Choisy’s «Historie de l’architecture», is considered a landmark in architecture historiography addressed from the point of view of constructive rationalism. In this paper, we intend to examine:

— What are the kinds of historical «processes» considered by Choisy as those that make up the history of architecture.
— What are the diversity of graphical procedures used by him and what is their role in the elaboration, exhibition and analysis of those procedures.
— Lastly, what kind of relationship does he establish between these aspects and other disciplines, particularly natural science.

In order to answer these questions, we shall start by examining his «graphical discourse» and take it as the basis for other considerations.

In Choisy’s History, does exist a variety of graphical approximations, which define a parallel speech to that outlined in the text. Some peculiarities of his drawings are noticeable, especially his use of axonometric from below or his particular way of making a building’s anatomy, but there are many others that have remained fairly unnoticed. A first intriguing feature is the frequent use of «evolutionary drawings», especially in Grecian and Gothic architecture study. If, as we shall do here, we isolate them from the text itself and put them together, this fact becomes even more obvious and somehow bring memories of drawings showing evolutionary scales that have been used sometimes in natural history. The use of cartographic representations is another aspect that, anecdotic as it may seem, was not ordinary. What lies behind those graphical discourses? And, confronted with others, how valuable are they?

PROGRESSIVE DRAWING AND NATURALISTIC ANALOGIES IN CHOISY

Precedents and formation of progressive drawing

In the 40’ of XIX century, we find a background for «evolutionary» drawing: the studies of synoptic charts proposed by A. de Caumont (1841), Batissier (1845) and Daly (1845–6). These are graphical representations of buildings’ fragments showed in a chronological sequence, although their authors do not become aware of a progressive and connected evolution.

An interesting feature appearing in these synoptic charts is that different periods are expressed by a language close to that used in geology and palaeontology, for instance there are «transitional» Romanic capitals and «primary ogival», «secondary» and «tertiary». These terms, coined by Caumont and Batissier and still used by Tubeuf, could suggest the possibility of building a history of architecture similar to that of geology.
Figure 1
A comparative display of architectural fragments («tableau synoptique») by Batissier published in the «Revue Générale»

Some years later, Viollet-le-Duc will criticise this kind of classification, as it shows a discontinuous historical process. In the first volume of its Dictionnaire Raisonné, first preface (1875, p. V), he accepts that incipient studies on the Middle Age divided the art of that period «par styles primaire, secondaire, tertiaire, de transition», and assumes «que la civilisation modeme avait procédé comme notre globe, dont la croûte aurait changé de nature après chaque grande convulsion» . . . But this ages approach —with revolutions and crisis— does not adjust to the continuous model that he believes it corresponds to Gothic.

According to Viollet-le-Duc, continuity in natural history was better reflected by another model —comparative anatomy. As we can read in his article «Profil» (522–23), what happens «en décomposant un edifice du XV siècle» is that one can see, once developed, what it was only the germ of an idea in the XII century, and that:

«en présentant une suite d'examples choisis entre ces deux époques extremes, on ne saurait, en aucun point marquer une interruption. De même, dans l'ordre de la création, l'anatomie comparée présente, dans la succession des êtres organisés, une échelle dont les degrés sont à peine sensibles, et qui nous conduir, sans sobresauts, du reptile à l'homme.

Some of the drawings in this article show how Viollet-le-Duc understands this gradual process, progressive, by its details. It must be said that this «échelle» has more conceptual affinity with the archaic versions of it (as, for example, would be represented by Charles White's drawings in his «regular gradation of men») than with the evolutionary sequences of Darwinists such as Huxley.

In Choisy's History, graphical examples will be even more abundant and systematic, both in Grecian and Gothic architecture.

As an example, there is the gradual transformation of the «organe d'appui, la pile gothique» (II, 294–5). It also draws attention to how each detail of the pillar and the ribs undergo this process. Drawings show how «se succèdent et s'enchaînent les transformations progressives du membre élémentaire de la nervure» (II, 344–6). Such modifications «se rattachent par une transition sans lacunes a celles des meilleures époques». He also arranges in sequences the evolution from the cylindrical pillar to the rib pillar, until finally a sort of exhaustion is provoked and a return to the original point happens: «alors la complication devient extreme . . . on revienne à l'appareil primitif . . . »(II, 348–51). This transition is followed by the loss of the capital, that will evolve into two varieties (II, 353) and that Choisy will want to look at, as he considers it an «atrophy» processs (II, 354) (drawings have been rearranged in the time sequence described in the text, in order to visualize this successive transformation in a better way).4

To a great extent, these drawings are based in Viollet-le-Duc's theories about Gothic style. But, there is something new in Choisy. Grecian architecture also exhibits graphically its evolutionary nature. In this respect, we can see how the passing of time has introduced subtle changes in Doric order
details: that is the case with the capital (I, 315–6), which, from a point of view of strength and load support, would respond to a «sentiment instinctif des formes» (I, 316). There was also a gradual increase in the arquitrave span that had previously diminished, when stone substituted wood (I, 318–9). Similarly, the pillars in antis of temples adopted gradually the most perfect form (I, 328–9).

Of all graphics, the most interesting is the one in which (I, 302), in a coherent constructive way, we can see how the Doric order shapes progressively in stone what at first was only an imitation of a procedure in
Figure 4
Reason and deduction at work. Some examples of progressive rational improvements in ancient Greek architecture

wood. We shall go into how important this is later. Now, let's focus on a different aspect.

**Does Choisy relate these progressive visions with natural science?**

Given the similarity between the scales mentioned previously by Viollet-le-Duc and some of the graphical representations that appear in natural science, we wonder if, as Viollet-le-Duc himself, Choisy finds some parallel features in this field. If this is the case, what is the reason to establish such parallelism between natural history and the history of architecture?

In Choisy, allusions to biological processes sometimes are too general to be inspired in that moment's science. When he states that continuity of Gothic solutions derives from a logical process of progressive deduction ("sa vie est une incesante deduction où tout s'enchaîne"), he is using an analogy somewhat vague that could be compared to the classical scheme of styles as life cycles (II, 526):

> ce sont des ages qui se succèdent fatalement, comme se succèdent dans un être organisé l'enfance, l'âge mûr et la vieillesse: ainsi que les êtres vivants, l'art gothique portait dans son organisme le germe de son déclin et de sa mort.

Nevertheless, there are times when the text reveals some influences by the science of his time. For example, when he states that in Grecian architecture (I, 294) an arquitrave, a lintel, a pillar are not the appropriate places to show symbolical representations, because «ce sont des organes: aux membres actifs on donne des formes en rapport avec leur rôle». Ornamental elements should be reserved to spaces where they would not hide nor complicate any of the essential details in construction, as:

> Un signe de supériorité chez les êtres vivants reside dans la division des fonctions; de même pour l'art grec, à mesure qu'on approche de la perfection, les fonctions se localisent.

This sentence evokes what Henry Milne-Edwards had said in 1827 for the first time:

> Si nous examinons les organes destinés à la vie de relation, nous verrons qu'ils suivent la même loi de complexification croissante de l'organisation et de division du travail . . . et qu'à mesure qu'une des fonctions de cet ordre se perfectionne, les divers actes dont elle se compose son exécutés dans ces animaux par des instruments de plus en plus dissemblables par leur structure et par leurs propriétés.

This idea would be known by then as «physiological work division principle» and would be most relevant in biological debates of the second half of the century.

There was no need to be a professional naturalist to be up to date, because Milne-Edwards wrote school books as "Cahiers d'histoire naturelle, à l'usage des colleges et des écoles normales primaires" that were published from 1833 until 1877, which had a great influence in at least two generations of children (among them, Choisy's, who was born in 1841). Spencer (1877), who was read widely at the time, also could have an influence, as he developed the
transformation from homogeneous to heterogeneous principle and its relationship with arts and architecture ( . . . 27–33).5

**Why this kind of drawing should be restricted to Grecian and Gothic architecture?**

In its «Profil» article, Viollet-le-Duc gives us a clue to understand why Choisy will only create those «evolutionary» drawings just for Grecian and Gothic architecture. Only these can be defined as art, «c'est à dire, que nous la considérons comme une véritable création, non comme un accident».

So, according to Choisy and Viollet-le-Duc, Gothic architecture is a continuous logical process of progressive improvement and refining. Such a process reminds the work of nature when designing species. Men do their best in order to achieve the best possible architecture: in their own way, men are involved in an analogous genuine creative process.

Choisy’s outstanding approach will consist in studying Grecian architecture from this point of view with a much clearer determination than that of Viollet-le-Duc. For a rationalist, the obstacle in Grecian architecture is that it seems to start from an illogical idea: imitating in stone a wooden architecture. If this is true, we cannot speak of a chained logic, of a «rational» and «natural» simultaneous evolution. In fact, Viollet-le-Duc is compelled to explain that there was no such imitation, but a creation in stone from the beginning. Although this was a clever explanation, Choisy must have thought it was a bit too forced. Being honest, he must have admitted that the Greek had sinned when copying in stone a previous solution made of wood. How to state then that there was a rational and gradual evolution?6

It is worth looking at the drawing on page I, 302. What does it tell us? It shows how what initially was an incorrect imitation of a wooden construction, in fact ends up making sense, step by step. The subtlety of the Greek, their superiority and their ability to evolve lies in having posed the problem of transforming imitation into a constructive architecture. For Choisy, this «petrification» phenomenon has its alibi in nature «Autant vaut reconnaître ici un de ces phénomènes de permanence si fréquents dans l’histoire du langage et de la vie organique elle même: un type qui survit aux functions qui l’ont originairement justifié» (I, 301). An allusion that echoes another of the scientific debates at the moment: the significance of the organs atrophy.

Nevertheless, gradualism needs to be emphasized (as, implicitly, it is a superiority feature): «l’art grec

[Figures] These Choisy’s drawings unveil the gradual adjustment of form and rational construction in the Doric entablature.
débute par un excès de force et s’approche de son idéal par un progrès continu, non point par une série d’oscillations qui franchissent le but pour revenir en arrière» (I, 309), taking up again the life cycle image that he will use in Gothic: «On dirait un être vivant qui passe sans à-coup de l’enfance à la jeunesse, pour arriver en fin par un pente inévitable à une décadence qui ell-même a son éclat» (I,310).

THE ROLE OF PROGRESSIVE DRAWING IN A RATIONAL HISTORY

Confrontation between progress and stagnation in the development of a constructive system

Let’s stop for a moment and consider again, from a broader point of view, what has been said up to now. Apparently, in the forties, when Gothic starts being studied systematically, a graphical system is adopted in order to separate a building in comparable pieces, something that should allow to identify styles, ages, etc. This procedure will suggest, especially for Viollet-le-Duc, that there is a successive, gradual change in Gothic style, directed by reason (so, it makes it preferable to other kind of architecture) and similar to a sort of «natural creation». Later on, Choisy will assume this point of view and will extend it to Grecian architecture. This process is also guided by reason, successive refinement and the accord between form and constructive procedure.

This point of view introduces a division in the structure of his History. How do the rest of architectures behave?

According to Choisy, different architectural cultures are influenced by the ability to pose a relevant construction problem and solve it with the best and finest formal expression. Gothic architecture raised the problem of a «new cross vault», something that gave birth, thanks to a superior logic, to a full universe of shapes. Grecian architecture is originated by the challenge to find the best possible expression for a kind of faulty architecture that originally was a «petrifaction» of a wooden model. Its worth lies in the fact of having been able to solve all the details in a «logical and coherent» way.

The rest of architectures raised also essential constructive problems, whose technical and formal solution contributes to defining them. The difference is that they do not achieve the goal of finding a true relationship between construction and formal expression.

In western Roman architecture, for example, there is such a clear gap between form and construction, that the progressions of its expansion and decline periods have a different rhythm (I, 542). In Egyptian architecture, even as Choisy admits vaguely some sort of gradual process, «la variation est lente et continue, mais les formes ont leurs époques, l'art ses alternatives de progrès, d'éclat et de décadence» (I, 81), there is no progressive agreement between constructive form and expression: «Il semble que, dans les architectures primitives, la forme doit tenir à la structure comme l'expression à l'idée: l'architecture de l'Égypte est loin de réaliser dans sa rigueur théorique cet accord entre la construction et la forme» (I, 38).

Stagnant architectures: unsolved petrifaction

What happens in «non progressive» cultures? There is a special feature in architectures of the past that complicate the access to an adequate expression of the constructive form: they tend to originate as a petrified metamorphosis of a procedure in other materials. Choisy collects such a great amount of such cases as to seem this is a general and inevitable process. In primitive epochs, the first brass instruments seem to imitate those made of flint «par un phénomène de survivance bien digne de remarque» (I, 7). Many examples appear in Egypt: the cornice (a transposition of a solution made of cane and clay) (I, 25); sepulchral grottos (an imitation of a wooden gallery architecture) (I, 40); columns (imitating stems, originated perhaps in lacustrine architecture) (I, 41).

Other examples can also be found in Micenic art. In its peculiar columns, one can find «le souvenir d'un Poteau fait d'un tronc d'arbre planté para la pointe», while the entablature «emprunte sa forme au rebord d'une terrasse sur rondins» (I, 234–5). Architecture in India is explained similarly: «la charpente était tellement de tradition dans l'Inde, qu'aux premiers moments où la pierre est employée, la pierre est mise en oeuvre à la manière du bois» (I, 153–4). According to Choisy, this imitation is essentially so «Indian» (everything else would be
Greek, Persian or Chinese added elements) that original wood architecture could be inferred from ornamental stone arches (I, 155). In the same way, lost systems of «encorbeillement» and triangulation could be read (II, 159, 160–1). Even cornices are transference of a clay detail and certain arcades are a copy of a wood solution coming from China.  

This problem is such a persistent one, that if a regular process can be observed, it is only that of decadence, of progressive separation between form and construction, as can be found in Egyptian cornices. These are the only «evolutionary» (or rather, involutionary) drawings that Choisy defines for this type of architecture (I, 46).

Races causing the double march of History: evolutionary and petrified architectures

If all this dead weight did not cause a problem to the Greek, why was it not the case for the rest? Why were they incapable of achieving progress in a correct way? There is a racist argument to explain it, an unpleasant aspect that has been unnoticed in most

Figure 6  
Instances of petrifications contrived in different cultures that are shown in «l’Histoire
When reason (and race) fails: the Egyptian cornice as a case of progressive degeneration

In the case of India, after a first stage when there was «un esprit inventif dont sont totalement dépourvues les populations actuelles de l’Inde», a crossing must have occurred, «quelque rénouvellement de race» that may explain the inferior «imitations inconscientes» (l, 177). Choisy tends to be very critical of Semitic peoples, being those Arab or Phoenician: «l’esprit d’invention que l’Arabe pur ne possède à aucun degré» (l, 136). On the other hand, he finds reasons to praise the Persian, who, over the Assyrian, have that superiority that gives «aux races aryennes le sentiment inné du beau, si différent de ce sens exclusif du grand qui semble un caractère des races sémites» (l, 119).

To be fair, Choisy’s racism is subtle and moderate in comparison with that of authors such as Ramée, Lesueur and Viollet-le-Duc, particularly evident in this last one’s Histoire de l’Habitation Humaine. This racism explains why works about architecture and archaeology frequently refer to treatises on ethnography. Or, as in Dieulafoy, where archaeological excavations are combined with anthropometric racial studies (... 110–111).

So Choisy elaborates a scheme of History where there are two kinds of processes—the progressive and coherent processes where form and construction are integrated, and the stagnant processes—and where race has an outstanding role. This is not a trivial feature. Racist positions interfere with the way Choisy and some other rationalist authors build the development lines of architecture, the «plan» and the «cartography» of the its history.

A diagram for the history of architecture

Previous graphical representations and cartography in Choisy

The difference between history and a mere chronology consists in how history can «have an structure», an outline. We have just gone through some of this story features in Choisy. On occasions, this «history plans» unfold graphically in a way that recall those used in natural science (parallels, trees, etc.). We have also mentioned that Choisy uses maps. In this context, what’s the reason for Choisy’s preference for maps? what scientific role could they play?, how valuable are these graphs in other authors?

A century’s experience: scientific graphical representation valuable for the research about the evolution and direction of architecture history

A peculiarity in XVIII–XIX centuries’ scientific method was its faith in creating a «chart of objects» (or rather, of their graphical representations), that show a law hidden otherwise.

So, several schemes were developed: tables, parallels, trees, etc. The great difference between these and the «cabinets de curiosités» is that not all graphical orders are valid, a «natural» one must be found. If this goal is achieved, not only a law gets revealed, but also a possibility of anticipating and filling in blank spaces arises (in the same way it happened with the periodic table of elements). According to this scheme, in the case of fauna and
flora it could be possible to think of the hypothetical existence of a species to be discovered yet, or the possibility of finding a common archetype from which variations arise.

When those displays arranged visually material from different ages, hypothesis about how changes occurred could be put forward, missing links could be detected or future trends in nature could be forecast.

Those chronological displays (parallels, trees, etc.) could be tried in an architecture history, but their explanatory and scientific value is more ambiguous. Only from a very deterministic point of view one could think that any of those schemes would allow anticipating the future (although there are noticeable cases such as Daly’s). Nevertheless, their contributions are significant: it can be useful to show that progress exists in certain fields of architecture, to verify formal lineages, to compare and come to new conclusions when planning, etc.

As we said, the main problem of a «good graphical display» consists in knowing how to select the object of study in history. In principle, at the chronological starting point there could be a comparison of different types of architecture (that is the case of parallels, Leroy), or of different formal preferences (as are unfolded in perspective by Coussin), or something that would be of more interest to rationalists: construction methods.

**Graphical representations that could be used in rationalistic architecture history (chronological parallels according to constructive archetypes)**

In fact, one of the options was to create a history of supposed constructive archetypes of mankind. Coussin’s drawings (1822) are already insinuating the possibility of developing this option according to an idea, initially put forward by authors as Quatremère de Quincy, that will be very successful in XIX century: architecture has a triple origin — the hut, the cave and the tent. Men started building by fastening branches and trunks, tying cloths and furs and excavating. Lintel architecture, vaults and domes or tensile architecture (and their supposed derivations, such as Chinese architecture) respectively derive from these archetypical solutions. This argument was so convincing that it succeeded in having an influence in such prestigious naturalists as Cuvier, who assimilated and divulged it.

**Figure 8**

Ways of displaying architectural history. The archetypical models of construction and the different lines of progress according to Coussin

This must have been an attractive plan for a «rationalist». Starting from this image, a first classification of architecture could be created, with three different and parallel development lines. But this egalitarian scheme got distorted as soon as an archetype was associated with certain peoples, cultures or races, which had different capabilities and progressed at different pace (this idea could lead to tree schemes with a «dominant trunk» as shown in figure 9).

So, for Thomas Hope, *Histoire de l’Architecture* (1852, iii) there exist these three archetypes, but their development is very unequal: «Les deux premiers, stationnaires et stériles, s’arrêtent aux régions qui les virent naître; le dernier, progressif et fecund, poursuit
son énergique existence à travers ses transformations successives en romain, en byzantin, en lombard, en ogival, en style renaissance, en style éclectique en fin». Another author, J. B. Lesueur, a professor of Theory at the national school of Beaux-Arts, says that the rules of Grecian architecture are born in Egypt, while China and India are condemned to a perpetual infancy (159).

According to this, different rationalistic «evolutionary» schemes could be outlined. Some of them shaped apparently borrowing from natural science, as the Arcisse de Caumont graph or the one that will appear, in a tree shape, in the Spanish edition of Fletcher (reminding the trees of life by Haeckel).

The preference for cartography in Choisy. From parallel diagrams to maps as instruments for research in History

Choisy’s History shows too a racist outline and he’s interested in genealogy, but cartographically displayed. So, when he comments on his map of classical Grecian architecture, he says: «aussi bien

45. A. de Caumont, «Tableau figuratif des variations de l'architecture religieuse depuis le Ve siècle, jusqu'à la fin du XVIIe», dans Cours d'antiquités monumentales professé à Caen en 1830, Paris, Lancel, 1830-1841, atlas, 4e partie «Architecture religieuse du Moyen Âge», 1831, pl. XLII.

Figure 9
Architectural history as a river or as a tree. Graphics in A. de Caumont's Cours d'antiquités and in a Spanish edition of B. Fletcher’s History
Drawing, reasoning and prejudice in Choisy’s Histoire de l’Architecture

que les dialects du langage, ceux de l’architecture sont des titres généalogiques» (I, 506), and «la distribution géographique des styles répond ainsi à la répartition des races» (I, 507) What is the reason for this change from a genealogy in abstract to a genealogy located geographically and displayed on maps?

The first reason is that it agrees better with his rationalism. Choisy thought, as well as the rest of authors mentioned, that the constructive fact had a fundamental importance. But this historical impulse was not a procedure guided by ideal archetypes. In fact, Choisy explicitly shows on many occasions that he knows and rejects this line of argument.13

On the contrary, this historical impulse will stem from the invention of certain procedures that depend on a local context to appear — on elements such as the available material resources, the «mental» attitude of the peoples that live in a certain territory, their particular way to organise work. The abovementioned conditions lead to «locating» the architecture in space, they give a geographic character to the «table» of history and therefore, its new graphical display is the map. That way, a new form of «graphical table», the map, is reached.

The second reason is that the use of maps as a new tool for research was already being promoted. When Choisy writes, using and correlating at least three kinds of maps had already been considered or proposed: geological maps, trade routes (or for conquest purposes) maps, and maps for the distribution of an ornamental or typological solution.

A.de Caumont had already asked for a geographical study of architecture history in France, and had pointed at the usefulness that it would be obtained by relating the kind of stone available with the style changes which can be observed when travelling through certain areas (Histoire de l’Architecture, 251–5). In 1855, Viollet-le-Duc developed this idea in an article published in the

Figure 10
Two maps to be compared: the geology of France and the distribution of architectural styles, both made by Viollet-le-Duc
Révue Générale d'Architecture. There he proposed making a comparative study of the geological substratum in France and architectural styles.

In addition to that, Viollet-le-Duc noticed («architecture» in his Dictionary, 136) that commercial routes of medieval France could be useful to understand the dissemination and utilization of certain constructive solutions. This idea already appears in a treatise by Vermeith, who considered the possibility of developing on a map Léon Drouyn’s classificatory and typological system: «il serait facile de rendre sur une carte monumentale toute la physionomie de la région des coupoles. De même que des pierres, jetées dans une nappe d’eau, à la fois ou successivement, déterminent une série d’ondulations concentriques, qui s’étendent ou se resserrent, se partagent ou se disputent l’espace» (298).

Choisy seems to have discovered, thanks to Viollet-le-Duc, the possibilities arising from this kind of reasoning, that implies a geographical view. In «L’art de bâtir chez les byzantins» he investigated about where could have originated Byzantine art. He reached the conclusion that there must have been a crossroads of western and eastern trade routes on a Hellenic substratum, because ideas and constructive methods were also transported through such routes. He owed that to Viollet-le-Duc and he recognizes it in a footnote. It is somewhat surprising that he only then discovered the potential of geography. Nevertheless, he would have the opportunity to be more involved with that later on, because when he returned from his travel to the East, in 1876, he took charge of a course on History of Architecture at the École des ponts et chaussées, where later on he would be appointed director of maps and plans.

In his Histoire (1899), this reasoning becomes graphical, with a map where he explains more precisely the dissemination course of Byzantine art (II, 80). There he insists on the argument «l’étude que nous entreprenons tient bien de près à celle de la transmission générale des idées; et comme les idées se propagent par la grande voie de la circulation et des échanges, c’est la carte des courants commerciaux qui nous donnera la clef de ces relations . . . » (II, 81).

Choisy finds out that the correlation between two geographical data —trade routes and geographical

Figure 11
The family tree of architecture unfolded. Some of the maps used by Choisy including one probably indebted to a seminal conversation with Viollet-le-Duc while he redacted his book on Byzantine construction.
location of constructive solutions—allows him to make hypothesis about the origin and possible ramifications of apparently similar forms (their genealogy).

In some way, the rest of maps used by Choisy are originated and depend on this Byzantine art map, the first one he created and where he locates Persia as the main source, in coincidence with the racial prejudices mentioned above. Therefore, the study of caravan routes explains how certain architectural elements disseminate from Caldea and Egypt within the Hellenic geographical framework (I, p. 205). Central Asia would also be the remote central point of Mesoamerican architecture, through their previous penetration in Nordic countries (he also ventures an influence from China and Japan).

But the correlation of maps has a wider potential. Choisy discovers the surprising facts that get revealed when comparing two typological distribution maps from two different periods.

It happens so with the «surprising» finding that emerges when superposing two maps: the distribution of Romanic and Gothic architecture in Europe are complementary, «les vides d’un des tableaux répondent dans l’autre aux parties les plus remplies». The graphical method, then, allows to extract new knowledge: «l’impression qui ressort du rapprochement des deux diagrammes peut se résumer en un mot: les régions où l’architecture nouvelle prospère dès ses débuts sont celles où la place n’était prise par les architectures antérieures» (II, p. 498).

Maps make possible a reflection about the continuity or decadence of irradiating centres. In the case of Romanic and Gothic, allow defining as a historical fact the existence of a gap between Romanic and Gothic.

For Choisy, these maps achieve to build scientifically a genealogical tree: «... nous relions les monuments d’une même famille en une sorte d’arbre généalogique exprimant autant que possible leurs attaches mutuelles» (II, 498). A genealogical tree that, when displayed on top of the geography of population migrations, conquest, trade routes or geological resources, turns out to be more powerful and truthful than those outlined in the ideal space of archetypes.

CONCLUSIONS

Some provisional conclusions can be reached from this study. Choisy’s rationalism considers a superior form of architecture one in which form agrees with construction and expresses it. In this sense, he distinguishes two histories: a «progressive» history and a «faulty» history. Drawing and contemporary science have played and important role in forming and conducting this scheme.

Figure 12
Two maps that when superimposed can reveal historical facts in Choisy’s «Histoire»: The centres and dissemination of French Romanesque and Gothic architecture
Progressive architectures (Gothic and Grecian, basically), analytic and evolutionary, find more and more perfect solutions from their starting premises. Their «progressive» solutions can be displayed when comparing graphically several parts of buildings (thanks also to an abstract drawing that illustrates and generalizes a «case»). This kind of procedure reminds those used in natural science. Conceptually, Choisy seems to translate some biology principles (such as the specialization of organs) to architecture. From an ideological point of view, their scientific like drawings are instrumental in demonstrating that when architecture is rational, behaves as nature. Faulty architectures, even if they start from clever solutions, are not capable of advancing continuously, burdened as they usually are by their dependence on forms not corresponding to constructive solutions (inherited from «petrifaction») and which are repeated by routine. The background for this position is a fundamental substratum (that appears in other authors as well) that connects it with nineteenth-century racism.

With this intellectual plan, Choisy tried to outline some sort of global graphical scheme of history. In XVIII and XIX centuries, the «parallel», the «chronological sequence» and the «tree» were used as a graphical research procedure that allowed visualizing the gaps of a complete order or suggesting the cadence of progress and stagnation in architecture. Rationalist theories outlined verbally (and sometimes graphically) schemes of progress starting from constructive «archetypes».

Choisy instead inherited from Caumont, Viollet-le-Duc, the conviction that maps where the scientific graphs needed. He replaces the impulse constituted by the dependence of an archetype by the resolution of a constructive problem locally originated. This last one reveals that the best method for historical analysis consists in the correlation of «maps» (trade or conquest routes, typological maps): to study the history of architecture is also to unfold it on he space of geography.

NOTES

1. Some articles and obituary notices appeared after his death, but two generations passed until the first critical revision was written (Banham, 1960). As it could be expected, his general approach had some gaps and sometimes could seem superficial, but he characterised well the more significant features of Choisy’s rationalist approach, and he revealed Choisy’s potential influence on modern architects such as Perret and Corbusier. He drew attention to Choisy’s relevance. Some decades later, Middleton (1980) published another influential article. More recently Abriani (1991) and T. Mandoul have made new contributions focusing on Histoire de l’Architecture.

2. S. Talenti’s excellent work (2000) has served as a reference for the XIX theory, where many of our observations can be set in a context. In her book she pointed out the relationship between architectural theory and the biological sciences that need to be explored more deeply. She is also attentive to the importance of drawing as a tool and a modeller of the mind of the architect in this period. We hope that this paper could be a contribution in the same direction.

3. To explore the influence of natural sciences on Viollet-le-Duc, specifically of anatomy, see Bressani (1996). He finds a sharp difference between Viollet and Choisy in this aspect, alleging the later has been more mechanist and less attached to an organic comprehension of the architecture. In this paper we try to show that this opposition is not so clear.

4. When Choisy studied the progressive path of capitals forms, he assumed a full rational guided process and, surprisingly, he made room for an irrational «evolutionary force». At the beginning of Gothic architecture, the sculpted decoration of the capital were plant sprouts. At the end of the period matured and full-developed ones were preferred instead. Something similar had happen before in the Egyptian capitals. How the rationalistic view of Choisy can make sense of that fact? «Il semble que les architectures a leurs débuts soient portées par une préférence instinctive vers ces formes simples de la végétation naissante». He then admits some kind of mysterious formative instinct.

5. For an account of this biological principle in Spencer and its spread and permeation in architectural theory see Steadman (187–195) It’s worth noticing that in all of his comprehensive searching of the influence of the biological sciences in XIX architecture Steadman only briefly refers to Choisy twice.

6. Choisy mentions Hubsch’s version, but he «forgets» many others, as the Viollet-le-Duc’s explanation (Entretiens, vol. I, 45) This was a remarkable «tour the force» aiming to demonstrate that from the very beginning all the details of the Doric temple were conceived on stone. A contemporary review of the many theories that the «petrifaction» problem has generated can be read in Cloquet (23–28) (where he refers to a previous Choisy’s article in la Gazette
archéologique (1887, 191) Guadet contributed also an interesting solution (1902, 32–47).

7. At the end of the Century successive historical essays have accumulated a great amount of evidences of the «petrifaction» case. Eventually it was inescapable to think that the process was almost general in the ancient architectures. To explain that, and to integrate it into a coherent ideology of architecture could generate a very complex theory, full of disquisitions as it happen in the interesting section dedicated to «analyse des formes architectoniques» in Cloquet (1901, 9–36). There he displays a variegated panorama of the relations between form and construction.

8. The pivotal argument in Viollet-le-Duc Histoire de l’Habitation Humaine is plainly racist. The centre of the discussion precisely turned on the way each race has eluded or solved the petrifaction. To him is essential to know what are the potentials and the limits that each race shows when faced to an architectonic problem. The inventions that may be credited to the ingenuity of some races are seen as instinctive or unconscious. The Semites «ont inconsciemment donné les éléments de la voûte» (364), in Mexico the stone imitations of the wood structures are made «même inconsciemment» (364), while in China, the construction is a systematic routine that reflects a mind incapable of deductive thinking. That suggests that the ascent from the animal constructions to the archetypical human constructions in Coussin and other authors could be understood as an ascent from the instinct to the conscious, from the animal to the human way of thinking, a scale of mental faculties.

9. See the measures of skulls practised by Marcel Dieulafoy (110–111) as a mean of complementing archaeological data.

10. Daly (1849, 6) y (1869, 10–72)

11. The origin and formation of the theory of the constructive archetypes are investigated in Vidler (1997).

12. Charles Cuvier (1859, 341)

13. Choisy knows very well this issue, but he’s uneasy with its implications. For a long time has been assumed that the Egyptian architecture was born in Nubia, and tacked for granted that «l’architecture, originaitairement troglodyte, se serait peu à peu manifesté au grand jour» (I, 81). But for Choisy this is a mistake not to be afforded after the hieroglyphics had been deciphered. The chronology of the dynasties simply doesn’t agree. He rejects also the assumption that the Chinese architecture imitates tensile constructions (as an example of this conviction, Hope (15,16). He neglects also the idea of the gothic architecture as inspired in the galleries of trees of the German Woods, «théorie étrange à laquelle le nomm le Châteaubriand donna une

vogue momentanée» (II, 513). Instead he can see in the tents of the Assyrian kings the model for «ces cours terminées par des niches couvertes qui jouent un si grand rôle dans les palais assyriens» (I, 109–110). This kind of translations can even be found in the architecture of the Arabs, who «par une habitude de race . . . aient transporté dans leur décoration architecturale les décors de tente qui avaient été pendant leur période de vie nomade» (II, 110)

14. «Cette vue sur les origines de l’art byzantin, appartient à Viollet-le-Duc. Je l’ai puisée dans une de ces conversations si pleines d’idées et de bienveillance . . . » L’art de bâtir chez les Byzantins (1883, 158, n.1)


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