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A VERY important bill, amending the Boston building-laws, has been introduced into the Massachusetts Legislature, and seems likely to pass. Under the present law, certain fire-limits are established, within which no wooden buildings can be erected. Outside these limits is a large territory, much of which is rather thinly settled, while portions of it, particularly along the main thoroughfares, are closely built up. To extend the fire-limits so as to prohibit a person who owns a ten-acre lot in West Roxbury from building a wooden house on it seems, to the people interested, injustice; yet, if the owner of the ten-acre lot is permitted to build of wood, the owner of a small frontage in a thickly-settled part of the same district must be permitted to do the same. To extend the fire-limits to cover all the thickly-settled parts of the suburbs would involve great complexity and frequent changes, and the result is that large tracts of land in Brighton, Jamaica Plain, Roxbury and Dorchester are now closely covered with wooden houses, among which terrible conflagrations will surely rage in the future. All persons in the city interested in sound and safe construction have felt the necessity for a radical reform, but it has been impracticable to extend the fire-limits materially without a storm of protests, and some apparent injustice. The present bill is intended to meet the difficulty, and does so in an ingenious and sensible way. Instead of extending the fire-limits by a fixed rule over districts which are partly dangerous and partly safe, the limits are made coincident with the territorial boundaries of the city, but a proviso is inserted, to the effect that the Building Commissioner, the Fire Commissioner, and three members of the Board of Appeal shall form a Board of Exemption, which shall be empowered to establish districts in the thinly-settled portions of the city, within which wooden buildings may still be erected, and to change or abolish such local exemptions from time to time, after public hearings, in such manner as it may deem for the public interest. In this way, for the first time, a reasonable elasticity is given to the application of the fire-limit regulations, and the Board of Exemption is enabled to permit the building of wooden houses on farming land, of which there is still a great deal within the city boundaries, without countenancing an increase in the size of the dangerous districts, which already imperil large sections of the city.

THE benevolent and public-spirited action of the Philadelphia Councils, in making an appropriation of money for the Pennsylvania Academy of the Fine-Arts, in return for the establishment of forty-five scholarships and other privileges in the way of popular education in art, has had an un-

expected result. It was supposed that the city scholarships would be used only by persons intending to become professional artists, but a very large proportion of them are now taken by Normal School graduates, who intend to teach in the city schools, but, finding no place open to them, utilize the time, while they are waiting for a vacancy, in drawing and modelling at the Academy. With such admirable tuition as they can have at the Academy, it is hardly possible that their course there should not have a great influence over Normal School graduates of talent and capacity, and, through them, over their future pupils, and in this way a strong impression seems likely to be made on the younger generation of Philadelphians. Whether the Academy is obliged to lower its standard of qualifications for admission, in order to receive candidates who have had no preparation but the training in the public schools, or whether the Normal School course in drawing in Philadelphia is thorough enough to qualify graduates for entering Academy classes, we do not know; but, if the standard of Normal School drawing could be, with the help of qualified artists, brought to a point where graduates could, with propriety and success, take up the work of students fitting for the artistic professions, the example of Philadelphia might, with advantage, be followed in all our great cities.

THE people of St. Louis have awakened, rather late in the day, to the fact that the drainage scheme for Chicago, which is rapidly being carried out, threatens the health and happiness of all the cities in the Mississippi Valley. A Commission was appointed, some six months ago, by the Mayor of the city, to investigate the Chicago drainage scheme, and consider its probable effect upon St. Louis, and the report of the Commission has just been presented. According to this the water of the Mississippi, at St. Louis, will contain, in dry seasons, more than one per cent of Chicago sewage, to say nothing of the additions made by towns on the river and its tributaries between Chicago and St. Louis. As the flow at St. Louis is accurately known, and the amount of Chicago sewage can be estimated by considering it to be equal to the consumption of water, there can be no doubt of the substantial correctness of the Commission's figures. A much weaker decoction of Chicago's filth might easily spread cholera or typhoid fever broadcast through the whole course of the Mississippi below the outfall of the Chicago sewerage canal, and it is not surprising that the St. Louis Commission thinks that something must be done immediately. So far as the cities on the river are concerned, it thinks that it would be sufficient to have Chicago compelled to purify its sewage, by one of the many effective processes, before discharging it into the river system; but it points out that other considerations will come up later, which the people who have already spent twenty-eight million dollars of public money on the drainage canal have not, apparently, thought of. One of these considerations is that in regard to the source of the water-supply for flushing the drainage canal, and for floating the vessels which Chicago now expects to see sailing through it from the Gulf of Mexico. The calculations of the engineers have assumed that six hundred thousand cubic feet of water per minute could be diverted from Lake Michigan through the new canal. This is, as the Commission thinks, about four per cent of the mean discharge of the Niagara River, and no one knows what effect the diversion will have on the navigation of the Great Lakes, or on the towns on their border; and, as the United States Government and the Canadian Government share in the control of the lake navigation, both of them must be consulted before any water can be drawn from Lake Michigan for the purpose intended.

FOR the new New York Custom-house, which is to be one of the most important buildings ever erected by the Government outside of Washington, competitive designs have been invited from a limited number of architects, from New York, Boston, Philadelphia and Chicago. The number of invited competitors is said to be twenty, and careful directions are to be issued to each, covering the materials, floor-spaces, heights and so on, which long experience has shown to be best suited for the Government service. It has been said that the building would cost about four million dollars. How much truth there may be in that we do not know, but the competition is likely to excite great interest in the profession.

OUR readers will remember the discovery, made recently in one of our university laboratories, that nearly all bricks are more or less magnetic, and that in physical laboratories built with brick the operation of magnetic apparatus is sensibly affected by the material of the walls. It appears, from the *Schweizerische Bauzeitung*, that the fact of the magnetic quality of bricks has long been known. On account of this, Professor von Wild constructed at Paulovsk, near St. Petersburg, a laboratory for absolute magnetic observations, entirely of wood, glass and copper, using bricks, which had been thoroughly tested, only for the piers on which the instruments rested; and Professor von Bezold, of Berlin, in building the magnetic observatory at Potsdam, dispensed entirely with the use of bricks, none having been found which were entirely free from iron, and, consequently, from magnetic properties. Fortunately, as the *Schweizerische Bauzeitung* observes, almost all magnetic and electrical measurements are relative, and, as the magnetism of the building in which they are made affects them all equally, the proportionate result is not changed; and, as it says, a far more serious source of uncertainty in determinations is to be found in the variable or so-called "vagabond currents," which come from electric railways, or other sources, and are often perceptible half a mile or more from their source.

SCIENTIFIC and technical questions seem to come more and more into court, in this country, to the decided advantage of the public. The Prospect Hill Cemetery Association owns a burying-ground in the city of Omaha. Recently, wishing to enlarge its accommodation, it opened an adjoining plot, with the intention of using it for interments. The people in the neighborhood objected, claiming that the extension of the cemetery would tend to pollute their wells, and to injure their health, and an injunction was prayed for, and ordered by the lower court. On appeal to the Supreme Court of Nebraska, this judgment was affirmed, the Court holding that the injury apprehended by the petitioners was not conjectural or contingent, but was established by satisfactory evidence from scientific men called as experts; and that as the proposed use of the ground would, with substantial probability, have the result feared, this use would be a legal nuisance, and could properly be enjoined.

THE indications are very favorable for a fine representation of American art at the Paris Exposition of next year.

As we have already mentioned, there will be room, in the space allotted to the United States, for only two hundred or two hundred and fifty oil paintings, and a small number of water-colors, pastels and architectural drawings, but Mr. Cauldwell, the Director of Fine-Arts of the United States Commission, is determined to sift the available material until he has secured the very best that America has to offer, and, whatever may be said of average American work, the best is very good. It seems that, in the Palace of Fine-Arts, the American exhibit will have that from Japan on one side, and the one from Great Britain on the other, and it could hardly be better placed, for the Japanese exhibit, beautiful as it is sure to be, will differ too much in character from the American to compete with it, while nothing is better calculated than the affectation which characterizes nearly all modern British art to bring out by contrast the directness and simplicity of the best American work. A good example of this is Frederic Remington's picture, in the present National Academy exhibition, of the "missing" soldier dragged away by Indians, with two lariats about his neck, and one can imagine the sensation that such a picture would produce in the Paris Salon; and there were several other pictures in the exhibition which would do very well to go with it. In the present case, it is intended, as we understand, to exhibit nothing but work executed within the past ten years. How the American artists resident in Paris, among whom are some of the greatest of our painters, are to be treated, does not appear, but it is certainly to be hoped that they will not be excluded. As before noted, two juries will make selection in this country from the works offered. One jury will sit in Chicago, and the other in New York, and both Eastern and Western artists will be represented on each. The juries will be appointed in September, and will probably meet in November to judge the works submitted.

THE attempts to render wood incombustible, which have been made at frequent intervals for the last twenty years, seem to have led to a successful result, and wood really fire-resisting is now in extensive use. Recently, a method of

treating wood for this purpose has been adopted by the Navy Department of the United States, which, warned by the disastrous effect of the burning of the wooden fittings of ships of war in action, in the Chinese and Spanish wars, has determined to guard against similar dangers in our own vessels. Professor Stillman, of the Stevens Institute, made some tests recently on specimens of wood treated in accordance with the specifications of the experts of the Navy Department, which were extremely satisfactory. A powerful blast lamp was used, giving a solid blue flame, two and one-half inches in diameter, and eight inches high. A piece of North Carolina pine board, twelve inches long, was held over this flame, and charred, but did not ignite; and a grooved moulding, such as is used for covering electric wires, also resisted the fire successfully. Ash proved as resistant as pine; and a thick block, on being left in the flame for nearly half an hour, simply cracked and smoked, without burning. In the last experiment, a quantity of shavings were cut from the fireproofed wood, placed in a dish, and soaked with alcohol, and then set on fire. The alcohol burned entirely away, without consuming the shavings. The process used is said not to injure the wood for working or painting, and, unless it is extravagantly expensive, it should, before long, be widely used.

THE second annual meeting of the American Section of the International Association for Testing Materials is to be held in Pittsburgh, Pa., August 15 and 16, 1899. This will be near the time of the annual meeting of the American Association for the Advancement of Science, which is held this year at Columbus, Ohio, so that persons interested can easily attend both meetings. Three sessions will be held, for the reading of papers and addresses, the reports of committees, and special discussions, and opportunity will be afforded for visiting testing-laboratories and industrial establishments. A detailed programme will be issued about the first of July. Meanwhile, those who would like to join an association which already includes the most distinguished engineers, and the most powerful and enterprising firms of manufacturers, in the country, should send to the Secretary, Mr. Richard L. Humphrey, at the Testing Laboratory, City-hall, Philadelphia, for blank applications, which must be endorsed by two members.

MOST of our readers have probably seen examples of the new French silver coinage, modelled by M. Roty. The French Government seems to have been encouraged by the success of this attempt to revive good art in coinage, and has employed M. Chaplain to model a new gold coin, the dies for which are so far complete that trial pieces are being struck. As Chaplain is more a sculptor, while Roty is more a medalist, although both enjoy the highest reputation as artists, there will be much interest in comparing the work of the two men. Whether M. Chaplain will show himself capable, as the French say, of doing great work on a little scale, or whether the result will show that the special experience of a medalist is necessary for success in minute sculpture, we shall know later; but it is certain that any artist who can surpass Roty's beautiful coins may well feel proud of his success. Probably many people have wondered why Roty's two-franc, one-franc and half-franc pieces were precisely the same, except in size, and have commiserated the artist for having been compelled to cut the same dies three times, in different sizes. The fact is, however, that the design was only made once, at a scale much larger than that of any of the coins, and cast in plaster, and cut on the steel matrix, by ingenious machinery, from the plaster-cast, the machine giving any reduction required. As compared with the antique method of engraving the dies by hand, the modern process has a repulsively mechanical air, and some of the lines in the Roty coins, which are reduced almost to invisibility, betray, perhaps, the effect of machinery, but the result is, on the whole, so charming that it is foolish to be over-critical, and the requirements of modern mints, which need to have the original design in relief, so that a number of dies can be made from it, to hasten the actual work of coinage, make it difficult to employ the ancient process. Still, it may be permitted to regret that, instead of one beautiful design in their silver coinage, the French could not have had three; and if our own Government should ever conceive the notion that artistic coinage is a good thing to have, and that it can only be produced by good artists, we hope that the idea will be accompanied by another, to the effect that a variety of beautiful coins is still more desirable than an assortment of sizes of a single design.



## PAINT-FACTS AND PAINTING-SPECIFICATIONS.—II.

## WHITE-LEAD: ITS ADVANTAGES AND ITS FAULTS.



Escutcheon from the Monument to Alexander III, Moscow, Russia.

Of an antiquity so remote that all record of its discovery is lost, white-lead still stands pre-eminently at the head of all pigments used for house-painting. Although scientists have repeatedly pointed out its faults and advanced arguments in favor of the substitution of other materials, practical painters still cling to the use of white-lead, because no other pigment now known can be made to take its place. The properties which make white-lead valuable to the painter are its opacity, which enables it to cover well; the ease with which it may be spread over a surface; its elasticity, which permits it to "give" with the surface of the wood to which it is applied, even though this is constantly expanding and

contracting with the varying amount of moisture in the atmosphere; its comparative durability and its property of forming with linseed-oil a lead-soap or linoleate of lead, which does not take place in a mixture of any other white pigment with linseed or other drying oils.

White-lead is not a simple substance, nor a definite chemical compound, but is a mixture of variable proportions of two substances chemically different, the carbonate and the hydrate of lead. Wigner and Harland, describing the result of a very careful series of experiments with white-lead, in a paper read before the Society of Chemical Analysis in 1877, which report has been accepted as standard by the latest authorities, say: "We have come to the conclusion that the combination or mixture of the two compounds, viz, carbonate and hydrate of lead, is necessary in order to secure a good and serviceable paint; that is, the hydrate of lead must be present in order to form a paint instead of an emulsion, and the carbonate of lead must be present in order to give covering power." In the course of their experiments they tested samples of the pure carbonate of lead, making them into a paint with the greatest care, and spreading them over the surface of the substance to be painted, but the paint neither dried nor hardened and was so pulverulent that even after several days of drying an ordinary washing was sufficient to remove it. On the other hand, commercially pure hydrate of lead mixed with linseed-oil possessed but little more covering power than the pure linseed-oil, and spread over the substance to be painted in a varnish-like film. There was, however, evidence that the oil and the hydrate of lead united to form a chemical compound, in the fact that a certain amount of heat was set free on mixing the two.

These two constituents of white-lead are not always present in the same proportions, depending on accidental variations in the process of corrosion. According to Charles L. Condit, one of the greatest authorities on the subject of paint, "It is the carbonic-acid lead [lead carbonate] which makes the paint white and causes it to powder; it is the water-lead [lead hydrate] which makes part of the oil into a soap and hardens the paint." When these two constituents are properly balanced the white-lead makes a durable paint; when lead carbonate is in excess there is a loss of spreading capacity, a lack of binding property, and a tendency to rapid chalking; when lead hydrate is in excess there is a lack of density, body and those working properties which appeal to the practical painter.

In spite of the great advances that have been made in industrial chemistry and in manufacturing processes of all kinds, it seems a singular thing that the important industry of white-lead making should still proceed along ancient lines and that the best white-lead of to-day is either made exactly as it was made in Holland three hundred years ago—a process learned by the Dutch from the Venetians—or by some modification of the "old Dutch process," in which its principles are rigidly followed, although variations in minor details have been introduced by which the corrosion is brought more directly under the control of the operator.

It might be in place here to describe briefly this "old Dutch process" of white-lead making. In the first place, the metallic lead is cast into flat, round, perforated plates called "buckles," about five inches in diameter and less than a quarter of an inch in thickness. These are piled in peculiarly shaped earthen pots, of perhaps one gallon capacity, each having two large holes in the sides to permit free circulation of gases. The bottom of each pot is filled with vinegar or mild acetic-acid, the buckles being kept from touching the acid by lugs cast on the inside of the pot. They are then piled up in a "stack" or "bed" and covered with spent tan-bark or manure and water, which soon heats and ferments, generating carbonic-acid gas, the whole stack being enclosed to confine the gases arising from the tan bark and the evaporating acetic-acid. These gases slowly

attack the metallic lead and convert the buckles into a snowy white swollen mass, with a portion of blue lead in the centre. The ordinary time allowed for one of these stacks to stand is from ninety to one hundred and twenty days, and during that time there is no possible way to exercise any control over the operation. At the expiration of this period, it is assumed that the metallic lead in the pots has been entirely corroded, and the stack is stripped, the corroded buckles being taken to specially-designed machines which separate the white-lead from such portions of uncorroded or blue lead as remain. This white-lead is then thoroughly washed, to remove any traces of free acetic-acid which might remain in it, and run through a series of vats, to permit any coarse material to separate from it. It is afterwards dried and is then ground in oil. "It will be evident," says Terry, a well-known English authority, in his book, "Pigments, Paint and Painting," "that the mode of proceeding in white-lead making by the stack process is most crude and clumsy, and a most uncertain method, one governed by rule-of-thumb, and by no element of certainty or science. . . . The uncertainty of the stack process is shown most clearly in this: that stacks may work, and some do not work. In the latter case, all the time and labor spent in forming the stacks and all the acid they contained is lost. No amount of foresight will avail to determine beforehand which stack shall accomplish the conversion of the contained metallic lead, and which will not." He mentions it as a curious fact that in all English factories of this description "some chambers are noted as always working well and others are equally well known as doing their work the reverse of well"; yet no one stops to ask the reason why. Although the incrustation that is most esteemed by the manufacturers is "a hard, china-like material, formed of thin deposits, layer upon layer, in a slow, continuous, regular way," it is impossible to foresee whether this kind of white-lead will result from any given corrosion, because it is almost impossible to subject all portions of the stack to the same conditions or the same action of the corroding gases. For this reason, it has been found that all the white-lead coming from the same factory working under the "old Dutch process" does not work just the same under the brush, when ground with linseed-oil and mixed to the consistency of a paint. Moreover, it will be found at times that there is a great difference in the durability of the same brand of white-lead under apparently similar conditions. In many cases these differences may be traced to those irregularities in the process of manufacture over which the factories working by the stack process have no control. The lead may be good or it may be poor, though in both cases it is absolutely pure white-lead. Then, again, a perfectly corroded white-lead may be insufficiently washed, and contain traces of acetic-acid, which will show its presence by the rapid chalking of the paint, or it may be coarsely ground, or burned in the grinding because the mills have been run at such a high rate of speed that the lead has become overheated. All these produce faults in the paint due to imperfect manufacture, and entirely apart from any inherent faults which may belong to white-lead as a paint-material. But in spite of the imperfections of the "old Dutch process," by far the larger portion of the white-lead used in the United States is made by it, and many painters prefer white-leads made by this process, because they assert that "old Dutch" white-lead is superior in density and covering power. It may be well to add that in those factories where due care in the separation of the corroded from the blue lead is used the product will be fairly uniform and of good quality, because the imperfectly corroded white-lead does not find its way into the grinding-mills.

While the stack process which has just been described represents the "old Dutch process" in its entirety, there is another method of manufacture, employed by two of the largest firms of white-lead corrodors in this country, in which the principles of the "old Dutch process" are applied in such a manner as to be thoroughly under control at all stages of the work, so that at all times, from the beginning to the end of the operation, the white-lead is under the observation of the workmen, and is capable of manipulation by them, so that the chemical action which it is undergoing may be controlled. In this modified Dutch process the lead, instead of being cast into buckles, is reduced to a fine powder, placed in slowly revolving cylinders and moistened with dilute acetic-acid or vinegar, while carbonic-acid gas is passed through it. The powdered lead is thus evenly subjected to the influence of the corroding agencies, and the workman who has charge of the cylinder may observe constantly the process of corrosion, adding more acid if necessary, or increasing or diminishing the supply of carbonic-acid gas as the lead may require. The apparatus is so arranged that a uniform temperature may be maintained throughout the entire period of corrosion, which goes on evenly, and, if proper care is taken, the result should be a perfectly corroded white-lead approximating very closely to the ideal in its proportions of lead carbonate and lead hydrate. Owing to the fact that the lead is introduced into the apparatus in the form of a fine powder, the corrosion is accomplished in very much less time than when the acid has to eat its way, as it were, through the thick lead buckle of the "old Dutch process," the entire operation occupying about sixty hours. Hence this has been very generally termed the "quick process." The washing, drying and other subsequent operations are the same as in the "old Dutch process" already described.

Lead whites made by other processes that are materially different from either of those just described are made and sold under the name of "white-lead," but they are not genuine white-lead and do not possess the same pigment-value, however useful they may be for

<sup>1</sup> Continued from No. 1219, page 44.

other purposes. Either they are crystalline in form, which causes lack of opacity or covering power, or they differ so materially in chemical composition that they cannot be classed as a true white-lead, this term being by long-established usage confined to the hydrate-carbonate of lead.

So far as the architect is concerned, he may safely leave the selection of a brand of white-lead to the painter, specifying only that it shall be a strictly pure hydrate-carbonate of lead, bearing the brand of a reputable corroding house. The purity of white-lead is readily determined by the familiar test of the blow-pipe, reducing it under the flame to a button of metallic lead; but to determine whether the component elements of the white-lead are properly proportioned to secure the most durable and satisfactory paint would require the services of a chemist experienced in white-lead analysis. While undoubtedly the discriminating painter may find differences in the various brands of white-lead which will cause him to select one rather than the other, these differences are so slight, and as a rule affect the practical working of the paint rather than its durability, that there is nothing ordinarily to be gained by mentioning the name of any special brand of white-lead in the specifications.

Considerable discussion has arisen in the columns of the paint-trade press and at the conventions of the master-painters with regard to the advantages and disadvantages of "pulp-lead." This term does not refer to the process of corrosion, but to a method of grinding by which, instead of drying the washed white-lead, it is placed in mixers with linseed-oil, and rapidly revolved, the theory being that the lead, possessing great affinity for the linseed-oil, will seize it and cast aside the water, which will be thrown out of the mixer by centrifugal action. It is certain that after the grinding very little water remains in the white-lead (less than one-half of one per cent), and whether that water is a detriment or not is a mooted point. Many painters prefer "pulp-lead," because of its greater ease in working, while others condemn it, because they claim that it chalks more rapidly than the lead which has been pan-dried before grinding, though the mass of the testimony by no means sustains this objection.

The chief and only real fault of white-lead is its tendency to chalk or powder-off in time. Whether this chalking will occur soon after painting or not is a question that cannot always be answered as it depends upon circumstances over which the painter cannot always have control, as, for example, the condition of the weather after the paint has been applied, the time allowed between coats, or the condition of the wood itself. But sooner or later the surface of the paint will disintegrate, owing to the decomposition of the oil by the action of the air and the rain, and the fine particles of lead on the surface of the paint will become loosened, forming a fine, flour-like coating, which may be wiped off, leaving the more solid paint underneath. When the painting has been well done, under favorable circumstances, with good lead and pure linseed-oil, this chalking should not commence on outside work under two years, and even then the appearance of the paint will not be much affected by it. The paint should last from five to seven years before it chalks away so much as to require renewal. Sometimes, however, this chalking will begin within a few weeks after the application of the paint, and will go on very rapidly, so that the house will need repainting in less than two years. And it is noticeable also that white-lead of the same brand, purchased by the painter at the same time, and presumably of the same corrosion, will not always behave alike, so that the painter should not be blamed for those shortcomings of the white-lead, which are incident to the material itself, and over which he can exercise no control.

On the other hand, this very chalking, unless it is unduly rapid in its occurrence, is a point in favor of white-lead, when the question of the economy of painting during a long series of years is considered. A paint that chalks upon the surface is always in condition for renewal, the oil of the subsequent coats of paint serving to bind together the loose particles upon the surface into a firm foundation for the new coat, while a paint which dries with a hard surface, and checks or peels rather than chalks, will require burning or scraping off before a good job of painting can be made upon its surface. Although durability is to be desired in a paint, it may be safely asserted that it will be obtained only at the expense of increased cost for repainting, unless the surface, when such repainting becomes necessary, is in such a condition that the oil of the subsequent coats of paint will find a surface into which it can sink and bind firmly the new paint surface.

Pure white-lead and pure raw linseed-oil make a paint that is admirably adapted for use as a priming coat on the bare wood, because of its elasticity. This peculiar property of the white-lead gives it what the painter terms "life," and makes a firm foundation for the succeeding coats, which will not be thrown off by it as they would by a hard and brittle primer. It is essential that the priming coat should be ground exceedingly fine, so as to enable it to enter the pores of the wood and thus obtain a better grip or clinch for the paint. It should also be soft, so that the oil of the succeeding coats should penetrate it and bind these more firmly to it. Anything that will harden the lead and make it more brittle or less elastic, such as the addition of zinc-white, will impair its usefulness as a priming paint, no matter what advantages such a paint might possess for the subsequent coats. Zinc-white, though a very valuable pigment, has no place in the priming coat. If, however, anything can be added to white-lead to increase its capacity for carrying linseed-oil, that will not at the same time harden it, it will make an ideal priming paint. Lamp-

black, perhaps, most perfectly answers these conditions, and next to this is a good grade of very-finely-ground French ochre. Under no circumstances should the so-called second grade or combination-leads, which consist largely of zinc-white and barytes, be used for the priming coat, since, where they are employed, the subsequent coats after a time will invariably crack and peel down to the bare wood. The writer has seen examples of this peeling, due to a brittle priming being used on the house originally, caused by a more elastic coat of paint applied from fifteen to twenty years afterward. And when this once occurs there seems to be no remedy but to burn off all the paint or else to replace the old clapboards with new, which is sometimes actually cheaper than burning off such a paint. Even where, for any reason, it is desirable to use a mixed paint for the finishing coats—and there are mixed paints which seem to give very satisfactory results—the priming coat should be pure white-lead, or lead tinted with lamp-black or ochre. The late William C. Wilson, of Philadelphia, than whom there was no better-posted man in the trade on all subjects connected with paint, in an address delivered before the Boston Architectural Club, November, 1892, said: "It is very necessary to guard against inferior priming. Many think anything is good enough for priming, and it is not uncommon to use cheap white paint for that purpose, or to mix with white-lead whitening or other cheapening material. If I would be dogmatic on any one point, it is that the priming is the most important part of the work, and that for priming there is nothing superior, if equal, to pure white-lead, and it should be the *finest and the best*." Later on in the same address, in describing what he believed to be the best possible system of house-painting, he said: "If the very maximum of durability were sought, both in the actual wear of the paint and the retention of color, then, for myself I should require the following directions to be followed: Priming coat to be made of finest quality of white-lead tinted to strong lead-color with best quality of lamp-black and thinned with raw oil only; plenty of time given for drying." The architect who incorporates these directions in his specifications may feel satisfied that he will get the best possible results and at the same time he will not offend the prejudices of the most orthodox and old-fashioned painter.

Before closing the subject of white-lead it may be well to call to mind the fact that, now that white is no longer generally used as a body color for house-painting, the principal use for white pigments is as a base to reduce the strong pigment-colors and bring them down to those tints which are usually employed in modern house-painting. In many of these tints the colored pigment is present in very small proportions, one pound of color tinting to the required strength from fifty to five hundred or even a thousand pounds of white-lead. Certain colors are, however, used either in their purity or nearly so, such as the greens, umbers, ochres, and siennas, and in these dark colors of course no white-lead at all can be used. This is a point that it is well for the architect to bear in mind when he writes a specification that a house shall be painted "with three coats of pure white-lead and linseed-oil to tints as directed," and then instructs the painter to make the blinds a bronze-green.

A great deal has lately been written about the alleged poisonous effects of white-lead used in painting, but most of this is absurd, especially when it is considered that nowadays comparatively little painted woodwork is used inside the house, most houses being finished in hardwoods, or in enamel-finish, in which the varnish absolutely prevents chalking. But even with ordinary paint, the chalking indoors is so slight that the quantity of lead-dust from the paint that might be swallowed by any one individual is infinitesimal, and would hardly equal the quantity of lead that may be taken into the system from drinking-water, especially when the cook fails to let the water run before filling the kettle in the morning and draws for the family tea-kettle water that has stood in a lead pipe all night. The whole subject of lead-poisoning, so far as it concerns the occupants of houses painted with white-lead, is so far-fetched and so utterly without any proof in actual examples of such poisoning having occurred that it may well be dismissed as utterly unworthy of consideration.

EDWARD HURST BROWN.

#### INTARSIA.<sup>1</sup>

INTARSIA, or inlays of wood, ivory, etc., one of the most interesting of the so-called "minor" arts, has probably suffered more both from its neglect and from its abuse than any other method of decoration. At its best—kept within its proper limitations—no more delightful form of decoration was ever devised. One must, however, be confronted with a bad example in order to be able to realize how bad it can become at its worst.

Probably every existing form of art or craftsmanship has at some period of its development suffered through the ultra-cleverness of its exponents. In painting, at the present time technique (especially in France) is worshipped for its own sake, and what we think should be only regarded as a means of expression is set before the student as the end to be attained. Intarsia, like every other art, is at its best when most itself, but, except in the earliest periods of its development, its students and makers were never able to resist the temptation to wander out of their proper limits in imitation of other arts. The reasons of the very earliest designers and craftsmen for keeping simple and pure in their designs and patterns did them little credit,

<sup>1</sup> A paper by Stephen Webb, read before the Society of Arts and printed in the *Journal* of that Society.



as they were probably merely mechanical reasons, and arose out of the difficulty of producing elaborate work by the only methods known to them at that time.

To a designer who has taken the thing up in the right spirit, and who has gone to the trouble of making himself even tolerably well acquainted with the resources of the craft, it would appear incredible that any one should consider it necessary to go outside its proper limitations in order to imitate any of the sister arts. The materials are so beautiful in themselves, so infinitely varied, and so adaptable to his purpose, that, assuming him to possess even a small measure of artistic instinct, his work is really half done to his hand before he draws or cuts a line. The decorative problems which present themselves to the worker in intarsia for solution are few as compared with those of the painter or sculptor. For example, he has not to concern himself with surface technique at all. Tone, harmony, and, in a limited degree, the sense of values, he must certainly cultivate. He must also be able to draw a line or combination of lines which may be ingenious if you like, but must be delicate and graceful, vigorous withal, and in proper relation to any masses which he may introduce into his design.

He must thoroughly understand the value of contrast in line and surface form, but these matters, though a stumbling-block to the amateur, are the opportunities of the competent designer and craftsman — if by good hap the designer is in a position to be the craftsman also. The most charming possibilities of broken color lie ready to his hand to be merely selected by him, and introduced into his design; and yet, with these and other advantages peculiar to work in this kind, the whole history of the art, so far as I can follow it, except in the earliest times, is a story of perverted ingenuity, the story of an art degraded more than any other by the perverseness and want of taste of its votaries. Surely in no other art has the clever, sometimes exquisitely clever, craftsman suffered so many things from the bad or perverted taste of the designer. Whether the craftsman has been his own designer or has worked from the drawings of another is all one; and it makes one marvel to find the most consummate technical skill so frequently associated with that which is worst in taste and in composition.

I do not know the precise date at which the use of veneer for furniture became general, but I have little doubt that what may be termed the "fatal facility" which this afforded to the craftsman must have suggested the over-elaboration which had been practically impossible through the limitations imposed by the earlier methods. The earliest examples of inlaid work, viz, those in which the ground is cut away and the pattern inserted into the solid wood, will nearly always be found to be good of their kind. The work, from its nature, could only be done at the cost of much time and labor, and this, doubtless, suggested to the executant the necessity for the elimination of everything from the design which was not absolutely necessary to the development of the motive — a condition of things which always makes for good decorative art in any material.

I doubt not that the early workers in intarsia often wrought, as the old builders are said to have sometimes builded, "better than they knew."

With the introduction of veneers or skins of wood came a complete change. The economical necessity for the reticence hitherto observed was removed, the smallest details could be introduced into a design with comparatively little difficulty or cost. Wooden pictures began to replace the former pure and appropriate decoration. All reserve was apparently thrown aside, and the *tarsator* of the period revelled in the representation of temples, gardens, figures in extravagant costumes, with wooden bodies and sometimes ivory heads or faces; and so the triumph of craftsmanship and the decadence of design may be followed through their various developments. In these the artist appears to have done his best (or worst) to outdo his predecessor or contemporary worker in the extravagant use of forms, proper only to the painter or picture-maker, till it touched what was perhaps its highest point of absurdity, in the wooden representation of whole towns, castles, etc. We see these illustrated in the German work of the eighteenth century on panels used chiefly for the interior decoration of cabinets.

The French work of the eighteenth century is every whit as extravagant as that of Germany in another way. There is a small table in the Jones Collection at the South Kensington Museum the top of which is decorated with "Boule work" (metal and ivory). In the plan of the decoration a band is used into which and on which are introduced figures in the costume of the period, curiously scalloped cloths, tassels, foliated forms, paterae, caryatides, monkeys, squirrels, swags of flowers, baskets of flowers, masks, birds (cranes), dogs, festoons formed of petals or husks, cornucopie, and probably a few other properties more or less material to the scheme. If this kind of thing was ever worth doing (a matter about which I am hardly prepared to speak here) an excuse for it would surely be found in this table, which, as a piece of craftsmanship, apart from its design, is certainly one of the finest existing examples of this kind of work.

Personally I never have been able to get up any enthusiasm for metal inlay for furniture. It is frequently very gorgeous, nearly always extravagant in design, seldom beautiful, and even if one has the fortune to get a beautiful design it is generally difficult to bring it into harmony with any color-scheme which may have been adopted for the decoration of the room.

Moreover, it is not easy to cut, though that is perhaps more a

matter of time than difficulty, and it is apt to leave the ground when laid, which is a much more serious matter.

These are only mechanical difficulties. The chief trouble, and one which I confess I never have overcome to my own satisfaction, is in the selection of wood of a color and texture which shall at the same time contrast agreeably with the metal surfaces and harmonize both with the metal pattern and the ordinary colors used in the decoration of a modern room. May I venture to recommend this problem to the notice of any of my *confrères* who have the requisite leisure and experience to attempt its solution. The thing has never been done yet.

In studying French — and indeed all other marquetry work of nearly every period — the superiority of the workmanship to the design is still constantly in evidence. In nearly every important example which remains it is plain that the executant, so far from being guided by the designer, has been led out of his way, the obvious result being a deplorable waste of skilful craftsmanship.

Curiously enough this want of taste shown in the selection of forms suitable to the embellishment of furniture is sometimes, and, indeed, often, found combined, in the same cabinet, with what one would fain believe to be evidence that the designer had the color-scheme perfectly and could select the woods suitable for his purpose with the certainty of getting the effect which he had in his mind. But the almost inevitable introduction of these little bits of ivory again gives one pause, makes one doubtful whether the harmony of color in the woods was not accidental, or the effect of time, as it would seem impossible that a designer who had sufficient knowledge of the conditions necessary to produce so good a color-harmony in the woods could deliberately bring himself to introduce anything so obviously disturbing to the whole scheme as these little bits of ivory always are.

It is not until the close of the fourteenth or beginning of the fifteenth century that we find intarsia used for the decoration of large surfaces, nor, indeed, till then does it appear to have been taken seriously into the consideration of artists or its possibilities recognized. Then we hear that Brunelleschi and Paolo Uccello gave lessons in perspective and tarsia to architects and others, of which Masaccio, in his paintings, and Benedetto da Majano, in his inlaid works, availed themselves.

There are certainly to be found examples of the craft in the small ivory boxes, ornamented with inlay of various colored woods, manufactured chiefly at Venice in the fourteenth century.

According to Vasari, one of the greatest names in the art is that of Fra Giovanni da Verona, who, in place of the dark and light woods of two or three tints only, used by the Majani, gave artificial colors to his wood-inlay by means of waters, colored infusions, and penetrating oils. To obtain brilliant high lights he was accustomed to use delicate slips of willow. F. Vincenzo dalle Vacche is mentioned by Morrell in his *Notizia* as excellent in such work, particularly in the Church of San Benedetto at Padua. Fra Raffaello da Brescia, of Monte Oliveto, ornamented the choir of San Michele. Sabba Castiglione, in his "*Ricordi overo Anmaestramenti*" (1562), given in Digby Wyatt's essay on the subject, in "*The Industrial Arts of the Nineteenth Century*," mentions the Legnaghi as good artists in this manner, and he speaks of the Dominican monk Fra Damiano da Bergamo, the most celebrated of the sixteenth-century followers of the art. "But above all, those who can obtain them decorate their mansions with the works, rather divine than human, of Fra Damiano, . . . who excelled not only in perspective, like those other worthy masters (Fra Giovanni and Legnaghi), but in landscapes, in backgrounds, and, what is yet more, in figures, and who effected in wood as much as the great Apelles did with his pencil. I even think that the colors of these woods are more vivid, brilliant, and beautiful than those used by painters, so that these excellent works may be considered as a new style of painting without color, a thing much to be wondered at. And what adds to the marvel is that though these works are executed with inlaid pieces, the eye cannot, even by the greatest exertion, detect the joints." Thus the worthy Messer Sabba Castiglione.

The coloring in this case was produced by chemical fluids, with the aid of burned-in shadows. Damiano's best works, in which he was assisted by Fra Antonio Asinello, of the same monastic order, are not in color, but are assisted in their effect by burned shadows.

Other works of his are mentioned by Lanzi, as in the Dominican Church at Bergamo, and in San Pietro da Casinensi, Perugia. Gian Francesco Capo di Ferro is spoken of as working also at Bergamo.

Other works in this manner are to be seen at the Certosa, Pavia, in the choir executed by Bartolommeo de Pola in 1486; in the choir of the Cathedral at Siena, by Fra Giovanni da Verona; in the sacristies of San Miniato al Monte and Santa Croce at Florence, and in the Sala del Gambia at Perugia, the last being signed with the name of Marc Antonio Mereatelli. The tarsia work of artificially colored woods which Sabba Castiglione so eulogizes is not to be found in any of the above-named works, and although the practice clearly originated in Italy it reached its ultimate development in France and Flanders.

Probably the inlay which in its character most nearly approaches that of the Italian Damiano is the modern French work, so much of which is sent over to England in and for the decoration of pianofortes, etc.

It has nearly all the faults so conspicuous in Damiano, and where the modern Frenchman has missed any of the weaknesses apparent in the work of the Italian he has more than made up for it by

those which he has invented for himself. Here is evident the same struggle to obtain the effect of painting, and an equal anxiety to conceal the joints which divide the various pieces of highly-colored woods introduced into the design. Indeed, the French critic of marquetry in these days makes this joining the test for good or bad work, and were a panel of intarsia submitted to his judgment in which the mark of a saw could be seen the work would be at once condemned as bad, though it exhibited all the finer qualities of design and cutting.

The experience of the writer is that the joinings of the various kinds of wood used in a design should not only not be concealed but that they should be dealt with as frankly as possible, and that their utilization in the design contributes almost more than anything else towards giving the work its character as intarsia or marquetry. It is true that the arrangement of the various pieces of veneer in a manner which will make the work of the cutter practicable and easy and secure an artistic line for the joinings at the same time calls for the exercise of some ingenuity, but this, though irksome and troublesome at first, soon becomes a habit with the designer for intarsia, or at least soon would do so if he understood its value. In nearly every example of modern work in which shading (generally produced by hot sand) has been resorted to it has been abused. If the wood be properly selected shading is rarely necessary, and if it is done at all it should be done by an artist. It can never be safely left to a merely mechanical cutter of marquetry, even though he works from the most carefully finished drawings. In the hands of an artist, very beautiful effects may be obtained by this process, the same kind of wood being made to yield quite a number of varying shades of color of a low but rich tone, and that without any sacrifice of what, for lack of a better term, I must call the transparent quality, so characteristic of all good marquetry work. Overstaining and the abuse of shading is destructive of this, one of the most valuable and distinctive qualities in inlays of wood.

Ivory has always been a favorite material with workers in tarsia, and in the hands of an experienced designer very charming things may be done with it. There is, however, no material suitable for tarsia which requires so much care and experience in its use. It is ineffective in light-colored woods, and in the darker ordinary woods, such as ebony, stained mahogany or rosewood, under polish, the contrast of color is so great that the ivory must be used very sparingly; in other words, the designer must invent for his panel or border a pattern or design which, while containing very few elements, shall convey the idea of a satisfactory furnishing or filling (always a difficult problem for the designer to solve in any material). In work intended for many other processes and materials, every artist has, at times, to consider the advisability of some such treatment as this, but it is seldom that he finds it so absolutely indispensable to the success of his work as in the application of design to the inlay of ivory for furniture. This kind of work is improved very much by age (the effect of light chiefly), even under polish. The ivory is sometimes stained in order to bring its color more into harmony with a dark-wood ground, but it is never quite satisfactory, and no one who had seen much old ivory in tarsia could be deceived by it.

There are conditions possible where, particularly in the decoration of furniture, the advantages are nearly all on the side of intarsia, as compared with carving or modelling. The amount of time wasted, for instance, on very small carvings in dark-colored woods intended to be used in furniture is incredible. The color of wood, such as mahogany, walnut, etc., makes it impossible to see small carved detail in the various and varying conditions of light, which usually obtain in a living-room, and when, as so frequently happens, rosewood or some other strongly-marked wood is used for this purpose the markings in the wood are so much stronger than the shadows by which the small carved forms are expressed that their effect is destroyed, and the result must always be confusion and waste of time.

Very small detail, especially in carvings, is introduced much more frequently than is necessary in furniture, as in architecture, and its introduction may usually be taken as indicative of some confusion in the mind of the designer or architect between smallness and delicacy. This idea, that scale or minuteness of detail must somehow be related to refinement or delicacy, absurd as it would appear to be to an artist, must really be very common to the designers of houses and furniture, or we should not see so much skilful labor and valuable time wasted in such useless productions. In this, as in other matters, it is only the thought or design in the thing which really counts; no amount of mere slavish though skilful labor undirected can possibly result in anything but disappointment, and there must be a very plentiful lack of direction in some of the places where modern furniture is decorated. If small carved details must be introduced into the external decoration of furniture they can only be certainly effective when plain and light-colored wood is used, such as box, pear-tree, etc., or quite black wood, such as ebony (which has generally to be made black artificially), materials which have but little marking to disturb the surfaces and lines of the carving.

Undoubtedly the color of these would render them in many cases unsuitable for the decoration of furniture, as they are apt to prove disturbing to the quiet color-effect generally associated with a living-room.

It is here that inlay for the surface decorations can be made so useful in the solution of a difficult problem, when it is done with judgment and taste. However quiet it may be kept in tone, and in

good hands it is always quiet; however rich and varied in color, it can always be seen, as it does not depend on the light for its due effect, either in the same degree or in the same manner in which carving depends on it. I am not making general comparison between the advantages severally of carving and marquetry for the purposes of decoration, nor do I wish it to be for a moment supposed that I think marquetry can ever supersede carving for general purposes, even if the thing were desirable.

This is merely a protest against the grievous waste of time and of skilful, and frequently artistic, labor caused by architects and designers through their inability to grasp beforehand the idea of the modifications which will be brought about in the effect of their work by the conditions under which it will be seen. The decoration on small pilasters and capitals as applied to furniture and carved in these woods is rarely seen at all, except on a rough and disturbed surface. Still more rarely can enough of the motive or details be made out to awaken any interest in it.

Assuming that about the same quantity of detail is introduced (which is usually the case), the carving on a pilaster 3' x 9" can be done as quickly and at no more — probably less — cost than the same design 1' 6" x 4 1/2", namely, half the size. There is no question of delicacy or refinement in this relation.

The inferior carver will inevitably give you a coarse and clumsy rendering of the small design, if you trust him with it. From an artist you will just as surely get a suggestion of refinement and delicacy pervading all the work in the large panel, though each man works from the same drawing or even the same model. Moreover, in the larger carving one is much more independent of the markings in the wood, by reason of the fact that the sinkings and shadows are deeper and stronger, and so, in a measure, control the disturbing color.

Apart from the question of cost, which is always in favor of tarsia, there is this essential difference between the two methods, that, while carving must always depend in a large measure on the direction of the light for its effect as carving (you can destroy the effect of carving which is in low-relief at any time by a direct front light), the use of inlay makes the direction from which the light enters the room a matter of no moment, so long as the light reaches the object decorated.

I cannot close this paper without some reference to the practice so prevalent among writers on art, and especially applied art, of comparing the conditions under which the work was produced two or three hundred years past with the conditions which obtain in our time. By no conceivable combination of circumstances can we ever get back to the conditions under which those workers produced their work, and although the productions of the writers above mentioned are frequently pleasant reading they are rarely helpful, and indeed we as artists or craftsmen have but little concern with them — we must accept matters as we find them and do our best under the changed conditions. Moreover, it is so easy to write in that way. The contrasts between the prevailing conditions and those of the past are so sharp, the change so complete, that a writer in this kind, possessed of only very ordinary ability, can hardly fail to be at least picturesque. We are so frequently told by poetical writers on art that a designer should, wherever practicable, carry out his design himself in the material for which it is intended. No artist who has a design in which a really fine idea is embodied need be told this: he would probably be but too glad of the opportunity to do this, assuming that he had ever had the chance to obtain the requisite knowledge and skill in craftsmanship. His ideas are the children of his mind, born not without travail, and when it becomes necessary to hand them over to strangers for their material development he does not part from them without a pang.

The modern designer, though he be really a master of his own branch of art in all its details, must needs leave a good many of those details to other and more mechanical hands.

#### AN UNFINISHED TEMPLE UNEARTHED AT POMPEII.

THE excavations at Pompeii have been continued during the last year, and have resulted chiefly in the discovery of small houses containing objects of secondary interest and importance. In the neighborhood of the Gate of Vesuvius a portion of the city-wall belonging to the earliest period of Pompeian building was laid bare, and is interesting, as it is apparently more ancient than such other portions of the wall as have been discovered. It appears to be of Oscan construction, being built of large blocks of rough stone neatly joined without mortar, and resembles somewhat the façade of "The House of the Surgeon," which is admittedly of Oscan architecture, though the stones are larger and not so smoothly faced. This section of the excavations being exhausted, the ground already appropriated being finished, the director determined to excavate the small corner near the "Sea Gate," which was the only unexcavated spot in that part of the city. Experts had long been anxious to see what lay buried there, for there was a portion of a very large and handsome red marble pillar which had long been above ground, and had given rise to sundry conjectures.

On removing the soil the site was found to be occupied by the foundations of a temple which was in course of construction at the time of the destruction of the city in 79 A. D. This is particularly interesting, because it was supposed that all the sacred edifices of the city had been discovered long ago, no important deity being without a



representative temple; but, unfortunately, there is nothing in the rudiments of the temple before us to indicate to whom it was to be dedicated on its completion. It is evident that, though very small, it was intended to rival in its decoration any temple which existed in the city, and though it had scarcely risen above the ground-level, the marble architraves, carved with the usual egg-and-tooth moulding, are lying around it ready to be put up, and the Corinthian capitals, some finished and others only partly executed, are displayed in the enclosure, as well as the base of a pillar upon which the mason was at work at the time of the catastrophe which overwhelmed the city. The tool-marks on this base are clearly perceptible, and look as if the workman had only just left his task.

As to the handsome red marble pillar to which we have alluded, it is reasonable to conjecture that it was the base for the statue of the god, as it is about four feet long, and the only piece of colored marble found on the site. The partly-executed capitals are extremely interesting, as showing the methods of the Roman artist who was engaged upon them, while those that are complete are very good specimens indeed, considering that they belong to an age of decline.

If Pompeii itself has not been productive of sensation this year, a small excavation on private ground only a few yards outside the walls has more than made up for this by revealing one of the finest and most interesting mosaics of antiquity. Surrounded by a most exquisite garland of flowers, with a theatrical mask thrown in here and there to break the pattern, is a picture representing a group of seven philosophers, one of whom is seated with a papyrus in his hand, and the others are grouped round listening to him. In the background are some ruined pillars, and in the right-hand upper corner is a representation of the Areopagus of Athens, with its rocks and buildings.

The mosaic is polychrome and in diminutive cubes of very fine workmanship, equal in merit to those by Dioscorides of Samos in the Naples Museum, which are believed to be the only signed mosaics of antiquity. It is about three feet square, and was, no doubt, intended for the centre of the pavement of a room. It had probably never been used, and was a new mosaic, because it was not found on the ground, but leaning against a wall, showing either that it had been moved from some other place, or that it was about to be put down for the first time. Its perfect condition leads one to prefer the latter conjecture. The Government has purchased it from Signor D'Acquino, and it will shortly be exhibited to the public in the mosaic department of the Naples Museum.

It is generally admitted that the earliest mosaics in Italy date from about 80 B. C., and there can be no doubt that in many cases they were reproductions, or, at all events, traditions of famous pictures. In the case before us the sketch of the Areopagus, concerning the identity of which there can be no doubt in the mind of any one who knows the spot even in its present state, displays the Greek origin of the work, and the scene depicted must either be some celebrated discussion on "Mars Hill" or, what is more unlikely, a casual group of one of the Attic schools of thought, such as might be seen there any day. At any rate, a sketch of the Areopagus which is recognizable at the end of the nineteenth century is no mean treasure, and we are encouraged to hope that one or other of the archaeological schools of Athens may be able to throw some light on the subject of this interesting mosaic.

It is not thought likely that the D'Acquino excavations will produce other objects of great importance, as the house so far has shown no signs of being anything more than a suburban villa. After the rich find of silver which was made some three years ago in a house about a mile from Pompeii, and presented by Baron Rothschild to the Louvre, it is unsafe to speak with too much confidence, but the above is the opinion of the expert who is in charge of the excavation.—*The London Times*.



## MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

AT the last meeting of the Society of Arts of the Massachusetts Institute of Technology, on April 27, Mr. T. B. Kinraide, of the Spring Park Laboratory, Jamaica Plain, Mass., presented a unique form of induction-coil of great power invented by him. This has been especially applied to the study of discharges by the aid of photographic processes, the plate being balanced on the point of discharge in a dark room and being developed after exposure. It reveals in a striking manner the marked difference that exists between the positive and negative discharges. The apparatus was exhibited in operation and photographic plates shown with the lantern. The figures thus produced by the electric discharge were of extraordinary beauty and size, the delicacy of detail being brought out by means of the lantern. It is thought they may be suggestive of forms useful to designers and decorators. A large and interested audience was present.

SUIT AGAINST A WATER COMPANY. — A woman in Greensboro, N. C., has won a suit against a water company, because there was no water in the standpipe when her home took fire, thus rendering the firemen powerless. — *N. Y. Evening Post*.



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

ENTRANCE TO THE CLUB-HOUSE OF THE NEW YORK ATHLETIC CLUB, NEW YORK, N. Y. MR. W. A. CABLE, ARCHITECT, NEW YORK, N. Y.

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

HOUSE FOR L. D. DOZIER, ESQ., ST. LOUIS, MO. MR. J. L. WEES, ARCHITECT, ST. LOUIS, MO.

PARLOR AND DINING-ROOM DETAILS OF THE SAME HOUSE.

ACCESSORIES OF LANDSCAPE ARCHITECTURE, NO. LXIX: CASCADE AND BASIN: PALAZZO REALE, NEAR CASERTA, ITALY. VANVITELLI, VIOLANI, BRUNELLI AND OTHERS, ARCHITECTS AND SCULPTORS.

ACCESSORIES OF LANDSCAPE ARCHITECTURE, NO. LXX: THE CASCADE AND FOUNTAINS: PALAZZO REALE, NEAR CASERTA, ITALY. VANVITELLI, VIOLANI, BRUNELLI, ARCHITECTS AND SCULPTORS.

[The following named illustrations may be found by reference to our advertising pages.]

STAIRCASE IN HOUSE OF L. D. DOZIER, ESQ., ST. LOUIS, MO. MR. J. L. WEES, ARCHITECT, ST. LOUIS, MO.

HOUSE OF W. H. ALLEN, ESQ., PASADENA, CAL. MESSRS. BLICK & MOORE, ARCHITECTS, LOS ANGELES, CAL.

HOUSE OF MR. DURRELL, PASADENA, CAL. MESSRS. BLICK & MOORE, ARCHITECTS, LOS ANGELES, CAL.

[Additional illustrations in the International Edition.]

THE RATHHAUS, KÖNIGSBERG, PRUSSIA.

[Gelatin Print.]

THE little town of Königsberg, situated in the province of Brandenburg, about midway between Berlin and Stettin, and not to be confounded with the capital of East Prussia, bearing the same name, played a leading part in the district called the "Newmark," during the Middle Ages. The original town-hall, of which nothing remains save the cellar-vaults and the basement of the north gable front, was erected A. D. 1290. Between 1400 and 1410 this building was enlarged by the erection of an extension, which forms the present handsome south front. The town was then at the height of its prosperity and power. Knowing it to be well protected from hostile attacks, by high walls and massive gate-towers, the citizens of the town took pride in the erection of churches and other public buildings that should do credit to its name.

The Gothic style, which, owing to the total lack of good building-stone in Northern Germany, had been modified so as to adapt itself to brick and terra-cotta construction, having about the end of the fourteenth century attained the height of its development, it is not surprising that so beautiful a façade resulted through the efforts of these art-loving burghers, who, no doubt, employed the best architect that could be secured — his name has not been handed down to us.

Great is the difference between the south front and the north, or rear-façade, shown in our second plate, which was probably erected as late as A. D. 1490, or 1500, when this attractive style had already started on its downward progress, although the technical perfection of the building-crafts ranked them as high as at any time previously. This later façade shows a distinct crudeness and exaggeration of decorative detail and cannot be compared in excellence of proportions with the earlier gable-front. Both façades show the characteristic recesses, or niches, plastered over and decorated with colored and gilded designs which greatly help to enliven the effect of the whole.

REAR OF THE SAME BUILDING.

[Gelatin Print.]

WEST HAM TECHNICAL INSTITUTE, WEST HAM, ENG. MESSRS. GIBSON & RUSSELL, ARCHITECTS.

NO. 147 HARLEY ST., LONDON, ENG. MESSRS. DAVIS & EMANUEL, ARCHITECTS.

## NOTES AND CLIPPINGS

**THE LAFAYETTE MONUMENT FOR PARIS.** — The committee of three, consisting of Messrs. George B. Post, John La Farge, and J. Q. A. Ward, charged with the selection of a sculptor for the Lafayette memorial, to be presented to the City of Paris, have decided in favor of Paul W. Bartlett. His sketch-model will now have to be submitted to the French committee, which is composed of M. Redon, architect of the Louvre; MM. Paul Dubois and Guillaume, sculptors, and M. Rougon, Director of the Fine-Arts. Mr. Bartlett's suggested scheme provides for a handsome architectural arrangement. Raised four steps above the ground-level will be a smooth floor of masonry, about ninety feet long by seventy wide. While in a general way oblong, the four sides are treated with waving lines that produce a variety of agreeable curves from every point-of-view. Upon each of the long sides, following the curves of the floor, is a parapet, in the centre of which is a group of one seated figure and two children. In the centre of the floor rises a pedestal, also oblong in suggestion, though treated freely. At each end of it will be a seated figure, representing, respectively, "Liberty" and "Justice," and upon the sides will be inscriptions. The pedestal appears to be about thirty feet high. Thus far the whole structure, sculpture included, will be of granite. The equestrian figure of Lafayette, about fifteen feet high, which is set upon the pedestal, will be the only part executed in bronze. In this way due emphasis will be given to the important feature of the memorial, and all the rest, through similarity of material, will present a single effect and be directly contributory to the main idea. The sketch shows great possibilities. It is hoped that by the time the Exposition opens, the floor, parapets, and pedestal may be in position in their final form and material, and that the sculptor may be able to set up the sculpture in staff, with sufficient approximation to their ultimate character to afford an opportunity for visitors to form a good idea of what the memorial will be like when finished. — *N. Y. Evening Post.*

**REAL GOLD-PLATE.** — So much appears in print about the gold-plate in the possession of this or that royal house, or family of multi-millionaires, that a popular impression prevails to the effect that there is a large amount of solid gold-plate for table use or for table ornament in existence. This is altogether an erroneous impression. When the word "gold-plate" is used it almost invariably means silver-gilt plate and all the so-called services are of this silver-gilt metal. There are very few pieces of solid gold-plate in existence, and these are known to the authorities on plate, and figure in the standard works of one kind and another on the subject. Thus in Great Britain there are not more than a dozen pieces, all told. Two of these belong to the Duke of Marlborough. They consist of a pair of ice-pails, weighing no less than 365 ounces, and were presented by Queen Anne to the first Duke of Marlborough, the victor of Blenheim. Queen Victoria has two great salvers of solid gold at Windsor Castle, and there is likewise in the royal plate-room a third and smaller salver of pure gold, made during the reign of King William IV from the presentation-rings of the sergeants-at-law. Exeter College, at Oxford, has a solid gold cup and cover of seventeenth-century work, presented by Bishop Hall to the college. The corporation of the ancient city of York has a cup, of baluster stem, which was presented to it in 1672, and which is of solid gold. A Mr. J. W. Walrond, cousin of the baronet of that name, has a similar cup of about the same date, while Lord Derby has in his possession a chocolate cup and cover of pure gold, which were found in the lake of his country-seat at Knowsley about one hundred years ago, on the occasion of its being drained. So far as is known these constitute the only pieces of solid gold-plate in Great Britain, and it is asserted by experts that they are quite as rare on the Continent. From this it will be seen that the term "gold-plate" as generally understood is misleading, and that it should be interpreted as silver more or less thickly plated with gold. — *Marquise de Fontenay in the Philadelphia Press.*

**MILL-CONSTRUCTION IN DISFAVOR AT CHICAGO.** — Mill-construction is being severely criticised in Chicago, and, if the underwriters have their way, it will soon be a thing of the past. The loss-record for this class of buildings — even sometimes when equipped with automatic sprinklers — has been unsatisfactory, and before the committee of the Board of Underwriters the argument was made that such structures are destroyed even more quickly than buildings of ordinary construction. Rapidly-spreading fires and total losses, it was stated, seem to be characteristic of the class. The Kaestner, Armour, Felt, Traders' warehouse, Jackson Street, and other buildings recently wholly destroyed, are cited to prove their lack of fire resisting qualities. It is, therefore, proposed to suspend all allowances for unequipped mill-constructed buildings, and a sub-committee has been authorized to make the necessary investigations, and report as soon as possible. The underwriters' association has for years made liberal allowances for mill-construction, upon the theory that such buildings were slow-burning, and fires in them could be extinguished with moderate loss. Possibly for this reason, and because so many rates would be upset by withdrawing all existing allowances, it is quite likely that whatever action is taken will apply only to new structures. But the day of mill-construction has probably passed, not to return. — *Exchange.*

**PROPOSED STATUE OF MILLAIS.** — The dean and chapter of St. Paul's Cathedral, London, having reported that a memorial dedicated to the late Sir John Millais was impossible, supposedly from constructive reasons, the committee of the Millais memorial has determined that a statue be erected "in a prominent position in connection with the National Gallery of British Art, founded by Sir Henry Tate, on the embankment at Millbank." — *Boston Transcript.*

**TREES GROWING IN CHURCHES.** — A curiosity of vegetation exists in the shape of a good sized pine-tree growing on a ledge of a façade of the ancient cathedral church of Fenieux (Charente Inférieure), France. This is paralleled by the tree which grows out of a window of the round tower at the Church of St. Benedict, Norwich, and many other instances in the United Kingdom. In the old church of Ross, in Herefordshire, two thriving elms are growing, one on each side of a passage between the pews. They are said to have sprung up from the pavement beside the pew once occupied by John Kyle, who, at considerable expense, planted elms about his native town. — *English Home Magazine.*

**MIDFORD CASTLE: AN ARCHITECTURAL ACE OF CLUBS.** — Midford Castle, near Bath, where the sale recently of the effects of the late Marchesa di Sant Agatha took place, was built about two hundred years ago. The castle is of singular construction, being triangular, and in the form of the ace of clubs, the angles being rounded off and embattled. A Mr. Roebuck, a great gambler, is said to have built the mansion with the proceeds of a night's gambling, and by backing the run of luck of the club suit. It came into the possession of the old Catholic Conolly family 120 years ago, one of whom married Louis Brancaccio, the late owner. — *Birmingham Post.*

**IRON-SLAG PORTLAND CEMENT.** — Portland cement from iron slag has been so profitably and successfully produced from the refuse at the Sparrow's Point Works in Maryland, and at the works of the Illinois Steel Company, that a plant is to be established at Birmingham, Ala. The supply of slag will be drawn from the Emsley furnaces of the Tennessee Coal & Iron Company, the plan being to have an initial capacity of 1,000 barrels a day. Machinery has been ordered for the plant, which will be in working order, it is expected, in about four months. This utilization of what was heretofore a useless by-product of pig-iron works is one that promises to add largely to the profits of the ironmakers, even though the production of the cement, as in this Birmingham case, is turned over to an independent company. — *Boston Transcript.*

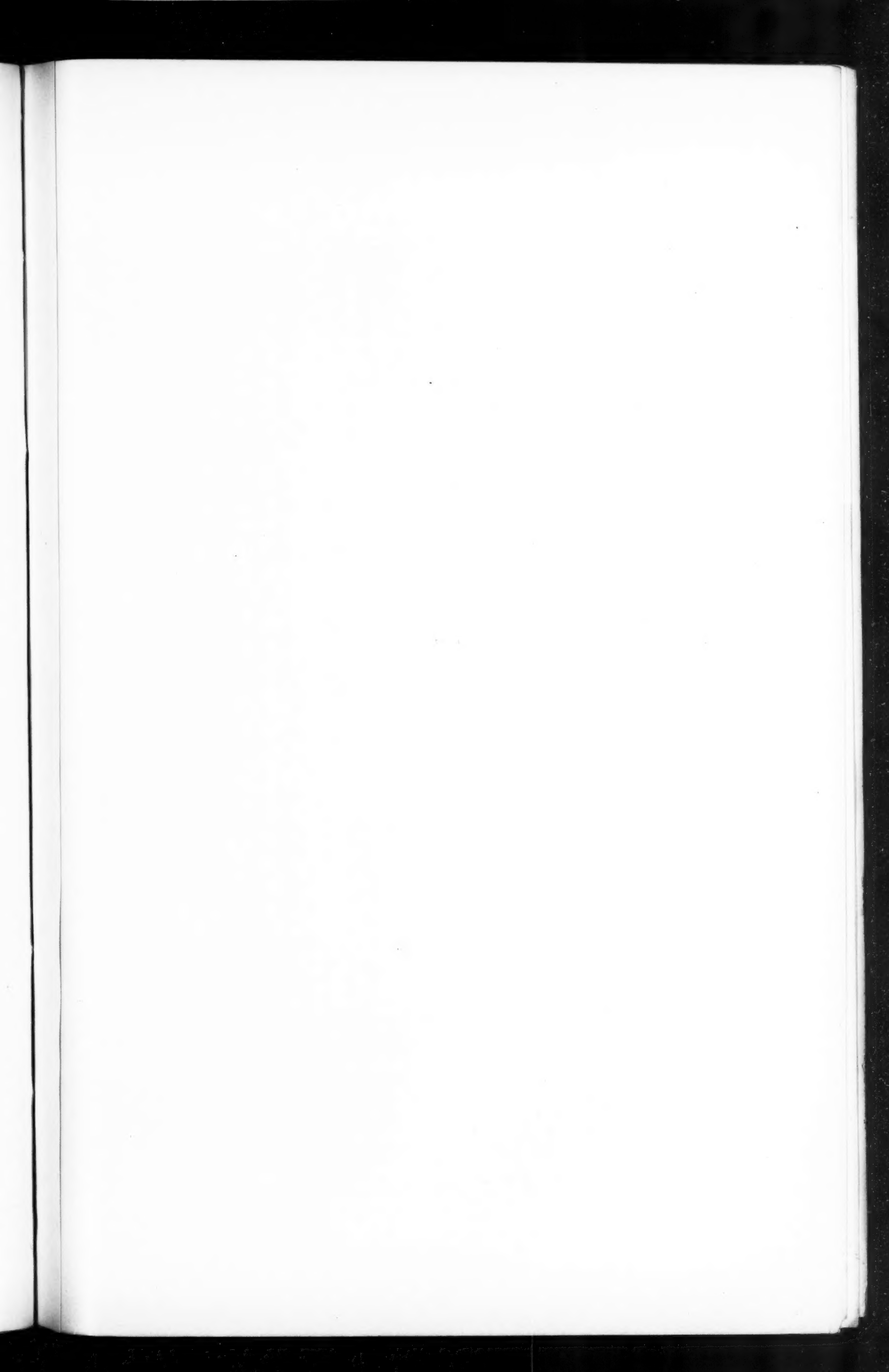
**INCENDIARY MICROBES.** — Under the above title a writer in our French contemporary *La Nature* contributes an interesting article on spontaneous combustion, showing that when stored hay, bales of cotton, tobacco, etc., take fire the action is in the first place due to bacteria. In wet seasons such fires are most common, and are due to storing the hay, etc., in a damp state; fermentation follows, with great rise of temperature — a process due entirely to the action of microbes; the hay is changed to a dry, porous, and carbonaceous condition, and it presently takes fire. It will consume slowly, until accident brings the external air to its help, when the incandescent mass bursts into flame, and the microbes which caused the initial mischief are destroyed in a funeral-pyre of their own making. — *Chambers's Journal.*

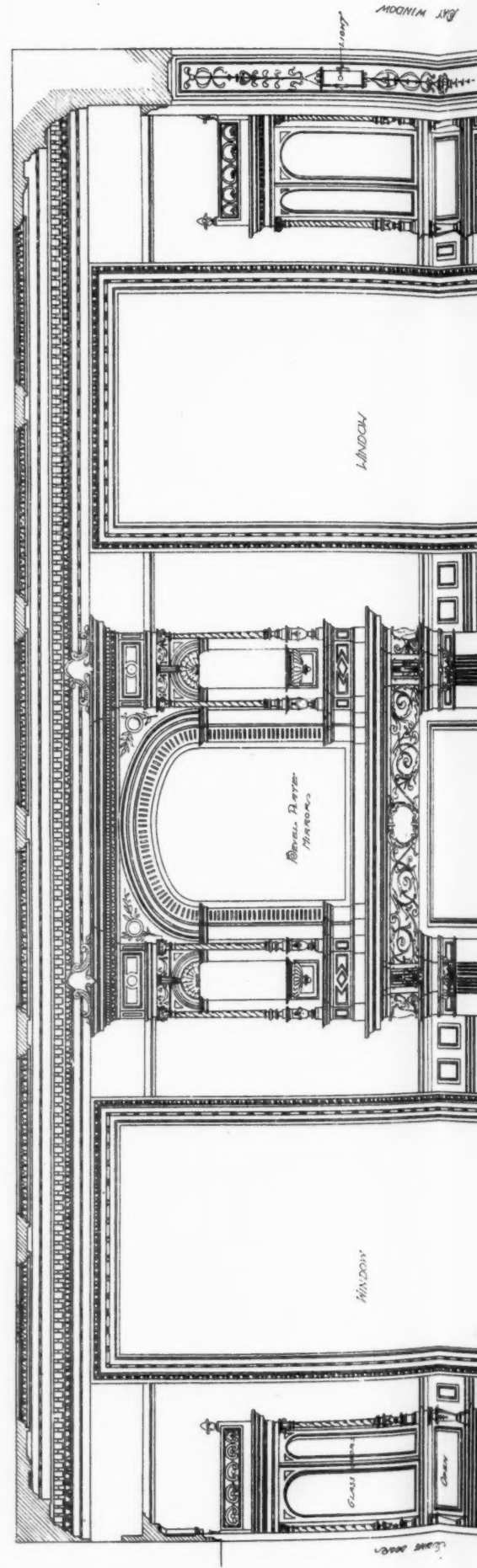
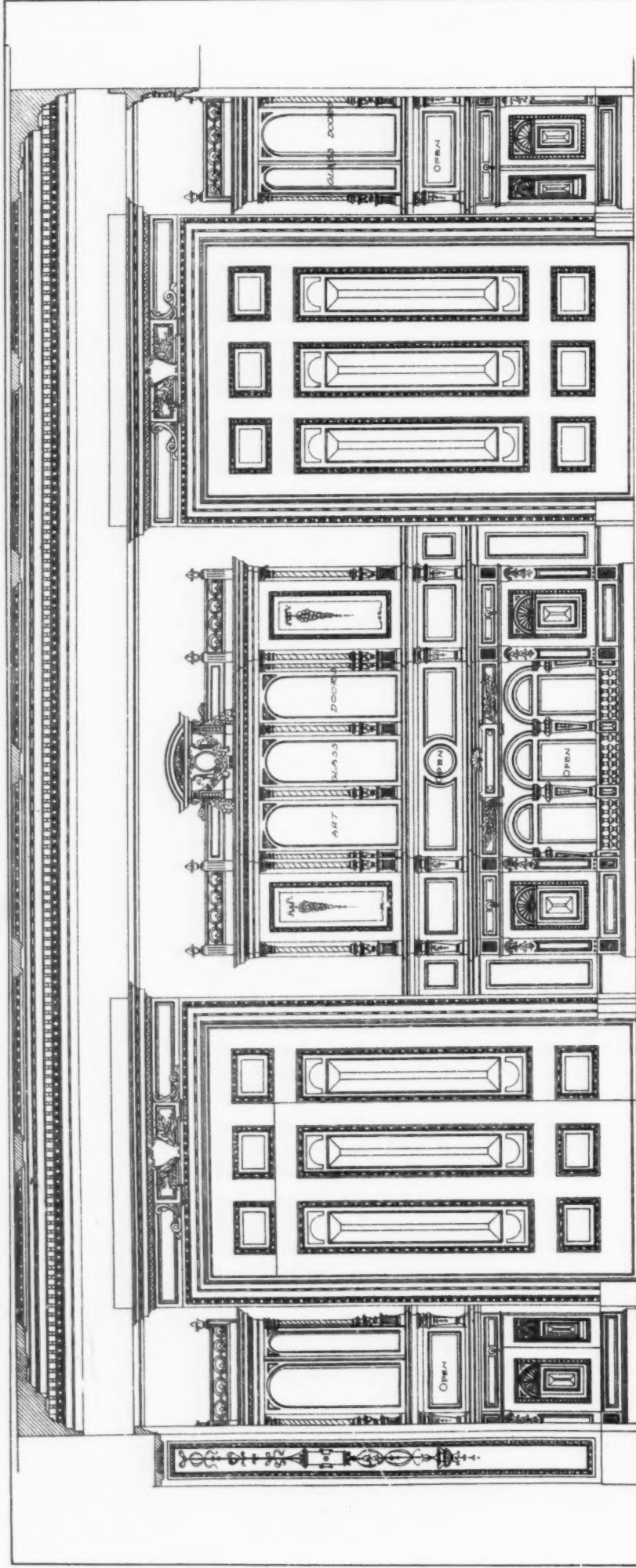
**THE LAFAYETTE MONUMENT AT BRANDYWINE, PA.** — A monument to General Lafayette is now in course of construction on the Brandywine battlefield, in Chester County, Pennsylvania, near the spot where the general was wounded. The height of the structure is to be 78 feet, and the size of the base 24 feet square. The material is Brandywine granite, and the largest stone, which is the die, is to weigh fifteen tons. On this stone are to be four bronze panels, inscribed with the full record of General Lafayette, setting forth the battles he was engaged in and designating on what spot he was wounded. The monument is to be crowned with an heroic bronze figure of Lafayette 12 feet in height. The memorial is the gift of John G. Taylor, of West Chester, who not only builds the monument but has set aside a sum for the perpetual care of the surrounding grounds. — *Exchange.*

**THE ACCIDENTS AT THE CARRARA QUARRIES.** — No machinery is employed, and all the work is done with the crudest appliances. A blast is announced by three long notes on a horn, but little attention seems to be paid to this signal by the workmen, and many terrible accidents result in consequence. A few years back, when accidents occurred, the cathedral bells were tolled to give warning to the people; but owing to the anxiety and anguish of thousands of poor families on hearing this gruesome sound, the custom has now been abolished, and the workmen all leave the quarries as soon as an accident occurs, in order to assure their families of their safety, and they are allowed their full day's pay. The pay of the workmen is wretched, varying from sixty to eighty cents a day. — *Boston Transcript.*

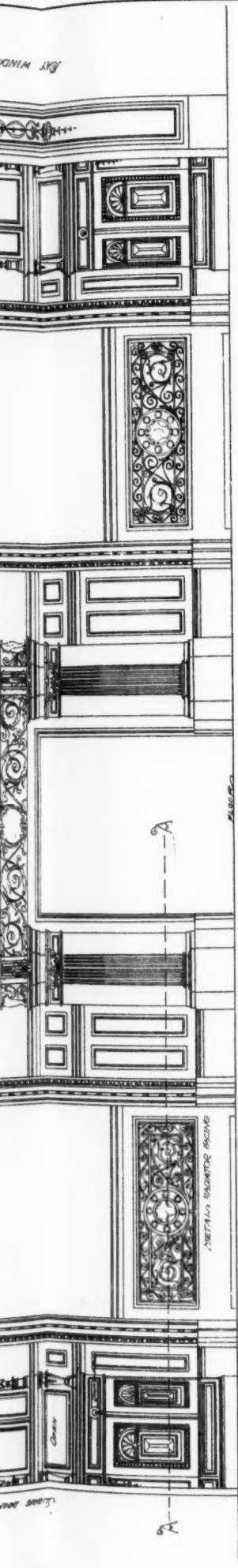
**THE SHINGLE TRUST.** — "The State of Washington has in active operation about two hundred shingle-mills, with an output of 292,000,000 shingles per month, or about 20,000 carloads per year," said Charles L. Patten, the lumberman, recently. "The State furnishes the only red-cedar shingle in the world, and it is the best shingle ever grown by nature and fashioned by the hand of man. Now we are getting \$1.20 per thousand for 'Star' shingles and \$1.40 per thousand for 'clears' and all the 'underweights.' Business was going along swimmingly, and both mills and dealers were making a fair profit, when suddenly the Eastern dealers in our shingles met, and, without a word to the manufacturers, cut the price of red-cedar shingles five cents per thousand, and demanded all the 'underweights,' that is all the shingles that were not up to standard, were theirs by gift. It's too long a story to tell you how they combined with Western men, firms even in this town, and were all prepared to simply lop off \$300,000 a year from the mills and put it into their pockets. The mill men of Whatcom, Snohomish, and Skagit Counties, the great shingle district of the State, called meetings to discuss the cut. Two of the three counties have already organized, and the third county will organize next Tuesday night. Each county will appoint a committee of three to meet in convention and form a State association of shingle manufacturers. In my opinion, the war is over. The dealers must have our shingles, and must pay a fair price for them. Just how the State association will be formed I do not know, but it will protect our interests." — *Seattle Post-Intelligencer, April 23.*



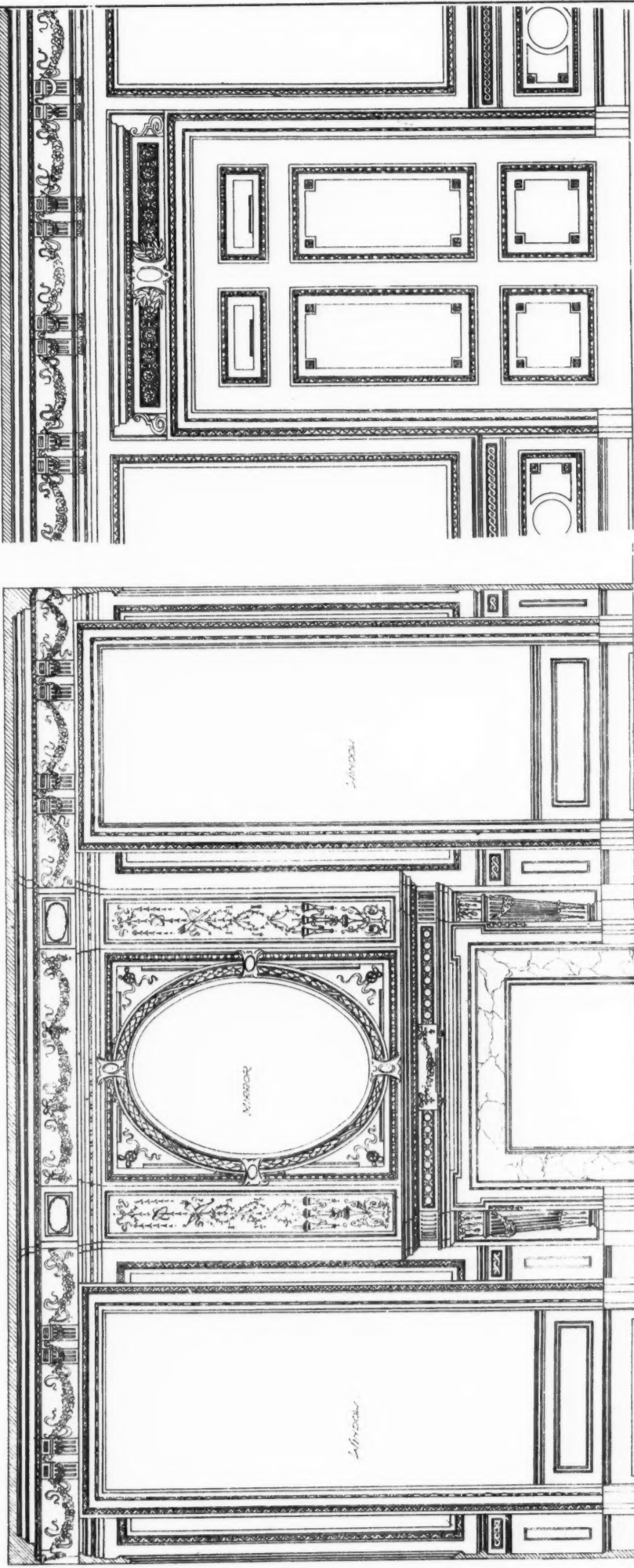






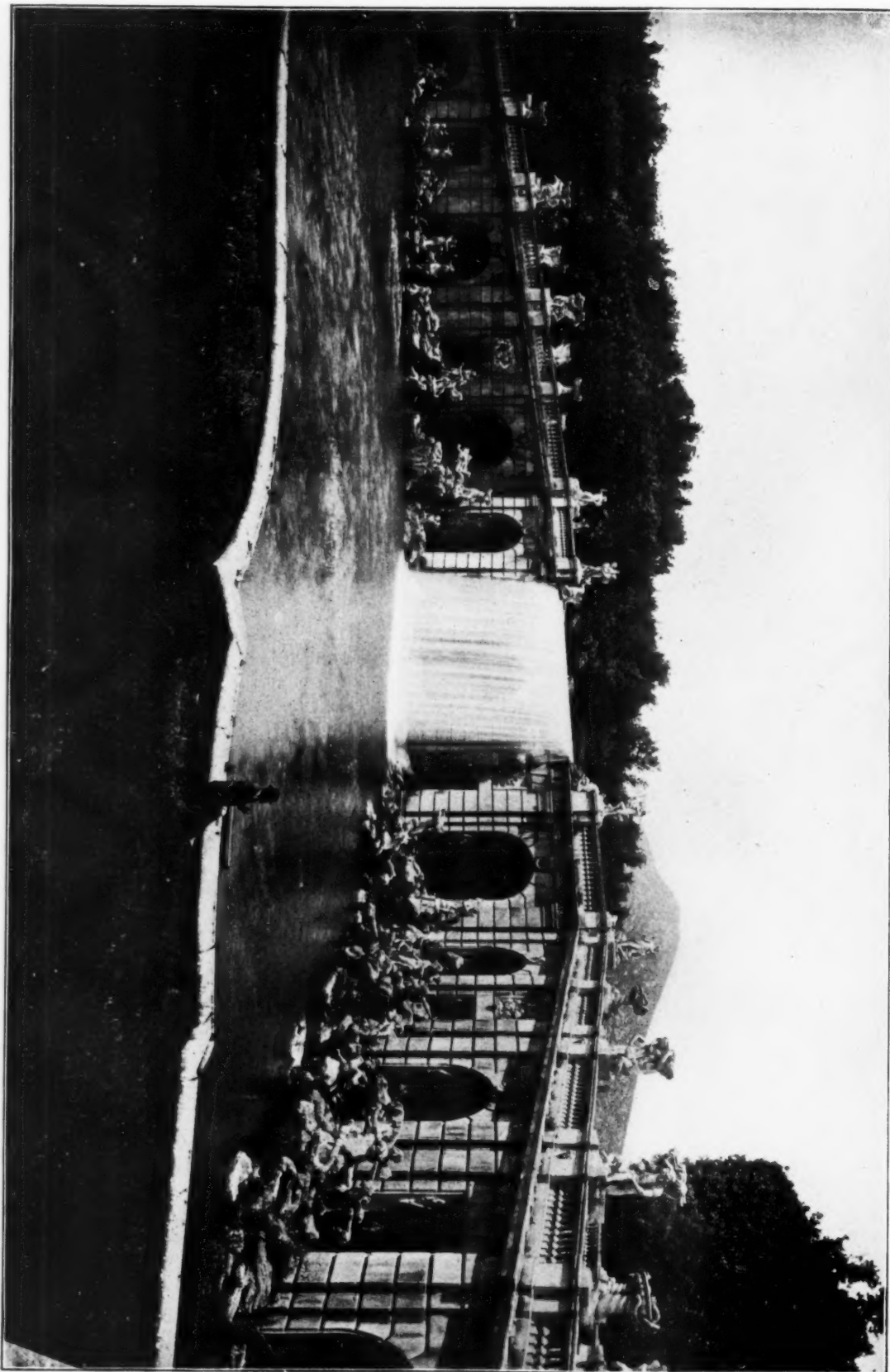


DINING ROOM DETAILS IN  
 A RESIDENCE FOR L. D. DOZIER, ESQ.  
 WESTMORELAND PLACE  
 & L. NEEDS ARCHT COMMERCIAL BLDG.



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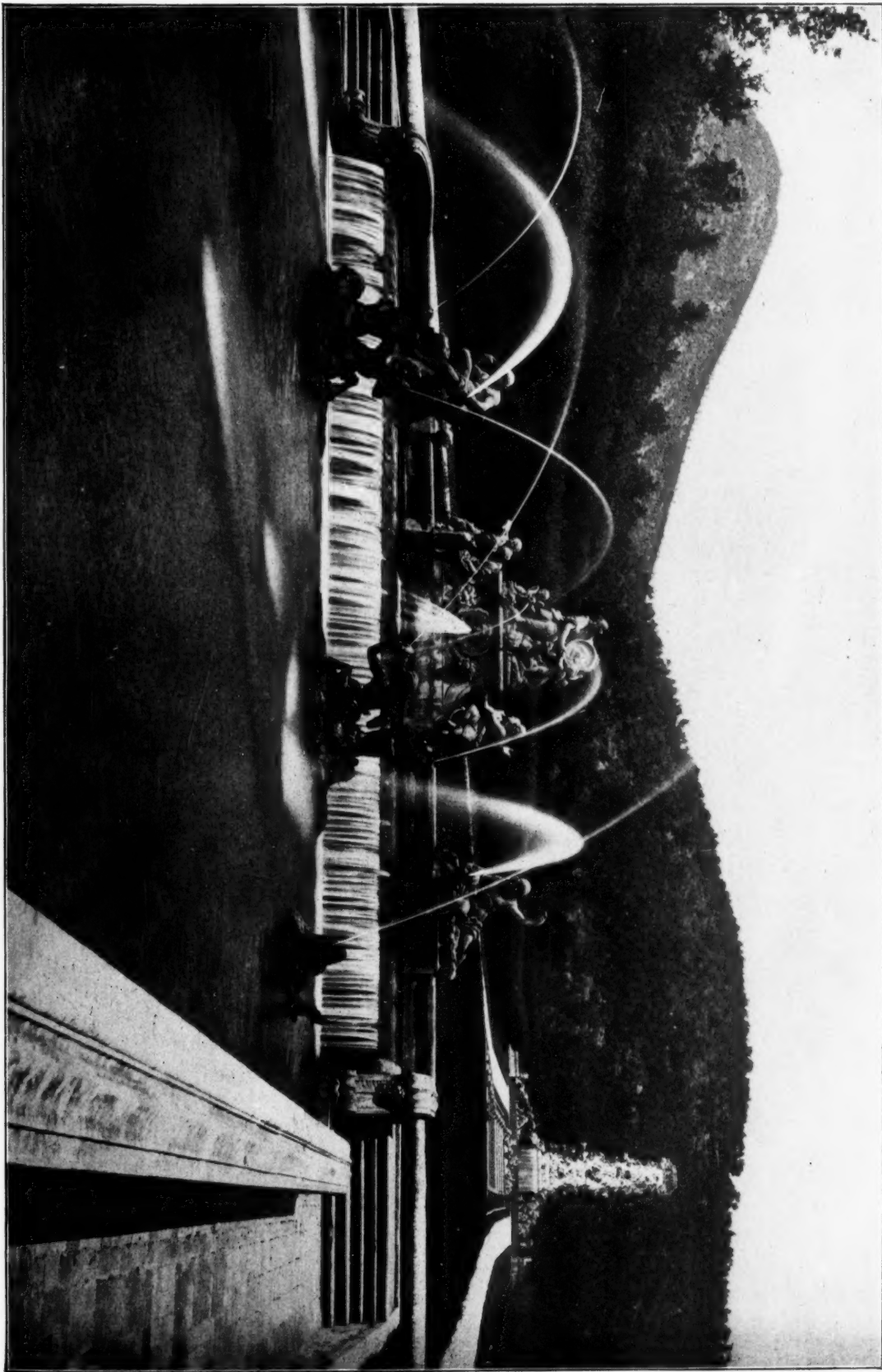
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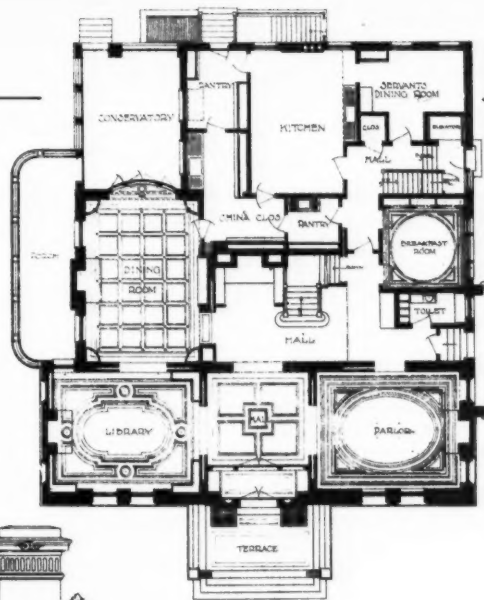
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J. L. WEES ARCHT.