assuming a more homelike and less manufactured style. Magazine and newspaper columns are filled with the praises of Queen Anne, whose name is invoked to give some sort of dignity to many strange and grotesque structures. The more radical of her followers tell us in

domestic edifices erected by the early colonists exhibit, in nearly every instance, stone chimneys and gable ends, as already described in connection with the house of Governor Arnold. The sides of these buildings and the ends above the

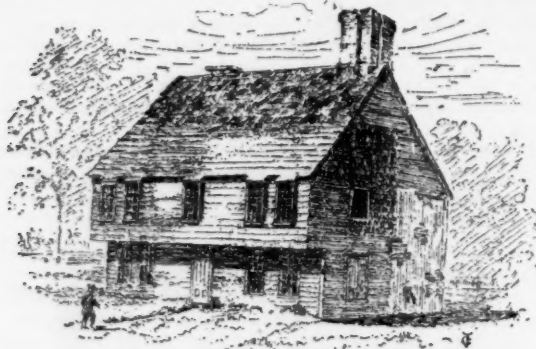


Fig. 5. — Governor Coddington House,¹ Newport, R. I.

line of the roof-plate were of frame construction, made of heavy oak timber, rudely squared, put together with tree-nails and boarded with oak, usually at an angle of 45°, thus making of every board a separate brace. The boarding was covered with coarse stucco,² as on the Bull house, or with split shingles, as on



Fig. 6. — "Whitehall," Newport, R. I.

the Governor Coddington house (Fig. 5), put on with wrought nails. Many of these venerable mansions of the past still remain, bowed and bent with time, but still firm and sound in their constructive features.



Fig. 7. — Old Houses on Thames Street, Newport, R. I.

"Whitehall" (Fig. 6) and the Old Houses on Thames Street (Fig. 7) may be said to represent the second period of American colonial architecture; that is, the first quarter of the eighteenth century. They are entirely of frame construction and are covered with thick clapboards with beaded edges, put on with wrought nails

¹ This house was pulled down some years since.

all honesty and at great length, that the rapid development of nineteenth-century civilization, with its marvellous machinery and discoveries of material resources, has gone wholly wrong in its attempts to erect artistic dwellings, however convenient they may be in practical requirements, and that we must go back and learn before we can go forward. In the same breath they tell us of the cosiness and comfort of the old colonial mansions scattered through the seaboard States; of the wide and homely fireplaces, the corner cupboards with quaintly arched door-frames, shell-topped niches, box-stairs with twisted balusters and ramped rails, blue India china and Dutch pewter, — until we begin to dream of an Arcadian existence and long to step back a hundred years into the past, to the good old days when George the Third was king, when stately men and women glided through life in quiet dignity.

All this is poetical and delightful; we take it in, sigh for the days departed, and straightway attempt to remodel our houses of to-day upon the plans of yesterday. We partially succeed, but only par-

and roofed with split shingles. In buildings of this type, brick began to take the place of stone for chimneys and the gambrel roof takes a pronounced char-



Fig. 8. — The Banister House,² on Pelham Street, Newport, R. I.

acter, as in the old houses here illustrated. The gambrel roof continued in favor for a hundred years or more, and gradually developed into a well-proportioned



Fig. 9. — Hazard House, Newport, R. I.

architectural feature, with richly moulded cornice and well-designed dormers, as in the Banister house (Fig. 8). This type of roof, although its origin and history



Fig. 10. — Vernon House,³ Newport, R. I.

has thus far eluded the researches of the architectural student, had its advantages. The framing was simple and strong, and the attic rooms thus obtained possessed

² This house was the headquarters of the English General Prescott.

³ This house was Rochambeau's headquarters during the occupation of the island by the French.

tially. Alas! in the lapse of a hundred years, three generations have come and gone; the world has moved on and men have changed. We cannot be purists, we cannot bring ourselves back to the ways

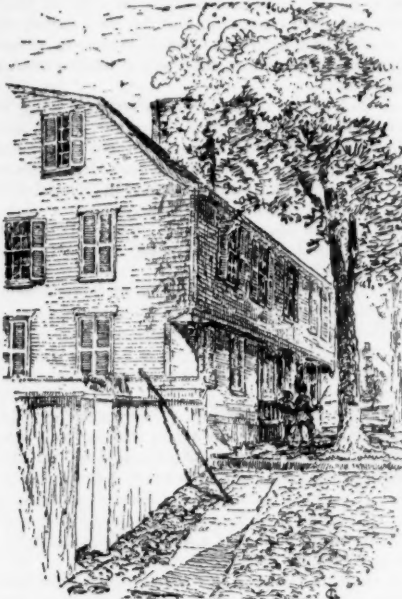


Fig. 14.—Sueton Grant House, Newport, R. I.
(Built before 1730.)

the oldest, in that they have at their command all the knowledge and hard-won experience of their predecessors. Let us therefore study

of life and modes of thought familiar to our ancestors, and our habitations must necessarily reflect our tastes. We will not rustle our silks and satins over sand-floors, or imagine ourselves comfortable when seated on splint chairs. We do not like rattling case-ments, and the much anathematized furnace has become a necessity of life. Our houses then are like ourselves, cosmopolitan; they are like the bric-à-brac with which we store our shelves, and the volumes in our libraries; moreover, it seems right that it should be so.

If not absolute copyists, we may however learn much from the past; the youngest are ever

all the height and floor-space obtainable in the modern French roof, so-called, while avoiding the disagreeable box-like appearance of the latter. The window-frames of these early eighteenth-century dwellings were made of plank, mortised and pinned together, the sills and caps were often moulded and a bead run around the inner edge of frame. The sashes were heavy, with small glass of very infe-



Fig. 11.—Old House on Broad Street, Newport, R. I.

rior quality set in wide muntins. The second of the "Old Houses" shows what is probably one of the first attempts to modify the gambrel into the hipped roof, a method of construction which became highly developed in the latter half of the century. In the earlier examples, the roof, instead of being truncated and hipped



Fig. 12.—Gibbs House on Mill Street, Newport, R. I.

in all around, with a railing above the crown moulding, is simply hipped in on the lower part, the upper part being turned up at the ends into small gables. The dwellings of this type seem to form a connecting link between the ruder erections of the seventeenth century and the well-designed and comfortable mansions built by the wealthy merchants of a later day.

the principles that shaped and guided the architecture of the colonial period and the first fifty years of American independence, not merely to find quaint details to copy in modern work and then unblushingly christen those works Queen Anne or Georgian, but humbly and earnestly, that we may brush away the dust and mystery surrounding their erection; delve among old papers, bills and accounts, study the material resources and appliances of the times, and thus elicit data which when brought together and well sifted will reward us with an insight into the causes which led to the adoption of forms of construction which we now admire, and the necessities which forced upon the early settlers systems of building which should be avoided in an age better supplied with materials and appliances.

The field of research is a wide one, and the materials for such a work are not wanting. Your committee feel constrained to admit that they have barely penetrated the mysteries of the craft. They trust, however, that what they have done may serve as an incentive for fuller investigation and research. The reward will be a great one, and our respect for the workmen of the colonial period will be enhanced as we see their sacrifices and struggles to perfect a system of construction and to bend the forces of nature to their wills. Their success was truly wonderful. They were men strong in mind and body, and devoutly determined by God's grace to do their best, and we acknowledge that to them and to their works we owe all deference.

Your committee, after mature reflection, has decided to divide the subject embraced under the title "Practice of American Architects and Builders during the Colonial Period and the first Fifty Years of our Independence" into several sections, each of which seems to merit special study and investigation. These sections, when brought together, will we believe give us a clearer insight into the artistic and mechanical arts of the last century, and add another chapter to the history of that eventful period which witnessed the youth and early manhood of the Republic.

We would suggest that the titles of the several sections be somewhat as follows:—

I. Preface: Queen Anne and Georgian architecture, giving their origin and the causes which have led to their renaissance.

The third period of colonial architecture may be said to have commenced about 1730, when the growing commercial importance of the seaport towns and the rapid accumulation of wealth induced a more lavish and elegant style of living. Prominent among the buildings of this period may be noted the Hazard house (Fig. 9) on Queen Street, now Washington Square; the Vernon house (Fig. 10) (Rochambeau's headquarters); the Ayrault house—fully described in specifications; the Old House on Broad Street (Fig. 11); the Ring house on Pelham Street, and the Gibbs house (Fig. 12) on Mill Street. The above are only a few representative buildings taken from the many of the same class to be found scattered through the seaboard States. The interior arrangements were extremely simple, but the architectural details and ornamentation is often rich, and is marked by great delicacy and refinement in treatment, the motif being based upon the Free Classic of the Queen Anne and Georgian reigns. The framing of these buildings is more systematically put together than in the earlier examples. The great beams crossing the ceilings, and the supporting posts and hanging knees are surfaced and beaded instead of being rough-hewn with an axe. The fireplaces are often surrounded with Dutch tiles held in place by brass bands. The locks and door-trimmings are of brass. The window glass is larger and clearer, and is set in well-made sashes with light muntins, carefully wrought by hand.

The truncated roof is fully developed with moulded cornices of good section, the modillions being frequently carved with acanthus-leaves.

The entrance doorways become the central architectural feature, and are often richly carved and moulded,

the pilasters surmounted with Corinthian capitals, and the pediment (Fig. 13) wrought with a wealth of Palladian detail, cut with much feeling; the muntins in the headlights being often carved into quaint and fantastic interlacings.

In a number of cases, I have found that when glass panels were required in doors, the glass was set as a panel, and the doors framed and built around it, the mouldings being wrought on the stiles and rails. Fortunately the old crown-glass of the period was of the toughest description and much of it still remains. The crystal sheets of the present day would not be equal to the strain of such rough usage and the cross strains of warping wood-work, even if they did not break in the putting together.

The old house on Broad Street (Fig. 11) shows one of the best examples of a moulded and panelled chimney with which I am familiar. The roof is of a most peculiar section when viewed from the gable end, and the cornice is heavily coved with stucco, still in good preservation.



Fig. 13.—Doorway on Pelham Street, Newport, R. I.

- II. Descriptions and illustrations of colonial buildings, both public and domestic, with original papers relating to their erection.
- III. Architects and builders, their status and connection.
- IV. Materials and appliances of the period, both crude and manufactured, native and imported.
- V. Reasons for combining certain forms and materials.
- VI. Duties and import laws, their effect on building enterprises.
- VII. Causes which led to the architectural decline in the early years of the nineteenth century.
- VIII. English architects of the seventeenth and eighteenth centuries, and their influence on American colonial architecture.
- IX. The architecture of the present day.

FORESTRY IN THE UNITED STATES.¹

At the meeting of this Association held at Saratoga, in August last, a resolution was introduced, and referred by the Standing Committee to the Committee upon Forestry, in which, in view of the great importance of the matter of Forest-Protection and Wood-Culture, the desire was expressed, that some report looking towards definite action be received from this committee, at the next meeting of the Association. . . .

Early in the Forty-fourth Congress, the Hon. Mark H. Dunnell, who had taken particular interest in this subject, introduced upon notice a similar bill,² which received the same reference as before. An opportunity for a hearing was given, but no report was made. Before the end of this session, this gentleman, however, secured the adoption of an amendment to an act making appropriations for the current expenses of the Government, in which the Commissioner of Agriculture was directed to appoint a person for prosecuting these inquiries relating to forestry, his powers and duties being similar to those specified in the bill just mentioned. This appointment was given to Dr. Franklin B. Hough, and on the 8th of December, 1877, he presented to the Commissioner of Agriculture a report upon a part of the subjects specified in the act under which this appointment was made. It was transmitted to Congress by the President on the 13th of December, and referred to the House Committee upon Agriculture. . . .

The Commissioner of Agriculture, deeming the authority granted under the act above mentioned as sufficient, gave directions for a continuance of these inquiries, and found means from the funds under his control for defraying the expenses. A second report was presented in January, 1879, and transmitted to Congress by the President early in February of that year. From various causes, wholly foreign to the subject, but chiefly from the occupation of the members of the Committee upon Agriculture (to which it was referred) in other business more urgent, no session was held by the committee at which a hearing could be obtained from the time when this report was laid before them till the end of the session. In fact, the committee met but once for business during this time, and then it was wholly occupied upon another subject. The report was therefore withdrawn at the last moment of the session, and returned to the department.

Early in 1880, a resolution was introduced in Congress, calling for a return of the report above mentioned, and it was again transmitted by the President, and at once ordered to be printed.

The Committee upon Agriculture, to whom it was referred, gave the subject a prompt and attentive hearing, and agreed unanimously to recommend the publication of 100,000 extra copies. This resolution was still pending when Congress adjourned, and lies over till next session. In the mean time, the stereotyping has been going forward to completion, making a volume of 618 pages. . . .

The intimate relation between the timber interests of the United States and of Canada scarcely allows us to consider one without taking into account the other. It is well known that for many years the lumber products of Canada have found an extensive and ready sale within the United States, and at the same time, that a large amount of the hewn timber from within the United States, in the country bordering upon our northern lakes, and intended for foreign markets, has been taken down the lakes and the St. Lawrence, for shipment at Quebec. In fact, there has always existed a certain community of interest in the forests, between the inhabitants of the United States and of Canada, and it may be reasonably predicted, that, so long as lumber and timber are produced in either of these countries, they will go to supply the wants of both.

It has therefore been deemed advisable, in presenting a full view of the commerce in wood-products for the United States, and in order that this branch of the subject should be as complete as possible, to enter upon a careful study of the Canadian timber-trade from data published by the Dominion and the Provincial Governments, beginning with the date of confederation in 1867, and coming down to the end of the last fiscal year. In some branches of this inquiry, the statistics are carried back to an earlier period, especially in regard to the passage of timber through the government slides and canals, and the inspection of lumber in the timber-market of Quebec. . . .

If they will go a step farther, and secure adequate means for reproduction, the wants of the future will be assured. As an indica-

tion that one of the means most certain to secure this desirable end is well understood, we may mention, that in the Province of Quebec, it is no longer permitted to cut pine-trees upon the public lands, measuring less than twelve inches in diameter at the stump. If they could, besides this, secure adequate measures for the prevention of forest fires and other waste, and apply the reservations to other kinds of timber, and especially the spruce, they would have a useful system of forestry in operation. . . .

It is a significant fact, that in the three States where planting is perhaps of greatest need, viz., in Kansas, Nebraska and Iowa, the premiums formerly offered for planting trees upon prairie lands were, after a few years' experience, wholly, or in part, withdrawn. This should not be regarded as a sign that the interest in this subject is declining — but rather that a realization of the necessity for plantations is increasing; and that, in fact, it has become so evident and convincing, that it does not need a motive, beyond the pecuniary interest of the owner of the land.

Furthermore, these acts, intended for encouragement, have everywhere led to fraudulent claims for premiums and exemptions, the work of planting being often done in the most superficial and indifferent manner, by those whose chief object was to secure the present benefit of these laws, rather than the more remote but substantial profits of a successful timber-growth.

In the State of Nebraska, after repealing a law extravagantly liberal in its provisions, and remaining some years without any, the Legislature has recently enacted a new statute upon this subject, which, after the experience of the past, may be presumed to approach more nearly the standard of greatest utility at the least expense. It is entitled "An Act to encourage the Growth and Cultivation of Timber in the State of Nebraska," and was approved February 27, 1879. Its leading provisions are as follows:—

The sum of three and one-third dollars per acre is to be paid annually for five years from the county treasury, to the extent of not more than three acres, planted in belts of six rows of trees running east and west, along the north or middle section lines. The trees are to be four feet apart in the rows, and the rows eight feet apart, the whole being under cultivation and in good condition during the time this bounty is paid.

We deem this act altogether too specific; for it assumes that shelter is needed only on the north side of lands, and that there is no diversity in this need. It is quite evident that the aspect and circumstances of some localities might render protection desirable from other points besides the north, especially in the remote prairie States, that often suffer from the dry and heated winds from the south-west.

It would be better to leave the direction and density of these timber-belts to the discretion of the planter, as his circumstances might indicate.

By another statute of recent date, the State of Nebraska, in pursuance of the authority expressed in its Constitution, now exempts from taxation the *increased value* of lands by reason of live-fences, fruit and forest trees grown and cultivated thereon, without regard to the area planted, or the time that the plantation is maintained. We deem this a simple and effectual mode of encouragement, well worthy of careful trial in the prairie States; but there should evidently be some limit to the period of exemption, to prevent the public burdens from bearing unequally upon property, for otherwise there would eventually arise a just cause of complaint from other interests. The limit might perhaps be extended to the time when the plantation would begin to bring a revenue to the owner.

We may here remark, that this accumulation and comparison of experience in the legislation of the country, for the benefit of forest-culture, may prove one of the most effectual means for bringing about that uniformity and that degree of excellence that secure the best results. We should profit from experience, where it leads to error, not less than when it is crowned with success. . . .

In the national census of the present year, provision is for the first time made for a special investigation of our forest resources, and in the hands of Professor C. S. Sargent and his assistants, we may expect that this work will be well done.

The only State Forestry Association, yet organized, is that of Minnesota, which is doing good service in the promotion of tree-planting in the prairie regions of that State. The project of a School of Forestry has been proposed in Minnesota, and a land-grant for its endowment has been asked from Congress, — but hitherto, as we understand, without success.

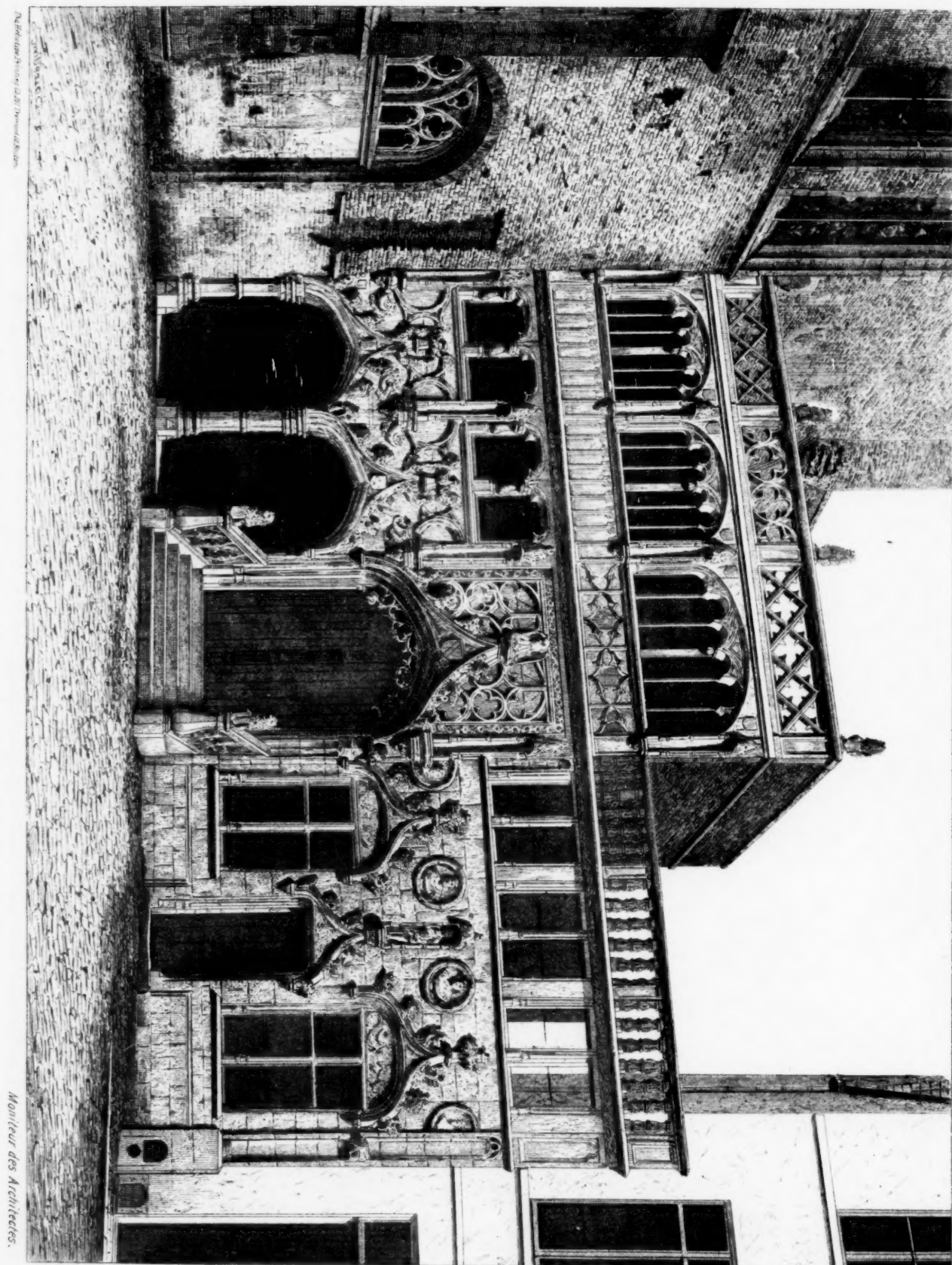
We deem it of the first importance that a better knowledge of the principles of arboriculture should be more widely diffused. It remains a question of the future, as to how far a special education in this branch of applied knowledge would, at present, find adequate remuneration, unless associated with capital, and sustained by an intelligent appreciation of the importance of forest-culture, by those having money to invest in this enterprise, which is as yet too seldom found.

In speaking of the results of associated effort, in the interest of sylviculture, we should not fail to notice our State agricultural and horticultural societies, many of which now recognize the importance of this subject, and admit discussions bearing upon tree-culture, at their meetings and in their published transactions. This is particularly the case in Iowa, where much prominence is given to questions relating to the planting of groves and hedges, and premiums are offered tending to improvements in management, and extension of amount done. In some of the older States, and especially in Mass-

¹ Portions of the report of the Committee on Forestry, presented at the twenty-ninth meeting of the American Association for the Advancement of Science.

² A bill providing for the appointment of a Commissioner of Forestry and affording facilities for his researches.

LE SAINT SANG DE BRUGES (STYLE RENAISSANCE)



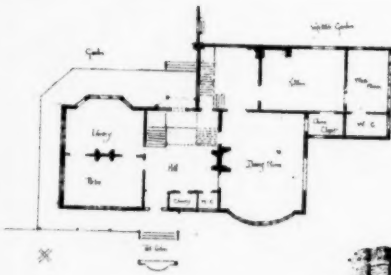
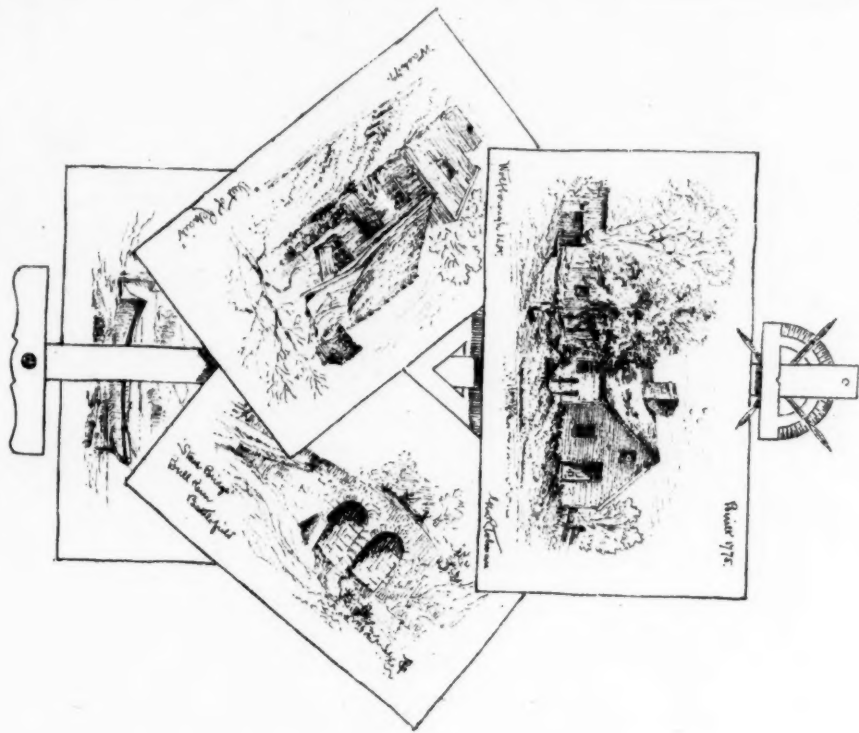
Moniteur des Architectes.

RESIDENCE OF R. H. WILSON ESQ.
CHICAGO, ILL. BURNHAM & ROOT ARCHTTS.



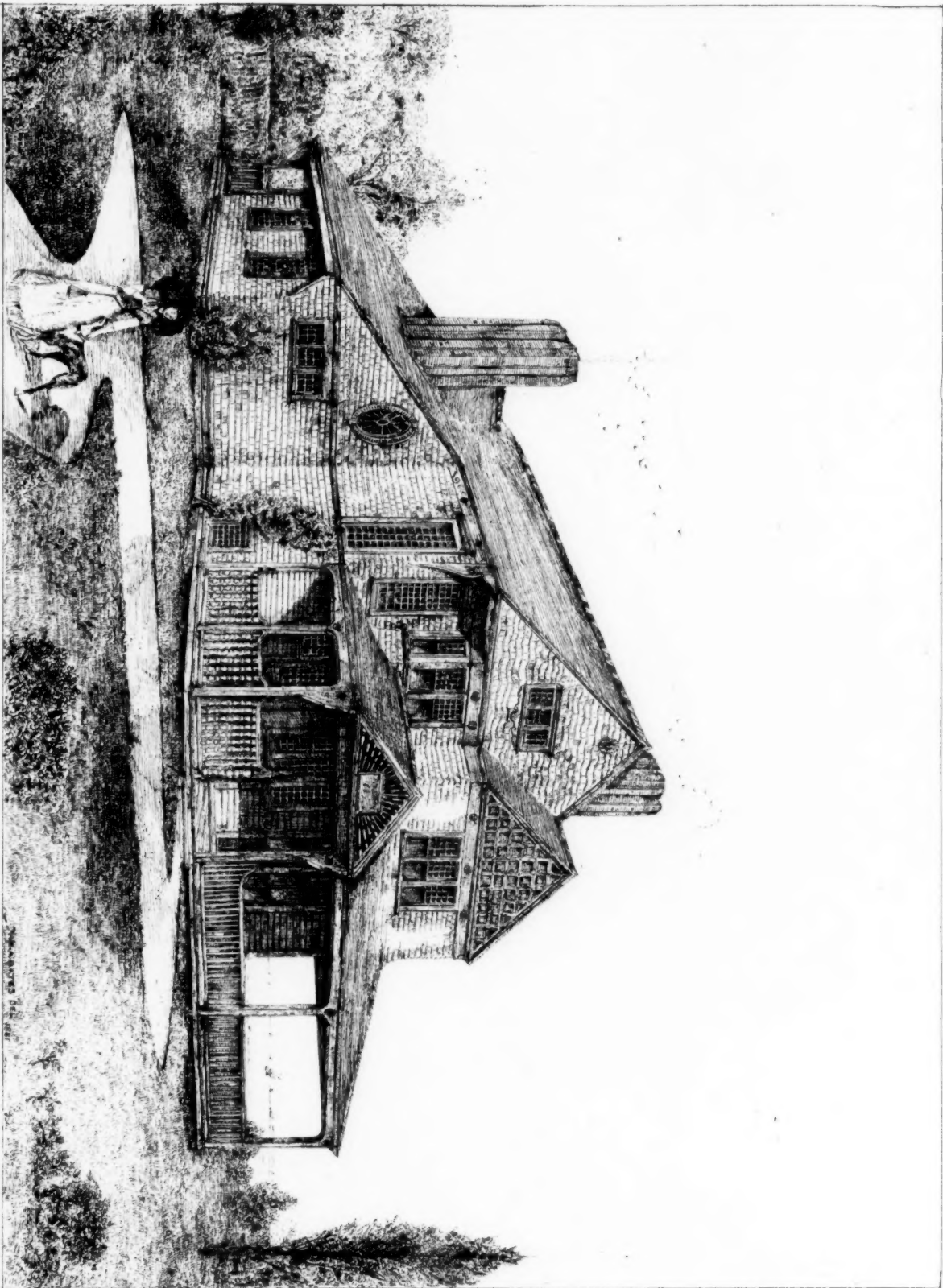
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Leaves from a Sketch Book.



Perspective of Front





Cottage at Babylon Long Island for Benj. K. Tice Esq. PERSPECTIVE VIEW. GEO. A. FREEMAN, JR. ARCHT. N. Y. N. Y.

achusetts, much attention has been given in recent years to this subject; but in none of the States have we seen statistics of the results obtained by the offer of these premiums of the later period.

Within the last three years, the Secretary of the Interior, in whose department is vested the care of the public lands, has been making commendable efforts to arrest the unlawful cutting of timber upon these lands. In this he has met with great opposition from interested parties, through the political and other influences that they have been able to bring in Congress, and from delays in the courts.

The shameful extent to which these depredations have been going on, through a long period of years, and, in fact, until the practice had gained from long indulgence the semblance of a right, will hereafter be looked upon as a striking evidence of the barbarism of the age.

These efforts to repress a criminal practice, long sanctioned by custom, have led to recent legislation in Congress upon the timber question, some of which will tend to increase rather than prevent the waste we have described. We refer particularly to an act passed two years since, granting to the inhabitants of certain regions, where conservation is of the first importance, the unrestrained use of timber upon the public domain, for all mining and domestic purposes, without so much as the pretext of a report as to the amount taken, the least check upon its limit, or the least payment for the privilege.¹

Among these recent statutes relating to our public domain, we still look in vain for the first indication of a policy tending to provide for future supplies by reservation of timber lands—except to limited extent and for naval use alone. We find no limitation in the cutting of small trees, and no protection of lands with the view of affording a new growth of timber, where it has been taken away; much less do we yet find any measures for planting upon the public lands, or any stipulations requiring this to be done by settlers, except in the still recent timber-culture acts, that have as yet scarcely passed through the trial of experience.

The first of these timber-planting acts was passed in 1873, and amendments have been since made, as deemed necessary. If faithfully administered, the law cannot fail to prove of inestimable value to the prairie States. According to this act as it now stands, a man may acquire the absolute title to a quarter-section, or 160 acres of land, by planting and cultivating ten acres of timber, there being not less than 2,700 trees to the acre. The patent is not issued until eight years after the claim is entered. The mode of preparation of the land is prescribed, and proof of successful planting must be shown.

According to the latest reports, 5,157,681 acres had been entered under this act within three years, chiefly in Kansas, Dakota, Nebraska and Minnesota. Undoubtedly some of these lands have been taken up for speculative purposes, and as little labor as possible will be spent upon them in the way of planting and improvement, while in many other instances, the undertaking is assumed in good faith, and with a desire to realize as much profit as possible from the cultivation.

Passing from these statements relating to American forestry, let us notice some facts of interest bearing upon the subject in Europe. As is well known, every Government of Continental Europe has now in operation a system of forest management, the best of which provides (so far as concerns the forests owned by general and local governments, and by institutions) for a perpetual supply, to the full limit of their capacity for timber-growth.

From this grade of excellence, requiring a special education and thorough training of agents for its maintenance, fully equal to that for any branch of the public service, we have various degrees of efficiency down to that of a mere police regulation for the prevention of fires, and the restraint of waste upon timber on the public domain. Yet these systems, however they may differ in details, agree in this: that unless the public interest is concerned, the owners of private estates are generally allowed to cut or plant upon their own premises, as their interest decides. The exceptions to this rule are, — along a frontier, where woodlands are needed for the public defence, the banks of a river liable to inundation, — where materials should be at hand for the construction of barriers, — upon mountains liable to erosion of torrents, or on drifting sands on the seashore. There may be a few other exceptions, but as a general rule, the Government does not often interfere with the timber upon private estates, even where it requires a notice of intention to be given before clearing is begun.

Yet upon these private lands, large forests are sometimes grown for profit, and their management is often placed in the care of agents who have received the highest grade of special education for this particular service. Except in Great Britain, we believe that facilities have been provided for this special instruction in every country in Europe, either in academies where forestry is taught alone, or in institutions where agriculture and other practical industries receive a share of attention.

It may be proper to notice here a change that has been taking place, in recent years, in the organization of these Schools of Forestry in Europe. In Austria, a first-class School of Forestry at Maria-brunn was, after more than forty years' existence, merged in 1875 in a High School of Agriculture and Forestry in Vienna. In Ba-

varia, the Central Forest Academy at Aschaffenburg, still older than the one above mentioned, has been more recently united with the University of Munich, and discussions tending to further changes with the view of consolidation are now in progress in other forest academies. In Prussia, the two institutions at Eberswalde and at Münden still maintain a separate existence, and the former has recently commemorated the fiftieth year of its history.

In looking at the organization of these institutions, we notice a marked change in their plan, particularly in Germany. In the preparatory studies, and especially in the natural sciences and in physics, so far as they in the least concern the forester, we find a more careful division of labor, and a more earnest purpose to make these sciences to their whole extent available in their profession, instead of the elementary studies in chemistry and botany which formerly satisfied the requirements for graduation.

In all of these institutions, excursions and practical exercises form a regular feature in the course of education, and microscopic studies now receive much more attention than formerly.

The science at present receives a substantial support from various experimental stations in Germany, Austria, France, and other countries, in which both practical and scientific questions are carefully investigated, and the results published. Among these we may prominently mention the Foresters' Experimental Union in Germany, and the experimental labors of the Austrian Ministry of Agriculture, under the direction of Baron von Seckendorff.

In recent years much interest has been manifested among investigators in Europe, in determining by instrumental observations, made at comparative stations in the open fields and in the forests, the influence of the latter upon the atmosphere in their vicinity, and upon the climate of the country generally.

That forests tend to render the climate of a country colder and more humid, has been known from general observation for many centuries; and the climate of Gaul, as described by Julius Caesar, compared with that of France at the present day, has been often cited as an instance of this fact. Yet it is only within a very recent period that anything like a full and systematic comparison has been attempted by instrumental observations.²

In selecting the location of these stations, one set of instruments is placed in the open fields, and the other in the woods, the former being as much as possible free from the influence of the forest, and the latter fully under its protection. Care is taken that the soil, altitude, and other circumstances, except the forest-shade, are alike.

Their outfit generally consists of open-air thermometers, — psychrometers, — rain and snow gauges, barometers, wind-vanes, and instruments for observing the evaporation from surfaces variously covered as compared with a free water surface — the percolation of water through various soils, ozone records, and observations upon the periodical phenomena of animal and vegetable life generally, so far as influenced by the seasons. In some cases the temperature of the interior of trees is recorded, and in some of the later systems of observation, it has been proposed to ascertain the temperature and humidity not only at the level of the tree-tops, but at a considerable height above them, the latter being obtained by the aid of masts, and by captive balloons that admit of the elevation of instruments. . . .

The number of stations at the beginning in January, 1879, was 570, and at the end of the first year, it had increased to 689. In February of the present year, the number was 712. The results are published monthly in detail,³ but as yet without attempt at generalization beyond the monthly means and totals. The system is under the care of Dr. Emanuel von Purkyně, a professor in the Forest Academy of Weisswasser, and cannot fail of proving valuable to the country and to the world, by making us better acquainted with the laws that govern the rainfall in a wooded country, and the circumstances that determine the amount.

Special investigations concerning the temperature of the earth at different depths below the surface, and under various conditions, have been made in Russia and elsewhere. These have more or less relation to forest-meteorology; and in several of the experimental stations now in operation, the results will contribute to a further knowledge of this important subject.

We regret that hitherto so little has been done in our own country for the determination of the relations between the forests and the climate by direct comparative observations. With the exception of a few desultory records of temperature and rainfall, we are not aware that anything has yet been attempted for this object, at any institution, or by any observer, in America. The greater general dryness of our atmosphere, and differences in our prevailing winds, appear to render the application of any general laws derived from European records very unreliable with us, and we never can have a certain knowledge of these laws as they operate in our country, until they shall have been determined from observations of our own. . . .

Among the recent researches concerning the influence of forests upon the amount of water in wells, rivers and streams, and incidentally the effect of woodlands in maintaining the amount, we may notice as particularly worthy of attention, the publications of Coun-

¹ An account of investigations in this line down to 1872 was published in that year by the Baron von Löffelholz-Colberg, under the title of "Die Bedeutung und Wichtigkeit des Waldes."

² Oubrometrische Beobachtungen der vom böhmischen Forstvereine in den Forsten Böhmens in verschiedenen Seelöhnen und Expositionen errichteten Stationen. Herausgaben von der Forstlehranstalt Weisswasser. Zusammengestellt und redigiert von Dr. Emanuel von Purkyně, Professor an der Forstlehranstalt Weisswasser. Prague, 4to (in monthly parts).

³ "An act authorizing the citizens of Colorado, Nevada and the Territories, to remove timber on the public domain for mining and domestic purposes." Approved, June 5, 1878.

seller Gustavus Wex,¹ overseer of the works of improvement in the Danube, at Vienna. These memoirs are not only of interest from the facts that they embody, but also for their citations to other works, making them in some degree a bibliography of the subject. They have been referred to commissions appointed by various academies of science, and the conclusions that they present have been approved by the highest authorities. They in fact confirm, by numerical statements, the observations of every one who has had an opportunity to notice the amount of water flowing in streams before and after the clearing of the district in which they rise, and through which they run. This amount affects the interests concerned in the hydraulic power of the larger streams, the supply of water to cities, and the navigation of rivers and canals.

As this diminution of water-supply is the result of man's acts, so also in a great degree is the remedy of control within his power, and by means of planting and with reservoirs he can often recover and maintain the advantages lost, perhaps as fully as they existed under the primeval forests. . . .

Returning to the original resolution under which the Committee upon Forestry was appointed by this Association, in 1873, there remains to be considered one subject that claims our careful consideration.

With the exception of a communication from its chairman to the New York Legislature,² and one of like import by Col. Whittlesey, another member, to the Ohio Legislature, no action has thus far been taken by this committee towards bringing the subject to the attention of our State legislatures. This delay has in part arisen from an uncertainty as to how far a State Government may, with any prospect of success, enact laws tending to secure efficient planting upon private lands. . . .

THE ILLUSTRATIONS.

HOUSE OF R. H. WILSON, ESQ., CHICAGO, ILL. MESSRS. BURNHAM & ROOT, ARCHITECTS, CHICAGO, ILL.

This house is built throughout of buff and blue Bedford limestone, laid in random courses and roughly dressed. The interior finish is of natural woods. The house is heated by steam, warmed air being passed into air-spaces formed in the depth of floor joists, and thence into the room. With this process it is found that the temperature of the floor is in all cases ten degrees higher than at a point five feet above the floor.

DESIGN FOR A COUNTRY HOUSE, BY MR. C. H. WALKER, NEW YORK, N. Y.

This design was placed second in the fourth competition held by the Architectural League of New York.

LEAVES FROM A SKETCH-BOOK, BY G. R. TOLMAN, ARCHITECT, BOSTON, MASS.

LE SAINT SANG DE BRUGES, BELGIUM.

This plate is copied from the *Moniteur des Architectes*.

THE NEW ROMAN SEWERS.

AFTER all that has been written concerning the unpleasant odors of Paris, which for more than a year have properly engaged the attention of its inhabitants and its municipal authorities, I have thought it worth while to investigate what is going on in Rome, of which the pollution is proverbial, but which is to-day making great sanitary advances.

It is very regrettable, of course, to see still, in the centre of the city, certain places liable to receive in broad daylight deposits most offensive to the sense of smell, and most revolting to the eyesight, of the passer-by. After all the efforts of the police to correct the disgusting habits of the people, who convert the vestibules, as well as the porticos and staircases of the palaces into public privies, had proved vain, the authorities have established numerous public urinals: but this is not enough; it is the private sense of decency, and the efforts of the public prints, great and small, which must be looked to to-day to aid the police in teaching the conventionalities which are incumbent on all civilized peoples, especially on those who like the Italians receive yearly thousands of foreign tourists who leave behind them large sums of money.

Let us admit that these special improprieties give rise to only local infection, and let us seek the causes of the all-pervading odors, since there is near the city no manufactory of fertilizers or large deposit of it, and the sewers only emit occasional discharges of noisome gases.

The arrangement of the existing sewers in Rome, introduced by Signor Vescovoli, an engineer of great merit and experience, is new: the experience of the last five years has proved their good qualities, and in many cases it is probable that they could be adopted elsewhere to advantage.

Before explaining the construction of these sewers, let us recall the system of the works which supply Rome with water, and rectify an error which obtains general credence in despite of the remarkable work of Belgrand on Roman aqueducts.

Rome is supplied with water as is no other city in the world.

¹ Ueber die Wasserabnahme in den Quellen, Flüssen und Strömen, bei gleichzeitiger Steigerung der Hochwässer in den Culturländern, von Gustavus Wex, K. K. Ministerialrath und Oberlautner der Donauregulierung bei Wien. 4to, pp. 43, with 7 plates.

² Zweite Abhandlung, etc., 4to, pp. 30, with 6 plates. There are separate imprints from the *Zeitschrift des österreichischen Ingenieur- und Architekten-Vereins*, 1873 and 1879.

³ Senate Document, 82, 1875.

Those which are fairly provided allow to each inhabitant a daily average of 200 or 300 litres, while most allow less than 100 litres *per diem* to each consumer. The authors who have written on Rome state that the daily supply of water in that city amounts to 1,100 litres *per capita*. Granting that this used to be so, we must nevertheless state that for a long time past the supply, taking the average of dry and wet years, has been but about 500 litres for each of the 270,000 inhabitants: this does not, it is true, take into consideration the numerous wells and certain springs which feed some small fountains. This amount of water ought to be more than sufficient to make Rome the cleanest of cities.

The works now in process of construction will before long furnish at least 1,000 litres a day to each inhabitant, — but we shall discover that the mode of reckoning the consumption *per capita* is in this case absolutely false.

In the first place it must be remembered that the general level of most of the streets has, like the bed of the Tiber in its course through the city, been raised fifteen to eighteen feet; that formerly water was brought by lofty aqueducts, and distributed everywhere through the buildings and in the streets, so as to cleanse them thoroughly and wash into the sewers filth of every kind; and then it is necessary to recall the fact that to-day the water only reaches the level of the ground, and hardly that, and that a beginning has but just been made to make use of it for the sanitary improvement of the city by sprinkling and washing the streets.

During the last few years a new water company has furnished water to the upper stories of buildings in the new quarters. A reservoir is building, but as yet there is no water for street service.

Of the 200,000 cubic metres of water which daily enter Rome, the city's portion is extremely small, not more than a tenth, perhaps. Almost all of it belongs to the owners of palaces and houses where it flows, often in the cellars or a little higher up in the court-yards, only to waste itself directly into the sewers, without being of any service in the sanitation of the city or of the neighboring buildings. Amongst these palaces there are some which are supplied with 1,200, 1,600, and even 2,800 cubic metres a day.

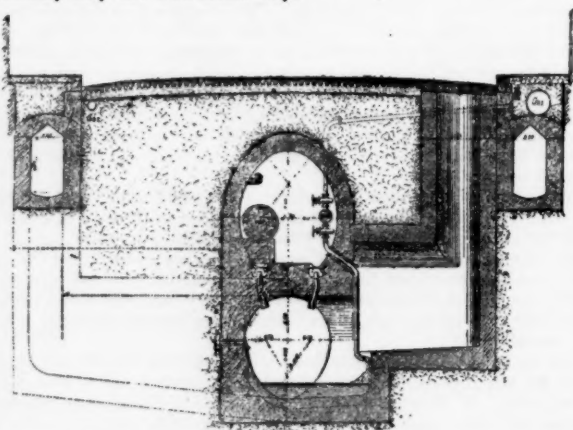
There is no doubt that the municipal government will have recourse to confiscation of these water-privileges when the necessary arrangements which will allow of this abundance being used for watering the streets during the dry season shall have been finished.

In the present condition of things, what happens is this: the joints in the pavements are impregnated with the filth of all kinds that is thrown on them, and exhale the odors of a thousand stables, the intensity of which is increased by a rain, in consequence of the fermentation which it induces. It is probably for the sake of getting farther away from this smell, that it is the custom at Rome for the richer families to inhabit the second and third stories, instead of the first as in other cities.

The reputation of the ancient Roman aqueducts has led to their being everywhere imitated, as well at Paris as elsewhere; but Belgrand says, and with justice, that what was well enough in the days of Augustus is absurd to-day. So the present authorities have entered on a career of progress, but not as yet with sufficient vigor.

The greater part of the old sewers of ancient Rome are no longer serviceable, whether because of their unknown labyrinths, their ruinous condition, — a consequence of their having been built without rule or reference to one another, sewers of two metres' diameter branching into those 0.70 metres in diameter, — or because of their depth below the surface, being as they are far below the present low-water mark of the Tiber.

These ancient sewers receive vast masses of foul water, which is discharged or absorbed as the case may be, but whose solid contents are deposited, and form vast cesspools from which arise miasms at certain points, and unite at the surface of the ground with the odors which have been mentioned above. This condition of things will end only when the new system of sewers shall be finished; fortunately they are well under way.



Since every reason induced the engineer to carry the invert (*radier*) to the lower level, he has found it most economical and desirable for the narrow streets to divide his sewer as is shown in the cut.

In the lower sewer flow the waters which come from all sources, and which bear along all sorts of refuse matter from the houses; kitchen garbage alone is excluded, and gathered by a special service every morning as in Paris. A system of lateral inlets for subsoil drainage is adopted as shown, and has already had a good effect in lowering the level of the ground-water. In the new quarters the kitchen-waste and rain-water are delivered into small sewers placed under the sidewalk, which discharge into a collector which receives directly the drainage of water-closets, etc. A visit to the sewers in October, before the rains, showed that there was not much odor in the sewers, thanks to the volume of water flowing through them, which overwhelms as far as possible matter of every sort as soon as it enters.

It would evidently be a desideratum to make more use of this water, and to cause a sufficient portion of it to pass through the waste-pipes which descend from every story of a building.

Above this sewer is built another, in which are laid the water-mains, etc., and of which the bottom is dry. Pipes trapped as shown connect the upper and lower sewers, and a pipe is branched from the water-main so that both sewers may be properly flushed.

Personal inspection enables the writer to state that, thanks to the volume of the water flowing through the sewers, the bad odors of the city are not due to the presence in the sewers of all kinds of matter discharged from the houses; that the sewers are never foul; that the foul odors are due only to the causes stated above, and wholly independent of the question of vault-emptying, which takes place almost every day.

When one knows the men of eminent ability whom the State and the City have placed at the head of their works and in charge of their schools, one is convinced that all that can be done will be, and that these distinguished men who will evidently be sent to make investigations wherever it may be necessary, so that they may incorporate in their own work whatever has been most successful elsewhere, will make it possible for future generations to find their models at Rome. It is certain that this ancient race which has been twice rejuvenated—once by the advent of Christianity and again by the renaissance of art and literature—is in a fair way to be born again, science, particularly economic science, being the rejuvenating principle. How many noble enterprises will be carried out by the architects and engineers who have confided to me their schemes! I will only mention a few of them, to show how important they are: The preparation of geological charts; the reclamation of the Campagna; the search for the best method of tunnelling, taking heed not only of the mercantile interests of the enterprise, but of the lives of the workmen (every one knows that it is Italian workmen who have cut the great tunnels, but the frightful mortality amongst these workmen is not so well known); the building of sewers; the distribution of water; the building of quays and dikes to preserve the city from the overflowing of the Tiber; the establishment of hydraulic power which will encourage numberless manufacturers to set up their works within the city, and that, too, under favorable conditions; the construction of an irrigation canal thirty-six kilometres long; the building of a permanent fine arts exhibition building; the building of the Houses of Parliament, etc.

All this proves that Italy is not merely the land of opera-singers, gondoliers, conspirators, lazzaroni and brigands; that it is not only the haunt of the muses, artists and antiquaries, but that it is also becoming the abode of labor. This people, negligent of their past reputation, seem to be changing their natures; their sluggish faculties are showing signs of life; one feels that new sap, fresh and vigorous, has begun to circulate. It must be cherished and nourished, for labor alone can lead to success. — *Emile Muller in Le Génie Civil.*

UPSTAIRS IN WESTMINSTER ABBEY.

WE are so accustomed to the fact that little or nothing remains of most English abbeys except the church that we say "abbey" when we mean "church" in a great many cases. As a good deal remains of the conventual buildings of Westminster Abbey, there is nothing extraordinary in going upstairs or downstairs or in the Abbot's chamber. But such ups and downs within the church itself strike the visitor as somewhat strange. He does not know, or has no means of knowing, that there are in some places at least two stories above the ground floor, that above some of the chapels are hanging chantries, miniature churches in themselves, and long-drawn aisles full of strange monuments. None of these nooks are shown to the public. It would be impossible to show them to more than a very few visitors at a time. The stairs are not only narrow and dark, but fragile in some cases, and when you reach at length the upper floor you often find it a very irregular surface on the top of the groining, without any railing to prevent you from falling into the nave or choir below. Nor is it altogether worth the trouble involved in ascending, for people do not always care to get behind the scenes and be made acquainted with the seamy side of what they only know as the perfection of beauty and order. The most lovely buildings in the world have their uncomely parts, and Westminster Abbey is no exception to the rule. The strange thing about visiting the triforium is the difficulty of recognizing the antiquity, the historical association, the absolute value of every heap of dusty rubbish which has accumulated there in the course of centuries. Here, a bundle of pieces of broken boarding are the canopy of some great king's tomb removed to make way for the burial of a greater. There, a heap of broken stones are fragments of the

monuments and chantries destroyed as idolatrous in fanatical times. A confused collection in a corner of carved and gilded scraps of plaster or wood represents the pomp of heraldic ornament at the funeral of a duke or a general. Nothing is lost that has once found its way into the church; and the storehouse has ample room for everything worth preserving, as well as for much that has ceased to interest the people of this generation.

The ascent is made by various flights of stairs. One of these opens on the east aisle of the cloister, close to the entrance of the Chapter-house. When the ancient church of the Confessor was superseded by the more magnificent building of Henry III., the cloisters, though they abutted on the new ground-plan of the western aisle of the south transept, were not removed, and the Poet's Corner is thus defrauded of its full proportions. The cloister is much lower than the aisle would have been in its place; and over it is the muniment-room, with its iron-bound coffers. The triforium is another flight above, and the winding stair is steep, slippery, and dark. When at length we stand on the red-brick pavement and look around, we are surprised to observe the great size of the chamber which intervenes between the top of the vaulting below and the timbers of the roof above. Nothing gives a better idea of the vastness of a building than to see the greatness of its minor parts. The pavement, which only dates from the time of Wren, becomes more irregular as we turn into the triforium of the nave. It conceals the "pockets" of the vaulting, receptacles probably filled with fragments of the statues and altars displaced at the Reformation. At the further end, in the south tower over the Abbot's Chapel or baptistery, the floor was of wood. On its being removed, the remains of Torregiano's images in terra-cotta, for the decoration of the altar in Henry VII.'s Chapel, were found. They indicate rather than prove the magnificence of the whole structure but are broken into such minute pieces that the united efforts of several antiquaries have so far failed to make up a single complete figure. Among them is the "torso" of a splendidly modelled statue of the dead Saviour, and beautiful are the feet of the angels of the canopy. This altar, which was engraved by Sandford as the monument of Edward VI., was destroyed in 1643 by one Sir Robert Harlow, who deserves to go down to posterity with Erostratus and Lloyd. Some portions, identified at Oxford among the Arundel marbles by Mr. Middleton, have been recently restored to their place, but it is to be feared that the terra-cotta fragments in the triforium are beyond repair. The chamber over the vaulting of the Abbot's Chapel, in which they were found, was that occupied, it is said, by Bradshaw, President of the High Court of Justice which condemned Charles I. The Deanery, with which by a separate staircase this part of the triforium communicates, was granted to Bradshaw, who died in it in 1659. Constant tradition avers that he actually died in this very room, a room which certainly was at some period used as a lodging, for it contains a fireplace of Late Perpendicular work. Hence, along the triforium his restless spirit walks on the nights of the 30th January and the 22d November; and in truth a more ghastly-looking corner than this it would be difficult to imagine. Little cherubs peep out here and there from behind the marble pancakes removed from the monument below of Admiral Tyrrell. Close by are two wooden obelisks removed in 1775 from the entrance to the choir, where, according to Dart's view, they stood on the summit of a pair of tall classical gate-posts. A label on one of them attributes the carving to Gibbons, but this inscription is more than doubtful.

In those parts of the triforium which are over the apsidal chapels, some curious collections have been formed. A buttress of Henry VII.'s Chapel long concealed a window here, and in it have been found some panels of the original glazing of the thirteenth century, being among the most ancient and complete examples of the kind left. They are very different from most of the modern glass. The delicacy of the design, the moderation in the use of color, and the evident desire to admit as much light as possible, are all qualities which our glass painters, with a few exceptions, do not care to seek after. In another recess is a ghastly cast in white plaster of the leaden coffin of Henry, Prince of Wales, the eldest son of James I. In a third are the remains of the old pulpit which used to stand in the nave, with its sounding-board and some exquisite carving. Farther on are the very similar panels of carving which adorned the organ-pipes, and some portions of marble statues and tablets. One of these last seems never to have been put up. Perhaps the fees were refused. On the beams above are placed in two long rows the helmets used at various times in the heraldic decoration of funerals. There are probably as many as seventy of them, but not one of any great value or beauty. Among other relics are two marble slabs long packed up in a box. They are beautifully carved in the late Italian style which Horace Walpole admired so much, and are clearly of his time or a very little earlier. On one is the head of St. Mary the Virgin, and on the other that of the Saviour. There are many points about them unsuitable for the decoration of a Protestant church, and so tradition or some wiseacre assigns them to a destroyed or unfinished monument of Anne of Cleves. But a glance at what does remain of her tomb in the choir below is sufficient to set that part of the question at rest. Near the marbles is a relic both of more interest and of less doubtful antecedents. Bundled up in two or three fagots are the venerable railings of the tomb of Edward I. How it comes to pass that in this "restoring" age they are not set up again in their proper place, it would be hard to say. But architects are fond of a kind of restoration which consists of the evolution from their own inner consciousness of a conception of what a thing ought to have been,

and are apt to neglect such a piece of evidence as this as to what it was. With regard to these railings, however, there is not any manner of doubt whatsoever, for they are figured by Dart in their proper place. Dean Stanley tells us that in 1764 the mob broke in during the funeral of Pulteney, Earl of Bath, and that the gentlemen who attended his body to the tomb in the Islip Chapel, opposite, tore down the canopy of Edward's tomb, and defended themselves with "the broken rafters." It may be so; but these iron spears, each tipped with its fleur-de-lis, would form much more obviously appropriate weapons on such an occasion. The "wooden hatch put up by Feckenham at the head of the stairs" has been restored, but not the beautiful rails. From the northern side of the triforium a fine view is obtained into the Poet's Corner and the muniment-room, with its great chests and coffers, erroneously described by Scott as being in the triforium itself. But in the upper story is a quadrant-shaped cope-chest and other vast chests for vestments, interesting in themselves, but not so splendidly locked and barred and clasped as the boxes in the muniment-room below.

Another interesting place upstairs is the chantry or Chapel of Henry V. It is a kind of gallery over the headless effigy so familiar at the end of the Confessor's Chapel. We are accustomed to admire the swans and antelopes and the curious scenes from the king's life which are carved on the high screen under which we pass on the way into the Chapel of Henry VII., without remembering that it conceals one of the most elaborate little buildings of that age now remaining. It is raised so high that people far down in the nave must have been able to see the daily elevation of the host, and with a certain felicity, leading as it does to the Lady Chapel, was dedicated to the Annunciation. Some ingenious person has discovered that the western side of the screen, with its tall staircase towers, forms the letter H, the initial of Henry's name, and unfortunately some still more ingenious person has discovered that the helmet on the crossbeam is not that in which the king fought at Agincourt, but one specially ordered by the undertakers for the funeral. It is more solid, but scarcely more important, in truth, than the threescore and ten we saw in the triforium. When we climb into a neighboring chantry, that of Abbot Islip, we find it filled with still more singular funeral monuments. The waxworks are no longer shown to the public, yet they are worth seeing, and are probably the most vivid likenesses remaining of the few personages they represent. Dean Stanley strangely observes that "they were even highly estimated as works of art." No doubt they were. It is unquestionable that the figure of Chatham, with his keen eyes, his bushy eyebrows, — features both lost in ordinary sculpture, — his great nose, his commanding attitude, is brought more distinctly before the mind by a sight of this wonderfully-speaking effigy. Did Macaulay ever see little William of Orange standing on a cushion beside his tall stout wife, and observe the intensely real look of the slight figure, and the worn yet vivacious face? Certainly these figures were the work of no mean master, and if the Duchess of Richmond and her dead son, lying in state, are not so good, it is rather because the subjects were not equal to the art than because the art failed to do them justice. Even the comparatively faded figure of Charles II., which faces the spectator as he enters the chantry, is startling with its appearance of reality. — *The Saturday Review*.

AMERICAN INSTITUTE OF ARCHITECTS.

MEETINGS OF THE BOARD OF TRUSTEES.

A REGULAR monthly meeting of the Board of Trustees was held in New York, June 20, 1881.

The Secretary, according to instructions at the last meeting, presented the draught of a circular he had prepared to be issued in accordance with the conditions prescribed in the paper he presented to the Board at its meeting of March 19, 1881, on the question of the best methods of increasing the membership and efficiency of the Institute. After an amendment, the draught was adopted as follows:—

AMERICAN INSTITUTE OF ARCHITECTS, SECRETARY'S OFFICE, 335 BROADWAY, NEW YORK.

Dear Sir, — The American Institute of Architects has reduced its annual dues for Associates to five dollars, — no initiation fee being required, — while it has given them the privilege of voting, before withheld. For Fellows (limited to seventy), the initiation fee has been reduced to ten dollars, and the annual dues likewise to ten dollars.

The Board of Trustees assume that architects old enough to remember the former drawbacks to practice recognize the fact that it is chiefly the Institute which has been instrumental in raising the profession so far towards its natural influential position. The schedule of charges recommended by it is now generally acknowledged in the courts, by corporations, and by private individuals; and it was mainly through the exertions of its Committee on Publications [See remarks below. — Eds.] that the establishment was secured of a proper organ of communication between the profession and the public, viz., the *American Architect and Building News*. The Institute publishes every year a pamphlet of the proceedings of its successive annual conventions (of which fourteen have been issued), as well as other matter of technical and general interest to practitioners. These are but the beginnings of what may be secured by intelligent interchange and concerted action among the members of the profession, through the medium of its recognized society.

The Secretary is instructed to forward this note to the past members of the Institute, — a list of whom may be found in the lately issued Fourteenth Proceedings, — in the hope that the increased practice resulting from the general prosperity of the country and the decreased financial obligations within the society may restore old ties, and to architects generally in the persuasion that they will recognize the benefit to all of an active and organized *esprit du corps* among practitioners in the same art. He will be very glad to answer questions and forward documents giving information in detail.

Respectfully,
A. J. BLOOR, Secretary.

THOS. U. WALTER, President.

The Secretary read from Mr. Ware's communication of June 9, 1881, a request that a new edition should be struck off from the existing stereotype plates of the "Abstract of a Tract on Competitions," issued by the Institute for the Committee on Professional Practice, in 1876. The Secretary was instructed to write to Mr. Ware for particulars as to how large an edition he would suggest, the cost, etc.

The Secretary read a letter he had received the day before from an architect, detailing a grievance with a client, and particularly asking the meaning of the word "superintendence" in the Institute schedule of charges, and the subjoined reply:—

NEW YORK, 13th July, 1881.

R. P. SOUTHARD, Esq.:—

Dear Sir, — Yours of the 16th ult. was duly received. The question you propound has been frequently asked, but the Institute has never given an official answer to it. At the last meetings of the Board of Trustees, however, the reading of your letter renewed the discussion, and I was finally desired to reduce to homogeneous shape the result of our deliberations, and present it at our next meeting in September. I will let you have a copy of this when it is accepted by the Board.

Meanwhile I may say that in my own practice I have never happened to deal with owners who did not apparently recognize the distinction between the constant and minute superintendence of a building in progress of erection exercised by a clerk of the works or a mechanics' foreman, and the general superintendence or supervision — as often by deputy or by letter as in person — which an architect exercises, as occasion requires, over the execution of work designed in his office; that is to say, sufficiently to ensure its being done in accordance with his drawings and specifications. It is not uncommon for architects to visit the building, in person or by deputy, only before giving the successive certificates required to enable the contractor to get his instalments of payment from the owner.

I will save you the necessity of going to the expense of appointing a commission by enclosing a list of some of the more prominent architects of this city, communication with any of whom will, I think, be apt to corroborate what I have just said.

I think it likely that the *American Architect and Building News*, 211 Tremont St., Boston, may be able to give you instances of adjudication on your side.

I add the addresses of the Secretaries of the Chapters of the Institute (I happen to be Secretary both of the Institute and of its New York branch) in case you wish to search for further possible information, and also the latest edition of our Schedule of Charges. Hoping to hear of your success,

I am, Yours truly,

A. J. BLOOR.

Resolved, — That the next and fifteenth convention of the Institute, in accordance with the desire of the last convention, be held in Washington, D. C., to open on Wednesday, November 16, 1881, and that the Committee of Arrangements for the same be the Secretary, Mr. McArthur, Jr., of the Philadelphia Chapter, and Mr. Murdoch, of the Baltimore Chapter.

A special meeting of the Board of Trustees was held in New York, June 28, 1881.

Mr. Gordon W. Lloyd, of Detroit, Mich., was elected a Fellow, and Prof. Charles Eliot Norton, of Cambridge, Mass., and Mr. Jno. H. B. Latrobe, of Baltimore, Md., were elected honorary members. On the question of the meaning of the word "superintendence" used in the Institute schedule, the definition prepared by Messrs. Littell and Le Brun at the last meeting was taken up. Messrs. Cady, Congdon, Hatfield and Bloor each added the written draught of a definition, and after some discussion all the said definitions were referred to the Secretary, to reduce to homogeneous shape, the result to be presented to the Board at the next regular meeting in September.

A. J. BLOOR, Secretary.

[THE GENESIS OF THE AMERICAN ARCHITECT.]

[The fact that the *American Architect* is "the adopted organ for purposes of publication" of the American Institute of Architects, a fact to which we gave some prominence in certain printed circulars which we issued early in the career of the journal, has not unnaturally given rise to a misconception, on the part of the public, as to the true relation existing between the *American Architect* and the American Institute of Architects. As it is not impossible that the statement contained in the circular printed above may increase this misapprehension, we think it worth while to give the following bit of history.

The Institute in its early days attempted, we believe, to maintain a periodical publication, but soon abandoned the enterprise. The desire for such a publication, though it still existed, remained dormant until it was revived at the annual convention of 1872, when a resolution was offered recommending that an official periodical publication should be established. The matter was then referred to a committee, who reported at the following annual convention (1873), that they had discussed the matter with various publishers, and had moreover endeavored by letters, circulars and personal applications to secure enough material for the first issue of such a publication, the result being that they had received "but one written response," and were "verbally assured that six illustrations would be forthcoming." The little success that had attended the endeavors of the Institute to establish a journal of its own made its members very ready to adopt at the next annual convention (1874) the following resolution:—

"Whereas, The Convention have learned from the report of the Committee on Publications that Messrs. James R. Osgood & Co., of Boston, are proposing to publish an architectural journal of the same general character as that heretofore proposed by the Institute,

"Resolved, That the Institute abandon its intention of editing and publishing a professional journal, and will cordially co-operate in promoting the success of Mr. Osgood's undertaking.

"Resolved, That the Board of Trustees and the Committee on Publications are instructed to assist Mr. Osgood's publication by all means in their power."

It is due to ourselves to say that the co-operation hereby promised was cordially extended to us. Thus much for the Institute's connection with the

American Architect. Now, as to the facts connected with the actual establishment of this journal.

Messrs. James R. Osgood & Co., as publishers of the *Architectural Sketch Book*, and the *New York Sketch Book*, had early perceived and discussed the commercial advantages of such a technical journal as is now published by them, and had decided to found a weekly architectural paper, as soon as times were propitious, so that when the Committee on Publications of the Institute approached them on the subject of becoming the publishers of the Institute's proposed journal, it was discovered that there was a likelihood that two similar and consequently rival publications might be established. As the desire of the Institute seemed to be not so much to have a journal of its own, as to have one established which should be acceptable to the profession, and as experience and investigation had made apparent the difficulties and expenses of such an undertaking, it seemed to it most advisable to abandon the doubtful enterprise in favor of its better equipped prospective competitor, and to do what it could to give shape and character to the *American Architect* by advice and moral support. This course was adopted, and the resolution quoted above was passed.

So far as we can judge, then, the influence of the Institute on the publishers of the *American Architect* was like that of the spur which decides the sagacious horse, craning at a hazardous leap, to make the plunge. It is safe to say that sooner or later the *American Architect* would have begun its career, whether the Institute had existed or not, but that its birth would have taken place in the midst of such severe commercial depression as existed in 1876, had it not been for the discussions which attended the question of an Institute publication, is by no means certain. —EDS. AMERICAN ARCHITECT.]

THE STANCHNESS OF "BALLOON-FRAMES."

WINONA, MINN., August 2, 1881.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Gentlemen,—I notice by reading your comments on the recent cyclone in Minnesota, that you have either been misled as to the real facts of the case, or are laboring under the mistaken theory that because the "balloon-frame" structures are so generally used in the West, that they must necessarily be the buildings that suffered in the recent cyclone at New Ulm. In fact, you intimate that had they been of the old-style frame no such destruction would have followed. Such is not the case. The city of New Ulm is (or was) built largely of brick buildings, more so in proportion than any city or village in Minnesota, and it is a notorious fact that the brick buildings suffered far the worst. The most substantial brick and stone buildings in the city were in cases wholly or partly demolished; brick business-blocks were completely destroyed, and every metal roof in the city was blown off.

While the brick buildings suffered so severely, the large majority of the despised "balloon-frame" structures stood the test, and are in more favor with the people of New Ulm than brick buildings.

Though more light and airy in appearance than the old style of framing, yet the "balloon-frame" is stronger than the "substantial structures of our ancestral homes," and will stand more wind-pressure.

The lumber, labor, and transportation question has nothing to do with the usage of "balloon-frames" in this region, as both labor and transportation are reasonable, and lumber is much cheaper here than in the East, seeing that one hundred million feet are annually sawn and marketed in this city alone.

Yours respectfully,

"READER."

[We are glad to have our correspondent's views, certainly founded on careful observation, of the relative advantages of different kinds of construction in case of cyclones. Perhaps he will favor us with a more extended communication upon a subject of so much interest to all our readers. —EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS.

A FRENCH ESTIMATE OF ENGLISH PALACES.—A French writer describes Buckingham and St. James's Palaces not inaptly when he calls the first "a house of the honest bourgeois sort," and the second that "scattered, dishevelled construction of bricks, which may be a school, a hospital, a barrack or a jail."

A NEW USE FOR THE PHONOGRAPH.—The Polyglot Institute at Paris proposes to try a phonograph of new construction, in order to teach its pupils how to pronounce correctly the difficult words of foreign languages. —*Chronique Industriel.*

PAPER BELTING.—It is reported in *Engineering* that paper belting is successfully used in the machinery-hall of an exhibition now being held in Japan. The Japanese have long been celebrated for their manufacture of some exceedingly tough descriptions of paper, and it is stated that the paper belting has been tested, and found much stronger than ordinary leather. Now that machinery is rapidly making its way into Japan, the manufacture of this paper belting is of special interest to the country, as from the want of proper tanning good leather is not made by the Japanese.

JAPANESE LEGEND OF THE ORIGIN OF ART.—The Japanese have a legend about the origin of art in their country. They say it was born about the commencement of the Christian era, when Nomino Soukune abolished the practice of burying living persons with the dead, and clay images were made to imitate them and sacrificed instead. Later tradition asserts that a party of Chinese immigrants landed in Yokohama, B. C. 200, under the pretence of seeking a plant which was a specific against death, and which they believed flourished in Japan, but that, failing to find the flower, they settled in the country and introduced the arts and sciences.

PALESTINE EXPLORATION.—The July number of the *Quarterly Statement*, issued in connection with the Palestine Exploration Fund, contains full particulars of the very remarkable discoveries which have been made in the last few months. First in interest, perhaps, comes Prof. Sayce's commentary on the newly found inscription at the Pool of Siloam. A text which dates from the time of Solomon is, indeed, a rare monument. There is next a discovery made by Lieut. Conder, which may prove of even greater interest. He has found, close to the spot where he places the site of the Crucifixion, which is still called the Place of Stoning, a Jewish tomb of Herodian period, standing alone, cut in the rock. "Can this be," he asks, "the 'new Sepulchre in the Garden?'" A drawing and plan of the tomb have been made for the society. Another drawing has been made of the real mouth of Jacob's well, recently uncovered by the Rev. C. L. Bardsley. The well-mouth is much worn by the friction of ropes. It was formerly covered over by a Christian church, and if, as is possible, this church dates back to the second or third century, the stone should be no other than the very stone on which our Lord conversed with the woman of Samaria. Another discovery, only indirectly connected with the Bible, is that of the ancient Hittite city of Kadesh, on the Orontes. Not the least surprising thing about this are the facts that Lieut. Conder found it from an Egyptian record written 3,000 years ago, and that the old name, though it has disappeared from history since the thirteenth century before Christ, is still attached to it. Another paper in the same number of the journal clears up a curious mystery attached to Ain Gadis, the probable site of Kadesh Barnea. It was visited and described, in glowing terms, by Mr. Rowland forty years ago. No one has since been able to reconcile his statements with those of other travellers. Mr. Trumbull, of Philadelphia, has now, however, discovered that no other travellers have seen the real fountain since Rowland, having all been taken to another spring ten miles distant from the real Ain Gadis. It is a most remarkable spring—it issues a full-grown stream from the rock; it forms an oasis in which there is abundance of grass, with great trees, even in the arid desert of the Tih; it runs away and loses itself in the sand. The place may or may not be Kadesh Barnea, but those who believe that it is will henceforth read the history of the events which took place there with far greater interest and fuller understanding. At all events, it is quite clear that there is plenty of water, and to spare, even for the large numbers who encamped at Kadesh.

AN UNDERGROUND RAILWAY FOR NAPLES.—A project for a metropolitan underground railway, devised by an Englishman, was presented to the municipality of Naples several months ago, and recently all the details of the plan, with eighty-one drawings, have been sent in for examination. The design is to put all the central points of the city, the suburbs, and the hill villages in easy and quick communication with each other. The line, beginning at Fuori-Grotta, will embrace the whole semicircle of hills, running under them in tunnels through the tufa rock, and communicating by means of elevators with a line on the top of the hill, which will connect the different villages there situated. On the seashore, at the Marina, the subterranean line will become an open-air one, re-entering the tunnels near the arsenal, and running under the city to Mergellina, thus completing the circle, while intersecting lines will connect all the central points of the city. Most of the tunnelling will be in the bosom of the hills, with double lines. The tufa rock is easy to cut and very safe, as is proved by the many existing quarries, all the houses in Naples being built of this stone. The tunnels running under the streets of the city will be only eighteen hundred metres long, and none of them pass actually under the houses, for they follow the lines of the middle of the streets at a maximum depth of eleven metres. The whole length of the lines is about twenty-two thousand metres. The line at the top of the Vomero (the hill at the back of the city) will be on the reduced, or narrow-gauge, system, but the lower and underground railway will have the usual gauge, and thus be capable of direct connection with the proposed new short line from Rome, coming through Pozzuoli, and connect it with the present central station of Naples.

DOUBLE-GLAZING.—Dr. James Edmunds, of London, points out in the *English Mechanic* some of the advantages of double-glazing in promoting the health of homes in winter. Skylights, he says, ought never to be put up unless double or double-glazed. Double-glazing answers perfectly if the sashes are grooved out for glass on each side, and are then glazed with an air-space of one-half inch or more between the panes of glass. The glass must be put in with its inner faces perfectly bright and clean, and the glazing should be done on a cold dry day, so as not to include watery vapor, which, in cold weather, will condense inside the air-space and cause mistiness. This double-glazing with air-space makes a window almost as warm as a brick wall, and not only keeps up the temperature of a room in winter, and saves firing, but it keeps the room cool in hot weather, and it makes the temperature more uniform throughout the apartment. With ordinary thin glazing in winter the inmates are always being chilled on that side which looks toward the window, and baked on the side which is toward the fire, and no sooner do ladies leave the dining-room than the gentlemen instinctively move up to the fireplace and proceed to bake the cold side of their persons. Double-glazing our window-sashes would save all this trouble.

NEW ELECTRIC BURNER.—Two Frenchmen, MM. Clérac and Bureau, have recently brought out and introduced with success in Paris an electric lamp which, on account of its mellow lustre, they call the sun electric light. The light is formed by boring two converging holes into a small block or brick of marble, and inserting into these two carbon rods. The rods are separated at their points by a partition of the marble, and they nearly penetrate through the block. Their upper ends are connected to the dynamo-electric machine, and the current in traversing the wall of marble between their points makes it white-hot. The carbons are slowly consumed, the gas escaping by the bore-holes, which are wider than the rods, and they are fed to the arc by their own gravity. They are consumed at a rate less than 0.5 inch per hour. The light is emitted by the bottom of the brick, which becomes calcined.

BUILDING INTELLIGENCE.

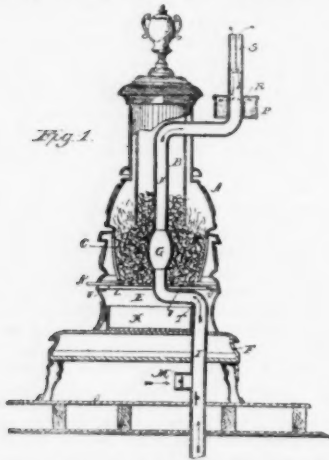
(Reported for The American Architect and Building News.)

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

BUILDING PATENTS.

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

243,548. HOT-AIR STOVE.—Egbert C. Goodrich, Pontiac, Mich., and John W. Johnson, Moravia, N. Y. This invention has for its objects, to provide means whereby a continuous current of thoroughly heated and moistened air may be supplied to the rooms above the one in which the stove is, and to provide for renewing the parts of the apparatus when injured by the intense heat of the fire. The letter A indicates a "magazine stove." B indicates the magazine, C the fire-pot, E the ash-pit, and F the base of the stove. The letter G indicates a heating-chamber, consisting of a shell of cast-iron, which is elliptical in vertical section, and which is provided with cylindrical extensions H at opposite ends. I indicates a pipe extending upward through the back part of the stove into the ash-pit, where it is bent forward to the centre of the stove, above the removable ash-box K, and then vertically upward, extending through the centre of



the grate L, which has an opening for the purpose. This pipe terminates just above the grate, and to it is detachably secured the heating-chamber G, in such position that it will be in the hottest part of the fire-pot, where it will be always surrounded by incandescent fuel. The lower end of the pipe I is carried outside of the room, and communicates with the external air. The pipe may be provided with a branch, provided with a suitable damper, M, leading into the room, by means of which air may be taken from the room directly, instead of from the outside. The letter N indicates a pipe detachably secured to the upper end of the chamber G, and extending vertically up into the magazine to near the top, where it is bent horizontally and passed through the walls of the stove, and then upward to the rooms above. The letter P indicates an annular water-chamber surrounding the pipe N above its second bend, and communicating with the interior of said pipe by means of apertures, R, to supply steam to the heated air, in order to moisten it. The letter S indicates a series of radial partitions in the upper part of the pipe N, for distributing the heated air in different directions, as indicated by the arrows.

244,968. WINDMILL.—John S. Adams, Elgin, Ill.
244,969. WINDMILL STEERING MECHANISM.—J. S. Adams, Elgin, Ill.

244,988. COMPOUND FOR SEWER-PIPES, ETC.—Daniel H. Dorsett, Clinton, Io.

244,993. ROTARY FAN-BLOWER.—Charles Gage, Boston, Mass.

244,994. MACHINE FOR GRINDING CEMENT.—Benjamin F. Holland, Utica, Ill.

245,011. TRAP FOR WASH-BASINS.—Andrew W. Nicholson, Brooklyn, N. Y.

245,016. COCK AND FAUCET.—Fergus A. Renton, Green Point, N. Y.

245,019. COMBINED SHUTTER-WORKER AND SASH-FASTENER.—Nelson Rowen and Martin D. Miller, Oswego, Kan.

245,023. EXPANDING REAMER.—Benjamin F. Sisson, Minneapolis, Minn.

245,034. REACTING TRUSS.—Hector von Bayer, Washington, D. C.

245,057. RIVET-SET.—Andrew F. Clinch, York, and James H. Clinch, Pittsburgh, Pa.

245,061. ELEVATOR.—Richard T. Crane, Chicago, Ill.

245,075. SAW-TABLE GAUGE.—Edgar A. Jones, Sturgis, Mich.

245,078. CHIMNEY AND COWL.—John H. Kohlmeier, Norwalk, O.

245,082. DOOR-CHECK.—William W. Massey, Elyria, O.

245,090. SAW.—Geo. H. Northway, Chicago, Ill.

245,093. ONE-HAND PLANE.—Isaac Reeder, Philadelphia, Pa.

245,095. ADJUSTABLE MANTELPIECE.—Thomas Scantlin, Evansville, Ind.

245,106. BORING-BIT.—M. Scott Weller, Jefferson County, W. Va.

245,114. SAW.—Joseph Ashenfelter, Blue Springs, Neb.

245,122. COMBINATION-TOOL.—George W. Bishop, Sterling Township, O.

245,132. SELF-CLOSING FAUCET.—Clara E. Carr and George D. Scott, New York, N. Y.

245,139. ELECTRIC WATER-METER REGISTER.—George Cressey, Louisville, Ky.

245,140. SEWER-TRAP.—Abraham Cummings, Philadelphia, Pa.

245,156. WINDOW-FRAME.—William Goforth and Andrew J. Goforth, Windsor, Mo.

245,158. HEATING-FURNACE.—Albert L. Goodenow and William J. Owens, Utica, N. Y.

245,193. WATER-CLOSET.—John McGuire, Milwaukee, Wis.

245,196. WATER-CLOSET.—Henry C. Meyer, New York, N. Y.

245,198. SASH-FASTENER.—John D. Miller, Lancaster, O.

245,213. SEAL-TRAP.—Dennis A. Ragan, Philadelphia, Pa.

245,227. CLAY TILE.—Fritz Schmidt and Martin Holzbecher, Oppeln, Prussia, Germany.

245,230. DOOR AND WINDOW SECURER.—Wm. Seeman, Honesdale, Pa.

245,237. PLASTERING AND ORNAMENTING WALLS AND CEILINGS.—David W. Stockstill and Thomas J. McGeary, Washington, D. C.

245,239. APPARATUS FOR EMPTYING WATER-PIPES.—James Thomas, Newark, N. J.

245,244. CHANDELIER.—Charles F. Spencer, Rochester, N. Y.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Eighteen building permits have been issued since the last report, the following only being of sufficient importance to be mentioned:
A. H. Schuyler, 6 three-sty brick buildings on Boston St., near Guy St.

S. W. Hunter, two-sty brick buildings on Greenmount Ave., between Monument and Madison Sts.

W. S. Pietsch, three-sty brick buildings, on Franklin St., between Paca St. and Pennsylvania Ave.

Geo. A. Frames, three-sty brick building, n e cor. Monument and Gay Sts.

Geo. A. Sargent, two-sty brick, on Claret Alley, between West and Stockholm Sts.

Wm. F. Hooper, addition and improvement to dwell., n e cor. Madison Ave. and Townsend St.

Thomas A. Gorman, 5 two-sty brick buildings on Chesapeake St., near Hudson St.

Lewis A. Kuzer, four-sty brick warehouse, n side Holliday St., near Lexington St.

Isaac Hartman, three-sty brick building on Baltimore St., between Gay and Holliday Sts.

R. P. Guy, three-sty brick building, s w cor. Lexington and Park Sts.

WAREHOUSES.—Mr. Chas. E. Cassell is preparing drawings for a new warehouse, for the Trustees of the Thomas Wilson Sanitarium, to be built on west side of Hanover St., between Pratt and Lombard Sts., 29' 1" front, x 140' deep, five stories and basement, of pressed brick with red sandstone finish; cost, about \$25,000 or \$30,000.

OFFICE-BUILDING.—The contract for the erection of a new building for the central station of the Irish Electric-Light Company, at No. 40 Monument St., has been awarded to John Waters, for \$10,300, the building to be 26' long, 16' wide, one-sty high (21'), the contract for building a stack for same, 100' high, 7' in clear inside, has been awarded to Jno. G. Robinson, for \$4,200.

Boston.

BUILDING PERMITS.—Brick.—Terrace St., near Parker Pl., for James W. Kenney, four-sty brewery, 80' x 45'; James Devine, builder.

Beacon St., No. 287 and 289, for Vinal & Dodge, 2 three-sty dwells., 24' x 68', mansard; Vinal & Dodge, builders.

Harwich St., near Dartmouth St., for John L. Lamprey, 8 dwells., 20' x 35'; Thomas R. White, builder.

Hewich St., near Yarmouth St., for John F. Mead, 11 dwells., 20' x 35'; Thomas R. White, builder.

Dale St., near Mills St., for O. H. Flanders, 3 dwells., 18' 6" x 36', dwell., 21' x 36', three-sty dwell., 29' x 38'.

Jauner Hill St., Sullivan and Wall Sts., for Middlesex R. R. Co., three-sty stable, 70' x 78'; M. S. & G. N. Miller, builder.

Acornbury St., near Clarendon St., for J. Avery Richards, four-sty dwell., 24' x 62'; Chas. Chipman, builder.

West Broadway, near A St., for J. J. Williams, boiler-house, 25' x 18'; Vinal & Dodge, builders.

Wood.—Parkman St., near Dorchester Ave., for A. W. Fice, two-sty dwell., 21' x 30'; Chas. Stinson & Co., builders.

Edgewood St., near Blue Hill Ave., for C. E. Currier, 2 dwells., 21' x 32'; C. E. Currier, builder.

Terrace St., rear of, near Parker Pl., James W. Kenney, cooper shop, 50' x 26'.

Soley St., No. 18, for Elizabeth Wiley, three-sty dwell., 16' 6" x 34'; Geo. M. Starbird, builder.

Dudley St., No. 124, for Donald Kennedy, store, 17' x 30'; Hugh W. Brown, builder.

Unnamed St., off Dorchester Ave., for Wm. Stetcher, dwell., 21' x 28'; Wm. Kadie, builder.

Bolton St., 121 and 123, for Edw. A. Kenney, 2 three-sty dwells., 22' x 30'.

Hemlock St., near Washington St., for David N. McKenney, storage, 35' x 25'; James Currie, builder.

Bacon St., near Brookline Ave., for James McGeary, two-sty dwell., 21' x 50'; James Campbell, builder.

Longwood Ave., No. 117, for Mary Lane, three-sty dwell., 24' x 32'.

Orleans St., cor. Webster, for Luther Hall & Co., two-sty stable, 22' x 21'; Jos. A. Brown, builder.

Brooklyn.

BUILDING PERMITS.—Eighth Ave., s w cor. Union St., three-sty brick dwell.; cost, \$58,000; owner, Mrs. M. L. Maxwell, 71 First Pl.; architect, R. B. Eastman; builders, W. H. Hazzard & Son.

Manjer St., No. 40, s s, near Lorimer St., three-sty frame tenement; cost, \$3,300; owner, Mr. Williams, on premises; builders, G. Welch and J. Bueger.

Penn St., n s, 229' w Marcy Ave., 3 two and one-half-sty brownstone dwells.; cost, \$4,000; owner, S. B. Saddington, 263 Hewes St.; architect, G. M. Casey; builder, W. H. Colson.

Stuyvesant Ave., e s, 60' a Gates Ave., 2 three-sty brick tenements; cost, total, \$7,000; owner, J. T. Perry, 1004 De Kalb Ave.; builders, A. Suchs and J. T. Perry.

Lafayette Ave., s s, 415' e Bedford Ave., 2 two and one-half-sty dwells.; cost, \$4,000; owner and carpenter, Geo. F. Chapman, 15 Kosciusko Pl.; mason, J. Brown.

South Elliott Pl., e s, 150' a De Kalb Ave., 3 three-sty brownstone dwells.; cost, \$9,000; owner, Isabella Gordon, 3 Willow St.; architect, R. Dixon; builder, J. Gordon.

Greene Ave., s s, 190' e Bedford Ave., 13 three-sty brownstone dwells.; cost each, about \$8,500; owner, etc., James H. Darrow, 106 Lawrence St.

Bedford Ave., n w cor. Hooper St., three-sty brownstone dwell.; cost, \$18,000; owner, Edward Havens, cor. Bedford Ave. and Keap St.; architect, W. H. Gaylor; builders, James Rodwell and C. L. Johnson.

Fulton St., s s, 100' w Hoyt St., two-sty brick ticket-office and theatre entrance; owners, Hyde & Belman, Adams St., near Myrtle Ave.; architect, Wm. Taylor; builder, M. J. Reynolds.

Baltic St., No. 328—80 West Smith St., three-sty brick tenement; cost, \$5,500; owner, Samuel Frost, 68 Irving Pl., New York; architect, etc., E. G. Vail; mason, John Hayes.

Graham Ave., n e cor. Moore St., 4 four-sty brick stores and tenements; cost, each \$6,500; owner, Jacob Kiefer, 142 Graham Ave.; architect, John Platte; builders, Grassman & Maurer.

Pier foot of Hudson Ave., four-sty frame elevator; cost, \$4,000; owner, Robert Colgate & Co., Riverdale, N. Y.; architect and builder, H. G. Seebler.

Montrose Ave., n s, 150' e Ewen St., three-sty frame store and tenement; cost, \$4,000; owner, Charles Ness; architect, J. Platte; builders, J. Schlereth and J. Friesse.

De Kalb and Central Aves. and Stockholm St., one and three-sty railroad depot; cost, \$100,000; owner, Brooklyn & Newton R. R. Co.; architect, Edward E. Raht; builders, John D. Anderson and Wm. Russell.

Hancock St., s s, 410' e Bedford Ave., 5 three-sty brownstone dwells.; cost, each \$7,500; owner and carpenter, S. E. C. Russell, 558 Grand Ave.

Twenty-third St., s s, extending to Twenty-fourth St. between Fifth and Sixth Aves., two-sty brick car-house and storage loft; cost, \$17,000; owner, Atlantic Avenue Railroad Co., cor. Atlantic and Third Aves.; architect, Geo. W. Anderson; builders, John D. Anderson and John Lee.

Wyckoff Ave., Woodbine and Ivy Sts., one-sty brick stable; cost, \$28,000; owner, Brooklyn City Railroad Co., 10 Fulton St.; architect, A. W. Dickie; builders, John Lambert and P. Brady.

Wyckoff Ave., Palmetto and Woodbine Sts., two-sty brick car-house and hay-loft; cost, \$48,000; owner, Brooklyn City Railroad Co., 10 Fulton St.; architect, A. W. Dickie; builders, W. H. Hazzard & Son and P. Brady.

ALTERATIONS.—Hewes St., No. 145, two-sty brick bay-window extension; cost, \$5,000; owner, L. J. Busby; architect, O. S. Teale; builders, W. T. & B. Lamb.

Even St., n w cor. Cook St., two-sty brick extension; cost, \$2,500; owner, Wm. Batterman on premises; architect, Th. Engelhardt; builders, G. Doering and H. Loeffler.

Hicks St., n w cor. Cranberry St., raised one-sty, interior alterations; cost, \$2,500; owner, Wm. Court, on premises; architect, I. D. Reynolds; builder, M. C. Ruch.

Chicago.

BUILDING PERMITS.—J. J. Marsen, two-sty brick store, 24' x 70', 2831 Halsted St.; cost, \$3,800.

E. A. Hartwell, four-sty brick warehouse, 43' x 100', Lake and Jefferson Sts.; cost, \$12,000.

W. Jacobs, one-sty brick store and house, 50' x 70', Paulina and Moorman Sts.; cost, \$5,000.

Union Iron and Steel Co., two-sty brick wire mill, 86' x 140', Ashland and Archer Aves.; cost, \$25,000.

Lizzie Lane, two-sty brick dwell., 22' x 60', Indiana Ave.; cost, \$4,000.

E. Baggott, two-sty brick store, 20' x 60', 132 Fifth Ave.; cost, \$3,000.

T. Mackin, 2 three-sty brick dwells., 50' x 74', 241 Illinois St.; cost, \$12,000.

E. W. Jennings, 3 three-sty brick dwells., 60' x 40', Washington St.; cost, \$13,500.

Mobile.

STORES.—Perryman Stores, Nos. 48, 50 and 52 North Commerce St., burnt March 20, 1881, rebuilt on original plans; Nos. 48 and 50, contractor, G. E. Tyndall, cost, \$4,200; No. 52, contractors, Marvin & Farley, cost, \$1,875.

DWELLINGS.—North-west cor. Church and Jackson Sts., two-sty frame dwell.; owner, A. Levy; contractors, John P. Enrich & Son; cost, \$3,500; architect, Jas. H. Hutchisson.

North-east cor. Government and Lawrence Sts., two-sty frame dwell.; owner, John L. Lauretta; contractor, M. Smith; cost, \$2,600; architect, Jas. H. Hutchisson.

New York.

BUILDING PERMITS.—Eighteenth St., n s, 140' e Avenue A, 2 three-sty hard-brick factories; total cost, \$9,000; owner, Vernon K. Stevenson, 115 Broadway; architects, D. & J. Jardine; builder, W. C. Fellows.

(Continued on next page.)