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FROM LATIN TO MODERN FRENCH: ON DIACHRONIC CHANGES AND SYNCHRONIC VARIATIONS.

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ABSTRACT

The goal of this paper is to give a brief summary of the main phonetic transformations from Latin to Modern French, and by doing so, to exemplify the leading role of the word stress and left boundary may play in sound changes. Most of the vowels in unstressed, non initial syllables were suppressed (*a* was transformed into *mute e* ('*bona* > *bonne* [bOn^ˈ] 'good'¹), creating a large number of clusters and word final coda consonants. The disappearance of almost every first consonant member in non word initial clusters (except *r* and combination with *r* and *l*), the dropping of intervocalic consonants, such as *d* and *t*, the vocalisation of [g], [k] and [l] in coda position, creates a large number of hiatus, which were then reduced to a single vowel (*vita* > *vie* [vi] 'life'). After monophthongization of the Latin diphthongs and several periods of diphthongization of the stressed syllables, all diphthongs and triphthongs were monophthongized. These phenomena lead to a drastic reduction of the phonetic length of the words. In spontaneous Modern French, the extension of the basic prosodic unit from the word to the sense group, the complete dropping of *mute e* (from *a*) and the transformation of [e] into *mute e* create new conditions where the 'old' reduction rules can again apply. All these drastic reductions create a very large number of homophonic (short) words. The double accentuation system of Modern French may to be inherited from its past: the final, syntactic stress from Latin, and the initial, emphatic stress from its Celtic and Germanic influences.

INTRODUCTION

Languages do not escape from the universal law of changes. As stated elegantly by Saussure, "toutes les parties de la langue sont soumises au changement ... et le fleuve de la langue coule sans interruption (Saussure, 1985: 193). The syntax and the meaning of the words continue to undergo more or less rapidly modifications in successive generations of speakers and the more often a word is spoken, the more likely its spoken form will undergo a

¹On the notation used in the present paper *a* > *b* [c] 'd': *a* is the Classical Latin written form, *b* is the present written form and corresponds to an intermediate stage of pronunciation (around the twelve-thirteenth centuries); [c] is the actual phonetic transcription; 'd' is the English translation of the word, and >> indicates an eventual trend in spontaneous speech.

phonological change. Most of the diachronic phonological changes mirror synchronic phonetic variations. Synchronic variability is caused in part by the influence of natural tendencies in speech, which, by definition, tend to be universal, independent of the language, and stems from constraints imposed by the acoustic laws, and by perception and production mechanisms (such as a different inertia or the antagoniscity of the muscles involved in the realisation of one phoneme). The physiological constraints play a greater role in rapidly spoken speech and in hypoarticulated 'sloppy' speech, particularly for the most frequently used words. Factors external to the language, such as bilingualism, loan of words and consequent introduction of new phonemes, coexistence of different prosodic systems and phonostylistic variations, imitation of the style of a particular social class, analogy, a general different articulatory setting, etc. can exacerbate one of the natural tendencies, and a phonetic variation may be then fossilised into a permanent phonemic change. The phonemic change may eventually disrupt the former phonological system. The internal system tends then to restore the equilibrium since the sounds selected by the language tend to be organised in some predictable ways. As put by Vendryes (1925:359), "... different states exist, succeeding each other, each dominated by certain general laws imposed by the equilibrium of the forces with which they are confronted". (on language change, see, among others, Aitchinson, 1991, Bynon, 1977, Jakobson, 1970, Martinet, 1955, and the inspiring small book by Boltanski, 1995).

French belongs to the group of Romance languages. As for the other Romance languages (Italian, Romanian, Spanish, Catalan, Portuguese, Provençal, Sardinian, Rhaeto-Romansh), French descends from Vulgar Latin², e.g. the Latin spoken by the soldiers, the merchants, the immigrants after the roman conquest. By the time of the invasion by Julius Caesar (58-51 AC.), the Gaelic were speaking a Celtic language (Celtic, Italic and Germanic languages belong to the same indo-european family). Roman successful invasion, the exhaustive use of literal Latin as the written language for administration, school and literature and the expansion of christianization in the third century and the subsequent use of Church Latin result in the quasi-complete disappearance of the former Gaelic dialects in a few centuries³. The admiration for the superior Latin culture has probably accelerated the extinction of the Celtic language. At the third century, a descendant Latin was almost the only language spoken in the Gaul. The Germanic invaders of the fifth century (the Wisigoths, the Burgundies and the Franks), who, unlike the Romans, had no cultural superiority to claim, have adopted the language of the conquered country. The invasion results in the introduction of a large number of Germanic words and to the (slow) introduction of new speaking habits. The extinction, in the sixth and seventh centuries, of active intellectual life has precipitated the rapid evolution of the spoken language (Zink, 1987: 11). Charles the Great (742-812), a frankish king and admirer of Classical Latin, encouraged the

²The reconstructed ancestor of the Romance languages is in fact the so-called Proto-romance.

³The Celtic substratum is still identifiable in many names of towns in France.

creation of schools, and the study of Latin. The history of the French language starts in the ninth century with the *Serments de Strasbourg*, and it is generally divided into three periods: *l'ancien français* (Old French), from the ninth century to the end of the thirteenth century; *le français moyen* (Middle French) (fourteenth-sixteenth centuries) and *le français moderne* (Modern French), from the beginning of the seventeenth century to now.

Modern French descends from the "langue d'oïl" and it is a transformation of one of a dialect spoken in the North, the "dialecte de l'île-de-France" (which took over the other dialects because of political supremacy). The more conservative "langue d'oc" (in the South of the Gaul) is believed to have received less influence from the Germanic invasions than the "langue d'oïl" (in the North).

Words of the "popular" type in Modern French are inherited from Vulgar Latin and correspond also to Germanic words loaned at the time of the Germanic invasions. Scientific words are mainly Latin and Greek and were loaned in ancient times, and essentially after the fourteenth century. Foreign words include oriental words (imported at the time of the Crusades), Italian words (loaned essentially in the sixteenth century), Spanish and modern German words (borrowed in the seventeenth century), and English words since the nineteenth century until now. Scientific and foreign words were franchified in an more or less artificial manner. We are concerned here by the way the words of popular type have been 'worn out' with time.

A great deal of works has been devoted to the description of languages changes since long time, and we are in possession of an extraordinary large data base, thanks to the tradition of comparative philology. The path from Latin to French has been particularly well studied, and every possible explanation for each change has been offered, but no theoretically unified account is yet available (Bloch and Von Wartburg, 1994; Bourciez and Bourciez, 1971; Chaurand, 1972; Dauzat, 1950; Martinet, 1955; Fouché, 1958, 1966; Pope, 1934; Rousselot, 1887; Straka, 1964, 1979; etc.). The descriptions are based on written records, which give to us an indirect view of how the words were spoken⁴ (see remark by Saussure, 1972: 44). The way the words are written to day, indicated in this paper gives us an indication on how they were spoken in the twelve-thirteenth centuries. Authentic recordings are naturally missing. The descriptions are generally completed by direct observations of still existing, more conservative dialects, and on comparison with the other romance languages.

Phonological changes concern the segmental and suprasegmental characteristics. Changes in both aspects are bounded through production and perception. Expending more muscular energy in the articulatory movements

⁴- Zealous graphists sometimes restore phonemes which were not any more spoken. The latin word <domitare> was written *damnum*, *dampnum*, *donter*, *domter* (Dictionnaire de l'académie, 1718). The written form <dompter> was reconstructed and the epenthetic [p] is pronounced again (but [p] is not uttered in the restored verb <compter> from Classical Latin <computare>).

for making a syllable more prominent influences timing may possibly result in different vocal tract configurations in stressed versus unstressed vowels. This may cause more or less perceptible changes in timber, leading eventually to a different set of syllables depending on position in word. When a stressed syllable is emphasised, jaw lowers and the short vowels tend to be perceived and perceived as more open (short i>e; short u > o; short e>E, short o> O, etc.). When an unstressed syllable is deemphasised, its vowel closes and consonants open (a> E >i; p>f). When unstressed and shortened, vowels tend too to be perceived as more open (Straka, 1959:279). Stress and the phonological use of length are not highly compatible. In an "ideal" pitch accent language, the realisation of the accent (or so-called melodic accent) should involve manoeuvres only at the laryngeal level, and not interfere with the supralaryngeal configurations⁵ which is required for the realisation of the phonemes. The later prosodic system accent system would be therefore fully compatible with the phonological use of quantity and favors equality in number and arrangement for both the long and the short vowels. In short, different types of prosodic organisation create different constraints on the segmental organisation. And a natural tendency in languages seems to make a dominant syllable per sense-group or (lexical word), even in tone languages or pitch-accent languages, so that few languages can be considered of pure prosodic type and prosodic variability can be great. Within a language, there are more or less controlled variations due to style.

The goal of this paper is to exemplify the tight coupling between the prosodic profile of the word and the segmental changes in the gradual transformation from Classical Latin (a quantity language with melodic accent through Vulgar Latin) into Modern French. The data presented here mainly come from the book "Phonétique française, étude historique", by E. and J. Bourciez, and the content is directly inspired by Straka's paper on "l'évolution phonétique du latin au français sous l'effet de l'énergie et de la faiblesse articulaires" (first published in 1964), although I don't agree with all the views expressed in this paper. Our point of view is well in line with the French tradition of prosodically dependent strength of the phonemes (the so-called 'force d'articulation, (see discussions). More production and perceptual experiments should be done, following Rousselot's and Straka's pioneers work with palatography and radiography to simulate the changes to get a more coherent picture (cf the efforts by J. Ohala in this direction).

I) FROM PITCH ACCENT TO STRESS LANGUAGE

a) Stress in Latin

⁵See Ohala, 1978, for asymmetry in the maximum speed of rises as compared to falls.

Classical Latin is considered to have a melodic accent on the penultimate or the antepenultimate (Roudet, 1910). The prosodic anchor point for the pitch-accent was the penultimate syllable, if the penultimate was an heavy syllable, i.e. a closed syllable ("syllabe entravée"), ending by a consonant (*amantem* > *amant* [amA\$] 'loving') or had a long vowel (*farina* > *farine* ' [faÂin] 'flour', *amatus* > *aimé* [Eme] 'loved'), and on the antepenultimate on the other cases ('*asinus* > *asne* > *âne* [An] 'donkey', *fragile* > *frêle* [frEl] 'frail').

b) Loss of phonological quantity

Classical Latin had pairs of contrasting long and short vowels, and the two types of vowels were equal in number and arrangement (Table I, first line) and four diphthongs. The functional load of the length distinction was very high (*liber* > *libre* ' {libÂ} 'free' / *li:ber* > *livre* {livÂ} 'book').

Around the third century, the syllable carrying the melodic accent seems to have been uttered with much greater articulatory force and greater intensity than the surrounding syllables. Such a transformation of the prosodic profile of the words is concomitant to changes in the vocalic system. The long syllable carrying the former pitch accent kept the same timber (i: > i; e: > e, a: > a; u: > u; o: > o), while the short ones opened (i>e; e>E; u>o, o> O) (third-fourth centuries). The unstressed syllables followed the same change in timber than the stressed ones, but the former long unstressed vowels changed their timber and opened too (i: > e; u: > o; *littere* > *lettre* [lEtÂ] 'letter'). Table I illustrates the resulting change in the vocalic system in Vulgar Latin: the quantity contrast is lost, the number of vowels has been reduced from 10 to 7 in stressed syllables and to 5 in unstressed syllables. Two new phonological contrasts were introduced (e/E; o/O). This gradual change leads to a period of instability where (phonologically) short [i] and long [e] were written either *i* or *e* (lat. *sine* [sine] written as *sine* or *sene* 'without'), short *o* and long *u* as *o* and *u*.

How to explain such a change in vocalic system? According to Straka (1959), a slight difference in timber between short and corresponding long vowels probably already existed in Classical Latin. The centralisation ("laxing") of the short high vowels i.e. /i/ versus /I/, /u/ versus /U/ is reported in 20% of the languages studied by Crothers having 5 timbers and phonological length contrasts (Crothers, 1978). The probably already existing difference in timber was probably enhanced under stress and has become "phonologized". The loss of the [i] and [u] timber for the unstressed former short vowels (third-fourth centuries) may be due to a perceptual bias⁶: a few periods extracted from [i] and [u] are perceived as [I] or [e], and as [U] or [o]. It seems that a

⁶ The demonstration is easily done by extracting some periods of a vowel using a speech editor, followed by listening test.

minimal duration is needed to perceived the [i] or [u] timber (I am not aware of an explanation for this perceptual phenomenon⁷).

stressed	Classical Latin	i:	i	e:	e	a:	a	o:	o	u:	u	10
	Vulgar Latin	i	e		E	a		O	o		u	7
unstressed	Classical Latin	i:	i	e:	e	a:	a	o:	o	u:	u	10
	Vulgar Latin		e		E	a		O	o			5

Table I: Vocalic system in Classical Latin and in Vulgar Latin. The number on the right indicates the total number of vowels .

c) Monophthongizations of the diphthongizations

Monophthongization and diphthongization for the stressed vowels occurred during different periods.

- First, in the third century, the Latin diphthongs *oe*, *ae* > *e* were monophthongized, and the nucleus got the timber of the second element : *poena* > *pena* later *peine* [pEn] 'pain'; *caelum* > *kelu* later *ciel* [sjEl] 'sky'; the diphthong *au* > *o* at the fifth century; *causa* > *chose* [Soz] 'thing'.

- Second, in the third and fourth centuries, the Roman diphthongization created "syllabes ouvrantes", with the insertion between the consonant and the vowel, of a first element more close than the second [E > ie] *petra* > *pietra* > *pierre* [pjEÂ] 'stone'; [O > uo] *novum* > *nuovum* > *nuef* > *neuf* [npf] 'new'. This is supposedly due to the strengthening (closing) of the initial stressed consonant (Straka, 1979).

- Third, in the fourth century, the Gallo-roman diphthongization, typical of French in comparison with the other Romance languages, resulted in diphthongs "fermantes" (closing), with the second element more closed than the first: [a > ae; e > ei; o > ou]: *mare* > *maere* > *mer* [mEÂ] 'see'; *me* > *mei* > *moi* [mwA] 'me'; *florem* > *floure* > *fleur* [flpÂ] 'flower'. For example, the French word <roi> (from Classical Latin 'regem') was pronounced [rei] in the XI century, [roi] in the thirteenth century, [roE] in the fourteenth century and [rwA] in the nineteenth century. It was written <rei> in the XI century, and <roi> from the thirteenth century up to now. The present written form represents how the word was uttered in the thirteenth century.

- Fourth, while at the beginning of the twelve century, all diphthongs were stressed on their first element (decreasing), the syllabication type changed from decreasing to increasing. Stress moves to the second element if more open, and the first became then a semivowel. If the second element was more close than

⁷Nasal vowels need also a minimal duration to be perceived as nasal.

the first, it just disappeared. Modern French does not have a single diphthong any more and there is no trace of a diphthongization tendency.

In Modern French, the exact position of the peak of fundamental frequency in a final syllable (which may be considered as related to the peak of effort) depends on the type of stress: earlier in the syllable with a reinforcement of the onset consonant for initial stress, later in the syllable for final stress and the delay increases with the degree of dependency of the word with the following word.

II) LOSS OF VOWELS

The confusion between "*cave ne*" and "*Cauneas*" reported by Cicero shows that unstressed vowels were often omitted in Classical Latin. This tendency increased in Vulgar Latin. As stated by Paris (1889:17), "the stressed vowel had already started to destroy or weaken the surrounding vowels, as it continues to do with out respite" (our translation). It seems like the criterion of economy has led the language to use no more syllables than strictly necessary for communicative purpose. The reduction of the number of syllables in French is drastic: the frequently used Latin words were reduced to monosyllabic or disyllabic words, creating homophones: *solidus* > *sou* [su] 'sou' and *subtus* > *sou* [su] 'sou'; *pediculum* > *pou* [pu] and *pulsum* > *pouls* [pu] 'pulse.

The vowel carrying "stress" in Vulgar Latin and the vowel of the initial syllable always resisted. The persistence of the vowel (and of the onset) in initial syllable (as opposed to the unstressed syllables) and its resistance against diphthongization along the centuries (as opposed to the stressed syllables) let suppose that the initial vowel was uttered in a particularly tense, precise way, and was relatively independent from an eventually following coda consonant. The evolution of the Celtic words in French proves that the Celtic words kept their initial stress ('Tricassos > Troyes [trwA]; 'Turoënes > Tour [tuR]; 'Nemausus > Nîmes [nim]) (the examples are borrowed from Garde, 1968: 104). It may be speculated that the prosodic Celtic habits of stressing the word initial syllable has left some trace in the way the Gaelic start to utter Vulgar Latin after the roman invasions. The Celtic influence, reinforced later by the Germanic influence, may have contributed to the actual double accentuation system of Modern French (see later).

The differences between strong (initial and stressed position) and weak (other positions) in the Gaul were much greater than the difference between stressed and unstressed syllables in the other romance languages. The best prove of the weakness of the weak vowels (i.e. non stressed, non initial) is their complete disappearance with time. The vowel [a] has resisted in weak position, and has been transformed into mute e. But in spontaneous and casual Modern French mute e is usually not uttered.

If the number of centuries they have resisted is taken as a measure of their strength, six degrees of resistance can be assigned to each vowel in a Latin word. The degrees depend on stress and boundary.

C	V	c	v	C	V	c	v	c	v	(c)
	4		2		5		1		3	

If the vowel is [a], its resistance should be increased by 1 in an ad hoc manner to fit the data. All vowels with resistance of 4 or less disappeared, in the order indicated by their degree. There is no historical trace of the natural tendency to alternate stressed and unstressed vowels. In a five syllables word like *auctoricare* (> *octroier*), the first and the fourth syllable resisted to time, but not the second (Dauzat, 1930).

a) Disappearance in the third-fourth centuries of the poststressed-non final position and prestressed-non initial position.

In Classical Latin, a large number of *i* and *u* were found between the initial and the stressed syllables, as a consequence of apophony (*con + facio* > *conficio*; *novos + tas* > *novitas*). The grapheme *i* and *u* were used probably by the graphists to note weak vowels.

The vowels (including [a]) in these positions disappeared during the Roman Empire: *cal(i)dum* > *caldum* (later > *chaut* > *chaud* [So] 'warm'); *masc(u)lu(m)* > **masclu* (later *mâle* [mAl]) *sub(i)tanum* > **subtanu* (later *soudain* [sudE\$] 'suddenly'); *separare* > *sevrer* [s'11vre] 'wean'.

b) Dissappearance in the seventh century of the final (postonic) position

The vowels other than [a] disappear very early, and the preceding consonant became a coda consonant and was suppressed too (*cal(i)dum* > [So] ; *sub(i)tanu(m)* > [sudE\$]).

- the vowel ending *a* marked the feminine case, and the vowel /a/ has become mute already at the end of the seventh century in the North (*bona* > *bonne* = [bOn´]). Mute e plays a very important role of a "voyelle de soutien" and as a "voyelle latente", so that the preceding consonant kept the status of initial consonant, and it has resisted to disappearance during the time when the other coda consonants have been suppressed (*bonu(s)* > *bon* [bo\$]).

Mute e (written *e*) is generally not pronounced in spontaneous in Standard French ([bOn´] >> [bOn]), but it is still pronounced in South French, and in careful reading.

V-Ca# -> V-C´- -> VC (maintenance of final consonant)

V-Cv#-> VC - -> V (suppression of final consonant)

(# represents a word boundary, and - a syllable boundary).

c) Initial and stressed vowels

While the initial and the stressed vowels have resisted change, their timber has been often altered. The timber of the initial vowel changed much less than that of the stressed vowel, and was not much influenced by the fact that the syllable was closed or open. The stressed vowel in open syllable was more altered than the vowel in close syllable. This different treatment probably indicates a different distribution of effort inside both types of syllables, and a different degree of juncture between the different elements of the syllable. In close syllables, it seems that the vowel was more constrained by the movement from the onset consonant to the coda, and less free to vary than in open syllable. The initial vowel was probably tense and not lengthened, while the lengthening in the stressed syllables favors diphthongization of the vowel.

In the eleventh century, [e] showed the tendency to weaken and became mute e ([e>ʹ], *debere* > *devoir* [d'vwAÂ > dvwAÂ]), which is not any more uttered in spontaneous speech. (*R'né r'vient d'main* 'René est coming back to-morrow'). There is some hesitation in the pronunciation of the initial vowel of some words: *regesta* > *registre* [ÂeJistÂ / Â'JistÂ / ÂJist].

In very frequent words in casual style, the initial vowel, mute e or not, may disappear in Modern French (*monsieur* [m'sjØ] > [msjØ] > [psjØ] >> [sjØ] 'sir'; *mademoiselle* [mad'mwAzEl'] > [madmwAzEl] > [mamzEl] > [mzEl] > [b'zEl] >> [zEl] 'miss'; *bonjour* [bO^JuÂ] > [b^JuÂ] >> [^JuÂ] 'hello'). This way of reducing the words is well in line with the traditional trends.

III) LOSS OF CONSONANTS

The Latin consonants were [p,t, k, b, d, g, f, s, v⁸, l, m, n, r, w, j, ʃ[h]⁹] and also [k<<<<w, g^w].

a) Initial position

The consonants in word *initial position* and as the second member of a cluster were maintained and their identity preserved.

The only noticeable exception is the palatalization of [k] and [g], which became [s] before front vowels, and [ʃ] before [a] (*Cicero* [kikeÂo] -> *Ciceron* [siserO^\$] 'Cicero'; *cattu* [katu] > *chat* [Sa]) 'cat'). [k], [s] and [ʃ] were in complementary distributions (the contrast became phonologized later).

⁸Classical Latin orthography used *i* and *u* to both represent, [i] and [j], [u] and [w], respectively. Only at the Renaissance, *j* and *v* were introduced (*maior* > *major*; *pluuium* > *pluvium*).

⁹Latin *h* was non pronounced and it has disappeared in the writing of very common words in French (Latin *habere*, *homo* > Fr. *avoir*, *on*), but has been restored by graphists in a large number of other words, (Latin *hominem* > Fr. > Old fr; *ome* > *homme* [Om], les hommes = [lezOm]). Note that *h* is still uttered in Alsass (under Germanic influence).

Latin [kw] and [gw] were simplified to French [k] and [g] in frequently used words (*quattor* > *quatre* [katâ] 'four'), but there is still variations in the pronunciation of less frequently used words. There is hesitation between [k] and [kw] in the word *quadragénaire* < *quadragenarius*. In rare words, it is still uttered [kw] (*quadratique, quadrature*).

While the word initial Latin consonant *u* corresponds to *v* in French, the word initial Germanic *w* was probably very 'strongly' uttered and became *g* (Germ. **werra* > *guerre* [gEâ]).

b) Intervocalic

Intervocalic position is a weak position for the consonants.

- /r/, /l/, /m/, /n/ in syllable initial position were maintained (*pira* > *poire* [pwâ] 'pear'; *dolore* > *douleur* [dulpâ] 'pain'; *amat* > *aime* [Em] 'loves'; *luna* > *lune* [lyn] 'moon'). Note that in Portuguese, *l* and *n* were suppressed between the ninth and the tenth century (*dolor* > *dor*; *luna* > *lua*).

- /s/ become voiced (*causa* > *chose* [koz] 'thing', such as the other unvoiced consonants).

- /p/ and /b/ become [v] (*ripa* > **riba* > *rive* [riv] 'border') (*Toscana: ripa, North Italy: riba, riva*)

- /t/ and /d/ were suppressed (*vita* > **vida* > *vie* [vi] (*Toscana ; vita, North It: vida; roda* > *roue* [ru] (*Tocsin: ruata; North It: roda*))

- /w/ was suppressed in back context (*pawonem* > *paon* [pA\$] 'peacock').

- /k/, /g/ were suppressed after back vowels, but transformed into yod ([j]) in other cases (*locare* > *louer* [lue] 'rent'; *ruga* > *rue* [ry] 'street'; *pacare* > *payer* [pEje, peje] 'to pay'; *plaga* > *plaie* [plE] 'wound').

Note that in spontaneous Modern French, the closure portion of the intervocalic voiceless stops yod tends to voiced, and yod tends to suppressed ([peje > pee]). There is still hesitation in the pronunciation of final *j* in *il paie* [ilpEj], [ilpE], [il pe] 'he pays'.

c) Suppression or devoicing of final consonants

Some suppression of the final consonants occurred already in the Roman Emporium (*idem* written *ide*). The reduction of the final syllable resulted in completely obliterating all case distinctions (and contributed to develop the use of prepositions).

- /r/, /l/ are maintained (*cor* > *coeur* [kpâ] 'heart'; *sal* > *sel* [sEl] 'salt');

- /m/, /n/ have disappeared, but the nasalization of the preceding vowel is maintained (*fame* > *faim* [fE\$] 'hungriness'; *non* > *non* [nO\$] 'no'). Phonologisation of vowel nasalisation is linked to the general tendency of suppressing coda consonants (the disappearance of the nasal coda is not yet complete in the South of France).

- /t/, /d/, /s/, /f/, /k/ and /g/ disappeared (*marit(u)* > *mari*; 'husband'; *nud(u)* > *nu*; 'nude'; *nos* > *nous* [nu] 'us'; *porc(u)* > *porc* [pOr] (porc'; *long(u)* > Old Fr. *lonc* > *long* [lO\$]).

- /p/, /b/, /v/ became /f/ after a vowel, but disappeared after a nasal consonant (*capu(t)* > *chef* [SEf] 'chief'; *novu* > *neuf* [npf]; *campu* > *champ* [SA\$] 'field'; *plumbu* > *plomb* [plO\$]; 'plumb').

In Modern French, as a consequence, most of the final consonants are not pronounced: *trop* [tro] 'too much'; *tôt* [to] 'early', *croc* 'fang', *mais* 'but', *mon* 'my'. The final consonant *g* is conserved only in a few words (*bec*, *duc*, *parc*, *sac*, *sec*, Carton, 1974: 149). There are variations for a number of words, where the pronunciation of the final consonants is not constant (exact [Ekza(kt)], *Christ* [kri/kris/krist], *ananas* [anana/ananas], *le but* [by/byt] 'goal', *fait* [fE/fEt] 'fact', *os* [o/Os] 'bone', *jadis* [Jadi/Jadis] 'once upon a time', *hélas* [ela/elas] 'alas', *gentil* [JA^^*tij/JA^^*ti] 'nice', *fusil* 'gun', *outil* 'tool', *sourcil* 'eyebrow').

d) Suppression of coda consonants before a initial consonant

The tendency to suppress coda consonant already existed in Classical Latin (*auctor* written as *autor*, *ensor* as *cesor*). Their disappearance of the stop consonant has been mainly explained by the lack of a strong burst for the stops, and the lack of transition with a following vowel.

CV-cv-**CV**-cv > CV-c(v)-**CV**-cv > CVc-**CV**c > CV-**CV**

CV-ca-**CV**-ca > CV-C()-**CV**-c() > CVC-**CVC** >> CVCVC

- /p/, /b/, /v/, /t/, /d/ disappeared (*rupta* > *route* [rut] 'road'; *subvenire* > *souvenir* [suv'nir] 'souvenir'; *advenire* > *avenir* [av'nir] 'future').

- /k/, /g/, /ŋ/ became vocalic, creating a diphthong with the preceding vowel, which was later reduced to a monophthong (kC/, /gC/ > /iC/ (*factu* > *fait* [fE] 'fact'; *nocte* > *nuît* [nwi] 'night'; /l/ > /u/ (*cal(i)du* > **caldu* > *chaud* [SO] 'warm'; *col(a)pu* > **colpu* > *coup* [ku] 'blow').

- /s/ disappeared (*testa* > *tête* [tEt] 'head'), but left trace in the length of the preceding vowel.

- /m/, /n/ were suppressed (and the preceding vowel become a nasal) (*campus* > [SA\$];

In Modern French, stop coda are particularly weak when followed by a nasal consonant (*maintenant* > [mE\$t'nA\$] > [mE\$tnA\$] > [mE\$dnA\$] > [mE\$nnA\$] (the most common pronunciation) > [mE\$nA\$] > [mEnA\$] (children speech).

When the word is internal to a sense-group, and located before a consonant, its final consonant tends to be very short or even suppressed, if not syllabified with a next vowel: *la fille de Jean* > [lafijdJA\$] > [lafidJA\$] 'John's daughter'; *la chambre de bonne* > [laSA\$bÂ'd'bOn] > [laSA\$bd'bOn] > [laSA\$md'bOn] 'the maid's room', *une chambre à coucher* [ynSA\$bÂ'akuSe] >> [ySA\$makuSe] 'a sleeping room'. The consonants which proved to be less resistant with time are the ones which are the more likely to disappear in spontaneous speech.

DISCUSSIONS

As mentioned before, every possible explanations have been offered for each change from Latin to French (some of the explanations are strange such as famine as to a cause to diphthongization, Straka, 1979). The notions developed by the French tradition (Rousselot, Straka), i.e. the notion of different degrees strength for each phoneme, on one side, and the notion of change in general articulatory tenseness, on the other side, are useful to explain the data, although their scientific basis are not completely demonstrated.

a) Local strength

Not all phonemes are pronounced with equal articulatory force. Grammont (1895), for example, defined "la loi du plus fort", 'the law of the strongest', the phonemes which are stronger, have more resistance and command the surrounding ones. Two types of strength can be distinguished: the internal (intrinsic and contextual) strength and the external force (general setting).

1) Intrinsic strength

A phoneme or a distinctive feature can be intrinsically stronger than other, either on production or perception grounds.

- According to Rousselot (1887), the vowels [i], [u] are weak on *perceptual ground*, and more likely to be not heard by the listener, while [a] is more easily perceptible. Intrinsic strength may explain the greater resistance of the open vowel [a] to disappearance.

- When shorter, vowels are more influenced by surrounding contexts. [i] is the least influenced by the place of articulation of the surrounding phoneme (Lindblom, 1963), and resists the most to coarticulation. In turn, it influences the most the surrounding context (palatalisation). [u] is the most influenced by context (become anterior in coronal context). Latin [u] lost its timber and became [y], even in strong position, while /i/ persisted in strong position.

2) Strength due to position in the syllable and in the word

Using palatography, Rousselot measured the surface of the contact between the tongue and the palate for consonants and compared the time it took for the saliva to dry, for consonants in different positions in the word and in the syllable, with different degrees of emphasis. He concluded "lorsqu'on fait varier la force de l'articulation, la zone de contact varie en proportion, augmentant pour les fortes et diminuant pour les faibles" (1924:590). Coda stops were shown to have less lingual palatal contact than the onset stops. Straka (1979) noted that under the effect of articulatory force, which augments the contraction of the levator palatini, the nasal vowels and consonants in strong position tend to be denasalized (confirmed by more recent experiments, Fougeron and Keating, 1996). In a closing position, [i] and [u] tend to become

semivowels or to disappear, just like the consonants [k] and [l] tends to become [i] and [u] in an opening position.

The combination between intrinsic strength and strength due to position in word and in syllable is sufficient to explain the data.

b) General articulatory settings

The second principle is the hypothesis of a global setting, in a very broad sense, as a quality through all sounds in a particular language (such as diphthongization, monophthongization, fronting, or backing, velarizing, or nasalizing). One of the characteristics is the degree of muscular tension through the vocal tract. A single characteristic of a language during a period of time may be replaced by a whole series of individual rules. As stated by Dauzat: *"La contraction s'accélère par l'affaiblissement et l'élimination progressive des éléments faibles du mot: réduction des hiatus, abrègement, amenuisement et chute des voyelles atones; chute de certaines consonnes finales; assimilation des groupes de consonnes, simplification des géminées; affaiblissement des intervocaliques qui conduisent par étapes, à la sonorisation des sourdes, à l'affriquement des occlusives, enfin, pour certains sons, à l'affaiblissement total. Tous ces phénomènes, qui proviennent en dernière analyse d'un relâchement d'articulation, d'une prononciation plus négligée, sont connexes et doivent être groupés ensemble"* (1930: 42).

In line with this principle, the evolution from Latin to French is said to correspond to two periods. Up to the twelfth century, the language was supposed to be characterised by a general laxing, by diphthongization of the vowels, affrication of the consonants, alternation between strong and weak syllables, and palatalisation. After the twelfth century, the general tendency reversed, and there was an end of the palatalisation¹⁰ period, a monophthongization of all diphthongs and triphthongs, an equalisation of the syllables, a clear syllabication, leading to Modern French which is a supposedly tense language.

A general anteriorisation is believed to have started as early as the first century, and led to the suppression of the timber [u] (which reappeared only at the twelve-thirteenth centuries) and to a very anterior [a] (which causes palatalisation of [k]). Anteriorisation is still a characteristic of Modern French. An extreme anteriorisation can be observed in the popular suburbs of Paris, while a certain amount of velarisation characterises the 'quartiers chics' of Paris ([mArjAJ] instead of [marjaj]).

French is also characterised by a 'mode croissant' and open syllabation with a tendency of intensity to decrease late in the syllable (Delattre, 1953). Open syllabation is concomitant with the phenomena of liaison, of enchaînement, and release (or suppression) of the coda consonant. This tendency of 'bien ouvrir la bouche' (open the mouth) when speaking tends to

¹⁰In German, the palatalisation of the consonants did not take place as opposed to English (Kind, Kirche, Käse versus child, cheese, church in English).

open the vowel in sloppy speech (oui [wi] >> [wE] 'yes') and to the introduction of epenthetic mute e in very careful speech (mardi [mardi] >> [maÂ'di]).

French favors synchronized voicing, and avoid aspiration. The pronunciation of aspirated [h] can still be found in common words like *hair* from germ. *hatjan 'hate'. A glottal stop is inserted in spontaneous speech at the onset of words beginning by a vowel or with a Germanic *h*.

CONCLUSIONS

As put flatly by Henriette Walter in her book on "L'aventure des Langues en Occident" (1994: 225), "French is the most Germanic romance language". One of the most striking particularity of French prosodic system is its double accentuation system, the word beginning being more or less stressed depending on the informational structure of the message, and the final syllable depending on depth of the syntactic break. It is tempting to speculate that final stress is directly inherited from Latin stress, and that initial stress may be a tendency compatible by the Celtic substratum and the Germanic influence, but it may be just a coincidence.

For what concerns the drastic segmental reduction, one may argue that the language got rid of all syllables unnecessary for communication. The suppression of phonemes leads to an extraordinary large number of homophones. For example, the sound [o] may correspond to *eau, eaux* < *aqua* 'water', *au, aux* 'to the', *o* 'the letter o', *oh*, etc; [SE^{^*}] to *sain* < *sanus* 'sane', *sein* < *sinus* 'breast', *ceint* < *cinquit*; *cinq* < *quinque* 'five', *seing* < *signum* 'sign' etc.; [vER] to *vers* 'toward', *vers* < *versus* 'verse', *vert* < *veridis* 'green', *ver* 'worm', *verre* < *vitrum* 'glass'. [ynvEstaSte] may be a vest that you have bought (*une veste achet *), or that you have to throw (*une veste   jeter*), or a spotted vest (*une veste tachet *) ... The existence of many allophones does not always ease every day communication, but allows daily word games. The acquisition of writing is certainly more difficult for the French child than for the Spanish or Italian child. But the French is generally very attached to his language, and all attempts to reform orthography and to make the written form closer of the spoken form of the present have failed. Many feel like a more phonetic orthography would erase trace of the prestigious (?) past of the words (Walter, 1994).

It is difficult to make previsions on language changes. Rousselot (Rousselot, 1899: 66) was wrong when he predicted palatalisation of *g*, and *k* from synchronic variations he observed with palatography. "La mouillure des consonnes dures est encore   son d but   Paris ... sans  tre encore sensible   l'oreille". Words that were not frequently used in the past (and consequently not worn out by time) are now generally shortened by pronouncing only the first syllable(s): perm(ission), comp t(ition), t l (vision), fac(ult ), prof(essor), pro(fessionnel), pub(licit ), publi(cation). The ways of reducing words have changed.

It is relatively easy to make speculations to explain the past changes.

Experiments are needed to check how far the changes in prosodic profiles can be responsible for allophonic variations which turned into phonemic changes through the listener's misinterpretation (Durand, 1956; Ohala, 1981).

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