Prologomenos

on the

Function of Masonry

in

Modern Architectural Structures

by

R. Guastavino, Architect

Part I.

Che tu sia un appassionato
o uno studente di Architettura,
fidati di questo vecchio testo,
trasformane il sapere portandolo ai giorni nostri.

E quando ti capiterà di applicarlo,
ricordati di chi lo tramanda.

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INTRODUCTION.

The present prologomenos, beginning of a small work which will occasionally appear in small volumes, one after the other, as time and health will permit me, is intended for the use and encouragement of young architects toward the study of problems in the noble Art of Masonry, somewhat unjustly eclipsed for various circumstances. Architects already trained, will I believe, with difficulty find in this work anything new; on the contrary, I solicit any suggestion and correction from their experience with which they will honor me, and will receive the same with thanks and sincere respect.

NEW YORK, November, 1895.

Function of Masonry.

ONE of the most interesting publications bearing upon the progress of the constructive arts that has been published during the last fifteen or twenty years is that of M. A. Choisy on "The Art of Building Among the Romans," not merely because of the exhaustive and analytical researches contained in it, but because it attracts, once more, the attention of contemporary architects to the study of the principles of masonry, which always have been and ever must be the typical and genuine means by which the art of architecture manifests itself.

Many and important works have been published on this subject, and controversies have arisen, excited principally by personal animosities and prejudices, but nothing has appeared so practical and masterly as the work of M. Choisy, which is especially interesting in a wealthy and progressive country like America, which still adheres pertinaciously to the use of timber as constructive material, notwithstanding the fact that the art of construction is now in an epoch of iron, clay and cement.

Perhaps this predilection for wooden frame construction may arise from its adaptability in all cases, which is much greater than that of masonry, and also because of its lower cost as a raw material. Wood possesses also the important advantage of being its own "auxiliary material" during the process of construction.

These important conditions, together with the indemnity from loss by fire which insurance companies offer freely and at a low cost, and the difficulty of finding architects who understand more than the mere rudiments of masonry, due to the fact that the majority of such architects have established themselves in the large cities as the only places in which their knowledge can be made of value to themselves, have kept true masonry construction, though general in other countries, still in its infancy here, but even so its application is not yet what it ought to be, and the more solid materials have not yet sufficiently displaced the perishable and inferior material, wood.

But true masonry is beginning to force its way

in this country now, as it has imposed its record for centuries back in all noble and progressive civilizations; not only because of its security against fire, but also because it is an unmistakable proof of moral progress, being the only medium that can satisfy the aspiration of each successive age, of transmitting to future generations its own conditions and existence.

Since the architect is, of all others, most especially charged with the development and expression of the tangible ideas of his epoch, he should feel the necessity, nay, the moral obligation of transmitting to future generations in durable and permanent materials, the highest artistic aspiration of his age, a mission which, though he may feel deeply and sincerely, the architect, as well as the writer, the sculptor or the painter, cannot satisfactorily fulfil because of the limited and imperfect means at his disposal.

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rhetoric are complementary to the art of the author.

The introduction of iron in architectural construction does not exempt the architcet from the most important study of masonry, although for several years past it has been thought to do so, much to the injury of constructive art. True, a quarter of a century ago, iron was looked upon as a noble material of construction. It was believed that its employment would solve the problem of attaining a building indestructible by fire, but experience has shown the fallacy of that belief. Iron cannot be exposed directly to the elements, as burnt clay and other similar materials may be, nor to conflagration, and it is now admitted that iron must be protected by solid masonry, just as nature utilizes the skin and flesh for the help and protection of the nerves, sinews and bones, and giving additional strength to the internal mechanical structure by an external and artistic envelopment.

But the young American students of architecture, as well as all young mechanics in the building

trades, especially the masons, have great difficulties to overcome. They have been born and brought up in wooden dwellings, the schools, town-halls and churches which they have been accustomed to see and admire at the age when nature exerts her most powerful faculties of observation and impressibility, are of wood. This fact alone is sufficient to explain the way in which young architects and masons conceive "masonry construction." They hardly realize the conditional terms of masonry work, which are those of continuous homogeneous and rigid character, and the consequences are not far from premature ruin if not well planned and treated accordingly with restricted static principles compared with those used for wooden construction. It is also the primal cause of the American architect's tendency towards composition in wood, selecting the easiest way when any dignified effort is required of him, to approach the classic style by means of that form generally called Colonial. Some young architects seek assistance from the

so-called mason-contractors whom they credit with a better knowledge of masonry than they themselves possess, but who, for the most part, are ignorant of the requirements of masonry construction beyond the rudimentary and vicious practices they have been trained up in, save some intelligent, honorable exceptions.

Thus the young American architect finds himself in a like position to that of the rustic poet, who is forced to clothe his thoughts, often brilliant and original, in the clumsy dialect of his native speech.

Under such conditions it is not surprising that even the most apt and cautious of young American architects, wishing to understand those wonders of art masonry that M. Choisy describes, feel that their beauties are for them mere dreams, and the mechanism of construction enigmas out of their reach and not of their epoch, while some console themselves by creating vulgar imitations through the medium of false construction.

Some may say that there are academies and schools of architecture for young students, and

further, that there are premiums to be won by those who wish to study abroad. But these are not enough. In the academies and schools of architecture there is scant time for the learning of drawing and the study of the history of architecture for familiarity with some of the classic buildings and some knowledge of materials and construction, all of which are necessary but not sufficient. In their studies abroad, always short and hurried, the students meet the same or other classic edifices, analyzing and copying them in the same way, all of which does them good, but is not nearly enough.

We will explain ourselves.

We all know that to create in a country a taste for dramatic music and the judicious enjoyment of the higher class of opera, also to create national music, we must begin by fostering the necessary elements for the development of that taste. This cannot be done by academies with imported singers, directors and classical music, nor even by sending pupils to Milan or Leipsic. There

is something else required. It is necessary to make music popular, to promote national music for the market, such as the ballad, the song, the operetta, in order to develop the seeds of national music and to encourage the growth of permanent national performers for the concert, the opera, the oratorio and the symphony.

In the art pictorial, in order to arrive at historical and imaginative painting, it is necessary first to develop the production of pictures dealing with homely and domestic life, and also commercial, mural and decorative painting, all of which leads to the growth of popular interest and the love for pictural illustration.

The same scheme of development must obtain in architecture. Dwellings constructed in masonry, the city hall, the school, the church, built no matter how simply, but of noble and substantial masonry construction, should anticipate the architecture of a later epoch if it would not be one of transition or parody instead of true art, because these modest buildings are the sure elements of future true architectural construction of every civilization.

It is true that in most populous cities, municipal ordinances compel us to build the exterior walls of fire-proof material, generally of brick, allowing us to construct interior partitions and floors as before, of wood. Although this employs the masons in foundation work and the laying of brick, it does not give correct knowledge to the workmen, nor can the young architect learn anything by this system of mixed and vicious construction. But, on the contrary, the system is a new power to destroy the healthy instincts and glimmerings of knowledge that he may have acquired in the academy, because in these centres of tuition, ideas are given not only about construction in the absolute, but also about hygiene and other appliances to construction, which conditions cannot be obtained except by the use of thorough and solid masonry, such as is used in other countries; and used in such an economical way that not only the churches and schools of the very smallest towns could be built in masonry, but also the dwellings of the humblest working classes.

A very reasonable observation was made to us

some time ago by one of the leading members of the intellectual aristocracy of Boston and ex-President of the Building Committee of the only public edifice in this country on which the trustees and architects agreed, in considering, as far as they could, not only what a cultivated people owes to itself from the lessons of the past, but also for what exists at present and what is due to future generations. He said: "In my several trips through Europe I was never able to go through the Southwest of the Continent until last year. I received then my greatest impression under various aspects. What struck me most were the dwellings for their noble, substantial, varied, and I think, economical construction of masonry. I have no idea why one cannot find here an imitation of this sort of construction, not only in the Middle and Southern States, but also here in the Northeast, and I shall try the first opportunity for myself, because I think we have all the materials needed as are most common everywhere and can be utilized in the most simple way. The houses I saw there are well suited

for summer and winter both; it is a wonder that thus far this style has not been adopted here."

The answer is very simple: Just for the reason that the materials used are of the most economical type, they need, of course, ingenious and expert handling to adapt and use them to advantage. At the present epoch we are so accustomed to see everything treated with Nineteenth Century manipulation, perhaps only to benefit intermediate trades, that very few people realize the fact that the common and most abundant materials for masonry construction are the most convenient, cheapest and proper in the end for building purposes. The trouble is that we take too much pains in looking for expensive materials under the impression that they are the best.

In architecture, as in musical art, it is more necessary to create the necessary elements by degrees than in sculpture or painting, because in the latter the artist himself is the direct executor, while music and architecture need performers, as the medium by which to convey ideas to the public.

The professional musician generally studies in public or private academies, where also both directors and composers are studying in contact with students of stringed and wind instruments, and the songsters follow along on like principles as those of composer and director, being not strange to one another; on the contrary, they are elements of true development identified with the same mission within the art they profess. On the other hand, the director and author, having been in contact with all the executors, know the mechanism, know the false and brilliant points of each instrument and voice for its use, thus forming themselves a link in an intellectual chain, as members of a religion inside of art, alike in spirit although revolving in different spheres. The same system was once practiced in the art of architecture.

Does the same practice obtain at the present day?

In architecture one needs assistants, executants, constructors in masonry, carpentry and iron-work, foremen and mechanics of the different branches, sculptors and modellers, decorative painters, etc.

He must be familiar with all these subordinates which are the means of expressing his ideas. Theory is not enough; there must be a fine perception and perfect knowledge of the nature of material and the elements of execution. In that way only it is possible to arrive at originality in art.

For these reasons it is an evident necessity that the young architect should be in close contact with all these elements through a system of study similar to that followed in the academies of music; that is to say, studying the theory and practice under the direction of the academy, by which means the young architects, the foremen of the different branches, the working stonecutters, the masons, the modellers, the iron-workers, the decorative sculptors and painters, etc., are brought in contact with all the elements of construction according to the practice of the Middle Ages, when every building was more or less an academy of architecture and the apprentices or students were also executants.

This system, this combination of study and exe-

cution, is every day more necessary on account of the complicated structures of the present day and their heterogeneous elements. Nevertheless the fact is that there is not in existence any academy of architecture based upon it. In Germany and England there is some tendency towards it, but these are merely beginnings, only showing that it is possible to establish such a system in a reliable manner.

Perhaps some people will say these ideas are exaggerated, and that genius alone can overcome difficulties in any of the fine arts. Others may think it is enough for an architect to know how to draw a capital or a classic door correctly, just as some people are of opinion that the correct rhymester is a poet. But this is a dangerous delusion. versification is not poetry, nor is the power to copy architectural fragments and edifices true architectural art.

The uneducated rhymester or the mere draughtsman can never originate artistic work worthy of the psychologic state of our civilization, just as the

wild crab-apple will not bring forth the aromatic and delicious fruit of the cultivated tree, and it is certain that if the Roman architects had not been thoroughly trained in the manner we advocate, M. Choisy would not have had such valuable monuments as material for study, nor have been enabled to give teachings of such interest to mankind.

Not only will it benefit the young architects to encourage and promote the establishment of schools and the construction of churches and other buildings in true masonry, together with carrying out the teachings and practices we have referred to, under the direction of an academy in which the theory and practice should be taught, but it would also be of great importance to the working classes, affording them the knowledge that they are in need of in order to reduce the thousand and one inconveniences that daily occur in their assistance to the architect.

As an instance of this we quote the following article from a popular weekly paper of New York referring to a disgraceful accident in that city:

"It must be borne in mind that the architect who planned the building should have satisfied any reasonable board of examiners of licensed architects

as to his theoretical fitness to carry his diploma, and so have found ready admission to the ranks of the licensed elect. The evidence brought before the coroner shows that the collapse was due to the want of knowledge of the rudimentary principles of construction that every builder and foreman on a job must carry in his head."

Thus showing the necessity of technical and practical advancement in the training of masons and builders on whom rests such great responsibility.

Some months ago we were told by one of the most popular and distinguished architects of Boston that, "In one of my last visits to New York I had occasion to see the great want of proper execution among our mechanics. The fault may be due more to the want of proper guiding and technical explanation than to any difficulty of execution. Some bricklayers were at work building a common rough stone wall. A few were evidently from the South of Europe, and others were Irishmen or Irish Americans. The well-known mechanical principle of a stone wall is to lay stones crossways and some at right angles to the others, taking care at the same

time to leave the least possible space for mortar, and to fill even that with small stones. In the work that was already done and was still going on, the application of this theory was plain to be seen, at least in so far as the work of the foreigners was concerned. But the native masons, though evidently fairly good workmen, were busily setting facing stones and filling in large spaces with small stones and mortar, evidently ignorant that this manner of construction would result practically in two half walls connected by mortar only. It took me considerable time to make them understand their error and to realize that it is not easy to obtain in a rough stone wall both solidity and handsome exterior facing."

The inconveniences referred to by the distinguished architect from Boston arise from the fact that the relatively scarce number of American masons have more practice in laying bricks than in building stone walls. But it is also true that the same errors can be noticed when bricklayers of different schools are working together. Most bricklayers are accustomed to consider a wall as divided

into two parts, the exterior or facing, and the interior or thickness of the wall. This idea has been impressed on their minds by the very general use of fine brick for the outside and rough brick for the inside. It is well known that such walls are, theoretically, not accepted for their full thickness, but their strength is calculated by the volume of rough brick inside, without consideration of the four inches of facing. The workmen, however, having no idea of that technical classification and being accustomed to this class of work, treat every brick wall as if it were cabinet veneer work; to such an extent is this error carried that scarcely eighty per cent of the brick walls constructed in this country have fifteen per cent. of the inside brick joints empty, so that most of them are not cohesive walls at all, but mere shells composed of bricks, with the outside joints well filled up and the interior merely empty, as if they had only vertical pressure to resist.*

*In the last seven or eight years great improvements have been introduced, due principally to the unavoidable strength required of walls for tall buildings and other works of noble masonry where the American mason brick and tile layers have shown their fitness and good qualities if well directed.

Another inconvenience in masonry construction to which very little importance is given is the manipulation of the materials used for mortar, especially when mixed with cements. Every architect knows the importance of this, but in practice there are very few buildings in which the workmen apply the principles that science calls for, nor do they know the necessary rudimentary practices. For instance, a few days ago the contractor of a very important building of a public character now being erected in a large northern city of New York State, said to one of the trustees: "If the terra cotta and the iron are delayed much longer and we are obliged to work in winter, we shall be forced to mix some lime in the cement mortar, to permit us to lay brick in cold weather."

It is almost impossible to conceive that responsible people will thus recommend and accept such a remedy, which is of no more value than a child's mud pies. But it is a fact that most architects in this country, where we have freezing weather from three to four months of the year, look upon such a prac-

tice with indifference and only a few of them see the absurdity of it.

We believe that some professed architects accept such recommendations in good faith, believing that the builders are anxious, in their ignorance, to be enabled to work in freezing weather, and also to obtain a good solid wall free from danger of the following frost. But, unfortunately, this is just as if a servant should strive to clean the sidewalk with hot water in frosty weather.

A mistake in a business affair is not of irreparable consequence or public interest, but in a building, where fatal results may follow, it is a criminal act to leave to ignorant men works that require special knowledge, together with capacity and recognition of duty to perform.

Yet the instances above given are only some selections from an infinite number that have occurred not only in masonry, but also in iron construction, although in the latter case, either because iron-work is less complicated or because, being done in a shop, it is easier to have better organization and

more educated workmen, technical principles are more observed than in masonry construction, which must be done in the open air.

But there are other difficulties in the way of young architects. The study of classic architecture, as well as the works of M. Choisy and others of similar character, although well worthy of study, cannot fill the void in architectural art of the present day, which critics like like Viollet le Duc and others have attempted, to the unsettling of the passing generations of architects and the misleading of modern critics.

Since the appearance in France of the "Art of Building Among the Romans," we have been expecting, with interest, similar publications, based on comparative criticism and analyzing ancient systems of construction similar to those in use to-day, hoping that something might result of historic importance, some light be thrown, some new philosophy discovered, some new points in nature brought forward which could end opposed school controversies.

We were disappointed. Perhaps any efforts were

premature until the present moment, when the attempt to construct those tall buildings, those aerial human nests, at altitudes formerly ventured only by eagles, has given a new impetus to the forms and elements of construction for the twentieth century.

It will be seen that the harmony between the architectural composition and the solid and noble construction of some of those monuments described by M. Choisy, whether in brick, concrete or stone, and their imitation, with the new elements at our command to-day, must result in two things: either the proportion of those monuments or of those parts of them that are thought worthy of revival must receive such essential changes as they formerly received at the hands of the Goths, so as to adapt them to the new condition for masonry construction, or the architectural composition will be falsely represented and not faithful to the true conditions of art which can find beauty only in ideas, while in physical reality it must descend to the field of science and experience and thus give us to-day new elements of construction as noble and truthful as those

of past epochs, rejecting those forms of obsolete civilization which we are now parodying. We must find a new representation, new forms to adjust to the necessity of the art of the present.

The Goths knew well how to overcome the difficulties belonging to their era, but they knew nothing of those of the present day. The revolution through which construction has passed during the two thousand years that have elapsed since the works so well described by M. Choisy were erected, and the materials and practices in use during the Christian era, can be compared only with the social, political and religious revolutions that have made the history of civilization.

The Goths, with the aid of years of study, succeeded in harmonizing masonry construction with the new form called for by the necessity of reducing the masses of material and the manual labor which the Romans had at their disposal by the employment of slaves. But the working classes being freed, and guilds and municipalities having been established, the Goths were forced to reduce the

volume of material in proportion to the covered space, and also the number of hands necessary to carry on the work.

Thus a typical architecture of the Middle Ages, from the dwelling house to the cathedral, was created. But we must remark that it took about thirteen centuries to complete the work.

Were the architects of the fourteenth and following centuries as successful?

Their relative ignorance, the fall of the communities and free cities and the great despotic political aggregations could not but have a pernicious effect upon architectural art, which example, arising from the Papacy and scattered by Jesuitism, was descended to parody of the ancient Roman monuments, while art itself was after reduced to the mere copying of models, which are considered as classic because of the great geniuses who originated them and without much consideration of their artistic merits.

The world was soon filled with structures inspired from St. Peter's of Rome, and St. Paul's Cathedral

in London, two works which have done as much harm to art as Alexander and Napoleon caused to the world, but without the healthy reaction those heroes caused by their meteoric career.

This idea may be looked on as doubtful on account of the long conventional customs of admiring such structures as models of architectural beauty, but the truth is that the first of these edifices initiated and the second forced the decadence from which it is difficult to escape, thanks to the influence still exercised by superficial French art. The discoveries in 1842 in Assyria, Greece, Pompeii and Herculaneum had introduced sober and correct private architecture in Germany and England, which, from 1850 till 1870, was known as the "New Greek," but unfortunately passed by France, and was itself soon unworthy through misconception.

Thus we come to American architecture which, after passing four centuries since the end of the Middle Ages, and no matter how it arose, in an anomalous way, is extending rapidly into a noble system of general construction, calling

into use the three modern materials of building—Portland cement, burnt clay and iron. These materials have been combined in such new structural conceptions that each is complementary to the others, realizing the ideals of their epoch in accordance with modern science and experience to such an extent that the architects of the time of Phidias could, we believe, endeavor to harmonize with success with the philosophy of their epoch, although yet we are far from reaching perfection, due more to the conventional engineering, iron interests, fear and lack of convictions, which will disappear in time through experience.

We are thus in a similar position as the Romans were in the time of Augustus. We have changed the form and manner of construction from those of the Greeks, just as the Romans did, but kept the forms of the Greek as decorative suggestions, and besides, the Roman monumental forms, constructed not in a classic spirit, but in an undignified mercantile iron false construction, which is, by the way, just what the aesthetics criticise the most severely.

The lie is the architectural dress of some of these structures—the clothes, which were parodies instead of realities, not corresponding to the race or class of bodies according to Greek philosophy.

The architects of the present day and their pupils understand all this, but what ideas are given to guide the neophyte? The work of M. Choisy has been translated into English, and now the appearance of a translation of the "Dictionnaire" is advertised, in which latter work, under the letter C, Viollet le Duc takes occasion (page 245, edition of *), to criticise what has been, for half a century, the keynote of all artistic teachers.

It is well to condemn what is evil and to do away with error; but in mere charity we must give some light, some ideal to youthful aspirations.

What can we give in exchange for those errors condemned by the critics?

The answer is somewhat embarrassing, owing to the failure of the "Entretiens" and other works of different authors who have criticised errors, but instead of going back to the original point and start-

*MDCCCLXXV.

ing afresh have, as one may say, begun in the middle with mediaeval, Romanesque, Roman or Byzantine art.

Why not go to the fountain head?

Let us first make sure of what we want and then proceed in our structures after the manner of the Greeks, the fathers of philosophy, especially artistic philosophy. The Greeks had their fine artistic perception less in the system they inherited from their Etruscan and Egyptian ancestors passing through Assyria, than in the natural and simple use they arrived at, after several centuries, with regard to the natural and simple material at their disposal.

Their proceedings, as those of their ancestors, were those of the miner and the lapidary. They searched in the interior of existing inert matter as one searches for gold, until they found in the bosom of a marble or granite block a column, a capital, or a cornice that satisfied their exacting taste.

The process of the Greeks was to find in the solid masses of natural material forms that were in harmony with their ideal of the constructive function.

based on the theory of wooden construction but in stone material. This ideal is simple, although dual. It consists of vertical support to a horizontal object.

Did the Romans proceed in the same manner?

The Romans understood, as we also understand, the Greek system of occupying an immense space in massive construction suitable to the surface covered, but as the Romans required a relatively larger covered surface than they could obtain between column and column, and wall and wall, set at short distances in the Greek manner, they proceeded on a different plan. The great masses of their vaults, piers and buttresses necessary for their large span were constructed of materials of small dimensions, thus creating a new process of construction, different from that of the Greeks, which process we may call cohesive or organic, as it is not that followed by the miner or lapidary, but similar to that of nature in the formation of bodies possessing latent life. This difference is the cause of Greek architectural decadence since the end of the Roman consulate, and extending through all following civilization until the present day.

No one can be surprised at these struggles, if the difference between the proceedings and the principles of each school of construction be taken into consideration, because true construction is the tangible effect, the language of architectural thought.

The Greeks knew that they could find the forms of their constructive ideas inside the block of marble or stone. They had only to remove the shell which nature had elaborated for them in the course of time.

The Roman process, which is our own, the one that we pretend to have improved on, is contrary to the Greek system. It began with nearly nothing, from infinitesimal matter and elaborated as nature does.

Is the last proceeding the more rational one?

This organic construction might philosophically be criticised as to the exterior, as the Greek edifices were criticised as to their independent members carried on separately, and coming from different inert masses to represent wooden construction, which was their theory.

Viollet le Duc and all German and contemporary critics denounce as false and untrue the art coverings of several celebrated Roman structures, and all coverings derived from the same source in contemporary architecture. But what if, instead of this covering, initiated from Greek forms of construction, the Romans had covered the monuments that M. Choisy described with an outside finish of the same kind as the internal real construction, as nature uses the epidermis or skin to preserve and decorate the interior constitution, as nature only can give perfect examples of individual harmony?

This might be untrue and liable to criticism if their walls of sustentation and buttresses, constructed in brick instead of being decorated with half-embedded marble pedestals and columns, were constructed externally in pressed brick, with a finishing process and sublimity given them by introducing colors, as the Assyrian and later Moresque and Oriental architects have done.

Could these immense structures of concrete that M. Choisy illustrates be criticised if they were cov-

ered externally by a coat of hydraulic casting, such as nature uses for decoration, as for instance the admirable arabesque that forms the network of the human skin, and had increased its beauty by means of the harmonious colorings which the Moors knew how to conceive and to execute, and in consequence of which their work has become classic?

But the Romans could not elaborate in any other way on account of a circumstance that has been passed over, and is, we think, unknown to many of their critics.

The Romans were well acquainted with Greek construction, and when they invented and carried out their own style, so opposed to that of their ancestors, they were obliged to have some lines of exterior construction so as to explain to a certain extent the mass of organic flesh, without skeleton or bond system, without self-adherence; an artistic covering no matter what sort of strange clothing, because their masses of flesh had no self-explanation, as we have in our modern organic construction by the use of internal skeleton, or

iron, a skeleton necessary to the physiognomy of cohesive or organic construction, as, for instance, in the bone system of nature, the discovery, development and gradual application of which is the legitimate offspring of the century now ending, and is also thoroughly American.

Consequently it would be strange if the Romans and the originators of the Renaissance, sadly in need as they were of these new elements, could not find the solution of the problem ?

Here we must remark that it was useless for the Roman architect to try to join architectural beauty and grace in the auxiliary masses of their construction, when they could not arrive at any conception of the elegance of Greek art, for the simple reason that these masses were merely auxiliary to the Roman architect, while they were the skeleton in embryo of the present days.

If now, after centuries have passed, the problem appears inverted to Viollet le Duc and others, because the auxiliary construction has prevailed and has resisted the wear of the centuries better than

the decorative for the logical reason of strength, it does not follow that the Romans were thinking and acting in accordance with an interpretation that they never dreamed could be given to their constructed creations after more than two thousand years of existence.

So, if the exotic, ill-matched and severely criticised envelope could have more or less reason to exist in past civilization, what excuse can there be for them to-day because now we have not only more complete elements, whereby to bring forth in a noble manner the cohesive Roman or organic construction—which is also our construction—but we also have externally and internally in these new elements the means to employ the Greek philosophy in its wise simplicity, a philosophy which evoked the beauty of nature forms during every historic period. Thus we are as logical in our construction as the Greeks were.

All of which is a surprising but natural proof of the harmony existing in the human ideal when without hesitation, without prejudice, we in good

faith approach and search in the only book, the only unerring and imperishable book, which humanity can depend upon as a guide in its earthly pilgrimage.

But what about exterior forms? The philosophy of outside architecture?

The Greek literature, as we all know, was inspired by the wisdom of nature. Its fables, comedies, dramas and tragedies breathe the very spirit of nature. The works of Aeschylus, of Sophocles, all gave to the philosophy and followed the same cult. The Greek architects, breathing the same atmosphere, also understood their mission. Vicious books and engravings were not for them in existence, knowing that primary, original, absolute art must draw from nature and have no other ideal to approach than in the tangible real and plastic expression of its conceptions.

From the Etrurian and yet Egyptian civilization, the origin of Greek construction till the time of Pericles, where perfection was reached, how many forms of

NOTE.—German aesthetic philosophy is, as we all know, of the modern theory and philosophy of art; but although inspired in the classics, it has not taken the essential idea in practical simplicity. Hence the deviation and complicated attraction that beset youthful students.

capitals, columns, bases and mouldings have been in use in Egypt, Assyria and Greece itself? Perhaps as many as we have used since the Renaissance! Nevertheless the architects contemporary with Kilikrates were wise enough to go back to the beginning, not merely to the Etruscans, Egyptians or the Assyrians, but to nature itself, in order to evoke the capitals, cornices and columns of the Parthenon. But when? In what period of Grecian history? When, after passing more than eighteen centuries in the physiological state of Grecian society, the disciples of plastic, as well as the literary arts, were religiously studying nature and thus evoking intellectual art from that great mother of all.

Why do we not follow in the same direction? Why do we not look back to the Greeks and Romans as the Greeks did to the Etruscans, Assyrians and Egyptians?

Is there any reason why we should begin in the Roman epoch or in the Middle Ages, instead of in the times of the Greeks or Egyptians? Is it not ac-

cumulated error if an apprentice or architectural assistant, in measuring a front, should begin at every pier and opening instead of measuring always from the start? Is it not evident that if an intermediate error be made all will be wrong?

Why not begin with Nature herself?

Other arts have been doing so for a long time. We all remember when boys were taught figure drawing from engravings, or other drawings, whereby they became every day more and more conventional.

Now all that has changed: there is no more copying of drawings, but of models, and models from nature. And, furthermore, if anyone should ask of Kolbach, Meissonier, Madrazo, Coubert, or any other genius of that epoch, what were the best way to begin figure drawing, does any one suppose the answer would be, "Begin copying from engravings, other drawings and hangings from the museum?" No; the answer would be "Copy first models from nature and afterwards look for your future compositions in the riddles that na-

ture will offer to you in abundance, if you know how to read them." And, indeed, to know how to read these riddles the student must be fitted to his epoch by physical, mental and moral education, and above all he must observe and analyze continually."

Is not this answer also well fitted to architectural students? Let them go to nature instead of to crude engravings and the conflicting ideas of various ages?

It may be asked how is it possible to read nature? There is no treatise on the philosophy of art!

Nature does not give us capitals, mouldings or ornaments and structures of epoch!

We have been accustomed to have everything done in books, illuminations and drawings, which divert and vitiate in plastic arts as in literature, and we have lost the habit of reading nature's secrets in nature's book, which is the only one where entire truth can be found And now we must begin as a child does to learn to read, and to assimilate what is useful and convenient in all science and art.

That was not necessary in the golden era of

Greek architecture, because then artists were psychologically disposed to the human criterion, giving as result the Parthenon and the Propylea, no matter how numerous the capitals, the mouldings and the columns of the past time.

The problem in any psychological momentum should be, for instance, to compute and adjust the physical, mechanical and philosophical function of each material and apply them accordingly to the structure, giving them externally and internally philosophical forms, according to the necessities and character of the building.

If that is true the problem is not a difficult one; it requires only to exercise the human faculty of criticism which is lower than the inventive faculty. Everybody will admit that it is easier for a young architect to begin by exercising critical faculties instead of that required for premature if not wild creative activity, which could be well developed if the architectural student, modest as he may be, will condescend to give a little more attention to the practical arts, as his ancestors were accus-

tomed to do, in order to know both the strong and the weak parts of his materials, and the difficulties of construction, so that he may use his own judgment, give his individual shaping to his conceptions, and be, in the end, original in every instance.

To develop these faculties we think the schools of architecture should have a department substantially fitted, where mechanics or executants of building trades and applied arts could be taught, especially to masons, more than mere rudimental practice of their trade, giving them an opportunity to decide and to separate the good from the bad, so that in dealing with their materials they may know what they are doing and for what they are responsible.

Prizes could be offered as a stimulation to every branch; for instance, in the mason section, for specimens of the cheapest and most substantial exterior masonry or facing wall, and other prizes offered for the cheapest and most substantial partitions of masonry; others yet for the cheapest, most practical and substantial floors of masonry, ceilings and roofs, and also for the cheapest and most substantial stairs of masonry.

Evidently the schools of architecture should set on foot these works in order to give unity to the action of the future architect, future superintendent, future master builder, foreman and workmen.

Of course the professors need not perform manual labor, but merely direct and give example to the students of both architecture, applied art and trades, together with lectures and practice. They should also distribute the yearly prizes and the commissions that corporations, wealthy people, or municipalities may offer for the benefit of the community as prizes are now given for traveling scholarships.

What master builders want in common with the working classes, is work and profit, leaving glory and public acknowledgment to the architect, but, nevertheless, we are positive that all true builders and mechanics are proud of their profession. They understand their mission and the necessity of united action for the advancement of the working class by the necessary technical education, and being in charge of and responsible for the execution of the

but is at liberty to employ the first person who happens to pass his door, but, naturally, having an unlimited number of professional architects to choose from, he will entrust the work to some trained man instead of giving it to an inexperienced person.

This will also apply when we have workmen who have passed through the special technical school of the building trade, which will doubtless be the case if the way be left clear for progress.

With reliable workmen will come reliable work, and the architect will be able to exhibit his knowledge and genius to advantage, for it is well known that in all arts where the executor himself is not the author, failure is due to the means employed and the workmen who use those means.

In corroboration of all this we recall the following anecdote, and we beg the reader to excuse us if it seems to apply more strictly to the musical art than to that of architecture, but, as all art is nothing more than the physical expression of our diviner nature, we fancy that little apology is needed. At one of the great winter concerts, given at the Im-

perial Theatre, St. Petersburg, the director, J. Goula, Sr., was informed, a few minutes before the time of commencement, that the kettle drummer was ill and could not be at his post. Now this instrument, although it looks so easy that a boy might thump it, is really of the utmost importance in the orchestra. Several of the musicians offered to take the sick man's position, but the master knew what he was about. He ordered a notice to be posted to the effect that "on account of the illness of the kettle drummer, the assistant musical director will conduct the concert." At first people could not understand why the illness of the kettle drummer should necessitate the abdication of the musical director and the promotion of his second in command. But, when the first number on the programme, which happened to be Meyerbeer's "Marche des Flambeaux," was played, everybody saw with surprise the great director Goula himself seated at the drums, belaboring them with all the energy of a professional drummer, and, when recognized by the audience, he received, in that humble position the greatest ovation of his life.

An architect might not, perhaps, be honored by an ovation if, on account of the illness of his superintendent, he were obliged to take personal part in the execution of any important work on a building under his direction, such as the filling in of foundations, for instance, which is always exposed to danger by negligence and can at no time be watched too carefully, or modeling a decorative figure, trying to give constructive lines to it by his own hand. Instead of an ovation he would probably be showered with mortar-cement, or water and clay, but this inward satisfaction would more than repay him for the lack of public applause and the reward of his conscience for work well performed, would give him the sleep of the just when, his labor over, he retired to the sanctity of his own dwelling.