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PHONETIC CHANGE AND PHONOTACTIC RULES IN PROTO-FRENCH *

I. INTRODUCTORY.

1.1. In a previous article ¹, I suggested that the metathesis of final or secondary final /sk/ in Northern Gallo-Romance was due to the fact that this cluster did not occur in final position in Latin, whereas the group /ks/ (or its reflex [ćs], which simplified to /is/) was a permitted final cluster (cf. SEX, REX, DUX, FALX, etc.). As I admitted in my paper, phonotactic rules can be changed : in the particular case under consideration, the fall of final vowels was allowed to convert /sk/ into a permitted group in Occitan, if not in Northern French, whence the contrast between O. Prov. *bosc* and *fresc* and Fr. *bois* and *frais*, to take a couple of simple examples. Without the possibility of a re-ordering of phonotactic rules, the evolution of language would be much circumscribed. It is nevertheless clear that any language has complex rules governing the clustering and positioning of phonemes, and that these rules change neither rapidly nor easily. A few scholars — notably H. Lausberg and H. Weinrich, and more recently, J. Klausenberger ² — have often taken phonotactic rules into account in their discussion of certain phonetic changes in French and Romance. Generally speaking, however, the role of phonotactics in phonological change has received little attention, and certainly has not been studied in any systematic way. The purpose of this paper is to examine the evolution of consonants in Northern Gallo-Romance and see how far it can be explai-

* I should like to express my thanks to Professor T. B. W. Reid for his valuable comments on an earlier draft of this paper.

1. 'The Development in French of Gallo-Roman -sk in Final Position', *Rev. Ling. Rom.* 38 (1974), p. 501-506.

2. Cf. Lausberg's *Romanische Sprachwissenschaft*, Vols. I and II, Berlin, 1956, Weinrich's *Phonologische Studien zur romanischen Sprachgeschichte*, Münster, 1958, and Klausenberger's *French Prosodics and Phonotactics*, Beihefte zur *Z. Rom. Phil.*, No. 124, Tübingen, 1970.

ned by the desire not to break drastically with existing patterns of syllabic structure.

1.2. The importance of the phonotactic rules governing a particular language is most easily recognized when one considers the way in which borrowings are adapted to the phonological patterns of the « debtor » language, although it can also happen that the latter modifies its phonological structures through the adoption of new sounds or combinations of sounds. In modern French, for instance, the affricates *te* and *dj* and the velar nasal [ŋ] have been adopted as a result of borrowing from languages such as English and Arabic. Educated English speakers using French words like *genre* and *ensemble* may well articulate 'un-English' nasal vowels. In both cases, there may be argument as to whether such borrowings are « part of the system » or not, and if so, to what degree. The sound [ŋ] has now been adopted, after a lengthy period of hesitation and experimentation¹, by most French-speakers. Whether or not one regards it as having acquired the status of a French phoneme will depend *inter alia* on the importance one ascribes to minimal pairs adduced by W. Rothe : *shopping* (/ɛøpin/) and *chopine* (/ɛøpin/), *camping* (/kãpin/) and *campine* (/kãpin/)². To a greater or lesser extent, however, many people would still regard [ŋ] as « foreign » or « marginal » to the system³, but clearly it is significant that the sound has been assimilated to French to the degree it has. The example illustrates the importance of sociolinguistic factors in the adoption of new sounds or sequences of sounds. Those who introduce them are almost certainly the better-educated or the bilingual members of the speech-community, and different trends co-exist within the latter : in « français populaire », for instance, according to Pierre Guiraud, not only does the *-ing* suffix still tend to be pronounced as *ɛj* or *ɛg*, but even combinations like /gz/, /kt/ and /kst/ are simplified : cf. Guiraud's orthographical representations *ezamen*, *insèque*, *strique*, *prêtesque* (for *examen*, *insecte*, *strict* and *prétexte*)⁴. Where consonantal clustering is concerned, the phono-

1. Cf. A. Martinet, *La prononciation du français contemporain*, 2nd ed., Paris, 1971, pp. 180-184.

2. W. Rothe, *Phonologie des Französischen*, Berlin, 1972, p. 69.

3. In his article on « Shampooing und die Integration des Suffixes *-ing* » in *Verba et Vocabula. Festschrift E. Gamillscheg zum 80. Geburtstag* (Munich, 1968, pp. 565-578), the late Ludwig Söll took the view that the suffix had not yet been integrated into French, in spite of the large number of borrowings involved.

4. Cf. *Le Français populaire*, Paris, 1965, p. 100 f, p. 110.

tactic rules for this variety of French are clearly different from those which apply to 'standard' French.

1.3. If one examines the adaptation of Greek words, it seems reasonable to believe, with M. K. Pope¹, that the aspirated plosives of Greek were first rendered by the unaspirated plosives which they most closely resembled within the system of Latin, but that the use of *h* in spellings from the second century A. D. (cf. adaptations such as COLAPHUM, BRACHIUM, etc.) indicates the introduction of aspiration, if only in the pronunciation of the educated. As within the French speech-community, there appear to have been significant differences in class usage: although the cluster /gm/ existed in Latin words such as AGMEN, the trend in popular usage towards less complex clusters, or possibly a longstanding difference between « popular » and « standard » usage, meant that a word such as *sagma* was adapted as SAUMA (Fr. *somme*)². Chronological factors also enter into the picture. The fact that Greek φ was adapted as /p/ in PURPURA (< πορφυρά) and as /f/ in O. Fr. *orfenes* (< ὀρφενός) would seem to reflect changes in pronunciation taking place in Greek. Differences in the adaptation of Greek ζ, on the other hand, appear to be related to changes taking place in the articulation of Latin: ζ would seem to have been first adapted as /s/ (cf. μάζα > Fr. *masse*), but later as an affricate *dj*, following the palatalization of Latin *di-* + vowel (cf. Greek ζήλος < Fr. *jaloux*)³.

1.4. It will be seen that there are a variety of variables (chronological, regional or sociolinguistic) that have to be taken into account in discussing the role played by phonotactic structures in conditioning phonological changes. There are also morphophonemic ones: frequently, combinations of consonants may occur, but exclusively or almost exclusively across morpheme boundaries: thus, /r/ + Plosive + Liquid sequences occur in Latin in combinations such as PER + root, INTER + root and SUPER + root (PERBREVIS, PERBLANDUS, etc.). Such clusters perhaps have a different status from clusters that occur within morphemes, but syllabically, they are comparable, and their function in making certain clusters more familiar is hardly to be denied.

1. Cf. *From Latin to Modern French*, 2nd ed., Manchester, 1952, p. 629.

2. Cf. also the entry in the *Appendix Probi*, « pegma non peuma ».

3. For differences in adaptation of Gk. η, see E. Richter, *Chronologisch e Phonetik des Französischen bis zum Ende des 8. Jahrhunderts*, Beihefte zur *Z. rom Ph.*, No. 82, Halle-Saale, 1934, § 63.

2.0. THE ADAPTATION OF GERMANIC ELEMENTS.

2.1. Although one may not attribute quite as great an importance to it as did W. von Wartburg, it would seem that one of the strongest of influences on the development of Northern Gallo-Romance was that of Germanic. The fact that an /h/ phoneme was reintroduced in Northern Gaul and nowhere else is an indication of the linguistic impact of the Germanic invasions, while the fact Gmc. /w/ imposed itself as an initial consonant in the North-East and East of the *langue d'oïl* area indicates an even more intimate degree of contact between the Latin and Germanic linguistic systems¹. It is agreed that the sound [w] no longer occurred in the spoken Latin of 5th-Century Gaul except as an element in the /kw/ and /gw/ clusters. The explanation of the Romance *w-* > *gw-* changes (e. g. of Franconian *WARDON > O. Fr. *garder*, It. *guardare*, etc.) has generally been explained, however, in what are physiological terms: if *w-* became *gw-*, the argument runs, it was because the effort of articulating an unfamiliar sound produced plosion of the initial element². Clearly, physiological factors are not without significance, but it does appear appropriate to consider the change from other view-points also. M. K. Pope placed the phenomenon in a rather wider perspective when she attributed it to the general tendency to reinforce initial consonants, notably initial yod (cf. JUDICARE > O. Fr. *jugier* (*djudjyēr*)³. This is still a largely physiological approach, although the reinforcement of initial consonants can be related to functional and phonological factors: the fact that initial plosives like *p-*, *t-*, *b-* and *d-* have been retained without change in French in spite of the fact that in utterances they were very frequently intervocalic shows that the desire to maintain the phonological identity of words is a factor that runs counter to the effects of ordinary phonetic erosion. If one considers the *w-* > *gw-* change in the light of the phonotactic rules that existed in Vulgar Latin, it surely is not without significance that /w/ occurred only in combination with a velar plosive: the substitution of /gw/ for initial Germanic /w/ seems

1. Map 626 (« Garder ») of the *Atlas Linguistique de la France* shows traces of the survival of initial *w-* in Eastern Gallo-Romance all the way down from the Pas-de-Calais to the Val d'Aosta.

2. For recent expressions of this view, cf. F. Carton, *Introduction à la phonétique du français*, Paris, 1974, p. 163, and F. de la Chaussée, *Initiation à la phonétique historique de l'ancien français*, Paris, 1974, 6.2.2.1., p. 96.

3. *Op. cit.*, §§ 203, 636.

more likely to be accounted for by a process of adaptation to the phonological rules of the vernacular than by the muscular effort of articulating the sound in an unfamiliar position. The « phonotactic » explanation, in effect, says that Germanic *w-* was replaced by /gw/ because this kind of labialized velar was its nearest equivalent in the phonological system of Vulgar Latin. One thing that does not absolutely confirm this explanation is that strictly, one would have expected to find *w-* being replaced not by /gw/, which only occurred medially in Latin (cf. LINGUA, PINGUIS, SANGUIS, etc.), but by the /kw/ complex which did occur in the same environment as *w-* (cf. *qui*, *quot*, etc.). Against this, it can be argued that of the two sequences, the /gw/ sequence is likely to have represented the closest equivalent to voiced *w-*, because in the sequence /kw/, one would expect the /w/ to be voiceless, in contact with the voiceless velar. There is no trace, to the best of my knowledge, of Germanic *w-* ever being adapted as /kw/ in the Romance languages, though the presence or absence of voice in the bilabial, as distinct from the velar plosive, would not have been functional: however, given a desire to adapt a specifically *voiced* /w-/, the choice of /gw/ rather than /kw/ can be explained in terms of economy of effort — a concept which has both physiological and phonological significance.

2.2. In addition to initial /w/ followed by a vowel, the Germanic languages also had a more complex initial cluster /wr/. This was avoided in Gallo-Romance by various means, notably metathesis, as in *WRAKJO > *gars* and *WRIST > *guêtre*, and intercalation of a vowel to separate the two elements, as in *WRAINJO > O. Fr. *guaragnon* « stallion » and *WRATTJA > *WARANTIA > *garance*¹.

2.3. At the time of the Germanic invasions, the spoken Latin of Gaul almost certainly contained a spirant [ç] deriving from the palatalization of preconsonantal /k/ in words such as LACTEM, LECTUM, TECTUM, etc. The assimilation of words such as Germanic *WAHTA and *WAHTON (O. Fr. *guaite*, *guaiter*) would therefore pose no phonotactic problems. Initial sequences such as [çr-], [çl-] and [çn-], or their reflexes *hr-*, *hl-* and *hn-*², on the other hand, had no equivalents in the Latin of the time, and were

1. Cf. P. Fouché, *Phonétique historique du français*, Vol. 3, Paris, 1961, p. 708, and for the last example, W. Meyer-Lübke, *Romanisches etymologisches Wörterbuch*, 3rd ed., Heidelberg, 1935, no. 9573.

2. According to P. Fouché, *op. cit.*, p. 693, the velar spirant [ç] was in the process of reducing to an aspirate at the time of the invasions.

replaced by sequences of phonemes or by individual phonemes which did correspond to the phonotactic rules of Vulgar Latin. Forms such as the O. Fr. personal names *Clovis*, *Clotaire* and *Clothilde* probably arose out of the adaptation of [çl] as /kl/ ¹, though this may represent not the adaptation of a sequence of sounds, but of the orthographical sequence *chl*- used by scribes in their rendering of Germanic sounds (cf. written forms such as *Chlodavicus*). The alternative development of *HLODAWIK ² involved the simplification of the initial cluster to /l/ : cf. O. Fr. *Loeis*, Fr. *Louis*. Other cases cited by Fouché ³ are *lot* < Frank. *HLOT, *ramper* < Frank. *HRAMPON, *râper* < Frank. *HRASPON, *rang* < Frank. *HRING, etc. ⁴ In Fouché's view, this mirrors the further weakening of the clusters in Frankish itself, but it would equally well represent merely a variant adaptation of an « unfamiliar » cluster. The other examples involving Germanic [çl] and another complex cluster [çr], show their replacement by the sequences /fl/ and /fr/ : cf. *flanc* < Frank. *HLANKA, *froc* and *freux* < Frank. *HROK, *frapper* < Frank. *HRAPON, *frimas*, a derivative of *frime* < Frank. *HRIM, *frelon* < Frank. *HRUSLO, etc. ⁵ The fact that *HNAF was adapted as *hanaf* was due, as Elise Richter states ⁶ to the fact that Latin did not include any initial sequence of Cons. + /n/. The /kn/ of Anglo-Sax. KNIF was also broken up by the intercalation of a vowel (Fr. *canif*).

2.4. Finally, although Gallo-Romance later developed a voiceless fricative *ç* deriving from intervocalic /t/ and /d/ which had become final, the sound would appear to have been unfamiliar at the time of the invasions, and was replaced by its nearest equivalent in the system, the dental plosive /t/ : Franc. *θWAHLJA* > *touaille*, *HAUNI θ A > *honte*, * θ RISKAN > O. Fr. *treschier* « to dance » ⁷.

3.0. THE ADAPTATION OF *t(u)l/d(u)l*.

3.1. The slurring of the unaccented penultimate vowel of words such as VETULUS, SPATULA, ROTULUM, CAPITULUM, etc., would have created a

1. *Ibid.*, p. 692.

2. Or some similar form : reconstructions vary.

3. *Op. cit.*, p. 704.

4. *Ibid.*, p. 693 ; cf. also M. K. Pope, *op. cit.*, § 635. Professor Reid has pointed out to me that initial Welsh *ll* (*l* devoiced) has been adapted in English variously as /l/, /fl/ and /kl/.

5. Fouché, *op. cit.*, p. 693.

6. *Op. cit.*, § 114 A.

7. M. K. Pope, *op. cit.*, § 634. For other examples, cf. Richter, *op. cit.*, § 91.

*/tl/ sequence, but in fact the group — and its voiced equivalent */dl/ — were systematically avoided. It is perhaps significant that these are sequences that do not appear to have occurred in Latin even across a morpheme boundary. The *Appendix Probi* contains the entries *vetulus non veclus* and *vitulus non viclus*, and the phonetic development of several French words indicates a substitution of the 'permitted' Velar + /l/ sequence for unfamiliar */tl/ or */dl/ : cf. *vieil* < VETULUM and *seille* 'bucket' < Lat. SITULA. In certain other cases, it would seem that the /t/ or /d/ dropped, like syllable-final /t/ or /d/ elsewhere (cf. CADENA > *chaine*), as in ROT(U)LUM > *rôle* (O. Fr. *rolle*), or was assimilated to /l/ : cf. QUERQUEDULA > V. Lat. *CERCEDULA > O. Fr. *cercelle*, Fr. *sarcelle*. In the case of the word SPATULA > *épaule*, an assimilation of /t/ or /d/ to /l/ has been postulated, with subsequent vocalization of the first /l/ to /u/ to form a diphthong, as with preconsantal /l/ in *talpa* > *taupe*, FALLĪTA > *faute*, etc.¹ : the principal example cited is that of SPATULA > *épaule*. There is some difference of opinion about the development of MODULUM, which has become *moule* in French, but appears as *mole* in O. French. As Professor Reid has pointed out to me, the vocalization of /l/ before another /l/ is somewhat suspect : we may note that the suffix -ĪLLA, for instance, has regularly developed to -*elle* (O. Fr. -*ele*), with no trace of vocalization of the first /l/. The form *épaule* could have arisen as the result of crossing between *espalle* and a form *espaude*, attested in O. Norman, in which the unfamiliar */dl/ was avoided by metathesis to /ld/ (cf. Span. *espalda* and *molde* < MODULUM).

3.2. Semi-learned forms were also involved, and here too the sequence */tl/ was avoided by the substitution of a permitted sequence, in this case /tr/, for the unknown one : cf. TITULUM > *titre*, CAPITULUM > *chapitre*, CARTULA > O. Fr. *chartre* (later *charte*), GLANDULA > O. Fr. GLANDRE, IDOLUM > O. Fr. *idre*².

4.0. GLIDE CONSONANTS.

4.1. Most scholars have explained the appearance of glide consonants in words such as CAMERA > *chambre*, TENERUM > *tendre*, *ESSERE > *être*,

1. *Ibid.*, § 372.

2. The treatment of other learned borrowings in the early period indicates a similar avoidance of unfamiliar sequences such as Plosive + Nasal : cf. DIACONUM > *diacre*, ORDINEM > *ordre*, PAMPANUM > *pampre*.

etc. in physiological terms : a recent version is that of F. Carton¹, who explains the appearance of /b/ in *chambre* by postulating a premature raising of the velum in anticipation of the following oral consonant, leading to a segmentation of [m] into an initial nasal element and a final element [b] which was oral and plosive as well as bilabial and voiced. Heinrich Lausberg, on the other hand, attributes the presence of the glide not to a physiological cause, but to a phonotactic one, namely the desire to assimilate sequences to existing sequences, or at the very least to accepted phonological structures². The sequence */mr/ was unknown in Latin, but /mbr/ was not (cf. UMBRA) ; */sr/ did not occur, but /str/ was common (cf. STRUCTURA, OSTREA). It is true that the sequence /ndr/ did not occur in Classical Latin, but the /ntr/ cluster, representing the structure Nasal + Dental Plosive + /r/, was relatively common, and would no doubt have served, as Professor Lausberg suggests³, to make acceptable the /ndr/ group brought about by the slurring of the atonic penultimate vowel of words like VENDĒRE, PREHENDĒRE and FĪNDĒRE. Factors which may well have aided the easy acceptance of the sequence were the fact that /ndr/ fitted neatly into existing patterns, since permitted clusters included /mbr/ and /ngr/, with voiced plosive between nasal and /r/, and also that the new group permitted greater economy of effort, with its succession of voiced consonants.

4.2. The Nasal + Plosive + Liquid and Liquid + Plosive + Liquid clusters in Latin, unlike the /s/ + Plosive + Liquid sequences, were not, as we have just seen, restricted to voiceless plosives for their medial element : in addition to combinations represented by words like COMPREHENDO, CONTRA, CONCRETUM, AMPLUM, SECLUDO, ULTRA and PULCHRITUDO, we find /mbr/ (cf. UMBRA, IMBRES), /ngr/ (cf. CONGRESSUS, INGRATUS) and /ngl/ (INGLORIUS). It is therefore not surprising that « gaps » in the series of permitted clusters should have been filled, as in the case /ndr/, just cited, and also in that of /mbl/, created either through the slurring of an unaccented vowel, as in AMBULARE > O. Fr. *ambler*, or through the introduction of a glide, as in CUMULARE > *combler*, SIMULARE > *sembler*, INSIMUL > *ensemble*, etc., and also in the much rarer sequence /lgr/ (cf. *bougre* < BULGARU), which matched /lkr/. The treatment of other secondary groups is generally

1. *Op. cit.*, p. 152. Cf. also F. de la Chaussée, *op. cit.*, p. 135 f.

2. *Op. cit.*, § 507-509.

3. *Ibid.*, § 513.

in line with this pattern. The slurring of the unaccented penultimate of AVUNCULUS (> *oncle*) is allowed to produce secondary /nkl/; in the same way, /ngl/ is allowed to arise from the slurring of the unaccented vowel of UNGULA (> *ongle*) and CINGULA (> *sangle*). In addition to these clusters with a medial element which is a plosive, we also find Nasal + /f/ + Liquid: INFRA, INFLATIO, CONFLUENS, etc. There were no voiced equivalents, and none appear to have been accepted in the early period (a form like *chanvre* was borrowed from Occitan in the Middle Ages). The non-acceptance of */nvl/ follows from the rejection of the less complex */vl/ (cf. the development of *table*, *sable*, etc., compared to *lèvre*) — whatever the reasons for this (*vide infra*, 6.1.). Fouché explains the development of Lat. INVOLARE > O. Fr. *embler* « to steal » in terms of the substitution of permitted /mbl/ for unfamiliar */nvl/ ¹.

4.3. The glide that is introduced between /n/ and /r/ when they are brought into contact is a dental, as might be expected, since /n/ is the dental nasal, but it is not voiceless /t/, as in Lat. INTRA, etc., but the voiced dental /d/ which occurs also in secondary groups such as those of *vendre* < VENDĚRE or *prendre* < PREHENDĚRE. If the relative chronology of the secondary group and of the glide-produced group (in TENĚRUM > *tendre*, CINĚREM > *ceindre*, etc.) is as estimated by Elise Richter, i. e. 1st-3rd century for the first type and 4-5th century for the second, ² the /ndr/ group was already a permitted cluster when the need came to cope with the *n'r* complex. In any case, from the point of view of economy of effort, the introduction of a voiceless glide between the voiced consonants would have been unusual, and would not be expected in a case like this, when the /ndr/ sequence was phonotactically acceptable.

4.4. The insertion of a dental between a nasal and /l/, on the other hand, would have produced the sequence */tl/ (or */dl/) which was not found in Latin, and which continued to be unacceptable (*vide supra* 3.1. — 3.2). The development of SPĪNŮLA > *épingle* is therefore in accordance with the general tendency to adhere to existing phonological patterns, which included /nkl/ and /ngl/, although words containing these groups were comparatively rare. As in the case of the TENĚRUM > *tendre* type, the voiced plosive was preferred. A variant development involving the assimilation of /n/ to following /l/, with subsequent simplification of the geminate, would

1. *Op. cit.*, p. 831.

2. *Op. cit.*, § 66 and § 113.

appear to explain the Norman dialect form *épîle*¹. The relative rarity of /nkl/, /nkr/, /ngl/ and other Nasal + Velar + Liquid combinations in Old French as compared to Latin is largely due to the fact that the reflexes of Lat. 'nc(e)re and 'ng(e)re contain a dental as the medial consonant. This is presumably because the velar palatalized to an affricate beginning with a dental before the slurring of the unstressed /e/ which had caused the palatalization: the development of words such as PLANGĚRE > *plaindre*, FĪNGĚRE < *feindre* and VĪNCĚRE < O. Fr. *veintre*, indicates that they all had in O. Fr. a diphthong produced by the combination of the stressed vowel with yod deriving from the palatalization of a velar.

Although Latin included /ltr/ (cf. ULTRA) among its permitted clusters, and not /ldr/, the glide that occurred between /l/ and /r/ when these two sounds were brought into contact by the slurring of an atonic vowel was in fact voiced /d/: cf. MOLĚRE > O. Fr. *oldre*, *moudre*, *VOLĚRAIO > *voudrai*, etc. This is in line with the tendency, observed elsewhere, for the glide to match the voice of the preceding and following consonants.

4.5. The /r/ + Plosive + Liquid clusters appear to be restricted in Latin to words in INTER-, PER- and SUPER-, i.e. at a morpheme juncture: cf. INTERPRETATIO, INTERTRAHO, PERBLANDUS, PERBREVIS, PERPLEXUS, PERTRISTRIS, SUPERGREDIOR, and the like. The degree to which the initial particles were recognized as separate morphemes would appear to differ: forms like INTERPRETATIO and PERPLEXUS, for instance, probably were felt to function as semantic units where ones like PERBLANDUS and PERTRISTRIS were clearly recognized as being composed of particle + adjective. The fact that there was no resistance to the assimilation of /r/ + Plosive + Liquid sequences to the list of permitted clusters would appear to suggest that the process of assimilation, through the acceptance of forms such as PERPLEXUS and of the phonological patterns it exemplifies, was already well advanced in Latin itself. Certainly, words such as PERDĚRE and *ARDĚRE (Class. Lat. ARDĚRE) were allowed to slur their atonic penultimate vowels to produce Fr. *perdre* and O. Fr. *ardre*, containing the sequence /rdr/, which does not appear to have occurred in Latin². We similarly find the secondary groups /rbr/ (cf. ARBOREM > *arbre*), /rpr/ (PURPURA >

1. In von Wartburg's *F. E. W.*, Vol. XII, p. 176, however, *épîle* and similar forms are derived from SPĪCŪLA.

2. The adaptation of the borrowing ORDO, ORDINEM as *ordre* presumably came after the reduction of *rd(e)re* to [rdr]. For the development of forms such as SURGĚRE > *sourdre*, *vide infra*.

pourpre), and /rkl/ (cf. CIRCULUM > *cercle*). The velar of the second syllable of words like CARCĔREM and SURGĔRE, like that of VINCĔRE and FINĔRE, has been replaced by a dental, presumably following the palatalization of the velar before front vowel (see 4.4.) : CARCĔREM > O. Fr. *chartre*, SURGĔRE > *sourdre*. The development of MARMOREM > *marbre* following the same slurring of the unaccented penultimate is one that can be explained in phonetic terms, but which also confirms the significance of phonotactic factors : whereas, as we have seen, the /r/ + Plosive + Liquid sequence occurred in Latin, albeit across morpheme boundaries, */rnr/ does not.

4.6. The type of three-consonant group that had the widest distribution in Classical Latin was /s/ + Voiceless plosive + /r/ (of the /s/ + Voiceless plosive + /l/ sequences, /*stl/ could not occur, since /*tl/ did not; /skl/ did not occur although /spl/ did — cf. SPLENDIDUS). Following the introduction of a prosthetic vowel before initial /s/ + Cons. when the previous word ended in a consonant, these groups ceased to be true initial groups in Vulgar Latin, but they remained common in medial position. It was therefore to be expected that when /s/ was brought into contact with a liquid through the slurring of an unaccented vowel, the « unknown » sequence /*sr/ should be avoided in favour of the familiar sequence /s/ + Voiceless plosive + /r/, and given that /s/ is a dental, that /str/ should have been preferred : cf. the development of *ESSĔRE > O. Fr. *estre*, of ANTECESSOR > O. Fr. *ancestre*, etc. Although elsewhere clusters have often been allowed to form that did not exist in Latin, but conformed to known patterns (e. g. the /rdr/ sequence — cf. 4.5.), a secondary sequence /skl/ was avoided in the early period at least (*muscle*, according to the *Petit Robert* dictionary of 1972, dates from 1312) : MASCŪLUM and MUSCŪLUM (cf. Fr. *mâle* and *moule*) show simplification of the -sk(u)lu sequence to [sl] in O. Fr. (*vide infra*, 5.1.). The /s/ + Velar cluster, brought into contact with /r/ through the slurring of the unstressed penultimate vowel, developed to /str/ in the same way as did the consonant sequences -nk(e)re and -rk(e)re, following the palatalization of the velar before the front vowel. The /skr/ sequence does survive in a word like O. Fr. *escrire* < SCRIBĔRE, where it was primary, while /spr/ occurs in O. Fr. *aspre* (< ASPĔRUM/ ASPRUM), where elision appears to have occurred at a very early date, or O. Fr. *vespres* (< VISPĔRAS), where the group was secondary.

4.7. The permitted sequences in Gallo-Roman seem to have differed from those of Classical Latin in that the voiceless sequence /str/ was mat-

ched by a voiced one /zdr/ : at least that is the phonetic value that one would ascribe to the cluster in O. Fr. words like *cosdre* < *COSĚRE. We know that intervocalic /s/ voiced to /z/ in Gallo-Roman, and it is to be presumed that in this and similar cases, voicing had already taken place when the slurring of the unaccented vowel occurred. Elsewhere also, we can observe the tendency to have a voiced medial consonant where the initial consonant was voiced (cf. TENĚRUM > *tendre*, SIMULAT > *semble*, *VOLERAIO > *voudrai*, etc.). The creation of the sequence is also in line with the tendency, observed in the case of the Liquid/Nasal + Plosive + Liquid groups, to admit parallel voiced sequences to the series of permitted clusters.

4.8. In Picard, Walloon and Lorrain, a glide consonant was not introduced¹ between /l/ and /r/, between /n/ and /r/ or between /m/ and /l/ : the examples in *Aucassin et Nicolette* include *vauroit*, *remanroit*, *tenront* and *asanlent*². One is strongly tempted to attribute this difference in phonotactic patterns to a greater degree of bilingualism in Latin and Germanic in these areas. As we have seen, it was in the same general areas of the North-East that initial Germanic *w-* was assimilated to the system without the anteposition of a velar plosive element. The fact that sequences such as /lr/, /nr/ and /nl/ do occur in certain environments in Germanic languages could explain that the inhabitants of more heavily Germanized areas should have been capable of assimilating the sequences in question without systematically introducing a glide. To judge from the examples cited by a Germanist colleague³, the sequences concerned occur without a medial glide principally across morpheme boundaries (cf. O. H. G. TUOMLĪH «supreme», HEIMLĪH «native», UODALRI(C)H > Germ. *Ulrich*), but also in more basic forms : cf. Goth. SIMLE «once upon a time», O. Norse HVALR «whale» and STALLR «crib». The /nr/ sequence occurred only in one example quoted to me, the O.H.G. personal name CHUONRAT (> Germ. *Konrad*). These rather disparate examples are intended to show only one thing, i. e. that the /lr/, /nr/ and /nl/ sequences did occur in the Germanic languages, unlike Latin, even if they were not very typical.

1. See C.-T. Gossens's *Grammaire de l'ancien picard*, Paris, 1970, § 61.

2. Cf. F. W. Bourdillon's edition, Manchester, 1930, p. xxxiv, and for other examples, the paragraph of Gossens's book cited in the previous note.

3. Dr K. Ostberg, to whom I am much indebted.

5.0. «NEW» /s/ + CONSONANT CLUSTERS AND THE SIMPLIFICATION OF CONSONANT GROUPS.

5.1. In Latin, /s/ was a common syllable-final consonant, above all before voiceless plosive : cf. PAS-TA, MUS-CA, HOS-PI-TEM, etc. /s/ before other consonants was much rarer : cf. COSMETA, NOMISMA and other words borrowed from Greek, with /sm/. Certain combinations existed across morpheme boundaries only, e.g. /sn/ and /sl/ : cf. TRANSNATO, TRANSLATIO, TRANSLEGO, EXLEX. The slurring of the unstressed penultimate in ASINUM, FRAXINUM, INSULA, *VASSALITTUM, etc. was allowed to take place, normalizing the /sl/ and /sn/ sequences in O. Fr. (cf. *asne*, *fraisne*, *isle*, *vaslet*). The /sm/ cluster was likewise current : cf. O. Fr. *esmer* < AESTIMARE, *blasmer* < *BLASPHEMARE, etc. The fact that such sequences were accepted in Gallo-Roman can be attributed with some plausibility to the fact that the /s/ + Cons. groups belonged to a well-established structural pattern. This is not to say, however, that the status of being a permitted cluster guarantees survival into Old French, or that new combinations did not come into being in spite of the fact that they were not permitted clusters in either Classical Latin or Spoken Latin.

5.2. Indeed, one of the most significant features of the development of Northern Gallo-Romance is the progressive simplification of consonantal clusters, which leads to a marked increase in the number of open syllables, partly though the assimilation of pre-consonantal /s/, although it survived into Old French, unlike, say, pre-consonantal /p/ (cf. RUPTA > O. Fr. *rote*, SEPTEM > O. Fr. *set*, etc.). The absorption of pre-consonantal /s/ also differs from that of consonants other than the liquids and nasals in that it produced a lengthening of the preceding vowel. That there were chronological differences in the absorption of /s/ before voiceless and before voiced consonants is shown by the form of borrowings into English following the Norman invasion : cf. Engl. *blame* and *isle*, but *coast*, *rest*, *task*, etc. Of the liquids and nasals, pre-consonantal /l/ (phonetically, [ɫ]) vocalized to [u], thereby also increasing the number of open syllables and helping to simplify the syllabic structures of Old French as compared to Latin or to Modern French, which has seen the reintroduction of all manner of complex consonant clusters. Both /r/ and the nasals, however, resisted absorption, /r/ indefinitely, the nasals at least into the middle of the Middle French period ¹.

1. M. K. Pope, *op. cit.*, § 436, dates the earliest absorption of pre-consonantal nasals, that occurring in the unstressed verb ending *-ent*, from the late

Although the trend was therefore very much towards the simplification of syllabic structures, some new clusters also came into existence, particularly in word-final position. However, many of the « Three-member prepausal clusters » listed by Klausenburger¹ seem unlikely ever to have existed, if phonotactic rules have any validity at all : spellings in O. Fr. texts may include the graphic clusters *rçs*, *rps*, *lfs*, etc., but it seems highly unlikely that, for instance, PORCUS and RUMPIT reduced to */porks/* and */rompt/* in Late Gallo-Roman, as suggested by Klausenburger. On the other hand, it is not in dispute that final sequences such as */rts/* (Cf. O. Fr. *forz*) and */nts/* (cf. O. Fr. *venz*) were allowed to come into being as a result of the combination of stem and declensional -s. One or two points need to be taken into account, however : */ts/* originated as an allophone of the */k/* phoneme, and may well have functioned within the Old French system as a unit rather than as a cluster. In any case, it is rather different from the other groups mentioned by Klausenburger. Most of the new sounds in Old French derived either from the voicing and slurring of intervocalic consonants (e. g. *-t- > -d- > -z-*) or from the palatalization of sounds (which *inter alia* produced the affricates *ts*, *te* and *dj*, reducing in 13th century to *s*, *ε* and *j* respectively). A new group was the Labial + */r/* sequence */vr/*, which matched the passage of intervocalic */p/* and */b/ > /v/* in most environments.

6.0. « MUTA CUM LIQUIDA » SEQUENCES.

6.1. The passage of intervocalic */pr/* and */br/* to */vr/* was not matched by that of primary or secondary */pl/* and */bl/* to a comparable sequence of Labial Fricative + */r/* : cf. OPERA > *œuvre*, but DUPLUM > *double*, FĒBREM > *fièvre*, but EBULUM > *hièble*. There are also significant differences between the development of tonic vowels before Cons. + */r/* and before

13th century, and gives a *terminus ad quem* of the mid-16th century for the absorption of other pre-consonantal nasals. J. Klausenburger, on the other hand, maintains (*op. cit.*, 5.3.) that pre-consonantal nasals (and also */l/*, */s/* and */z/*) were « weakly articulated, if at all », in Old French, with a very significant accretion to the number of open syllables. The idea is in fact rather confused : open syllables are not open if they include even a weakly-articulated final consonant. Klausenburger seems to be voicing a much more conventional view when he states later (*op. cit.*, 6.2.) that « Syllable final */n/* and */m/* disappeared, nasalizing the preceding vowel. This nasalization process began in early Old French, but was not completed until the Middle French period ».

1. *Op. cit.*, 6.2., p. 58.

Cons. + /l/ (cf. FABRUM > O. Fr. *fevre* and TABULA > *table*). Although the tonic vowels of POPULUM (> *peuple*) and EBULUM (> *hièble*) have undergone the expected diphthongization of the tonic free vowels ò and è, with one exception the vowels /a/, /e/ and /o/ show no trace of the diphthongization or change which they have normally undergone before Cons. + /r/ (cf. BIBĒRE > O. Fr. *boivre*, LABRA > *lèvre*, CAPRA > *chèvre*, etc.)¹. The exception is the O. Fr. word *foible* < V. Lat. *FĒBĪLE (< FLĒBĪLEM by dissimilation). Even here, however, there has not been a change from /bl/ to /*vl/ parallel to that of intervocalic /br/. The late Pierre Fouché explained the development of forms such as TABŪLA > *table*, DŪPLUM > *double* and TRĪPLUM > O. Fr. *treble* by postulating a gemination of the labial plosive which would explain both the non-diphthongization of the tonic vowel and the retention of the labial plosive². Variants of this theory are put forward by F. de La Chaussée and by E. and J. Bourciez³. Both Fouché and the Bourciez adduce as a reason for the gemination the desire to avoid the unknown sequence *vl. As the Bourciez put it, « ... la langue hésitait à prononcer *vl. En francien, cette répugnance a maintenu b(l), malgré la pression débilante exercée par la voyelle précédente, et par réaction, bl est sans doute devenu *b-bl. » The cluster -fl- never becomes *vl either, and Fouché again explains it by gemination: *TRIFULU > *trefflo > *trefflo > *trèfle*, and SIFILARE > *siflare > *sifflare > O. Fr. *siffler*.⁴ This is in fact a phonotactic explanation, although it cannot be said to be entirely satisfactory. It involves postulating a very convenient gemination that followed the voicing of -pl- > -bl- (cf. DUPLUM > *double*), but preceded the diphthongization of tonic free /e/ and /o/ (except in the case of FLĒBĪLEM > O. Fr. *foible*). It is a gemination that is not paralleled by examples elsewhere, and indeed does not seem to be supported by any kind of evidence in the shape of gemination in Latin documents of the Dark Ages. Further, it seems to run counter to a general tendency towards the simplification of consonantal clusters. If we take the variant develop-

1. There do not appear to be any convincing examples of the diphthongization of /o/ before labial + /r/. The situation is complicated by the fact that labial /v/ has quite often had an influence on the development of a preceding vowel: cf. LUPA > *louve*, ROBOREM > *rouvre*, etc.

2. *Op. cit.*, p. 824.

3. Cf. de La Chaussée, *op. cit.*, 4.2.2.1. and E. and J. Bourciez, *Phonétique française*, Paris, 1967, § 169.

4. *Op. cit.*, p. 824.

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ment of -B(Ū)L which occurred in the North-East — cf. Picard *taule* < TABŪLA, *peule* or *pule* < POPŪLUM, etc. — we find a development which is similar to that which occurred sporadically in Francien, e. g. in PARABŌLA > *parole* : that is to say, a vocalization of the reflex of /b/ before /l/, which similarly results in the avoidance of /vl/. It is not impossible that in Picard, /vl/ was a stage which the /bl/ sequence went through¹. Could it be because the relevant Germanic language had phonotactic rules which permitted the sequence² ? More significantly, the Picard forms can hardly be derived from geminated variants of the Vulgar Latin words — and yet *taule*, *faule* (< FABŪLA) and *estaule* (< STABŪLA) do not show the change of tonic free /a/ > /e/ which one would expect in Picard as well as Francien. This seems a good reason for rejecting Fouché's hypothesis, since the main reason for postulating a gemination of /b/ in the /bl/ sequence was precisely to explain the failure of most tonic vowels followed by it to develop as if tonic free³. Given that the development of vowels in Picard is the same in this respect in spite of the fact that there was clearly no gemination of the labial in that dialect, the usefulness of the gemination hypothesis is called in question. All that we need to explain the retention of /bl/ — or the kind of development which led to the replacement of the cluster by /ul/ in PARABŌLA > **paraula* > *parole* — is that **vl/* was a phonotactically unacceptable sequence. It can be argued that what is puzzling about the development of the Cons. + /l/ sequences is not so much that there was resistance to the passage of /bl/ to **vl/*, but rather that the parallel change in intervocalic /br/ > /vr/ did take place, given that /vr/ was also an unfamiliar sequence. The difference cannot be explained in an obviously satisfactory way, though one can point to the existence of other differences between the Cons. + /l/ and Cons. + /r/ clusters : as we have seen, Dental + /l/ sequences were impossible in Latin, and have remained so ; we have also noted significant differences between the acceptability of /skr/ and the unacceptability, in the early period at least, of /skl/ (cf. MASCULUM > *mâle*, MUSCULUM > *moule* and « learned » *muscle*).

1. Cf. C.-T. Gossen, *op. cit.*, § 52-53, with its inclusion of forms such as *owlierv*.

2. My colleague Dr. Ostberg is doubtful about this, although the sequence *wl-* did occur in O. Gothic.

3. For a lengthy study of tonic vowels + *muta cum liquida*, cf. O. Gsell, « Zur Entwicklung der Gruppe 'Haupttonvokal vor Muta cum Liquida' im Französischen », *Zeitschr. f. franz. Spr. u. Lit.* 85 (1975), pp. 219-246.

7.0. CONCLUSION.

7.1. Because language change is often idiosyncratic or apparently idiosyncratic, any type of explanation will leave questions unsolved. What has been attempted here is to show that many of the changes that led to the emergence of Old French from Vulgar Latin are consistent with the desire to keep close to existing structural patterns. That some developments broke with those patterns does not destroy the validity of the approach, any more than apparent asymmetries in development would invalidate the thesis that language systems tend towards symmetry. The view that phonological changes are generally in line with existing phonotactic rules has points in common with the TG conception of language as rule-governed activity and with its presentation of changes in terms of the re-ordering of rules — indeed it would be interesting to see how transformationalists would handle changes such as those involving the insertion of glides, or those which substitute 'known' clusters for */tɫ/. Work so far in generative phonology has not come to grips with such questions, but it is to be hoped that it will do so in due course.

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