Guided Tour

ChantDigger is a program that gives basic material for the analysis of plain chant. The database contains about 2200 chants being the repertory of proprium chants in the Gregorian, Old Roman and Milanese (Ambrosian) repertory. The data are taken from (in bold are given the abbreviations used in the program):

AntMed: Gregorio Maria Suñol (Hrsg.), *Antiphonale missarum juxta ritum sanctae ecclesiae Mediolanensis*, Rom 1935;

GrTr: *Graduale triplex seu Graduale Romanum Pauli PP. VI cura recognitum & rhythmicis signis a Solesmensibus Monachis ornatum, Neumis Laudunensibus (Cod. 239) et Sangallensibus (Codicum Sangallensis 359 et Einsidlensis 121) nunc auctum* (1979);

OffTr: *Offertoriale triplex cum versiculis*, [hrsg. v. Rupert Fischer], 1985;

MM: Graduale Vat 5319, herausgegeben von Stäblein/Melnicki (*Die Gesänge des altrömischen Graduale Vat. lat. 5319*, Einführung von Bruno Stäblein; Notenteil, kritischer Bericht und Verzeichnisse von Margareta Landwehr-Melnicki, Kassel: Bärenreiter, 1970 [*Monumenta monodica medii aevi* II]).

I inserted the data myself without correction help. That's why I assume that there are mistakes. I'm sure you will find them.

Be cautious: *ChantDigger* helps. But it never gives solutions which could be results in current research. Every „result" needs scholarly interpretation!

ChantDigger is free. It seems that all major browsers give a comfortable workspace: Chrome, Firefox, Opera and Safari. I had no chance myself to test InternetExplorer.

Let's start: a first tour

When you choose *ChantDigger* in the internet start with pressing the red load button: *Load the data.* You should see something like (see next page).

Your first selections can be managed with the following buttons:

– When you press *Without notes*, you change the colour of the button as well as the text. The effect will be that you get always above the first line of any graphic representation a one liner summary of the action. Useful when you work some hours and when you make during this time a little collection of photographs.
– *All word forms* may be useful when you look for text items.

– In the beginning you will start with the button *Contents* (the contents of the database or the contents directed by you choice with corpus and genre). Or you enter a word – e.g. *summo* – after the button *Word int title* and you get all relevant chants.

ChantDigger Version alpha 0.6 published 31.10.2014 secs: 0.214 | 1.11.2014 6:16:26 pm | 2195 chants in db

Loaded

Graphics

Without notes All word forms

Corpus + genre: all ⬍   all ⬍   Contents   Word in title   Page: 1

Presentation of SM 1: normal ⬍   SM 1: Chant   Delete number(s):   Find axis

SM 2: Syllable segment   witho ⬍   SM 3: Sequences   SM 4: BNA   SM 5: Syllables

to the right   Photograph

| 0 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 |

Text

Let's say your choice was GR for the corpus and Graduale for the genre.
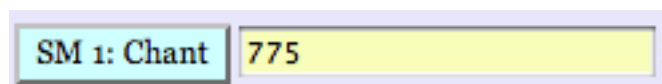
From the list

A domino factum est (GR GradualeV GrTr 45) 921
A summo caelo (GR GradualeR GrTr 27) 775
Ab occultis meis (GR GradualeR GrTr 101) 779
Accedite ad eum (GR GradualeV OffTr 103) 2131
Ad annuntiandum (GR GradualeV GrTr 327) 2140
Ad annuntiandum (GR GradualeV GrTr 510) 2174
Ad dominum dum tribularer (GR GradualeR GrTr 282) 780
Ad te domine clamavi (GR GradualeV GrTr 312) 2136
Ad te domine clamavi (GR GradualeV GrTr 355) 2147
Adiutor in opportunitatibus (GR GradualeR GrTr 69) 781

you select the line

```
A summo caelo (GR GradualeR GrTr 27) 775
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The line contains five informations: The *title* (A summo caelo), the *corpus* (Gregorian), the *genre* (graduale responsorium), the *source* (Graduale triplex) and the current number of the chant in the database (which will never change).

To see the chant you enter its number

and press the button *SM 1: Chant*. You get a picture which is partly reproduced here:

The neumatic content is reduced: there are normal notes, liquescentes and oriscus – not more. Please note that the option *With notes* is selected. That's why you see the one liner

above the first line. By the way: I speak of *search modes* and use for it the abbreviation *SM*.

The representation contains three lines of numbers below the syllables: the number of the syllable (zero based); the number of the syllable segment ("Silbenstrecke") and the number of occurrences of this segment. A segment (in the sense of Silbenstrecke) consists of the tones above *one* syllable. Segment Nr. 3415 starts with *c'* and ends with b (before the a above [cae-] lo.

If you would like to see the segment you enter the number in the field for *SM 3*:

Now press this button:

You see a synoptic presentation of segment 3415.

If ever you would like to see a sequence of segments you could enter 3415, 3416 886, 1696, 3417 and you would see (only first two lines of five):

What we did with these segments is a very limited business. It's evident that we must know the sequences and that we look only for syllable segments. It should be possible to give a more sleek formulation of a search. Let's try it.

In *SM 3* – you remember: *SM* is *search mode* – you give the definition of a sequence and a search width. This means: you give a sequence of tones and define within how many tones the sequence should be found. A valid expression could be

Please note that ChantDigger is written by a Swiss. That means: there's no b (B, b' etc.), but only h (H, h' etc.).

Thus: d f a c' a g 10 means, that the sequence d f a c' a g must occur within 10 tones. The result is (as always I give only the first lines of 82 lines):

BTW: There are 82 matches but ChantDigger gives always not more than 20 lines a page. What to do? Use the page option. Page 2 = lines 21-40, page 3 lines 41-60 etc.

Let's go back to the syllable segments. For three segments in line I use the abbreviation *BNA* = B[efore], N[ucleus], A[fter]. The case of finding the Nucleus is given by *SM 2*, as we have seen. Very interesting could be the case of *B_A*, meaning: a *B* and a *A* and – marked with _ as a variable – a Nucleus as the bridge between a certain *B* and a certain *A*. One could find with this formalism the occurrence of 1_949:

SM 4 | BNA: 1 949 | Page: 1 alle alle | 1.11.2014 8:32:22 pm

1
1481 Avertantur retrorsum
AR
OffertoriumV
MM 348

A-		ver-	tan-			tur	re-	tror-
		1	2			3	4	5
		1	5477			949	4	630
		395	1			125	4380	35

2
1508 Confiteantur tibi
AR
OffertoriumV
MM 357

Confi-		te-	an-			tur	ti-	bi
		2	3			4	5	6
		1	5581			949	20	1407
		395	1			125	5528	44

3
1510 Confitebor tibi domine
AR
OffertoriumV
MM 356

Con-		fi-	te-			bor	ti-	bi
		1	2			3	4	5
		1	5587			949	20	1407
		395	1			125	5528	44

4
1577 Exspectans exspectavi dominum
AR
OffertoriumV
MM 348

Ex-	pec-			tans	ex-	pec-	ta
0	1			2	3	4	5
1	5831			949	2	20	22
395	1			125	5222	5528	14

5
1651 Miserere mihi infirmus
AR
OffertoriumV
MM 349

Mi-		se-	re-			re	mi-	chi	do-
		1	2			3	4	5	6
		1	6110			949	20	1407	25
		395	1			125	5528	44	857

When you experiment with 1_949 you see a different picture. Why? With the help of the button to the right I shifted the chant indications to the right. That's why I have the indications and the interesting parts of the melodies together. Try it yourself!

The bridge between the segments 1 and 949 is a very long melisma which is extremely interesting. It occurs in several shapes but never in a verbatim copy. As Leo Treitler has pointed out a long time ago this could be a symptom of an oral tradition.

Last and not least let's have a look at *SM 5*. It may occur that chants have the same number of syllables. Is this by chance or have they the same model in common? Select a corpus and a genre (e.g. GR and Offertorium) and you get by pressing the button

SM 5: Syllables

in the text field chants with the same number of syllables.
        Let's have a look at those with 24 syllables. We enter the number

SM 5: Syllables   24

SM 6 GR Graduale | Length of segment: 24 1 | 1.11.2014 8:37:50 pm

1 — 775 A summo caelo / GR / GradualeR / GrTr 27

A	sum-	mo	cae-	lo	e-	gres-	si-
0	1	2	3	4	5	6	7
11	2	20	3415	20	20	3416	407
971	5222	5528	11	5528	5528	13	376

2 — 779 Ab occultis meis / GR / GradualeR / GrTr 101

Ab	oc-	cul-	tis	me-	is	mun-	da
0	1	2	3	4	5	6	7
11	11	2	20	3415	20	3416	407
971	971	5222	5528	11	5528	13	376

3 — 784 Angelis suis / GR / GradualeR / GrTr 72

An-	ge-	lis	su-	is	man-	da-	vit
0	1	2	3	4	5	6	7
108	20	20	3415	20	20	3416	3467
58	5528	5528	11	5528	5528	13	3

4 — 792 Benedictus es domine / GR / GradualeR / GrTr 372

Be-	ne-	dic-	tus	es,	Do-	mi-	ne,
0	1	2	3	4	5	6	7
101	124	159	20	1252	20	37	3525
2653	307	28	5528	32	5528	1223	2

5 — 802 Deus exaudi / GR / GradualeR / GrTr 107

De-	us	ex-	au-	di	o-	ra-	ti-
0	1	2	3	4	5	6	7
103	2	199	3589	3511	103	2	2
68	5222	73	2	13	68	5222	5222

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
A	sum-	mo	cae-	lo	e-	gres-	si-	o	e-	ius:	et	oc-	cur-	sus	e-	ius	us-	que	ad	sum-	mum	e-	ius.
Ab	oc-	cul-	tis	me-	is	mun-	da	me	Do-	mi-	ne:	et	ab	a-	li-	e-	nis	par-	ce	ser-	vo	tu-	o.
An-	ge-	lis	su-	is	man-	da-	vit	de	te,	ut	cu-	sto-	di-	ant	te	in	o-	mni-	bus	vi-	is	tu-	is.
Be-	ne-	dic-	tus	es,	Do-	mi-	ne,	qui	in-	tu-	e-	ris	a-	bys-	sos,	et	se-	des	su-	per	Che-	ru-	bim.
De-	us	ex-	au-	di	o-	ra-	ti-	o-	nem	me-	am:	au-	ri-	bus	per-	ci-	pe	ver-	ba	o-	ris	me-	i.
Di-	ri-	ga-	tur	o-	ra-	ti-	o	me-	a	si-	cut	in-	cen-	sum	in	con-	spec-	tu	tu-	o,	Do-	mi-	ne.
Di-	sper-	sit,	de-	dit	pau-	pe-	ri-	bus:	ius-	ti-	ti-	a	e-	ius	ma-	net	in	sae-	cu-	lum	sae-	cu-	li.
Do-	mi-	ne,	re-	fu-	gi-	um	fa-	ctus	es	no-	bis	a	ge-	ne-	ra-	ti-	o-	ne	et	pro-	ge-	ni-	e.
Po-	su-	i-	sti,	Do-	mi-	ne,	su-	per	ca-	put	e-	ius	co-	ro-	nam	de	la-	pi-	de	pre-	ti-	o-	so.
Re-	qui-	em	ae-	ter-	nam	do-	na	e-	is	Do-	mi-	ne:	et	lux	per-	pe-	tu-	a	lu-	ce-	at	e-	is.
Ti-	me-	bunt	gen-	tes	no-	men	tu-	um,	Do-	mi-	ne,	et	om-	nes	re-	ges	ter-	rae	glo-	ri-	am	tu-	am.
U-	nam	pe-	ti-	i	a	Do-	mi-	no,	hanc	re-	qui-	ram:	ut	in-	ha-	bi-	tem	in	do-	mo	Do-	mi-	ni.
De-	us	me-	us,	po-	ne	il-	los	ut	ro-	tam,	et	si-	cut	sti-	pu-	lam	an-	te	fa-	ci-	em	ven-	ti.
Con-	fun-	dan-	tur	et	re-	ve-	re-	an-	tur	i-	ni-	mi-	ci	me-	i,	qui	quae-	runt	a-	ni-	mam	me-	am.
Con-	tur-	ba-	ta	sunt	o-	mni-	a	os-	sa	me-	a:	et	a-	ni-	ma	me-	a	tur-	ba-	ta	est	val-	de.
Li-	be-	ra-	sti	in	bra-	chi-	o	tu-	o,	po-	pu-	lum	tu-	um,	fi-	li-	os	Is-	ra-	el	et	Io-	seph.
Do-	mi-	ne	re-	fu-	gi-	um	fa-	ctus	es	no-	bis	a	ge-	ne-	ra-	ti-	o-	ne	et	pro-	ge-	ni-	e.
In	Do-	mi-	no	lau-	da-	bi-	tur	a-	ni-	ma	me-	a:	au-	di-	ant	man-	su-	e-	ti,	et	lae-	ten-	tur.
Be-	ne-	dic-	tus	es	Do-	mi-	ne,	in	fir-	ma-	men-	to	cae-	li,	et	lau-	da-	bi-	lis	in	sae-	cu-	la.
Pot-	ens	in	ter-	ra	e-	rit	se-	men	e-	ius:	ge-	ne-	ra-	ti-	o	re-	cto-	rum	be-	ne-	di-	ce-	tur.

and we get a presentation with syllables:

Let's go on: a second tour with more details

It's obvious that the shown possibilities have serious drawbacks. We must always know something. The sequence of segments for SM2 – 3415 3416 407 887 1696 3417 – is known to those who are acquainted with the so called *Justus ut palma*-type of gradualia. But not everybody knows this type. And what's worse: we don't know much about types at all. Thus it could be comfortable that ChantDigger teaches us a bit more. Let's see!

I repeat the walk from *SM1* to *SM5* and show you the details not mentioned until now.

Chants only

SM1: Our example, the graduale *A summo caelo*, can be displayed in different ways. Choose with the option after the label

Presentation of SM 1:   normal

By displaying onle the first (or the last or the first and the last) notes you get an insight in the structure of the melody (as I hope – but this is not more than a working hypothesis). You can do more. When you enter the number and after a space the letter „x" you get the melody. The tones which occur most are signed with red noted or hollow notes:

SM 1 Num. 775 x | 1.11.2014 8:59:59 pm

775	A summo caelo							
GR								
GradualeR								
GrTr 27								

A	sum-mo	cae-		lo	e-	gres-	si-	o	e-	ius:
0	1	2	3	4	5	6	7	8	9	10
11	2	20	3415	20	20	3416	407	886	1696	3417
971	5222	5528	11	5528	5528	13	376	66	54	15

There may be occasions when you want to see more chants the same time. You can either enter several chant numbers or a word from the text. Or you mix the two possibilities. What you see is one chant after the other with no correspondence between the segments of the syllables.

Segments

SM2: How can we get informations about sequences of segments? Select a corpus and a genre (I select GR and graduale) and then let's enter something like

SM 2: Syllable segment   a 4 4 4

In the text field you find sequences of segments, e.g.

```
0    2855 2856 1898 2857(4)
1    3416 886 1696 3417 3420 (8)
2    3416 886 1696 3417 1898 1343 3420    (4)
3    3415 1898 1343 3420 (4)
4    3415 3416 1696 3417 3420      (6)
5    1696 3417 1898 3420 (6)
6    3416 1696 3417 1898 1343 3420    (5)
7    3415 3416 886 1696 3417 1343 3420    (4)
8    886 1696 3417 308 3419 1343 3420    (5)
9    3415 3416 886 1696 1343 3420      (5)
10   3415 3416 1343 3420 (4)
11   3416 886 1696 3417 3438 2856 3420   (5)
12   3438 2856 1343 3420(9)
13   3415 886 1696 3417 1343 3420       (5)
14   3415 3416 1696 3417 3438 2856 3420 (4)
15   1696 3417 3438 2856 1898 3420   (4)
16   886 1696 3417 3438 2856 1343 3420   (4)
```

Every line gives three informatiuons: line number, the sequence of syllable segments and the number of occurrences. If you select line 0 and enter 2855 2856 1898 2857 then you get (with help of the button *to the right*)

As we know plain chant was transmitted orally during centuries. It's a common believe that in the times of writing, of musical notation, there was no redaction from an oral tradition to a written transfer. In other words: we may try to find signs of an oral tradition in the written versions. As Leo Treitler has put it years ago, oral tradition has to do with "concepts [. . .] like 'formulas', 'tradition', 'archetype', 'work', 'structure', 'unity',

'improvisation', 'memory', 'composition', 'orality', 'literacy', 'sameness' and ‚difference'".[1]
In other words: we should not only find occurrences of the same segment (sameness
meaning here: the same note-by-note) but sameness in the sense of similarity (similar
shape and same function). How can we find it?

ChantDigger gives the possibility to look for the same segment and to look for the
same in the sense of similar based on criteria which can be found as options after the input
field for SM 2:
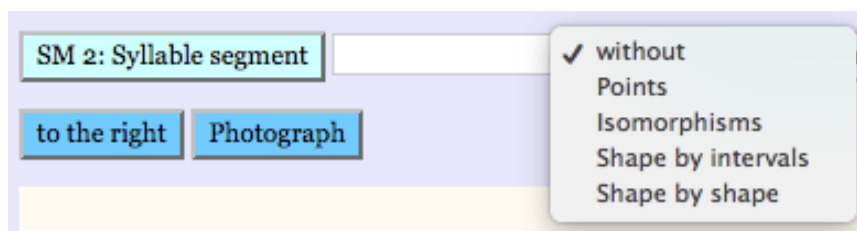
We try it and take segment 3415 as our candidate
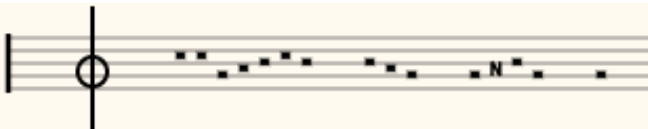
We take criterion 1 as criterion for similarity and we find

_____

[1] Leo Treitler, "Sinners and Singers: A Morality Tale", in: *JAMS* 47 (1994), 148 (= Review: Peter
Jeffery, *Re-Envisioning Past Musical Cultures: Ethnomusicology in the Study of Gregorian Chant*,
Chicago [*Chicago Studies in Ethnomusicology* 1]) – see now id., *With Voice and Pen. Coming to
Know Medieval Song and How it Was Made*, Oxford 2003. – Franz Bäuml made the difference
between „wortwörtlich" and „stofflich": „wortwörtlich" (verbatim) tradition as technique which is only
possible in writing, whereas „stofflich" (according to the shape) lacks writing: "Der Übergang
mündlicher zur artes-bestimmten Literatur des Mittelalters", in: Norbert Voorwinden, Max de Haan
(Hrsg.), *Oral Poetry. Das Problem der Mündlichkeit mittelalterlicher epischer Dichtung*, Darmstadt
1979, 238–250 (*Wege der Forschung* 555); orig. in: G. Keil, R. Rudolf, W. Schmitt, H.J. Vermeer
(Hrsg.), *Fachliteratur des Mittelalters. Festschrift für Gerhard Eis*, Stuttgart 1968, 1–10.

Segment 246 matches segment 3415 in four notes: first, last, highest and lowest. But is this enough? It's up to you! Or is segment 786 a better candidate?

In analogy to SM1 you can enter a word of the text. You get then an ordered layout of the corresponding chant, the synopsis given by the selected word.

Sequences

SM3: Sequences are extremely important because their formulations are not so much influenced by a working hypothesis. There are two possibilities to find a sequence.

First possibility: You select a chant (let's say once again Nr. 775). Before you display it you select in the options for SM 1 the last one:
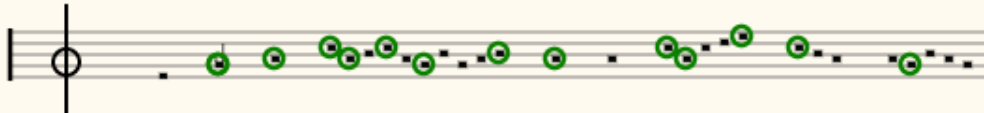
Press the display button *after* the selection!

An then you click with the mouse those notes which seem to be of importance for you. E.g.:

The clicked notes have now a green circle. Press the SM 3 button. You get the sequence in alphanumeric characters:

SM 3: Sequences   g a c' a c' g h a c' a
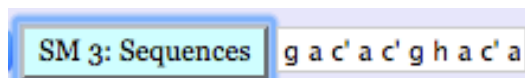
When you press the button again you get the result:

1
468 Tu es sacerdos
GR
AlleluiaV
GrTr 449

Al-	le-		lu-	ia.		V.
0	1		2	3		4
101	2295		4	2296		22
2653	2		4380	2		14

2
775 A summo caelo
GR
GradualeR
GrTr 27

A	sum-mo	cae-		lo	e-	gres-	si-	o	e-
0	1	2	3	4	5	6	7	8	9
11	2	20	3415	20	20	3416	407	886	1696
971	5222	5528	11	5528	5528	13	376	66	54

3
779 Ab occultis meis
GR
GradualeR
GrTr 101

Ab	oc-	cul- tis	me-		is	mun-	da	me	Do-
0	1	2	3	4	5	6	7	8	9
11	11	2	20	3415	20	3416	407	886	1696
971	971	5222	5528	11	5528	13	376	66	54

4
808 Dispersit dedit
GR
GradualeR
GrTr 520

Di-	sper-sit,	de-		dit	pau- pe-		ri-	bus:	iu-
0	1	2	3	4	5	6	7	8	9
11	2	20	3415	20	20	3416	407	886	2
971	5222	5528	11	5528	5528	13	376	66	5222

Second possibility: You enter in the sequence field (SM 3) two numbers. The first indicates the number of notes in a segment and the segment the number of occurrences. Before you press the sequence button select a corpus. I select Gregorian and in the text field I get:
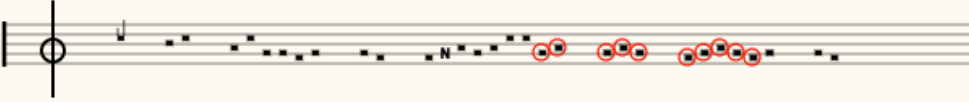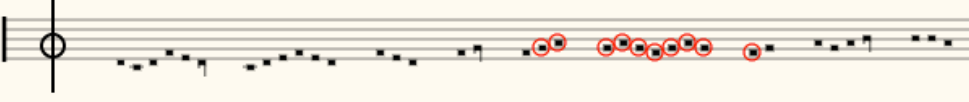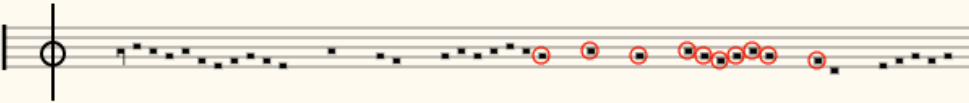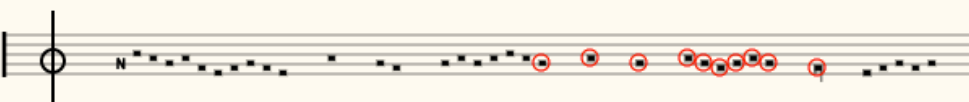
Num: 0:	f e f g g f f g f f	Occ: 16 Distr: Intr: 5 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 10 Comm: 0 Off: 1
Num: 1:	f g e f e d e f e d	Occ: 10 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 3 Off: 4
Num: 2:	g e f e d e f e d e	Occ: 12 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 5 Off: 4
Num: 3:	e f e d e f e d e e	Occ: 11 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 4 Off: 4
Num: 4:	f e d e f e d e e d	Occ: 27 Distr: Intr: 8 Ingr: 0 All: 0 Grad: 1 Psal: 0 Tract: 0 Comm: 10 Off: 8
Num: 5:	g a g a g f g a g f	Occ: 12 Distr: Intr: 1 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 4 Off: 7
Num: 6:	a g a g f g a g f g	Occ: 20 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 2 Psal: 0 Tract: 0 Comm: 8 Off: 7
Num: 7:	g a g f g a g f g g	Occ: 21 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 4 Psal: 0 Tract: 0 Comm: 9 Off: 5
Num: 8:	a g f g a g f g g f	Occ: 44 Distr: Intr: 12 Ingr: 0 All: 0 Grad: 5 Psal: 0 Tract: 0 Comm: 21 Off: 6

The informations given in one line are:

```
Num: 5:        g a g a g f g a g f              Occ: 12 Distr: Intr: 1
Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 4 Off: 7
```

On line 5 we get the segment g a g a g f g a g f It occurs 12 times and is distributed within the corpus: 1 Introitus, 4 Communiones, 7 Offertoria.

We try it:

When we enlarge the search width then we get more results. Have all the same meaning?

BNA
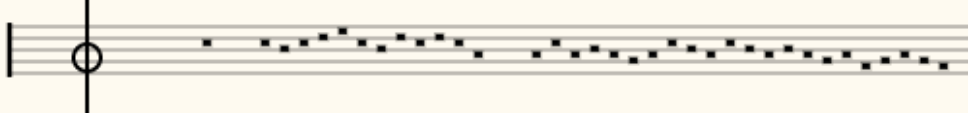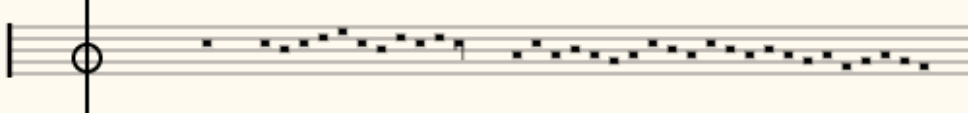
In analogy to the finding of segments and sequences there's a possibility to find BNA's. Enter (as for the segments) a letter and then three numbers. The first being the width iof the nucleus, the second the width of B[efore], N[ucleus] and A[after]. You get some results. We try it. With GR as corpus and Gradualia as genre selected I enter

and I get

0	29 407 (2)
1	2 2 (2)
2	8 2508 (3)
3	20 20 (2)
4	567 4 (2)
5	101 4374 (2)

Every line gives three informations: line number, BNA and number of occurrences.With the B_A of 8_2508 I get e.g.:

This leaves me with the question of the segments 2515 and 2507 (being the bridges between 8_2508) have the same function.

Find axis

We let *SM 5: Syllables* aside. There's nothing new about it. But we haven't experimented with the possibility to find axes. We speak of *repercussa* or *tenor* and mean an important note of a chant being something like the axis of it. One often get's the idea that there are two *tenores*, not only one. In any case: it could be interesting to find chants based on a quantitative criterion.

   We try it. Enter 5 in the field:

You see the results in the text field. The layout is already known from the sequence field. Now we go ahead. You may enter a line number after the 5 and see then the corresponding chants. If you enter 1 as a third number you see above the first line the five most used notes together with their colours:

This input gives the information about the most used notes

and naturally the corresponding chants:

In the presentation of the data you see that the notes are coloured according to their occurrence.

It may be that you are not interested in all those data but would like to know if a particular chant has corresponding chants with the same quantitative distribution. You do it this way: enter the number of notes (the maximum is five) and the chant number of your main chant in the second field:

You get a message about the corresponding line. The message will be somewhat different depending on the browser you use. In any case you learn from it that chant number 42 – together with chant numbers 807, 880, 886 – is presented in line 31

```
function alert() { [native code] }Num: 31:          a f g c' h
                    Occ: 4 Distr: Intr: 1 Ingr: 0 All: 0 Grad:
3 Psal: 0 Tract: 0 Comm: 0 Off: 0 (42,807,880,886)
```

Enter now the line number in the first field. You get the display of the corresponding chant the normal way:

Press the button and you get