Knowing by Drawing: Anatomy, Mechanics and Architecture in Viollet-le-Duc's Drawings

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Abstract

The present study investigates the relations between technical-scientific illustration and architectural drawings in the context of European Historicism. In the thriving publishing activity that characterised the first decades of the 19th century and aimed at promoting knowledge dissemination, such illustrations take on growing importance in all fields. In such a context, the case of the renowned architect and restorer Viollet-le-Duc is significant due to the quality and consistency of his theoretical elaboration and graphic work, as well as to his undisputed critical and editorial popularity. The tireless French scholar and draughtsman theorised drawing as a fundamental means of knowing the deep structures of reality in every field.
The analysis of texts and images sheds light on a transfer of ways of thinking from the natural sciences to architecture that translates into a sort of "biological" depiction of buildings based on unshakeable rationalism founded on life sciences. In accordance with his surrounding epistemological context, Viollet-le-Duc carries out an inquiry into architecture, and medieval architecture in particular, that was based on the study of the existing relations among the parts and the relationship between conformations and functions, and was borrowed from studies in anatomy and integrated with a reading of the rational efficiency of the architectural organism in mechanical terms. Thus, did organic and mechanical metaphors attain a synthesis that is significantly mirrored in the ways of drawing.

Keywords: scientific illustration, theory and history of architectural drawing, Viollet-le-Duc, mechanical drawing, anatomical drawing.

Introduction

Starting from the 1830's, the dissemination of European technical-scientific knowledge was entrusted to the thriving publishing activity of an encyclopaedic calling that also involved the disciplinary field of architecture. Illustration played an essential role in all fields, also thanks to a simplification in paging and reproduction techniques that led to an increase in the number of images and offered a closer and more direct relation between text and image. In such a framework, and especially in France, significant reflections are highlighted between historicist architectural thinking and scientific knowledge and may be traced back to the wider epistemological context in which such reflections were developing. These connections are even more evident upon examining the relation between architectural drawing and the development of scientific illustration. The imposing theoretical, graphic and editorial work of the famous French restorer Viollet-le-Duc (1814-1879) constitutes a particularly fertile field of investigation in this sense, also thanks to the architect's renown sensibility towards the natural sciences [Baridon 1996, Thaon 1982].

The notion of organization

The tireless and versatile scholar Viollet-le-Duc was known as an extraordinary drawer a true "*machine a dessiner*" ("drawing machine") according to his uncle Delécluze (1781-1863), who was his mentor and a disciple of David

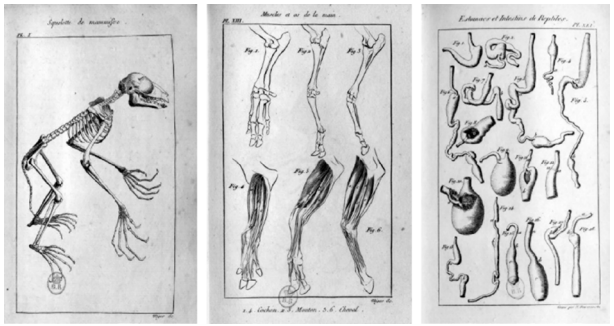


Fig. 1. Anatomical drawings. Frames from Lessons in comparative anatomy (Cuvier 1805, pl. I, XII, XIII).

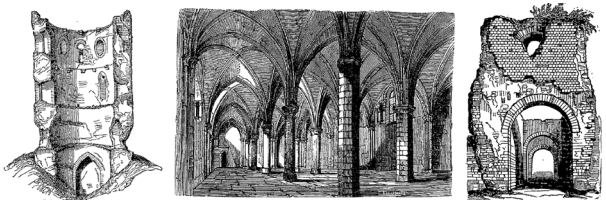


Fig. 2. Drawings of ruins and views from Abécédaire ou rudiments d'archéologie (Caumont 1858, pp. 68, 336, 376).

[Bressani 2014, p. 50]. The architect's numerous publications shed light on his multifaceted interests that ranged from geology to biology, from anatomy to planetology to mechanics. His writings reveal how the notion of organisation appears to him –in accordance with the cultural context in which he operated– as the key to the mystery of nature and life, and how he upholds it as the principle on which his thoughts on architecture and restoration are founded. In fact, Viollet-le-Duc unveiled the solid presence of an elementary principle in each of the various aspects of reality that he investigated. The definition of such a principle is only possible upon analysing its many applications in nature and referring to the appearance, in 19th century culture, of a new way of considering beings that, starting from the secret of their creation, suddenly appeared to be endowed with temporality. In the genesis of a crystal, in the conformation of a sprout, and in geological transformations, nature seemed to be guided by a profound rationality with which man, in his own creations, was called to act in sync.

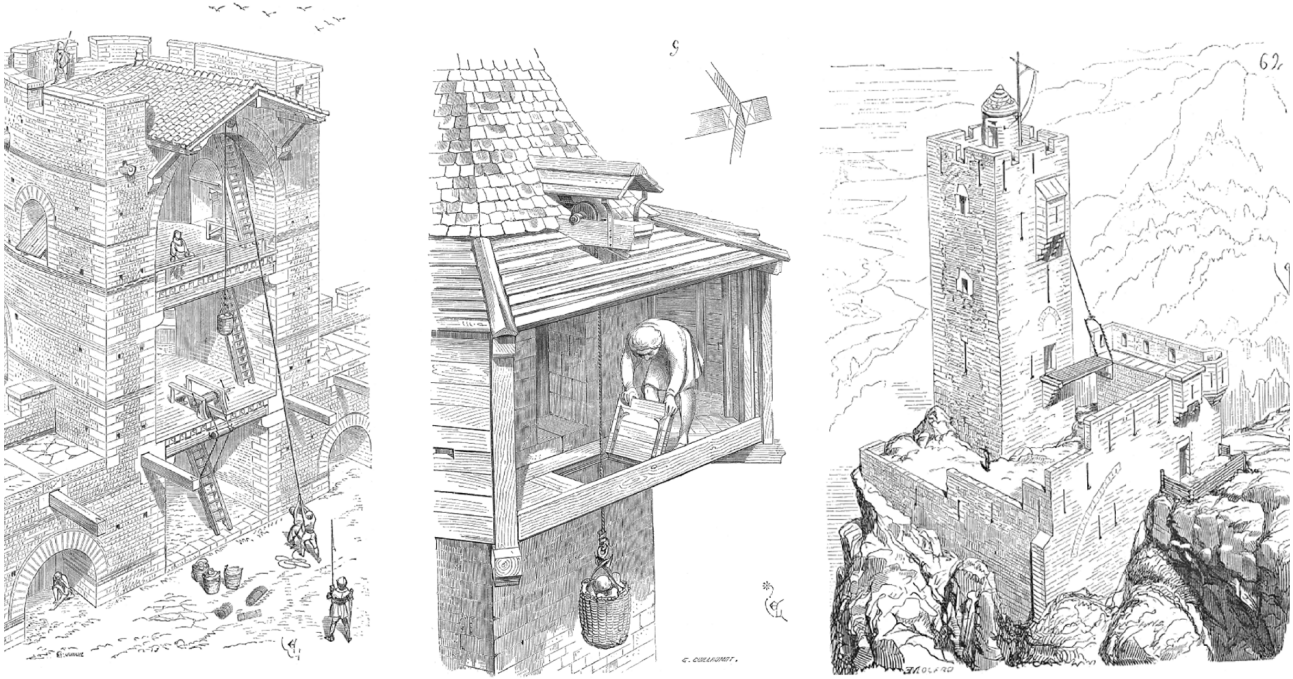
At the end of the 18th century, the natural sciences, which were at first mainly engaged in the great taxonomic endeavour based on the evidence of visible characters, began to inquire into relations instead of coexistences, and into functions instead of mere morphologies. The flat space of the chart of nature thus revealed a hidden depth from which the complex set of relations, the fascinating mystery of finality and the extraordinary variety of solutions emerged along the line of learning processes. It was now possible to make out the accessible echo of an efficient but obscure genetic process under the apparent shapes of the visible [Foucault 1978, pp. 272, 273].

In this context, Georges Cuvier (1769-1832) began his study of the relations between organs by integrating the definition founded on description and that based on function, which were initially rigidly autonomous, thus shedding light on the set of derivations, variables and dependences that lead to the immense multiplicity of living beings. Through reflection on finality, a sort of abstract conception of organs appears as a theoretical and operative instrument and is defined by the very function that it contributes to fulfilling with others. Therefore, regardless of its morphology or position, it is possible to conceive an idea of a part of the body, i.e. the organ, that serves one purpose in general, for example respiration. As a result, it becomes easy to compare and connect specimen that are apparently rather different but are actually similar due to their analogies in structure and function. The idea that hidden functions are what signal the true nature of things, and that visible traits are, on the other hand, only the final and multifaceted expression of few hidden and constant functional units, was thus consolidated (fig. 1).

Viollet-le-Duc was referring to something very similar when he claimed, in his famous *Dictionnaire raisonné de l'architecture française du XIe au XVIe siècle*, that the conclusion prevails over the premises. Since the aim of a room is an empty covered space, such a space is the goal to be reached, while pillars and walls are, and should not be anything but, the way to attain such emptiness [Viollet-le-Duc 1875, p. 198, entry «Trait (art du)»]. At the same time, the goal may be met through different means according to the time, places, principles and constructive means at one's disposal. In this sense, denying

medieval architecture any artistic dignity due to its diversity compared to classical architecture is the equivalent of claiming that «a horse is a deformed animal because its organisation essentially differs from that of a swallow" [Viollet-le-Duc 1981, p. 236, entry "*Proportion*"]. In particular, the harmonic system of Gothic architecture proceeds from the inside to the outside, exactly like the process that leads from one function to a plurality of different solutions in nature. For this reason, the compliance of outside and inside, necessity and shape, finds its full realisation in it. «In these buildings –Viollet-le-Duc explains –the outside appearance is nothing more than exact covering of the internal structure», and further on «the frame that appears externally is only the encasing of the internal conception» [Viollet-le-Duc 1981, p. 217, entry "*Proportion*"]. "We say organism –the writer summarises– because it is difficult to give another name to medieval architecture, which develops and progresses like nature in the creation of beings, starting from a very simple principle that it changes, perfects, and complicates without ever destroying its raw essence" [Viollet-le-Duc 1981, p. 323, entry "*Style*"]. When the scholar defined Gothic buildings like a stone organism, he revealed his profound knowledge of and meditation on the naturalistic thought of his time, as well as his belonging to the epistemological horizon of his time. This aspect emerged with more clarity and evidence by integrating the reading of his texts with an analysis of his drawings, both for their theoretical content, which goes well beyond the graphic description of constructive systems or the documentary portrait of existing buildings, and for their familiarity with the scientific illustrations of the time.

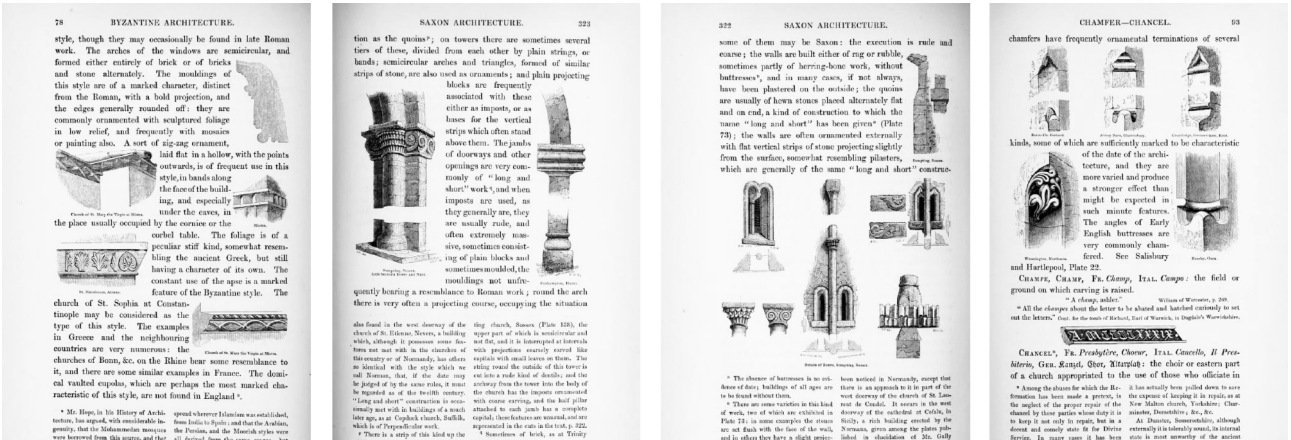
Fig. 3. Analytic drawings with clean and linear strokes from the Dictionnaire (Viollet-le-Duc 1875, vol. IX, entry "Tour", vol IX., pp. 71, 78, 162).



The role of illustrations. *Dictionnaire*'s references between medieval archaeology and scientific texts

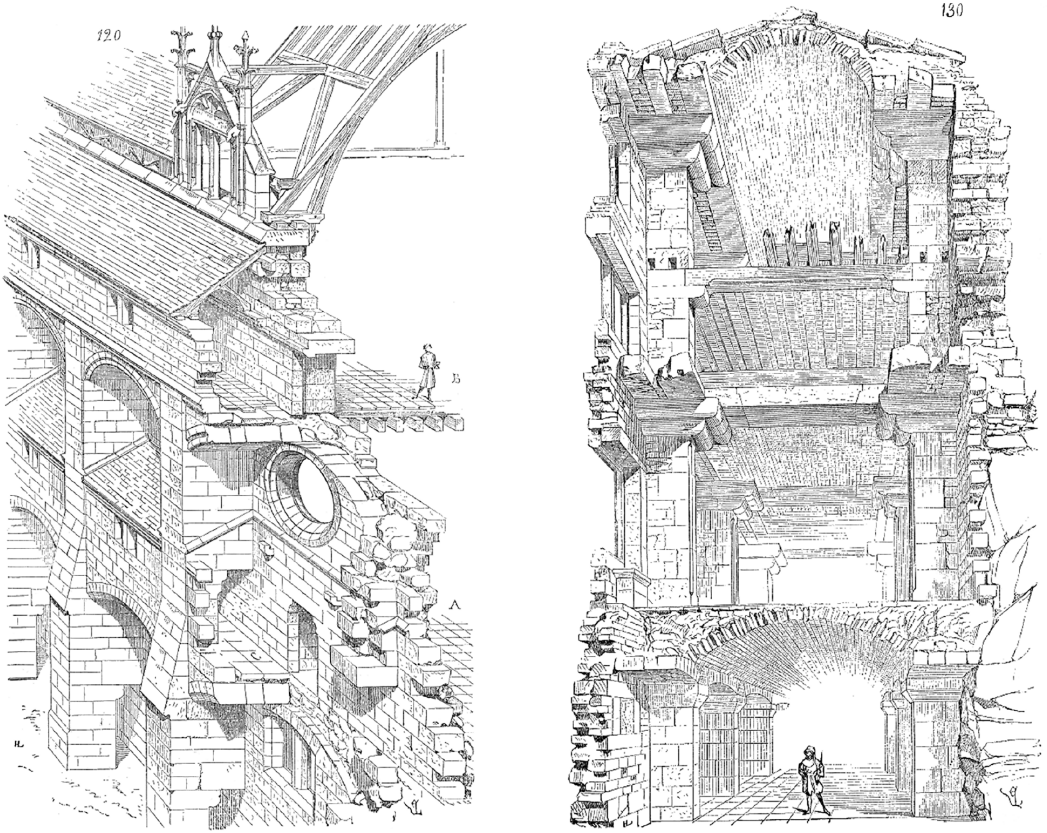
Upon embarking on the ambitious editorial project of the above mentioned *Dictionnaire raisonné de l'architecture*, Viollet-le-Duc had numerous references for the construction of a systematic illustrated dictionary at his disposal, and naturally the first and foremost of these was Diderot and D'Alembert's *l'Encyclopédie* ou *Dictionnaire raisonné des sciences, des arts et des métiers*. However, the passage from the *Encyclopédie* to the *Dictionnaire* is distinguished precisely by the change in paradigm that, upon the turn of the century, substituted the search for a hidden organisation under visible forms with the logic of a taxonomic classification; such a passage may also be read, as we will see, in the corresponding ways of representing. Among the architectural references, it is important to mention the *Encyclopédie méthodique*, which was published at the beginning of the century and whose volumes on architecture were edited by Quatremère de Quincy (1755-1849) but is not illustrated [Quatremère de Quincy 1788-1825]. In contrast, in the *Dictionnaire*, illustrations take on a fundamental role and acquire, as we will see, an essentially scientific nature, and more specifically demonstrate an anatomical approach to architecture. In fact, even in cases in which they recall picturesque ways of representation, they are always aimed at illustrating the "functioning" of the building. The extremely popular *Abécédaire ou rudiments d'archéologie* by de Caumont (1801-1873) [Caumont 1858] presents some important anticipations in this sense, for it contains analytic figures and drawings of ruins that suggest an anatomical orientation [Bressani 2014, p. 243] (fig. 2). Alongside more technical representations, the *Abécédaire*, like the volumes of the *Voyages pittoresques et romantiques en ancienne France* [Taylor, Nodier, Cailleux 1820-1878], the ambitious project on which Viollet-le-Duc himself collaborated [Leniaud 1994, pp. 18-20], presents suggestive views that are often populated with small figures gathered in prayer and rich in chiaroscuro contrasts, with the aim of recreating seductive medieval atmospheres. Bressani observed how Viollet-le-Duc adopted a more analytical drawing compared to his contemporaries, even when he was engaged in this type of "immersive" and evocative image, in the *Dictionnaire* and the drawings that were published in the *Annales archéologiques*. His stroke was clean, linear, and devoid of strong chiaroscuro contrasts [Bressani 2014, p. 245] (fig. 3).
In truth, Viollet-le-Duc's references seemed to be positioned among scientific publications rather than architectural texts. After all, the appearance of a connection between the natural sciences and historical studies on architecture, and medieval architecture in particular, was also highlighted in re-

Fig. 4. Relation between text and images in the Glossary of Terms used in Grecian, Roman, Italian and Gothic Architecture (Parker 1836, pp. 78, 93, 322, 323).



ference to other authors of the time. Buchanan, in his study on engineer, mathematician, and archaeologist Robert Willis (1800-1875), who was professor of natural and experimental philosophy at the University of Cambridge, underlined his adoption of an approach and a lexicon that had been borrowed from sciences like botany and geology, thus highlighting the existence of what is referred to as a "membrological approach" [Buchanan 2013, pp. 97-114] in the author's works on medieval architecture.
Viollet-le-Duc borrowed his visual strategy from manuals of natural sciences in which the insertion of small didactic or analytic drawings had become the norm. After all, the field of archaeology, which is particularly close to natural sciences, quickly adopted this type of illustrations which initially maintained a purely taxonomic intent in texts with an overall narrative tone. However, an anatomic orientation that had been borrowed from scientific texts and aimed at investigating ancient buildings in depth to discover their secret "functioning", progressively gained ground. This manner of proceeding found its full expression in the *Dictionnaire* [Bressani 2014, p. 243]. Its nine volumes contain more than 3700 images, all directly drawn by the author and inserted into the text to accompany the reader throughout a systematic analysis of architectural bodies. The great popularity of the work,

Fig. 5. "Anatomical" representations of buildings. Illustrations from the Dictionnaire (Viollet-le-Duc 1875, entry «Construction civile», vol. IV, pp. 215, 233).



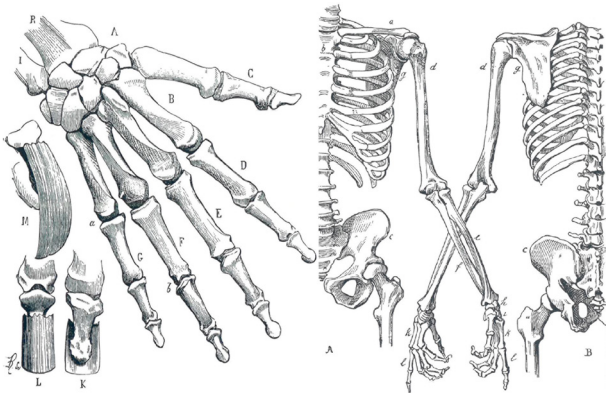


Fig. 6. Depiction of the human skeleton from Histoire d'un dessinateur (Viollet-le-Duc 1992, pp. 78, 85).

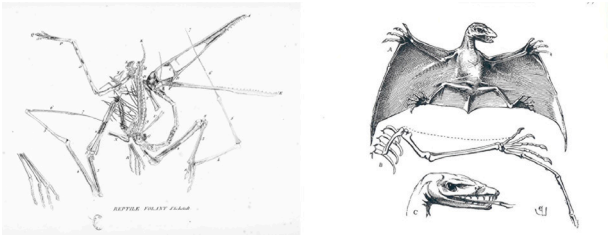


Fig. 7. On the left: "Reptile volant" (Cuvier 1812, vol. 4, s.p.). On the right: "Pterodattilo" (Viollet-le-Duc 1992, p. 77).

which was printed in multiple editions, is mostly due to this extraordinary iconographic apparatus. The illustrations and their relation to the text are not univocal, but rather were modified in the project, which started as a lexicon consisting of short articles that are, for the most part, illustrated by small schematic figures of a taxonomic sort. Its structure is similar to that of Parker's (1806-1884) contemporary *Glossary of Terms used in Grecian, Roman, Italian and Gothic Architecture* [Parker 1836], which established a standard in the terms of the quality of the illustrations and in which larger figures that competed with the test already made their appearance (fig. 4). Starting with the entry «Arch», and then definitely the entry "Architecture", Viollet-le-Duc embarked on a true graphic experiment: the figures here are larger, varied and start to take on the peculiar "anatomic" trait that characterises the entire work. In following the interaction between the text and the figures that penetrate the depths of the analyses of the buildings, thus raising one "layer" after another, the reader has the sensation of being initiated into a complex and hitherto unknown world [Bressani 2014, pp. 232-233] (fig. 5). These linear drawings, in which the chiaroscuro contrast is reduced to a minimum, are to be read as a mathematical demonstration, for the clarity of their strokes is equal to that of the writings, and images visually meld in perfectly with the text [Baridon 1996, pp. 125-130].

Anatomical and mechanical metaphor

The interest that Viollet-le-Duc directed towards studies in anatomy may be traced back to the beginning of his learning and lasted throughout his entire life (figg. 4-6). His uncle Delécluze, who represented a fundamental figure for the architect's training, enabled his nephew to meet anatomy scholars and, most importantly, to attend to their works. The *Dictionnaire*, like Cuvier's ***Leçons d'anatomie comparée*** [Cuvier 1805], conveys his desire to find the role of each object within an entirety by means of the comparative study of different types of said individual object. In fact, the author aims at grasping the connection of each part of the architectural system with its surroundings since each "organ" interacts with those near it and influences their conformation. At the same time, he showed the different types of each element that may resurface in distinct examples in space and in time, in accordance with different conditions [Baridon 1996, pp. 34-38]. The structural conception that Viollet-le-Duc sets at the head of medieval architecture, which is illustrated by examining each form in its logical and tectonic relation with the one that surmounts it, starting from the vaults and descending to the foundations, pertains to this logic precisely because each element is explained by means of the role it takes on in the system.
Within this theoretical system, the anatomic metaphor is accompanied by a mechanical metaphor, and it is interesting to notice how the architect's visual references in the field of anatomy showed a degree of affinity with the mechanical drawing. In the course of the 19th century, architectural drawings manifested important connections with mechanical drawings [Salerno 2000, pp. 11-33]. In the architect's last work, *Histoire d'un dessinateur*, the relations between architectural, anatomical and paleontological thought are made

explicit. The text describes the learning process of Jean, a young man devoid of means but endowed with a sharp spirit of observation and destined to become successful thanks to his systematic and reasoned exercise in drawing. In the story, the young man's encounter with the industrial environment was preceded by a methodical observation on nature and, in particular, by two lectures in comparative anatomy [Viollet-le-Duc 1992, pp. 71-93] (figg. 6, 7). With the same clear immediacy with which simple frames equate (human) joints and (mechanical) joints or compare muscle interactions with the articulation of connecting rods, a direct language straightforwardly overlaps the metaphor of a machine with the description of the functioning of limbs and ligaments (fig. 8). In following the precepts of rational pedagogy, the book invites readers to look at the world with great attention, to "disassemble" it like a machine in order to understand its inner laws and then be able to proceed with a new "assembling".
In the description of natural phenomena, the author openly adopts a technical-mechanical lexicon and the identification of organic and mechanic structures is clearly argued in virtue of the analogous rational nature. It is claimed that the analysis of the structure of bodies is useful for the study and understanding of machines because in mechanics man does nothing more but apply the same principles to anatomy, so "it is necessary […] study animal mechanics while trying to learn everything possible, or in other words finding the appropriate form for the object" [Viollet-le-Duc 1992, p. 90]. After all, references to the mechanical precision of animal structures –like those to the perfect efficiency that is typical of natural creations and may resurface in the highest human achievements– were already recurrent in the *Dictionnaire*: "[the bird] flies, and its wings are a perfect machine that enables it to fly" [Viollet-le-Duc 1981, p. 312, entry "*Style*"].
Machines, meant here as a set of devices capable of conducting, regulating, and directing trajectories of forces and motions, have become the model of an architecture in which formal genesis, static conformation, and material realisation attain the essential collaborating necessity that is attributed to the machine itself. In reading medieval architecture, the organic metaphor of the building is thus associated with the mechanistic one: it is a tense and balanced set of interacting forces that are conveniently led by means of a structure that is as efficient and elastic as an animal body that is precise, essential, and rigorous like a functioning machine. "The law of equilibrium, applied to this architecture for the first time –Viollet-le-Duc writes– provides a sort of life for these monuments by opposing reverse actions within its structures,

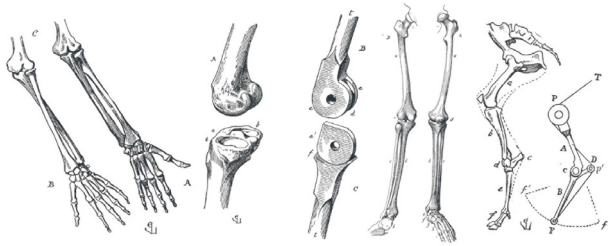


Fig. 8. Comparison between human and mechanical joints. Illustrations from Histoire d'un dessinateur (Viollet-le-Duc 1992, pp. 86, 87, 88, 91).

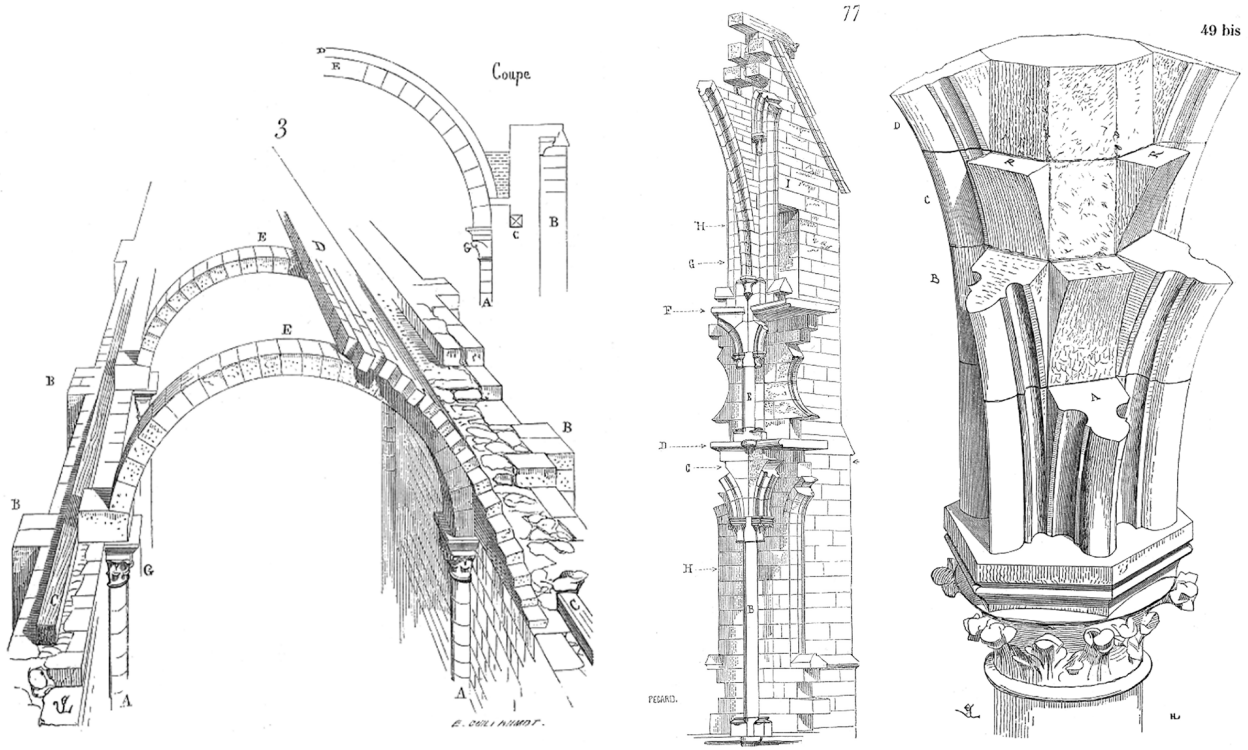
pressures to pressure, counterweights to overhangs, dismantling weights to cast them far away from the point in which they vertically lean, giving […] each stone such a function that it could not be suppressed without compromising the whole. Is this not life, to the extent to which man is allowed to convey it to the work in his hands?" [Viollet-le-Duc 1981, p. 323, entry "*Style*"].

Body and machine: the "anatomical" drawing of architecture

The architect's words reflect the certainty of the existence of an intrinsic coherence between science and nature, engineering and natural formation. Such positivistic faith was made possible by the sincere conviction of the absolute rationality of every thing that science (considered objective and neutral) could reveal. The homogeneity of the various natural and artificial expressions of the real enabled a permeability of methods of scientific investigation among the various disciplinary fields, an inquiry that Viollet-le-Duc claimed should be primarily conducted through drawings. After all, graphic representation was configured as the privileged instrument of that rigorous analysis of organisms' visible traits –including architectural ones– that enabled the in-depth investigation of the relations between hidden function and apparent forms in the attempt to identify the underlying reasons for formation processes, and consequently the founding laws of the real.
It was thus possible to bear witness to the transfer of the methods of mechanic and naturalistic (and in particularly anatomic) drawing to the field of architecture. In particular, the author borrowed two types of representation from scientific illustration: the *écorché* ("the peeling away"), which, like anatomical figures, dissects and lifts tissues in order to

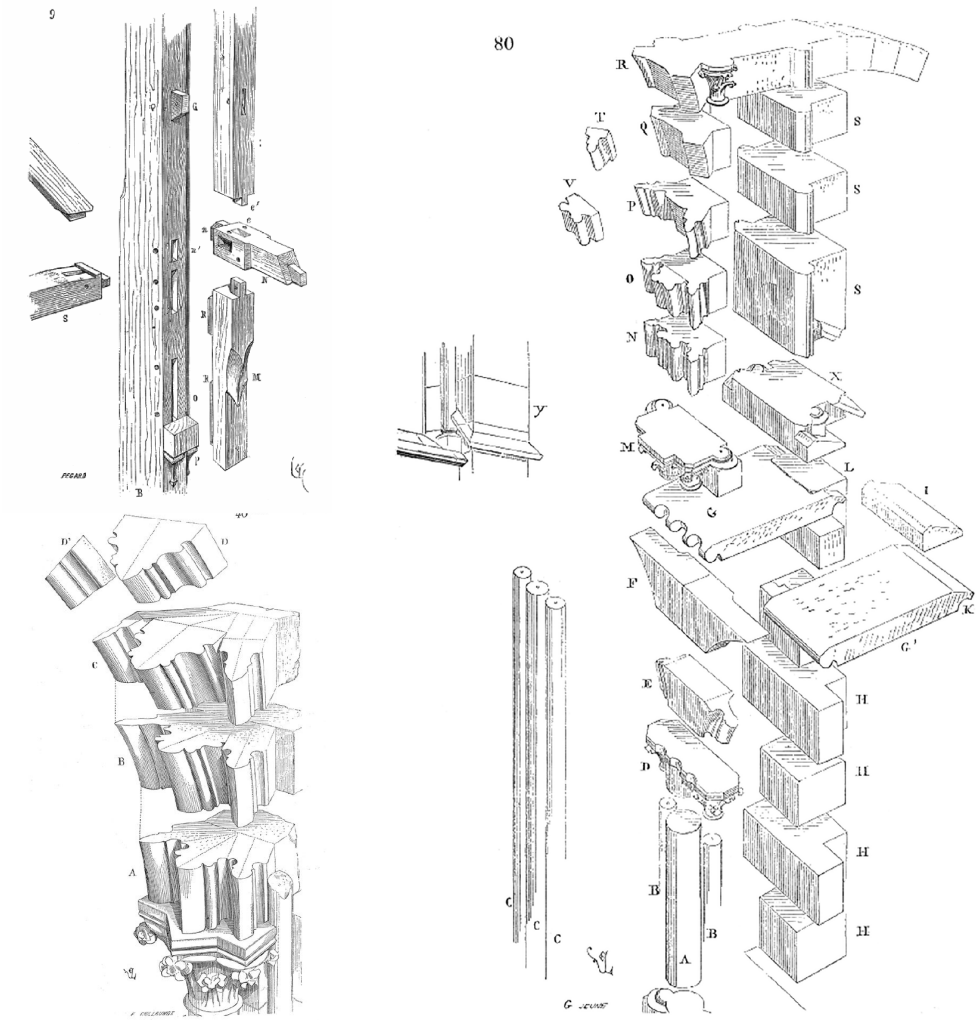
show the insides of bodies (fig. 9), and the exploded view that architects and scholars in anatomy alike borrowed from mechanic drawings.
These connections naturally had precedents: for instance, the previously mentioned versatile scholar Robert Willis, author of a series of structural studies on Gothic vaults, adopted a mechanic approach in his reading of medieval buildings, thus disassembling and analysing its parts in order to distinguish between the structural and decorative elements and compare different solutions [Buchanan 2013, p. 71]. Willis carried out interesting axonometric studies on the constructive systems of vaults that would later exercise a determining influence on Choisy. His drawings for the fifth edition of Parker's *Glossary*, which was published in 1850, included a sort of prototype of an anatomical écorché that Viollet-le-Duc later used in his *Dictionnaire* [Bressani 2014, p. 246]. It is therefore possible to unveil relations between mechanics, anatomy and medieval archaeology in other authors and contexts.
However, in the work of the French restorer, the reference to scientific illustration takes on particular significance. Under the entry "*Construction*" in the *Dictionnaire*, the author progressively penetrates into the details of the structure of the Notre-Dame of Dijon. By using the text, as well as the ordered sequence of illustrations, he led the reader to true knowledge of the object, going from the mere exterior appearance to extracting the innermost laws of its tectonic functioning. Having reached the description of the nodal point of the transmission and neutralisation of contrasting forces, he explicitly claims that he wants to "dissect" the construction piece by piece and proceeds to graphically di-

Fig. 9. Application of écorché to architectural drawings, examples from the Dictionnaire (Viollet-le-Duc 1875, entry "Construction", vol. IV, pp. 15, 94, 133).



smantle the building and then display them in a spatial order to indicate the solution to their assembly in accordance with the finest tradition in technical drawing [Viollet-le-Duc 1981, pp. 136-139, entry "*Construction*"]. This results in the renown exploded prospective of the element in which the forces of the vault and those of the buttress converge (fig. 10). This drawing summarises not only Viollet-le-Duc's entire conception of a Gothic structure in equilibrium, but also his way of using drawings as a mental act of deconstructing a Gothic building into disjointed limbs and recomposing it within a

Fig. 10. Application of the exploded perspective to architectural drawings. Examples from the Dictionnaire (Viollet-le-Duc 1875, entry «Pan de bois» vol. VII , p. 47 and entry "Construction", vol. IV , pp. 92, 140).



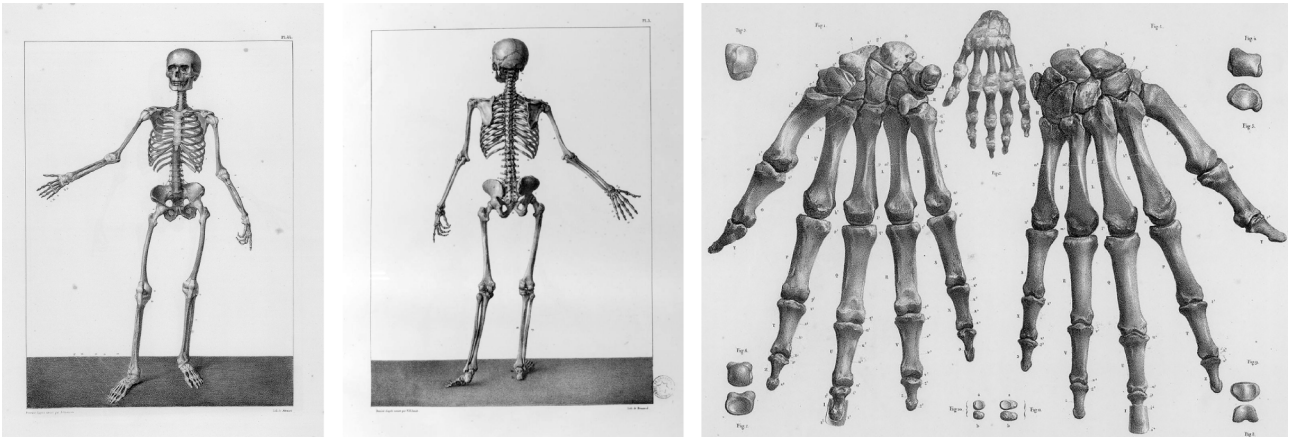
hitherto unseen entirety [Bressani 1996, pp. 29-30; 2014, p. 251]. The reference to analytical methods that had been borrowed from anatomy texts result to be quite evident here from its use of illustrations, as well as the adoption of a specific lexicon, as well as of a procedure of analysis that was inspired by scientific methodologies. In fact, although it consists in images that are perfectly consistent with the ways of architectural representation, the rigorous sequence that oversees their disposition, the analytical trait that is emphasised by the punctual use of indexes, the increasing schematisation that oversees the progressive "elimination" of layers with the intent of discovering their inner mechanisms, all led Viollet-le-Duc to conduct a true anatomical dissection in these pages.

Contemporary scientific illustration provided models to this type of depiction. In particular, it is necessary to quote the work by physician Jean-Marc Bourgery (1797-1849), whose treatise on anatomy [Bourgery 1832-1854], which had been officially praised by Georges Cuvier himself, had impressed Delécuze for the effectiveness of its illustrations (figg. 11, 12). The latter observed how the treatise's "sections" of anatomical parts induce the learning of an abstract idea despite representing real objects, exactly as a drawing made by the Monge's method projection would by emphasising the unique contribution that they bring to the understanding of the relationship of the separate parts with the whole [Baridon 1996, pp. 34-35]. In the first volume of the treatise, which appeared in 1832, there is an extraordinary exploded perspective of a human skull (fig. 12). According to Delécluze, this image summarises Bourgery's entire work, showing the articulations of each bone with the adjacent one as well as its position within the system [1]. The illustration of the skull and that of the exploded perspective of the Gothic vault share their extraordinary ability to convey a mental act. In fact, these drawings make the deconstruction and restoration processes, on which the treatise on anatomy and the dictionary on architecture are based, immediately visible.

In these depictions which aim at grasping the relations between the internal and structural conceptions and the external layers, the construction appears as an organism formed by the necessary and progressive development of superficial tissues on hidden functional nuclei. Therefore, when inside and outside, structures and encasing, and organs and tissues are visible in one, synthetic same image thanks to the skilful use of the three-dimensional cross-section image, the very secret –and almost "biological"– rationality of man's work, in accordance with that of nature, is represented.

The reference to the later axonometric cross-sections with which Choisy (1841-1909) illustrated his *Histoire de l'architecture* [Choisy 1899], is inevitable. He explicitly theorised the effectiveness of a drawing having the same immediacy in reading of a perspective while allowing the object to be measured and presenting a plan, elevation and section in one synthetic representation. Nevertheless, Viollet-le-Duc's

Fig. 11. Anatomical drawings from the Traité complet de l'anatomie de l'homme (Bourgery 1832-1854), vol. I, pl. 2, 3, 36).



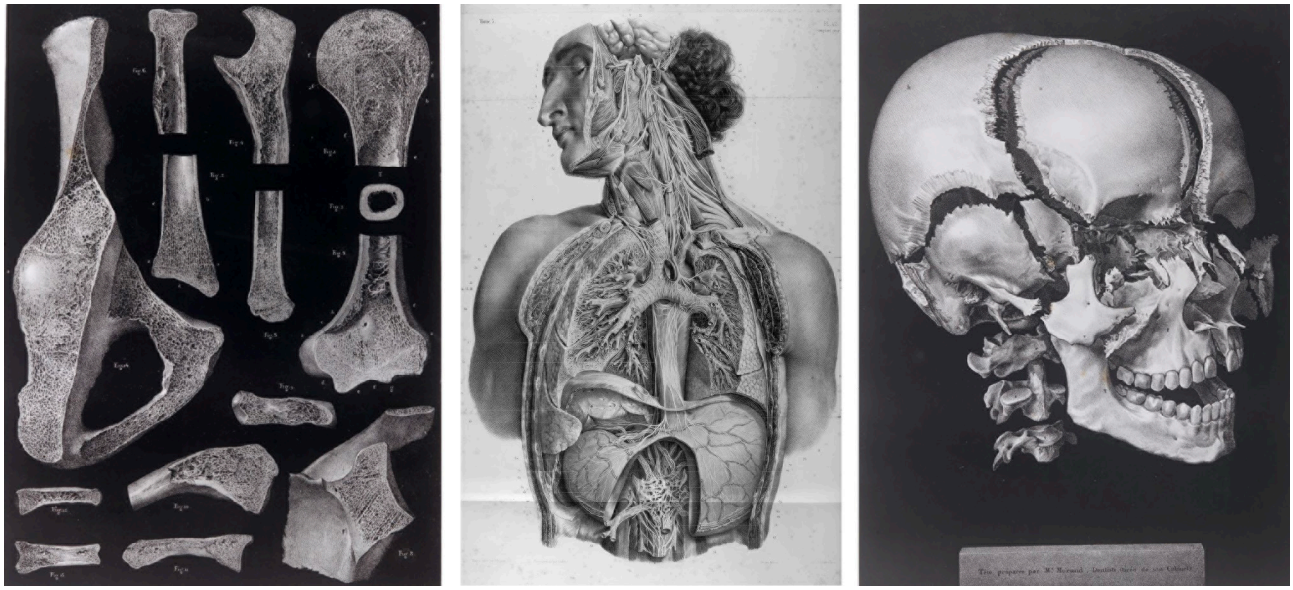


Fig. 12. Anatomical drawings from the Traité complet de l'anatomie de l'homme (Bourgery 1832-1854, vol. VIII, pl. 30, 42, 65).

drawings are not real axonometries: if extended, the straight lines that seem parallel at first reveal themselves to be converging, albeit on lengths that are incompatible with the immediate perception of the drawing. After all, in the author's thought system, there is no swerve between main internal generators and visible formal results, but rather a clear and necessary deviation. In this sense, that which is offered to be viewed has the precious function of revealing the underlying rational principle to the observer. Perspective, being a means to observe and restore the appearance of things, also becomes a means for investigating its secret functioning and intrinsic logical rigour. As a matter of fact, Viollet-le-Duc's perspectives can neither be reduced to the reproduction of simple views, nor can they be limited to the construction of evocative picturesque views but are rather built with geometrical parameters that are chosen from time to time in relation to precise representational goals. In cases in which the intent of the drawing consists in underlining the structural and constructive traits of the buildings, or in identifying its various elements and related syntax, the vanishing points actually result to be unavailable, and the representations thus become similar to parallel projections (fig. 2). The result consists in images that are aimed not so much to the representation of the object in space, as to the space of the object itself. Such images are figures that fulfil a sort of "spatial demonstration" of the object's functioning and manufacturability, a task that was traditionally carried out by axonometric projections [Scolari 1984]. Moreover, it is necessary to bear in mind that the author's didactic vocation imposes a sort of representation that must immediately be read, is realistic, does not require specific competencies and capacity for abstraction: all this resulted in the great predominance of perspectives among his illustrations [Bressani 1996, p. 29]. By adopting perspective, Viollet-le-Duc clearly renounced measurability: after all, references to sizes are rarely present in his works. In his texts, references to metric data are limited to rare graphic scales, isolated dimensions and sporadic notes, indicating the essentially theoretical trait and strictly exemplificative role of the illustrations.

Conclusions

The overview of the connections between scientific and architectural illustrations in the context of European Historicism is rather articulated and would certainly deserve a more extensive treatment that could be supported by the analysis of further specific cases, starting from the English context. On the basis of the examples mentioned in the present study, however, it is certainly possible to claim that Viollet-le-Duc's work is an emblematic case, in which a sort of "biological" representation of architecture reflecting a form of rationalism founded on life sciences appeared. Moreover, the outlined context makes it possible to claim, more in general, that the ways of representing XIX century architecture of which Viollet-le-Duc certainly constitutes a significant example for the quality, consistency in production and critical popularity, present interesting analogies even with fields that appear to be rather distant, such as anatomy, botany, and mechanics. Such similarities find their reason of being in the common epistemological context in which the authors move, and therefore in the contamination among forms of knowledge that connects natural sciences, mechanical engineering and architecture, especially in the positivist system of thought.

Notes

[1] The reference is to: Delécluze Étienne-Jean, Varieté. Traité complet de l'anatomie de l'homme comprenant la médicine opératoire par M. le D. Bourgery. Journal des dèbats, 15 Novembre, 1834, quoted in Baridon [1996, p. 35] end Bressani [2014, p. 255].

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