

CHAPTER FOUR

או ליברו די קומו שי פאזין אש קוריש

O LIBRO DE KOMO SE FAZEN AS KORES

(PARMA MS. 1959)

1. INTRODUCTION

The text known as *O libro de komo se fazen as kores* 'The Book on How to Make Colors' is the best-known Hebraicized Portuguese manuscript, the only one to be specifically mentioned in more general studies of pre-expulsion Portuguese Jewry (Ferro Tavares 1992: 146). The earliest printed reference to it appears in Zunz (1876), though the only substantial study of the text was not undertaken until well into the twentieth century. Based on a photograph of the manuscript at the Jewish Theological Seminary in New York, the text was transcribed and translated by Blondheim (1929), with a Romanization appearing in Blondheim (1930). However, this edition contained only a few notes of commentary, along with a number of hesitations with respect to individual transcriptions, transliterations, and translations.

Based on my first-hand consultation of the manuscript at the Biblioteca Palatina in Parma (Italy), the present edition addresses these errors, and expands on excerpts first published in Strolovitch (2000c) to include a thorough philological commentary on the entire text. The Romanization presented in this chapter also corrects several of Blondheim's errors, most of which consist of unwarranted Castilianizations¹ of several forms, as well as a

¹ Although the spelling of some forms is, in principle, ambiguous with regard to a given Spanish-versus-Portuguese feature, Blondheim does not actually justify these Romanizations (see chapter 7 § 4.3 for clearer examples of Castilianisms in Judeo-Portuguese).

small number of characters that he plainly misread. It also departs significantly in form from his, since I have used the system of transcription described in the previous chapter, which more faithfully preserves the distribution of Hebrew graphemes and disregards some conventions of Roman-letter Portuguese writing. I do, however, owe a great deal to Blondheim for his translation, which provides the English meaning of many rather obscure elements and compounds.

As kores contains 45 chapters, varying in length from single sentences to several folios, each of which provides instructions for the preparation of inks and dyes, as well as practical information on how to best apply them in manuscript illumination. The text is bound together with ten other manuscripts which, based on similarities of format, justification, number of lines, and other features – and in spite of their varied subject matter – were probably designed as a unified volume (Metzger 1977). In her discussion of Hebrew manuscript production in late fifteenth-century Portugal, Metzger devotes a lengthy introductory footnote to the debate over the date and authorship of *As kores*. Although a colophon reveals the name of Abraham ben Judah ibn Hayyim writing at Loulé in Portugal, the year of composition or copy is given only as "22." Blondheim (1929) takes this to be the year 5022 in the Hebrew calendar, that is 1262 in the Gregorian, a date that would place the text among the earliest examples of Judeo-Romance (beyond individual glosses). Yet the writing style and language clearly places the extant copy later than the thirteenth century. Metzger does contend, however, that despite its distinct Portuguese character, it was probably not a manual used by the scribes and illuminators of what she considers a "Lisbon school" of practitioners.

2. OVERALL LINGUISTIC CHARACTER

Like the larger astrological text *O libro de maḡika* in chapter 5 (and most non-liturgical Judeo-Romance writing), diacritic vocalization is used in only a handful of words. The use of the four *matres lectionis* א *a*, ה *a#*, ו *o/u*, and י *e/i* is generally more robust than in *O libro de maḡika* (chapter 5), and with rare exception only /a/ is left implicit and unspelled, most often in Arabic loanwords (cf. chapter 3 § 2.4.2). The double-duty of ב *b*, ג *g*, and פ *p*, representing both plosives as well as the corresponding spirants *v*, *ḡ*, and *f*, is indicated less than consistently by a diacritic apostrophe (as opposed to *rafeh*). Nevertheless, *As kores* does offer the most wide-ranging adaptation of Hebrew script for writing Portuguese, in terms of both orthographic variation and overall linguistic structure. While most of these features are discussed in specific detail in the commentaries on individual items in § 5, one aspect of its adaptation of Hebrew script is worth highlighting in advance.

2.1. Sibilants

As noted in the previous chapter (§ 2.3.2), the spelling of sibilants in Judeo-Portuguese, as in the Roman-letter orthography of the time, is quite variable. Further adding to this variation, *As kores* is the only text in the Judeo-Portuguese corpus to make any significant use א *ṣ* for vernacular² words. It occurs most often in final position, where the rest of the corpus would have ז *z* (usually corresponding to <z> in the modern orthography):

² Along with a number of items in this text, א *ṣ* is used in the spelling of several Arabic and Greco-Latin loanwords in *O libro de maḡika*. Given their technical nature, however, it not clear to what extent they would have been part of the colloquial language, so that the question of a distinct pronunciation as indicated by this letter may not be pertinent.

(1)	דיין	deṣ	dez	'ten'
	גיין	gīṣ	giz	'chalk'
	וירניץ	verniṣ	verniz	'varnish'
	פריין	preṣ ³	(Fr. <i>après</i>)	'then'

As *kores* is also the only text in the corpus in which the noun-marking plural *-s* is spelled by a letter other than ן, though in most cases it appears to be influenced by another non-ן sibilant letter in the stem of the word:

(2)	וייץ	vezeṣ	vezes	'times'
	אונסאס	onçaç	onças	'ounces'
	קאביסאס	kabeçaç	cabeças	'heads'

This variation is further complicated in future subjunctive forms of the verb *querer* 'want', which occurs frequently in the text as an opening formula for a given set of instructions, usually addressed to the reader in second-person singular form (ModPg. *si quiseres* 'if you want (to)' < perf. subj. QUAESIVERIS). Not only does the normally stable verb desinence vary between ן and ץ, but the stem-final consonant varies even more frequently between ן or ך (both of which may or may not include the apostrophe). Thus all three of the following alternate throughout the text:

(3)	קישיריש	kišeres
	קיגיריש	kiḡeres
	קישיריין	kišeres ⁴

³ This word does not survive in Modern Portuguese (see § 6, note line 155).

⁴ The only other verb to feature this unconventional final consonant is one future subjunctive occurrence of טוביריין *tubereṣ* 'you (will) have' (ModPg. *tiveres* < TENUERIS) on folio 13r. Since it is followed there by דיין *deṣ* 'ten', which more justifiably contains the same final letter, the verb spelling may be an anticipatory gesture.

3. ROMANIZATION

Although the scribe has not made use of any word-internal punctuation to indicate morpheme boundaries, I have used a hyphen to indicate a clitic pronoun that is not graphically separated from the verb stem or desinence. In contrast, I have used a period to indicate an otherwise free-standing morpheme (most often the definite article) that the scribe has not separated from an adjacent word. The intralinear numbers indicate the line breaks in the manuscript itself, though line numbers in the commentary of § 5 refer to the numbering in the left margin.

aki se.komeinça |² o libro de komo se fazen as kores das tintas |³
todas pera aluminar os livros e digamos |⁴ logo primera mente do
oro sol □ si |⁵ kiseires fazer o |⁶ oro kon.ke posas aluminar |⁷ o
pintar o kabidoar o eskreber |⁸ asi komo te.este libro dišer e m^andar
5 |⁹ adiante e tu non mengues nin akreçentes |¹⁰ mas do.ke tu libro
dišer ka si o fizeires todo |¹¹ eraras, e nao tebera prol enkuanto |¹²
fizeires e por esta razon nao faças |¹³ per otra gis^{ah} sinon komo ti o
libro |¹⁴ dišer e mandar fazer. primera |¹⁵ mente tomaras deş onças
|¹⁶ de ġupiter ides estanyo kraro e [1v.] linpio, e tomaras çinko onçaç
10 de fuġitibo |² ides azoge e dereteras primero o ġubiter |³ e deit^{ah} o
fuġitibo en un almofariş. e o |⁴ estanyo deretido deita o no almofariş
ko o |⁵ azoge. e mistura-ly^e çinko onçaç de ensofre. |⁶ e dos onçaç de
sal armeniko, ides anoštar |⁷ e esto seġ^{ah} mui bein modo e peneirado
e |⁸ oke non si poder peneirar torna-o a moer |⁹ ata ke seġa todo
15 peneirado e enton aġunta |¹⁰ todo en un baçio bein linpo e despois
|¹¹ deita-o en uah aredom^{ah} de vidro. e enbestiah |¹² de.bitume e de
bou baro forte kuarto |¹³ o çinko vezes porke pos^{ah} soportar o |¹⁴
fogo e enton mete-ah en uah panel^{ah}. |¹⁵ ġeah de çiniz^{ah} do lar e da-
ly^e fogo manso |¹⁶ ata ke veġas ke sai^{ah} o fogo vermelyo e entou |¹⁷
20 atap^{ah} ah boka da.redom^{ah} kon do baro e leša ah |¹⁸ estar sobre o
fogo apanel^{ah} kon ah aredom^{ah} [2r.] en estos tripes. e as vegadas
destap^{ah} |² a.boka daredom^{ah} e kuando vides ke nao |³ deit^{ah} fumo

nenyun tira a.panela ko.ah |⁴arodom^{ah} de sobre a.fogo e leiša estar
 |⁵ ah esperar ata otro dia. e despois |⁶ kebrantaras ah rodoma e
 25 aḡaras un |⁷ pao de oro fino e moy-o pekeno e pekeno |⁸ kuando
 kiseires labrar ko.ele e destenpera-o |⁹ ko aguah gomada e faze
 ko.ele tu ah |¹⁰ prol. e este oro dizen o oro musiko.
 |¹¹ **kapitulo segundo** do.ouro pera |¹² fazer o oro de |¹³ musiko
 kon.ke eskerbas. toma ḡubiter |¹⁴ e fuḡatibo e sal armeniko o enšofre
 30 |¹⁵ tanto de uo komo de otro e.fonde-lo-as |¹⁶ nuah kulyar de fero
 grande o ḡubiter e |¹⁷ deitaras ençima o fuḡatibo e meçe-lo-as [2v.]
 todo muy bein kon pao e deita-lo-as kento no |² almofaris sobre os
 pou do sal armeniko e do |³ ensofre e moe-lo-as ata tanto ke sega |⁴
 todo en pou sutil e tomar^as todo esto |⁵ esto e deita-lo-as en uah
 35 kulyar de fero |⁶ atal enke todo esto solta mente pos^{ah} |⁷ kabere mui
 bein e akenta-lo-as sobre brasas |⁸ ata ke fumeḡe mesendo senpre
 mui bein e despois |⁹ torna-lo-as ah moer otra veḡ e deita-lo-as |¹⁰ na
 kulyar e poe-l-as sobre as brasas |¹¹ ata ke fomeḡe e esto faras ata
 tres |¹² vezeḡ e desae mete-lo-as en un pano de linyo goso |¹³ e ata-
 40 lo-as mui bein kquanto poderes e poe-lo-as |¹⁴ en kal biḡa komo sair
 do.forno en uah |¹⁵ panel^{ah} sobre o.fogo ata ke saya o bafo e |¹⁶ poe-
 lo-as ante sobre brasas porke |¹⁷ seḡa ante kente e despois tira-o do
 pano [3r.] e deita-o en un pokaro de baro ke seḡ^{ah} feito |² e kozido e
 manera de rodom^{ah} e kobre-o e |³ bara-o mui bein kon baro de sobre
 45 akabeç^{ah} do |⁴ fokaro bein çarada e poen-o sobre uas |⁵ tripees. e
 da-ly^e fogo grande des a.manyaah |⁶ ata meo diah e ata ses oras do
 diah. |⁷ e si eskebralyar o baro pon-ly^e otro por |⁸ las
 eskebralyaduras e esto feito saka |⁹ tuha obra mas ante ales^{ah} esfriar
 |¹⁰ ata otro diah. e kuando kiseres eskrever |¹¹ ko.el toma goma
 50 aravika koma un ervanço |¹² e o otro sega komo lentilya e deita
 aguah |¹³ en uah vieira kont^{ah} posa avondar |¹⁴ agoma e kon ela
 destenpera o oro e eskerbe |¹⁵ e fik^aran as letras fartas do |¹⁶ oro.
kapitulo 3 do oro [3v.] pera poer o oro en libros o sobre folyas |² de
 ḡupiter ke e ḡamado *alfer* e pos^{ah} bruny^ar |³ toma o grude do çervo e
 55 deita-o en molyo |⁴ aguah e leiša-o estar evanto ata ke |⁵ se desaçe
 por si e kuando for been |⁶ desfeito proba-o en teu dedo e si for bein
 |⁷ likido e mole en esa aguah asi feit^{ah} |⁸ lanças okre e en k^aroço
 de pesego todo |⁹ modo e o karoço seḡa primero keimado porke |¹⁰
 faç^{ah} o oro mas resprandeçente e despois |¹¹ poen esta konfaçon do
 60 grude e do okre e do |¹² karoço keimado komo dito e eskrebe u
 kiseires |¹³ mas bafeg^{ah} primero o lugar onde puḡeres |¹⁴ esta
 konfaçon sobre dita e poen en çima |¹⁵ o oro de eskreber e despois ke

for enšuto |¹⁶ brune-o ko.o dente do ġābāri muy pasa mentre |¹⁷ e asi
 65 foras bein o oro. ite mas [4r.] p^era f^azer sesa para poer o oro toma o
 |² koyro de kongreo e mete-o akuzir ata ke |³ se desfaga per si e koa-
 o en esta |⁴ koadura e façe sesa dokre e do k^aruço |⁵ de pesego e
 poen o oro do esk^eber ençim^ah |⁶ en enest^ah ses^ah do peskado □
kapitulo |⁷ 4 do oro □ si kiseires poer |⁸ o oro kon dobre o
 70 kon.eskudo o kon |⁹ f^arolino kon anel de oro toma apedra |¹⁰ kristal
 e moya muyto e filya akra do |¹¹ obo been pretado e goma e tenpra
 koest^ah |¹² e faze masa e poen esta mas^ah |¹³ u kiseires e leša sekar e
 toma uah |¹⁴ dobra o.frolen o eskudo o anel komo dito |¹⁵ e e
 esfriga-o muto ençim^ah da mas^ah |¹⁶ e oke akel^ah mas^ah fikar luzente
 do |¹⁷ oro nunca se toly^ara. e despois pes^ah [4v.] a dobra e.nou
 75 aġaras menos dela nada □
 |² **kapitulo 5** de komo se faz nobre |³ azul. kuando kiseires |⁴ fazer
 azul ke semely^e de akre toma uah |⁵ p^anela grande e noġa e faze
 en.ela kuarto |⁶ furakos e poen e akeles furakos duas |⁷ vergas de
 fero e (ke) vinyao en manera de krus |⁸ e despois aġeras liminas
 80 destinaliṣ luna |⁹ ides folyas de prata estena ben delgadas |¹⁰ e untas
 kou mel e ponas ençim^ah das |¹¹ vergas do fero ental gis^ah ke nou
 aġege |¹² uah ah otra e despois deita dentro |¹³ na panela vinagre
 been forte atanto del |¹⁴ ke ġege ah as vergas e nou pase ariba |¹⁵ e
 depois atapa been a.panel^ah kon |¹⁶ brao forte e poras a.panel^ah en
 85 |¹⁷ estirko de best^ah kente ke seġa soterada [5r.] en ela ata a boka e
 muy bein kobert^ah ata |² vente e dos dias e akabo de estes 22 dias |³
 destapah apanel^ah e aġaras na boka azul |⁴ fino e arapa-o kon uah
 paleit^ah de palo o de |⁵ kan^ah. e despois torna as laminas ah |⁶
 a.panel^ah eh lešas (estar) os dias as komo de primeiro |⁷ fizeiste e per
 90 est^ah gis^ah faras bou |⁸ azul e podes fazer poko o muito asi komo |⁹
 uberes gisado.
kapitulo 6 do azul |¹⁰ para tenperar o azul |¹¹ toma agoma arabika
 luzente e fina en aguah |¹² en uah taç^ah e depois toma akela taç^ah |¹³
 en.ke estuber e koa-las kon o pano de linyo |¹⁴ e toma a.terça parte
 95 da.krara do oġo e |¹⁵ deita ko.el^ah no korno o na konġa □ ite |¹⁶
 deġes asaġer ke o azul debes renoġar en kada |¹⁷ un dia porke si
 estuber per longad^ah mente [5v.] akela aguah no azul tornase negro
 e esto |² faras dos o tres vezes no dia e tomaras |³ da goma arabika e
 da.krara do obo |⁴ e eščreveras ko.ela □ |⁵ kaġidar-t-as do azul
 100 luzidio. e o ke es |⁶ asi komo kardeo e bou. dazul te dou |⁷ para o
 konoġeres mete un pekeno dele na |⁸ linyo o no p^alma on^ah onya
 do |⁹ do dedo e si o sentires as komo a.de uso |¹⁰ mao e □

kapitulo 7 do azul |¹¹ pera temperar o |¹² azul toma azul dakre e moyo ben ko.ah |¹³ de koahda das vides leve mente o koly^e o |¹⁴ un uah veeyrah o kong^āh e lava-o |¹⁵ kon akel^{ah} de koad^{ah} das vides e moy-o otr^{ah} |¹⁶ veş leve mente kon uah pok^{ah} de rosa e eskreve |¹⁷ o ke kiseires o alumin^{ah} o pint^{ah} o |¹⁸ ret^{alyas} uah peken^{ah} de krara dobo kon goma e nao |¹⁹ fike de un diah [6r.] pera otro kon ela ke se tornara negro

|² **kapitulo 8** pera fazer ros^{ah} |³ toma uah onç^{ah} |⁴ de brasil fino e rapa-o meudo e pon-o |⁵ adepate e depois toma uah kuart^{ah} |⁶ onça de pedra ume e toma peso de dos |⁷ dineros de alvai alde e moy-o kon a.pedra ume |⁸ en un almofariş e pon-o aparte e toma |⁹ depois o brasil e deita-o en uah |¹⁰ taç^{ah} de maleg^{ah} e deit^{ah} os otros pous |¹¹ e kon o brasil e deita-ly^e e çima urin^{ah} |¹² ata ke se reskobrao e esten asi per 3 |¹³ dias akaḅados e toda viah meçendo-os |¹⁴ kon un pao k^ada diah 5 o 6 vezes. e depois |¹⁵ koa-o e apora-o por un pano de |¹⁶ linyo e çima de uah piah feit^{ah} de ġis o de pedra kri. e leşa-o bibir na [6v.] piah e kuando for enşuto rapa-o muy |² bein kon uah paleit^{ah}. e guarda-o bein do |³ ayre e kuando kiseires labrar ko.ele |⁴ moio kon aguah gomada □

kapitulo 9 |⁵ pera fazer otra ros^{ah} |⁶ toma do brasil oke uḅeres mester e |⁷ ahrapa o been meudo e deita-o en un^{ah} |⁸ olya pekena noḅa e deit^{ah} na olya de koad^{ah} |⁹ de vides ke seġ^{ah} o brasil dela koberto |¹⁰ poen-^{ah} ao fogo e da-ly^e uah |¹¹ fer vora atanto ke tome adekuada sustançiah |¹² do brasil e toma duas p^{ar}tes |¹³ de pedra ume e mais a.meiah parte de |¹⁴ pedra kri e moy^e kada un muyto por si e |¹⁵ depois mistura-o e moya de konson e faze |¹⁶ komo ġa sabes de pedra ume ros^{ah}.

|¹⁷ **kapitulo 10** para fazer mui noble [7r.] az^{arkon} □ toma alv^{ayalde} kuantu kişeres |² e moyo e peny^{era}-o e lança-o en uah |³ tiġela o tiġelas anġas o levas ao forno |⁴ do vidrio e leşa o e estar per vente e |⁵ dois dias e akaḅados estes dias tiraio do |⁶ forno e aġaras muy fermoso az^{arkao}. |⁷ desta ġis^{ah} faras kunato kiseires □

|⁸ **kapitulo 11** pera fazer azinyabre |⁹ mui fino toma folyas |¹⁰ de kobre mui delgadas e molyas en |¹¹ vinagre kente e mui forte e mete-o en |¹² unah olya akoçtad^{ah} e unt^{ah} abok^{ah} |¹³ da panel^{ah} kon mel e kobreah kon testo e |¹⁴ soterah son o estirko de bestas grandes |¹⁵ e estee ali trinta e un dias e akaḅados |¹⁶ os dias tiraras e olya e aġaras |¹⁷ azinyabre e rapa o kon uah paleit^{ah} e [7v.] si mais kişeres fazer torna afazer |² komo dito e aḅeres dou aziny^{abre}.

|³ **kapitulo 12** de otro anizyabre |⁴ tomaras un algidar |⁵ e mea-lo-as
 de urinas bein pudres e tomaras |⁶ un *baçio* de laton muy ben labado
 do fondo |⁷ de fora e poe-las en çim^ah do algidar ke |⁸ non ġegen as
 145 urinas ao fondo do *baçio* |⁹ kon dos dedos. e seġa o fondo do *baçio*
 |¹⁰ untado de bou mel e o *baçio* seġ^ah |¹¹ meado de dentro da keles
 meġados e ençima |¹² do *baçio* enbroka otro algidar. e |¹³ ençima do
 algidar poras enšalmos |¹⁴ e vertiras o vido do *baçio* eno algidar |¹⁵
 de fondo. e vee ao fondo do *baçio* e |¹⁶ aġaras o mel ke-ly^e puseste
 150 tornado en |¹⁷ azinabre e rapa-o ko uah p^aleit^ah. e [8r.] guarda-o en
 papel e mas verde kišeres |² fazer unta o fundo do *baçio* kon mel |³ e
 faze komo da primeira fiezste e asi |⁴ faras kuantu kiseires. e pera ah
 des tenpraçon |⁵ pera este verde kuando kišeres |⁶ labrar kou ele
 moyo ante mui bein e |⁷ deitaly^e e poko de aça^afrao bein modo |⁸ e
 155 destenpera-o kon aguah gomada ke nao |⁹ ah diablo ke-ly^e tolya preš
 a akolor.

|¹⁰ **kapitulo 13** para fazeres nobre |¹¹ karmen tomaras |¹² uah olya
 grande noba e ke kaybao |¹³ kuarto açumbres de aguah e engiah de
 |¹⁴ meġados do omen e mese os por dias |¹⁵ e faze-os been kraros e
 160 toda ora |¹⁶ ke lebantaren eskuma e depois ke foren |¹⁷ been kraros e
 eskumados toma uah [8v.] tiġela grande e poen sobre ela palya de
 çenteo |² e ençima da palya un pano de linyo e en |³ çima do pano
 deitaras zinça de vides as duas |⁴ partes e o terço de k^albiġa e poe de
 fundo |⁵ uah olya e deit^ah ençima da baril^ah as |⁶ urinas dekoadas
 165 ke koaste no asado e |⁷ vayo koando ata de se enġa apanela dest^ah |⁸
 de koadada per gis^ah ke kaibao e kuarto açumbres |⁹ e poen-a ah feber
 ke menguen ata |¹⁰ 2 dedos e ao fogo otra olya ġeah de urinas |¹¹
 kraras komo de kada e fervao anb^as |¹² e lançaras na panel^ah das
 urinas klarifikadas |¹³ komo de kada uah libra de laka e |¹⁴ daras
 170 fogo manso e toda viah meçendo-ah |¹⁵ kon un pao forkado poko e
 kuando for |¹⁶ a laka deretuda koa-o en un sako de linyo |¹⁷ e poe en
 fundo un *baçio* o ke fikar no [9r.] sako mete-o na olya da dekoada ke
 guardaste |² ao fogo ferbendo manso ata ke sega deretuda |³
 mesendo-ah kon un *fuste* e depois koa-o ah |⁴ parte kon akel sako
 175 koah frol. asi faras |⁵ karme de duas naturas e en pero prim^era |⁶
 mente deġes klarifikar as urinas

|⁷ **kapitulo 14** p^era otro karmen |⁸ toma uah olya daguah |⁹ linpa e
 teġa en gisa ke si posa en |¹⁰ el^ah dereter (desolber) uah libra de
 180 pedra ume e |¹¹ toma dest^ah aguah do aume un açumbre deit^ah |¹² o
 meo en uah olya e otro meo en otr^ah |¹³ olya e bolbe-o kon o pao e
 depois leša-o |¹⁴ krarifika e kuando for peisado vae |¹⁵ vertindo da

aguah ke sobre nadar e kuando |¹⁶ for apurado ke nao posas sakar
 aguah |¹⁷ mete-os en.senyos sakos de linyo e kolga-os [9v.] ke verta
 o sobre senyos testos ou |² tiğelas e o.ke se-koar si for tiraõ e torna o
 185 |³ ao sako e asi faras ata ke saya |⁴ kararo. e depois ke for kraro faras
 pelveri |⁵ nyos komo ervanços e poyn-os e sekar |⁶ a o.sol ke seğ^{ah}
 manso e si o sol for forte |⁷ poen uah saban en çima e deske foren |⁸
 sekos guarda-os e faze deles tuah prol.

|⁹ **kapitulo 15** para fazeres vermelyon toma çinko |¹⁰ libras de
 190 fuğatiño ides azoge e poyno |¹¹ en uah aredoma o tiğel^{ah} grande
 vidrada |¹² e toma uah libra de pedra enşofre bein |¹³ meudo e
 deita-ly^e do pou de enşofre poko e |¹⁴ poko sobre o arğen viño ata ke
 seğã bein enkorporado |¹⁵ e toda viah meçendo-o kon pie de |¹⁶ kao
 195 kon suah pele e sa la^{ah} ata ke se torne |¹⁶ a.fogo komo çinza [10r.] e
 depois ke asi for mortifikado deita-o en |² duas olyas noḃas ke seğan
 feitas komo |³ aredomas anğas de ġuso e estreitas ençima |⁴ e nao
 fike por ençerar de elas sinaõ |⁵ un furako pekeno por o saia o umor
 e poras |⁶ as olyas sobre o fogo en suas fornalyas e |⁷ baras bein kon
 o baro e poen uah tiğela |⁸ en çima dos forados e kuando o fumo
 200 veres ke sal |⁹ vermelyo e nao feder mete dentro no furako |¹⁰ un
 espeto delgado e si alguah kosa se apegar |¹¹ ao espeto tira as olyas
 deo fogo e |¹² leşã-o esfiar e depois ke for frio kebrant^{ah} |¹³ as
 panelas e ağara o bermelyou feito. e |¹⁴ per este peso faras kuinto
 vermelyon kiseires |¹⁵ fazer e auah terça do azoge poy 5 libras do |¹⁶
 205 enşofre e ah 5 libras da zoge uah libra |¹⁷ de enşofre e kileires ental
 gisa o fogo ke nao [10v.] se keme e da-lye fuego tenperado nin vivo
 |² nin manso. ite se per ventura sese |³ keimar o bermelao kebrant^{ah}
 as olyas e |⁴ moy-o e enkorpora-o e mistura-o kon otro |⁵ peso
 dazoge e de enşofre e poen-o en otras |⁶ olyas e faze komo dito e. e
 210 para been mentes |⁷ nos fumos komo saen asi e nunkao os eraras.

|⁸ **kapitulo 16** para por o oro en espada o kuytelo toma |⁹ as kabeçaç
 do karḃao de braço e mete-as |¹⁰ na forğã ata ke seğan been
 bermelyas e depois |¹¹ sakas e ponas en uah taboah e lançarãas |¹²
 215 sobre elas dos punyados de sal moido e moiras |¹³ todos en uo e
 depois lança-lye dos onças |¹⁴ da noşatar meia onça da zinyabre e |¹⁵
 amasa todo muy bein kon o forte vinagre. e faze |¹⁶ primeira mente
 alinpar a espada o o kuytelo [11r.] e komo si eskreḃeses poen desta
 çinrada |² u kiğeres fazer letras o figurar mais |³ primera mente
 220 seğ^{ah} untada kon *vegera* boli |⁴ e kon *azarkoanboli* e si for tenpe de
 inḃenro |⁵ este e a espad^{ah} o kuytelo 2 dias ke.nao |⁶ alinpes. e si for

verao este-e un dia |⁷ de pois lāba e guarda tuah arma ka ḡa |⁸
onrada fika.

225 **kapitulo 17** |⁹ para tinḡer os osos |¹⁰ e paos de kual kolor kiḡeres
toma o |¹¹ pao de būso o otro kual |¹² keir madero e koze-o en azeite
por tres |¹³ vezes e depois tira-o e deita-ly^e pous |¹⁴ dalkebrite
moido e lēsa-o estar |¹⁵ por 3 dias e depois alinpa-o e sera negro de
|¹⁶ fora e de dentro.

230 **kapitulo 18** p^era |¹⁷ tiḡer e fazer osos [11v.] *bermelyos* tomaras o
alakar kquanto ūberes |² meester e desfaze-o en mui forte |³ vinagre e
seḡ^ah kon quatro danōsatar |⁴ e depois koze os osos o o madeiro en
|⁵ est^ah fēçao ata ke se tornen vermelyos |⁶le ke se pages da.kolor ke
est^ah tinta pareça |⁷ vermelya de dentro e.de fora.

235 **kapitulo 19** |⁸ para fazer tinger o būso |⁹ o otro madeiro de kolor
preto e fermoso |¹⁰ ke semelye azeviḡe toma as limaduras do fero e
do kobre e do sal komun |¹¹ almartake e fezes de oro o kual aḡado
|¹² no azarnefe de kada uo uah onç^ah e lança |¹³ os en muy forte
vinagre por trinta dias |¹⁴ e de pois koze-o ata mengue a.metade |¹⁵
do vinagre e depois toma do azeḡe e destenpera |¹⁶ o en aguah ke
seḡ^ah un poko espeso e metan [12r.] o pao e os osos kon al por
240 muytas vezes |² sakando ao sol per kada veḡ e tu veras |³ ke se
tornara preto de dentro e de fora e es |⁴ ta tintura nunca se tirara do
pao o dos |⁵ osos.

245 **kapitulo 20** para f^azeres os |⁶ osos de o mangos kolor verde komo |⁷
de azinyabre □ toma o azinyabre e do anōsatar |⁸ 2 onçaç de kada
uah e moy-o kon o vinagre |⁹ bein for e des e deita en eles os osos o
|¹⁰ mangos de gisa ke seḡan kobertas dakel vinagre |¹¹ kon os pous e
leisa os ḡazer ata ke se faça |¹² verdes de tal kolor de ke te pages e
pera melyor |¹³ se koze-os en kadeira de kobre e si en.esta |¹⁴ tintura
meteres kual ker madeiro tornar-se-ah |¹⁵ verde e mui fermoso.

250 **kapitulo 21** dos |¹⁶ osos limados pera |¹⁷ fares āsedreç. kuando
kīseres fazer os osos [12v.] kon fogo o sin fogo e fazer de muytos ou
|² si o kiḡeres fazer toma osos de vaka ke |³ nao aḡao karne nenyuah
o osos de marfil |⁴ e lima-os bein kon uah lima ata ke seḡan |⁵
limados komo limaduras de fero o seraduras |⁶ de madeiro e deita
255 estas limaduras dos |⁷ osos en uah panela vidrada kon muy forte |⁸
vinagre e seḡa a.panel^ah been kōberta e |⁹ barada kon baro daredor
e depois dal |¹⁰ fadida peso de 5 onças e.de alyos pesados |¹¹ peso de
uah onça e ferban en quatro |¹² onças de vinagre vermelyo o en mais
e |¹³ kobre-os akeles osos kon este vinagre |¹⁴ bolbe-os ben kon estas
260 konfaçioes |¹⁵ e poyn-o sobre o fogo ata ke se fundao |¹⁶ e kuando

veres ke se fundey e koalyen |¹⁷ komo ġunbo e kišeres ke fiken
brankos tira [. . .]

[13r.] [kapitulo 24 . . .] panos o ħumo de katasol e dos rgaos |² e
depois ke tubereš deš e vente panos o un |³ ke seġ^{ah} grande ġeos de
265 ħumo tomaras un algidar |⁴ o testo ġeio de vidos d.omees e pon-lye
|⁵ en ħima dos bastoes atravesados que nao |⁶ ġegen ah o vido e
deita os panos en ħima |⁷ estendidos e esten ai por 9 dias o 12 |⁸
meçendo os vidos 4 o 5 o 6 vezes ao diah |⁹ e rebolvendo os panos de
uah parte aotr^{ah} |¹⁰ ata ke seġan korados non vidos e kuando os |¹¹
270 vidos foren mais pudres e mais fedegosos |¹² kuantu melyor kolor
farao. e depois ke |¹³ foren koradas do bafo dos vidos poyn-os ao |¹⁴
sol ata ke tomen kolor komo morado e os |¹⁵ panos enestas kolor e
been enšutos e |¹⁶ korados guarda-os been do ar do inberno |¹⁷
kuando ko.ele kišeres aluminar o labrar [13v.] toma un korno been
275 labado o uah vieyra |² e talya kon osos tesoyras un pekeno do |³
pano do k^atasol e deita-o na konġa o vieyra |⁴ o korno e deita-ly^e da
aguah gomad^{ah} e depois |⁵ keo pano for tomado ke seġ^{ah} ben
enbebido |⁶ dela meçe-o bein e logo labraras kon.el |⁷ ka.si ai esteber
mais de un diah logo e |⁸ botado e perde a kolor. e asi faras en kada
280 |⁹ un ano kuantu kiġeres fazer.

kapitulo |¹⁰ **25** kein kišer obrar |¹¹ kon oro o kon otras kores e komo
se |¹² deven afazer e ameçkrar por este inġenyo |¹³ o deven af^azer ke
e ġ^{ah} probado primera mente |¹⁴ kuando o oro kišeres poer toma
okre e o |¹⁵ alvayalde tanto de un komo de otro e un poko |¹⁶ de ġiš
285 e todas koisas aġunta-as en uo e |¹⁷ moyas todas muyto e muy bein
kon krara [14r.] dobo ke seġ^{ah} muy fraka e muy liġera e si for |²
muy forte deitaly^e daguah e moyo bein e si for |³ muy liġeira deitaly^e
da krara do obo e esto |⁴ proba^{ah} en un pergamino ena kele lugar u
|⁵ kišeres poer o oro por ante kon pinzel est^{ah} |⁶ kon façion e ante ke
290 se seke poen o oro en |⁷ ħima e des e brune-o mui bein kon dente de
porko |⁸ o de kaġalo □

kapitulo 26 pera tenperar |⁹ azul toma ah ġema do obo |¹⁰ en tal
maneira ke non ande ko.el^{ah} d.alġaġen nada |¹¹ depois moy^e ese azul
muy been en uah atalmiah |¹² e depois filya esa ġema do oġo e
295 meçkra-o |¹³ kon o azul. e moyo todo de konson muy been e deske
|¹⁴ for ben modo toma ese azul en uah fokara e lança-ly^e |¹⁵ da
aguah e mete mao e meçe-o kon teu dedo por |¹⁶ muytas vezes. e
deske veres esa aguah ençima do |¹⁷ azul pareçer e depois ke o
lešares de meçer enton [14v.] kata sol. e sia for muy puro e muy
300 linpo de toda |² maldade. e deske esto for feito detenpera |³ o kon

aguah gomada e en ton eskrebe kon ele |⁴ pero antes ke ly^e deites
aguah gomada seğa o |⁵ azul been enšuto da aguah e si kiğeres |⁶
podes deitar na dit^{ah} krara do brasil por-ly^e |⁷ dar melyor kolor.

305 **kapitulo 27** si kişeres |⁸ fazer boah ros^{ah} filya |⁹ do brasil kuantu
kişeres e rapa o muy ben |¹⁰ ençima de uah konğ^{ah} o korno e desae
|¹¹ ağunta kon el da pedra ume e deske esto |¹² fizeres filya da urina
do omen kasto e |¹³ deita tanta ençima dese brasil e da pedra |¹⁴
ume ata ke seğa tres kobertos e leša-os |¹⁵ asi estar por 3 dias e
depois filya un |¹⁶ pao de ġiş e deita do pou dele ençima dese |¹⁷
310 brasil ata ke se mely^e ke seğ^{ah} tanto doun [15r.] komo dotro e desae
leiša-o asi estar esa |² konfaçion por un diah e por dois e depois |³
toma esa rosa e moya kon krara dobo gomada |⁴ e eskrebe ko.el^{ah} □
si kiğeres fazer |⁵ fazer koor indiah |⁶ mete kon el do azul e si por
ventura kişeres |⁷ fazer *pinça* negra mete kon el do negro e si |⁸ por
315 ventura akor alva kişeres tornar en |⁹ negro ağunta kon el do negro e
do alvo e toma |¹⁰ do brasil e mete-o en un pano alvo e koa-o |¹¹
sobre ġiş. sabe ke deş sao as kores prinçipais |¹² azul. oripimento e
vermelyon. |¹³ verde. karmen. çufⁱy. katasol. açafrao. |¹⁴ az^arkon.
alvay^{alde}. brasil. □ kuando kişeres |¹⁵ kebrar la krara do obo eğa
320 aly^e |¹⁶ dela leğe dela figeira e kebralya as muito bein |¹⁷ para tu
obra klara komo aguah.

[15v.] **kapitulo 28** si kişeres fazer verde |² e destenpera-o deita do |³
vinagre kon do verde e da ġema do obo e moyo |⁴ todo de konson e
as tres partes seğ^{ah} do |⁵ verde e a kuart^{ah} da ġema e si o melyor
325 kişeres |⁶ fazer deta-ly^e da aguah gomada e destep^era-o |⁷ kon ela si
o kişeres tornar en otra kor |⁸ mete kon al do aç^afrao e si en otra kor
kiğeres |⁹ tornar mistura kon el do brankete e pareçera |¹⁰ en sonbra
verde e alvo.

330 **kapitulo 29** |¹¹ si kişeres destenprar azul |¹² deitaly^e daguah e moy-
o kon el^{ah} un poko e des |¹³ ke for bein seko daguah si o kişeres
tornar |¹⁴ en otra kolor ġunta kon el do branğete ides |¹⁵ leo kon
krara do obo e si o kişeres torner |¹⁶ ençeleştre ġunta koel 3 p^artes de
branğete |¹⁷ e ah uah do azul.

335 **kapitulo 30** si kişeres [16r.] bou karmen filya o k^armen aguah e da
ğema do obo |² kuantu ah metade e moy todo de konson e si kişeres
|³ ke semely^e kolor sanginya ağunta kon el ah |⁴ terça parte do azul
□

340 **kapitulo 31** |⁵ si kişeres destenperar |⁶ aç^afrao pera eskrever kon ele
deita-ly^e da krara |⁷ do obo e nao o moyas nin metas kon.el otra |⁸
kosa. e si kişeiress meter en otra kor |⁹ semelyabel ağunta kon el do

oripimento been |¹⁰ modo kon a.krara si kišeres matizar kon el |¹¹
do azul been moido kuantu aterça parte e nou |¹² mais □

345 **kapitulo 32** si kišeres destenperar |¹³ o oripi mento destenpera-o |¹⁴
kon aguah e kon ġema do obo e depois tira-o |¹⁵ dinde es^{ah} aguah e
oġra kon ele ka nao ker |¹⁶ otra natura □

kapitulo 33 si kišeres |¹⁷ destenperar o negro anil [16v.] fila da
aguah gomada o da ġema de obo e moy |² todo de konson e si kon.el
kišeres destenperar |³ e obrar ġunta kol el do branko ata ke |⁴
semely^e kor nuben □

350 **kapitulo 34** |⁵ filya o azul e destenpera-o kon aguah gomada e kon
ġema de |⁶ obo e deita sobre el para matiza-ly-o k^armen |⁷ o do
brasil.

kapitulo 35 si kišeres |⁸ kolorar kon azul branko |⁹ matiz^{ah} kon azul
puro. e si kišeres kolorar |¹⁰ kon karmen matiz^{ah} kon k^armen o kon
355 brasil o |¹¹ kon ħermelyon. e si kišeres kolorar indio |¹² alvo matiz^{ah}
en al kon verde puro. e si |¹³ kišeres kolor^rar kon az^arkon matiza
sobre el |¹⁴ karmen o brasil o vermelyo e si kišeres kolorar |¹⁵ kon
ħermelyon matiz^{ah} kon brazil o kon k^armen |¹⁶ pero as kores tod^as se
poden matizar kon negro □

360 [17r.] **kapitulo 36** filya açafrao e agoma e |² krara de obo
destenperad^{ah} kon |³ todas estas kousas e poen todo esto en |⁴ akel
lugar o letra ke kišeres fabrikar e depois |⁵ toma a folya do oro muy
sutil mente e a.sabor |⁶ en uah kasa sin vento e sin ġente per amor ke
non |⁷ fale a.nenyuo e un çendal o pano na boka e nos |⁸ narizes ke
365 non bafeġe ao oro ke-ly^e foġa atade na |⁹ kabeça. e ponya-o ençima
das ditas kous^as |¹⁰ e leše-o e estar per uah or^{ah} do diah e depois |¹¹
filya un poko dal godao e pono sobre esta |¹² folya pasa mente e oke
uġer de fikar pera |¹³ letra leiša-o estar e o al tolya-o. e deske fizeres
|¹⁴ esto mete mao ao bruny^a dor e brunya-o muy |¹⁵ bein kon un
dente de porko □

370 **kapitulo 37** os meçkramentos |¹⁶ das koores atais |¹⁷ ker kišer fazer
kor komo dazul o de k^armen toma [17v.] a.metade de azul e a
metade de k^armen e a terça |² parte de branko e si kišeres mais
vermelyo |³ mete mais do k^armen e si kišeres mais branko |⁴ mete
375 mais do branko. e kuando kišeres perfilar |⁵ o aluminar toma azul e
o k^armen a metade de |⁶ kada uo. e meçkra todo kon da aguah
gomada |⁷ e kon da krara e podes perfilar e aluminar |⁸ e mete e
mais do destenperamento ke seġa been |⁹ kraro.

380 **kapitulo 38** si kišeres por |¹⁰ o oro en lⁱbro toma d.aguah |¹¹ das
k^artas koġa ke seġ^ah de boah gisa forte |¹² e pono kon pinzel uah veš

o duas en akel |¹³ lugar u kišeres poer o oro e depois moy |¹⁴ o ġis
kon aguah koġ^ah forte mente e mete i un |¹⁵ poko d.açafrarao e pon-
o en akel lugar u kišeres |¹⁶ poer o oro per tres vezes. e deske for |¹⁷
seko mete kuantu kišeres e poen o oro [18r.] kon aguah gomada
385 friah e depois brune-o forte |² mente kon dente de porko □
kapitulo 39 si kišeres |³ been bruny^ar e oro o argen |⁴ aprime-o been
o brunyador e depois aḅre ah bok^ah |⁵ e bafeg^ah sobre o oro
eskentado kon mano linpa |⁶ e seġ^ah o bruny^ador kente e kobra o oro
kon pano |⁷ de linyo velyo e depois brunya-o otra veṣ perçima |⁸ do
390 pano eskentado o bruny^ador otra veṣ sobre o |⁹ trapo e bafeġando
aberta ah bok^ah □
kapitulo |¹⁰ **40** si kišeres fazer kol^ah toma dos p^ergaminos |¹¹ e laṽ^a-
os mui been e depois mete-os en uah |¹² olya noḅa e velya e faze-os e
muito feber |¹³ ata ke seġ^ah been koġos e deske for sumida ah |¹⁴
395 primeira aguah mete dentro otra aguah e deske |¹⁵ kiġeres probar
toma dela uah pok^ah e pon-a |¹⁶ ena p^alma e aġunta uah mao kon
otr^ah e si |¹⁷ prenderen as maos ten ke e muy bein feit^ah ah t^ah kol^ah
[18v.] **kapitulo 41** si kiseires fazer okre |² toma do bermelyo
destenperando |³ kuantu kišeres e mezkra-o kon ġalde |⁴ ke seġ^ah
400 bou e si veres ke e muito kolorado mete |⁵ poko de negro e sera bou
e si for muito kolorado |⁶ en negro mete un poko na primeira veṣ e
|⁷ de pois mete mais tanto do al□
kapitulo 42 si |⁸ kiseires fazer braniṣ filya |⁹ uah libra de garas^ah de
nobra o duas o kuantu |¹⁰ kišeres fazer e poen uah libra de gras^ah |¹¹
405 e dos d.olio de linyaça e mete-ah kada uo |¹² dele en.suah olya e as
olyas segan noḅas |¹³ e koze kada un de granṽagar e guarden-se ke
|¹⁴ non kai^ah en elyas aguah nin otra kois^ah |¹⁵ e dales fogo a sabor.
e kuando entenderes |¹⁶ ke sera a gras^ah koġ^ah toma un fuste linpo
|¹⁷ e meçe kon akel fuste a gras^ah e akelo ke se [19r.] apegare ao
410 fuste [kol] dayo kon o kutelo e deita-o |² dentro en^ah olya e proba-h
senpre ata ke se |³ nao pege e toda viah meçe-ah kon ese fuste |⁴ e
deske veres ke e rara ke nao pega en nin |⁵ uah de ayⁱ toma uah
penah de galinya e mete |⁶ ah na olya do olio e si veres ke se enġe ah
|⁷ pen^ah enteende ke e kozido e toly^e-o do fogo e |⁸ deita-o sobre a
415 gras^ah e tod^ah viah meçendo-o |⁹ e kuando for ralo e fermoso enton e
feito e |¹⁰ si dakel barniṣ kiseires fazer kolor de oro ah |¹¹ part^ah ah
meitade o kuantu kišeres fazer |¹² e koao do ke fikar en fundo da
olya e des e |¹³ toma uah onça d.aloes o duas o kuantu |¹⁴ kišeres
fazer e moyo been en un morteiro |¹⁵ e toma dos pous dos aloes e
420 deita os no |¹⁶ verniṣ e estando a olya sobre o fogo e ferḅa |¹⁷ e

- depois toma uah pekena de folya e pon-^ah [19v.] sobre uah t^aboah e
 poe dakela doiradura |² sobre a folya do estanyo ou de parat^ah |³ e
 si bides ke e boah tir^a-ah de sobre o fo e si |⁴ nao deitaly^e mais dos
 pous ata ke seḡ^ah been |⁵ doirada toly^a-ah de sobre o fogo e koly^e-o e
 425 asi |⁶ fikara bou.
- kapitulo 43** toma dos |⁷ farelos grosos e poyn-os |⁸ e remolyo en
 uah konka vidriad^ah e depois |⁹ ke foren remoly^ados e koados por
 un pano dobrado |¹⁰ linpo e kon akel^ah aguah poeras onde sabes |¹¹
 e oro ençima e brune-o a sabor kon dente de |¹² porko □
- 430 **kapitulo 44** si kišeres fazer |¹³ boah roseta toma o |¹⁴ brasil e mole-o
 no almofariş ke seḡa been moido |¹⁵ peny^erao e toma uah pok^ah de
 kal virḡen e |¹⁶ pona nuah altamiah kon aguah ates ke se faça |¹⁷ a
 aguah krar^ah e kon akel^ah aguah moy o brasil [20r.] e lançaly^e un
 pekeno de pedra ume e destenpera |² kon goma e eskreḡe kon el □
- 435 **kapitulo 45** |³ si kišeres fazer bou verde |⁴ toma o lirio azul verde e
 toma aguah dalunbre |⁵ e molya os panos no alumbre e depois no
 çumo |⁶ de lirio e faze komo ao kat^ah sol nos vidos □ abr^ah^am b^ar
 y^ehud^ah ç''t ab^en ḡ^ayⁱm

4. TRANSLATION

Here begins the book on how to make colors of all shades for illuminating books. And let us talk first about gold (*sol*). If you wish to make gold with which you can illuminate or paint or capitalize or write, as this book states and directs you forward, do not omit nor add anything more than what your book states, for if you do so you will do everything wrong, and you will not profit no matter what you do. And for this reason do not do proceed in any way other than what the book tells you and directs you to do. First of all take ten ounces of *Jupiter*, that is, tin, clear and [1v.] pure, and take five ounces of *fugitive*, that is, quicksilver, and first melt the *Jupiter* and place the *fugitive* into a mortar. And the melted tin, place it in the mortar with the quicksilver. And mix with it five ounces of sulphur and 2 ounces of sal ammoniac, that is, *anoštar*, and let this be well ground and sifted, and that which cannot be sifted, grind it again until it is all sifted, and then put it all together in a well-cleaned basin and then place it in a glass bottle. And cover it with pitch and good strong clay four or five times so that it can withstand the fire, and then put it in a pot full of ashes from the hearth and give it moderate heat until you see the fire becoming red, and then cover the mouth of the bottle with some clay and let [the pan] stand over the fire together with the bottle [2r.] on a tripod. And

from time to time uncover the mouth of the bottle, and when you see that it gives forth no smoke remove the pot along with the bottle from the fire and let [it] stand waiting one more day. And then break the bottle and take out an ingot of fine gold, and grind it very fine when you want to work with it, and temper it with gum-water, and do with it as you wish. And this gold is called *aurum musicum* [bisulphide of tin (Blondheim 1929: 120)].

Chapter 2. On gold. To make *aurum musicum* with which to write, take *Jupiter* and *quicksilver* and *sal ammoniac* and sulphur, as much of one as the other, and melt them in a large iron spoon the *Jupiter* and pour [it] over the *quicksilver* and mix them [2v.] all well with a [wooden] stick and pour it hot into the mortar [and] over the *sal ammoniac* powder and sulphur, and grind it until it is all a fine powder, and take all this and place it in an iron spoon in such a way that all of it fits well and smoothly, and heat it over embers until it smoke appears, always mixing well. And then grind it again, and put it in the spoon and place it over the embers until it smokes. And do this three times. Then place it in a piece of coarse linen and tie it up as tightly as you can, and place it over the fire in a pot containing quicklime, which has just come out of the furnace, until it gives off steam. And place it first over the embers so that it may already be hot. And then take it from the cloth [3r.] and place it in a clay pitcher that has been made and baked like a bottle, and cover it and encase the lid with clay to seal it well. Place it on a tripod and heat it vigorously from morning until midday, that is until the sixth hour. And if the clay breaks off, replace the broken fragments. With this done, remove your work, but first let it cool until the next day. And when you want to write with it, take *gum arabic*, the size of a chick pea and another the size a lentil, and pour water into a shell, enough to submerge the gum arabic, and with this temper the gold, and write. And the letter will remain fully gilded.

Chapter 3. On gold. [3v.] To put gold in books or upon leaves of *Jupiter*, which is called *alfer*, so that you may burnish it, take stag's glue, and pour it into water and let it stand in the wind until it dissolves on its own. And when it is fully dissolved, test it on your finger; if it is very liquid and soft in the water thus prepared, pour ochre and a completely-ground peachstone over it. The peachstone should first be burnt, in order for the gold to be more resplendent. And then place this concoction of glue and ochre and burnt peachstone as described, and write where you wish, but first breathe on the place where you apply the concoction described above. And place over it the gold for writing, and once it is dry burnish it very gently with a peccary tooth, and thus you will work well [with] the gold. Likewise, [4r.] in order to make

size for applying gold, take the skin of a conger-eel, and set it to boil until it dissolves on its own, and strain it in a strainer, and make size of ochre and peachstone. And place the gold for writing on this size made of fish.

Chapter 4. On gold. If you wish to apply the gold with a *dobre* or a crown or a florin or with a gold ring, take rock-crystal and grind it well and take an egg-white, well fried, and gum, and temper [it] with this, and make a mass. And place this mass where you wish and let it dry, and take a *dobra* or a florin or a crown or a ring as mentioned, and rub it well against the mass. And whatever part of the mass becomes brilliant will not come off. And then weigh [4v.] the *dobra* and you will not find there to be any less of it.

Chapter 5. On how to make fine blue. When you want to make blue that resembles *Acre* [ultramarine], take a large new pot, make four holes in it, and place two iron rods in these holes, in the form of a cross. And then take leaves of sterling *Luna*, that is, very thin leaves of sterling silver, and smear them with honey, and place them on the iron rods in such a way that they do not touch each other. And then pour into the pot strong vinegar, enough to reach the iron rods and not higher. And then seal the pot well with strong clay, and place the pot in hot animal manure, such that it be buried [5r.] in it up to its mouth, and be well covered for twenty-two days. And at the end of these 22 days, unseal the pot and you will find in its mouth some fine blue, and scrape it with a wooden or reed spatula. And then return the leaves to the pot and let it stand as many days as you did before, and in this way you will make good blue, and you can make as little or as much as you need.

Chapter 6. On blue. In order to temper blue, take gum arabic that is brilliant and finely divided in water in a cup. And then take this cup where it stands and strain it through a linen cloth. And take a third of an egg-white and put it, with the gum arabic, in a retort or bowl. On that note, you should know that the blue must be renewed each day, for if the that water sits for too long a time [5v.] in the blue it will turn black; so do this two or three times a day. And take from the gum arabic and egg-white and write with it. Beware of shiny blue; that which resembles dark violet is good. For blue I give you [this sign] to recognize it: place a little of it on your tongue or palm or fingernail, and if you smell it as it usually does, it is bad.

Chapter 7. On blue. In order to temper blue, take ultramarine and grind it well with lye made out of vine branches lightly. Collect in a shell or bowl and wash it with the lye made out of vine branches, and grind it again lightly with

a little rose [color]. And write whatever you wish, or illuminate, or paint, or temper it with a little bit of egg-white with gum. And do not let it sit from one day [6r.] to the next, for that it would turn black.

Chapter 8. In order to make rose, take one ounce of fine brazil-wood, and scrape it very fine, and set it aside. And then take a quarter ounce of alum and take two pennyweights of white lead and grind it with the alum in a mortar and set it aside. And then take the brazil-wood and place it in a cup [made] of *malega*, and put in the other powders with the brazil-wood, and pour urine over them until they are covered. And let them stand thus three whole days, always stirring them with a stick 5 or 6 times each day. And then pass it and strain it through a linen cloth above a trough made of gypsum or chalk-stone. And let it soak in the [6v.] trough, and when it is dry, scrape it very well with a spatula, and keep it carefully from the air. And when you want to work with it grind it with hum water.

Chapter 9. In order to make another rose color, take brazil wood, as much as you need, and scrape it very fine and place it in a small new pot. And place in the pot lye of vine branches, so that the brazil wood is covered with it. Put it on the fire and heat it enough for the lye to take up the substance of the brazil wood. And take two part alum and at least a half a part of chalk and grind each one well by itself. And then mix it and grind it together, and make, as you already know, rose out of alum.

Chapter 10. In order to make very fine [7r.] red lead, take white lead, as much as you wish, and grind it and sift it, and toss it in a broad bowl or bowls. And take it to a glazed furnace, and leave it stand for twenty-two days. And after these days take it out of the furnace, and you will find very good red lead. In this way you will make as much as you wish

Chapter 11. In order to make very fine verdigris, take very thin leaves of copper foil and moisten them in very hot and strong vinegar. And put them in a pot leaning on its side, and smear the mouth of the pot with honey and cover it with potsherds, and bury it under the manure of large animals, and let it stand there for thirty-one days. And after these days take the pot out and you will find verdigris, and scrape it with a spatula. And [7v.] if you want to make more, repeat as directed, and you will have good verdigris.

Chapter 12. On another kind of verdigris. Take a bowl and half-fill it with well-putrid urine, and take a brass basin, very well washed from bottom to top, and place it above the bowl so that the urine does not come within two

fingers' distance of the bottom of the basin. And the bottom of the basin should be smeared with good honey, the basin should be half-filled with that same urine, And above it place another bowl upside down, and above the bowl place coverings for pack mules, and pour the urine from the basin into the bowl underneath. And look at the bottom of the basin and you will find the honey that you placed there has become verdigris. And scrape it with a spatula and [8r.] keep it in paper. And if you wish to make more green, smear the bottom of the basin with honey and do as you did before, and this way you will make as much as you wish. And for tempering this green, when you want to work with it, grind it very well beforehand and place in it a little bit of well-ground saffron, and temper it with gum-water, so that the devil will not then remove the color.

Chapter 13. In order to make fine carmine, take a large new pot that holds four *açumbres* of water, and fill it with human urine. And mix it for days, and make it very clear all the while so that it gives off foam. And once it is very clear and skimmed, take a [8v.] large bowl and place rye-straw over it, and above the straw a linen cloth. And on the cloth place ashes of vine branches, two parts, and a third part quicklime, and place a pot underneath. And throw on the lye the strained urine that you strained through fried meat and continue straining it until the pot is full of this strained lye, in such a way that there are four *açumbres* of it there. And place it on the fire until only two fingers of it are left, and on the fire put another pot full of clear urine with the strained lye and heat both. And into the pot of clarified urine with the strained lye toss one pound of lac, and heat it gently, all the while stirring it with a slightly forked stick. And when the lac is melted, strain it with a linen bag, and place a basin underneath; whatever remains in the [9r.] bag, place it in the pot of strained lye, which you have kept on the fire with gentle heat, until it is melted, stirring with a piece of wood. And then strain it separately with the bag containing the powder. Thus you can make carmine of two kinds, though first you must clarify the urine.

Chapter 14. For another kind of carmine, take a pot of clean and tepid water in such a way that you can dissolve a pound of alum, and take one *açumbre* of this alum water. Pour half of it into a pot and the other half into another pot, and stir it with a stick. And then let it clarify, and when it has settled continue pouring off the water that is floating. And when it is so clear that you cannot remove any more water, place **them** in separate linen bags and hang them up [9v.] so that they drip over separate pots or bowls. And that which is strained, if any, remove it and return it to the bag, and do so until it comes out clear. And once it is clear, make small particles like chick peas and place them

to dry in the sun, which should be gentle, and if the sun is strong place a sheet on top of them. And once they are dry, keep them as do with them what you will.

Chapter 15. To make vermilion, take five pounds of quicksilver, that is mercury, and place it in a bottle or large glazed bowl, and take a pound of very fine virgin sulphur. And pour the powdered sulphur over the quicksilver little by little until it is well incorporated, always stirring it with a dog's foot that has its hair and wool, until the fire turns to ashes. [10r.] And once the fire has thus died down, place it in two new pots that are made like bottles, broad below and narrow above. And seal them, leaving only a small hole through which the vapor will escape. And place the pots on the fire on their holders and cover them well with clay, and place a bowl over the holes. And when you see the smoke coming out red and not malodorous, place a thin spit in it. And if anything sticks to the spit, remove the pots from the fire and let it cool. And once it is cool break the pots and you will find the vermilion made. With these measures you will make as much vermilion as you wish: for a *terça* of mercury take five pounds of sulphur, and for five pounds of mercury take one pound of sulphur. And regulate the first in such a way that it does not [10v.] burn, and keep the fire moderate, neither quick nor slow. On this note, if by chance the vermilion burns, break the pots and grind it and incorporate it and mix it with another measure of mercury and sulphur, and place them in other pots and proceed as described. And pay attention to the vapours that escape, thus you will never ruin anything.

Chapter 16. In order to place gold on a sword or a knife, take the ends of carbonized ashes and place them in the forge until they are very red. And then remove them and place them on a board, and pour two handfuls of ground salt over them, and grind it all together. And then add two ounces of sal ammoniac [and] a half-ounce of verdigris, and knead it all very well with strong vinegar. And first have the sword or knife cleaned. [11r.] And, as if you were writing, place some of these ashes where you wish to make letters or designs. But first have it smeared with *vegera boli* and with *azarcoanboli*. And if it is winter time, let the sword or knife stand two days without cleaning. And if it is summer, let it stand one day, then wash and keep your weapon, for it is already adorned.

Chapter 17. In order to dye bones and sticks whatever color you wish, take a piece of box-wood or any other kind of wood, and boil it in olive oil three times. And then remove it and pour powder from ground sulphur over it, and let it stand for three days. And then clean it and it will be black outside and in.

Chapter 18. In order to color bones [11v.] red, take lac, as much as you need, and dissolve it in very strong vinegar, together with a quart of sal ammoniac. And then boil the bones or the wood in this mixture until they turn red and the color sticks, for this dye appears red inside and out.

Chapter 19. In order to color box-wood or another wood a beautiful black that resembles jet, take iron filings and copper filings and plain salt and litharge [of silver] and litharge of gold, which is found in arsenic, an ounce of each one, and place them in very strong vinegar for thirty days. And then boil them until half the vinegar is gone, and then take vitriol and temper it in water until it is a little thick. And put [12r.] the wood and the bones in it many times, taking it out into the sun each time. And you will see that it will become black inside and out, and this color will never disappear from the wood or the bones.

Chapter 20. In order to make bones or handles a green color like that of verdigris, take verdigris and sal ammoniac, two ounces of each, and grind them in very strong vinegar. And place in this the bones or handles in such a way that they are covered by the vinegar and the powders. And leave them to settle until they become a green that pleases you. And for better results boil them in a copper kettle, and if in this dye you place any kind of wood it will turn a very beautiful green.

Chapter 21. On filed bones to make chess pieces. When you want to make bones [12v.] with fire or without fire, and to make many, if you wish to do so, take cow bones on which there is no meat at all, or ivory bones, and file them well with a file until they are filed like iron filings or sawdust. And place these filings in a glazed pot with very strong vinegar, and be sure the pot is well covered and encased with clay around the outside. And then take five ounces of cuprous oxide and weighted garlic in the amount of one ounce, and heat them in four ounces or more of red vinegar. And cover those bones with this vinegar, and stir them well with this concoction. And put it on the fire until they melt, and when you see that they are melting and coagulate like lead, and you want them to remain white, take [. . .]

[13r.] [Chapter 24 . . .] rags, sunflower juices, and grains. And once you have ten or twenty rags, or one that is large, full of juice, take a bowl or ceramic pot full of human urine and place it on top of two crossed staves, which should not touch the urine. And place the rags stretched out on top, and let them stand there for nine or twelve days, stirring the urine four or five or six times a

day, and turning the rags from one side to the other until they are colored not of urine. And the more putrid and fetid the urine is, the better the color it will make. And once they are colored with the vapor of the urine, place them in the sun until they take on the color of mulberry. When the rags are well colored and dried, keep them well away from winter air. When you want to illuminate or work with them, [13v.] take a well-washed retort or a shell and with scissors cut a bit of the sunflower rag, and place it in a conch or shell or retort and pour gum-water on it. And once the rag is well soaked with it, stir it well and you can work with it immediately; for if it stood there more than one day, it would immediately spoil and lose its color. And thus each year you can make as much as you wish.

Chapter 25. Whoever wishes to work with gold or other colors, and how they should be made and mixed, it should be done this way, which is already well tested. First, when you wish to apply gold, take ochre and white lead, as much of one as of the other, and a little chalk, and mix all these things together and grind them thoroughly and very well with egg-white [14r.] that is very thin and light. And if it very stiff, add water to it and grind it well, and if it is very light and egg-white to it. And test this on a piece of parchment. On the place where you wish to apply the gold, apply this concoction with a brush, and before it dries place the gold upon it. And then burnish it very well with a swine's or horse's tooth.

Chapter 26. In order to temper blue, take egg-yolk in such a way that no albumen goes with it. Then grind this blue very well in a ceramic bowl, and take this egg-yolk and mix it with the blue. And grind it all together very well, and once it is well ground, place this blue in a pitcher and add water to it, and place your hand and mix it with your finger many times. And as soon as you see this water appear above the blue, and once you have stopped mixing it, then [. . . 14v. . .] sunflower. And it should be very pure, and very clean, free from all impurities. And as soon as this is done, temper it with gum-water and then write with it. But before you add water, be sure that the water has well dried from the blue. And if you wish you can add egg-white [or] brazil-wood to give it a better color.

Chapter 27. If you wish to make good rose-color, take brazil-wood, as much as you want, and scrape it well over a conch or retort, then add alum to it. And once you have done this, take the urine of a chaste man and add pour it over the brazil-wood and the alum until they are well-covered, and let them stand thus for three days. And then take a piece of chalk and throw some of its powder over this brazil-wood until it seems that there is as much of one

[15r.] as of the other. And then let this concoction stand for a day or two. And then take this rose-color and grind it with gummed egg-white, and write with it. If you wish to make indigo, put blue in it, and if perhaps you wish to make a black **color**, put black in it. And if perhaps you wish to turn white color black, add black to it and white and take brazil-wood and place it in a white cloth and strain it over chalk. Know that the principal colors are ten: blue, oripiment, and vermilion, green, Sufi carmine, sunflower, saffron, red lead, white lead, brazil-wood. When you want to thin egg-white add the sap of a fig tree to it, and thin it very well, clear as water, for you work.

[15v.] Chapter 28. If you wish to make green and to temper it, add vinegar and green and egg-yolk and grind it all together. There should be three parts green and a fourth part yolk. And if you wish to make better color, add gum-water to it and temper it with that. And if you wish to turn it another color, add saffron to it, and if you wish to turn it another color, mix ceruse into it, and it will appear green and white in the shade.

Chapter 29. If you wish to temper blue, add water and grind it with it a little, and once the water has dried off, if you wish to turn it another color, add ceruse, that is **Leo**, and egg-white. And if you wish to turn it sky-blue, add three parts ceruse to one part blue.

Chapter 30. If you want **[16r.]** good carmine, take carmine, water, and half as much egg-yolk, and grind it all together. And you want the color to resemble blood, add to it a third part of blue.

Chapter 31. If you wish to temper saffron in order to write with it, add egg-white and do not grind it nor mix anything else with it. And if you wish to put it in another similar color, add oripiment, well ground with egg-white. If you wish to shade with it, add well-ground blue, as much as a third part and no more.

Chapter 32. If you wish to temper oripiment, temper it with water and with egg-white. And then remove this water from it and work with it, for it needs no other preparation.

Chapter 33. If you wish to temper black indigo, **[16v.]** take gum-water and egg-yolk and grind it all together. And if you wish to temper or work [with it], add white to it until it resembles the color of clouds.

Chapter 34. Take blue and temper it with gum-water and with egg-yolk, and pour carmine or brazil-wood over it to shade it.

Chapter 35. If you wish to color with light blue, shade it with pure blue. If you wish to color with carmine, shade it with carmine or with brazil-wood or with vermilion. And if you wish to color with light indigo, shade it with pure green. And if you wish to color with red lead, shade it with carmine or brazil-wood or red. And if you wish to color with vermilion, shade it with brazil-wood or carmine. But all colors can be shaded with black.

[17r.] **Chapter 36.** Take saffron and gum and egg-white tempered with all these things, and place it all in the spot or letter that you wish to make. And take the leaf of gold and very neatly and carefully, in a house without wind and without people, so that you do not speak, and a bandage or a rag over the mouth and nostrils, so that you do not breathe on the gold, which is tied around the head. And place it over the above-mentioned items and let it stand for one hour in the daytime. And then take a little cotton and place it gently over this leaf, and whatever must remain for the letter, let it stand, and remove the rest. And once you have done this, get hold of the burnishing iron and burnish it very well with a swine's tooth.

Chapter 37. The mixtures of colors as follows. Whoever wishes to makes a color like blue or carmine, take [17v.] a half blue and a half carmine, and third part white. And if you want it redder, put more carmine, and if you want it whiter, put more white. And when you want to pain or illuminate, take blue and carmine, a half each, and mix it all with gum-water and egg-white, and you can paint or illuminate. And put more temper in it for it to be very light.

Chapter 38. If you wish to apply gold to a book, take boiled parchment water, which is good and strong and apply it with a brush once or twice in the place where you wish to apply it. And then grind chalk in vigorously boiling water and put in it a little saffron and apply it three times where you want to apply the gold. And once it is dry apply as much as you wish, and apply the gold [18r.] with cold gum-water. And then burnish it vigorously with a swine's tooth.

Chapter 39. If you wish to properly burnish gold or silver, polish the burnishing iron well and then open your mouth and breathe upon the gold warmed with a clean hand. Be sure the burnishing iron is hot. And cover the gold with an old linen cloth, and then burnish it another time over the cloth,

heating the burnishing iron once again, over the cloth, and breathing with an open mouth.

Chapter 40. If you wish to make glue, take two pieces of parchment and wash them very well, and then place them in a new [old] pot, and heat them vigorously until they are well boiled. And once the first water has disappeared, add more water into it, and as soon as you wish to try [it], take a little of it and place it in your palm. And place one hand with the other, and if your hands grip, it must be that your glue is well made.

[18v.] **Chapter 41.** If you wish to make ochre, take red, tempering [it] as much as you please, and mix it with yellow that is good. And if you see that it is very colored put a little black, and it will be good, and if it becomes too black-colored put a little at first and then put more, as much as the other.

Chapter 42. If you wish to make varnish, take a pound of *nobra* grease (or two pounds, or as much as you wish to make), and take a pound of grease and two of linseed oil and place each one in its own pot. The pots should be new. And cook each one vigorously and be sure than neither water nor anything else fall into them, and heat them at your discretion. And when you think that the grease is cooked take a clean piece of wood and stir the grease with it. And whatever [19r.] sticks to the wood, scrape it off with a knife and put it into the pot, and continue to test it until it does not stick. And always stir it with that piece of wood, and once you see that it is thin and does not stick to any there, take a hen's feather and put it in the pot of oil. And if you see that the feather is swelling, assume that it is cooked, and take it from the fire. And pour it over the grease, always mixing it. And when it is thin and fine, then it is done. And if you want to make gold color from that varnish, separate half or as much as you want to make, and strain it from what remains at the bottom of the pot. And then take an ounce or two of aloe, or as much as you wish to make, grind it well in a mortar. And take the powdered aloe and place it in the varnish, and with the pot on the fire, let it boil. And then take a little foil and place it [19v.] on a board, and apply some of this gilding to the tin or silver foil. And if you see that it is good, remove it from the fire, and if not, place more powdered [aloe] until it is well gilded. Remove it from the fire and gather it up, and thus it will remain good.

Chapter 43. Take two large pieces of bran and place them to soak in a glazed shell, and as soon as they are soaked, strain [them] through a clean folded cloth. And with this water apply it where you wish, and gold over it. And burnish it to taste with a swine's tooth.

Chapter 44. If you wish to make good rose-color, take brazil-wood and grind it in a mortar, until it is well ground. Sift it, and take a little virgin lime and place it in a glazed earthenware bowl with water until the water becomes clear, and with this water grind the brazil-wood, [20r.] and put in it a little alum, temper it with gum, and write with it.

Chapter 45. If you wish to make good green, take a blue-green lily and take alum water, and wet the rags in the alum and then in the juice of the lily and do as you did with the sunflower [juice] and urine.

5. COMMENTARY

f. 1r.

1 שיקומיינסא

se.komeinça

'begins'. ModPg. *começar* < CUM+INITIĀRE. This is one of the numerous instances in which נ *n* appears where the modern orthography has <m> or Ø (e.g. לינפיו *linpio* 'clean', טינפראדו *tenprado* 'tempered'). Indeed there is only a single instance of a nasalizing context spelled with מ *m* (see note line 436). Blondheim also uncritically interprets the digraph יי *yy* as the Castilian-style diphthong <ie> in this and other forms in his transcription (e.g. בייאין *been* 'well'). It should be noted, however, that the orthography alone does not strictly preclude this reading, since י may stand for any non-low front vowel.

3 אורו שול

oro sol

Blondheim (1930: 119) states that *sol* 'sun' is the name given by medieval alchemists to gold. Other such glosses within the text include איסטאניו *estanyo* 'tin' and נוביטיר *gubiter* (line 9), אזוני *azoge* 'mercury' and פוניטיבו *fuḡitibo* (line 10) or ארגין ויבו *arḡen vibo* (line 192), and פראטא *prata* 'silver' and אישטינאליץ לונא *estinaliṣ luna* (line 80).

אלומינאר

aluminar

'illuminate'. ModPg. *alumiār* 'light (up), give off light' < *ALLŪMINĀRE has clearly shifted in meaning, with the sense here taken over by a more recent importation from Latin, ModPg. *iluminār* < ILLUMINĀRE. The form used here has been relatinized, with its etymological /n/ restored.

4 קבדוואר

kabidoar

'capitalize'. The more recent formation *capitular* < MedL. CAPITULARE evidently replaced this word. The form used here could reflect either a verb formed on the basis of *cabido* < CAPITULU, or perhaps a semi-latinizing spelling similar to *kolorar* (see note line 353).

קומו טיאישטי ליברו דישייר אי מנדאר אדיאנטי

komo te.este libro dišer e m^andar adiante

'as this book says and guides you forward'. The clitic pronoun *te* (object of *dišer e mandar*) appears at the head of the clause (see a similar phrase in line 6). It is tempting to construe the *a* that is affixed to *diante* 'forward' (< *denante* < DE INANTE) as a still-independent periphrastic future auxiliary on which both verbs depend, a phenomenon found elsewhere in the medieval language (Williams 1962: 207). Yet ModPg. *adiante* is attested early enough to here constitute the adverb on its own, and the װ *š* spelling of the stem-final consonant in *dizer* points to the form here as a future subjunctive (ModPg. *disser* < DĪXERIT) rather than a future indicative (ModPg. *dirá*, whose shortened stem probably originated in Vulgar Latin; Williams (1962: 222) does note that of the long infinitive was used with infixed pronouns, e.g. *dizer-me-ha*, until the fourteenth century).

6 קא שי או פיזיריש

ka si o fizeires

'because if you do (so)'. *ka* < QUA (RE), replaced in the modern language by *porque* (cf. Fr. *car*), and distinct from ModPg. *ca* 'here' < ECCU HAC. The diacritic ꝛ *p* to indicate /f/ occurs inconsistently in the text.

טיבירא פרול

tebera prol

'gain advantage'. Future subjunctive of *ter* (ModPg. *tiver* < Latin perf. subj. TENUERIT). Most etymological dictionaries derive *prol* < **prode* < PRODEST, though it was possibly influenced by PROLES 'growth, progeny' (hence 'advantage, gain').

9 קרארו

kraro

'clear'. Although the initial cluster is relatinized in ModPg. *claro*, here the form occurs without latinizing interference. Nevertheless, *krara do ovo* 'egg white' and *klara* occur together in a single sentence in chapter 27, and the variants *klarifikar* (line 176) and *krarifikar* (line 181) 'clarify' also occur in consecutive chapters.

f. 1v.

11 נו אלמופאריץ קו או אזוגי

no almofariš ko o azoge

'in the mortar with the mercury'. Although both of the terms here are Arabic loanwords (ModPg. *almofariz* < *al-miḥraṣ* and *azougue* < *az-zāḡuq*), the <z> in the modern spelling has a different source in each. Yet the fact that the letters of the Hebrew alphabet have cognates in the Arabic alphabet allows the scribe to capture the etymological distinction not maintained in the Roman-letter spelling, by using ז ם and ז ם respectively. ModPg. *com* 'with' < CUM occurs here without the final consonant, which does appear elsewhere in the text. Based on this instance, the variation does not seem to be a function of whether the following segment is a vowel.

13 שאל ארמיניקו אידיש אנושטאר

sal armeniko ides anoštar

'sal ammoniac' (ammonium chloride), paraphrased by the loanword (ModPg. *nochatro*) based on Ar. *an-nuṣāṭar* (Blondheim ignores this gloss in his translation). This word has caused some confusion among etymologists. Franca (1994) and others list the word as the attested but now-obsolete *almoxatre*, while Ferreira (1999) derives *nochatro* from *nušādar*. Corriente (1999) cites the ultimate source of the Arabic term as Pahlavi *anōš ātaxš* 'eternal fire'. The paraphrase marker *ides* 'that is',

which occurs throughout the text, is Latin *ID EST*, one of a very few words in the text with diacritic vowels; the others are אֶלְפִיר *alfer* (line 54), אַזְרְקוֹאֲנְבּוֹלִי *azarkoanboli* (line 219), פִּינְסָא *pinça* (line 314), and one occurrence of פִּישְׁטִי *fuste* '(wood) stick' (line 174).

16 אואה רודומא

uah rodoma

'a bottle'. This word appears in various guises in the text: *ua aredoma*, *d.aredoma*, *ko.a arodoma*. Most etymological dictionaries indicate *redoma* 'glass sheath' as being "de origem obscura/incerta/controversa," though some cite Ar. *raḏûma* as the source (Silvera Bueno 1967 suggests more specifically a Mozarabic dialect variant).

18 גיאה די סיניזה דו לאר

gēah de çiniz^ah do lar

'full of ashes from the hearth'. Words spelled in ModPg. with <ch> such as *cheio* < PLENU are most often spelled in this text with the Hebrew ג g, augmented by a diacritic (presumably meant to indicate [ʧ] or [ç], which have since deaffricated). ModPg. *cinza* 'ash' < *CINITIA (da Cunha 1982 suggests *CINISIA), derived from CINIS.

f. 2r.

23 קואה

koah

'with the (f.)'. Although this preposition is normally spelled with an overt final ן *n*, on occasion the scribe drops the nasal letter and fuses it to the following article or pronoun. In the modern language this preposition is always written separately (spelled *com*), but orthographic fusion does occur with other prepositions, e.g. *na* < *en+a*, *nesta* < *en+esta*. In this text (and throughout the corpus) *en* is usually written out in full (e.g. אין אואה *en uah*, ModPg. *numa*, אין אקיל *en akel*, ModPg. *naquele*), though some contractions do occur (e.g. line 248 אינישטא *enesta*, line 410 אינה *en^ah*), and are generally more frequent in *O libro de maḡika*.

24 אנאראש און פאאו די אורו

aḡaras un pao de oro

'you will find an ingot of gold'. ModPg. *achar* 'find' < AFFLARE 'sniff out'. The fricative, which derives from a non-sibilant Latin sound, is

spelled here by פֶּגֶ. ModPg. *pão* 'bread' < PANE here retains more of its original meaning of 'loaf' (of bread) by extension to 'ingot' (of iron).

- 26 פֶּאזִי קוֹאִילִי טו אה פֶּרוֹל
faze ko.ele tu ah prol
 'do with it what you will'. This is probably an incorrect division of the possessive adjective *tua* (this is in fact the phrase cited by Blondheim to illustrate how the scribe "stupidly divides common words"), with *prol* as direct object of *faze*.
- 27 אִישְׁטִי אֹרוֹ דִּיזִין אֹ אֹרוֹ מוֹשִׁיקוֹ
este oro dizen o oro musiko
 'this gold is called *aurum musicum* (bisulphide of tin)'. As in medieval Spanish, *dizen* takes a direct object, in the sense of ModPg. *chamar* 'call'. *musico* < MedL. *musaicum* 'mosaic'.
- 30 קוֹלִיֶּאָר
kulyar
 ModPg. *colher* 'spoon' < COCHLEĀRE. The text contains several instances of words where an expected /e/ or /i/ appears as /a/, e.g. *fuḡatibo* 'quicksilver' in the following line (but *fuḡitivo* elsewhere), as well as other instances of *kulyar* in this chapter (cf. ModSp. *cuchara*). By contrast, the three-letter system leaves the identity of the vowel in the first syllable (apart from its backness) ambiguous.
- f. 2v.
- 32 אֶלְמוֹפֶּאֲרִישׁ
almofaris
 'mortar'. As opposed to line 11 above, the etymological identity of the final consonant is obscured by the scribe's use here of the "standard" sibilant letter שֶׁ š.
- 35 שׁוֹלְטָא מִינְטִי
solta mente
 'freely'. A syncopated form of the past participle of SOLVERE (*SOLTUS < SOLUTUS) serves as the basis for ModPg. *solto* 'free' and *soltar* 'let go'. The modern language does not seem to have preserved the adverbial use of this word.

- 36 פִּוּמִיגִי
fomeḡe
 'smokes'. ModPg. *fumigar* < FUMIGĀRE. As preceded by *ata ke* 'until', the verb is properly in the subjunctive; yet the /g/ of the stem is not maintained as it is be in ModPg. *fumigue* but is instead softened by the front vowel, as indicated by the diacritic on ם g.
- 39 וִיזִיץ
vezeṣ
 'times'. This is another sibilant-rich word that occurs in many variant spellings. The use of צ ṣ in the final position is especially rare elsewhere in the corpus (but note the use of the letter's final-position form).
- 40 קַאֵל בִּיבָא
kal biḇa
 'quicklime'. ModPg. *cal* 'lime' is not the reflex of classical CALX, -CIS but rather derives from VLat. **cals*, a derivative of the classical accusative (Houaiss 2001). Note the spelling of *viva*, in which both instances of /v/ are spelled using בּ, albeit in one case missing the diacritic to signal the fricative reading, even though using ם would not yield any of the potential ambiguities (cf. chapter 3 § 2.3.2)
- f. 3r.
- 45 סַאֵרַאֵדַא
ṣarada
 'sealed'. ModPg. *cerrar* < SERĀRE. This is another instance in which a word in the text appears with א, representing /a/, where /e/ is expected (cf. note line 30).
- 46 דִּישׁ אַמַּאֵנִיאַאֵה
des amanyaah
 'from morning'. This preposition no longer occurs in the modern language as a free-standing word (cf. ModFr. *dès* 'from'). It also occurs frequently in the text in the combination דִּישִׁקִי *des.ke* 'as soon as' (cf. ModPg. *manhā*). The hiatus left by the deletion of intervocalic /n/ is spelled here in as much detail as the orthography affords, with two א as well as ה for word-final /a/.

47 אישקיבראלייאר

eskebralyar

'break'. ModPg. *quebrar* < CREPARE, with *r*-metathesis also preserved in the modern form (cf. chapter 7 § 2.3). The verb formed here is prefixed by EX- and suffixed by -ALIA, a noun-forming affix with a collective meaning, i.e. based on a noun **kebralya* 'broken-off parts'.

51 אוונדאר

avondar

'cover (with water)' < *ADFUNDARE, with an unexpected progressive voicing of the root-initial consonant. Only nominal forms of this root are found in Modern Portuguese, e.g. *fundo* 'bottom'. The use of double-וו *ww* to represent a CV syllable is extremely rare (cf. סירוּו *çervo* above). Indeed it is highly unconventional in this writing system to see any doubled letters other than א and י. It is conceivable, of course, that as in contemporaneous Roman-letter orthographies, the double-letter spelling in fact indicates a voiceless segment (cf. Domincovich 1948).

f. 3v.

54 אַלפֿיר

alfer

Given as a more specific name for גופיטיר די פולייאש *folyas de ġupiter* 'tin leaves', this is one of five words in the text with diacritic vowels added (see note line 13). In this context it appears to have little semantic relation to either *alferes* < Ar. *al-fāris* 'horseman' or *alfir*, a variant of *alfim* < Ar. *al-fil* < Pers. *pil* 'elephant', the chess piece usually represented as the bishop in the modern Western form of the game. It is also possible that it is a metathesized form of מארפֿיל *marfil* 'ivory' without the unetymological *m*- < Ar. *‘azm* 'bones' (cf. note line 253).

ברונייאר

brunyar

'burnish, polish'. ModPg. *brunir*, borrowed from French, itself based on a Germanic loanword. This form shows not only an unexpected א *a* in the final syllable (unless the verb has simply been treated as belonging to the first conjugation), but also an unetymological palatal /ן/ (although not in all occurrences, e.g. line 63 ברנייאו *brune-o* 'burnish it').

MedL. BRUNUS is attested in Isidore of Seville (6th c.) and the glosses of Reichenau (8th c.), so the verb here could be a native formation based on *BRUNIARE.

גרודי די סירוו

grude de çervo

'stag's glue'. ModPg. *grude* < GLŪTINE, with the *l* > *r* seen also in the initial clusters of other words, e.g. *krara* < CLARA. ModPg. *cervo* < CERVUS, with rare use of ןו, though etymologically justified, to represent CV syllable (cf. אונדאר *avondar* below).

56 דישאסי

desaçe

'dissolves'. This could be considered an ad hoc borrowing from Castilian, as shown by the lack of any consonantal segment following the prefix *des-* (ModPg. *desfazer*, ModSp. *deshacer* 'undo'). More native forms דישפייטו *desfeito* (line 56) and דישפאנא *desfaga* (line 65) do also occur. This and several other more obvious "errors" could point to a copyist of Castilian extraction (see chapter 7 § 4.3).

57 קארוסו די פשיגו

karoço de pesego

'peachstone'. Note that the sibilant resulting from assimilation (ModPg. *pêssego* < PERSICU) is not in this instance spelled with the Hebrew letter ס *ç*, which normally serves this purpose. The ס in *karoço* is indeed not the reflex of a simple Latin /s/, though the etymology of the word is not certain. Most dictionaries cite VLat. CARUDIUM, based on Gk. *karydion* (a diminutive of 'hazelnut'), though Houaiss (2001) also suggests a form **coroço* based on COR, CORDIS 'heart' as the source.

59 רישפראנדיסינטי

resprandęcente

'glowing'. ModPg. *resplandecente*. This form as used here shows not only the morphology associated with the Latin iterative ending -ĒSCERE, but also the unrestored PL > *pr* in the second syllable.

קונפ'אסיון

konfaçion

'concoction'. While ModPg. *confeccão* is probably borrowed from French, this is the more native development of CONFECTIÖNE, as shown by the lack of obstruent in the palatalization of the -CT- cluster. The form also displays the /a/ for expected /e/ that occurs throughout the text. In other occurrences it also occasionally lacks the ם representing /y/ in the final syllable (e.g. line 62).

61 אונדי פוג'יריש

onde puçeres

'where you place (it)'. Note that the sentence immediately preceding uses *u* < UBI as the locative pronoun (cf. Fr. *où*), a form that appears elsewhere in the text but that has since disappeared from the language.

63 אינשוטו

enšuto

'dry'. ModPg. *enxuto* < EXSUCTU, past participle of EXSUGERE (the related EXSUCĀRE yields ModPg. *enxugar* 'dry (v.)' and the semantic doublet of this adjective, *enxugado*). The unetymological /n/ could have developed by confusion with similar words beginning with *en-*.

גאב'ארי

gābari

'peccary'. ModPg. *javali* 'boar' < Ar. *ğabalī*, an abbreviation of *ħinzīr ġabalī* 'mountain swine' (Silvera Bueno 1965 cites the form with *r* as archaic). Many of the techniques in the text call for a דינטי די פורקו *dente de porko* 'swine's tooth', and it is possible that the intended reference is not in fact different here.

פאשא מינטרי

pasa mentre

'gently'. Most of the adverbs in the text, indeed in the Judeo-Portuguese corpus as a whole, occur with the *-mente* orthographically separated. This is the only occurrence in this text with the intrusive /r/ that occurs frequently in medieval Ibero-Romance, probably under the influence of DUM INTERIM > MedSp. (*do*)*mientre* > ModSp. *mientra(s)* (Penny 1991: 118).

f. 4r.

64 שישא

sesa

'size'. A pore-filling ingredient of certain glutinous materials. Like the English term, the Portuguese word is probably borrowed from OIt. *sisā* 'painter's glue', an aphetic form of *assisa*, which ultimately derives from the past participle of ASSIDERE 'seat, settle'.

65 קויירו די קונגריאו

koyro de kongrio

'conger-eel skin'. Unlike ModSp. *cuero*, ModPg. *couro* < CORIU has given way to *pele* in the general sense of 'skin, hide', retaining only the meaning of 'leather' (cf. Fr. *cuir*). The form is spelled here with an /oj/ diphthong, a variation also seen in *kousa* 'thing' (cf. ModPg. *coisa*; see chapter 7 § 2.5).

69 פרולינו

frolino

'florin'. A monetary denomination named for the lily pictured on the coin, and a term ultimately based on FLOR- 'flower'. The form here shows the *l-r* metathesis that has occurred in words such as ModPg. *milagre* < MIRACULU (cf. chapter 7 § 2.3). It is listed among a set of metallic objects that may be used for applying color, including the *dobra* and *eskudo*, two other medieval denominations, or an *anel* 'ring'.

70 אקרא דו אובו

akra do obo

'egg-white'. Although *krara* (*de ovo*) '(egg) white' appears throughout the text and the form here is likely a simple scribal error, it is possible that this is an instance of /l/ having been deleted after *l-r* metathesis seen elsewhere (cf. *frolino* above), i.e. CLARUM > **kralo* > **krau* > *kra*. However, other forms such as *mau* < **malo* < MALUM, which preserve a diphthong, might argue against this. Note the "unetymological" spelling of *ovo* with ב, a strategy that avoids writing three consecutive ו.

פריטאדו

pretado

'fried' (lit. 'blackened'). Most Portuguese etymologists derive ModPg. *preto* 'black' from *PRETTU, a regularized past participle of PREMERE

'press' (replacing PRESSUS). Corominas (1980), however, describes this etymology as "increíble," citing the paucity of similar models (e.g. Fr. *assiette* 'plate; seat (on a horse)' < *AD+SEDITU, replacing SESSUS as the participle of SEDĒRE 'sit'), and describes Sp. *prieto* 'dark; tight' as a back-formation from *apretar* 'grip, press' < APPECTORARE, based on PECTUS 'breast(bone)').

72 אישפריגאן

esfriga-o

'rub (it)'. ModPg. *esfregar* < *EXFRICĀRE, replacing the more evolved EFFRICĀRE with an assimilated prefix.

74 שי טולייארא

se tolyara

'will disappear'. ModPg. *tolher* 'take, rob' < TOLLERE. This form again shows /a/ for a modern form with /e/ (cf. note line 30).

f. 4v.

77 אקרי

akre

'ultramarine'. Blondheim capitalizes this word in his translation and inserts his own gloss for this shade evidently meant to resemble blue.

78 פוראקוש

furakos

'holes'. If the lack of diacritic on the initial consonant is deliberate, then it is in fact a bilabial stop /p/, suggesting a word akin to ModPg. *buraco* 'bore'. However, forms with a diacritic, i.e. *furako*, also occur (e.g. line 197). In fact this form is cited as a variant in da Cunha's (1982) entry for *buraco*, though the etymology of the word is listed as being "de origem controvertida." Alternatively, the word could be related to It. *foro* 'hole', based on FORĀRE 'pierce'.

79 קי ויניאאו אין מאנירא די קרוש

ke venyao en manera de krus

'that they come in the form of a cross'. 3rd pl. pres. subj. of *vir* 'come' (ModPg. *venhão* < VENIANT), used here in the sense of 'be arranged'. Note the use of the "basic" sibilant letter in *krus* (ModPg. *cruz* < CRUCE), even though the sibilant does not represent Pg. /s/ < Lat. /s/.

אביריש לימינאש דישינאליץ לונא

aĕeres liminas destenaliş luna

'take leaves of tin, (that is) Luna'. The verb *haver*, which in the modern language is restricted to only a few auxiliary functions, is used here in the very lexical sense of 'take'. The *i* in the first syllable of *liminas* 'leaves' is unexpected, especially given that *לאמינאש* *laminas* occurs just below in line 88, a reversal of the usual pattern seen in this text where **ʀ** occurs for expected /e/ or /i/ (cf. chapter 7 § 2.6). A word akin to 'sterling' (Blondheim's translation) appears to be the sense of *estenaliş*, since it is glossed by *prata* 'silver' immediately following. Blondheim capitalizes *Luna* but does not translate it.

84 **אטאפא**

atapa

'close, seal'. ModPg. *tapar* is based on a noun *tapa* 'cover, lid' < Gothic **tappa*. The initial *a-*, which occurs on several other verbs in the text, may therefore in this instance may be construed as a denominal verb-forming prefix.

85 **שוטיראדא**

soterada

'buried' < *SUB+TERRATA. Although the modern language uses *enterrar* 'bury', the *sub-* prefix occurs in more recent Latin borrowings such as *subterrâneo* 'underground'. A variant form **שון** *son* is used as an independent preposition in line 138.

f. 5r.

87 **אראפאן**

arapa-o

'scrape (it)'. ModPg. *raspar* < Gothic **hrapôn*, but again with a prosthetic *a-*. Note the orthographic ambiguity posed by the enclitic pronoun: although there is no question as to its pronunciation, it is not clear whether the **ʀ** should be construed as representing the verb desinence or the diacritic that indicates the vocalic value of **ʀ**.

- 88 פאליטה די פאלו
palet^h de palo
 'wooden spatula'. The modern term *paleta*, though akin to native *pá* 'shovel' < PĀLA, is in fact borrowed from It. *paletta* 'little shovel'. The form *palo* does not appear in Modern Portuguese, and is most likely a latinizing spelling of ModPg. *pau* (cf. note line 170).
- 91 קומו אוביריש נישאדו
komo uberes gisado
 'as you (will) need'. Although occurring only once, this appears to be an idiom *aver gisado* (in future subjunctive, ModPg. *houveres*), along the lines of *ter mester* 'need', rather than a past-tense form of *guisar* (based on *guisa* 'manner', based on a Germanic loanword **wisa*).
- 94 אטירסא פארטי
a.terça parte
 'the third part'. The feminine definite article is often procliticized graphically, probably due to its similarity with the Hebrew ה *ha-*, which is obligatorily written adjoined to its noun. This shorter form of the ordinal number (from TERTIA, vs. ModPg. *terceira* < TERTIARIA) can still be found in some fixed expressions, e.g. *terça-feira* 'Tuesday'. Corre (n.d.) has in fact suggested that the Portuguese practice of naming the days of the week as a sequence of ordinals is due to the influence of Hebrew, through the usage of New Christians in post-1497 Portugal.
- 95 איטי דיביש אשאביר
ite debēs asaber
 'likewise you should know'. *ite* < ITEM is a Latinism that occurs throughout the text (as with *ides* noted above, the final consonant, if it was indeed pronounced, is not written). Despite ModPg. *saber* < SAPERE, the diacritic on ב seems to indicate that [i] or [v] is intended, and may represent another Castilianism. Haury (1989) in fact cites *devees de ssaber* [sic] as a recurrent syntactic formula, so it is possible that the prosthetic *a-* has a similar function here.
- 97 אישטוביר
estuber
 'stand'. This future subjunctive form of *estar* (which also occurs transitively throughout the text in the sense of 'let stand, leave') does

not derive from classical STETERIT, but is based rather on a stem formed analogically from *haver* (Penny 1991). Note the ambiguity in the spelling of the vowel in the second syllable (cf. OSp. preterite *estove*).

לונגאדה מינטי

longad^h mente

'for a long time'. The first element clearly derives from LONGU (in fact, an alleged *LONGATA < *LONGARE), for which Recuero (1977) does list a variant *longo* alongside *luengo* 'long' in Judeo-Spanish. Note the orthographically separate *-mente*.

f. 5v.

טורנאשי

tornase

'become'. Though it appears correctly as a future-tense form in his translation, the second <s> in Blondheim's transcription of this verb as *tornas[s]e* implies that he considers it an imperfect subjunctive (presumably derived from the classical pluperfect subj. TORNAVISSET).

99 קאבידארטאש

kaḇidar-t-as

'(you will) be aware of (it)'. Although this verb means what modern *cuidar* does, it does not derive from COGITARE like the modern verb, but rather from an iterative *CAVITARE, derived from an original participle *CAVITU (from CAVERE 'beware, guard'). Machado (1967), by contrast, considers the syncopated classical participle CAUTU as the innovated form with respect to the participial source of the verb used here.

100 אי או קי איש אשי ... אי בואו

e o ke es asi ... e bou

Although Blondheim transcribes the 3rd sg. copula with an acute accent as <é> to distinguish this א from the homographic conjunction *e*, I have not added this layer of interpretation to my transcription, since no such distinction is made in the Hebrew-letter manuscript. With regard to the copula, Williams (1962) states that the -s (< EST) fell "because of the relation of this form to the 2nd singular *es* by analogy with the relation between 3rd and 2nd singular of the present tense of all other verbs." Since איש *es* here is unlikely to be 2nd person, this conservative variant could be construed as a synchronic allomorph used before vowels.

קומו קרדאיו

komo k^ardeo

'like a thistle'. ModPg. *cardo* < CARDUU, with early vowel coalescence in the final syllable. The *y* in the spelling, along with Blondheim's translation as 'violet', suggest that this is an adjective, perhaps < *CARDEU 'of thistle' on the model of *vidro/vitreo* (VITRUM/VITREUS) 'glass/vitreous' (note that the text does feature וידרארו *vidrado* 'glazed' < *VITRATU, ostensibly based on a verb *VITRARE 'glaze').

101 פארא או קונוסיריש

para o konoçeres

'so that you recognize it'. This is the so-called inflected infinitive, ModPg. *conoceres* < imperfect subjunctive CŌGNŌSCERĒS.

103 קומו אדי אושו

komo a.de uso

'as there usually is'. The verb *a* 'there is' appears joined to the preposition in the adverbial phrase. Note, however, that the *a-* in a similar structure in line 111 אדיפארטי *adeparte* cannot be considered a form of *aver*.

104 די קואהדא דאש וידיש

de koahda da vides

'lye of vine branches'. One of only two occurrences of non-final ה *h*, though it is most likely due to the scribe having revised what he first wrote as קואה *koa* (based on *coar* 'strain' < COLARE) to more correctly write the intended קואדא *koada* < COLATA. Blondheim translates this term as 'lye' (ModPg. *lixívia*, which does not occur in the text), a strong alkaline solution leached from wood ashes.

107 אישקריי או קי קישיריש

eskreve o ke kiseires

'write whatever you wish'. Blondheim translate this as 'write *wherever* you please', interpreting the relative pronoun as *u* < UBI (cf. Fr. *où*). This form has been replaced in the modern language by *onde* (see note line 61), and though it does occur elsewhere in the text, the presence of the *ke* following makes that interpretation unlikely. Note the spelling of *eskreve* with an unetymological ו for /v/ < Lat. /b/

f. 6r.

111 רַאפּאַאן מִיאודוֹר

rapa-o miudo'scrape it until very fine'. ModPg. *miúdo* < MINŪTU used adverbially.

פּוֹנוֹ אַדִּיפּאַרטי

pon-o adeparte'put it aside'. As opposed to the structure in line 102, this *ade-* cannot be construed as a form of *aver*, and may represent a particle of some kind in this adverbial structure.

113 פִּידְרָא אֹומִי

pedra ume'alum'. ModPg. *alume* has been relatinized based on ALŪMEN. The medieval forms *alumbre* and *ahume* cited by da Cunha (1982) show two possible outcomes of the development of the word after syncope of the second syllable, and both are found in the text. The former, however, must be considered a Castilianism, since the /mn/ clusters resulting from syncope were not subject to epenthesis in Portuguese (e.g. LUMINE > Sp. *lumbre*, Pg. *lume*). Although the modern form is masculine (as in line 179), it is possible that the form here is the result of a reanalysis of *ahume* as a feminine form plus the corresponding definite article.

114 מַאֲלִיגָה

maleg^ah'bowl'. Blondheim notes that "in modern Portuguese *malega* means a soup-bowl such as is used by country people. Apparently here it is used as a name of the wood of which such as bowl is made" (1930: 123).

118 פִּידְרָא קְרִי

pedra kri'chalk'. Probably borrowed from French (modern *craie* < CRETA), since the complete lenition of the /t/ in the Latin term would not be expected as the native outcome. The synonym גִּיץ *giṣ* (ModPg. *giz* < GYPSUM) occurs just before, and is the more frequent term used in the text.

לישאאו ביביר נא פיאה

leša-o bibir na piah

'leave it soak in a trough'. ModPg. *deixar*, the product of an apparently spontaneous change $l > d$ in *leixar* < LAXĀRE (also found in the ModSp. cognate *dejar*), also occurs in the text. For 'soak', the modern language uses the prefixed form *embeber* < IN+BIBERE. ModPg. *pia* 'sink, trough' < PĪLA, with the regular deletion of intervocalic /l/.

f. 6v.

123 אהראפא אן

ahrapa o

'scrape it'. Non-final ה is extremely rare in all Judeo-Romance writing, used almost exclusively as an allograph for א in final position. Its presence here is probably due to the scribe having erroneously written the definite article אה *a* (cf. note line 104).

אונה אולייא

un^ah olya

'a pot'. The native doublet *ola* 'clay pot' < OLLA of this Castilian loanword does not occur in the text (Ferreira 1999 lists it as a now-archaic regionalism). Note the of ן *n* in *un^ah*, which like the <m> in ModPg. *uma* may simply be due to orthographic convention.

128 מישטוראו

mistura-o

'mix it'. This word alternates through the text with its near-doublet *meçer* < MISCĒRE, whose participle MIXTUS served as the basis for the noun MIXTURA that gave rise to the denominative *misturar* used here. Both of the Portuguese verbs are often spelled with the sibilant ס, since in both cases the sound is not the result of an inherited Latin /s/. A third term used occasionally is *meçkrar/mezkrar* (ModPg. *mescrar* < MISCULĀRE; cf. ModIt. *mescolare*). Note how the use of א here may be considered haplological, standing for both the /a/ of the verb desinence as well as the diacritic before the ן of the enclitic object pronoun /o/.

f. 7r.

130 אלוֹיִיאֵלְדֵי

alv^ayalde

'white lead'. The modern form *alvaiade* < Ar. *al-bayād* does not contain the second /l/. Corriente (1992: 50) suggests that the liquid in this and several other words (e.g. *alcalde* 'judge, governor' < *al-qāḍī* and *arrabalde* 'suburb' < *ar-rabād*) may reflect the preservation in early Andalusian Arabic of the lateral feature from older 𐤀 *ḏ*, a segment known in Semitic philology as an "emphatic lateral" (see Steiner 1977; it may also be transcribed as <z> or <ṣ>). The lateral feature is also seen preserved in Modern South Yemenite Arabic *abyal* 'white'.

131 טיגֵּלָא

tiġela

'bowl'. ModPg. *tiġela* < *TEGELLA < TEGĪLLUM 'head-covering, straw bonnet', based on TEGULA 'tile', which more directly yields the doublet *telha* (Houaiss 2001).

134 אֶזְרֵקְאֹוּ

az^arkao

'zircon, red lead'. ModPg. *zarcão* < Ar. *zarqūn*. The term also occurs at the start of this short chapter with its nasal consonant preserved in the spelling, i.e. אֶזְרֵקְוֹן *az^arkon*. Yet the fact that it occurs with only vowel letters in the last syllable suggests that the nasal consonant had generally disappeared from speech (a number of other words feature this same variation, often in close proximity to one another; cf. note line 189). The initial *a-* may in this case reflect the preservation of the Arabic definite article, which assimilates fully to coronal consonants (although the word does occur elsewhere without the initial vowel).

135 אֶזִּינֵי־אַבְרֵי

azinyabre

'verdigris (copper oxide)'. ModPg. *azinhavre* < Ar. *az-zinġār*, itself borrowed from Persian *zengir*. Also expressed in the modern language by *verdete*, a loanword from French. Both da Cunha (1982) and Houaiss (2001) give the source as Ar. *az-zinġafr*, which includes an unetymological /f/ in an attempt to account for /v/ (here spelled ב *b*).

- 137 אקוטאדה
akoṭad^ah
 'on its side'. Although the stem *costa* appears in many forms in the modern language, the sense of 'leaning, lying' has been taken over by other words (e.g. *inclinare-se*). Unlike some of the other instances, the prosthetic *a-* here quite likely derives from an etymological prefix AD-.
- 138 שוטרעה שון או אישטירקו
soterah son o estirko
 'bury (it) under the manure'. Blondheim misconstrues *soterah son* as a single word that has been misdivided by the scribe, i.e. a noun based on SUBTERRATIONE, which he translates as 'burial earth'. If this were the case, however, we would expect the nominal suffix to be spelled with ט. In fact this is the same preposition attested in the Brotherton Passover text (ch. 6 § 3), namely OPg. *so* < SUB with an *-n* added by analogy with *non, nin*, etc.
- f. 7v.
- 142 מיאלואש
mea-lo-as
 'half-fill', with the object pronoun interposed between the stem and desinence. ModPg. *mear* < MEDIĀRE. Both da Cunha (1982) and Ferreira (1999) refer to this verb as a "popular form" as compared to ModPg. *mediar*, and in fact the former is the expected outcome, while the latter is a conservative form or more recent borrowing (it first appears in the fifteenth century, spelled <medear>).
- 143 אוריןאש בין פודריש
urinas bein pudres
 'very putrid urine'. The form *pudre*, deriving from the basic adjective PUTER, PUTRIS has been replaced in the modern language by *pútrido*, which is based on the participle of the verb formed from the same basic adjective, PUTRERE 'become rotten'.
- באסאיו די לאטון
baçio de latun
 'brass basin'. ModPg. *bacio* < *BACCĪNUM < Gk. *bacchinon*, though da Cunha (1982) cites a feminine form in *-a* from the fourteenth century.

Although never spelled with initial ן *v*, this word also occurs in the text with the diacritic on ב *b* which presumably indicates a fricative pronunciation. ModPg. *latão* < OFr. *laton* < Ar. *lāṭūn* 'copper', itself probably borrowed from a Turkic language (cf. Turkish *altın* 'gold').

147 אינברוקא

enbroka

'place upside down'. Although this term is not preserved in the modern language, cf. ModSp. *embroca* 'poultice' < EMBROCHA, a loanword from Greek.

148 אינשאלמוש

enšalmos

'coverings for pack mules'. ModPg. *enxalmo* is borrowed from Sp. *enjalma* < OSp. *salma* < SAGMA, a Greek loanword (Ferreira 1999).

וירטיראש או וידו

vertiras o vido

'pour the urine'. Note that the term *vido*, along with its synonyms *meḡados* and *urinas* normally occurs in the plural (see note line 265).

150 אזינאברי

azinabre

'verdigris'. This variant lacks any indication of a palatal /j/ (cf. note line 135), a variant not mentioned in the etymological dictionaries. It may, of course, be simply due to a scribal error omitting the double-ײ following ן.

f. 8r.

155 נאאו אה דיאבלו קיליי טולייא פריין א אקולור

nao ah diablo kely^e tolya preṣ a akolor

'there is no devil who [could] then take the color'. Blondheim takes *preṣ* to mean 'worth' (as in ModPg. *preço* < PRETIU). Yet the word is more likely akin to ModFr. *après* 'after', which derives from the expression AD PRESSUM 'near', used here without the prepositional element. The diacritic in the spelling of 'devil' (ModPg. *diabo* < DIABOLUM) shows the vernacular lenition of /b/ to /v/, but not the deletion of /l/ (cf. *povo* < *poboo* < POPULU), just the opposite of the modern semi-learned form.

- 158 קואטרו אסומבריש די אגואה
kuatro açumbres de aguah
 'four *açumbres* of water'. ModPg. *azumbre* < Ar. *aṭ-ṭumn* 'eighth (part)' (based on *tamāniya* 'eight'), probably a Castilian borrowing as signalled by the epenthesis of the *mn* cluster. According to Houaiss (2001), this liquid measure used in Moorish Spain was equivalent to two litres and 16 millilitres, while Corominas (1980) describes it as "la octava parte de una cántara."
- 160 ליבאנטארין אישקומא
lebantaren eskuma
 'give off foam'. As opposed to ModPg. *espuma* < SPŪMA, this word is based on MedL. *schuma*, a loanword from Frankish **skūm* (the ultimate source of English *scum*). See also *eskumado* 'skimmed' in the same line, which Blondheim translates more wordily as 'no longer gives off foam'.
- f. 8v.
- 161 פאלייא די סינטיאו
palya de çenteo
 'rye-straw'. ModPg. *centeio* < CENTĒNU, so called because each plant produced 100 grains per stalk (da Cunha 1982). The spelling of the penultimate syllable with a single *y* likely indicates a monophthong, in contrast to the diphthong found in the modern form.
- 163 זינסא די וידיש
zinça de vides
 'ashes of vine branches'. Although the orthography of sibilants is quite variable in this text, given earlier סינזא *çinza* it is difficult to see this "metathesis" as anything other than a scribal error.
- 164 באריליה
baril^ah
 'lye ashes'. ModPg. *barrilha* < Sp. *barrilla*, with the expected palatal segment not spelled as such (cf. note line 150), so perhaps this is an archaic native form. Although it is the only occurrence of this term, in context it refers to an item already known to the reader. Note that a form akin to the modern term *lixívia* 'lye' does not occur in the text.

- 165 וואיי קואנדו
vayo koando
 'continue straining it'. An idiom (see also note line 181) using a form derived from *VADERE* (whose conjugated forms become associated with the infinitive *IRE* 'go') and a present participle, in this case of ModPg. *coar* < *COLARE*.
- 169 קומו די קאדא
komo de kada
 'as of each'. Blondheim reads this phrase as a scribal error for an intended *kon a-dekoada* 'with the strained [item]', a reference to the lye mixture.
- 170 פאאו פֿורקאדו
pao forkado
 'pitchfork' (lit. 'forked stick'). ModPg. *pau* < *PALU* 'stake, post', although a latinizing form *palo* occurs elsewhere (e.g. line 88). ModPg. *forcado* denotes 'pitchfork' on its own.
- 171 דיריטודא
deretuda
 'melted' (also in line 173). Although the participle of ModPg. *derreter* is the regularized *derretido*, this form shows the Late Latin tendency to form participles in *-UTU*.
- f. 9r.
- 174 פושטי
fuste
 '(wood) stick' < *FŪSTIS*. One of the handful of words with diacritic vowels indicated, perhaps because it has a more technical sense or specific reference here than in its other occurrences, or perhaps because the scribe sees it as a Latinism along the lines of *ides* 'that is', which is similarly vocalized.
- 175 פֿרול
frol
 'powder'. Apparently a metaphorical extension based on its principal sense of 'flour' (which has been taken over by ModPg. *farinha*), with *l-r* metathesis (cf. chapter 7 § 2.3).

- 177 לינפא אי טיבא
linpa e teḇa
 'clean and tepid.' Like ModPg. *pútrido* (see note line 143), ModPg. *tépido* has been relatinized based on Latin TEPIDUS (itself derived from the noun TEPOR, -ŌRIS 'gentle warmth'). The form used here shows the vernacular outcome with deletion of intervocalic /d/.
- 179 אאומי
aume
 'alum (water)', here showing the intermediate form with the intervocalic /l/ deleted but the initial syllable preserved (cf. *ume* earlier in the same line, and note line 113).
- 180 בולביאו
bolḇe-o
 'stir it'. ModPg. *volver* < VOLVERE '(cause to) turn', whose derivative *VOLVITARE yields the more common modern term *voltar* 'return'. Note that the diacritic indicating the fricative form of ב *b* is used only on the second of the two, though both are unetymologically representing /v/ < Latin /w/. Indeed, the use of ב is the strategy used frequently to avoid the ambiguous double-וו spelling in spelling /vo/.
- 181 קראריפיקאר
krarifikar
 'clarify, purify'. Like other forms with initial /kr/, this word alternates with a conservative, or more likely remade form with initial /kl/, e.g. קלאריפיקאדאש *klarifiakadas* in line 169 above.
- וואי וירטינדו
vae vertindo
 'continue pouring'. The spelling of the form derived from VADIT (ModPg. *vá* 'go') in this expression is conservative enough to indicate the hiatus from the lenited /d/ and its later-deleted syllable.
- 183 אינשינייוש שאקוש
ensenyos sakos
 'in separate bags'. ModPg. *senhos* < SINGULOS, which also yields the doublet *sendos*.

קולגאאוש

kolga-os

'hang them' < COLLOCARE (cf. Sp. *colgar*). The modern language uses *pendurar* 'hang' < *PENDULARE, a verbal diminutive based on PENDERE.

f. 9v.

186 פילויירי ניוש קומו איר וואנסוש

pelveiri nyos komo er vanços

'small particles like chick peas'. ModPg. *pó* 'dust, powder' < **pulu* < VLat. *PULVUS < classical PULVIS, -ERIS. The ultimate source of the diminutive form used here is the classical plural PULVERA, which da Cunha (1982) claims was borrowed in Portuguese from Castilian *pólvora*, itself borrowed from Catalan.

187 אואה שאבאן

uah saban

'a towel' < SABANA, plural of SABANU, a Greek loanword. Note that it remains feminine here despite the apocope of the final vowel.

189 פארא פאזיריש

para fazeres

'in order to make'. Another inflected infinitive, derived from the Latin imperfect subjunctive (in this case < FACERĒS).

וירמיליון

vermelyon

'red'. ModPg. *vermelho* < VERMICULU (diminutive of VERMIS 'worm') is the basic term for this color. The form here is one of several variant spellings that occur in this chapter: בירמיליוואו *bermelyou* (line 203), בירמילאאו *bermelao* (line 207). The latter is especially curious, since it does not contain the double-ײ indicating palatal *l*, but does seem to indicate a nasalized vowel in final position, albeit a different one from the preceding form in line 189. It is likely that the nasal ending reveals those forms to be borrowed from OFr. *verm(e)illon*, whereby that form of the word refers to a more specific shade of red, namely 'vermilion'. Note that in reference to the color of the smoke, as opposed to the substance being produced, the form used is וירמיליוו *vermelyo*.

192 אַרְגֵּיזײַן וויבֶז

argen viḇo

'quicksilver'. ModPg. *mercúrio* or *azougue* (only the latter is found in the text). For *silver* itself, Modern Portuguese uses *prata* 'silver' (which also occurs in this text). It has not retained a direct reflex of the term used here (which also occurs in line 386), but only a more recent formation *argento-vivo* < ARGENTUM VIVUM (cf. *argente vivo* in *O libro de maḡika*).

f. 10r.

196 אַננאַש די גוּשׁוּ

anḡas de ḡuso

'broad below'. ModPg. *amplo* is the relatinized doublet of ModPg. *ancho* < AMPLU. The modern language has not preserved *ḡuso* < DE ORSU (but cf. OIt. *giuso*, ModIt. *giù* 'down').

201 קוּשׂאַ

kosa

'thing'. ModPg. *coisa* < CAUSA. Although the modern language has chosen the <oi> variant, forms with the diphthong <ou> occur throughout the medieval language. Indeed, *O libro de maḡika* contains numerous occurrences of קוּשׂאַ/קוּשׂאַה *kous^ah/kousa*. What is rarer is a form such as this Spanish-like variant lacking the diphthong altogether, again pointing to Castilian interference in the text's transmission.

205 קילייריש אינטאל גישא אױ פּוּגוּ

kileires ental gisa o fogo

'reduce the fire in this manner'. If the verb here is akin to ModPg. *quilher* < *(TRAN)QUILLARE 'to calm', it may in fact be a Castilianism, since cases of geminate -LL- appearing as -lh- in Portuguese are considered to be borrowed (Williams 1962: 74; also cf. note line 123). Although *fogo* < FOCU occurs as expected, a non-Portuguese diphthong is clearly spelled a few words onward in פּוּזאַיִנוּ *fuego*.

f. 10v.

209 קומו דיטו אַי

komo dito e

'as has been mentioned', with *e* 'is' < EST. Blondheim's translation 'as I have mentioned' assumes that אַי *e* < HABEO (ModPg. *hei*), and that this is a present perfect form of *dizer*. Yet this would constitute the only instance in the corpus of a modern-style periphrastic tense (cf. chapter 7 § 1.2). The phrase is more likely a syntactic Latinism on the model of DICTUM EST, which carries a past rather than present sense.

210 פארא ביאין מינטיש

para been mentes

'pay close attention'. As noted above, אַי *y²y* may be intended to indicate a diphthong, i.e. non-Portuguese *bien*. There are several other spellings that may also be interpreted as similar non-Portuguese diphthongs, especially those that alternate between monophthongs and diphthongs (e.g. *fogo~fuego* above), which may be due to the influence of a Spanish copyist at some stage of the text's transmission. The expression here is akin to Spanish *parar la atención* 'fix (one's) attention' (with *parar* < PARARE 'stop; prepare'), though it is also worth noting the plural use of *mentes* 'minds'.

נונקאו אוש איראראש

nunkao os eraras

'you will never ruin anything'. ModPg. *nunca* < NUMQUAM. The final אַו *-ao* here may be a hypercorrect spelling for a nasal segment that had deleted well before nasalized vowels had emerged. Blondheim's translation of *os eraras* (lit. 'ruin them') as an intransitive 'go wrong' must be due to English influence, since an overt object pronoun precedes the verb, which is also used transitively elsewhere (e.g. line 6 טודו איראראש *todo eraras* 'you will ruin everything').

211 קאביסאס דו קארב'אאו די בראסו

kabeçaç do karbao de braço

'ends of burnt charcoal'. Blondheim translates *braço* as 'branches', obviously seeing it as a metaphorical use of 'arm' < BRACCHIU. However, the term is more likely akin to French *braise* or Italian *brace* 'embers' (cf. chapter 6 § 4.4), borrowed from West Gmc. **brasa*. The

sense of ModPg. *carvão* < CARBŌNE has narrowed to 'coal', but here it indicates the "carbonized" charcoal. Note also the very uncharacteristic use of ס ץ for the plural morpheme -s, no doubt due to its presence earlier in the word.

215 לאנסאליי

lança-ly^e

'toss (in) to it'. ModPg. *lançar* 'throw' < LANCEĀRE, based on LANCEA 'spear'. This word occurs frequently in the text, meaning 'add' here (hence the dative), and simply 'put' or 'place' in other cases.

דא נושאטאר . . . דא זינייאברי

da nošatar ... da zinyabre

'of sal ammoniac ... of verdigris' From the perspective of ModPg. *azinhavre*, this would appear to be an instance of incorrect word division. However, it is also possible that this division reflects the scribe's awareness of the Arabic etymologies of these two words, since the *a-* in both cases derives from the Arabic definite article.

217 פואין דישטה סינראדא

poen dest^h çinrada

'place (some) of these ashes'. The form related to ModPg. *cinza* 'ash' is a participle CINDERATA (used in a collective sense), based on CINDERARE.

218 או קיגיריש פאזיר ליטראש

u kiġeres fazer letras

'where you wish to make letters'. The ݢ ġ spelling for the stem-final consonant of the future subjunctive of this verb (ModPg. *quiseres* < QUAESIVERIS, after shift to the second conjugation), alternates throughout the text with analogical ש s (as well as שׁ on occasion).

f. 11r.

219 קון ויגירא בולי אי קון אַזַרְקואַנבולי

kon vegera boli e kon azarkoanboli

Appearing with diacritic vowels added, these two terms remain untranslated and of unknown origin.

- 220 קינאאו אלינפיש
ke.nao alinpes
 'that you not clean (it)'. This initial *a-* appears on *linpar* repeatedly in the text on this and other verbs. Although the verb is lacking a clause-internal object, it is unlikely that this prefix is a clitic object, given that a number of non-phonological processes could give rise to prosthetic *a* (cf. Williams 1962: 112-113).
- 221 קא גא אונראדא פיקא
ka ġa onrada fika
 'for it will remain adorned'. *onrada* is most likely a misspelling of *ornada* 'adorned' < ORNATA, the same confusion of letters as that seen in אינב'נרו *inḅenro* 'winter' (ModPg. *inverno* < HIBERNU) one line above. Curiously, it is the exact counterpart to the opposite error in *O libro de maḡika*, where אורנדא *orn^ada* is the form spelled for 'honored' (ModPg. *honrado* < HONORATU).
- 224 מאדירו
madero
 'wood'. The modern form *madeira* is feminine, deriving from the neuter plural MATERIA. The form here is masculine, deriving from the singular form MATERIU. Note also the lack of diphthong in the spelling (cf. note line 161).
- 225 פואוש דאלקריב'טי
pous dalkrebite
 'powdered sulphur'. Pg. *alcrevite* < Ar. *al-kibrit* (now archaic according to Franca 1994), with the characteristic *r*-migration seen in other Portuguese words, e.g. *trevas* 'darkness' < TENEBRAS, *preguiça* 'laziness' < PIGRITIA. This loanword also appears (via Turkish) in Romanian *chibrit* 'match'. In this text it occasionally replaces the native אינש'ופרי *enšofre* (ModPg. *enxofre*, from *enxofrar* < *INSULFRARE).

f. 11v.

- 229 אלאקאר
alakar
 'dark red resin'. ModPg. *laca* < Ar. *lakk*, ultimately Sanskrit *lākṣā* (cf. English *shellac*). The OED cites *lacquer* as borrowed from the alternative

Portuguese form *lacre*, similar to the form used here, which Silvera Bueno (1966) suggests may have arisen by *r*-metathesis in yet another attested variant, *lácar*.

קואנטו אוב'יריש מי'אישטיר

kuanto uberes meester

'as much as you need'. Fut. subj. *houveres* < HABUERIS, used as a main verb of possession with object *meester* < MINISTERIU (with a vowel hiatus clearly indicated by the spelling 'יא'), in the sense of Fr. *avoir besoin* (ModPg. *ter mister* 'need, must', also expressible by *haver de*). Both expressions may be considered syntactic Latinisms, in the sense of OPUS EST 'must be done'.

231 אישטה פייסאאו

est^h feiçao

'this mixture'. An unprefixed form based on FACTIÖNE, but used in the sense of קונפ'אסיון *konfaçion* 'concoction' that occurs elsewhere.

234 אזויני

azeviġe

'jet black'. Both da Cunha (1982) and Houaiss (2001) cite as the etymon of ModPg. *azeviche* the specifically Andalusian Arabic form *az-zabīġ*. By contrast, Penny (1991) derives the Castilian cognate *azabache* 'jet' from classical Arabic *az-zabāġ*. Since this text tends to have /a/ where /e/ is expected and not vice-versa, the classical Arabic form is probably the immediate source of the form used here.

235 אלמארטאקי אי פיזיש די אורו

almartake e fezes de oro

'litharge of silver (lead monoxide) and litharge of gold'. Corriente (1999) cites the Spanish pair *almárta/almartega* 'litharge' as deriving from Andalusian Ar. *al-mártaq* < classical Ar. *martak* (the word may be related to ModPg. *almadraque* 'pillow, mattress' < Ar. *al-maṭraḥ* 'rug', with *r*-migration in the form here). Replaced in the modern lanague by *litargírio*, a Greek loanword. I have followed Blondeheim in translating *fizes* as 'litharge' as well, though it may be akin to ModPg. *fezes* 'dregs' < FAECES, plural of FAEX.

- 236 **אזארניפי**
azarnefe
 'arsenic'. ModPg. *arsênico* is the more recently-formed doublet of *arzenefe* < Ar. *az-zirnī*, both based on Gk. *arsenikón*, though Corriente (1999) lists classical Arabic *zirnīq* (with the Andalusian variant *azzirnīx*) as deriving from Pahlavi *zarr nēk* 'fine gold'. The form here shows *r*-migration relative to the Greek form, though Ferreira (1999) lists *arzenefe* as a variant, which itself shows *r*-migration relative to the Arabic and Pahlavi sources.
- 238 **אזיגי**
azege
 'vitriol' (an acid of metal sulfate). ModPg. *azeche* 'iron sulfate' < Andalusian Ar. *azzāğ* < classical Ar. *zāğ* (Corriente 1999). This term has largely been supplemented by the Latinate *vitriolo*.
- f. 12r.
- 243 **מאנוש**
mangos
 'handles'. A masculine or neuter form *MANICU (> It. *manico*) based ultimately on MANUS 'hand', which survives only as the term for a component of a cereal thresher (the fruit name *mango* is a Spanish loanword; the feminine MANICA does yields ModPg. *manga* 'sleeve'). In translating it as 'stick', Blondheim seems to have misconstrued it as a figurative reference to the stirring device.
- 248 **קאדיירא די קוברי**
kadeira de kobre
 'copper kettle'. While the modern language uses *chaleira* '(tea)pot', the term here is akin to Sp. *caldera* < CALDARIA, based on CALIDUS 'hot', (though the scribe has apparently forgotten its letter ל *l*). ModPg. *cobre* derives from a popular and abbreviated variant of classical AES CYPRIUM 'Cyprus bronze' (da Cunha 1982)
- 250 **פירא פאריש אשידרים**
pera fares ašedreç
 'to make chess pieces'. An apparently syncopated form of the inflected infinitive form of *fazer* (ModPg. *fazeres*). ModPg. *xadrez* < Ar. *aš-šitranğ* (via Persian, ultimately from Sanskrit). Like ModSp. *ajedrez*, the form

here has kept the initial *a-* of the Arabic definite article. Note that like the modern spelling, none of the sibilants are spelled using the unmarked letter **ש**, indicating that the final sibilant was not reanalyzed as a plural morpheme.

f. 12v.

253 אושױש די מאַרפּײל

osos de marfil

'elephant bones'. ModPg. *marfim*, a loanword based on Ar. (^ʿ*azm*) *al-fil* 'elephant (bones)', refers only to 'ivory', having been replaced by *elefante*. It is the animal rather than the material that is the likely referent here, given that such bones are offered as an alternative to אושױש די וואַקא *osos de vaka* 'cow bones' in line 252.

254 שיראַדוראַש די מאַדיירו

seraduras de madeiro

'sawdust', lit. 'wood sawings'. Note again the masculine gender of *madeiro* (vs. ModPg. *madeira*).

257 דאַל פאַדידאַ

dal fadida

'(some) cuprous oxide'. Corriente (1999) lists the cognates Cat. *alfadida* and Sp. *alhadida* as derived from an Andalusian variant of classical Ar. *ḥadīdah* 'piece of iron' (cf. Moroccan Ar. *ḥdida ḥamra* 'copper oxide'), used here as a synonym of אַזיניאַברִי *azinyabre* 'verdigris'.

261 שײ פּוֹנדיאַיי

se fundey

'melt'. ModPg. *fundir* < FUNDERE. A subjunctive form שײ פּוֹנראַאו *se fundao* occurs earlier in the following line, but the extra syllable here does not appear to have any motivation in this present-tense form.

קואַליין קומו גוֹנבו

koaly^en komo ḡunbo

'coagulate like lead'. ModPg. *coagular* is a relatinized doublet of the *coalhar* (used here in fut. subj.), whose regular development is shown by the vocalization of the -GL- cluster that resulted from syncope.

263 רגאוש

rgaos

'grain'. It is difficult to see this as anything other than a confusion of the first two consonants in the ModPg. *grāo* 'seed' < GRĀNU. Linguistically-unmotivated errors such as these (cf. note line 123) could suggest that the scribe is not transliterating the text for the first time but is working from a pre-existing Hebrew-letter manuscript.

f. 13r.

265 אלגידאר או טישטו

algidar o testo

'bowl or vessel'. Because the Hebrew-letter manuscript contains little punctuation, it is unclear whether the native term *testo* < TESTU is a gloss for or a practical alternative to the borrowed *algidar* < Ar. *al-ğidār*.

וידוש דומיאיש

vidos domees

'human urine'. For *vidos* (lit. 'evacuates') cf. ModFr. *vuide* < *VOCITU from classical VOCIVUS/VACIVUS, an adjective that does yield ModPg. *vazio* 'empty'. The more frequent term in this text is אורינאש *urinas*, though מיגאדוּש *meğados* (ModPg. *mijada*).

270 מאיש פֿידיגוּשוּש

mais fedegosos

'more fetid'. ModPg. *fedegoso* < **feticosu* < *F(O)ETICU, a variant of FOETIDU 'of ill smell', the adjective that yields ModPg. *fétido*. Both are Vulgar Latin forms derived from the basic adjective FOEDU 'filthy, ugly'.

קואנטו מילייור קולור פֿאראאו

kuanto melyor kolor farao

'so much better the color will (the urine) make'. The ך *d* in *kuando* in line 250 immediately above is best interpreted as a scribal error for what should be קואנטו *kuanto*, so that the phrase is an equivalence with the *kuanto* here: "the more fetid and putrid the urine..."

- 271 באפֿו דױש װידױש
bafo dos vidos
 'vapor from the urine'. Most dictionaries claim an onomatopaeic origin for *bafo* 'breath', with the earliest citation given as a sixteenth-century attestation of *abafo* (da Cunha 1982). A form of this word also occurs as a verb (באפֿיגֿע *bafegē*) in line 365.
- 272 מוראדו
morado
 'mulberry'. The Latin name for this fruit was MÖRUM, but the adjective here derives from *MORATU (cf. ModSp. *mora* 'mulberry', *morado* 'purple; bruise [n.]'). The modern Portuguese form *amora* derives from the basic Latin form, with accretion of the definite article.
- f. 13v.
- 275 טישױיראש
tesoyras
 'scissors'. ModPg. *tesoura* < TÖNSÖRIA. Like *koisa* above, the form here shows an alternate spelling of the reflex of Latin /ō/ as compared to the modern orthography. Indeed, the development of *r* + yod has led to a number of similar alternants, e.g. CORIUM > *coiro/couro* 'leather', AUGURIUM > *agoiro/agouro* 'foreboding' (cf. chapter 7 § 2.5). The unexpected *e* in the first syllable may be due to contamination from *tesouro* 'treasure' < THESAURU (a Greek loanword), which may have exhibited the same *oi/ou* variation as well.
- 279 בוטאדו
botado
 'spoiled'. ModPg. *botar* 'strike, push' < OFr. *boter* (ModFr. *bouter* 'expel, push'), borrowed from Frankish **botan*. Used here with a slight extension of meaning, in that the color is "pushed out."
- 281 קומו שי דיױן אפֿאזיר אי אמױסקראר
komo se deven afazer e ameçrar
 'how they should be made and mixed'. Note the placement of the reflexive pronoun before *deven*, indicating that this verb may have at least transitory status as an auxiliary. Note also the prefixed *a-*, which

does not otherwise occur on these verbs, but given its frequency in the text may well represent a complementizing particle.

- 285 מווייטו אי מוי ביין
muito e mui bein
 'thoroughly and very well'. ModPg. *muito* < MULTU, also the source of the apocopated form, which has disappeared from the language (cf. ModSp. *muuy* 'very'), but which is the preferred form in the Judeo-Portuguese corpus and is found frequently in medieval Portuguese.
- f. 14r.
- 288 פירגאמינו
pergamino
 'parchment'. ModPg. *pergaminho* < PERGAMĪNU shows the palatal /ɲ/ that developed in similar contexts elsewhere (Williams 1962: 71-73). The form used here does not indicate any palatalization, perhaps due to latinizing interference.
- 289 קון פֿאַסיאון
kon façion
 'concoction'. Although there is no call for this word division, the final form ן ך *n* leaves no doubt that it was intentional on the part of the scribe.
- 293 דאלבֿאגין
dalbaġen
 '(some) egg-white, albumen'. ModPg. *albume* < ALBUMEN. Like the classical and relatinized modern terms, the form used here is based on the adjective ALBUS, -A, -UM 'white' > *alvo, alva* (cf. note line 315). It may be a native development of *ALBAGINE (cf. *imagem* < IMĀGINE, *origem* < ORIGINE). Like most ModPg. words in *-agem*, however, it may be borrowed from French or Provençal (e.g. *viagem* 'voyage' < Pr. *viatge* < VIĀTICU). Thus it could be a similar loanword based on *ALBATICU 'whiteness', or else an analogical extension of the borrowed suffix.
- 294 אטאלמיה
atalmiah
 'ceramic bowl'. Corriente (1999) lists a variant Portuguese *altamia* derived from Andalusian Ar. **ħaltamíyya* 'of ceramic' < classical Ar. *ħantam* 'sealed'.

f. 14v.

303 דיטה

dit^ah

'mentioned'. Blondheim mistranscribes (but correctly translates) this word as an indecipherable מטה $$.

305 קונגיה

kong^ah

'conch, shell'. Also mistranscribed (but correctly translated) by Blondheim as קורגיה <qwrgh>.

318 טריש קובירטוש

tres kobertos

'well covered'. This adverb does not survive in Modern Portuguese (cf. Fr. *très* 'very' < TRANS).

f. 15r.

313 קואור אינדיאה

koor indiah

'blue color'. The hiatus from deleted /l/ in *color* is fully spelled out here. As a color term, Modern Portuguese has replaced native *indio* < INDICUS with *índigo*, borrowed from Castilian (da Cunha 1982).

314 פנסא ניגרא

pⁱnça negra

'black color'. One of the handful of words with vowel pointing, perhaps because this is a more technically-specific term for 'color' that the scribe deemed more obscure than the usual קואור *koor*.

315 אלוא

alva

'white' < ALBA. This word has been replaced in the modern language as the basic term by *branco*, a loanword from Germanic. The masculine form אלוו *alvo* occurs in the following line, and is one of a very few forms in the corpus where double-וו serves to represent a CV syllable

rather than a single consonant (most of which are in this text, e.g. סירוּו *çervo* and אוונדאר *avondar* above).

317 קוריש פרינסיפאיש

kores prinçipais

'principal colors'. Note that many of the "basic" color terms that follow are transparent loanwords, with only *azul*, *vermelyon*, and *verde* serving as basic color terms in the modern language. It is possible, then, that these are not meant as the basic words of the language per se, but rather of the art or trade, or perhaps that they are the main ingredients for making the dyes described in the text.

318 קרמין סופיי

k^armen çufⁱy

As opposed to its usual omission, the lack of orthographic /a/ in *karmin* could be construed as an etymological spelling, since the term is borrowed from Arabic, through MedL. *CARMINUS*, a contraction of *CARMESINUS*, itself from Ar. *qirmizī* (cf. ModPg. *carmesim* 'crimson' < Andalusian Ar. *qarmazê*). The word does, however, occur in line 175 with no nasal consonant in final position, an alternation similar to that seen in ModPg. *alume(n)*. As Blondheim notes, *çufii* makes eleven terms, and most likely modifies *karmen*, possibly referring to a reddish wool (Ar. *suf* 'wool') perhaps worn by members of the *Sufi* sect of Islam.

אסאפראאו

açafrao

'saffron'. ModPg. *açafrao* < Ar. *az-za^cfarān* (ultimately of Persian origin), with agglutination of the Arabic definite article. As opposed to other words with etymologically nasal endings, this term consistently appears in this text, as in its modern form, with no final consonant.

319 לא קרארא דו אובז

la krara do obo

'the egg white'. Although it is the only occurrence of this un-Portuguese *l*-form of the definite article, this could be taken as further evidence Spanish interference in the text's transmission.

אינא אליי

eḡa aly^e

'pour (in)to it'. In contrast to ModSp. *echar* < IACTĀRE 'throw', a frequentative based on IACERE, Modern Portuguese has not preserved a reflex of this verb per se, though it is reflected in *jeito* 'manner, skill' < IACTU as well as in the numerous words containing *-je(c)t-*.

320 ליני דילא פיניירא

leḡe dela figeira

'sap of the fig-tree'. ModPg. *leite* < LACTE, used figuratively to describe the white sap of this tree (ModPg. *seiva*). The spelling with ל rather than a diphthong suggests that the form may be another Castilianism (cf. ModSp *leche*).

f. 15v.

322 דישטיפראאו

destep^era-o

'temper'. The form here lacks both an explicit /e/ vowel in the penultimate syllable (unless the spelling intends to indicate a syncope), as well as any indication of /n/ or nasalization before the /p/ (normally spelled with נ *n*). It does, however, spell out the nasalized verb desinence with vowel letters only.

327 בראנקיטי

brankete

'ceruse, white lead pigment'. This term, clearly based on a form of *branko* 'white', appears in the next chapter (line 331) spelled with נ instead of ק. If this form can be considered the "error," then it would constitute the only instance in which ק represents a fricative/affricate, which is common practice in other medieval Judeo-Romance writing.

331 ליאו

leo

'Leo'. As indicated by אידיש *ides* 'that is' < ID EST that precedes it, this is a gloss for בראנגיטי *branḡete* (though Blondheim misconstrues it as a verb plus clitic pronoun, i.e. 'thin it'), though it may also refer to gold, the metal associated with this sign of the Zodiac. Note that unlike in *O*

libro de maḡika the word appears in a vernacular spelling with no nasal consonant (ליאון *leon* in *O libro de maḡika*, ModPg. *leão*).

332 טורניר אינסיליסטרי

tornar ençeļtre

'to turn (it) sky-blue'. ModPg. *celestial* is a relatinized form of the word used here to describe a shade of blue. The form here may show the *l-r* dissimilation that affected words even in classical Latin such as SOLARIS 'solar' for *SOLALIS and REGULARIS 'regular' for *REGULALIS (but cf. *filial* < FILIALIS), though it may also be formed by analogy with *terrestre* (cf. סיליסטריאיש *çeļctriais* in *O libro de maḡika*, where the adjective suffix *-al* is added to the analogically-formed stem).

f. 16r.

335 נימא די אובו

ḡema de obo

'egg-yolk'. ModPg. *gema* < GEMMA 'bud; gem'.

342 נואו מאיש

nou mais

'no more'. ModPg. *não* is usually spelled in the corpus with a final consonant (i.e. נון *non*, though נאוו *nao* does also occur), but here it is actually written with a vowel spelling more typical of a form with a hiatus from deleted /l/ or /n/, e.g. קוואר *koor* 'color,' בואו *bou* 'good'.

346 ניגרו אניל

negro anil

'black indigo'. ModPg. *anil* < Ar. *an-nīl* (via Persian and ultimately from Sanskrit *nīlī* 'indigo').

f. 16v.

351 מאטיזאלייו

matiza-ly-o

'shade it'. Though da Cunha (1982) states that ModPg. *matizar* is "de origem incerta," Corominas (1980) claims that the word ultimately derives from Greek *lammatizein*, based on *lamma*, which referred originally to a belt and fringe of different colors.

- 353 קולוראר
kolorar
 '(to) color'. Modern Portuguese has the doublets *corar* and *colorir*, the former showing the regular development of COLŌRĀRE. Da Cunha (1982) lists *colorir* as first occurring in 1548 (probably based on an Italian borrowing). The form used here is a semi-cultismo, retaining the *-ar* conjugation of the evolved form but restoring the etymological /l/.
- 358 פירו אש קוריש טודש
pero as kores tod^as
 'but all colors'. Spanish-like *pero* < PER HOC (attested with other uses in medieval Portuguese), later replaced by *mas* < MAGIS.
- f. 17r.
- 363 סינדאל
çendal
 'bandage'. Ferreira (1999) cites ModPg. *çendal* 'fine cloth' (an alternative here to *pano*) as a term of Arabic and Greek origin, derived via VLat. CENDALU. Corriente (1999) suggests that it is based on Ar. *şandal*, with contamination from Lat. SUNDUS, itself based on Gk. ΣΑΝΔΑΛΙΟΝ.
- 365 באפיני
bafege
 'breathe'. Present subjunctive of a verb formed on the basis of *bafo* 'breath' + *-ejar* < -IZĀRE (later spelled -IDIĀRE, where -DI- represented the affricated segment), a Latin verb-forming suffix first used with verbs of Greek origin, which also yields ModPg. verbs in *-ear*.
- 371 מיסקראמינטוש דאש קואוריש
meçkramentos das koores
 'color mixtures'. The only occurrence of this alternative to *misturas* based on *meçkrar* < MISCLARE, a verbal diminutive of MISCLERE.

f. 17v.

375 פִּירפִּילָאָר

perfilar

'paint'. Based on OPr. *perfil* (ModPg. 'contour, profile'), this word seems to have a more general meaning here than its etymological sense of '(paint a) profile'.

379 לָבְרוּ

lⁱbro

'book'. One of the rare instance of an implicit vowel other than /a/, in this case /i/ (cf. note 317).

אָגוּאַה דאַש קאַרטאַש קוֹגָאַ

aguah das k^artas koḡa

'boiled parchment water'. *kartas* seems to be used in the sense of *pergaminos* 'parchment leaves'. The adjective here is related to *cozer* 'boil' < *COCERE < COQUERE (a more regular past participle קוֹזִידוֹ *kozido* occurs in line 414) but appears to be based on an apocopated form.

381 פּוּאַיר

poer

'put'. This infinitive is generally spelled with a monophthong, much like its modern form *pôr*, but it is spelled here and one line further down with the hiatus from the deleted /n/ spelled out.

382 מִיטִי אִי

mete i

'put there'. The use of this locative pronoun derived from *IBI* (> Fr. *y*) has not been preserved in Modern Portuguese.

f. 18r.

388 אִישְׁקִינְטָאָדוֹ קוֹן מַאָנּוֹ לִינְפָאַ

eskentado kon mano linpa

'warmed with a clean hand'. ModPg. *aquecer* '(to) heat' < CALĒSCERE, an inchoative based on CALĒRE 'be hot', which is also the ultimate source of this form, based on *ex + quente* 'hot' < CALENTEM. Note the intervocalic ɲ in *mano* (ModPg. *mão*), a conservative or Castilian-style spelling.

- 389 פִּרְסִימָא
perçima
 'above'. A single occurrence of this alternate formation based on PER+CYMA (borrowed from Greek), rather than the usual *ençima* < IN+CYMA.
- 390 טראפו
trapo
 'cloth' < VLat. *DRAPPU (Sp. *trapo*, It. *drappo*, Fr. *drap*), probably of Celtic origin. The provection of *d-* > *t-* in the Ibero-Romance forms may be due to the absence of native Latin words with initial *dr-* (Houaiss 2001).
- 392 לאוואש
lava-os
 'wash them'. Occurring between two א, the double-ו spelling for Pg. /v/ < Lat. /b/ may seem in this case unwarranted. Yet it does serve a grapho-tactic purpose, allowing the scribe to avoid repeating the same sequence of two characters -או- when it is not serving as a digraph.
- 393 אואה אולייא נובא אי וילייא
uah olya noġa e velya
 'a pot (that is) old and new', though this makes as little sense as Blondheim's implausible translation of *velya* as 'watch it'. Perhaps the copyist has added another's marginal correction into the text proper.
- 397 אה טה קולה
ah t^ah kol^ah
 'your glue'. The scribe has probably forgotten the ו *u* in what should be *tua*. Note that this is the only instance in which the possessive construction occurs in its modern form, with both the definite article and possessive adjective.
- f. 18v.
- 399 מיזקראאון קון גאלדי
mezkra-o kon ġalde
 'mix it with yellow'. The modern language uses *amarelo* < **amarellus*, a Hispanic Latin diminutive of AMĀRUS (da Cunha 1982), which has replaced this borrowing of OFr. *jalne* < GALBINUS, a Germanic loanword.

- 402 טאנטו דו אל
tanto do al
 Blondheim's hesitant translation 'as much as *the other*' suggests that he correctly identifies *al* < **ale* < *ALID < ALIUD (Ferreira 1999).
- 403 בארניץ
braniṣ
 'varnish'. ModPg. *verniz* is probably borrowed from OFr. *verniz* or OIt. *vernice*, both of which derive from MedL. VERONICE, itself based on Greek *bernikê*. The form here, which occurs twice in the chapter, shows the /a/ for expected /e/ characteristic of this text (cf. § 1.2), though it occurs as בַּרְנִיץ *verniṣ* in line 420, with /e/ and a more etymologically-justified initial consonant.
- 404 גאר אשה די נוברא
garas^ah de nobra
 '*nobra* grease'. Since גראסא *graça* occurs in the next line, the form here has an unnecessary extra syllable. The term *nobra* is untranslated by Blondheim, and seems unrelated to *nobre* 'noble'.
- 406 די גראנוואגאר
de granvagar
 'vigorously'. Although it does so here, Portuguese does not generally apocope forms such as *segundo* 'according to', *primero* 'first', or *grande* 'great' as Spanish does in certain contexts (cf. ModSp. *según*, *primer*, *gran*). The second element in this adverb seems akin to *vigor* but with an unexpected א *a* in both syllables.
- f. 19r.
- 412 ניין אואה די איי
nin uah de ayⁱ
 'not one of (them) there'. Since forms such as *nenyua* occur elsewhere, it is likely that *nen uah* occurs here without indication of a palatal *n* because it is split by a line break (although, as noted above, other words occur without a palatal spellings where one is expected).

- 415 ראלו אי פירמושו
ralo e feroso
 'thin and fine.' *ralo* is a dissimilated doublet of *raro*, both derived from RARUS (cf. It. *rado* 'sparse'). ModPg. *feroso* < FORMOSUS, although as da Cunha (1982) points out, the variants *fremoso* and *feroso* (the latter used throughout this text) dominated in the medieval language.

- 419 מורטיירו
morteiro
 'mortar'. Although the Arabic loanword *almofariz* is more frequent in the text, this is the relatively more native term, ultimately derived from MORTĀRIU but borrowed from It. *mortaro* (da Cunha 1982). Fr. *mortier* is the source of the homonym associated with weaponry.

f. 19v.

- 430 רושיטא
roseta
 'rose-color'. ModPg. *roseta* (diminutive of *rosa*) refers either to a small rose, or to an arrangement of ribbons in the shape of a rose and worn as an ornament. Blondheim leaves the word untranslated, since it would appear to refer here simply to rose-color.

מוליאן

mole-o

'grind it'. The only occurrence of this frequently-occurring verb spelled conservatively with ל for the deleted /l/.

f. 20r.

- 436 אלומברי
alumbre
 'alum'. This is the only occurrence of a nasalizing context spelled with מ *m* preceding a labial consonant), which is the standard modern graphy (the more expected spelling אלונברי *alunbre* does occur earlier in the same line; also cf. note line 113).