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THE New York *Tribune* makes some excellent editorial remarks on the movement which, to a great extent through the unselfish efforts of Mr. Richard Watson Gilder, has attained such force in New York, for improving the condition of the dwellings of the very poor. The *Tribune* observes, with truth, that although the political conditions existing in this country are, as we believe, far more favorable for the welfare of the poorer class of citizens than those prevailing in Europe, the houses in which they are compelled to live, are, as a rule better in Europe than they are here. The main reason of this is that, although there, as here, a good deal has been done by private benevolence to provide decent and wholesome habitations for poor people, we have not yet come to a sufficiently keen appreciation of the menace which the worst sort of tenements offer to all the inhabitants of the city that suffers them to adopt the rigid police measures by which, in foreign cities, such buildings are supervised and regulated. By the well-directed zeal of Mr. Gilder and his associates a great reform has been initiated, in the passage of the so-called "Tenement-house Law," and the carrying-out of the law should enlist the sympathy of all good citizens. The cardinal principle of our political system assumes that every man is capable of thinking and acting for himself, and any movement, however well-intended, which involves the suggestion that any class of citizens is entitled to ride on the backs of other citizens or is under obligations to carry other citizens on its back, is, in the end, dangerous to liberty; but it is one thing to relieve a fellow-man from the necessity of walking, by carrying him in our arms, and another thing to clear away from his path obstacles which have not been placed there by his fault, and which his eyesight, less keen than our own, may not enable him to detect, or which his strength may be insufficient to remove. One of the most serious obstacles which a poor man in a great city finds in the way of maintaining his capacity to work, and in bringing up his children in decency and health, is the difficulty of finding a habitation, at a rent within his means, offering a reasonable amount of light and air, and freedom from noxious influences. If he could afford to choose his dwelling-place, he might be expected to assume the responsibility of choosing wisely; but a great number of people cannot choose, the lowest rents being the only ones that they can pay; and these people ought not, through their helplessness, to be exposed to material and moral contaminations, due to the neglect and selfishness of others. "Use your own in such a way as not to injure others" was the maxim, in regard to the management of property, of the greatest nation that ever existed, and the restraint of those to whose selfishness is due the existence of conditions which threaten the welfare of innocent people is a plain duty.

MR. A. J. BLOOR writes a timely letter to the *Tribune* on the subject of the recognition of architecture as a fine art by American artistic bodies, and particularly by the National Academy of Design. Notwithstanding the reputation of the National Academy of Design among the general public as a somewhat fossilized institution, it is certainly held in great respect by architects, as the principal representative in this country of the great artistic corporations in Europe, the Royal Academy of England, the Institute of France, and the various Italian and German bodies, which have been made illustrious for centuries by the reputation of their members, and the wisdom and dignity with which their affairs have been administered. Holding such a place, it has for years been a matter of wonder to the profession that the National Academy should not have provided for the admission of architects to membership, and we imagine that a good many people, outside the profession as well as within it, were not pleased, on the death of Mr. R. M. Hunt, at the reflection that an American who had been selected in England as the recipient of the Royal Gold Medal, and had been for years a member of the Institute of France, should never have had the smallest recognition from the principal artistic body of his own country.

OF course, the National Academy of Design understands its own affairs best, and is under no obligation to admit architects to membership if it does not want them, but if it prefers not to associate with them, there should be no delay in taking steps for the formation of a national body, devoted to the promotion of fine arts, which will provide a place for the most distinguished of the men who have done more to raise the artistic reputation of the United States, and to direct the attention of the American public to matters of art, than all other agencies put together. It is true that the Architectural League unites the various artistic professions in an admirable way; but the work of the League must necessarily be somewhat local, and membership in a body of earnest and active practitioners and students is a different thing from election, as the reward of conspicuous merit, into a circle composed of men whose career has already reached its zenith, and who choose a new companion, not on account of what he promises to do, but by reason of what he has already done. The objection is sure to be made to the establishment of bodies of this sort, as it has often been made to the proceedings of the National Academy, the Royal Academy and the Institute of France, that it creates a hierarchy, promotion in which is reached through favoritism, rather than through merit. No doubt there is some truth in this notion, for the members in control at any given period naturally select, for admission to their ranks, men who sympathize with their own view of artistic matters; but a good tradition, kept pure, is an excellent safeguard against temporary vagaries, and nowhere more so than in the affairs of art; while the advantages of some sort of hierarchical system of promotion, in developing and encouraging merit, far outweigh the evils of an occasional mistaken estimate of merit. It is a familiar principle that a few great professional prizes will encourage a whole profession to the industry and good conduct without which such prizes cannot be hoped for; and the profession of architecture is now so large that such prizes can be of much use to it in keeping it to a standard of conduct and accomplishment. For this purpose, nothing at present available would be more effective than the prospect of membership in a body composed of the very elect of the artistic world, and there is no reason why America should not offer to its artists such an object of emulation.

A CELTIC builder has got himself into trouble in Massachusetts, by forgetting temporarily, as it appears, what country he lived in. It seems that he is the contractor for a public school building in the city of Lawrence, and, on the Fourth of July, took it into his head to decorate the unfinished structure with the flags of Ireland and the United States, hung side by side. Now there is a statute in Massachusetts, which says that "it shall be unlawful to display the

flag or emblem of any foreign country upon the outside of any state, county, city or town building or public school-house within this Commonwealth, provided, however, that when any foreigner shall become the guest of the United States or of this Commonwealth, upon proclamation of the Governor the flag of the country of which such public guest shall be a citizen may be displayed upon public buildings, but not upon public school-houses"; and the contractor was, in accordance with this statute, duly summoned to answer for the misdemeanor, to which a fine of not more than twenty dollars is attached. Before the fine can be imposed, however, some knotty legal questions must be answered, and the inhabitants of Lawrence are awaiting the trial of the case with some curiosity. The principal question is, of course, whether an unfinished school-house is a public school-house, within the meaning of the statute, or not. The city of Lawrence has paid for the land on which the building stands, but has not completed payment for the building, nor has the structure been turned over to the city authorities. Unless there are some precedents applicable to the case, the question offers possibilities of argument on both sides which should highly commend it to law-schools and debating-societies, but it remains to be seen whether the contractor will have the question fought out at his expense, or will choose the cheaper, if less noble course, of pleading guilty and paying his fine.

THE Executive Committee of the National Association of Builders gives notice of the Tenth Annual Convention, which is to be held in Buffalo, beginning on Tuesday, September 15, and calls attention to the importance of urging all builders, so far as possible, to be represented in the Convention. The Committee points out, with much force, that labor is constantly becoming better organized, and that, relying on its organization, it now appeals to Legislatures to procure for it by statute the advantages which it has hitherto struggled for by means of strikes. Against the influence brought to bear on law-making bodies by the powerful trades-unions individual builders have practically nothing that they can oppose; their only chance of protection against legislation by which they may be seriously injured lies in united action. Of course, the best way to secure the advantages of this united action is to join the influential body already existing, and the Committee thinks that, for the good of all, the next Convention should be mainly devoted to the discussion of the reasons for and against the association of builders.

AS an example of the way in which the unions in the building trades, which are now very generally bound, by annual agreements with the master-builders, not to strike, pursue their object of compelling men to join them, by preventing them, if they do not, from obtaining employment, it is interesting to learn that a committee of the Massachusetts Building Trades Council was recently appointed "to secure the employment of union men on all structures being erected by the Catholic Church in Boston and its vicinity," which seems to have met with considerable success in its efforts; while a hearing has been granted to the same body by the Mayor of Boston, relative to its request that none but union men shall be employed on buildings erected or repaired for the city. The agreement in force between the Boston unions and the master-builders provides, we believe, that the latter shall employ union or non-union men, without discrimination in favor of either, and the plan of evading this agreement by appealing to the two principal real-estate owners to exclude non-union men from employment on their buildings is characteristic of union management.

THE *Engineering Record* prints some interesting letters on garbage cremation in Germany, communicated by Mr. Rudolph Hering. It seems that, in Europe, the reduction processes, in which the grease and valuable fertilizing materials are separated and saved, are not in favor, owing to what is considered there the excessive cost of the processes concerned; and the incineration of the garbage is preferred. Considering that in most of the large cities in Europe ashes are mixed with the kitchen refuse, it is not surprising that the chemical treatment of the mixture should be a costly matter, but it certainly seems a matter of regret that so much valuable fertilizing material should be wasted. Taking things as they are, however, the cremation of the mixture of ashes and garbage is greatly facilitated by the unburnt coal contained in the ashes. In England, the half-burnt coal is said to amount to about twenty-nine per cent of the whole mass of refuse, and it is hardly surprising that this serves, not only to dry and burn the garbage, but to furnish enough surplus heat, in some cases, to generate steam for driving electric-lighting or pumping engines. In Germany, the coal consumed in households is much better utilized, and less than two per cent of the waste is available in the shape of coal. The German garbage contains, however, a large proportion of paper, rags and wood chips, which are combustible, so that, in Hamburg, no extraneous fuel is used for consuming the garbage, and in Berlin it is only necessary to employ such fuel in winter, when the house refuse contains, besides ashes, a good deal of sand. The incineration, in the Hamburg and Berlin furnaces, is completely carried out, so that nothing remains but inorganic matter. Although this matter probably contains a certain amount of phosphate and alkali, no one has been found willing to assume the cost of carrying it away, for the sake of the valuable materials in it, and the expense of removing the ash forms a considerable portion of the cost of maintaining the plant.

WHETHER our people would be willing to give up the practice of collecting kitchen refuse separately from ashes it would be difficult to say. The separate system is certainly regarded here as cleaner, and, where the ashes alone are used for filling, as is often the case, there is an economy in carting them directly to the place where they are to be used, instead of taking them to the crematory, to be uselessly heated, and then reloaded into carts and carried away again. As the kitchen refuse by itself contains, however, nearly ninety per cent of water, there are obvious difficulties in the way of burning it directly without extraneous fuel. It has been proposed to treat it in much the same manner that bricks are burned in a Hoffman kiln, by means of an elliptical ring of ovens, drying the fresh material by successive stages by means of the waste heat from the calcining oven, the fire being shifted continuously from one oven to the next, so that there are at all times one or more ovens at the maximum heat, one or more cool ones, ready to receive fresh garbage, and several intermediate ones varying in degree of heat with their distance from the burning oven, in which the garbage is dried and brought to a condition suitable for combustion. Theoretically, with a series of ovens arranged in this way, the burning of the combustible portion, even of wet garbage, should be amply sufficient to evaporate the water, and bring the material into a condition suitable for burning; but, so far as we know, the idea has not yet been put in practice.

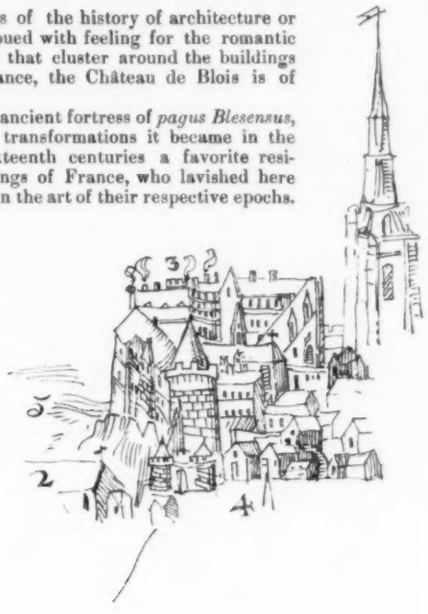
PROFESSOR GOODYEAR'S collection of photographs, showing the intentional deviations from symmetry practised by the Byzantine and early Gothic architects in Italy, has been placed on exhibition at the Brooklyn Institute of Arts and Sciences, and should certainly be visited by every architect who can find opportunity for doing so. The means by which the photographs are made to show the irregularities of plan and construction in their subjects are as ingenious and simple as they are effective. To show the intentional curves, both in horizontal and vertical planes, of the principal string-courses in, for example, the Cathedral of Trani, the camera is set close to the line of the string-course, just as a carpenter would look along the edge of a board to see if it be straight. Of course, in this way every deviation from a straight line is clearly visible, and the photograph, which takes in the bases of the upper columns, and the upper part of the nave arches, shows relations which could hardly be noticed in a mere diagram. In a similarly simple way, the curious outward bends of piers and columns are shown by suspending a plumb-line by their side, and photographing both together. In the Cathedral of Pisa, the effect obtained in this way is that of a reversed curve, carrying the lines of the main arches down to the pavement; but, as in the case of the profiles of Grecian buildings, the curvature is so subtile as to show itself, under ordinary circumstances, only by the unaccountable softness and sentiment of the interior. It is hardly necessary to say that one does not get a camera into position for sighting along a string-course, fifty feet above the pavement, without a good deal of gymnastic exercise, and Professor Goodyear and his skilful assistants have shown a devotion to their interesting and important work which cannot be too warmly commended.

THE CHATEAU DE BLOIS. — I.

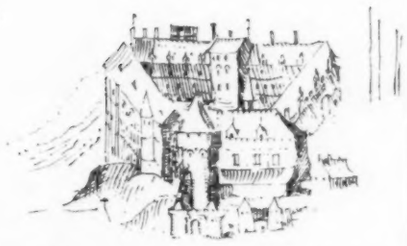
THE WING OF FRANCOIS I.

TO all students of the history of architecture or to those imbued with feeling for the romantic associations that cluster around the buildings of mediæval France, the Château de Blois is of great interest.

Originally the ancient fortress of *pagus Blesensus*, through various transformations it became in the fifteenth and sixteenth centuries a favorite residence of the Kings of France, who lavished here all that was best in the art of their respective epochs.



2 S. Lomer
3 Le Chajteau
4 La porte du Foix
5 Les Jacobins



The palace occupies but a small portion of the fortress or *château fort*, the ancient walls of which stretch irregularly around the summit of a lofty promontory that overlooks the City of Blois and is the highest elevation in that portion of the valley of the Loire.

As early as the time of the Merovingians a well-defined fortress is known to have existed and the name *Bleso castro* appearing on coins of that period proves it to have been a place of considerable importance. The Merovingians were not a race of builders, rarely erecting new works, utilizing, instead, the buildings of their predecessors: so from this reason, one is safe in assigning a Roman origin to the Château now standing.

The site of a Roman camp was usually selected at the juncture of two rivers, the banks of which were easily defended; while the weakest point, the base of the triangle thus formed, was protected by the strongest works, an essential feature of which was the deep moat or *fossé*.

Blois, situated at the confluence of the Loire and a tributary, the Aron, was at the time of the Romans a place of considerable importance, several ancient roads here crossing the river which formed a natural boundary between two ancient provinces. Such a strategic point the Romans would not have left unfortified, though few remains are left to attest the real importance of their work. The high precipitous banks of this promontory were a natural defence, while the dry moat, to-day a veritable ravine, was defended by the strongest works.

After many changes and rebuildings necessitated by the advance in military science, the centralization of power led to the abandoning of the *château fort* and, gradually transformed into the palace, Blois finally lost all martial aspect. Henceforth its history is that of a dwelling, refuge and prison: the retreat of Charles VII; the birthplace of Louis XII and favorite residence of Claude of Lorraine, his daughter, for whom her husband, François I, doubtless undertook those alterations that have so identified the Château with his name.

Henri II, caprice led, found here, surrounded by a gay court, refuge from the turmoil of his angry cities. During the religious wars of François II and Charles IX political questions often led them to a residence here and Henri III, the last royal occupant, found at Blois greater security than at Paris. Marie de' Medici was here imprisoned and from the north façade made her romantic escape. At last, losing royal favor, it was given to Gaston, Duke of Orléans — a bribe for his submission to Richelieu — together with the duchies of Orléans and Chartres. After his death the Château was practically abandoned and Louis XVI granted to several ancient families the privilege of occupancy, which they retained until the Revolution.

Suffering at that time the mutilation common to all buildings that bore any emblem of royalty, it became a barrack of the Revolutionists and endured changes and depredations at the hands of a loose and lawless soldiery.

In 1841, with the good taste that so distinguishes the modern French, the restoration of the Château was undertaken by the Société des Monuments Historiques and the work intrusted to Duban. Four hundred thousand francs were raised, and later an annual appropriation made, with which funds the first restorations were begun.

The subsequent decay of the material then used necessitates continual repair and the present explorations of the many remains of the ancient fortress demand the services of a resident architect (M. Grenobille) and a corps of workmen.

This brief glance into the history of the château shows how closely it is connected with the history of France itself, and no single edifice is more indicative of the civilization and society of each epoch moulding it than this regal palace, seated on its grim foundations of Roman *castrum* and Mediæval fortress.

What clouds of traditions, true and fabulous, cluster around this romantic pile! How many songs and romances of love, of war, of chivalry are written here! Its floors have been stained with blood of a mighty prince and its walls bear many inscriptions in Gothic and Roman letters, carved by idle hands.

On the terrace Charles d'Orléans wrote his famous rondel:

> "*Le temps a laissié son manteau,*
> "*De vent de froidure et de pluye.*"

and, engraven with bodkin or stilleto, tributes of love and complaints of ennui are found on walls of guard-room, gallery and staircase.

Some weary sentinel has with greatest pains and care, proof in itself of his plaint, engraven:

> "EN VIE
> "M'ENNVIE
> "ET NE PUIS IOVIR DE MA MIE
> "LA BRVIERE"—

while a faithful sentinel hands down to all ages his trust:

> "CY SVIS QUI SVIS
> "BON HOMME SVIS
> "ET SVIS COMMIS
> "A GARDER L'HVIS
> "JE LE GARDERAI SI LE PUIS."

A modern truth has found a recorder in those days:

"FAULTE D'ARGENT EST DOULEM GRÄDE."

To the casual visitor the Château appears raw and cold with all the freshness of restoration, and little romance can one find in the studied tales of the concierge, who has little thought save of the expected fee. But, once visit the court-yard in the evening, when the fading light has softened the marks of the restorer's chisel, or at night in the full moonlight when the façade of François I seems a work of enchantment; wander some rainy day among the vaulted rooms of the lower stories or along the roof gallery, with no sound to break the silence save the melancholy drip from the gargoyle or the distant sound of workman's hammer, and all the romance in one's nature surges up and little effort does imagination require to re-people the Château; to see that "*roi chevalier*" enter, surrounded by his Scottish guards, whose very names some idler of them has engraven on the balcony on which we stand. One shudders, too, in passing the New Gallery to recall the gallant fight for life of the Duc de Guise, who, single-handed, his sword entangled in his cloak, fought six armed men with a silver candy-box till, stabbed in the back, he fell a victim to the hatred of his master.

Judge of the interest of the three months' residence granted the writer in this Château among such surroundings, and if the following observations and accompanying drawings made during this sojourn add but little to all that is known of this building, the pleasure of the task alone is a reward.

The approach to the Château is usually made from the north where, at the foot of the façade on this side a series of terraces lead, through a breach in the ancient fortress wall, to the Place du Château.

As one ascends, the façade above seems literally to spring from the living rock.

Resting on the gray foundations of the old fortress, its legacy from the Middle Ages, its walls broken by the many-colored loggias and projecting oriels; crowned by the deep-shadowed roof gallery with the broad expanse of dark slate roof rising above, the building, in composition and in details, is as full of charm and romance as the cloud of association and tradition surrounding it. To the right, the façade is terminated by the picturesque tower now half-concealed by the more severe work of Mansard. To the left, the irregular projections of the courses and unfinished portions of the loggias indicate the incompleteness of the design.

This façade, the exterior of the wing of François I, can only be thoroughly understood after a detailed consideration of the plan; so,

hastening to the Place above, let us leave until later a more critical examination. One passes at the foot of the Salle des États, the grand hall of the Château, through the breach, the sides of which show a wall of a defensive character.

Here, formerly, stood a large entrance arch, unfinished, of the period of Henri II, but happily destroyed by the restorer in order to free this end of the Salle des États from all incumbrances.

We now reach the Place and stand within the walls of the ancient fortress, the towers of which can readily be traced among the modern buildings surrounding us. This was the outer court of the *château fort* and probably was devoted to the residence of the garrison. The centre, however, was once occupied by a large church, Saint Sauveur, demolished during the Revolution, of which no trace has been left us save in the two sketches here shown and descriptions in various chronicles.

The façade of Louis XII, facing us, is an innovation on the original fortress plan, a wing dividing the court-yard in two. The smaller court, the existing one which we enter through a vaulted

gallery, is surrounded by buildings of three different periods of French art and records the best efforts of the artists of each epoch. To the right, the wing of François I; in front, an intrusion, the wing of Gaston d'Orléans; to the left and behind us, the Gothic buildings of Louis XII and the earlier one of Charles d'Orléans.

The most noticeable features of the court-yard are the staircase cages of François I and Louis XII, all that remain of a symmetrical grouping of towers, a chance one perhaps, destroyed by Gaston d'Orléans.

Once within the court-yard, in our exploration of the surrounding buildings, the plan of the ancient fortress can readily be examined and is of the greatest importance in having determined the disposition of the present buildings. Following the crest of the promontory the defensive works incrusted by the houses in the Place are readily traced, and the excessive thickness of certain walls in the existing buildings declare them defensive in character.

One free-standing tower, on a terrace back of the chapel, remains entact and owes its preservation to its strength and strategic importance, commanding the extremity of the moat. This tower, the Tour de Foix, is unaltered on the interior, the old vaulted rooms and loop-holes of the twelfth century remaining. On the summit a small building was erected in the seventeenth century together with a staircase giving access thereto. Tradition associates the name of Catherine de' Medici with the astrological observations for which this building was erected.

The Tour du Moulin, the tower commanding the opposite extremity of the ancient moat, has been incorporated in the façade to the north and surrounded with galleries by François I, retaining in the interior, however, the ancient rooms used then, as in the Renaissance, as prisons. The old moat between these two towers has been gradually deepened until it has become a small valley.

Within the wing of François I another tower is embedded in the north façade and its foundations are traceable on the exterior.

On the roof of this wing, the height of the old fortress wall is marked by the existing *chemin de ronde* of the Middle Ages. The old sketches show an approach from the town, the upper portion of which lands at the end of the wing of Louis XII, and, on the side of the moat, several towers that doubtless were alterations of defensive features by Charles d'Orléans. But Gaston d'Orléans obliterated all that remained and work is now in progress in the cellar and foundations of the present wing to verify the drawings of Du Cerceau who made very detailed sketches of this Château in 1579 — published in "*Les plus Excellents Bastiments de France.*" In its transition from fortress to dwelling the numerous alterations were gradual and doubtless began before the time of the accredited restorer, Charles d'Orléans.

The drawings left us in the book above mentioned show no trace of the fortress save in plan, and much of the work, judging from the remaining gallery, was constructed in brick.

Alterations were also made by Charles d'Orléans on the wing now known as that of François I, to which fact several Gothic mantels and the woodwork of the roof attest.

Louis XII, born here, reigned at Blois and enlarged the Château by constructing across the court from the Salle des États, the large hall, to the Chapel, the wing bearing his name, thus limiting the size of the court-yard. His work is so characteristic, one has little difficulty in identifying his alteration in the Salle des États itself and to the Chapel.

The plan of this wing is identical in character with that of Charles d'Orléans, viz., a series of rooms opening on an open arcade

on the first floor and on a corridor above, with staircase towers at either end giving access to the various stories. François I altered the north wing, which had already been converted into a dwelling by Charles d'Orléans, building the staircase, possibly a new court-yard façade and a terrace between the Tour du Moulin, whose strategic importance led to its preservation, and a central tower.

Access to this terrace was gained by means of a staircase, still existing, and doubtless several balconies were built in the old fortress wall, now appearing as alcoves in the later wing.

Hardly had these alterations been completed when a greater one was begun. A new wall far richer than the one adjoining the grand staircase was continued to the Salle des États. This was undoubtedly built from the ground, as it is considerably thinner than the one of which it is a continuation.

A new series of rooms was constructed *outside* the old fortress wall, embracing the central tower of the old fortress wall and abutting the gallery around the Tour du Moulin, whose lines the new façade carried through.

This was at a later date continued along as far as the Salle des États where it remains to-day incomplete.

Thus it is seen there is a single wing, that of Louis XII, which was built anew and the work of the early Renaissance, but with a series of alterations made at different times by different workmen, the old work influencing the new in every way.

The result is full of charm, but no more inconvenient arrangement of rooms for a palace could, according to modern lights, be devised.

The grand staircase has really a double function of corridor and staircase and no access can be gained to the King's Chamber save through all the other rooms, which proved convenient on a single occasion only — the assassination of the Duc de Guise.

Throughout this wing, the feudal fortress and Gothic alteration appear with more or less distinctness as on some old parchment the previous writings, half obliterated, appear beneath the later text.

W. T. PARTRIDGE.

[To be continued.]

THE ART OF BRONZE CASTING IN EUROPE.[1] — I.

ABOUT ten years ago it was my privilege to deliver an address in this room on "Artistic Bronze Casting," and when I received the invitation of your Society to read another paper on the same subject, I confess that my first impulse was to avoid the task. I was afraid that I should, of necessity, go over much of the same ground that I had traversed on the former occasion, and only weary you by repetition. Besides this, I had fresh in my memory that admirable paper on "Japanese Bronze Casting," delivered some twelve months ago, when Mr. Gowland treated the whole practice and theory of bronze casting in so complete a manner that it seemed superfluous for any one to say more on the subject, unless he could show some entirely new process, or point out some hitherto unknown principle of the art.

Now, I confess, I have no such discovery to boast of, and yet I am here. I remembered that the historic side of the question had not been touched on in my former paper, which was almost, if not entirely, confined to the technical difficulties which this art presents. I propose, therefore, to treat the technical part as concisely as may be consistent with lucidity, and I do this with an easy conscience, as many of you are familiar with the process, and there are now several bronze foundries in England where excellent work is carried out on the waste-wax system.

When Mr. Alfred Gilbert, Mr. Onslow Ford and myself first began to agitate for the introduction of waste-wax bronze casting in this country, there was scarcely any one in England besides ourselves who had any knowledge of the subject; nor was there any foundry on this side of the Alps where waste-wax casting was practised or understood. For years we were unable to awaken any interest in the subject, but at last I was asked by the editor of the *English Illustrated Magazine* to write an article on bronze casting, which was published in 1883. This was followed, curiously enough, for there was no pre-arrangement, on the very next day by a most interesting lecture at the Royal Academy by the late Sir Edgar Boehm, assisted by Mr. Alfred Gilbert.

In 1884, further interest in the subject was aroused by the very able and interesting report of Sir Savile Lumley to Earl Granville on bronze casting in Belgium, where the waste-wax process had just been experimentally introduced by the Société Anonyme des Bronzes, at Brussels. In Paris also, M. Gonnon had produced more than one work by the wax process, although it was stated, I do not know with how much truth, that these were only partial successes, having need of very considerable repairs and chasing before leaving the foundry.

From that time to this the interest in this process has gone on increasing; and there is now no difficulty in getting bronzes cast by the wax process in England. This, and the advance in sculpture that has taken place in the public estimation during the last twenty years, must be my excuse for again addressing you on the same subject.

As to the antiquity of bronze casting in Europe, we only know that it dates from prehistoric times, and that it is impossible to say how or where it originated, or to give to any individual the credit of its invention. Sir J. Savile Lumley says that according to several Danish and German writers, the European bronze of prehistoric ages was probably an indigenous industry, not of Phœnician origin, but originally discovered in Britain. I am content to accept this theory as being quite as worthy of belief as the legend for which Pliny is responsible, that the art of bronze casting was invented by Scytes the Lydian, or Theophrastus the Phrygian.

The Palafites, or lake-dwellings of Savoy and Switzerland have yielded a very considerable harvest of early European bronzes, and also, in some instances, they have preserved some record of the manner in which these were produced. At Thonon, Switzerland, a mould for a spear-head was found which was composed of two slabs of stone, on each of which a spear-head was cut out to a proper depth. The two stones, being placed face to face, and bound together, would form a very simple but effective close mould from which many casts could be taken, without any injury to the mould itself. It is this mould of which Sir J. S. Lumley says that a modern lance-head was produced from a prehistoric mould. It was probably the earliest known example of piece-moulding amongst European bronze founders.

All their works, however, were not produced by piece-moulding, since another mould was found, made of clay over a wooden pattern, which seems to have been burned out, leaving a cavity to receive the molten bronze. In this, then, we find the first principle of the wax process, namely, the destruction or "wasting" of the pattern by fire.

This earliest process, which we may term a waste-wood process, would be only applicable to simple forms on account of the difficulty of completely destroying the wooden pattern, and afterwards getting rid of the ashes from the cavity of the mould; but it was a great discovery, and doubtless the genius who invented it would not be long in discovering that other substances more easily wasted by fire, such as wax, were capable of being fashioned into various shapes, and of being advantageously used as patterns for bronze casting; and there is every reason to suppose that the more important works found amongst the lake-dwellings of Lake Bourget were cast by the very waste-wax process which we have been trying to revive in England for the highest class of bronze statuary.

In the opinion of Count Casta de Beauregard, whose discoveries in Lake Bourget have so greatly enriched the museums of Aix and Chambéry, these settlements were destroyed by a race of men of the iron age, who carried fire and sword through the district long before the Roman era. Be this as it may, there can be no doubt as to the great antiquity and artistic value of the wax process, and moreover, as the ancient European nations do not seem to have been in the habit of making piece-moulds, except of the most simple description, namely, in two halves, it is not easy to see how else they could have executed large or complicated works. It is true that clay figures of the Tanagra type were got from moulds which were made, as I believe, in two halves, and some of these figures seem to be of a complicated character. Yet the heads and arms seem to have been moulded separately, and the undercutting in folds of drapery, etc., to have been omitted. Each of these figures, therefore, would consist of the following separate simple piece-moulds: — First, the body or trunk of the figure; second, the head; third and fourth, the arms; four moulds in all. After the soft clay had been squeezed into these moulds it was an easy matter to join heads and arms to the trunk of the figure and to retouch the whole, which was then allowed to dry, after which it was fired in a kiln and became terra-cotta. This principle of dividing the figure into several parts to be afterwards joined up to form a complete whole was a great discovery in the art of the moulder.

Of all the European nations of remote antiquity the Etruscans and Greeks stand forth pre-eminent as artists, and when we think of antique sculpture, whether in marble or bronze, it is Greek sculpture that is always in the foreground of our thoughts. And it would be strange if this were not the case, since we possess in our museums so large an amount of works, which although they are chiefly rather from Rome than from Greece, yet the Roman sculpture being greatly an echo of the earlier Greek art, was inspired by Greek legends and traditions, and executed, almost without exception, by the hands of Greek artists often brought as slaves from Greece to Rome, and employed by their conquerors to reproduce the originals they had brought to Rome as the spoils of war.

In ancient Greece the art of the statuary in bronze was held in high estimation; the desire of possessing bronze statues of divinities, heroes and statesmen seems to have been insatiable, and there were more bronze statues than we modern sculptors can conceive of.

It is then of Greek bronze casting that I propose to speak first. According to some old author — Pausanias, I believe — the art of modelling the figure, and of casting it in bronze, was first practised at Samos about 700 B. C. Many writers on art have put forward various theories as to how the old bronze statues were produced, and as many of these writers knew nothing about bronze casting, their ideas were often somewhat absurd.

Winckelmann, for instance, states that the horses of St. Mark's, at Venice — of which there are four — were all cast out of two moulds, not knowing that the mould is destroyed every time a bronze casting is made. Lemot, the French sculptor, who made some repairs to these horses, when they were taken to Paris by order of Napoleon the First, had ample opportunity of examining them, and

[1] A paper read before the Society of Arts by Mr. George Simonds and published in the *Journal* of the Society.

found that their heads and necks were cast separately, and that collars had been added afterwards to conceal the joints. This is not surprising. It is very doubtful if the Greeks or Romans ever attempted to make castings of the dimensions that we find to have been successfully carried out in later ages. It is pretty certain, I think, that they cut up their larger works, and cast them in parts, which were afterwards fitted together on much the same system as the terra-cotta figures were produced in clay. There is much to be said in favor of this system for large work, and little to be said against it. I will try briefly to tell you what, in my opinion, are the advantages and disadvantages.

A bronze casting, unless it be of very small size indeed, is always cast hollow, and, in order that it may be so cast, it is requisite that it should have a core inside as well as a mould outside it.

Now it is clear that if an object like a horse is to be cast, with a core inside, and if it is to be cast all in one piece, then that core will have to stay inside, since there will be no opening whereby it can be removed. Now the great weight of the core inside is a considerable disadvantage in erecting or moving a statue, and puts an unnecessary strain on the legs, which have quite enough to support without it. Moreover, the material of which cores are composed is excessively porous, taking up moisture greedily from the air, so that it is a source of danger to the thin bronze statue, which is certain not to be absolutely air and damp proof. There will be here and there some tiny fault, through which the core will absorb, and at last become so moist, that a severe frost might swell it almost to bursting. If the horse is cast without his head and neck, the core is easily removed and these dangers avoided.

There is, however, a more weighty reason for casting a horse without his neck and head. When the bronze is poured into a hollow mould it is at a temperature of, roughly speaking, 1,900°, consequently the air in the mould is expanded so suddenly that, unless escape were provided for it, an explosion would be the result; but although the main body of air escapes through the vents, there seems to be a film of air remaining, which, I imagine, prevents actual contact between the walls of the mould and the metal, so long as the latter is in motion and the mould is not yet full. When the mould is full, the outward pressure of the fluid metal forces this film of air out through the pores of the core and of the mould; those of the mould give a fairly free passage outwards, but the core cannot do so, however porous it may be, if it is enveloped on all sides by the bronze. In this case the gases that should have passed away through the core come boiling up through the fluid metal, forcing their way to the vents, which themselves full of metal, can no longer act. The gases become imprisoned in the bronze as it sets, and the result is a bad, unsound casting, "blown on the core," as we say, and full of holes like a sponge. To avoid this the ancients cut their large works to pieces. The only drawback to cutting is, that unless it is skilfully done, it is impossible to join it again without altering the movement or proportion to some extent.

There are various ways of making these joints in bronze, but at present I will merely say that the ancients used to cover the joints, if possible, with a bracelet or band of ornament of some kind, and join the parts together with rivets. They also made a species of box-joint by bending a strip of metal round the inside of an arm, and rivetting it in such a manner as to allow a couple of inches to project beyond the edge of the cast metal; this projection was then forced into the corresponding edge of the part to be joined, and secured in position by rivets. These joints were frequently further strengthened by dowel plates of a double dove-tail form, which were counter-sunk in the thickness of the bronze, so that one dove-tail was on each side of the joint. In principle this method is much the same as that now in use, though in practice we have somewhat improved upon it. The system of cutting was, I think, always practised by the ancients, except in the case of very small bronzes, such as the little "Victory" or "Fortune" whichever she may be, and the charming statuette of "Venus," both of which are in the Naples Museum, as are also those other highly interesting examples of bronze work, which I have now the pleasure of bringing to your recollection.

The ancients, as far as I can discover, did not understand the practice, now almost universal, of putting a "lantern" into the core, and of core-vents. I shall speak of these later on, merely observing at present that it is possible to get very small castings quite sound, even when the core is shut in, and gives no exit whatever to the gases. This is, however, a difficult matter, because it is essential that the metal should be poured at its lowest possible temperature — that is to say, it must still be quite fluid, and fill the mould easily and at once. It must also be a very thin casting, and solidify before the heat has penetrated the core to any distance, in which case little or no disturbance can take place.

It is a matter of great difficulty to pour these small castings at the proper temperature, and in many cases it will be found that they have blown on the core from being too hot and setting too slowly, or that the metal has not been fluid enough to fill the mould properly and ensure a sharp casting.

The works of vast dimensions which were so often executed by the ancients, of which the most generally known is the Colossus of Rhodes, were probably not cast in very large pieces, but in sections of very considerable thickness, with flanges on the inside by which they could be bolted or rivetted together. They could thus be built up from the ground without the elaborate internal framing which would have been needed had they been, as some writers have supposed, made of thin wrought plates and rivetted together. Indeed, the difficulty of executing large works in beaten plate is so much greater than that of casting, that it would only be used under very special circumstances. It was so used by Ernest Rietschel, of Dresden, for the statue of Brunonia in a quadriga with four horses all larger than life. The reason for its use in this case being that the gateway at Brunswick, on which it was to be placed, was not considered strong enough to support the weight of cast metal. That the colossal statue of "Apollo" at Rhodes was cast work, and not beaten, I think is fairly certain, since it would seem that it lay prone and in ruins for nearly 900 years, after which the metal was sold to a Jew, who it is said, loaded 900 camels with his purchase. The weight of metal is said to have been 720,000 pounds and it seems hardly likely that sheet-metal would have lasted so long, or that it should not have been stolen away long before, had it not been for the size and weight of the pieces of which it was built up. This is almost all that I can tell you of the methods of the Grecian bronze founders, and of the sort of work that they produced.

Of the Romans I can only say that, although they had a passion for sculpture, they do not seem to have cared to produce for themselves that which they could more easily acquire by conquest. We find accordingly that whenever they wanted sculpture for any purpose they stole it from other people, and where this was not possible, owing to the non-existence of anything suitable to their purpose, they employed foreign artists in the execution of the work. The fashion of collecting bronzes in this simple way was set, so we are told, by no less a personage than Romulus himself, who carried off from Carmerium a bronze quadriga, which he placed in the temple of Vulcan, after having had a statue of himself placed in the car. We do not know who made the statue of Romulus, but it could hardly have been by any save an Etruscan artist.

According to Plutarch, one of the Tarquins dedicated a quadriga to Jupiter Capitolinus, and we are told that artists were brought from Veii for its execution. This seems probable, since Veii is only some twelve or fifteen miles from Rome, and was an ancient and civilized city long before the days of Romulus and Remus.

As early as the days of Numa, laws were made concerning sculpture, and one of these forbade the representation of the gods. But it does not seem to have been observed, since Tarquinius Priscus employed the sculptor Vulcanius, of Veii, to make a sculpture of Jupiter, which he placed in his temple on the Capitol. Another curious law of Numa's restricted the height of statues to great men. These were not to be more than three feet in height, and were hence known as *tripedaneæ*. It is, therefore, to be presumed that "half life-size," as we should now call it, was the size of the statue of Horatius Cocles, which was erected in the *comitium* after his noble defence of the bridge.

For very many years, then, the Roman demand for sculpture, whether in bronze or in marble, was supplied by foreign lands and foreign hands. Indeed, we are told by Perkins that the first foreign sculptor of whom any record is found is one Manurius Vitturius, who seems to have made copies in bronze of the *ancile*, or little shield which the Romans believed to have fallen from heaven; and although after that period a few names are found, still they are merely exceptions that prove the rule.

Greek artists, however, had been brought to Rome, and with them the traditions and practice of their native art. That these rapidly deteriorated amongst their new surroundings is hardly to be wondered at, since their employers and their public lacked the appreciation and the cultivation of ancient Greece. The emperors changed the fashion in art according to their own whim or love of ostentation. Caligula, says Perkins, decapitated Greek statues, and placed upon them his own vile head, while Nero gilded the masterpieces of Lysippus, and employed Zenodorus to erect a colossal statue of himself, which is estimated to have cost a sum equal to about £3,600,000 of our money. Pliny remarked that it showed how much the art of casting in bronze had deteriorated. It is hard to understand how this vast sum could have been spent on this statue, and it is a pity that we do not know more about it. It lasted, however, but a short time, having been destroyed by the people of Rome to mark their hatred of the man it represented. We have another work, however, of that period, in the equestrian bronze statue of Nero, in the museum at Naples. I am, however, of the opinion that this statue is rather a Greek than a Roman work, although I can give no account of its history or authorship, save that it was found at Pompeii.

In strong contrast to this work is the well-known equestrian statue of Marcus Aurelius, remarkable above all else as being, I believe, the only statue of an emperor which, from the time of its erection to the present day, has always been respected and carefully preserved by the Roman people. There is, I believe, nothing known as to its authorship, and we can only guess, from a certain heaviness and from its general style, that it is probably the work of a Roman artist or, at least, of a very Romanized Greek. This, at least, is the opinion of Perkins, and I must say that it is also my own. I am quite unable to find any signs of Greek feeling in it, and although it is undoubtedly, in many respects, a noble and impressive work, yet I must certainly protest against its being considered, as it has been by some writers and many readers, to be the finest equestrian statue in the world. Winckelmann, who seems to have a natural gift for mistakes of this sort, supposes this monument to have been of beaten plate, and this story has often been repeated. It is, however,

nothing of the sort, but is a waste-wax bronze casting — not, however, cast at one pouring, but in separate pieces, as I have stated was usual among the ancients.

It would be too long, and indeed foreign, to our present purpose, to trace the decline of the art of the statuary in bronze through the various ages of the decline of the Roman power down to the final destruction of the last refuge of art by the siege and sack of Constantinople in the thirteenth century. There are, however, two bronze statues that I may mention as belonging to this period of decadence, one of which is supposed to represent either the Emperor Heraclius or Erico, King of Lombardy; it stands in the piazza of the town of Barletta. According to tradition, this statue was cast at Constantinople by a Byzantine artist named Polyphobus, about the middle of the seventh century. Perkins, however, considers it to be a genuine Italian work, and believes it to be of earlier date. I have never seen this statue myself, nor any photograph of it, but as Perkins was a most excellent judge of sculpture, he is probably correct in his estimate. The other is the well-known statue in bronze of St. Peter, in the basilica of St. Peter's at Rome. This statue is said to have been cast by order of Pope Leo I, as a thank-offering to the saint for his interposition and deliverance of the City of Rome from Attila. The date assigned to this statue is A. D. 153.

There is a legend that it is an antique, and was a statue of Jupiter, and that the head and hands only are of Christian origin. There is, however, no evidence of this, and, on the contrary, plenty of internal evidence that the work is of one period, and that not Classic. Possibly an antique Jupiter may have been melted down for the sake of the metal, and as a further honor to St. Peter by the destruction of a pagan divinity.

The period from the fifth to the ninth century gives us no record of any Roman artist, and we may easily understand that the iconoclastic war and wholesale destruction of statues, which was so vigorously prosecuted by Leo the Isaurian and his son in the eighth century, must have given the *coup de grâce* to the already dying art of the statue-founder; nevertheless, the persecution of artists, and the consequent emigration of numbers of them from Byzantium, was the means of spreading such tradition of the art as might have survived, into other and far distant lands, and the affiliation of numbers of these emigrants to the society or craft of the Comacine builders was the means of bringing a knowledge of the principles of the art into France, Germany and possibly into England also.

During the ninth and tenth centuries sculpture seems to have been at its lowest ebb. In the eleventh and twelfth centuries, however, the art began to receive some consideration, and artists, it is said, were sufficiently proud of their calling to begin once more to sign their works.

[To be continued.]

THE EIGHT-HOUR AGITATION.[1]

THIS is the fundamental principle or philosophy of the trades-union movement in this country, and, in 1888, the American Federation of Labor, numerically one of the strongest of the unions, voted to unite with the Eight-hour League, and thenceforth to concentrate all effort on the struggle for eight hours. Their programme was then to take charge of one trade at a time. Thus, in 1890, the gauge of battle fell to the lot of the carpenters, who accordingly struck, under orders, for an eight-hour day on May 1st, and won temporary victories in 137 cities. Plans were laid for the miners to strike on May 1, 1891, for eight hours, but the conditions were not then favorable; and, although these plans have since been in abeyance, owing to depressed conditions of trade, they have not been abandoned, and I have reason to believe that employers in almost all trades will be called upon to meet this question in the not very distant future.

The argument of the eight-hour philosophers is that, by restricting the hours of work, more laborers must be employed and the idle surplus provided for. I consider that this is specious reasoning. The overflowing stream of immigration from European countries, attracted to America by comparatively high wages, suffices even now to produce a permanent flood, at least in the fields of unskilled labor. If to this we add the still more powerful attraction of a legal working-day of eight hours, the tidal wave flowing from all the less-favored countries in the world would swamp our native industrial population, and induce a condition which would be far less favorable to them than that which now obtains.[2]

The eight-hour party has succeeded, through political influence, in making eight hours a legal working-day in Governmental employment, and largely also in municipal contracts, and violators of the law have been rigorously prosecuted. A remarkable case occurred in Buffalo, which worked great hardship upon a citizen, and led to the decision of Justice White, of the Superior Court at Buffalo, declaring the eight-hour law unconstitutional. Justice White's decision was based upon the clause of the Constitution which provides that "no person shall be deprived of life, liberty or property without due process of law." That provision of the constitution has been construed to mean that the rights and privileges of a citizen to make contracts relating to his business or property cannot be interfered with by legislation. It has been declared by the courts, that liberty, in its broad sense, as understood in this country, means the right not only of freedom from actual imprisonment, but the right of one to use his faculties in all lawful ways, to live and work where he will, to earn his livelihood in any lawful calling, and to pursue any lawful trade or vocation. All laws, therefore, which impair or trammel these rights, which limit one in his choice of a trade or profession, or confine him to work or live in a specified locality, or exclude him from his own house, or restrain his otherwise lawful movements, except where the public health or safety intervenes, are infringements upon his fundamental rights of liberty, which are under constitutional protection.[3] — People *vs.* Warren, 34 N. Y. Supp., Superior Court, Buffalo, 942.

The impossibility of regulating the rate and hours of labor by legislation, unless in the exercise of the police power, or law of public health and safety, was recognized years ago by Chief Justice Ruger, in McCarthy *vs.* Mayor, who said in reference to the original eight-hour law then under discussion:

"It is well to premise that this act was not intended to affect or regulate the rate of wages which should govern as between employer and employé. That subject is left by the act, as it always must remain, open, to be fixed by the agreement of the parties intending to enter into those relations. Experience has shown that legislation on the subject must always be futile and ineffectual, for the reason that it is controlled by the natural laws determining the value of labor and property, and which are as much beyond the power of statutes to affect as they are above the control of the wishes of the parties interested therein."

I do not mean to imply from the foregoing statements that I am opposed to shorter hours for labor; on the contrary, I believe that a shorter working-day, wherever it is practicable, is beneficial alike to employé and employer; but under present conditions, it appears to me, after a careful survey of the field, that there are some prominent obstructions which must be removed before an eight-hour day can be universally adopted, or before the operatives who now work ten hours a day can reasonably hope for a general reduction to eight hours without a corresponding reduction of wages.

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[1] Appendix to an address delivered by A. E. Outerbridge to the students of the Wharton School of Finance, U. P. Philadelphia, and published in the *Journal* of the Franklin Institute.

[2] I am able to substantiate these views by figures bearing upon the subject. The official statistician of Paris, M. Bertillion, gives the proportion of foreigners in that city as 7.5 per cent; these are chiefly wealthy persons who distribute a portion of their funds among the tradespeople. London and Vienna have each 2 2 per cent. Berlin has 1.1 per cent of foreigners, also mainly persons of wealth.

The foreigners residing in American cities are chiefly poor immigrants, who compete with the native working-class for wages, and are accustomed and content to live in comparative squalor. The percentages of "foreign-born" to total population in five principal American cities are as follows: Philadelphia, 25.74 per cent; Boston, 35.27 per cent; New York, 42.23 per cent; Chicago, 40 98 per cent; Milwaukee, 38.92 per cent. More than 30 per cent of the foreign-born males, twenty-one years of age and over, in the five cities named, are aliens. The percentages of "persons of foreign parentage" to total population in these cities are as follows: Philadelphia, 56.58 per cent; Boston, 67.96 per cent; Chicago, 77.90 per cent; New York, 80.46 per cent; Milwaukee, 86.36 per cent. This information was courteously furnished by the Chief of the Census Division, Department of the Interior, Washington, March 12, 1896.

More rigid enforcement of contract-labor laws has decreased importation of foreign labor under direct or written contract, but there is ample evidence that Italian labor purveyors still influence such immigration. Immigrant Inspectors Birmingham and Hinkle reported (under date of January 11, 1895) to the Secretary of the Immigration Investigation Committee, among other facts, as follows: "Mr. Desabadia (an Italian *padrone* of New York) informed us that he was regularly engaged in supplying Italian laborers, in any numbers, to contractors or others desiring labor done; that he was prepared now to furnish from 200 to 600 men (Italians) for work of any nature; that he could furnish stone-masons, carpenters or men for almost any of the building operations."

The equivalent of the *padrone* system is not confined to Italians. Poles, Hungarians, Greeks and other foreigners, temporarily camping in this country, are forwarded, "on call," wherever large operations are in progress, crowding out American labor by accepting lower wages. In Texas and other border States, invasions of Mexicans occur at regular intervals, especially at sheep-shearing time; these people contribute nothing to the wealth of the country, and patronize the railways by walking home on the ties!

An investigation made by the Senate Committee on Immigration in 1893 (Senator Hill, chairman) developed the startling fact that Italian bankers remitted to Italy from New York City alone $25,000,000 to $30,000,000 a year, largely savings of "Dago" laborers, and a marked increase in wealth in certain sections of Italy has been traced directly to money earned in the United States by these "birds of passage." Italians who have become domiciled here for a few years are beginning to make incursions into skilled-labor fields where formerly they were unknown, and where even a suggestion of the kind would have been ridiculed. In the shoe trade, for example, it is said that large numbers of Italians have been substituted for American workmen who went out on strike some time ago.

The facts stated in these various foot-notes have been gathered by the writer at different times during several years from a variety of independent sources, and it is only when placed in juxtaposition that their true significance becomes apparent. These illustrations are but a few samples of facts at hand that are too numerous to mention, and they present practical problems for legislators and workers, of far more importance than any theoretical discussions.

[3] Henry J. Warren, superintendent of the Barber Asphalt Company, was convicted by a police-court in Buffalo, of a misdemeanor for a violation of this [eight-hour] section of the Buffalo charter, and punished by imprisonment. From his conviction he appealed to the Court of Sessions and to the General Term of the Supreme Court, where the conviction was affirmed, the courts holding the act constitutional and the conviction valid. As Warren could not by law appeal to the Court of Appeals in that case, he sued out a writ of *habeas corpus* in the Supreme Court, to test the questions affecting the validity of the conviction, and to inquire by what authority he was restrained of his liberty. This proceeding is a good illustration of the efficacy of the ancient writ of *habeas corpus*, for, although the Special and General Terms of the Supreme Court dismissed the writ, and again declared the prohibitory statute constitutional and the accused properly convicted, yet, upon an appeal to the Court of Appeals, the decisions of the lower courts were reversed, and the arrest, trial and conviction declared without jurisdiction and void.

"After this long and tedious fight Warren was released, only to be arrested again for a violation of the eight-hour law, this time for employing an alien Italian laborer. He was indicted by the grand jury, and convicted in the Superior Court at Buffalo. His counsel contended that the act in question, so far as it seemed to prohibit the employment of alien laborers upon public works, was repugnant to the Federal and State Constitutions and to the treaty between the United States and Italy. Upon an appeal to the General Term of the Superior Court, the act, so far as relates to the employment of aliens, was declared unconstitutional, and Warren was discharged." — People *vs.* Warren, 77 Hun., 120; People *ex rel.*, Warren *vs.* Sheriff, 144 N. Y., 225.

Wise men usually count the cost of any new undertaking before embarking in it, and a very simple calculation will show surprising figures as to the additional cost of manufacture, should employers be called upon to pay the same wage for eight hours' that they now pay for ten hours' work. If we assume that an establishment employs a thousand hands (there are factories having capacity for four or five times this number) a reduction of two hours per day per man would mean an aggregate of two thousand hours' reduction per day in the shop. Assuming the average wage to be ten cents an hour (this is much below the true average) the additional cost for this item alone would be $200 per day; while the loss from decreased output and increased fixed charges, rate of interest on plant, etc., per unit of product, would, I believe, extinguish any margin of profit obtained under present prices in any manufactured article where competition is keen. It is, of course, possible that in those occupations in which the output depends more upon manual dexterity than upon the mere tending of automatic machinery, a decrease of working-hours may be partly offset by an increase of effort; but this would, I think, prove an exception, the effect of which is, in part at least, discounted by the low figure selected to represent average wages.

It is apparent that a rearrangement of some kind would be necessary; is it not likely that this rearrangement would be found in a corresponding reduction of wages?

Sympathizing as I do with all legitimate efforts of workingmen to better their condition, it appears to me that the aim of their organizations should be to secure a reduction in the hours of those workers who are now compelled to submit to clearly excessive consecutive hours of attention to duty — conditions that are not only deleterious to the welfare and happiness of the laborer himself, but in some instances increasing the danger to life and limb of others, whose interest and sympathy would be a powerful lever, if properly applied, to help to remove this incubus resting at present upon the boasted freedom of labor in this country.

If the views which I have here advanced shall have the effect of tending, on the one hand, to discourage the unwise and impracticable schemes of some misguided wage-workers, and, on the other hand, to stimulate keener and more general interest on the part of employers of labor in the welfare of their operatives, and thus to foster a closer union between these two great interdependent elements of society, I shall feel that my efforts have been repaid. The nature of my occupation for the past fifteen years has perhaps afforded unusually favorable opportunities for viewing both sides of the sociological questions here discussed; it has certainly aroused keen personal interest in the subject and has stimulated study of these problems.

ILLUSTRATIONS

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

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For description see article elsewhere in this issue.

COURT FACADE OF SAME WING.

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THE CHÂTEAU DE BLOIS, AFTER DU CERCEAU.

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NOTES AND CLIPPINGS

Soot and Smoke. — An item is now making the rounds which ought to afford factory owners who are wrestling with the smoke problem something to think about. The stack of a German sugar factory, so it is stated, was provided with a soot-catcher, and six days afterward the accumulation was removed and found to figure up about 6,700 pounds which, at a low estimate, ought to amount to about 175 tons in a year. While the correctness of the figures cannot be vouched for and a liberal discount may be in order, it is safe to presume that the result of the experiment was instructive. Soot-catchers are not very commonly used appurtenances to steam plants, and probably have little value except as means of complying with local smoke ordinances. But the object-lessons which they could teach might lead to very acceptable fuel economies. *Cassier's Magazine.*

Shall Plumbers use Bicycles? — A reform movement has been started among plumbers which may upset the traditions of the men in that trade. The bicycle craze has introduced the reform movement, and now a good many plumbers have taken to bicycle riding, and go to their jobs on wheels. They are thus enabled to attend to more jobs in a day. One of the fundamental rules of the plumber's trade, it is well known, is for a journeyman and his helpers to take the most roundabout way of going to their jobs, and taking as long a time as possible to complete them. Now, one journeyman on wheels can do as much work as three plumbers formerly did. Plumbers' Union, No. 73, of Indianapolis, is evidently alarmed over the outlook, and has passed strong resolutions condemning plumber wheelmen. These resolutions have been sent to all the plumbers' unions throughout the country for ratification. The resolutions ask the unions not to allow any of their members to ride bicycles during working hours, because a man doing jobwork and riding a wheel can do as much as three ordinary plumbers. — *N. Y. Times.*

Testing Quicksand. — Suppose we take a certain quantity of quicksand, dry it artificially, and then try to make it into quicksand again. Put it into a box and pour water on it carefully. Instantly the water is soaked up, and if we measure the volume, or better, the weight of the sand, we shall see that it takes up a quantity of water that measures 30 per cent of its own volume, or 20 per cent by weight. The rest stays above the layer of sand. If we now pierce a little hole in the bottom of the box, we shall see pure water run out; the sand forms a kind of immovable filter. Also, by turning the box upside down we see the sand keep its form like a stopper. It follows from this experiment that we cannot obtain quicksand in this way. We must reverse the condition of the experiment. Let us put the water into a vessel and sift in the dry sand in a thin stream, while shaking the vessel lightly. Then we shall get the thick but easily-flowing compound known as quicksand. That the mixture may keep its mobility two conditions are necessary: (1) The quantity of water contained must not be less than 21 per cent by weight. (2) The whole must be continually though lightly shaken. If we increase the proportion or interrupt the agitation for an instant, the mass settles down, retaining about 20 per cent of water, while the surplus, if it exists, rises to the top. — *La Nature (Paris).*

A Warning as to Piles. — It is a commonly accepted belief among architects, engineers and builders that piles cut off below the level of standing water are safe from decay, but Col. Peter C. Hains of the corps of engineers of the United States Army has recently described an experience with some Government fortifications which indicates the possibility of there being an occasional exception to this freedom from decay. Between the years 1833 and 1849 several thousand piles were driven for the foundation of a fort on an island in Delaware River. These piles were cut off about 20 inches below the level of mean low tide, the mean rise and fall of which is about five feet. The level of the standing water within the enclosure of the fort, while it varies somewhat with the tides, does not change to the same extent, so that the lowest level of the standing water where the piles were driven is above that of the mean low tide outside. Colonel Hains has not the slightest doubt but that the heads of the piles have been below the water-level ever since they were driven, yet some of them were eventually decayed to such an extent near their tops that a stick could be pushed several inches into the decayed part. The decay was confined chiefly to the sapwood in the upper four or five feet of the pile, and the surprising fact was noticed that the grillage resting on top of the piles was free from decay. The piles were of poor quality Chesapeake Bay pine, from twelve to fourteen inches in diameter, and many of them had apparently been injured by hard driving. The soil into which they were driven consists of a soft, bluish-black mud to a depth of 42 to 45 feet. From that depth to 85 feet, various strata of sand are found, some fine and some coarse. The sand strata contain plenty of water, the latter rising in the well within the fort above the level of mean low tide. Below a depth of 85 feet, there is said to be compact clay with boulders. The upper strata of mud have a disagreeable odor, with indications of marsh gas. — *Boston Transcript.*

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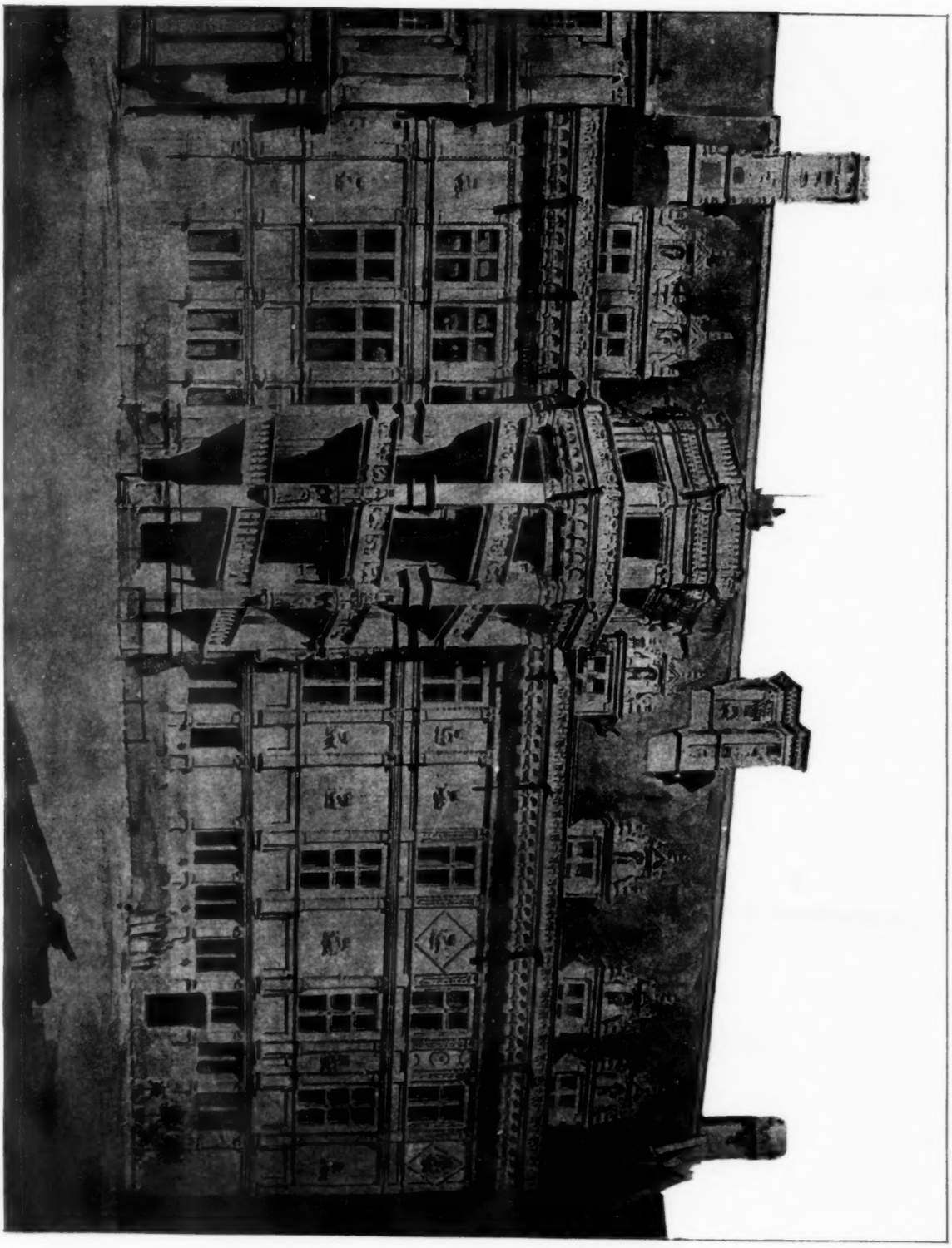
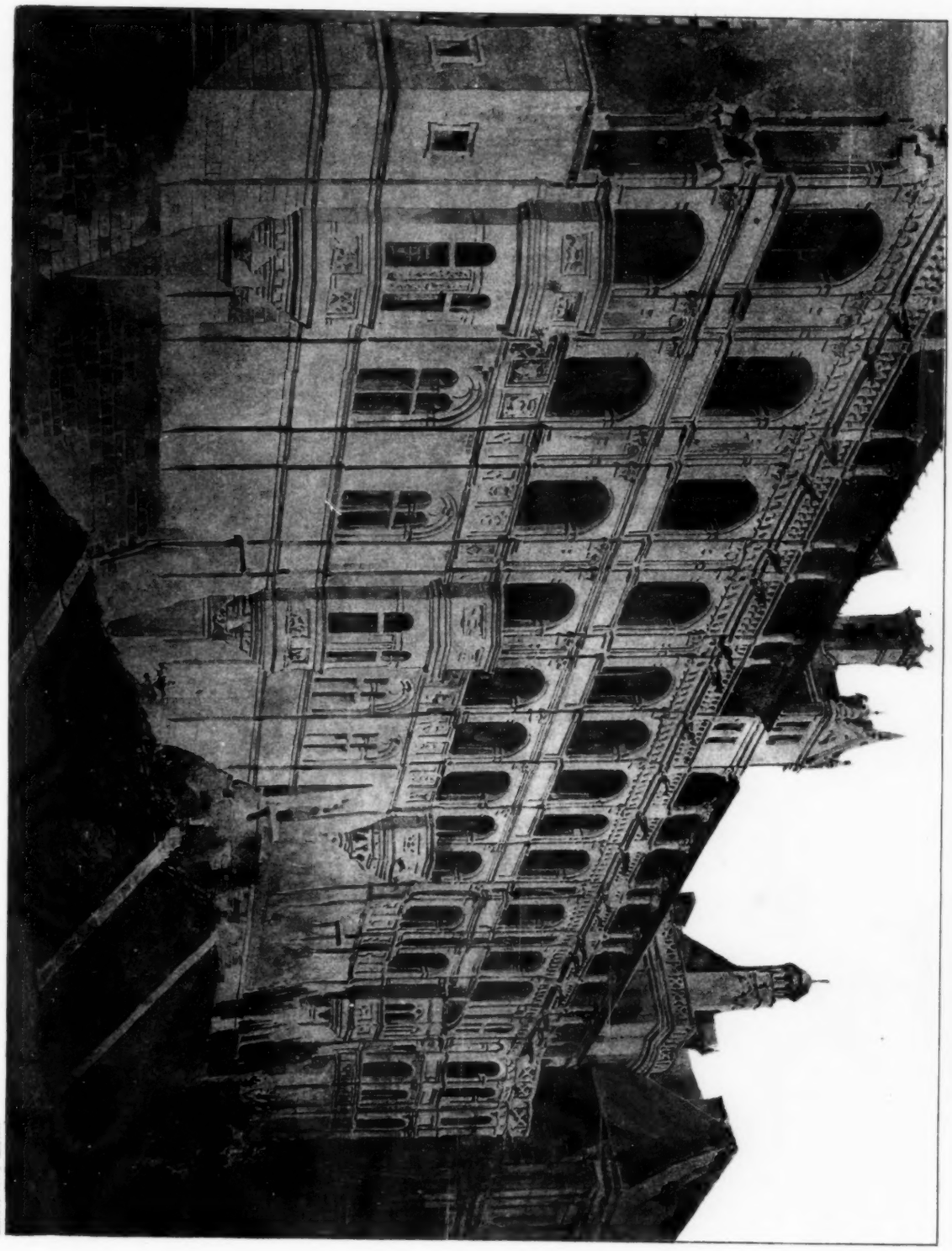


CHATEAU DE BLOIS.

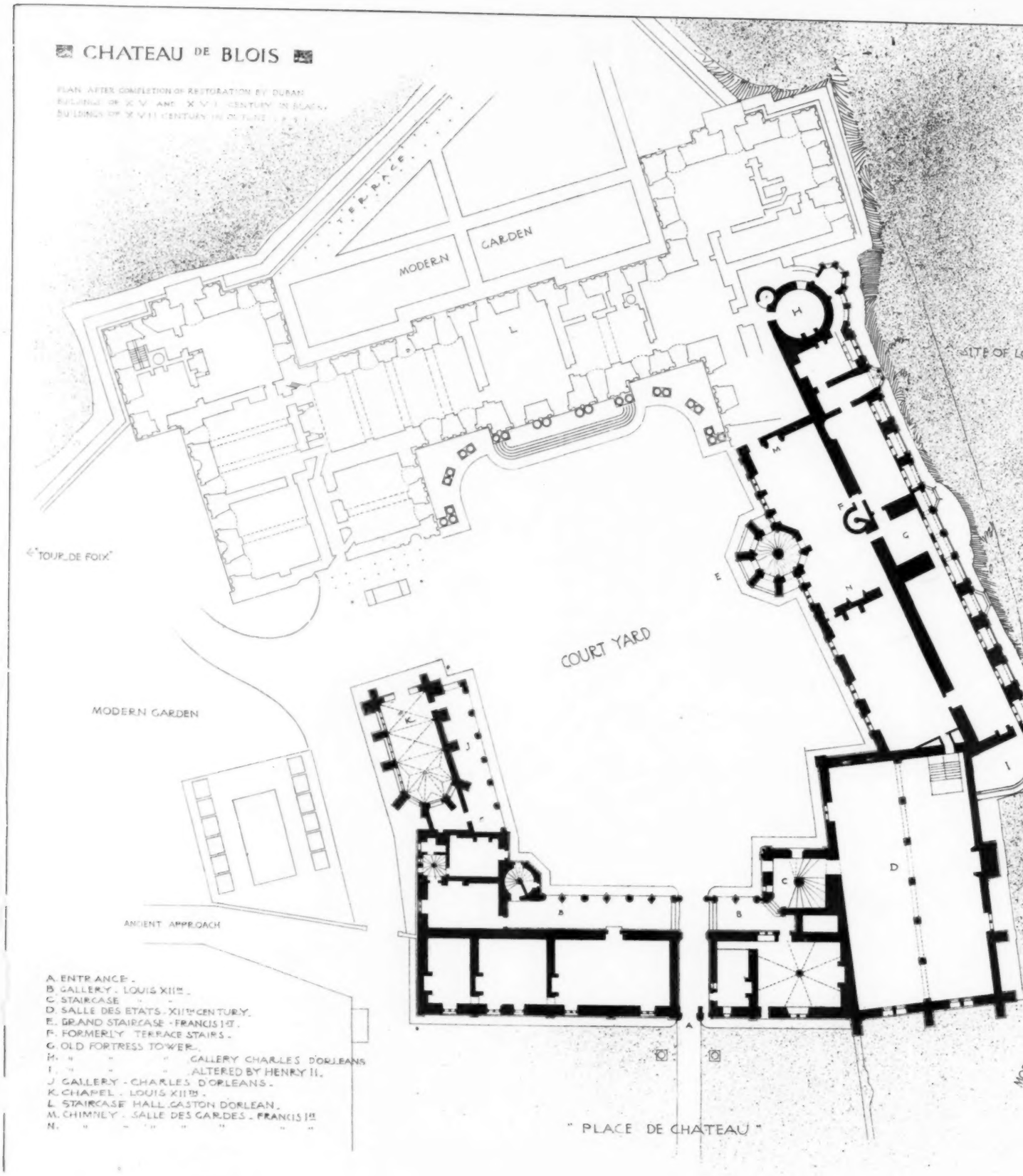
THE COURT FACADE. WING OF FRANCIS I

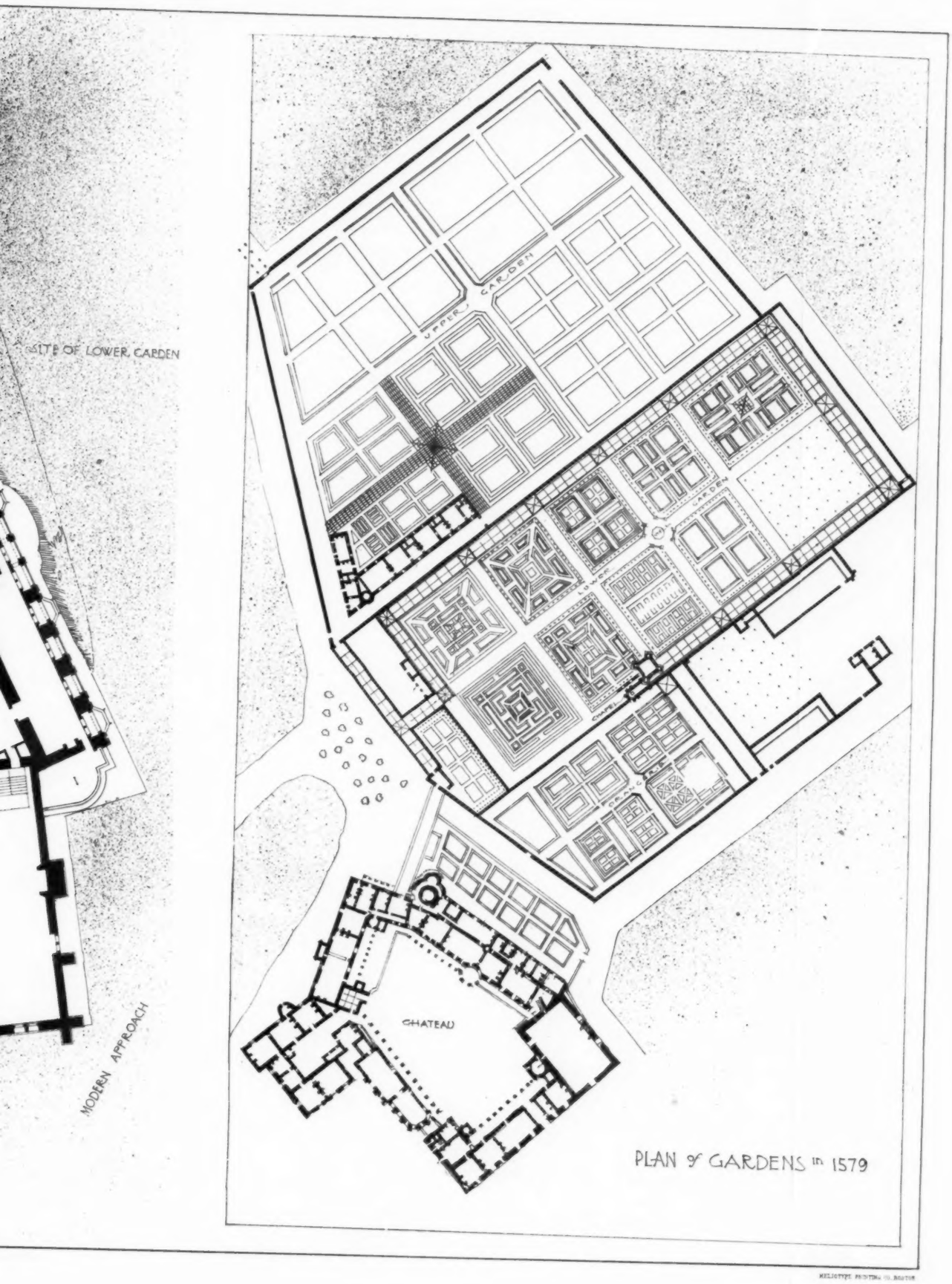
NORTH FACADE. WING OF FRANCIS I.

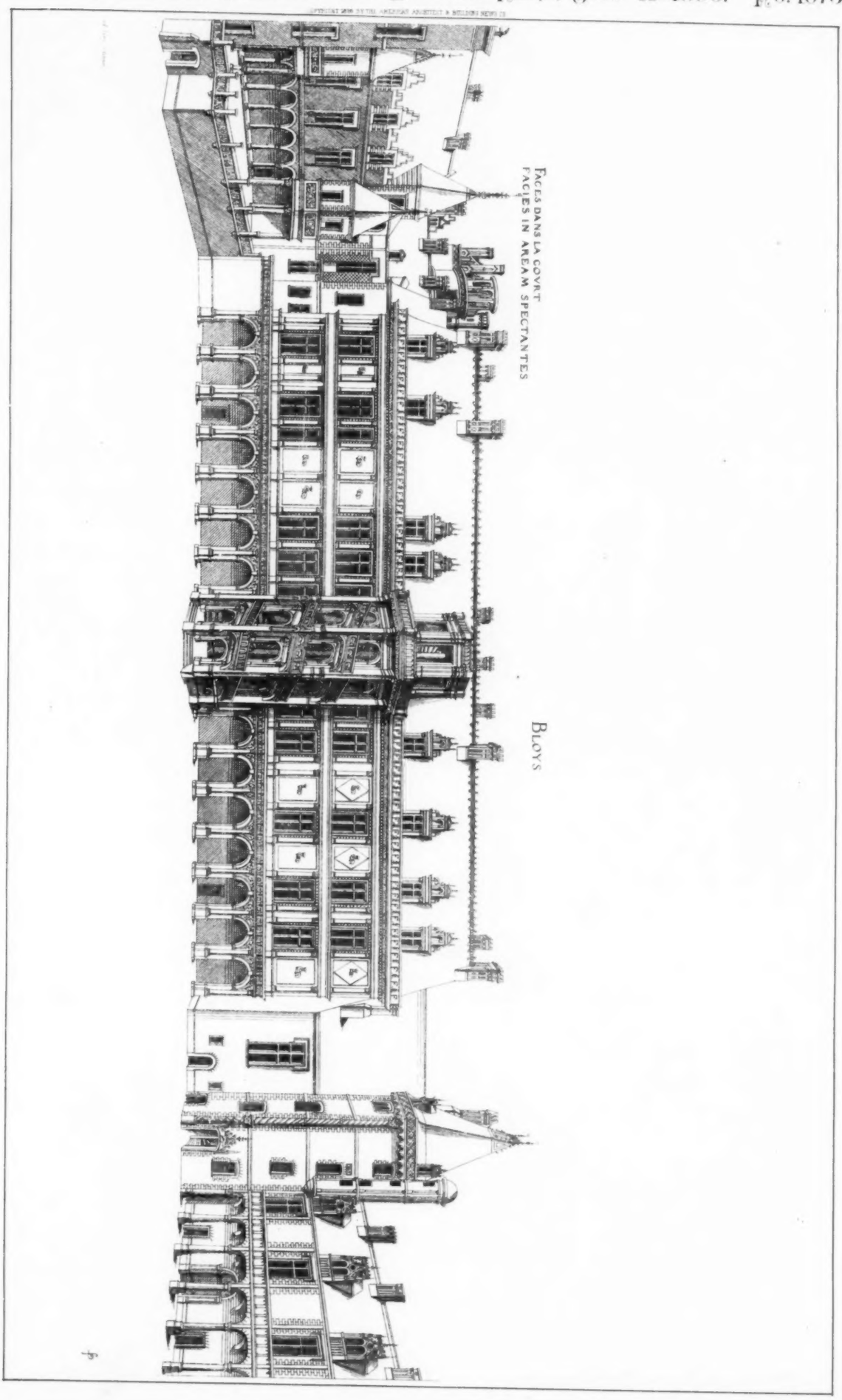


CHATEAU DE BLOIS.

NORTH FAÇADE, WING OF FRANCIS I.




SITE OF LOWER GARDEN
MODERN APPROACH
UPPER GARDEN
LOWER GARDEN
CHAPEL
CHATEAU
PLAN of GARDENS in 1579



FACES DANS LA COUR
FACIES IN AREAM SPECTANTES

BLOYS

HOUSE FOR MRS J H BURLEIGH
SO BERWICK MAINE
KENDALL & STEVENS ARCHITECTS
BOSTON MASS