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**New system of architecture founded on the forms of nature, and
developing the properties of metals**

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London, 1845

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CHAPTER III.

OF THE GENERAL CHARACTER OF ITS FORMS.

Having selected for the constituent materials of our art, a series of substances of an altogether different nature, and possessing more widely extended capabilities, than the original and legitimate constituents of the pre-existent arts, —we find ourselves in possession of the means of realizing, that first and most essential concomitant of “a new Architecture,” namely, the uniform and systematic introduction of *an order of forms*, of a totally different description from those previously produced in these arts; and, consequently, for the production of all the different effects occasioned by the peculiar combinations of the same. An examination, therefore, into the abstract and distinctive character of *the forms*, which the respective productions of stone and metal afford facility for the embodiment, will, doubtless, be now desirable, in order to assist the determination of the definite and general nature of the forms and contours requisite for the fulfilment of the legitimate intentions of art, in its

application of the properties of metallic substances to the purposes of Architecture.

Stone (and also marble; for, with the exception of superiority in color and texture, the qualities of each are synonymous) being an inflexible and brittle substance, capable only of being reduced into definite regularity of configuration, by means of sawing, chiseling, friction, and the like, can only be employed in the embodiment of forms of a heavy and massive character. These must necessarily be limited to those of geometrical science, or to the representation of such objects of nature, or forms deriveable from nature, as are of considerable bulk or substance. y.

The only manner in which forms of slender and delicate proportions, can with any regard to durability be executed in stone, is by carving them *in relief* on the surface of a block (as practised in all the masonic Architectures) a style of execution perfectly consistent with the nature of the material,—but incompatible with the *perfect* representation of any given object; inasmuch, as it must of necessity be made to appear as if growing out of, and therefore forming part of the block itself.

The character of metallic bodies, on the contrary, being flexible and tenacious, capable of compression, distention, and, by reduction into a fluid state, of being cast into an endless variety of moulds,—affords facility, not only for the illustration of problems and the embodiment of combinations of geometrical forms, which are impossible of accomplish-

ment in stone, and consequently in all pre-existent Architecture; but also for the embodiment or substantial representation, in a detached and perfect state, of almost every object or form within the whole range of *natural* product, and of poetic fancy, to a degree of minuteness and delicacy far beyond the legitimate requirements of Architecture, or even of *genuine art* itself.

Metals, then, as will be found, afford facility for the substantial embodiment of the greatest possible variety of forms; and it is a singular coincidence in relation to art, and one which, *if iron continues to be employed in Architecture*, loudly calls for *a new system of design*,—that the definite and regular forms best suited to the nature of stone, as being most easy of accomplishment, viz. those of simple geometrical science, are the class of forms most difficult of production in metal; and especially unfavorable in reference to the accuracy of *combination*, and undeviating exactitude of relationship to each other, which the distinctive parts of an Architecture, composed of such description of forms, are required to bear. For example,—a regular cube is one of the most easy figures to produce in *stone*, being merely required to be sawed out of a block; but a regular cube is one of the most difficult figures to produce in *metal*, whether by the process of casting, or by hand labor; for, in either case, the variation it undergoes in the process of cooling, will usually cause it to be in some degree warped or drawn out of the exactly intended form, inde-

pendent of the natural contraction and expansion of the metal, which ever afterwards takes place, on the variations of the atmosphere. The difficulty, moreover, of producing with such elements, the continuity of perfectly *level lines*, whether perpendicular or horizontal, required in the numerous mouldings, and other parts and features of masonic Architecture,—proves, the successful combination of such forms, when produced in metal,—a task demanding, perhaps, greater skill and patience for its accomplishment, than that attending the production of the individual forms themselves.

But “the forms” developed in the various objects of nature, being usually composed of *curved* rather than *straight* lines, requiring less exactitude in casting or other preparation, depending less *upon*, and presenting less difficulty in fitting, and being also less *visibly affected* by the subsequent variations of the atmosphere, are unquestionably most coincident with the nature and properties of metallic bodies; and are therefore (with all the combinations of which they are susceptible) adopted for the purposes of this system of Architecture; in conjunction with the *detached or perforated style of execution*, (so far as the same shall be found consistent with beauty and utility) as being also most expressive of the characteristics of its constituent materials.

“The forms” exhibited in the productions of *nature* are here alluded to, in contradistinction to those of *geometrical*

science. Not that the former are *unscientific*,—for they exhibit the developement of the highest order of science; but because it is *nature* that best instructs us in the combinations of these forms, for the production of the most perfect beauty, in conjunction with the highest and wisest of *utilities*, and in so doing becomes the handmaid, or rather the director and controller of science, in the production of art.

e. out It is *not*, as will be seen, from any *capricious preference* to forms derivable from general nature over those of positive geometrical science, that these are selected for the purposes of a practical architecture; or simply from a desire to depart from the forms, or the methods of expressing the forms, employed in pre-existent Architecture, merely for the sake of novelty; or even for the production of that higher and more varied order of beauty, (in conjunction with all the necessary utilities of the building art) which is fully capable of being realized in an Architecture composed of such description of forms; (though this alone were amply sufficient reason to justify their adoption); but from their being *best* adapted to the properties and capabilities of metals, and therefore *best* adapted to the purposes of “a metallurgic Architecture.”

The object, however, in view, is to establish a system of Architecture, which, while providing for the fulfilment of the just intention of the art in general, by the combination of beauty with utility, shall at the same time be integrally

dissimilar from all known and commonly practised systems, in *design*, in *construction*, and consequently in *effect*. And on examining into the general character of the forms best suited to the properties of metals, and also into the indispensable concomitants of "a new system of Architecture," the nature and capabilities of the one will be found perfectly synonymous and coincident with the requirements of the other. Forms, and methods of execution, different from those previously employed for such purposes, are amongst the inevitable requirements of "an integrally new Architecture;" and it is such forms, and such methods of execution, that the properties of metals, under the direction of art, are best able to supply. y.

It now, however, remains to be considered, how and in what manner are the *forms* exhibited in the productions of nature, and all modifications of the same, to be adapted to the practical purposes of Architecture.

In reference to the accomplishment of *the beautiful*, in the combinations of forms and lines, some highly useful lessons may be derived from nature herself, particularly in the Architecture of *man*, in which, while the *rounded* or *undulating* line is generally found to prevail, the effects of the various combinations of these are relieved by the occasional and partial introduction of the *straight line*; and this is found to occur in those parts usually esteemed the most beautiful,—as for example, the *nose*, the *junction of the lips*, *teeth*, etc., exhibit *straight lines*, while all the re-

maining forms and contours of the human head are composed of *curved lines*.

In the composition of *flowers*, also, the *curved line* is most predominant; but is counterbalanced by the introduction of the *straight line* in the stamina and stem. In fact, the same law is found to prevail throughout organic nature in general.

Following the analogies of nature, therefore, in the application of her forms to the purposes of Architecture, it will be found, that the general preponderance of the *curved* over the *straight line*, is not only perfectly coincident with, but (provided the adaptation be conducted with requisite artistic skill) is also inseparable from, the production of the highest order of beauty.

The relations of these *forms* to the necessary *utilities* of Architecture, have now to be considered; and in this view also, the general preponderance of the *curved* or *undulating line* over the *straight line*, may equally be brought to prevail, without any sacrifice whatever of the various utilities and conveniences its productions are required to serve; and indeed, in very many instances, with considerable advantage in these respects. For example,—a most desirable result in buildings, (whether public or private) is, that they should be *cleanly*; and if due regard was paid to this in constructions, the junction of right angles, (or, at least, the preservation of the acute points of such angles) would be as carefully avoided, as they are now almost unboundedly

introduced. For, whether in the corners of stairs, the floors, or ceilings of apartments, the panellings of doors, etc., or the frames and sashes of windows, they answer to no real utility; but on the contrary, form receptacles for troublesome insects, etc., and accumulations of dirt, which baffles the endeavours of the domestic thoroughly to eradicate.

On many occasions, it is true, straight and level lines are indispensable,—as, for instance, in the floor, and perpendicularly or partially so in the walls; but no necessity exists for direct right angles in apartments, except at the junction of the floor and walls; and then, indeed, domestic convenience and economy would dictate the gentle rounding of the acute point of the angle, as is almost invariably observed in the economy of nature. In but one or two instances, therefore, is there any necessity for level lines in apartments; and in scarcely a single instance is any utility to be derived from the junction of *right angles*.

In respect, then, to the various utilities in building, this art is at once free to follow the example furnished by her unerring prototype, *nature*, in the production of the *beautiful*, by means of the preponderance of the *curved* over the *straight line* in her forms and constructions.

The universal law of the preponderance of the *curved* over the *straight line*, manifested in the productions of organic nature, being adopted in the arrangement of the *primary parts and masses of this art*, the preservation of

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consistency and propriety, and the consequent production of unity in its effects, imperatively demands, that the same principle shall be followed up in relation to all the extraneous, or more decorative parts and features, of its several productions; and the unlimited capabilities of metallic bodies for the fulfilment of these intentions, renders the adaptation of the forms exhibited in the productions of the whole range of organic nature, to these several and respective purposes of the art, an object equally felicitous in the accomplishment, as it is conducive to unity, originality, consistency, and peculiar interest and beauty, in its general effects.

The extraordinary strength and tenacity possessed by these bodies, and the fulfilment of the just intentions of art, in its application of these properties to the purposes of Architecture, will necessarily require the introduction of *perforated work*, in the various parts and features of the art to which it is applicable; the same being in strict conformity with the economy of metallic manufacture, and by no means contradictory to the requisite utilities of the art.

The employment of these substances in solid masses, is most uneconomical and useless, for any constructive purpose; and when applied as a substitute for such—for example, as columns in buildings, they are invariably hollow tubes; and even then, are not required to possess anything like the bulk, indispensable in stone, for ensuring an equal amount of strength. While, therefore, a due regard to

economy, and conformity to the properties of the material, require objects of such a nature to be hollow—Art demands the manifestation of this fact and property, and the adaptation thereof, to the production of “the beautiful.”

The most artistic and consistent method, therefore, to be pursued in the application of bodies of such a nature, to any purposes of constructive art in architecture, is not to disguise or conceal the qualities of which they are innately possessed, by making objects assume an appearance of solidity, which in fact are hollow (unless the faithful representation of any natural production shall demand it)—but by honestly exhibiting the nature of the substance of which it is composed, in the perforated, light, and flowing style of design and execution, for which they are so eminently applicable.

It has previously been remarked, that “the carved” or *basso relievo* style of execution, or any imitation thereof, is a peculiar and necessary consequence of the nature of stone, in its application to the purposes of Architecture; and that it is as equally inapplicable to, and inexpressive of, the different properties, and more enlarged capabilities of metals. The facilities presented by these bodies, for the substantial and durable embodiment of “perfect forms” of the most delicate proportions, altogether does away with the necessity of subjecting forms, of this description, to the conventional restraints of representing them as forming part of a block or solid, on the surface of which they are carved

or moulded ; and the greater boldness and freedom attending the detached and isolated style of execution, and the infinitely greater amount of cleanliness, consequent upon its application to the purposes of building, forms sufficient reason for the total *rejection* of the *former*, and *substitution* of the *latter*, in the arrangements of this Architecture—for which also provision is effectually made in the application of the peculiar constructive principle of the art—the nature and effects of which will be explained in the succeeding chapters.

It will now be necessary to consider the limitations and modifications under which the forms exhibited in organic nature are to be introduced, and the conventions requisite to be observed in the adaptation thereof to the Art in question.

In the embodiment or representation of all human or ideal forms, the principles of the art of Sculpture must inevitably be observed ; and especially those principles of the art which affect the convention of the various descriptions of *alto*, *mezzo*, and *basso relievo*, and which, when applied to metallic productions, become fully coincident with their nature and properties, in the circumstance of the omission of an attached ground, or plane surface, to the objects or figures represented.

In the embodiment or representation of all other natural productions, whether of the animal, vegetable, marine, or mineral kingdoms, a free imitation of the forms of nature,

in the object represented, will be required; subject, of course, to those principles of Sculpture previously referred to and elucidated in the several conventions of the *relievo* style of execution, and which may be defined as *the laws* by which the compression or flattening, in various degrees, *the forms and actions* of the objects represented, are governed. And, also, in peculiar reference to the production of the respective parts of *this Architecture*, *synonymous*, although *contradistinguished* rules, will be necessary to be observed, and which relate to the thickening or distention of the substance of any object, whenever its natural proportions shall be found incompatible with the just requirements of art in Architecture, and exemplified in the combination of beauty with utility.

At the same time—that the principles of this art, require the free imitation of the forms of natural objects, it does not of course require, that the precise aspect they present, or manner in which they are exhibited to view in living nature, is at all times to be adhered to:—For example; by the application of the skill of the gardener, the productions of the vegetable and floral kingdoms, may be trained and constrained into a vast variety of forms, which, although extremely different from, and it may be, the very reverse of those, which they would naturally present, are by no means incompatible with their growth. Such constraints, or other ideal variations from native habit, or from the combinations of nature, are therefore not only perfectly al-

lowable, but highly essential in this art—as also the choice of representing such objects after separation from their parent stem; as for instance, in wreaths composed of various fruits and flowers.

In the combination of forms, not representative of the productions of nature, and the application of the same to the extraneous or decorative features of this art—consistency and uniformity with the forms and contours of the integral masses, and the preservation of harmony in the general effects of the art, will (while fully admitting the application of geometric science in the *arrangement* of these forms and combinations) require the *preponderance of the CURVED* over the straight line, in accordance with the analogies of nature, upon which this art is founded, and the fulfilment of the just intentions of an Architecture—*dis-similar* from all others, in the character of the beauty, in conjunction with the peculiar utilities it has the power to produce.

An inevitable consequence of the practical application of “these principles,” and one by means of which, the primary intentions of this art can alone be fulfilled, is, that “*an entire independence*” of the several members, parts, or features of pre-existent Architectures must at all times be maintained. It is not by this to be inferred, that *all* such *primary* forms, as may be found in masonic Architecture, are to be rejected; because this would arbitrarily exclude from this art a vast variety of combinations and modifications

of the arch, a feature most peculiarly coincident with the general character of its forms and outlines. But the rejection of the *precise manner*, in which such forms are expressed, is inevitable; because the general character of the decorative constituents of this art,—the preponderance of the *curved* over the straight line in *detail* as well as *en masse*,—the *rejection* of the carved or *basso relievo* style of execution,—and the substitution of forms originally *isolated* and *detached* from the primary masses,—will render impossible the imitation of the precise forms and effects of any application of the arch in masonic Architecture.

Again, the cylindrical form is adapted to the purposes of a *column in masonry*,—and such form is by no means inconsistent with *the philosophy of this art*; but, in the application thereof in accordance with these principles, an equal independence of *the manner* in which such form is expressed, and the effects produced by it, is inevitable.

A further and necessary consequence of the established independence of *the forms* exhibited in *the members or parts* of pre-existent Architecture, is, *an entire independence* of those several members themselves. For example, a *column* which, upon classic principle, is composed of the separate members of *base*, *shaft*, and *capital*, or an entablature, having those of *architrave*, *frieze*, and *cornice*, denoted by distinct lines of demarcation,—may each, in any synonymous features in this art, be composed of one, two, or more members; according as the particular character or circumstances

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of a design shall require, and the realization of beauty and peculiarity in effect may demand; a similar rule or example will equally hold in reference to all other members or parts of every known style of Architecture.

In thus establishing an independence of the *members*, as well as the *forms*, of "pre-existent Architecture," an entire independence of *arrangement*, in relation to these constituents generally, (and by which *form* is affected, in reference to any given work, as a whole,) is also of necessity to be inferred. And, when the general nature of the forms of this Architecture are taken into account, the utility and advantage of this maintenance of independence will also in this respect become manifest.

Nevertheless, the subtle and peculiar nature of *this*, as well as every other species of fine art, renders it impossible to exhibit *the particular laws, rules, or methods*, by which the combinations and arrangements of *forms* are to be affected; except in the several productions of the art itself.