Flavus

July 4, 2017

Chapter 1

The planet Flavus

1.1 Flavus

Flavus is a smallish Earth-like planet orbiting a K0-class star. The common name refers to the planet's distinctly yellow tint, due to surface sulfur deposits.

The axial tilt of Flavus is extremely modest, which leads to an imperceptible seasonal cycle and small polar circles. The temperature variation due to eccentricity of the orbit is even larger, though still minute. Therefore any given location on Flavus does not experience much difference in temperatures throughout the year.

The average surface temperature is significantly higher than on Earth. Only the polar regions, which host tropical-like climates, are inhabitable by humans. Intermediate latitudes are occupied by a vast, dry, acidic desert.

Flavus has currently very reduced tectonic activity and suffers from much more frequent asteroid impacts. The result is a relatively flat topography, mostly dominated by impact craters.

picture

1.2 The sulfur cycle

The Yellow Planet slowly alternates between short periods of intense volcanism and long pauses of geological inactivity. During the former, copious amount of sulfur are produced, which are turned into fine dust and diluted into the sands of the planet.

When elemental sulfur concentration in sand exceeds a certain threshold, the possibility arises for a fire. Sulfur fires are awesome and terrifying, spreading quickly and then burning for days with a deep blue glow. Fires produce large columns of toxic sulfur dioxide.

The inverse direction is provided by the lifeforms native to the planet, the Plunts, which during photosynthesis consume sulfur dioxide in addition to carbon dioxide. Plunts store the absorbed sulfur in elemental form as small stones called **calculi**, which they release after their death.

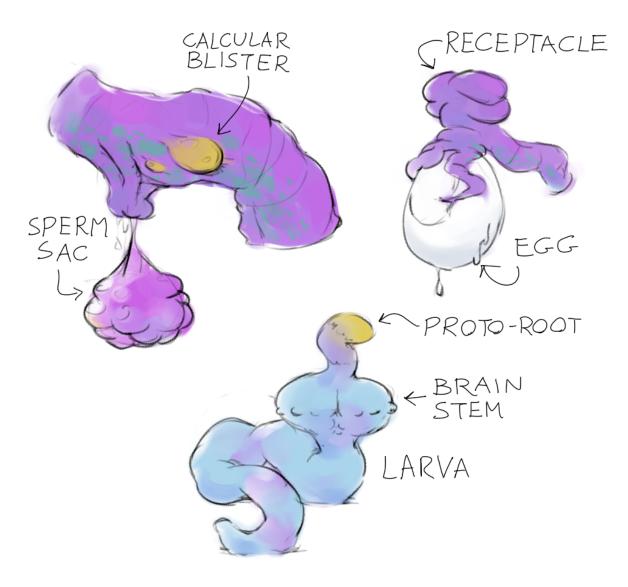
At equilibrium, this feedback pair mantains a constant concentration of elemental sulfur in the sand and sulfur dioxide in the atmosphere. The latter (at 10 ppm, to be compared with Earth's 1 ppm) is low enough for humans to survive, but still results in some permanently acidic rains and bodies of water.

1.3 Flora

The dominant native lifeforms of Flavus are a large class of plant-like creatures known colloquially as Plunts. Plunts perform a variant of photosynthesis in which sulfur dioxide can be also processed alongside carbon dioxide; the relevant combination of pygments (including clorophyll) gives almost all plunts a purple-blue colour.

Plunts however also possess animal-like traits; they are in fact often capable of limited locomotion and have primitive nervous-like systems. But it's the nature of their reproductive habits that is priceless for the human inhabitants of Flavus. The male organ of a Plunt consists of an elastic sac which is filled by sperm capsules over the course of a few months. When the pressure is sufficiently high, the sac bursts releasing the capsules, which are designed to be then transported by wind. The female organ instead produces an egg-like structure, a translucent white ovoid with a thick rubbery skin filled with a sugary protein syrup. The egg is topped by a receptacle, the true female organ. When a sperm capsule reaches a receptacle, a Plunt embryo is conceived and transferred to the egg.

The new individual is gestated for months inside the egg, which then hatches to reveal a cyan toadpole-like larva. The larva has some locomotive ability which it uses to get as far away as possible from the mother over the course of a few days. It then burrows the root tentacle on its head into the sand and becomes sessile, entering its adult stage.



Humans eat almost exclusively unfertilized plunt eggs, since they are relatively nutrient and not toxic like most of the organs of most plunt species. Growing eggs is fairly easy, consisting essentially in sealing the receptacle so that it cannot be fertilized. Plunt eggs are more agreeable when cooked, and are slightly alcaline with an ammonia-like smell.

Plunts do not have any significantly rigid components. They are always elastic to some extent and their trunks are analogous to the tentacles of mollusks, being kept in position (or moved) through a hydraulic system. Their gummy purple skin is covered in a watery mucus, acting as an insulant to protect them from the extreme heat.

1.4 Fauna

There isn't a hard-cut distinction between truly vegetal and truly animal Plunts. Some of them are distinctly animal-like, in that the photosynthetic abilities are mostly vestigial and live through consumption of other Plunts.

Crab-bushes

Bluegrass

Squid birds: how they can be trained

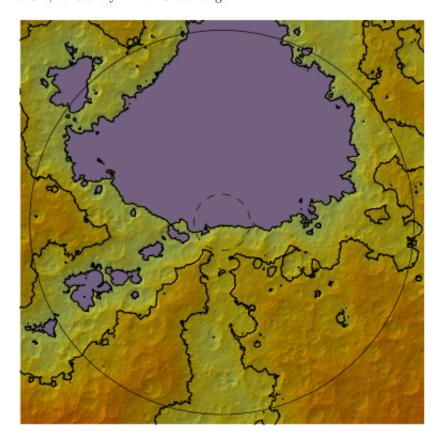
1.5 Humans

The most intelligent inhabitants on the planet are humans, or Flavans. What exactly they are doing there is unknown, and Flavans have no understanding of recollection of Earth, nor of the fact that they are not native to Flavus. Nevertheless, the planet is a harsh, inhospitable environment, with its dry, hot climate and acidic chemistry, and apparently Flavans have still not completely adapted accordingly, testifying that they haven't been around for more than a handful of millennia. Still, the small effect of these hardships on the bodies of humans are perceptible already. Flavans grow 5 to 10 cm taller than Earthlings on average as a consequence of the lower gravity, which also increases chances of bone and heart-related diseases. They have very light skin, pearly white, since UV radiation on the surface is low, owing to Flavus' star low temperature and the planet's thicker magnetic field. A darker skin tone would facilitate vitamin D deficiency and has been quickly selected against. Paradoxically, Flavus' scorching sun cannot sunburn.

The last important physiological difference is that Flavans have respiratory and digestive systems slightly more suited for acidic environments.

Flavans live in nuclear communities (pak), analogous to villages and averaging 200 individuals, based in oases in the arctic regions. Frequently, travelling groups will hop between oases by crossing the desert, carrying goods, knowledge, and money.

Two main ethnic branches inhabit the Arctic. The Demorog ("square-writing") occupy the pole, the lower-left, central, and right regions, while the Bymarog ("flame-writing") live in a strip in the left. The two civilizations are connected by thin straits inbetween a row of small lakes. It makes little sense to distuinguish smaller subdivisions as Flavan cultures, by virtue of their nature, constantly mix and rearrange.



Obviously, finish map.

1.6 Fashion

copy from that reddit comment and add pics

1.7 Travel, shrooms and bannering

add pics

Oases are small specks in a vast, unforgiving and extraordinarily bland desert, with very few recognizable points. A traveling group walking straight into the desert in a random direction could very well walk to their death without ever sighting a village. Orientation doesn't help much, as even a small error can build up and the destination could be missed entirely. How do travelers on Flavus manage to move around consistently? The solution is provided by the single largest living beings on the planet: shrooms.

Shrooms are gigantic mushroom shaped plunts, between 100 and 200 m tall, and inhabit primarily the polar desert, avoiding the excessive humidity of the oases. They have impressive root systems, sometimes even a kilometre across, to extract the necessary nutrients for survival. The "stalk" is relatively thin (two to three metres in diametre) but equipped with a powerful hydraulic pump is able to sustain the weight of the very large "cap", actually a disc-shaped layer of branches and leaf-organs. The cap itself is very light and little dense. Shroom (and their caps in particular) are home to rich ecosystems including parasites, symbionts, and predators.

Travelers use shrooms primarily as reliable reference points. Shrooms live easily for centuries, and skilled Masters can recognize individual shrooms from the shape of the cap, even from kilometres away. Shrooms are marked on maps and named, and traveling routes "hopping" from shroom to shroom are established. Not only: even if it wasn't for orientation, shrooms still make for attractive stops for travelers: the stalk can be cut to drip out sap, which is easily filtered for drinking, and its large (although distant, considering the Sun's low altitude) shadow, where the group can rest. Sadly, they cannot literally stop in the cap's shadow and drop the tents: the shroom is so tall that the shadow moves too fast throughout the day, forcing travelers to continuously move every half-hour.

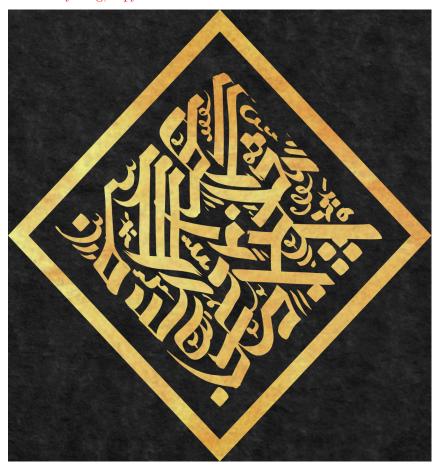
Upon passing by an undiscovered shroom, the Master will mark it with a banner of their village (or occasionally one of the recently visited villages), a flag-like piece of cloth bearing the pak name. These banner are manufactured in advance by children in the pak and travelers always carry a few. The banner has a pouch in which travelers insert "update documents": writings reporting on their travel, maps, news on the recently visited villages, general updates, and a bit of gratuitous personal diary. The next visitors to the shrooms can then enjoy this information and add their own to the shroom's archive. Travelers communicate much more information through bannering than through actually meeting in travel, which happens rarely.

I have this drawing already; where the hell did I put it?

A shroom banner for the Ramy village, with embroidery in geometric style. Below the word *ramy* itself, the map symbol for a village is used as a shorthand for pak. On the bottom, a pouch for update documents.

1.8 Villages

write everything, copy from reddit cmmnt



also copy caption for this

1.9 Sex, Gender and Parenthood

Flavans don't like children. Even in what is relatively speaking an oasis, the harsh lifestyle makes survival of the community the first preoccupation; procreation, and thus a noticeable population increase in a small village is seen as damaging. Bearing child is therefore heavily regulated and the mother is required to pay the *pak* authority a fee whose value is regularly updated depending on the village's situation. Failure to produce the money can result in expulsion.

This "demographic phobia" has its origin in Flavan folklore of villages destroyed by overpopulation, and results in very unusual ideas on sex drive, reproduction, gender, and the role of children in society. Children are perceived as "impure", "indecent" or more precisely "unstructured"; physician Baryk-t Ardeman describes the process of growing a child into an adult as akin to the drying of gum-birch skin, removing its toxic "blue" essence to reveal a structured individual:

the child is born as an amalgalm of the elements, imbibued with blue as the skin of the gum-birch. Living amongst the yellow, it is dried, and the blue drips, and it takes face.

The genitals and nose of children are always to be covered in public, and the distinction between child and adult is stronger than even that between male and female, a feature reflected in the Flavan language. A child is grown and educated by his mother only; there is no concept of fatherhood on Flavus. The biological father has no responsibilities nor rights concerning the child. The closest idea to fatherhood is a form of tutorage in which an adult (almost always male) trains a child in various skills, most importantly reading and writing and the basic of travelling; it's not uncommon for an emotional bond to develop, nor is it frowned upon. A child can have any number of tutors.

Children become adults as they reach ... Visits (... Earth years) of age, at which point they are "uncovered" in a ceremony. To emphasize that the adult Flavan is not far from being considered a distinct person from themselves as a child, adults count their age starting from their uncovering.

Because reproduction is almost always seen in such a negative light, Flavans rationalize the sex drive as "intrinsic suffering" to being alive, and in alignment with their philosophy believe that like all forms of pain it should be embraced and redirected towards good or constructive purposes. Therefore, they understand the need for recreational sex. There is variety in the sexual habits of Flavans, but an obvious constraint is that vaginal penetration is forbidden (unless the woman is prepared to have - and pay for - a child). Demorog do not really perceive any difference between male and female and tend to engage in often short, vaguely monogamous relationships, either heterosexual or homosexual. Bymarog forbid all recreational heterosexual contact, but gladly accept homosexual (male and female) pairings, but do not have any concept of relationship or commitment at all.

The body of a Flavan is considered their most prized possession, because of the suffering associated with owning it. (In fact, the female body is regarded as even more valuable, because of the menstrual cycle and the associated physical pain and discomfort). Therefore, Flavans classify rape as a form of theft, which is an unforgivable sin. All forms of rape are punished with expulsion, in addition to the child fee in case the rape results in a pregnancy.

The reason for reduced gender differences in Flavan society is mostly that there is neither much hunting, nor child-bearing to do on Flavus. (Side note: Flavans would not be able to understand an arrow symbol). Gathering, building and travelling require skills common to both sexes and almost all roles in Flavan society include men and women in comparable fractions. Flavan grammar does not distinguish male and female, and while most proper names are indeed gendered, a good portion of them are Unisex. In fact, the very physician quoted above, Ardeman of the Baryk village, bears such a name and it's not possible from their writing to infer whether they were a man or a woman.

1.10 Culture

Perhaps section about behaviour, politeness, hospitality, conflict resolution

1.11 Science

The School, education, teaching and research

1.12 Astronomy and Religion

In addition to the fixed stars, the only two astronomical objects that the Flavans are aware of are the Star and the Wanderer (Vulcan being too close to the Star to be visible). Flavans believe these two objects to be identified with copy that nice idea about the pantheon

The Wanderer is a bright, spectacular sight when in opposition, that is when it is closest to Flavus, and reaches maximum altitude at midnight. In fact, Flavans measure years as spanning between consecutive oppositions (which they call "visits") of the Wanderer, instead of through the motion of their sun on the fixed stars as it is done on Earth. Thus, Flavans prefer the synodic period of the Wanderer with respect to Flavus, rather than Flavus' own sidereal period, to act as a measure of time. This choice is coherent both with the absence of detectable seasons and with the secondary role the "fixed" stars have in Flavan cosmology.

finish finish finish add main religion

1.13 Food

pics!

Recipe for dhlorg

1.14 Magic and Medicine

Chirocasting, fever, bloodletting, humoural theory

1.15 Writing

Flavan writing arises from the practical need of mapmaking. Since mutual intelligibility is key, Flavans essentially all use one unified script, but with distinct styles of rendering shapes. The Flavan script was originally an alphabet (with consonant and vowels being represented by distinct glyphs) but has transitioned into an abugida as consonant and vowel glyphs have fused into new forms. It is written vertically, more precisely top-to-bottom, right-to-left; words within a single column are separated by a dot. The script is specified in detail in chapter 3.

The most bizzarre aspect is the writing tool Flavans use, the pen-leech. Pen-leeches are parasitic worm-like animals distributed throughout the Polar regions, and which feed on large plunts, in particular shrooms. The pen-leech attaches to the trunk of the plunt through its two cartilage fangs; when secured to the skin it squeezes out a corrosive mucus, essentially digesting the host externally, then sucks back the mucus into its body for absorption. This cycle is repeated. Pen-leeches are barely taxing on the gigantic shrooms and the latter can often host hundreds or thousand of parasites with no real damage to itself. Flavans exploit the leeches' sucking and splurting ability to use them as pens. Travellers collect a few as they hop by a shroom. Once brought home to the village, they are prepared as such:

- The brain node, in the posterior of the creature, is cut off alongside the vestigial root. This kills the leech :(
- The carthilage fangs are removed carefully to retain a smooth, circular mouth.
- The leech is cleaned and hanged to dry out the sap

add drawing

The pen-leech, now more rigid and elastic, is then ready to be used similarly to a fountain pen, sucking in an ink produced from ashes, and releasing it on paper when squeezed. This gives rise to the characteristic roundish strokes in Flavan writing. Pen leeches do not last more than a month before starting to rot, and thus must be replaced frequently - therefore, there is no such thing as a "luxury" pen-leech, even though a skilled pen-leech preparer is highly regarded.

v this could be moved to script chapter.

Writing styles can be split roughly into three general categories:

- The Demorog "geometric" style, mostly employed in embroidered or chiseled designs or in very large writings (such as on walls). Occasionally also used in tattoos and maps.
- The Demorog "cursive" style, for maps, letters, books, and everything in pen-leech.
- The Bymarog "flame" style

Here are the words *Demorog* (right) and *Bymarog* (left) themselves, written respectively in geometric, cursive, and flame style.

The words denoting the two ethnic groups themselves (Demorog = square-writing, Bymarog = flame-writing) refer to the appearance of these writing styles.

A few designs for the word *moshl* ("mother")

add pic...

1.16 Tattoos and makeup



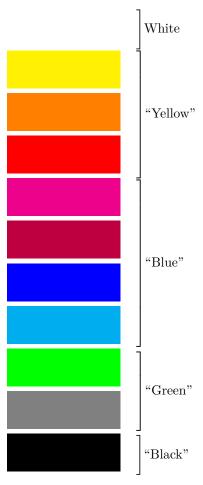
finish drawing

ofc.
and write everything:

- Name tattoos
- Chiroportals
- Graduation eyebags

1.17 Colours

Leave here or move to lang chap? Add phylosophical repercussions



1.18 Music

Flavan music is strongly percussive and often based on a specific 5/4 rhythm:



And melodies are played in a hexatonic scale:



(This representation in terms of equal temperament notes is of course an approximation). This scale can be seen as an extension of the major pentatonic to include the maximally dissonant flat fifth / sharp fourth, or equivalently as a subset of the western lydian scale. The inclusion of the tritone interval, a modern and daring device which on Earth had essentially never been truly appreciated as anything else than *diabolic* before Romanticism, is baffling - the other intervals are instead extremely natural and based on small integer ratios. (Arguably, the pentatonic scale is likely universal to all humans).

Music is played by traveling "bands" composed of a Drummer, a Lead vocalist, and one or two Backing vocalists. Songs take a vaguely choral form as the backing vocalist open by singing the title/refrain in a constant note; this works as an "introduction" to the piece of music, and also establishes the fundamental note and the tempo. The Drummer joins in and the Backing continues to hum the refrain on the fundamental. After, the Lead introduces the main melody and lyrics, harmonizing on the backing's drone. Flavan music is thus essentially biphonic, though the bass is simply a drone, very rarely changing. Lyrics almost always tell a story, either humorous (and vulgar) or tragic, and the refrain itself is very often an ironic twist on the subject that is only understood after the main lyrics are presented, even though it gets continuously repeated throughout the song. Sometimes, the refrain even rhymes with the last verse of the lyrics.

A translated Demorog example:

It's empty like death

(backing starts droning: "it's empty like death")

Abar of the Shefe village has brimstone hair and silver sweatdrops Rkon of the Bybang village wants the sweet green breasts that Abar of the Shefe village has.

But everytime that Rkon comes to Shefe village and Abar's tent Abar's mother is always there.

Abar writes a letter then, "come to visit in seven days, and no one will be in the tent."

Rkon of the Bybang village reads, Rkon walks from here to there sulfur feet he has to have He enters Abar's tent and (it's empty like death)

In this interesting example, the refrain is doubly deceiving as it also sets up a dramatic mood which is then inverted by the humorous subject. The expression "empty like death" refers to the fact that the internal organs of dead plunts decay much faster than their skin, which leaves them with a "deflated balloon" appearance. The curious combination "green breasts" makes sense in the context of Flavan perception of colour, and probably refers to a grayish-pinkish hue of very pale skin.

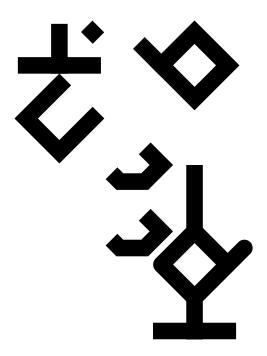
1.19 Psychedelics

do

Chapter 2

The Flavan Language

Reference Grammar and Lexicon



"If I could speak light..."

2.1 Introduction

The language that Flavans speak in does not seem to have any discernible relationship with any ever spoken on Earth. It is thought therefore that most of the basic structure of the Flavan language has indipendently developed on the planet. As a result, it includes a combination of alien and unfamiliar constructions and more usual features that might have the character of linguistic universals of all humans. It is hard however to make this kind of generalizing statements with confidence since Flavus has likely only ever hosted **one language** at any given time: the constant rearrangement of population, and an army of travelling merchants perennially jumping from village to village, has guaranteed that differences in all aspects of culture, language in particular, are smoothed out and always remain somewhat modest. Thus Flavan enjoys limited regional variations, almost entirely in pronunciation, and remains mutually intelligible from the left-most of Bymarog villages to the antipodal dialect of the Demorog settlements in the far-right.

As per the origins of this language, little is known about Flavans in general before around 1500 years ago. Villages at this time likely only occupied a smaller area in the central region, and the small population used a strongly agglutinative language which is known as **classical Flavan**, written in a rune-like alphabetic script meant for carving. Classical Flavan's pronunciation is unknown but has been tentatively reconstructed as having the unusual four-vowel inventory /a e o i/.

Between 900 and 800 years ago the population increased dramatically as technological advances allowed Flavans to explore and colonize the entire survivable Northern cap, resulting in the branching of the Bymarog¹ culture in the somewhat isolated left region. It's only after the opening of the School of Karobet, which introduced new writing tools and the **modern Flavan script**, an abugida, that one begins to find an immense amount of written documents, most importantly maps and village registries, which testify that strong changes have already begun in the spoken language, mostly moving it into slightly fusional territory.

In the remaining years, Flavan has evolved significantly in syntax/grammar (developing a very strict word order for example) and phonology (the Classical Flavan phoneme /i/ was unstable and underwent fragmentation into significantly different sounds in the various dialects). The cultural and linguistic divide between **Demorog** ("square-writers") and **Bymarog** ("flame-writers") was born. However, the aforementioned continuous cross-cultural contact has kept Flavan relatively very similar to itself as it changed in time. The current situation is known as **Modern Flavan**, and is the language this chapter will try to introduce.

Every respectable reference grammar on a language should at least present the language's own name for itself before anything else; however, this is simply impossible in our case: Flavans know one culture, with one language, and one script - granted, with modest variations in customs, manner of speaking, and writing styles. They do not conceive of a boundary between themselves and an outside - they don't need a word to mark this border. Therefore, there is no Flavan word for the Flavan language, or the Flavan people. To them, it's just speaking, and just people.

¹the name **bymarog** (flame-writer) is used here anacronistically, since the modern script has not been introduced yet at this point.

2.2 Phonology and phonotactics

The phonetic inventory of Flavan is most conveniently presented by means of their own organization in terms of an "alphabet", which is a list of allowable consonant clusters and single vowels. Curiosly, they arbitrarily separate consonantal sounds into "common" and "uncommon", crudely reflecting the frequency of those phonemes in spoken language. The following chart lists the Flavan names for the phonemes, their average Demorog and Bymarog pronunciations, their romanization, and also introduces the corresponding glyphs in the Flavan abugida, which will be better explained later.

The "I	Males" ((common cons	onant	clusters)								
Glyph	Rom.	Pron. (Dem./I	3ym.)	Name	. п	The "Females" (rare consonant clusters)						
ı	None	$//^2$		pode				<i>'</i>				
♦	\mathbf{m}	$/\mathrm{m}/$	[m]	ma	Glyph	Rom.	Pron. (Dem.	· · · · · · · · · · · · · · · · · · ·	Name bla			
ı	\mathbf{p}	$/\mathrm{p}/$	[p]	pa	*	bl	/bl/	[bl]	Dia			
" \$	b	/b/	[b]	ba	£	\mathbf{ttf}	/tːf/	[txf]	kottfa			
*	\mathbf{n}	$/\mathrm{n}/$	[n]	na	_	ttl	/t:1/	[t:l]	kottla			
_	\mathbf{t}	$/\mathrm{t}/$	[t]	ta	*	ttk	/tːk/	[t:?]	kottka			
II	\mathbf{d}	$/\mathrm{d}/$	[d]	da	<u>√</u>	\mathbf{ttg}	/t : g/	[t:g]	kottga			
~	\mathbf{ng}	$/ \eta /$	[n]	nga	\$				_			
٥	$\mathbf{t}\mathbf{t}$	/t : /	[t:]	kotta	\Diamond	$rac{\mathbf{r}\mathbf{g}}{\mathbf{s}\mathbf{g}}$	/rg/	[rg]	rga			
→	$\mathbf{d}\mathbf{d}$	/d ː /	[dx]	kodda	dda 🚜		$/zg/$ (or $[\delta g]$)	[zg]	zga			
*	\mathbf{shl}	/ʃ1/	$[\varsigma l]$	shla	*	\mathbf{gm}	$/\mathrm{gm}/$	[gm]	agme			
Ť	\mathbf{k}	/k/ (or $[x]$)	[3]	ka		\mathbf{rm}	m /rm/	[lm]	rma			
~	${f g}$	/g/	[g]	garyn	\$	pd	$/\mathrm{pd}/$	[pd]	$_{ m pda}$			
1	\mathbf{dh}	/ð/	[z]	dhe		pu						
þ	\mathbf{dhl}	/ðl/	[zl]	dhla	<i>α</i> , ,	-	The "Children":					
7	\mathbf{S}	$/\mathrm{s}/$	[s]	syk	Glyph	Rom.	Pron. (Dem.,		Name			
	${f sh}$	/ʃ/	[ç]	shyk	None	a	/a/	[a]	atta			
Ж	\mathbf{f}	/f/ (or [v])	[v]	fa	ı,	e	$/e/$ (or $[\varepsilon]$)	[e] (or [i])	etta			
	${f r}$	/r/	[1]	ra	I^	\mathbf{y}	/i/ (or [i], [w])	[u], [y]	ytta			
3	\mathbf{rd}	/rd/	[rd]	rda	اد	0	/o/ (or [ɔ])	[c]	ordar			
⇔	$\mathbf{r}\mathbf{k}$	/rk/	[rk]	rka			(see section	(2.2)				
_	rb	/rb/	[rb]	rba								
~		/ • ~ /	[- ~]	100								

A flavan word is just an alternating sequence of consonant clusters and vowels (with at least one vowel). So, if C is a cluster and V is a vowel, words can be V, CV, VC, CVC, VCV, CVCV, etc. Any clusters can be at the beginning, middle or end of a word.

It is occasionally possible for two vowels to be consecutive (VV) as a consequence of affixing. In that case, if the vowels are different they form a diphthong.

As a final note, it is possible for the cluster /kt/ (actually pronounced [xt]) to appear exclusively in word-final position. This is not understood by Flavans as a distinct "letter" as it arises from a vowel elision in some genitive suffixes. Notation for /kt/ is explained in the section for the script.

Pronunciation rules I

- ytta assimilation: when not before another vowel, /ir/, /im/, /in/ become a syllabic consonant [r], [m], [n]. Example: yrk / rk/, and, kym /km/, while. Some speaker also assimilate /in/ →[n], but this is fairly rare. Assimilation does not happen if the y is preceded by the same consonant that would become syllabic; e.g. ryrga / 'rirga/, meaning, and not /'rrga/.
- mid opening: /e/ and /o/ when stressed open up to $[\epsilon]$ and $[\mathfrak{d}]$ respectively. Example: rgodha /rgp.dh:a/, long,

²The **pode** (//) is not an actual phoneme, but simply a vowel carrier necessary to represent a vowel without a preceding cluster in the Flavan script.

and egord /'egord/, examination

- syllabic l: word-final /l/ after a consonant becomes syllabic [l] (this creates a new syllable). Example: moshl /'mɔ.ʃl/, mother. (Some speakers do the same with word-final /gm/ to make it [gm], others insert a schwa: [gmə]).
- nasalization: a vowel following /ŋ/ will become nasal. Example: ngon \star /ŋỗn/, I (ergative)
- word-final /ð/, or /ð/ between two vowels becomes geminated: [ðː]. Example: **my agaredh** /mjɨaga'reðː/ goodbye
- /r/ alone between two vowels with at least the first unstressed becomes a flap: [r]. Example: **pottarat** /pot:a'rat/, sew.

The tell-tale ytta and regional variation

The phoneme /i/ represented by the letter **ytta** (**y**) requires clarification; this will actually expand to a discussion about vowels in general. (We have already considered the merge $/ir/\rightarrow [r]$ and similar, so we exclude this case here). It should be noted first of all that [i] is only an average sound over all dialects, and that the essential characteristic that sets it apart from /e/ and /o/ is only its being closed. Therefore all closed vowels, rounded and unrounded, and closed \rightarrow closed dipththongs are allophones for /i/. Different dialects and accents of Flavan however employ different subsets of allophones with different pronunciation schemes. This allows a Flavan speaker to identify the origin of a speaker from his pronunciation of **yttas** and his choice of closed vowels, a phenomenon known as the **tell-tale ytta (ytta robordam)**.

The "standard" pronunciation (**Central Demorog**, **CDR**) has only *unrounded* closed vowels accompained by approximants, and no diphthongs. The idea is that the three different positions of unrounded closed vowels (/i i u/) are employed when the ytta is between consonants of similar place of articulation, and a "slide" from one to another is made if the consonants are differently articulated. More simply: the consonant before is the row and the one after the column, the depicted sound is that of y when sandwiched between them.

	/mpbtfnlt/	/kgrs∫/	/ŋ/
/mpbtfnlt/	[i]	[jɨ]	[jɯ]
/kgrsʃ/	[ij]	[i]	[jɯ]
/ŋ/	[ųųĩ]	$[ilde{u}]$	$[ilde{f m}]$

Having no consonant is equivalent to the second group.

Another interesting system is that of the Bymarog (\mathbf{BR}). For them, \mathbf{y} is always rounded: [u] or [y], but with a strong predominance of [u]. They follow the scheme:

	/mpbtfnlt/	/kgrs∫/	/ŋ/
/mpbtfnlt/	[y]	[u]	[u]
/kgrsʃ/	[y]	[u]	[u]
/ŋ/	[u]	[u]	[u]

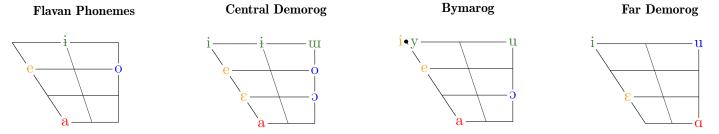
Because the Bymarog ytta is shifted towards the back and rounded, their \mathbf{e} actually moves to [i], and \mathbf{o} becomes always [5] to be distinguishable.

In completely opposite fashion, far Demorog (**FDR**) do tend to pronounce \mathbf{y} as [i] almost always, but by contrast push \mathbf{o} to [u] and \mathbf{e} to [$\mathbf{\epsilon}$].

To give a rough idea of how the different dialects sound, here are a few words with their local pronunciations:

Romanization	Central Demorog	Bymarog	Far Demorog
gydda	[gɨjˈdːa]	[guˈdːa]	[giˈdːa]
mydhlark	[mjɨðː'lark]	[muz'lalk]	$[mi\theta'rark]$
kagmenyr	[kag'menr]	[kag'minul]	[kag'menr]

The following diagrams present the Flavan abstract vowel inventory and the range of phones the dialects use to implement them. The colour encodes which phonemes that sound is allophonic for.



It should be stressed that all current variants of Flavan are mutually intelligible, and to most speakers these differences in vowel pronunciation are nothing more than a weird curiosity. We will not comment further on these technicalities of pronunciation and will focus of the grammar of the language, employing the Central Demorog pronunciation as the standard phonology.

Pronunciation Rules II

A couple other consonantal sound changes happened only in CDR depending on the specific pronunciation of the ytta:

• palatalization: /n/, /k/ before [e], [i] or [j] become palatal [n], [c]

Consonantal inventory

The final array of consonantal sounds of CDR Flavan, including those only appearing as allophones, is depicted here:

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Palatal	Velar
Plosive	рb		t d			\mathbf{c}	kg
Nasal	\mathbf{m}			\mathbf{n}		n	ŋ
Trill				\mathbf{r}			
Flap				ſ			
Fricative		f v	ð	S Z	ſ		x
Approximant						j	щ
Lateral Appr.				1			

In the end, the size of the inventory of distinct consonant phonemes is surprisingly modest, at 14 consonants.

Phonetic Romanization

The romanization scheme implicitly specified above has the advantage of mapping unambiguously with the Flavans' own orthography and only employs ASCII characters. A different choice is sometimes employed that reflects the actual pronunciation more directly, **phonetic romanization**. There is a one-to-one correspondence between letters and sounds:

a	b	d	đ	ð	е	è	f	g	i	ì	ï	ì	J	k	X	1
[a]	[b]	[d]	[dː]	[ð]	[e]	$[\epsilon i]$	[f]	[g]	[i]	[iː]	[i]	[iː]	[j]	[k]	[x]	[1]
ļ	ł	m	m	n	ņ	ñ	О	ò	р	r	ŗ	s	š	t	ŧ	ш
[1]	[]:]	[m]	[m]	[n]	[n]	[n]	[o]	[zc]	[p]	[r/r]	[r]	[s]	[[]]	[t]	[tː]	[w]

(The: symbol on vowels in this chart is a shorthand to mean that the vowel is stressed).

The following is a short text in standard and phonetic romanization. The former is more useful in the study of grammar, while the latter is more suitable for pronunciation.

sha osab dengonak rda mydhlark yrk sha rdan pottarat kym sha dhlapottarat ša osàb deñonàk rda mjiðlark rk ša rdan potaràt km ša ðlapotaràt

In the end, the romanization scheme is completely arbitrary and carries no information at all about the language and culture of Flavans. Our conventional choice for this grammar will be the standard romanization.

2.3 Stress and intonation

Absolute vowel lengths are not distinguished phonemically in Flavan; however there is a notion of the longest and loudest (stressed) syllable in a word as compared with all the others (unstressed). Stress, or accent, in each word is applied according to precise rules, thus it cannot help distinguishing single words lexically; however it helps in communicating word boundaries, which can often help disambuguating. Stress is (very optionally) marked with a grave accent: à è ò ỳ in romanization (an accented l is not necessary since it is impossible for [l] to be stressed). The rules for stressing a word with at least two syllables are as follows, to be applied in order:

- 1. Stress is placed on penultimate syllable³.
- 2. If last syllable's nucleus is a, stress moves to the last syllable.
- 3. If there is gemination in the cluster between penultimate and last syllable nucleus, stress moves to penultimate syllable.
- 4. If the word ends in a cluster with gemination, stress moves to last syllable.

An example: **kottla** (the cardinal numeral 4096) starts as **kòttla** according to rule 1. Rule 2 changes to **kottlà**, but rule 3 changes back to **kòttla** because of the geminated t. Rule 4 does not apply, as there is no final cluster. Thus **kòttla** is the final stress, and pronunciation is /'kɔttla/.

intonation

 $^{^3}$ the syllabic liquids are counted here. So mashl has two syllables, with nuclei a and l.

2.4 General Syntax

Verb phrases and morphosyntactic alignment

Flavan could be briefly described as a SOV language, meaning sentences follow the order subject-object-verb. For example, *Shlem eats a dhlorg* could be translated as

 $\begin{array}{c} \textbf{Shlem dhlarg rbam} \\ \textbf{Shlem.SUBJECT dhlorg.OBJECT} \\ \textbf{eats} \end{array}$



However, this is not strictly correct and potentially confusing because Flavan has ergative-absolutive alignment. This means that the distinction between subject and object is not well-defined, while entities involved in an actions are instead classified as **agents** (subjects of transitive actions) or **patients** (objects of transitive actions or subjects of intransitive actions). In fact, Flavan is unusual in being more "thorough" in its ergativity than most earthly ergative languages. The word order is thus better described as agent-patient-verb, or APV.

The nouns/pronouns that represent the agent/patient are declensed respectively in the **ergative/absolutive** cases. This means for example:

ngon nar rbap - I ate it me.ERG it.ABS ate





ngan bodark - I slept me.ABS slept

The sleeper (actor of an intransitive action) is treated like the eaten (object of a transitive action).

In addition, many verbs admit an **indirect object**, generally the person or thing that the action tends to move towards or to which something is given to or provided to or sent towards as a result. The indirect object is in the **dative** case and goes **before** the verb.

There is yet another alien element to Flavan syntax, the wanter. This can only appear if the verb is in the deontic mood (which expresses wishes, hopes or orders) and specifies who actually desires the action to happen. The wanter is declensed in the dative case too, but comes after the verb. Example:



Shlem dhlarg rbem ngof

I want Shlem to eat the dhlorg Shlem.ERG dhlorg.ABS eat.DEONTIC me.DAT

Thus to conclude, the order could be simplified as APIVW, or

Agent - Patient - Indirect - Verb - Wanter

Note that while the order is very strict, all elements are actually mandatory, except for the verb.

Adverbs modifying the verb can be introduced, generally between I and V, though they can occasionally be moved to earlier position if it brings meaningful emphasis and does not result in ambiguities with subclauses.

Because the wanter being specified is actually uncommon, Flavan verb phrases are strongly **head-final**.

Focus expulsion

It is almost always possible in a spoken sentence to distinguish the **topic**, the information present for the purpose determining the context or specifying what object is being talked about, and the **focus**, the actual *new* information the sentence communicates about the specified topic. As an example, the following English triplet

Shlem eats the dhlorg Shlem eats the dhlorg Shlem eats the dhlorg

have three different choices for the focus. The first means "it is Shlem, and not someone else, who ate the dhlorg", the second "Shlem ate the dhlorg instead of doing anything else with it" and "Shlem ate the dhlorg, not something else". English marks the focus using prosodic stress (pitch, volume, and vowel length).

Flavan (especially spoken) does *not* necessarily employ prosodic stress to mark focus, but rather breaks the otherwise rigid word order and **expels** the focus at the end of the sentence. The above are translated as

dhlarg rbam Shlem Shlem dhlarg rbam Shlem rbam dhlarg

A series of points are in order:

- Marking the verb as the focus is evidently a no-op on an agent-patient-verb phrase. This reflects the fact that the verb is already at least partially the focus by default. If it really needs to be marked ("I didn't kill him!") the adverb meka / meka/, even, actually does the job.
- Focus expulsion can get ambiguous if there isn't sufficient pause between neighbouring sentences (i.e. in written Flavan). In these higher-risk situation expulsion is performed by keeping a pronoun in the original position; e.g., the expulsion of **dhlorg** in the third example above would go **Shlem nar rbam dhlarg**.
- In the presence of I or W, expulsion can get tricky. Verb expulsion does move the verb to *after* W, so if both I and W are present they can get confused. Or an I expelled

after a verb in deontic mood can be confused for a W. Generally context clears most ambiguities of this type, but if nothing works, focus can simply be left unmarked.

Noun phrases

By contrast, noun phrases (i.e. phrases that occupy the roles of either A, P, I or W) are strongly **head-initial**. The head noun or pronoun comes first, declensed for number and case. It is then followed by adjectives or adjective phrases. In particular the adjective can include participles, which come with their own still strictly APIVW subclause, with V occupied by the participle and either A/P/I embodied by the head noun; this will be clarified in section 2.8 and section 2.9.

No antipassive voice

Flavan "does not have the antipassive", which means transitive verbs without an object are *still* treated as transitive. So *I ate* is still **ngon rbap**, with "me" in the ergative case, while a language with antipassive voice might shift to the absolutive.

The ak copula

The verb **ak**, meaning *to be* in the sense of copula (i.e. "the sky is blue") has two unusual properties that deserve care:

1: It is **transitive**. The complement to the subject is literally treated as an object and thus takes the absolutive, while the subject itself is in the ergative. Example:

Shlem katarotta attk - Shlem was a woman Shlem.ERG woman.ABS was

** -|*3| -

2: It always disappears in the present indicative, an example of **zero copula**. So *Shlem is a woman* is literally **Shlem katarotta**. It readily reappears when conjugating the verb in any way, for example in the interrogative mood: **Shlem katarotta yk?** - *is Shlem a woman?*. Thus, the specific word **ak** does not actually exist in Flavan.

2.5 **Nouns**

Nouns are declensed according to number and case.

Number and countability

Three main numbers are always present: **singular**, **dual** and **plural**. These take on different meanings for the two classes of countable and uncountable nouns. **countability**

Ergative

The ergative case's role was already explained in section 2.4.

The ergative case is *unmarked* and it's the default ("lemma") form for nouns, in stark contrast with the typical situation for ergative languages in which the absolutive is the unmarked form.

The number declension in the ergative case is as follows:

However, there are a few irregularities.

For duals: nouns ending in vowel only take -f in the dual.

For plurals:

Nouns whose ending matches with any in the singular column below form the plural by replacing said ending with the corresponding entry in the plural column.

\mathbf{sing}	plur
-yr	-yr ta
-yn	-yn ta
-ym	-ym ta
-yng	-yng ta
- O	-y
-shl	-shar
-a	-ata
-e	-et

Absolutive

The absolutive case's role was already explained in section 2.4.

The absolutive is marked by first vowel opening (FVO), the shift in the first vowel of the noun as:

and in addition, the number suffix becomes a number prefix:

Genitive

The genitive signifies possession (alienable or inalienable), and origin.

It is marked by the suffix **-t** on the ergative form (after the number suffix). A few irregular genitives arise for some noun endings:

If a noun is not part of these exceptions, and the suffix -t were still to create a nonexisting cluster, -et is used instead.

Dative / Locative

The dative marks the receiving end of giving or communication. The locative instead signifies the noun represent a place where the action happens or towards which motion is intended.

The dative is built through the prefix **o-** on the ergative form.

Ablative / Instrumental

The ablative indicates motion away from or through, extraction, origin, topic. As the instrumental, it denotes the action happens by means or thanks to the noun.

The ablative is marked by **first syllable reduplication** (FSR) which is the repetition of the first syllable with a vowel shift, namely if the first vowel is **e,o,y** the duplicated vowel is **a**, if it is **a** the duplicated vowel is **y**. To be precise, what is duplicated is only the onset cluster, the (shifted) nucleus, excluding the coda.

If the noun already starts in a vowel, then one only reduplicates the cluster right after it.

A few examples:

Ergative	Ablative
borgoredh	baborgoredh
sodhl	sasodhl
shlarby	shlyshlarby
darg	dydarg
egord	gegord

Example declension

The noun **berb** /bɛrb/, arm is declensed as follows:

	ERG	ABS	GEN	DAT	ABL
singular	berb	barb	berbet	oberb	baberb
dual	berbef	febarb	berbefet	oberbef	baberbef
plural	berby	ybarb	berbyt	oberby	baberby

Definiteness

Flavan avoids marking for definiteness unless necessary. For singular and dual countable, indefiniteness is signaled by the adjectives ${\bf e}$ and ${\bf ka}$, the literal cardinals *one* and two, placed after the noun just like normal adjectives. finire

2.6 Adjectives

Adjectives are incredibly simple in Flavan: they are not declensed nor do they align with the nouns they complement. Because of this adjective position is crucial for clarity; adjectives always come right after the noun they refer to.

To be precise, the above construction describes the attributive use of adjectives in which they specify a quality about a noun. Adjectives can also be used *predicatively*, as linked with a noun phrase with a copula: *Shlem is beautiful*. In this case the adjective acts as an object of the **ak** copula, and is placed in the absolutive position, but not declensed.

Intensity

The strength of adjectives can be modulated by a series of constructions.

- strengthening (e.g. very) is realized through first syllable reduplication. For example, ttla good-looking, beautiful becomes ttlyttla, very beautiful.
- **inversion** (not to be confused with negation) turns an adjective into its opposite, and it's marked by the prefix **dhla-**. Example: **dhlattla** uqly.

Comparison

Comparison is subtle and alien in Flavan. It is expressed by means of *comparison verbs*, most importantly **merak** and **dhlamerak**, very vaguely translatable as "to be more this than" and "to be less this than". To express that X is more A than Y, one says that X **meraks** A to Y, or said otherwise the object of comparison takes the dative case. For a concrete example:

Shlem ttla o-Rkon merak - Shlem is more beautiful than Rkon Shlem.ERG beautiful Rkon.DAT merak.IND.PR



This verbal form of comparison is preferrable, but if strictly necessary a true comparative adjective can be formed through the agent participle of the comparison verb (see section 2.8).

The possible comparison verbs are

merak | more than | less than | kobymat | equally as | differently from

Nominal Adjectives

It is possible to use adjectives as nouns. (i.e. ttla can also mean the beautiful person).

If the adjective is to be used in the ergative or absolutive position, one just uses the adjective itself in the expected position. It should *not* be declensed as a noun in the absolutive case.

If instead the adjective needs to be in any other position (dative, ablative, after a preposition...) it should be prepended by a 3rd person pronoun (see section 2.7).

Therefore the beautiful person is ttla, while to the beautiful person is onorg ttla.

2.7 Pronouns

Personal Pronouns

	ERG	ABS	GEN	DAT	ABL	VOC
1st singular	ngon*	ngan	\mathbf{nget}	ong	ngangon	-
2nd	my*	\mathbf{me}	\mathbf{met}	omy	mame	my-na $(s) / my$ -nana (d/p)
3rd singular	nor	nar	\mathbf{net}	onorg	\mathbf{nanyr}	-
1st plural inclusive	sho	\mathbf{sha}	\mathbf{shet}	osh	shasho	sho-nana
1st plural exclusive	nysh	\mathbf{nosh}	\mathbf{neshet}	\mathbf{onysh}	nanysh	-
3rd dual/plural	ney	nay	\mathbf{neyt}	one	naney	-

^{*}ngon and my are fairly high-register forms; they are often replaced by the contracted forms \mathbf{n} (/ \mathbf{n} /) and \mathbf{m} (/ \mathbf{m} /).

Personal pronouns can be supplemented with **specifier particles**, if and only if it is strictly necessary for disambiguation; the particles clarify facts about the person (i.e. gender, number, animacy...). Generally only one specifier particle is allowed, and it is placed *after* the pronoun.

Particle	Meaning
ky	male
fa	female
\mathbf{sy}	animate
$d\mathbf{a}$	inanimate
foba	older
\mathbf{fen}	younger
$\mathbf{y}\mathbf{k}$	close to the listener / reflexive
badd	far from the listener
my	2nd p singular
$\mathbf{e}\mathbf{k}$	2nd p dual
tta	2nd p plural

So, **nar yk** might mean "this one here, as opposed to that other one far away", or **nysh fa** might mean "us women, excluding all men" when talking to another man. The particles **my**, **ek**, **tta** are only to be used for the 2nd person pronouns when it is necessary to specify the number. So **my my** is "you, and emphatically you alone", or **my ek** is "you two".

yk has a second meaning: it makes the pronoun reflexive, if it's in a non-ergative case. For example: nor ky nar yk rbodattk /nor ki nar ik rbo'dat:k/, he (male) killed himself.

Demonstrative, indefinite, interrogative

Interrogative Pronouns

Questions whose focus is a noun phrase can be formulated through interrogative pronoun **mat**, whose irregular declension is as follows:

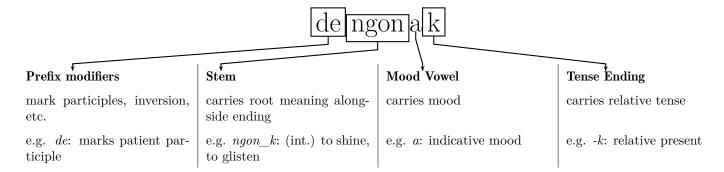
	ERG	ABS	GEN	DAT	ABL
sing	mott	$_{\mathrm{matt}}$	motet	omote	mamot
dual	mottef	fematt	motetef	omotef	mamotef
plur	mottv	mattv	mottvt	omottv	$\max_{}$

mat is to be placed in the right case and position in the interrogative phrase, and this by itself is sufficient to mark it as a question. However, most speakers also add the interrogative mood to the verb (normally only used for yes/no questions) if the verb would have normally taken the indicative - this will be clarified better in section ??.

The interrogative pronoun, which is always necessarily the focus, can be subject to focus expulsion as explained in section 2.4.

2.8 Verbs

/deŋō'nak/, glistening, shimmering



Tense

Conjugated tense is relative to the absolute tense of the proposition, which is instead established through specific time adverbs or inferred from context (e.g. inherited from the previous sentence). So the three conjugated tenses, **present**, **anterior**, **posterior** mean the action is performed respectively simultaneously, before, or after the current absolute time.

Relative tense is marked by the final consonant cluster; verbs are arranged in classes according to their present tense ending, with the -k class the most populated.

Present	Anterior	Posterior
-k	-ttk	-dh
-rd	$-\mathrm{rk}$	-r
-t	-tt	-d
-tt	-ttk	-dd
-rg	$-\mathrm{rk}$	-ng
-m	- p	-ng

Mood

The final vowel marks the mood, as follows:

Indicative	-a-	belief and evidentiality	
Interrogative	-y-	yes/no question	
Deontic	-e-	desire, wish, hope, exhortation,	
		command	
Subjunctive	-O-	protasis, doubt or uncertainty	
Conditional	-ate-	apodosis	

Vowel harmony

When the mood vowel is conjugated to either of -e-or -o- (deontic or subjunctive), and the stem has at least one vowel, the last vowel of the stem is changed to -o- or -e- respectively. For example, **agarak** (to be well) when conjugated to the deontic mood becomes **agarak** \rightarrow **agarek** \rightarrow **agarek**.

Example conjugation

The verb **pyrdak** (tr., bring/present/introduce) would thus be conjugated as follows for mood & relative tense:

	Pres	Ant	Post
Ind	pyrdak	pyrdattk	pyrdadh
Int	pyrdyk	pyrdyttk	pyrdydh
Deo	pordek	pordettk	pordedh
Sub	perdok	perdottk	perdodh
Cond	pyrdatek	pyrdatettk	pyrdatedh

Deontic particles

Commissive

The deontic mood encodes a large array of meanings. It might happen that this is too generic and the nature of the desire or requirirement needs to be specified more precisely. In this case a **deontic particle** is placed before the verb. Here are the most common:

dabe | promise dadabe | threat, promises with negative connotation **Directive**

tyba polite request kottela plead (also used ironically)

rkydh order, imperative
Volitive
mao need

mao need blange want, desire shange pessimistic wish say optimistic wish

Participle, gerundive

Participles can be constructed as agents (that is, subjects of transitive verbs) by adding the prefix **ro-**, or patients (subjects of intransitive verbs or objects of transitive verbs) with **de-**. Example: **fattarym ropyrdak**, the neighbour that is bringing, **feshlarb depyrdak**, the water that is being brought.

But most interestingly, there is also an indirect participle

marking the indirect object (the one that would go in the dative case) of the action, with prefix **do-**. For example, **kad**, *give* has **dokat** /do'kad/ *receiving*

A participle can be used as it is as a noun. The ??? is declensed as a normal noun.

Combining a participle/gerund with mood and tense can yield some interesting constructions. A gerundive can be built with a patient participle of a posterior deontic verb: **ropordedh**, the one that must be brought.

Irregular participles and ak- verbs

Some verbs, those starting on **ak**- (except **ak** itself) construct one of their participles irregularly. To be exact, the irregular participle itself is the original form, and the verb is derived from it. The remaining two participles are constructed regularly from the verb.

Part.	Translation	Voice	Verb	Translation
rog	writer, writing tool	ag	akrog	write
bot	known	pat	akbat	know
rkygo	newborn	pat	akarkygat	be born

Modifiers

There is another interesting phenomenon in verbs, on the edge between fusion and agglutination: modifier prefixes. These do attach to the original root to produce a new, longer root with modified meaning; therefore they must be applied before conjugation. Modifiers act somewhat irregularly in terms of the resulting change in meaning, and many modified verbs become their own new lexical units and are reported separately in our dictionary; nevertheless Flavan generously applies modifiers on new verbs in speech to create predictable transformations. The usage and parsing of modifiers requires a good dose of common sense, and Flavan speakers tend to avoid them whenever the possibility for ambiguity arises and a different verb already exists to communicate the intended modified meaning.

A few popular modifiers:

dhla-: inversion; the action opposite, inverse, or undoing the original action.e.g.: **pottarat**, sew, entangle, **dhlapottarat**, unsew, disassemble, disentangle

kyta-: negation; the original action not happening, being stopped or ignored. e.g.: pat, walk, kytapat, not walk, stand still, wait still

FSR: strengthening; a strengthened, more intense or faster version of the original action. e.g.: **pat**, walk, **papat**, run

Modifiers can be composed together, even repeating the same modifier: to run fast could be translated as **papapat**, applying FSR twice.

Perfectiveness

do perfectiveness

2.9 Relative Clauses

Flavan doesn't use relative pronouns to form relative clauses in the traditional sense, for relative clauses in the in the position of subject, object, intransitive subject and indirect object. Instead, it employs directly its extensive participle system.

As any adjective, the participle goes after the noun it refers to, and the rest of the relative clause is in standard word order with respect to the participle, which is the main verb from the subclause's point of view. Moreover, relative clauses are Flavan relative tense's time to shine: the participle's tense denotes time *relative* to that of the main clause (which is in turn relative to background time).

Examples for each position (with the subclause in square brackets for clarity):

ERGATIVE

"I saw a man that was eating (transitive)"

Ngon toreb [rorbam] moratt /ŋɔ̃n 'təreb ro'rbam mo'rat:/
me.ERG man.ABS (eat.IND.PRES).(AG PART) see.IND.ANT

ABSOLUTIVE

"I saw a man that was running"

Ngon toreb [depapat] moratt /ŋɔ̃n 'təreb depa'pat mo'rat:/
me.ERG man.ABS (eat.IND.PRES).(PAT PART) see.IND.ANT

DATIVE

"I saw the man that you gave the book to"

Ngon toreb [my kagmenyr dokatt] moratt /ŋɔ̃n 'tɔreb depa'pat mo'rat:/

me.ERG man.ABS you.ERG book.ABS (give.IND.PRES).(DAT PART) see.IND.ANT

(note: dokatt is in the anterior tense since the giving of the book was certainly anterior to the main action.)

A delicate point is word order. The head noun **toreb** in all of these cases occupies two roles simultaneously: P in the main clause and A/P/I in the subclause. Since the rest of the subclause must come after the head noun, if the participle is of patient or indirect type then it's possible the APIVW order will be broken for the subclause. This is considered one of the few acceptable exceptions. Thus in the last example above the subclause is really in IAPV because the I just cannot be moved forward.

add other positions

Relative clause expulsion

It might be that the rigid order in the above construction of relative clauses is too strict for the expression some concepts; for example, situations in which it is important that the main clause is finished before one can start a relative subclause. In that case it is possible to postpone the relative clause with the **kon** construction, described as follows.

The main clause is stated normally, but the special adjective **kon** is appended to the noun phrase to be referenced. Then the subclause is exposed, with the reference embodied by the relevant personal pronoun, this too accompained by **kon**. This is much clearer with an example:

"I saw a man that was eating"

N toreb kon moratt [nor kon rbam]
me.ERG man.ABS.kon see.IND.ANT he.ERG.kon eat.IND.PR

In this example the **kon** adjective marks that the man mentioned in the main clause is the same as the "he" that enters as agent in the expelled subclause.

More often than not spoken Flavan will omit the first instance of **kon**, leaving the referenced noun phrase from the main clause to be deduced from context. For example, if we were to make such an omission in the above example, it would still be obvious that the referenced noun is *the man* and not *me*, because the pronoun in the relative clause is in the third person. In general, one would always prefer to add a necessary specifier particle to the pronoun to disambiguate, rather than repeat **kon** twice.

It can also happen that the above construction is inverted: the main clause has the pronoun and the subclause the actual noun phrase. Example:

"I saw him, the man that was eating"

Ngon nar kon moratt [tyreb kon rbam]
me.ERG him.ABS.kon see.IND.ANT man.ERG.kon eat.IND.PR

2.10 Declarative clauses

Declarative subclauses are built by means of a **declarative pronoun**, standing for the subclause in the main clause, while the subclause itself is constructed as a normal declarative clause - with the exception that an irrealis subclause should take the subjunctive mood. The pronoun (and its position with respect to the subclause) is declensed as follows:

	pronoun	position
ERG	bogm	after
ABS	bag	before
DAT	obogm	before
ABL	babogm	before

Here are a couple of example of declarative subclauses in ergative and absolutive positions.

[nor fa ttla] bogm karygma /nor'fat:la bogm kari'gma/ [she beautiful (is)].ERG fact.ABS (is) It's a fact that she is beautiful

N bag [nor fa ttla] akbat /n bag nor fattla ak bat / me.ERG ABS.[she beautiful (is)] know.IND.PRES I know she is beautiful

2.11 Negation

A negation modifier for verbs has already been introduced,

2.12 Conditionals

 ${\rm cond}$

2.13 Numerals

Flavan arithmetic terminology has undergone a remarkable number of revisions, most of them artificial, following the strong push for clarity, ease of calculation and mutual intelligibility imposed by the needs of a civilization based on trading and travel. The current situation is a positional base-16 / base-4 system, with the spoken language mostly working in the former while written numerals (described in the reference for the script) employ the latter.

The first cardinal numerals are

base-10	base-16	numeral	pronunc.	etim./alternative mean.
0	0	kydh	/kɨjðː/	nothing
1	1	e	/ε/	-
2	2	ka	/ka/	original dual affix
3	3	pok	/pok/	triangle
4	4	$_{ m demo}$	/ˈdɛmo/	square
5	5	fam	/fam/	hand
6	6	eka	/eˈka/	"one-two" in base four
7	7	rbargar	/rba'rgar/	hole^4
8	8	mom	/məm/	sun^5
9	9	dhlarma	/ðlarma/	"not quite ten" (sort of)
10	A	darma	/darma/	-
11	В	kodany	/ko'dani/	from the old system
12	С	kardeny	/karˈdɛni/	from the old system
13	D	pottke	/ˈpɔtːke/	from quaternary "three one"
14	E	kargar	/ka'rgar/	two-seven
15	F	dhlarda	/ðlaˈrda/	"not quite sixteen" (sort of)
16	10	garda	/gaˈrda/	[unknown]

To which we can add the powers of sixteen:

base-10	pow of 16	numeral	pronunc.	etim./alternative mean.
16	16 ¹	garda	/gaˈrda/	[unknown]
256	16^{2}	dhonga	/ðo'ŋa/	many
4096	16^{3}	kottla	/ˈkɔtːla/	complete
65536	16 ⁴	gardakottla	/gardaðo'ŋa/	16×16^{3}
1048576	16 ⁵	dhongakottla	/ðoŋaˈkɔtːla/	$16^2 \times 16^3$
	1			I

An arbitrary number can be expressed in the following way. Write the number in base-16, so as a sum of powers of 16, and sort the powers from **smallest to largest**. For example, let's take $12345_{10} = 3039_{16}$, so

$$3039_{16} = 9 \times 16^0 + 3 \times 16 + 0 \times 16^2 + 3 \times 16^3$$

Then reading literally, the word representing the number is

dhlarma-pok-garda-pok-kottla

/ðlarma'pok ga'rda pokə'kət:la/
nine (plus) three-sixteen (plus) three-4096

This insistence of Flavans on reading from least significant to most significant digit is certainly frustrating especially in light of their most-significant-first written representation of numbers.

There is a possible ambiguity when **e** and **ka** appear consecutive, as in **e ka garda** = $1+2\times16$, as they can be confused with **eka**, as in **eka garda** = 6×16 . In these cases **e** is replaced by **ef**. So $1+2\times16$ is **ef-ka-garda**.

⁵The etimology of **rbargar** is worthy of explanation: it refers to the seven orifices of the human body according to Flavans: the two ears, the two nostrils, the mouth, the urethra/vagina, and the anus.

⁵It's not known whether this is a coincidence or has some philosophical or religious significance. It is known that the attention to eight as a sacred number of sorts has definitely shifted in later times towards sixteen, and this term is likely to have been inherited from a much older system.

2.14 Possession

In Flavan, there is no verb "to have": possession is described entirely through the genitive.

There is a distinction between alienable and inalienable possession. Alienable possessors are placed before the head noun:

Shlemet tatyr kakoryb /ˈʃlɛmet 'tatṛ kaˈkɔrɨjb/

Shlem.GEN dagger.ERG (very).expensive (omitted copula) - Shlem's dagger is very expensive

While an inalienable relationship uses the opposite order:

forb Shlemet ttlyttla /forb 'flemet ət:lijt:la/

Brother.ERG Shlem.GEN (very).beautiful (omitted copula) - Shlem's brother is very beautiful

There is an exception in genitive expressing geographical or cultural origin, such as the origin village in Flavan names. If Shlem comes from the Karek village, she is **Karek-t Shlem**, even if the possession is inalienable.

dhana \Leftrightarrow [ðan'a] adv · after this,

2.15 Kinship and Relationship

2.16 Dictionary

Flavan script transcription is rotated to horizontal for formatting purposes.

adhla - [aðl'a] · in the way of, according to, through, in (smth) way | commonly combined in adhla matty, in which way or how agarak - [agar'ak] $v intr \cdot feel$ good, feel well, be well $ak \rightarrow [ak] v tr \cdot be (copula)$ ame \rightarrow ['ame] adv · here anyshl \rightarrow [an'if]] adv in the far future **arbyd** \rightarrow ['arbid] n · river arkatt - [ark'at:] v tr · be disgusted by, be appalled by **babyr** \sim [b'abr] $n \cdot \text{suffering}$, pain **barkag** \searrow [bark'ag] n · number **bemon** \Longrightarrow [b'ɛmon] $n \cdot \text{rock}$ **berb** \Longrightarrow [berb] $n \cdot \text{arm}$ blyshl 🐝 [bl'if] $n \cdot sap (of$ plunts) **bob** \bowtie [bob] $n \cdot \text{head}$ **bodard** \longrightarrow [bod'ard] $v intr \cdot sleep$ **borag** \longrightarrow [bor'ag] n · sulfur **bord** \gg [bord] $n \cdot \text{death}$ **bordam** \gg [bord'am] $v \ tr \cdot tell$, say, recount borgoredh XXX [borgorˈɛðː] n $\cdot \ discipline$ boryg 💸 [b'ərɨg] adj · acidic, yellow, sulfurous byrma ६६० [bṛmˈa] adj · heavy byrmodak 🗫 [bṛmodˈak] $v \ tr$ · weigh (asses weight of something) da = [da] response particle · no $\mathbf{darg} = \langle \mathbf{darg} | v intr \cdot \mathbf{burn} \rangle$

following, in a little while dhlaboma → [ðlabom'a] adj · old dhlattla 🔩 [ðl'at:la] adj · ugly **dhlekyr** \checkmark [ðl'ɛkr] n · tree-like plunt dhyn ★ [ðin] conjuction · but, surprisingly, yet **dhyrg** \leftarrow [δ rg] $n \cdot \text{eye}$ $dyp = [dip] conjunction \cdot after$ eat \leftarrow [e'at] $v \ tr \cdot see$ egorat $\vdash_{\mathbf{A}}$ [egor'at] $v \ tr \cdot \text{exam}$ **egord** $\rightarrow \infty$ [' ϵ gord] $n \cdot \epsilon$ examination **fam** \Rightarrow [fam] $n \cdot 1$. hand 2. five fattarym **∃**⋒ [fat:'arim] n · neighbour **febodh** \Rightarrow [feb'əði] $n \cdot \text{pocket}$ **femen** \Longrightarrow [f'emen] $n \cdot \text{need}$ [f'et:fok] advfettfok **≒<**≢+ · strangely, weirdly, in an unusual way forb \Rightarrow [forb] $n \cdot \text{word}$ forba \Rightarrow [forb'a] adv · about, approximately · act, behave fysh (fi) $n \cdot \text{single hair}$ fytta fa [fit:a] adj · male fyttfyt 強負」 [f'it:fit] adv · immediately, right away garyk 🔀 [g'arik] pronoun · this (close to listener) godhl $= (g'o\check{\partial};l] n \cdot desire$ \mathbf{goma}_{\bullet} [gom'a] $n \cdot \text{skin}$ gydda \longrightarrow [g'id:a] n · love | both

meaning fraternal or sexual love or affection, also directed towards inanimate entities but only in the sense of caring about, never in the sense of strongly liking. The verb "to love" is gydda kat $gyrb \stackrel{\checkmark}{\mathbf{x}} [grb] n \cdot leg$ gysadhl '> [gis'aðil] n · greedy person, someone blinded by desire $kag \rightarrow [kag] n \cdot milk$ kagmenyr + [kagm'enr] n· book, booklet, notepad, diary $\mathbf{kam} + \mathbf{o} \quad [\mathbf{kam}] \quad v \quad tr \quad talk \mid \mathbf{object} \quad is$ listener, topic is in ablative **karatto** \leftarrow [kar'atzo] n · oasis, crater $\mathbf{karb} + \mathbf{\hat{y}} \quad [\mathbf{karb}] \quad v \quad tr \quad \mathbf{\hat{y}} \quad \mathbf{\hat$ karyttfa Kar'it:fa] adj · old **kashl** \rightarrow [k'aʃ] n · urine **kat** \vdash [kat] $v \ tr \cdot$ offer, give, provide katarotta -1 [katar'ət:a] n · female kerb 45 [kerb] adj · low **ketta** + [k'et:a] $n \cdot$ coin $\mathbf{korb} \mathrel{\mathbf{1}} \mathbf{\hat{s}}$ [kərb] $n \cdot \mathbf{child}$ korbaradem (korbar'adem) adv · all this time, through the whole thing, throughout, this whole time | sets verb to progressive, with the end of the action at the moment in time indicated by the verb.

koreny \leftarrow [kor'ɛnɨ] n · psycholog-

ical or mental unbalance, mental

koryb (k'ərib) adj · expensive

illness | plural

kym ५ [kɨm] conjunction ⋅ while, kyng 4δ [kiŋ] $n \cdot \text{mouth}$ kyryd 🌾 = $[k'rid] n \cdot woman$ kyttkat 4/3 [k'it:kat] v tr · meet $\mathbf{mak} \Leftrightarrow [\mathbf{mak}] \ v \ tr \cdot 1. \ \mathbf{lead}, \ \mathbf{guide},$ 2. teach, pave the way mardat 🗞 [mard'at] v intr· dream | X.ABS Y.ABL (mardat): X dreams Y or of Y $\mathbf{mashl} \iff [\mathbf{m'afl}] \ v \ intr \cdot \mathbf{go}, \ enter$ matty (m'at:i] interrogative pronoun · which, what medh ఈ [mεðː] adverb · behind **megyn** \Leftrightarrow [m' ϵ gin] $n \cdot 1$. stick, rod 2. tent pole 3. (vulgar) finger $\mathbf{mom} \iff [\mathbf{mcm}] \ n \cdot \mathbf{sun}$ **morad** \sim [mor'ad] n · ground, land morat \sim [mor'at] $v \ tr \cdot look$ $moshl \iff [m'of] n \cdot mother$ mydhlark 🗞😋 [mɨðlˈark] v intr · lay down, lie myfo ੑੑੑੑੑ [m'ifo] adj · tall, deep na ♦ [na] response particle · yes **nadd** \Leftrightarrow [nad:] adverb · it seems like, it appears like | before a verb in subjunctive, expresses apparence **nedhat 🔊 -** [neð'at] $v intr \cdot swim$ **ngangat** \bowtie [ŋãŋ'at] v intr · be sick, have a fever **ngonak** \longrightarrow [ŋõn'ak] v intr · glisten, glimmer, shimmer, shine **ngyard** \Longrightarrow [\mathfrak{n}^{\sharp} 'ard] $n \cdot \operatorname{salt}$ **ngyb** \gg [$\mathfrak{g}ib$] $n \cdot \text{son (of mother)}$ **ngynga** \Leftrightarrow [$\eta i \eta' a$] $n \cdot sickness$, fever

nynga \Leftrightarrow [nɨŋˈa] $adj \cdot 1$. sweaty 2.

sticky **nyngyr** (n'inr] n · sweat **om →** [ɔm] *adj* · all $pak = [pak] n \cdot village$ **papat** = [pap'at] $v intr \cdot run$ $pat = [pat] v intr \cdot walk$ **pdamen** \Leftrightarrow [pd'amen] $n \cdot \text{sky}$ [pot:ar'at] v trpottarat · sew pyka ≒ [pɨkˈa] adj · small pyrdak \hookrightarrow [pṛd'ak] $v \ tr \cdot$ bring, present, introduce **rbam** \Rightarrow [rbam] $v tr \cdot eat$ **rbargar** $\searrow \qquad$ [rbarg'ar] $n \cdot 1$. hole 2. orifice **rbo** (rbo) (rbo) $(n \cdot breast)$ **rbodat** >= [rbod'at] $v tr \cdot kill$ rda [rda] adverb · then, in the past $\mathbf{rdak} \geqslant \mathbf{l} \quad [\mathbf{rdak}] \quad n \cdot \mathbf{again}$ rdan **⋄** [rdan] adverb · together rdonarod 🌭= [rdon'arod] nrdonaroda **>>=** [rdonarod'a] adj rgodha ← [rgoð'a] adj · long rkygo (x) [rk'igo] n · newborn **rkyng \phi** [rkin] n · beard $\operatorname{rodan}_{\mathsf{x}} = \operatorname{rod'an} n \cdot \operatorname{day}$ $\mathbf{rog} \nearrow \mathbf{rog}$ [rog] $n \cdot 1$. writer 2. any writing tool romak \sim [rom'ak] $n \cdot 1$. teacher 2. Master rykashl $\leftarrow \mid n \mid n \mid 1$. membrane, sac 2. peel 3. placenta 4. water canteen sab \triangleright [sab] $n \cdot \text{sand}$

 $\operatorname{sedh} \cdot \ker [\operatorname{se} \delta :] n \cdot \operatorname{fear}$ **setta 'M** [s' ϵ t:a] n · regret **shaf** \Leftarrow [ʃaf] n · hospitality shlattky ※ [ʃlˈatːkɨ] n · blood **shledd** \gg [fled:] $n \cdot \text{daughter}$ **shoryk** \leftarrow [f'arik] n · idea, proposition, suggestion (on how to act) sodhl r [s'ɔð:l] $n \cdot cloud$ syng ' [sin] adj · safe (as in safety) syrbattam 1888 [srb'at:am] ntaryng \Leftrightarrow [t'arin] n · tent tatyr $[1]_{\bullet}$ [t'atr] $n \cdot 1$. knife, dagger 2. (vulgar) penis $torkam _{lq}$ [tork'am] $v tr \cdot take$, grab, remove ttakyba 🙌 [tːakɨbˈa] n · visit, opposition of the Wanderer, years of age ttakyrg ላፋሪ [tːˈakṛɡ] n · village authority ttarkaset $\langle \mathbf{n} \cdot \mathbf{n} | [t:ark'aset] n \cdot liver$ ttfysh \leftarrow [t:fif] n · rain, raindrop ttla \diamond [t:la] n · beauty, beautiful things ttlyttla 🔆 [tːlˈɨtːla] adj · beautiful, stunning tyreb $\uparrow \leftrightarrow [t'reb] n \cdot human, per$ son, man, woman yngap \hookrightarrow [iŋ'ap] n · buttock the buttocks is dual yngok \hookrightarrow ['iŋõk] n · light $\mathbf{yrk} \subseteq [\mathbf{rk}] \ conjunction \cdot$ and

Chapter 3

The Flavan Script



 $"beauty\ from\ discipline."$

3.1 Functioning of the abugida

The Flavan script is an abugida: the main series of glyphs (called "the adults") represent consonantal sounds, while secondary glyphs (called "the children") attached to the adults represent vowels following them.

To be more precise, adults mark consonant *clusters*. When writing a word, the entire group of consonants between one vowel and the next is one cluster and maps to one adult. For example, consider the word **syrbattam**, *room*; if it were to be written it would be decomposed as such¹

$$(s)^y(rb)^a(tt)^a(m)$$

It would therefore be written as the **s** adult with the **y** child attached, the **rb** adult with the **a** child attached, and so on. If the word starts in a vowel, we use a "carrier" adult called the **pode** (-). For example, **arbyd**, *river* would be

$$(-)^{a}(rb)^{y}(d)$$

Note you cannot "compose" the \mathbf{r} and \mathbf{b} adults to make $\mathbf{r}\mathbf{b}$. They are separate phonemes and glyphs in Flavan. The Flavan script can only represent words that follow the phonotactical rules, so only those that alternate vowels with allowed consonant clusters. **andra** is not a Flavan word and it cannot be written because there is no $\mathbf{n}\mathbf{d}\mathbf{r}$ adult.

Words with consecutive vowels can occasionally appear though. These can easily be written using podes.

The letter "a"

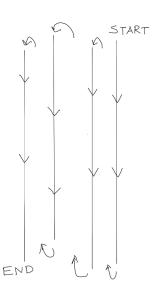
There is no letter a. By default, unmarked adults carry an a vowel, unless at word end. So really, syrbattam should be

But what if a word ends in a? Just add more podes. gydda, love is

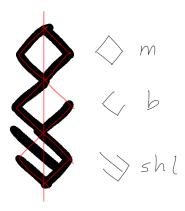
To be exact, what's happening here is that the final (-) makes it so (dd) is not final anymore, and thus does carry **a** being unmarked. The (-) here does not contribute any sound by itself.

3.2 Visual guidelines

Flavan is written top to bottom, right to left. Running through the middle of a single column of text is a (partially imaginary) line, the main stem. The adults are placed one below the other, centered on the stem; the centering is essential for readability. You're always allowed to play around with the distance between stems and also with the height of the beginning of each column of text, for aesthetic purposes; however, the stem should never bend or be curved or diagonal (except for some very wild designs), and adults should be correctly centered. These are valid stem lines. Spacing and starting height are inconsistent, but all stems are perfectly vertical and straight.



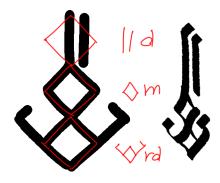
¹syrbattam is actually pronounced [sṛ'bat:am] with a syllabic [r], however for the sake of the Flavan script phonological rules such as the contraction $/ir/\rightarrow$ [r] are ignored.



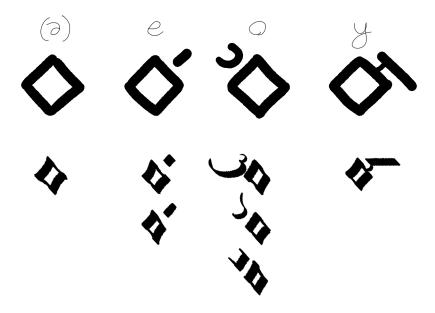
The stem is included literally in some adults, so that words can appear as single connected shapes spanning vertically. Other adults break the stem line, so a disconnected symbol does **not** mean a word boundary.

The adults themselves are all built, fundamentally, on a "template" of a 45°-rotated square, at least in the basic "geometric" style. The resulting visual coherence helps in distinguishing glyphs: each square is an adult. For example, the (imaginary) word **mabashl**, with adults **m**, **b**, **shl** becomes as on the left.

Some rules are meant to be broken. Some really aren't. You can for example break free of the grid's vertical constraints. In the right example, the (again imaginary) word **damard** was stylized by stretching the vertical letter **d**; this is ok because this glyph, while meant to fit in a template square, does not really follow the lines of the square at all. Moreover, the two lower squares have been stretched into rhombi, and some curvature has been added to the lines. However, both rhombi are equal (approximately) in width and height. In general, stylization (at least for the Demorog script) can result in deformation of the fundamental square shape and stretching of non-square elements, but whenever the deformed squares appear, they should be consistent. This is essential for distinguishing adult boundaries (is there a joke here?).



3.3 Children



The four children markings (the absence of a marking is also considered a vowel letter by Flavans) are depicted here on the letter **m**. Below, a few variants for the cursive style are presented. There is great freedom in stylization of position and shape of vowel markings, because there is little chance of ambiguity; this freedom should be employed to avoid overlap of the markings with the previous adult. Some guidelines should be however satisfied to guarantee legibility:

- e should always be detached from all adults and children on the same column and to the right of its parent adult, upper right if the adult includes a guide square. It should be either dot-like or angle upwards going to the right. It should be straight.
- o should also be detached from all glyphs of the column and on the left or upper left of its adult. It can take a great variety of shapes, generally c-like curves with the opening to the upper left, and might include one, two, or even three arcs. On many adults, however, the o and the adult join to create another form (generally it turns into a "hook" for the adult), the full syllabary table includes all possible combinations.
- y is attached by a little stem to its parent adult. Otherwise, it should not attach to anything else in the same column. The point of attachement is specific to each letter (see the full syllabary table) but it's always either right or upper right. The main stroke angles downward in the strict geometric style but is horizontal in handwritten geometric or in cursive.

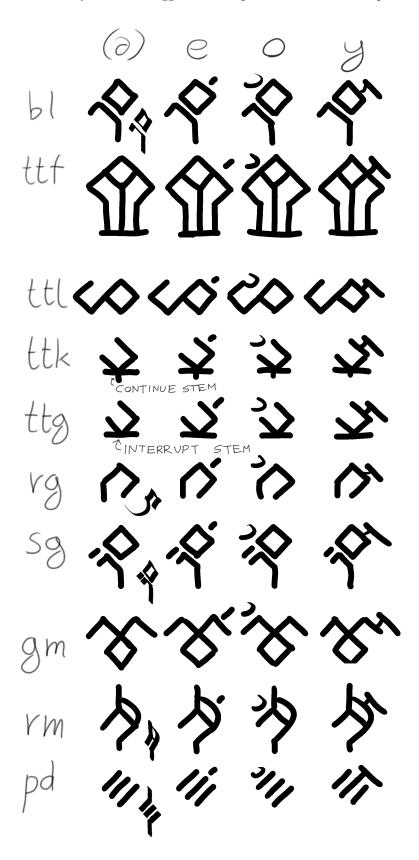
3.4 Syllabary (Males)

The following are adult-child combination for the "common" adults, the "males", in geometric style. Some non-obvious cursive version of the geometric glyphs are depicted to their lower-right. The combination \mathbf{ngy} contains in the cursive script the only permissible intersection of strokes. Note that the glyphs \mathbf{g} and \mathbf{s} interrupt the stem above, so there is a space between the adult and the one before. Similarly, \mathbf{k} breaks below, and \mathbf{t} breaks both above and below.

(a) e 1 1 1 **ひなななくい** 11 11 4 4 4 4 5 7, -> Sh IN ← Ⅲ Ⅲ- 班 WWW WWW

3.5 Syllabary (Females)

And here are the more "uncommon" glyphs, the "females". **ttk** and **ttg** are identical; the only distinguishing feature is that the former does not interrupt the main stem while the latter does (and there's a corresponding space before the next letter). The very rare **pd** glyph must necessarily be drawn bigger than a square in the cursive script for the strokes to be distinct.



3.6 Orthography and punctuation

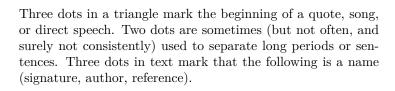
There's one last "letter" to add: by reducing the space between consecutive \mathbf{k} and \mathbf{t} letters, one obtains a glyph for \mathbf{kt} , representing the sound [kt]. This can only be word-final and it's generally a consequence of a genitive ending where the last vowel has disappeared. In the rare case that a word does literally end in \mathbf{kat} , an extra amount of space has to be introduced to clarify this.



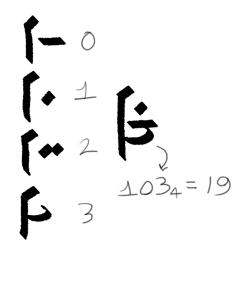


Dots (or small strokes) aligned with the stem line separate words. They are identical to the **e** marking except for the positioning, in all styles. Words **never** span multiple columns, and no marking is placed when the column ends.

Note that Flavans might separate words differently than the standard employed romanization, and that there are numerous irregularities and regional variants to this.







Flavans, after way more careful deliberation than was honestly necessary, have settled on a positional system for writing numbers, the **Borg system**. To write a number, draw a pode, then draw its digits in base 4 from top to bottom using the scheme to the left.