Petter Hellström:
“Tree of Harmony”

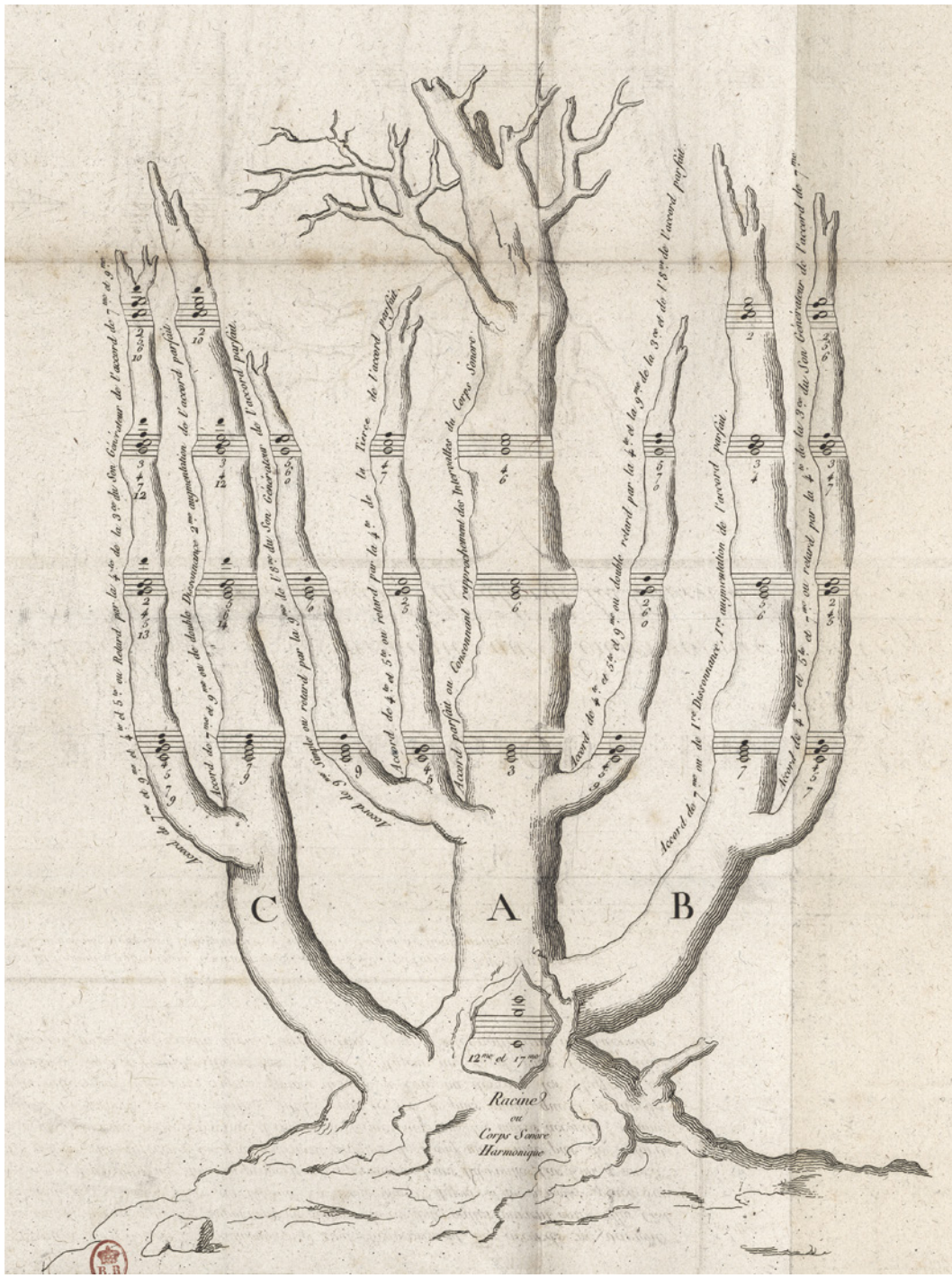
in: Eric Hounshell, Ruth Amstutz (eds.):

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SHADOW OF THE TREE

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TREE OF HARMONY Chords



Detail from Henri Montan Berton: *Arbre généalogique des accords*, second edition, Paris: Duhan (1815). Paris: Bibliothèque nationale de France.

Berton's *Arbre généalogique des accords* (Genealogical Tree of Chords) was drawn to represent "the great family of Chords."

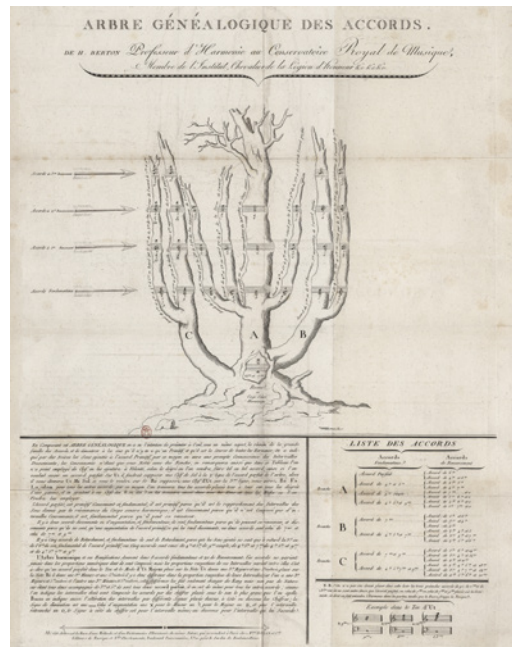
In 1807 or shortly thereafter, the celebrated composer and professor of musical harmony Henri Montan Berton (1767–1844) published an engraved broadsheet entitled *Arbre généalogique des accords* (Genealogical Tree of Chords).[1] A second edition appeared in 1815.[2] While in the modern sciences, we have come to associate tree diagrams – especially family tree diagrams – with evolutionary biology and linguistics, Berton's "genealogical tree" was drawn to represent "the great family of Chords."

In light of the profusion of historical studies concerned with tree diagrams in natural history and language studies, it is intriguing that trees produced in other fields of learning have barely been noted or are otherwise completely absent in the historical literature.[3] In the case of Berton's tree at least, this cannot be because the author is forbiddingly obscure. A celebrated instrumentalist as well as a prolific composer and a well-placed opera director, Berton was born into a family of distinguished musicians and grew up to assert his place in the contemporary musical establishment. He was a member of the prestigious National Institute as well as an Officer of the Legion of Honor. As a professor of musical harmony, he taught at Europe's leading institution for music education – the Paris Conservatory – from its foundation in 1795 and until his death in 1844.[4]



Henri Montan Berton: *Arbre généalogique des accords*, first edition, Paris: Duhan (ca. 1807). Paris: Bibliothèque nationale de France.

The only known, surviving copy of the first edition is in poor condition. The editions of 1807 and 1815 are, however, almost identical. Berton apparently remained loyal to his idea over a longer period.

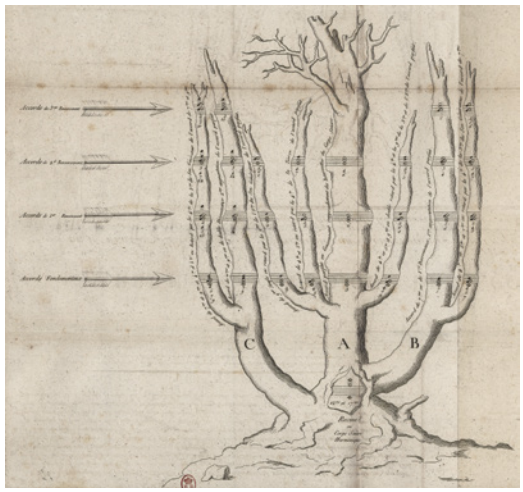


Henri Montan Berton: *Arbre généalogique des accords*, second edition, Paris: Duhan (1815). Paris: Bibliothèque nationale de France.

The only apparent difference between the first and the second edition of Berton's tree is the description of its author. In the earlier edition, Berton is presented as a professor at the Imperial Conservatory of Music. The later edition, published after the Restoration, presents him as a professor at the Royal Conservatory, a member of the National Institute, and a Knight of the Legion of Honor.

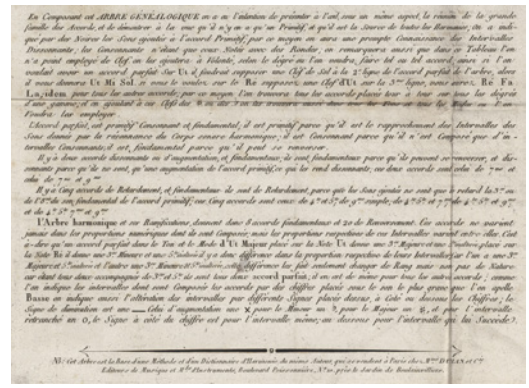
TREE OF HARMONY Roots

Why did a celebrated musician and experienced pedagogue like Berton produce a "genealogical tree of chords"? In what sense was it "genealogical"? And what was it meant to do? In an explanatory note, printed onto the poster below the tree, Berton clarified that "In Composing this GENEALOGICAL TREE, one has had the intention to present to the eye, at a single glance, the reunion of the great family of Chords, and to demonstrate to the eye [*à la vue*] that there is only one Primordial [Chord], and that it is the Source of all Harmonies [...]."[5] The tree was at the center of Berton's design. Gnarled and leafless, it grew out of a sturdy root, labelled "Root or Harmonic Sonorous Body." The tree had three principal stems or "branches," and an additional five branches or "ramifications." The main issue of branch "A" – the central stem of the tree – represented the "Perfect or Consonant Chord." In the explanatory note, Berton clarified that this chord issued directly from "the Intervals of the Sounds provided by the resonance of the Harmonic Sonorous Body."



Detail from Henri Montan Berton: *Arbre généalogique des accords*, second edition, Paris: Duhan (1815). Paris: Bibliothèque nationale de France.

The central "branch" of Berton's tree, labelled "A," had three lateral arms apart from the principal stem, while "B" and "C" had one lateral arm each, which meant there were eight "ramifications" in total. A set of arrows pointed to the chords, which were distributed across the ramifications on four distinct levels. Each ramification had a "fundamental" chord at the bottom level and "inverted" chords on the second and third levels. Four of the ramifications had an additional inverted chord.



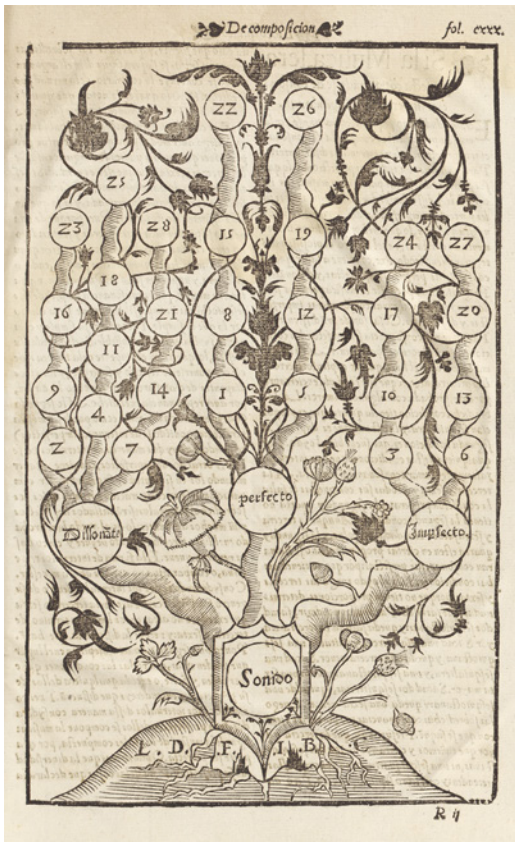
Detail from Henri Montan Berton: *Arbre généalogique des accords*, second edition, Paris: Duhan (1815). Paris: Bibliothèque nationale de France.

Berton apparently felt his readers would not know how to make sense of his diagram, as in an explanatory note printed onto the poster below the tree he gave detailed instructions for how to interpret and make use of it.

Berton's design was unconventional. The concepts and theories that informed his tree were, by contrast, perfectly standard. What Berton taught about the "sonorous body" and the "perfect chord," as about harmony and composition more generally, was largely on loan from Jean-Philippe Rameau (1683–1764). The most influential music theorist of the French Enlightenment, Rameau applied "scientific" methods to uncover the "laws" of music. The "source" of all harmony, he argued, was the "sonorous body," as Rameau believed that any vibrating, resonating body would generate a bass tone and harmonically aligned overtones, which were there even when they were not audible.[6]

TREE OF HARMONY Ramifications

In making the sonorous body the root of his tree, Berton not only followed Rameau in theory, but he also followed him in his use of metaphors. Consistently throughout his career, Rameau deployed genealogical and arboreal images in writing. Time and again, he compared the "sonorous body" to the hidden "roots" of a tree, while comparing musical harmony to the tree's visible parts. As the sonorous body "begins to resonate," Rameau declared at one point, "one sees how it gives birth to the trunk of the tree [...] which in turn produces an infinity of branches [...]: and then, above each branch twigs rise up [...] from which the flowers and the fruit are born."[7]



Juan Bermudo: *Declaracion de instrumentos musicales*, Osuna: Leon (1555). Paris: Bibliothèque nationale de France, fol. cxxx r.

Tree diagrams were used in music theory long before they were brought into natural history and language studies. Inspired by Boethius, the Franciscan friar Juan Bermudo (ca. 1510–ca. 1565) made sound the "root" of his "consonance tree."



François Guillaume Vial: *Arbre généalogique de l'harmonie*, Paris: chés l'Auteur (1766). Paris: Bibliothèque nationale de France.

Berton was not first in exploiting Rameau's metaphors for didactic purposes. In 1766, François Guillaume Vial (born ca. 1725) published an *Arbre généalogique de l'harmonie* (Genealogical Tree of Harmony), meant to facilitate modulation.

Like early tree makers in natural history and language studies, Berton did not dream up the image of a tree. He teased out already established metaphors – family relations, generation, birth and growth, ascent and descent, roots and branches – and made them visible on paper. While the outcome may seem strange to a modern reader – a "genealogical tree" that did not chart history – it should be remembered that we still today speak of chord "families" and "roots." Tree diagrams and metaphors of generation have, in fact, been at play in music studies for centuries, without this implying any temporal dimension. For Berton as

for Rameau, it appears that the ontological claim embedded in the image of the tree was one of natural principles, not one of historical development.
Rameau helped revolutionize music theory. Berton, for his part, partook in a didactic revolution. For centuries, music education had revolved around private tuition and the relationship between master and apprentice. Established in 1795, the Paris Conservatory was a revolutionary creation and the first of its kind: a state-sponsored music school where students were taught in cohorts. To facilitate this aim, Berton and his colleagues set out to develop new teaching methods. A pedagogue first and foremost, he did not draw a family tree to argue for any new theory but to help his students get chord composition right.

Notes

1 Henri Montan Berton: *Arbre généalogique des accords*, first edition, Paris: Duhan (ca. 1807).
2 Henri Montan Berton: *Arbre généalogique des accords*, second edition, Paris: Duhan (1815).
3 The only reference I have seen to Berton's tree is a short mention in David Damschroder: *Thinking about Harmony: Historical Perspectives on Analysis*, Cambridge: Cambridge University Press (2008), p. 247.
4 For Berton's biography, see Petter Hellström: *Trees of Knowledge: Science and the Shape of Genealogy*, Uppsala: Acta Universitatis Upsaliensis (2019), chapter 4.
5 Henri Montan Berton: *Arbre généalogique des accords*, second edition, Paris: Duhan (1815). All translations are my own.
6 For Rameau and his theories, see, in particular, Thomas Christensen: *Rameau and Musical Thought in the Enlightenment*, Cambridge: Cambridge University Press (1993).
7 Jean-Philippe Rameau: "Lettre de M*** à M. D****, sur un ouvrage intitulé l'Origine des sciences, suivie d'une controverse sur le méme sujet", in: *Mercure de France* 1 (1762), pp. 103–119, pp. 116–117.

Further Readings

Malcolm Boyd, Kailan R. Rubinoff (eds.): *Music and the French Revolution*, Cambridge: Cambridge University Press (1992).

Thomas Christensen: *Rameau and Musical Thought in the Enlightenment*, Cambridge: Cambridge University Press (1993).

Suzannah Clark, Alexander Rehding (eds.): *Music Theory and Natural Order from the Renaissance to the Early Twentieth Century*, Cambridge: Cambridge University Press (2001).

Petter Hellström: *Trees of Knowledge: Science and the Shape of Genealogy*, Uppsala: Acta Universitatis Upsaliensis (2019). A revised version of the dissertation is forthcoming with Zone Books.