Why French sounds so unlike other Romance languages

Sources and notes for claims made.
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Sources

Background remarks

My animation presents the history of French sound changes as a pastry recipe. It took more research and planning than expected. The general sketch relies heavily on Morin's "Histoire des systèmes phonique et graphique du français". Other big-picture influences were Perret, Huchon, Leclerc and Nyrop. Historical forms rely on Godefroy's dictionary and the glossary in Roget's *Introduction to Old French*. Derivations were checked against the *Trésor de la langue française informatisée* (TLFi) at ATILF. Other authors carry much of the weight for specific sections, such as Confiant for creoles, or Delattre and Mallet and Hualde for liaison and intonation. I'll list individual sources for beat-by-beat claims below.

I kept a second document for researching pastry. Sources for this metaphor include a number of YT channels (including Gourmandise Alya, l'Atelier de Roxane, France24, Baking Nicky and Aïda from Apprendre la pâtisserie française) as well as *Pâtisserie* by Mélanie Dupuis. And a big thanks again to those on social media who shared ideas with me about how pastry recipes are like linguistic sound changes.

Specific claims

Comparative cognates and French divergence. Though reflexes were checked in TLFi, the section recalls Mario Pei's attempt to measure Romance changedness in the old "New methodology for Romance classification". There, French "departed furthest from the original Latin" based on an "elementary, incomplete and tentative demonstration" comparing stressed vowels in seven languages to Latin. Hualde shares the sentiment that French sounds very distinct: "Impressionistically, at least, the most divergent Romance language in intonational respects is clearly French. When we get to the specifics of the analysis, how different French intonation really is from other Romance intonational systems is, to some extent, a matter of opinion" ("Romance intonation from a comparative and diachronic perspective", start of section 2).

Comparative grammar (remark cut). I originally mentioned how it's another Western Romance language with the same gender agreement, the same synthetic

future and conditional formed from infinitive + HABĒRE, even the same diphthongized mid vowels: měl > miel(e).

Pop theories (remarks cut). Throughout my life I've heard a few explanations for French's unique sounds. This must be the most frequent: it's like Latin spoken with a Celtic or a Frankish accent. Others blamed nasal vowels and R. A linguistically savvy but incomplete one: it's actually *not* unlike nearby Norman, Picard, Gallo, Walloon. In an earlier draft, I mentioned a couple, only to offer "a different theory … that strings together lots and lots of sound changes."

Latin in Gaul (recipe: dry ingredients)

Latin with Gaulish influence. All authors I cite analyze French as Latinic and Romance. Those willing to put numbers on origins (like Julien Soulié) credit Latin for over 80% of French vocabulary. A number of words are of Gaulish or Celtic origin and may have passed into Latin in what is now France. In Lewis & Short's *A Latin Dictionary* "caballus" is possibly Celtic and "camisia" is from Gaulish. The TLFi entry for "vassal" has it built on Latin "vassus" of Celtic origin, "chemin" from "camminus" is also "d'orig[ine] celte", and "glaive" derives "gladius" from Celtic, maybe Brittonic. Another example not listed in the video is "chétif". Some examples I give, but not "vassal" nor "gladius"/"glaive", are cited as borrowed Celtic items in section 5 of Harris' "French" article in *The Romance Languages*. Place names ending in -ākon > -acu(m) or even the Latin-Celtic hybrid -ini-acum > -ignac are another source of lasting influence. Fingers sometimes or often point to Gaulish for two French features beyond vocabulary; see below.

Gaulish blamed for /y/. The shift u > y was credited to Celts in the late 1800s according to Gebhardt's "La palatalisation u > ü en piémontais et en gallo-roman". Section 2 summarizes an old argument by Ascoli and Gröber for the "Substrat gaulois" hypothesis. The author then reviews the strengths and weaknesses of structural arguments and concludes that this change is too complicated to make an easy call. More study of both structural and historical elements of both Romance and Germanic varieties is needed.

Gaulish blamed for base 20, quatre-vingts. Avanzi and Thibault in "Documenter le système vigésimal et sa contrepartie décimale" warn that "le système vigésimal" is "souvent attribué – à tort – à un substrat gaulois", going on to show that the decimal numbers are not more medieval or archaic as is often assumed. Bauer's "Vigesimal numerals in Romance" recognizes upfront that the Gaulish substrate hypothesis is "not satisfactory" and concludes that they are a "medieval development".

Bad Latin. Shown are pairs of corrections (this-not-that) from the Appendix Probi, a well-known document in Romance circles. The exact text I use derives from an

archived website that repeats Baehrens 1922, which Powell's "New text of the *Appendix Probi*" calls "the last full philological commentary devoted to" the contrastive list. Powell warns that readings of the sole surviving manuscript "vary considerably". I say "wait three centuries" from the -2000 year old start of the story because this text dates to sometime after 305 (Powell's first footnote). I chose three shifts: loss of h ("adhuc non aduc" and "hostiae non ostiae"), palatalization of eV/iV > jV (confused in "lancea non lancia" and "alium non aleum") and simplification of diphthongs ("caelebs non celeps", "auris non oricla"). Syncope is also well represented ("vetulus non veclus" and "oricla" for "auricula") and called out in my earlier drafts.

Western Romance (recipe: add fat and shape pâte)

Pre-French Romance is a linguistic concoction (remark cut). Morin does not sugarcoat the hypothetical nature of linguists' "proto-français": it's "an old state, more or less imagined, called Proto-French, from which can be derived the group of Oïl Romance varieties. This linguistic state, if it ever existed, would be situated during the pre-literary period" ("un état ancien, plus ou moins fictif, qu'on appelle proto-français à partir duquel on peut faire provenir l'ensemble des parlers romans d'oïl. Cet état de langue, s'il a jamais existé, se situerait pendant la période pré-littéraire", start of section 2).

Spread out mixed pâte across Western Romance continuum. The usual term here for the Romance continuum is Ross' "linkages", which I had in earlier notes but avoided as jargon.

Lenite ptk. Stop softening took place over centuries (Jacobs & van Gerwen, "Romance lenition" 2). To shade in the discussion, the trend here was for sounds to soften between continuants. I left out a softer-than-fricative approximant (even spirant) stage often heard in Spanish dialects. See section 2 of Gurevich's "Lenition" for general patterns and *Lenition and Contrast* intro 1.2.1 for a summary of Jacob and Wetzels' pathway for French (frère but avril, where -p- > b > v > β but NOT > 0 as "underspecification" typical of lenition "to avoid neutralization"). The following centuries, pathways, and examples from French, Spanish roughly repeat Jacobs & van Gerwen:

<4th	bdg > βδγ > 0 (esp. d, g)	*avoir* (<b!), *loar*
4th-6th	ptk > bdg > βδγ > 0	*vie*, *vida*
>6th	pp tt kk > p t k	*chape*, *capa*

Those dates are early for the last round of lenition (deletion) and suggest an even application for all stops. Roget's glossary contains both "vie" and "vide". About a century ago, Berthon & Starkey proposed a very weak pronunciation of ð by 1000

and its retention in at least some varieties until around 1100 ("Tables synoptiques de phonologie de l'ancien français", table 6, E 1).

Palatalize "gent" and "cerise" ("people'' and "cherry"). These words exemplify two shifts. Morin 2.2 sketches the paths of kj > tj and then tj > t͡ʃ, t͡s. For a while, t͡ʃ as in "braz" contrasted with t͡s like in "chaz". Ceresia is "cerise" in Roget's glossary. TLFi derives from Vulgar Latin "*cerĕsia", while Turville has a fuller derivation in an old thesis on "French feminine singular nouns derived from Latin neuter plurals".

Palatalize "fact" and "lact". The "fact" and "lact" palatalization is a complex but key piece of the history: kC/gC > xC > ... > tʲ, plus the addition of an off-glide i̯ before palatal consonants (Morin 2.2, paragraph before brat͡ʃ).

Palatalize "cangiar" and "sache" ("change" and "know"). Pope's *From Latin to Modern French* derives labials BVMj > bd͡ʒ pt͡ʃ > d͡ʒ t͡ʃ > *caβja > cage, *sapja > sache (6.5.305).

Palatalize nasals (remark cut). The change nj > nd͡ʒ like extraneum > *-nj- > étrange is sporadic. It's also found in archaic verb forms like tiegne < te-nja vs tienge < ten-ja and subjunctives like prenge, volge (Urdiales "Sobre algunos voces del francés antiguo condicionados por el corte silábico").

Five short-long pairs to seven vowels. This is massively simplified for time. Morin 2.1.1 describes a pre-Old-French system where each of the seven vowels comes to have long and short variants in open vs closed syllables. Old French "*pie* 'pied' < PĔDĔM" contains the outcome of Proto-French "[i̯ɛ]" (Morin 3.1.2).

Inserting short i- (later e-) before sp-, sc-, st-. Sampson's *Vowel Prosthesis in Romance* estimates the time and place: "It is not until the early seventh century that I-prosthesis is directly alluded to by contemporary observers of linguistic usage. Geographically, I-prosthesis evidently came to be widely used across the Empire" (2.1). This process "operated on words beginning with onsets consisting of /s/ + obstruent" according to the same source. Central, Eastern and Sardinian Romance do not share this specific prothesis. Contrast Italian, like Old French estat vs Italian stato. Or Romanian, which also lost the final vowel, for a cleaner matchup: estat vs stat.

Double consonants like in Anne (remark cut from rewrite). For Morin, "*Anne* [ˈaːnə] < ANNA" is an example of "mots savants" that by Middle French lose a consonant and have the preceding vowel compensatorily lengthened (4.2). This is distinct from the earlier "tendance générale à la simplification des géminées romanes" (2.2).

Frankish and Oïl (recipe: chill, roll, cut)

Frankish France. The timing here is overly linear. Merovingians ruled before and during some of the above sound changes, and many of the changes discussed in the previous section apply well beyond their borders. The Carolingian leaders alluded to here post-date some key sound shifts and Frankish borrowings. However, the timing works well for the Oaths, showing off what would become the "oïl" variants of the "romana" language.

Gaul vs France (remark cut from rewrite). It's fine if you're feeling nostalgic and want to call it Gaul every once in a while. After all, even today in French , "Gaule" and "gaulois" are still sometimes used with present reference, though with historical connotations (and not necessarily always about *Astérix*).

Franks name the country France. The TLFi entry for "français" derives France from "*Francia* 'country inhabited by the Franks'" (my translation). Nègre's *Toponymie générale de la France* breaks it into the Germanic root "Frank" with an "unstressed Romance suffix -ia", and finds it attested for the meaning "kingdom occupied by the Franks" since the fourth century (12415, translations mine).

Borrow a few hundred Frankish words. Walter's *L'aventure des mots français venus d'ailleurs* tallies 544 words from older Germanic, usually taken to be from "francique" ("Frankish"), representing 13% of the more than 4000 borrowings that appear in a dictionary of 35,000 common-use words. Perhaps more surprising is their frequency: "of the 1,000 most frequently used words in contemporary French, some 35 are from this source" (Harris "French" section 5).

Naming very early French. Instead of Gallo-Romance (regional grouping sometimes used by linguists to separate branches) or a hard-to-locate Proto-French (product of comparative reconstruction), in my story the stages go from a Western Romance continuum to langue(s) d'oïl. Compare Morin's shift from "protofrançais" to "français central" around the year 1000 (sections 2-3) and Perret's "latin familier" to "ancien français" (*Introduction à l'histoire de la langue française*, chapter 13). The text of the serments (sources below) call it the "Roman language"; I joked this was named "hastily" before the emergence of French.

Oaths of Strasbourg. The text of the "Serments" is found in Nithard's *Historiae* 3.5. Huchon starts chapter 1 of *Histoire de la langue française* with a formatted version of the text and a photo of the passage in the manuscript. The author writes that the Romance oaths are in a "*romana lingua* différente du latin", while the Germanic version reflects the "teudisca lingua (langue francique rhénane)", or Ripuarian Frankish. Nithard calls the languages "romana lingua" and "teudisca lingua" in the brief Latin lines between oaths. Hall's reconstructed pronunciation, given on the Wikipedia page, offers a start but is not wholly consistent with other scholars I've

read. For a single example, compare Hall's [o] for the "u" in "amur" to Morin's Proto-Romance [o̯u̯] > Old French [ʊ]. Huchon sees this as the start of French, and Solodow's *Latin Alive* finds at least one "feature of French" in the text (chapter 14, section on the "Strasbourg Oaths"), but according to Roget's *Introduction to Old French* it "occupies an undefined position antecedent to both *Langue D'Oc* and *Langue D'Oïl*" (chapter 2, section "Serments de Strasbourg"). Here is a picture of the manuscript, a printed text retaining original formatting and sigla, and Huchon's modernized transcription:

> "Pro Deo amur et pro christian poblo et nostro commun saluament, d'ist di en auant, in quant Deus savir et podir me dunat, si saluarai eo cist meon fradre Karlo, et in adiudha, et in cadhuna cosa, si cum om per dreit son fradra salvar dift. In o quid il mi altresi fazet. Et ab Ludher nul plaid nunquam prindrai qui meon vol, cist meon fradre Karle in damno sit."

Sound changes in the Serments. Loss of h- > 0- in "om", softening of "aiudha" and loss of final vowels, -V > -0 in "christian" (-ŭ > -o > -0), "amur" (-e > -0), vs "cosa" are all singled out early in Huchon chapter 1. (The modern spelling of "om" is "on", compare the silent h- at the start of French "homme" derived from Latin "hominem", the same noun declined in a different case.) The vowel weakening and confusion in fradre/fradra, Karlo/Karle may indicate -e or -ə (reconstructed final vowel). The TLFi entry for "ce, cet, cette, ces" gives the etymology of "cist (< ecc(e) istum)", including a contracted spelling "eccístum". Godefroy lists "cest" as a variant of "cist"; while for Roget "cist" is a variant of "cest".

Germanic Frankish accent. Solodow sees in the Serments at least one clear modern French feature: "The feature that most clearly stamps the Oaths as French, and no longer Latin, and not Italian or Spanish either, is the fate of the final syllables: most unstressed final vowels are lost. This is probably due to Frankish influence. The Germanic language stressed the accented syllable so heavily that the one following was weakened, even to the point of disappearance" (*Latin Alive*, "French" chapter 14). While Solodow is in good company in attributing the accent to Germanic, Noske stresses that the evidence strongly disfavors this traditional borrowing explanation: "[L]'accent d'intensité fort du gallo-roman ne peut avoir de source francique, parce que... le francique ne peut avoir eu d'accent d'intensité fort et que la règle d'accentuation de l'ancien francique (avec l'accent sur la première syllabe de la racine) n'a pas été empruntée" ("L'accent en proto-français", section 5).

Germanic Franks blamed for /u/ > /y/ (remark cut). Along with the Gaulish Celtic influence earlier, fingers have pointed to Frankish as the source of this sound: "En effet, selon les descriptions traditionnelles (cf. entre autres, Von Wartburg (1946) et Haudricourt et Juilland (1949)) la naissance de la voyelle u en français devrait être

considérée comme causée par l'influence germanique" (Jacobs & Kusters, "A propos de la 'voyelle verte'"). See remarks under Old French /u/ > /y/ for more.

Frankish h. Assessing the consonant inventory around 1200, Morin theorizes a silent Latin h-, but a phonated /h/ in Germanic loans ("‹h› est comprise comme une «aspiration»: elle est en général muette, mais a certainement aussi la valeur secondaire [h] dans les emprunts du latin au germanique, comme *halla*, *hansa*, ou *helmus*") (3.3). This second /h/, sometimes entirely Germanic-derived like in homard, sometimes added to a Romance word like alt > haut (influenced by Frankish hauch?), has consequences much later in Contemporary French liaison.

Devoice final consonants. Morin's "Histoire des systèmes phonique et graphique du français" mentions general word-final devoicing, including grand- to "[grant]" and final -ð to -θ ("[θ] est une variante en fin de mot de [ð]"), below the consonants table in 2.2. Roget's glossary lists the variants "brief, bref", which TLFi derives from Latin brev- and finds the forms "*bref, brève* et *brief, brième*" still competing with each other in the 16th century. TLFi derives "oeuf" from popular Latin *ov-, with a complex early history. Morin's sketch of proto-French could support something like [u͡ɔv] > [u͡ɔf] (2.1.1, 2.2), that diphthong later shifting to yield [u̯ɛf] in Old French (3.1.2). Godefroy's dictionary lists the collective "ove, *oeuve, ueve*" and in the complement there appears a headword "uef" with quite a variety of spellings in period texts.

Glide L. The shift from Vl to Vu̯ yielded a large set of diphthongs and even many triphthongs (Morin 2.1.2). For that author, citing Straka, "TALPĂM" already becomes [ˈtau̯pa] in the seventh century, and from there Old French "talpe, taupe" (last paragraph in 2.1.2).

Mid diphthongs. Long (open-syllable) allophones of ɛ and ɔ early on became "[i͡ɛ, u͡ɔ]", while in the same environments diphthongs possibly emerged for other mid vowels: "[ei̯] pour /eː/ ou [ou̯] pour /oː/" (first and third paragraphs of 2.1.1).

Other pre-French changes (remarks cut). The "fact"/"lact" examples probably sound like [fatʲ] before the shift VCj > ViCj expresses an intermediate -i- in [faitʲ] (Morin 2.2; see Western Romance palatalization above). All vowels lose length distinctions except eː (Morin 3.1.1, but this as by the end of 11th century).

Oc vs Oïl vs Si. Perret attributes the medieval three-way classification based on affirmative "yes", "langues de *si*", "d'*oïl*" and "d'*oc*", to Dante (chapter 1, section "Moyen Âge : la reconnaissance des parentés"). Writing in the 1300s, Dante separated Western Romance speakers by their affirmations: "nam alii oc, alii oil, alii sï affirmando locuntur" (*De vulgari eloquentia*, book 1, 8.6-7). Oc features are represented by a wide net of variants grouped under the names Occitan and Catalan (where the affirmative is now "sí" but historically also (h)oc). Dialectology and variation in the north gives the clearest picture of oïl, too (versus traditional

philology, since only some formal writing survives, often under unusual circumstances like Strasbourg). Rothwell's review of Pope's *From Latin to Modern French* cheers on the horizontal approach to understanding oïl: "the whole of France is now covered by a close-meshed network of linguistic atlases giving a picture of the evolution of French parallel and contemporary to that presented by traditional philological studies... These linguistic atlases, together with the many essays on linguistic geography to which they have given rise, have added a new dimension to our understanding of the way in which French has developed by concentration on the living speech of country dwellers in contemporary France rather than on the literary remains of past centuries." As Guylaine Brun-Trigaud describes in "Le Croissant : un carrefour linguistique", there also exists a heterogenous croissant (the shape not the pastry) between oc and oïl where speakers blur features of both.

Oïl varieties and French actually not so unique (remark cut). In an earlier draft, at this point "we stumble across one of French's open secrets to sounding so different: it's not unlike every Romance language. Study some Chti and Wallon!" For a joyful if explainer-y comparison, flip through Francard's *Wallon, picard, gaumais, champenois*. Or bring up that big wiki we all know in Picard or Walon. From Gallo to Jèrriais to Burgundian, the names are plentiful, examples relatively few but with a bit of work findable. If you speak or have studied French, once your eyes adjust you may be able to puzzle out large chunks of text without prior study, though you may find this harder to do with speech.

Old French (recipe: dock and bake)

Old French not unified (remark cut). Continuing from remarks about oïl varieties, in an earlier draft I described Old French as "an umbrella word for many varieties of oïl captured in writing and spelled many different ways over three hundred years." Even after refashioning this into a pastry recipe, I said that this stage "won't look uniform, more like a mixture of Oïl varieties spelled various ways for centuries." Morin tabulates spelling trends across centuries of regional oïl varieties (3.3). Even a glance at Roget's glossary will give a sense of Old French variation. Perret describes it as not a very uniform language, for example the verb "aller" has three present subjunctive forms in Old French: "L'ancien français est une langue beaucoup moins uniformisée que le français moderne... (un verbe comme *aller*, par exemple, a trois formes de subjonctif présent : *voise, alge, aille*)" (*Introduction à l'histoire de la langue française*, chapter 3.4). The traditional story tells of the emergence of a Parisian "Francien" oïl variety; Morin instead posits a koiné. However, Lodge disagrees with both notions (more at the end of this Old French section). Perhaps it suffices to pass along the warning that Wiktionary contributors put atop the Old French verb template: "Old French conjugation varies significantly by date and by region."

Palatalize /k/ > /t͡ʃ/. The north vs south isogloss references the "Joret line". Morin quickly mentions the change and gives the example of "chat [t͡ʃat]" from "CATTŬM" (3.2; note the presence of a final consonant still). This is how the name Charles derives from "Kar(o)lus" (with a nominative case -s; the Serments had Karle/Karlo ['karlə]). Later spellings include Charles-Magne (Charles-Great) as in a note in Rousset's *Les interests présens des puissances de l'Europe*, volume 3, chapter 5, page 355. Lodge's "« Francien » et « français de Paris »" shows an isogloss for /k/ palatalization, leaving Latin /ka/ unpalatalized in only the northernmost varieties. A similar shift happened with the voiced /g/: "En Picardie et dans la partie nord de la Normandie, le [ka] latin demeure non palatalisé, tandis qu'ailleurs dans le domaine d'oïl il se palatalise... [ga] > [dʒa] suit une trajectoire parallèle (voir *ALF javelle, gerbe, jardin*)" (section 3). I'm unclear on the relation between the g > j change and Medieval Latin jardinus (see entries for gardinage ~ jardinage in Godefroy's dictionary). For a bit of fun, compare Wiktionary conjugation tables for both Old French changier and cangier.

Multiple /a/s to /e/. The variants mere ~ medre ~ madre, cangier ~ changier, chief ~ chef, chose ~ cose, chastel, cheval ~ chival ~ caval, chier ~ cher, aigue ~ ague ~ awe ~ ewe are in the glossary of Roget's *Introduction to Old French*. For chen ~ chien vs can, the TLFi has Latin "canis" changing to "chen" by 1100 and the online Dictionnaire de l'Occitan Médiéval gives the variants "caṉ, cheṉ, chiṉ" from Raynouard's 1836 dictionary and Levy's 1894 Provençal vocabulary. (Across modern Oc there is similar variation.) According to Morin, it's by the middle of the Old French period that the Proto-French vowel length distinctions (described above for Western Romance) were lost, though closing of [aː] to [eː] leaves the old language with a single renewed length contrast between /e/ and /eː/ (3.1.1). Gil Sáiz gives "aimer" verb forms as examples of the Bartsch Effect when tonic and open: ames > aimes vs amer > amer ("Les graphies des diphtongues en ancien français", section 4). Gil Sáiz dates this change quite early: "Ce processus a lieu entre la seconde partie du Ve siècle et le début du VIe siècle" (3.3.3). In more detail, specific a > e changes range from the 6th-13th, though note two competing pathway explanations (3.1.2.3). Bartch's a > ie for open tonic a has disputed pathways, but yields chief and laissier, in contrast to the palatal Cja > Cje change even in unstressed environments: cheval, chemise. Morin notes that these are tricky to relate to the generalized a > e in any environment: parl/e/r.

Final stress, single syllables and a > e (remark cut). Stress patterns and unstressed weakening already left Old French with the oxytonic shape of later French words: "À l'époque, tous les mots en français sont déjà oxytons, c'est-à-dire, l'accent frappe le dernier son vocalique du mot" (Gil Sáiz, section 4 note 34 on amer/aime paragraph). In different verb forms, this left different vowels open for the Bartsch shift, like aime (áme > /e/me) versus amer (amár > am/e/r; same section by Gil Sáiz). The stressed root shift reminds me of verbs like treuve/trover or veut/voleir.

For "amer" this difference has since been regularized away (apparently extending Bartsch to unstressed forms!), so the verb is today consistently "aimer" with "aim-" across all forms.

Old French /u/ > /y/ and /o/ > /u/. In much of oïl /u/ was moving forward in the mouth to /y/ and /o/ closing in on /u/. (See Celtic and Germanic influence hypotheses earlier for /y/.) In Buckley's relative chronology "the fronting of /u/ is later than palatalisation of K, perhaps starting in the eighth century", otherwise /y/ would have palatalized /k/ ("Gallo-Romance palatalisation" 2.2). Calabrese thinks "substratum theory" and "structural pressure" explanations for this "peculiar sound change" are "outdated" (introduction to "The feature [Advanced Tongue Root] and vowel fronting in Romance"). For Calabrese, front-round vowels heard in Altamura Pugliese are motivated by two optimality constraints involving backing, rounding and notably ATR, an explanation that could apply to other cases in Romance like French. Morin 3.1.1 sketches both shifts by end of 11th century, where /u/ becomes /y/ and the path for /o/ is first to [ʊ], though many linguists transcribe Old French with "la voyelle fermée [u] qu'elle finira par devenir" ("the close vowel [u] that it will end up as"), giving French back an /u/ that /y/ had taken away.

Oïl to oui. Besides the phonological /o/ > /u/ path sourced above, lexicographically TLFi derives the headword "oui" from "*oïl*". That word is from Latin "hoc" (yes, the very same word behind "oc") but is "reinforced by the personal pronoun *il*" (TLFi entry for "oïl", translation mine).

French known as Wīwī in Māori (remark cut). The headword appears in Te Aka Online, which I've cited in my sources docs before. Besides the fun aside, Māori ends up at this point in the tale for two reasons: the term continues the old tradition of naming French language varieties using their word for "yes", and early Māori migration to Aotearoa may fall within a century of this story beat! (Compare the usual date for the end of "Old French", 1300, to the dates in Pei Te Hurinui's "Maori genealogies" and "Mass migration and the Polynesian settlement of New Zealand" by Walter et al.)

Not from a single Francien variety in Paris, actually from social changes. The 19th-20th century proposal for a single Île-de-France variety at the historic root of standard French is often challenged both for linguistic and social reasons (Morin 1.1). The struggle to identify a single Parisian linguistic identity, and the presence of Picard features, even applies to texts from the very end of the Old French period: "la langue de la Cour sous Philippe Auguste aurait été une forme de koinè intégrant des traits des parlers des nombreux familiers de diverses régions au service des Capétiens, à laquelle il donne le nom de «picard-francien» parce qu'elle incorpore certains traits picards" (Morin 4.1, following Robson). However, Lodge sees that the 1980s overthrow of the Francien theory replaced it with a new orthodox theory deriving French from a medieval supra-regional written mixture of several dialects

("« Francien » et « français de Paris »", section 1). Russo thinks that a mixed dialect is unlikely before the 1200s: "En Gaule, une *koinè* avant le XIIIe siècle au Moyen Âge est très peu probable, étant donné que la *scripta* de Paris et de l'Île de France ne gagne son influence qu'en 1200, période jusqu'à laquelle il est correct de parler de dialectes de l'ancien français" ("La dialectalisation de la Gaule au Moyen Âge"). Lodge reviews several isoglosses and concludes instead that a spoken contact variety ("koinè parisienne orale") emerged from the sociolinguistics of a dynamic, growing Paris undergoing "l'urbanisation exceptionnelle" in the 12-13th centuries (section 5).

Middle French (recipe: finish case, prepare caramel)

1300 French gaining prestige. Morin sees a mixed French as the court language of Philippe Auguste (4.1), though the written language was still directly dependent on Latin's graphic system ("sous la dépendance étroite de celui du latin", 4.4). This video nudges earlier and compresses the linguistic period for Middle French (very roughly 1250-1500) to profile changes happening during and after the Renaissance.

Shift diphthongs. These are among the changes profiled in Morin 4.2. M[e̯i̯] becomes m[o̯i̯] then m[u̯ɛ]. Puet ~ peut becomes [pøt], although sometimes ue simply becomes e like avuec > avec. Fact/lact get another outcome of a shifting [e̯i̯]: fɛt, lɛt. Confounding predictability, the shifts e̯i̯ > u̯ɛ and e̯i̯ > ɛ can even be heard in the same environment: "FRǏGǏDĂM" > "[ˈfru̯ɛdə]" but "RǏGǏDĂM" > "[ˈrɛdə]", not *['ru̯ɛdə]! Other changes and variations are hard to explain, like main e̯i̯ ~ ɛ̯i̯, vrai e̯i̯ ~ ɛ̯i̯ and vraie ɛ̯i̯ ~ a̯i̯ (still Morin 4.2).

Fashionable disoit actually disait (remark cut). With Picard influence, alternating u̯ɛ/ɛ outcomes provided some of the reasoning behind quaint old spellings like "*(il) disoit*", which despite appearances really did sound like "[dizɛt]" (Morin 4.1).

Nasalize [bʊn] to [bõn]. I don't give timing for the start of nasalization. According to Morin, the contrast won't become phonemic until after this period, and even then is subject to some variability (Morin 5.1.2). Terry & Webb assign the origins of nasalization to Old French, vowel change and nasal dropping to Middle French, and the full modern phonological nasal vowels to post-1600s French ("Modeling the emergence of a typological anomaly", section 2). Though I pronounce something closer to Middle French [bõⁿ], my transcription used a less progressed [bʊ̃n] only to keep the visual simple and add a nasal above the onscreen vowel (see the pathway for "*bon*" at the start of 5.1.2).

Long vowels seep out. Before settling on pastry, I thought of this step as a muffin. I retained the word "seep" from that draft. Here is my mother's feedback:

"blueberries in a muffin don't really 'ooze' or 'seep' so much as break apart. To avoid that blueberry stain, coat them with flour and put them in at the end."

A new set of long vowels emerges. Renewed length distinctions have at least the six sources listed in Morin 4.2; I chose two that I find interesting: "*goste* [ˈgʊːtə]" vs "*gote* [ˈgʊtə]" (list item 1 in 4.2) and "*seüre*" with "[-yːr(ə)]" ("contraction de suites vocaliques, comme... *sûre* < *seüre*" in 5.1.3). (Morin gives "*veële*" > "vêle" as the vowel contraction example in 4.2.) I like how these examples show off two of the complex historical changes behind later circumflex spellings (modern "goûte" and "sûre"). For an extra taste of the four of six lengthening changes not mentioned in the video, [ai̯], [oi̯] + [z] > [ɛːz] left the first vowel long in "*plaisir* [plɛːˈziɾ]" (4.2).

Dissolve complex consonants. Deaffrication and delabialization are found in Morin 4.3. The changes [t͡s] > [s] and [d͡z] > [z] are represented with cerise in the video. Their palatal parallels are represented by sa[t͡ʃ]e, sa[d͡ʒ]e > sa[ʃ]e, sa[ʒ]e in the animation. Quand and qui drop their labial [w] component to become [kãnt] and [ki]. These shifts were neither simultaneous nor complete in oïl: Walloon tch and dj (more on them below), Île de Serq d͡ʒ but ʃ, Walloon kʷ. Thanks to these, ce/se are pronounced the same, and English who borrowed earlier chief will get a new shot at adopting a later version of the word when it sounds like chef.

Walloon tch, dj (remark cut). Morin points to the Walloon change of [t͡s] > [s] but retention of affricates as examples of how affricate and labial simplifications weren't generalized (4.3). "Tchestea" appears as Eastern "tchèstê" in Stasse's *Dictionnaire populaire de wallon liégeois*, while the Old French for château is "chastel" or "chasteau" in Roget's glossary.

Middle French spelling. Morin reviews the challenging graphic representation of these changing sounds in 4.4 (-sC- and qu-/gu-, and the breakaway of a diphthong subsystem) and 5.3 (a small number of silent consonants that will increase after the mid-14th century). Although I will mention major consonant loss in Renaissance and Early Modern French, the trend was well established in Middle French. The silent p in "*escript*" is called out in Morin 6.3, but timing the fall of its two other silent letters is reasoned out from 4.2 list point 1 and the "amuïssement de nombreuses consonnes finales à la pause" in 5.2.

Spelling of mieulx and beaulx (remark cut). These come from the pages of Rabelais' *Gargantua*. Early in the period, the "eau" in beau represents a "triphtongue de valeur relativement variable [e̯aɯ̯] ~ [e̯aɯ̯] ~ [i̯aɯ̯] < [ɛɯ̯]", while "ieu" is already "i̯ø" (Morin 4.2), and by 1600 the singular "beau" sounded like "[be̯ɔu̯]" (5.2). The -au- and -eu- owe their existence to changes from an earlier /Vl/, so the insertion reads to my eyes like a charming anachronism. Morin attributes l-insertion to the phonological change that left syllable-final l weakened even when reading Latin,

which conditioned writers to add an "<l> muet" after vowel digraphs where -u represented a glide from original -l, like in "crueuls" (4.4).

Sçapvoir (remark cut). This spelling hasn't left my mind since my teens when I read it in Harris' "French" chapter. It melds the sage wisdom of sapere (savoir) with the science of scire (a lost verb in Western Romance). While language enthusiasts make a fuss about it in English, I've yet to find it in older printed texts or manuscripts (though I can find "sçavoir").

Renaissance French (recipe: add caramel to shell)

Renaissance French. Instead of splitting Middle from Classical French around 1600, I selected a breakpoint in the Renaissance. This fits with Perret's overlapping and branching varieties of French in the same period. My periodization in the animation flows from a few major trends, including the dropping of final consonants (after the mid 1300s), the development of nasal phonemes (1500s) and the retention of vowel length distinctions (through the 1600s).

Melt away more sounds at the end of words. Observations from mid-millennium grammarians (like Meigret) give insight into changes that won't be registered graphically yet including "délatéralisation du [ʎ] palatal > [j], affaiblissement de [s] en finale de mot, de [z] à l'intervocalique et [ɾ] dans toutes les positions et amuïssement de nombreuses consonnes finales à la pause" (Morin 5.2). Loss of final schwa did not necessarily level grammatical differences at first: "*sûre*" could sound like [syːɾ] while "*sûr*" was [syɾ] (5.1.3). Bonus note: Gussenhoven & Peters explain the unusual French plural disfix or "subtractive morphology" as arising from a change in the singular's vowel since "the lowered vowel in the singular is independently conditioned by the presence of a coda consonant" ("Franconian tones fare better as tones than as feet" 3.1).

The stage is set for a major French feature (remark cut). Most of these shifts already have roots in Old French. The Renaissance accent falls on the last syllable, like aime [ˈɛm] / amer [aˈme]. Adding elision only heightens the effects: losing length, focusing on stress and melting post-tonics off eventually set French up for some of its most resounding features (Mallet's "La liaison en français" 2.17; see liaison below).

Nasal vowel phonemes. Morin postulates a phonological nasal vowel inventory by the end of the 1500s, with nasalized monophthongs and diphthongs derived from earlier allophonic variation (5.1.2). Morin gives two norms before unreduced nasals, which neutralize in standard French ("*bonne* [bɔ̃n(ə)]", meaning that since then bõnə ~ bonə > [bɔn]). Carignan et al. describe the origins of nasalization as a relationship between nasal and vowel, where the vowel becomes increasingly nasalized while the following nasal consonant shortens or drops, and is especially

common when nasals fall between a vowel and a voiceless obstruent ("Planting the seed for sound change" 1.1).

Spelling reforms. The use of "accents" (diacritics) in writing around the year 1600 is explained in Morin 5.3. For an example of their use that looks unusual to modern French eyes, in Rousset's history I cited earlier, "Tome *troisiéme*" is printed on the title page (versus today's "troisième"; emphasis mine). According to Auguste Bernard's 19th-century book on the life work of *Geofroy Tory*, said printer proposed accents, apostrophes and cédille in *Champ fleury* in 1525-1526 (Table 1, "Sommaire chronologique").

New letters ç, u, j. See above for the adoption of ç in French printing. The Spanish backstory of çedilla "little zeta" really is for another time, but it stems from Visigothic handwriting. I introduced u (alongside v, y) and j (versus i) in my video about "Modding the Latin alphabet"; briefly, pre-to-post Renaissance texts slowly distinguished v from u and i from j.

Colonial, Global, Modern French (recipe: temper, make and cool ganache)

Kingdom and colonization. As a single period, the centuries following the Renaissance have many names. If you're doing great-ruler history and pin the start of the "Modern" period to Henry IV, then this beat falls closer to the start of "Classical"/"Early Modern" French than to Napoleon.

Beau and eau towards /oː/ and /o/. Morin finds the triphthong quality of beau and beaux developing by 1300 (4.2) and pronounced [bo̯ɔu̯] and [bo̯ɔːu̯s] with final [u̯] "sur le point de disparaître" around 1600. The au diphthong was freely confused with [ɔ] ou [ɔː] (5.1.1), though I don't have a source for the timing of the starting glide's loss (the o̯ in [o̯ɔu̯] > [ɔː]).

Frette, froid and moi. Huchon writes that the "oi" in "roi" popularly shifted from [wɛ] to [wa] through the 18th century (but not in "oi" > "ai" personal names or imperfects, as mentioned earlier for "disoit"). This pronunciation was cemented in the Revolution: "À la Révolution est entérinée la prononciation populaire de [wa] au lieu de [wɛ] dans des mots comme *roi*. Mais elle était dans la seconde partie du siècle de mieux en mieux représentée" (6.4). Though sometimes dated, Walker's *The Pronunciation of Canadian French* presents ten realizations of "oi", with /we/ observed in "moi" (3.8). The we ~ wa variation may capture a Norman feature or a French change in mid shift (Ferreira & Alleyne near end of section 3).

Retention of initial /h/ in the Caribbean. Green's chapter on "Romance Creoles" in Vincent & Harris claims that "/h/ maintains a precarious independence in the eastern Caribbean", though it is lost in Haitian and where retained often varies with /r/ (section on "Consonants and glides"; the same paragraph notes these were

"formerly aspirated items in dialectal French"). You can hear it retained where earlier modern French had it, and where liaison does not operate in standard French, in entries for "haut" as "ho", "haler" as "halé" or "hangar" as "hanga" in Gwadloup creole and "henn" for "haine" in Matinik creole from Confiant's *Dictionnaire universel français-créole* (note again alternative forms with initial r).

Resegmented creole words like zabapẽ. Ferreira & Alleyne call these "agglutinated forms" and list "djife" from "*(du) feu* /dyfø/" among their fourth class of lexical sources for Kheuól (Amazonian French Creole) nominals, and "zabapẽ" from "(les) arbres à pain" in class 2 ("Comparative perspectives on the origins, development and structure of Amazonian (Karipúna) French Creole", section 2.6). Location and social history are given in 2.2-2.3. Here is an example of a Kheuól speaker saying a sentence including the word "Kheuól".

Nasal harmony (remark cut). Ferreira & Alleyne also share examples of progressive nasalization across creole vowels, like Haitian zhãmẽ (table 7).

Trilled [r]. You can hear this sound in lessons from a Tahitian and French speaker ("E Reo Tō'u" by Steve Chailloux). You also hear it in an interview with a Louisiana French speaker ("En Louisiane, avec les Cajuns qui veulent préserver leur identité" France24). Although the sound [r] is present in the French of Africa, its status is complicated. To pick one example, according to Bordal's "Phonological study of French spoken by multilingual speakers from Bangui", this trill is one of three realizations of "the /R/" in the CAR, though very often "/R/" is deleted entirely including in "[afik] (*Afrique*)" (4.3.1).

Africa has more French speakers than any other continent. Leboucq's article "«Et le monde parlera français», plaidoyer décomplexé pour la Francophonie" pins the number of French speakers at "130 millions de personnes", half of them ("la moitié d'entre elles") in Africa. A chart near the end of the article breaks the 77.2 million students who have French as their language of instruction into three large geographic categories, the large majority falling in Subsaharan Africa and the Indian Ocean ("Afrique francophone subsaharienne et océan Indien").

Contemporary French (recipe: pour ganache, chill, decorate and salt)

Trilled vs uvular R. Galazzi and Boukia review the great variation in the early modern and contemporary pronunciation of French R. They trace how uvular [ʁ] entered as a fashionable German sound in the 17th century, was associated with the urban prestige speech of Paris, remained less common than [r] outside of Paris at the turn of the 20th century, and became the standard French pronunciation of the letter while the trilled pronunciation is unheard and even disparaged ("dévalorisée") in many varieties ("L'«r» du temps", section "Des bribes d'histoire"). Morin discusses this change after the [ɾ]-[r] merger, following Wollock in

considering it difficult to place and having little effect on the phonological makeup of French (6.2). I avoided discussing the difference between "r grasseyé" [ʀ] and the standard "r guttural" [ʁ], but you can catch my imperfect and underused French [ʁ] trending towards [ʀ] and even too velar.

L mouillé like Spanish (remark cut). By the late 1800s "[l]a liquide palatale [ʎ] est remplacée par yod [j], fille [fiʎ] > [fij], non sans résistance dans la norme des puristes (cf. Bruña Cuevas 2003)" (Morin 6.2). This change probably started quite a bit earlier (compare Morin 5.2 and Green's "Romance Creoles" section "Consonants and glides"). Bruña Cuevas times its definitive loss to the 19th century ("Comment présenter un phonème moribund", abstract).

Shift reemerged long vowels. Length transitioned from long-short pairs around 1700 to quality distinctions by 1950 (Morin 6.1.1). Only some contrasts remained for standard speakers, including a lettered distinction between long [iː]/[yː] in -is/-us and short -isse/-usse [is]/[ys] (6.1.2). The ɛ/ɛː opposition maintained by Morin in that section would cause speakers to make Québec-style quality distinctions between mettre and maître. However, in France by the 1990s this became "somewhat residual, and is unknown in younger Parisian native speakers" (Battye et al., *The French Language Today* 2.8.7.3). This length is distinct from contextual, non-contrastive vowel lengthening (end of the same section). For speakers of standard French, "the contrast between the two low vowels, namely front [a] versus back [ɑ], is now rather uncommon", with "considerable individual and regional variation" and [ɑ] falling from favor (Battye et al. 2.12).

More spelling inconsistencies and reforms (remark cut). This section teased about the differences between inherited silent Latin letters like "p" in "baptême", dropped silent letters like the p in old "escript", and originally silent letters that gained a spelling pronunciation like "objet" (Morin 6.3). One notable change to spelling norms over time is the replacement of some "oi" with "ai" like françois > français, estois > étais, disoit > disait.

Linking and chaining deleted consonants. The pieces mentioned earlier, including oxytone stress and elision, come together with dramatic effect in Mallet 2.1. The TLFi entry for "français" observes that the final [z] was subject to liaison before a word with an initial vowel by the end of the eighteenth century. Battye et al. introduce the various interlocking phenomena, including "linking", "(non-)elision", "(non-)enchaînement" and "liaison" as a specific case of enchaînement (2.15, "Syllables and sense groups").

Liaison and class judgments (remark cut). According to Mallet 2.2, in the 17th century, the fixing of liaison delimits social classes ("mais bien plus comme un phénomène délimitant les classes sociale"). This section provides background that neatly leads to the next, concerning twentieth-century prescriptivists (2.3) and

Delattre's placement of the "*h* aspiré" liaison context among the "classe des erratiques" (3.2.3.2.1).

H aspiré vs silent h. Vowels preceded by earlier pronounced h- are the ones most likely not to be chained with a final consonant in the previous word (Morin 6.2). My summary plays with the persistent French concept of "h aspiré", a theory that requires most speakers to distinguish silent "aspirated" h from silent "non-aspirated" h: h- that isn't silent and wasn't silent does chain; h- that isn't silent but was silent does not chain.

Schwa dropping and insertion. Mallet quickly notes and tabulates examples of the presence or absence of a medial, final or medial+final "schwa potentiel" (6.3.3.3). Figure 6-85 contains "[pti(t)]" and "[pəti(t)]", where final -[t] is heard in liaison. Elision, retention and insertion vary by dialect, speaker and even where speakers are in their discourse (Racine & Andreasson, "A phonological study of a Swiss French variety" 3.1). Counting where they hear "schwa in the Neuchâtel variety", Racine & Andreasson find that "la fenêtre" pronounced [lafənɛːtʁ] in 23% of corpus occurrences (3.2).

Masculine and feminine adjectives (remark cut). Dropped consonants and schwa impact the morphology to an extent where Latin gendered suffixes often don't survive on French nominals and adjectives: rouge/rouge (identical spelling and pronunciation), bleu/bleue (identical pronunciation). When they do, the distinction often sounds like masculine -V, feminine -VC (petit [pti], petite [ptit]). See well above for one source that considers this a "disfix".

Rounded schwa. Although French /ə/ acts like "a phonologically distinct segment", phonetically it "is pronounced /ø/ before high vowels and glides... and at the end of major prosodic phrases ... but it sounds like /œ/ in other contexts, particularly before and after /ʁ/" (Faygal et al., *French* 2.4.3.1).

Rounded j, ch and assimilated je (remarks cut). For many speakers, the word I typically see transcribed [ʒə] ("[ʒ(ə)]" in the TLFi entry for "je") actually starts with heavy lip rounding followed by rounded schwa: [ʒʷø]. In a previous draft, at this point I gave examples of how "syllables and words can smoosh together: j't'aime, j'sais pas" (since je t'aime readily contracts and assimilates to [ʃtɛm] and je ne sais pas > j'sais pas > [ʃɛpɑ]).

Rhythm groups. Sources for this section cite or build on Delattre's "Le mot est-il une entité phonétique". Battye et al. give fuller overviews of the component pieces interacting here: "ə muet" (2.9), "Syllables and sense groups" (2.15) and "Stress and intonation" (2.16). Mallet again analyzes many of the same components throughout 3.1, including 3.1.5, though with a focus on liaison throughout the rhythmic units. Mallet's discussion of prominence, secondary accent on initial syllable, reasons. Apparent exceptions include the "accent d'insistance" (Delattre),

the "initial secondary stress" (Hualde's "Romance intonation" 2.1) or the "emphatic stress" (Battye et al. 16.2). The schwa dropped from fenêtre to f'nêtr (Battye et al. 15.2, Racine & Andreasson mentioned in schwa paragraph above) and chaining and linking (Battye et al. 15.1) both impact syllabification.

œ̃ > ɛ̃ > æ̃. The first change (resulting in an œ̃-ɛ̃ merger) is general but not universal in contemporary French. Decades ago Battye et al. noted that "[œ̃] and [ɛ̃] are not distinguished" by "the majority of speakers" (*The French Language Today* 2.11.3). That leaves three nasal vowels in "Northern Metropolitan French", all them "quite different than the traditional IPA transcriptions suggest: [æ̃], [ɒ̃], and [õ]" (Carignan's "When nasal is more than nasal", 1.2.2 and Figure 1.1).

Merger of pot and peau. Battye et al. assign phonemic status to /ɔ/ and /o/ based on the one environment where they contrast: "final closed [syllables]" (2.10.2). TLFi entries for "peau" and "pot" both give the pronunciation [po], though [pot ~ pɔt] in expressions like "pot(-)aux(-)roses".

Merger of ɔ and œ. Boula de Mareüil et al. find that /ɔ/ trends toward [œ] in many words for many speakers, often including the tokens "d'accord" and "personne" ("Antériorisation/aperture des voyelles /ɔ/ ~ /o/ en français du Nord et du Sud", 3.2).

Final vowel devoicing. I notice this sounds very strong from some speakers. Smith's "Vowel devoicing in contemporary French" starts with a popularly recognized case: [wi̥]. Though initially reported just in high vowels, Smith notes it has now been recorded for all vowels. In Québec French, the phenomenon of medial devoicing has also been studied. One speaker in Smith's study did not devoice any vowels, while when it came to "vowels in non-final position", "no speaker devoiced any of them" (section 3). The study's data support "Fónagy's supposition that devoicing serves as amark of finality" in non-question utterances (4.1).

I missed your favorite sound change (remark cut). It's easy to stumble on steps to words left unexplained here. For instance, despite multiple attempts to capture the changing nature of diphthongs in both spelling and pronunciation, a full explanation behind /o/ in "beau" is left to the imagination. Others include singular "œil" and plural "yeux" (or "bœuf"/"bœufs"), the /a/ in femme, loss of in pre-modern French [ɾ] (> [ð], compare Jèrriais "heuthe" for "heure") and why nasal vowels are no longer nasalized before double nasal consonants unlike in Wallon. On the flip side, this project contains enough info to piece together paths that span multiple changes like sauce going from [saʊ̯t͡sə] to [sos].

Outro. You're reading the doc shown in the final scene. The colorful image behind it is my earliest timeline concept for this animation. That's also where you can see my

behind-the-scenes creator posts and join other patrons. A big ***merci*** for watching my animation as well as reading my sources document!

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Media

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Merovingian disc:
https://commons.wikimedia.org/wiki/File:Disque_de_Limons.JPG

Serments de Strasbourg manuscript:
https://commons.wikimedia.org/wiki/File:Serments_de_Strasbourg_(5).jpg

Medieval door:
https://commons.wikimedia.org/wiki/File:Door_on_Odos_Ippoton.jpg

Charlemagne:
https://commons.wikimedia.org/wiki/File:Vitrail_Cathédrale_de_Moulins_160609_34.jpg

Medieval château:
https://commons.wikimedia.org/wiki/File:Ch%C3%A2teau_de_Montbrun_le_1er_Mai_2012.JPG

Illustration of Paris in the Middle Ages:
https://upload.wikimedia.org/wikipedia/commons/e/e9/Les_Très_Riches_Heures_du_duc_de_Berry_juin.jpg

Medieval peasants:
https://commons.wikimedia.org/wiki/File:Peasants_breaking_bread.jpg

Villers-Cotterêts Ordinance:
https://commons.wikimedia.org/wiki/File:Villers-Cot.jpg

Pitcher by follower of Palissy:
https://commons.wikimedia.org/wiki/File:Palissy.jpg

Wolf:
https://commons.wikimedia.org/wiki/File:Eurasian_Wolf_(9358589025).jpg

Renaissance painting by Dubois:
https://commons.wikimedia.org/wiki/File:Ambroise_Dubois_1543-1614_Allegorie_de_la_Peinture_et_de_la_Sculpture..jpg

Crown from Louis VIX monogram:
https://commons.wikimedia.org/wiki/File:Royal_Monogram_of_King_Louis_XIV_of_France.svg

Cora Geffrard of Haïti:
https://commons.wikimedia.org/wiki/File:Cora_Geffrard.jpg

World map:
https://commons.wikimedia.org/wiki/File:World_map_without_Antarctica.svg

Print from French Revolution museum:
https://commons.wikimedia.org/wiki/File:Supplice_Joseph-François_Foullon,_23_juillet_1789,_Musée_de_la_Révolution_française_-_Vizille.jpg

Napoleon:
https://commons.wikimedia.org/wiki/File:Eggmühl_Gasthaus_Napoleon_Gemälde_an_der_Traufseite.jpg

Métro sign:
https://commons.wikimedia.org/wiki/File:Métro_de_Paris,_Iéna_station,_totem_Val_d'Osne.jpg

Baguette icon:
https://commons.wikimedia.org/wiki/File:Baguette-1294148.svg

Music

Some music I scored myself, including the outro theme and the intro lullaby playing after the open. Credit for the rest belongs to these talented creators:

Laid Back Guitars, Danse Macabre, Sardana, March of the Spoons,
Village Consort, Suonatore di Liuto, Heavy Heart, Silver Flame,
Thinking Music, Duet Musette

Kevin MacLeod (incompetech.com)
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Sneaky Snooper
Jason Shaw (audionautix.com)
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En tu all da Biarritz (gavotte du Bas-Léon)
Performed by Luc Danigo (violin) and Philippe Lamézec
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Fonts

Text on screen is handwritten by me. The following fonts were used for reference:

Alegreya by Juan Pablo del Peral.
https://www.fontsquirrel.com/fonts/alegreya

Perspective Sans and Daniel by Daniel Midgley.
http://goodreasonblog.com/fontery/

JSL Ancient, JSL Ancient Italic, JSL Blackletter by Jeff Lee.
http://www.shipbrook.net/jeff/typograf.html

Kelvinch by Paul Miller, SIL Open Font License 1.1.
https://www.fontsquirrel.com/fonts/kelvinch

Noto Sans used under SIL Open Font License v1.10.
https://www.fontsquirrel.com/fonts/noto-sans

Charis used under SIL Open Font License 1.1.
http://software.sil.org/charis/

Architect's Daughter by Kimberly Geswein, commercial use license purchased.
http://www.kimberlygeswein.com/commercial-use/

SFX

(from www.soundbible.com and www.pdsounds.org)
Woosh, Mark DiAngelo
Swoosh 1, man
Swooshing, man

Blop, Mark DiAngelo
Mouth pop, Cori Samuel
Wind storm, Mark DiAngelo
Dragon wheeze, Gregory Weir
Dull thud, Gregory Weir
Turning a page, John Rose
Page turn, planish
Books and paper, Stephan, pdsounds.org
Flapping wings 3, Mike Koenig
Knocking on door, ERH
Clock ticking, Natalie, pdsounds.org
Ting experiment, Thore, pdsounds.org

I recorded the shooshes/hushes and chalk writing sound effects.

(from http://en.soundeffect-lab.info)
head-stroke1
page1
page2
firewood-put1
sword-gesture1
sword-gesture2
sword-gesture3
head-stroke1
tin1
magic-cap-write1