ROGER BACON'S POLYGLOT ALPHABETS

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ROGER BACON AND LANGUAGE

Encyclopaedias usually label Roger Bacon as "theologian, philosopher, and scientist." Literary scholars and critics will certainly associate Roger Bacon with Robert Greene's *Friar Bacon and Friar Bungay*. The romantic comedy illustrates Bacon's close connections with experimental science and with magic art. Oculists even credit Greene's Franciscan friar with the epoch-making invention of spectacles. As for acoustics and experimental phonetics, the *doctor mirabilis* in *Friar Bacon and Friar Bungay* tried hard but eventually failed to construct a speaking machine. To his great disappointment, his Brazen Head collapsed while repeating the magic spell "Time is out."

As a matter of fact, Roger Bacon composed his "Linguarum Cognitio" or Part Three of *Opus Majus* and a fragment of a *Cambridge Hebrew Grammar*, besides several minor contributions to comparative linguistics.[1] With respect to language cognition, he clearly distinguished three stages of acquisition and perfection: a reading and comprehending knowledge after three days, a translating knowledge and ability after several years, and a

full teaching, preaching, and praying competence to a speaker's mother-tongue after thirty years.[2] Bacon's own language studies date back to his early university days at Oxford and Paris, lasting for over forty years of his life.

Substantially, the present state of research on Roger Bacon must and can build upon the critical text editions by John Sherron Brewer (1859), John Henry Bridges (1893, reprinted in 1964), and Edmond Nolan and S.A. Hirsch (1902). On the occasion of the seventh centenary of the monastic scholar's birthday in 1914, S.A. Hirsch composed his most important contribution "Roger Bacon and Philology" to A.G. Little's Festschrift for Roger Bacon. In 1963, a Mediaeval Studies symposium at Cologne focussed on the historical background of the humanities in Europe and on Jewish Studies.[3] In 1973, Matthias Thiel submitted the printed version of his Munich dissertation on *Grundlagen der Hebräischkenntnisse des frühen Mittelalters*.[4] In 1978, Hans H. Wellisch devoted one of the subchapters of his monumental study on *The Conversion of Scripts* to "Roger Bacon."[5] In 1990, Sarah Larratt Keefer and David A. Burrows reported on their research into "Hebrew and the *Hebraicum* in Late Anglo-Saxon England."[6]

As for Roger Bacon's command of Hebrew, there still prevail the evaluations formulated by John Henry Bridges, Edmond Nolan, and S.A. Hirsch, as well as again by S.A. Hirsch in 1893, 1902, and 1914 respectively. Hebraists and philologists praise Roger Bacon's amazing erudition and perspicacity as much as they blame his astounding or almost incredible ignorance of comprehension and his disregard for spelling.[7] Of course, any praise or blame should be weighed against the general thirteenth-century setting and potential of foreign-language learning. For, contrary to the long and splendid tradition of mediaeval Latin studies, Hebrew was then meeting with some serious lacks and reservations which detracted from its full acquisition and cognition:

- Religious barriers and aversions between Latin-oriented Christians and Hebrew-oriented Jews used to block off unimpeded cultural interchanges on a larger scale. In Solomon A. Birnbaum's words: "Isolated Jews acquired a knowledge of the Christian script, and some learned Christians got to know the Hebrew alphabet."[8]
- A deplorable neglect and lack of dictionaries, grammars, handbooks, and translations on both sides of the Channel (but, as Roger Bacon remarked, at Paris in particular) hampered the straight, ready, and systematic approach to foreign-language acquisition. Only long after Roger Bacon's undergraduate and postgraduate thirst for knowledge,

the expulsion of Jews from England in 1290 brought some quite considerable accession of Hebrew manuscripts and source-material to insular monastic libraries.

- Up to the eleventh century, literacy, literality, literation, and literature had remained the customary ways to foreign-language learning. After Jerome's superb and unique knowledge of Hebrew had fallen into oblivion, *linguarum cognitio* practically survived as a rather sporadic and superficial command of paradigmatic lexical items. Late-mediaeval monastic students of Hebrew failed to acquire any deeper comprehension of or flexibility with syntagmatic contextual forms. Only towards the end of the eleventh century and during the twelfth century did orality, oration, and orature come to the fore. Abraham ben Meir ibn Ezra's stay in and around London since 1158 must have established and promoted Hebrew studies in the Middle English period. First and foremost, the monastic scholars of Saint Victor soon took the lead. Urged by a horde of fanatic crusaders, Richard the Lionhearted hastened to blame the friars of Saint Victor for their Judaizing tendencies.[9]
- Despite the complementary attempts at biblical literacy and orality, thirteenth-century scholars would, as a rule, stare at Hebrew knowledge as something rare and quite exceptional.

Roger Bacon's basic conception of language sticks to the Donatist and Priscianic canon of Latin grammar. Progressing from the smaller to the larger units of segmental description, or from simple features to complicated phenomena, his studies follow the consecutive chapters or lessons on "vox — littera — syllaba — dictio." Like his insular and continental contemporaries, Bacon shows and propagates Latin-oriented thinking. Accordingly, authors and scribes would follow the rules and habits of the letters of the Latin microalphabet for universal literation and transliteration. Each of the letters bears a name (*nomen*), a shape (*figura*), and a sound-value (*potestas*), but no longer a numerical code or symbolism (*computus*).[10]

Theoretically and biographically, Roger Bacon could have acquired his knowledge of Hebrew either in England before 1240 as well as between 1247 and 1257, or in France between 1240 and 1247 as well as between 1257 and 1268. Practically and linguistically, some conclusive evidence and cogent arguments speak in favour of the Continent. It is true that the Franciscan scholar renders, transliterates, demonstrates, and teaches Hebrew punctuation in a complete (although partly erratic) Latin-alphabetic scheme as a linear set of ten long and short vowels.[11]

a	a	e	e	e	e	e	i	o	u
אַ	אָ	אֶ	אֵ	אֱ	אֶ	אְ	אִ	אֹ	אֻ

Yet occasionally, spontaneously, and thus all the more convincingly, he presents his inventory of vowels after the Continental mnemonic pattern as conventionalized and internalized in Romania. Anglo-Saxon and Norman English vernacular mnemonics should rather have guided the Oxford scholar to the spoken letter-names of the Latin microalphabet as conventionalized and internalized in Germania. Speakers descended from insular or Continental Germanic stock as well as speakers descended from Anglo-Norman stock (like Bacon) but born, bred, and resident in thirteenth-century England for generations would normally tend towards sounding the *sonus naturalis* of vowels and the *sonus vicarius* of consonants in full length and sharp contrast to the short *sonus vicarius* of semivowels:

ā bē cē dē ē ĕf gē hā ī cā ĕl ĕm ĕn ō pē cū ĕr ĕs tē ū ĕx/ïx.

Romance speakers would tend towards sounding the *sonus naturalis* of vowels at half length and in mild contrast to the short *sonus vicarius* both before semivowels and after consonants:

ā bĕ cĕ dĕ ē ĕf gĕ hă ī că ĕl ĕm ĕn ō pĕ qŭ ĕr ĕs tĕ ū ĕx/ïx.

ba be bi bo bu
Roger Bacon's Latinized scheme of the Hebrew vowels[12] בַּ בֶּ בִּ בֹּ בֻּ avoids any reflections of or connections and associations with the vocalic length in Kamets, Sere, Ḥirek magnum, or Ḥolem magnum. Rather, it mirrors a short *sonus vicarius* of the syllabophones and identifies the sound-values with the mnemonic typology of Romania.

ROGER BACON AND HEBREW

Beyond these preliminaries, only a minute analysis of the two alphabets in Roger Bacon's "Linguarum Cognitio" and in the fragment of his *Cambridge Hebrew Grammar* can give a deeper insight into the state and perfection of his Hebrew. "Linguarum Cognitio" presents a Hebrew-Latin microalphabet plus a Hebrew macroalphabet in three manuscript lines; modern editors expand it into four printed lines. The chart takes stock of the elaborated 27-letter Hebrew pansystem. It comprises the 22 letters in graphemic transliteration and integrates the allographic final shapes of the letters K M N P TS or the so-called KaMNaPeTS. Bacon correlates the Hebrew macro- and microalphabets with the equivalents of the Latin microalphabet.
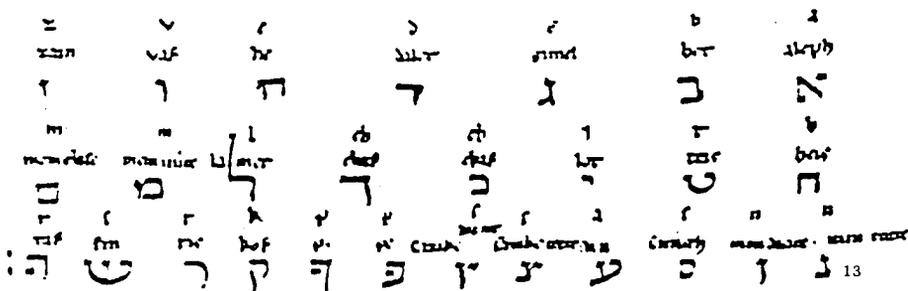
z	v	e	d	g	b	a
zain	vaf	he	dalet	gimel	bet	aleph
ז	ו	ה	ד	ג	ב	א

m	l	ch	ch	i	t	h
mem uverte	lamet	chaf	chaf	iot	teis	heis
מ	ל	ך	כ	י	ט	ח

s	s	a	s	n	n	m
sazake dreite	sazake torte	ain	samech	nun dreite	nun torte	mem close
ץ	צ	ע	ס	ן	נ	ם

t	s	r	k	p	p
taf	sin	ris	kof	pe	pe
ת	ש	ר	ק	ף	פ	14

Unlike "Linguarum Cognitio," the fragment of the *Cambridge Hebrew Grammar* merely correlates the Hebrew macroalphabet with the Latin microalphabet.[15]

ha he hi				a e i			
ho hu	d	g	b	o u	ch	i	t
he.	deleth.	gimel.	beth.	aleph.	caph primum.	ioth.	teth.

ha he hi						
ho hu	z	v o	n	n	m
heth.	zain.	vav.	nun secundum.	nun primum.	mein secundum.

m	l	ch	s	ph
meyn primum.	lamed.	caph secundum.	sadich primum.	phe secundum.

ph	a e i o u	s	t	s	r	[k]
phe primum.	ain	samech.	tav.	sin.	res.	coph.

s
sadich secundum.

Instead, it superposes the allophonic transcripts of the Latin sound-values above the 22 regular and the 5 diacritic letter-names of the Hebrew macro-alphabet. At first (and further) sight, Roger Bacon arranges the leftward Hebrew alphabet in an inconsistent, confused, and erratic sequence. Obviously, the copyist did not grasp or misconceived and spoilt the rough draft; subsequently, the grammarian never corrected the scribal blunder. At any rate, the chart must have complicated or discouraged elementary learning. Unless some plausible solution to the puzzling disorder and transpositions can be produced from the manuscript reading as it stands, the alphabet of the *Cambridge Hebrew Grammar* will justify the blame for Roger Bacon's poor Hebrew. Fortunately, there seems to have been some method in the mediaeval scribe's "madness."

For lack of cultural organization through school attendance or circulation of manuals, mediaeval minds had to contrive various subtle ways of learning by rote the complete sets of the Hebrew, Greek, or Latin alphabets with over twenty-two letter-names. Biblical, Talmudic, Patristic, and Scholastic masters used to transmit the Hebrew (or any other) macro- or microalphabet in subsets or mnemonic stretches called *connexiones*. In order to ease the learners' minds by splitting up the memorial load into brief mnemonic aids, teachers subdivided the predominantly seven *connexiones* according to the numerical scheme "4-4-2-2-3-3-4." Thus, the closed set of the Hebrew macroalphabet fell into its subsets: Aleph, Bet, Gimel, Dalet (4) — He, Wav, Zayin, Het (4) — Tet, Yod (2) — Kaph, Lamed (2) — Mem, Nun, Samekh (3) — Ayin, Pe, Tsade (3) — Koph, Resh, Sin/Shin, Tav (4). Each of the subsets yoked together a sequence easy to remember and worthy as symbols of faith and life.

The edition of the fragment of the *Cambridge Hebrew Grammar* transfers the basic material of the manuscript copied into a Hebrew alphabet of five printed lines. The Latinized version without the Hebrew microalphabet renders the four *connexiones* as a scheme of "8-9-5-5" letters. All the lines follow the Hebrew writing- and reading-direction from right to left.

8:	ה	ד	ג	ב	א		כ	י	ט
9:	ח	ז	ו		ן	נ	ם	מ	ל	ך
5:	צ	ף	פ	ע	ס				
5:	ת	ש	ר	ק	ץ				

The initial segment at 5 letters of the first *connexio* of 8 and its final segment at 3 run from the centres of the first and the second line to their left ends. The initial segment at 3 letters of the second *connexio* of 9 and

its final segment at 6 fill the first and the second line from their right ends
to their centres.

This close inspection of the macroalphabet in the *Cambridge Hebrew
Grammar* can trace Roger Bacon's own or his scribe's copy to some manu-
script at issue with a five-line Hebrew alphabet in five *connexiones* at "5-6-
6-5-5" letters.

5:	ה	ד	ג	ב	א
6:	כ	י	ט	ח	ז	ו
6:	ן	נ	ם	מ	ל	ך
5:	צ	ף	פ	ע	ס
5:	ת	ש	ר	ק	ץ

The scribe must have read, thought through, and written the right-to-
left Hebrew *connexiones* in his left-to-right Latin habit, filling the rest of
the lines after the same reverse procedure.

I: 1 2 3 4 5
    א ב ג ד ה.
    5 4 3 2 1

    I: 6 7 8   II: 1 2 3
       כ י ט   ו ז ח
    11 10 9   8 7 6

      II: 4 5 6   III: 1 2 3
          ן נ ם   ך ל מ
       17 16 15   14 13 12

        III: 4 5   IV: 1 2 3
            ץ ף   ס ע פ
          22 21   18 19 20

           IV: 4 5 6 7 V: 1
              ת ש ר ק   ץ
           27 26 25 24   23

The legend or message of the chart reads as follows: The Roman numerals
mark the five printed lines in the *Cambridge Hebrew Grammar*. The num-
bers in Arabic figures of each first line count the scribe's reverse left-to-right
arrangement of the Hebrew letters in the second below. The numbers in
Arabic figures of each third line count the proper and original right-to-left
arrangement of all the subsets or *connexiones* of the complete set of the
Hebrew alphabet.

Upon reconstruction, the two-layered Hebrew alphabet of the *Cambridge Hebrew Grammar* agrees perfectly with the three-layered alphabet of "Linguarum Cognitio." From top to bottom, the three layers hold the symbols of the Latin (micro)alphabet, the Hebrew macroalphabet, and the Hebrew microalphabet. In other words, the upper line transcribes the Latin sound-value (*potestas*); the central line transliterates in Latin the letter-name (*nomen*) of the Hebrew macroalphabet; the lower line draws character for character (*figura*) the letters of the Hebrew microalphabet, starting consistently from right to left.

Apart from some diacritic specifications of the full letter-names, the surface structures of the pansystems of Roger Bacon's two Hebrew alphabets (the macroalphabet in the *Cambridge Hebrew Grammar* as well as the macro- and the microalphabet in "Linguarum Cognitio") form a seemingly monolingual block. Their dual arrangement along with the Latin alphabet presents them in bilingual comparison. Yet, certain features and incongruities in the surface structures of the Hebrew macroalphabets point towards deep structures comparatively impure and heterogeneous owing to their polyglot provenance.

Excepting the marks of Sephardic pronunciation as not necessarily acquired in France, several phonic, graphic, and lexical features run through Roger Bacon's linguistic corpus, producing an impression of something quite regular, normal, or habitual in his conception, diction, and description, of something bearing the Continental stamp of Roman internalization. Along these lines, Bacon builds upon the typological change into short prop-vowels after the consonants in the Latin alphabet in Romania, such as bĕ cĕ dĕ că pĕ qŭ tĕ.[16] As customary on Romance territories, the alphabets drop the lenis aspiration of Aitch. Lexically, the letter-names of the central line implement the Northern French and (Anglo-)Norman diacritical wordpairs "uverte–close" and "torte–dreite" in order to differentiate between the Hebrew subset of the five dual letters (initial or medial versus final) memorized as diacritics for the KaMNaPeTS letters.

ROGER BACON AND ASHKENAZ

Neither a consistent reconstruction of the pansystem of the Hebrew macro- and microalphabet nor the clear evidence for Romania as the linguistic main source area of the Latin microalphabet and of several phonic, graphic, and lexical features can sufficiently exhaust the surface structure of Roger Bacon's dual alphabet in the *Cambridge Hebrew Grammar* and his triple

alphabet in "Linguarum Cognitio." Hebrew and Latin-Romance bilingualism must fall short of a thorough reading of the manuscript material and of an adequate solution to Bacon's knowledge of Hebrew. Some marks of surface-structural significance suggest historical ties to the sound-evolution in Germania. "Linguarum Cognitio" alters the letter-names *vav* and *tav* of the *Cambridge Hebrew Grammar* into *vaf* and *taf*

respectively. Although fortis–lenis oppositions may well occur in French or in (Anglo-)Norman adjectives like *juif–juive, neuf–neuve, vif–vive*, the further instances of the tenuis t in *Iot* and *Lamet* instead of the media d in *Iod* and *Lamed* will hardly admit of a purely Romania-based explanation of the phenomenon. Similar observations on devoiced final consonants make the pendulum still more decidedly swing towards Germania. Byrhtferth's late-Anglo-Saxon *Manual*[17] and Roger Bacon's *Cambridge Hebrew Grammar* mention the letter-names *Beth, Deleth, (Heth), Theth* and *beth, deleth, heth, teth* respectively. Yet, "Linguarum Cognitio" switches over to *bet, dalet, heis, teis*. Final s for t in *heis* and *teis* attests to the Second or Old High German Consonant Shift in Merovingian days.[18]

What in the lexical distribution of the letter-names can account for the "t-t-s-s" break with either sound system or for the "Hebrew plus Old High German" mix? For lack of charts, dictionaries, encyclopaedias, grammars, handbooks, and other scripted aids, mediaeval teachers and learners organized and memorized the continuum or pansystem of the Hebrew macro-alphabet in shorter stretches, subsets, or *connexiones*. On an average, a mediaeval *connexio* used to bind together some 4 or 5 letter-names of the macroalphabet or acrophones of the microalphabet. The seven *connexiones* of the Hebrew macroalphabet normally subdivided into the numerical scheme "4-4-2-2-3-3-4." Memories naturally served at a higher degree of clarity, precision, and retention of the correct sequence, when memorizing the comparatively frequent first and second *connexiones*. Erratic memorization or reproduction would more likely creep in with the rare and final sections of the alphabet. Likewise but outside the subsets or *connexiones*, erratic reproduction might occur in the subsystems of the *voces memoriales*, which classify and memorize particular acrophones of the microalphabet in

phonological order. Besides, mediaeval religious communities tended to-
wards segregation, and Christian students of Hebrew more often than not
depended upon liberal Jews and converts with only moderate education
and literacy. Roger Bacon or his scribe corrupted the Talmudic mnemon-
icon SaSSaTSaReSH (זסצרש) in the anonymous *Sepher Yetsirah* for the
sibilants from voiced z via voiceless s, whizzed ts, and rhotacized r to hissed
ʃ.[19] The letter-name *sazake* mistakes the mnemonicon for TSade. The hap-
lology of compressing *sassaza-* into *saza-* drops the voiceless acrophone of
Samekh, a sound-value nonexistent and superfluous in Judaeo-French after
its convergence with Sin instead of Shin.[20]

A comparative investigation and systematic description of Roger Ba-
con's scattered heritage of Hebrew can help to grasp and to judge anew his
language conception and cognition. It lends sharper profile and power of
distinction. The reinterpretation can clear away the contradiction prevail-
ing among the scholars praising Bacon's amazing erudition and perspicacity
as much as blaming his astounding or almost incredible ignorance of com-
prehension and his disregard for spelling. Practically, all the strange signs
of a chaotic or random command of Hebrew and the instances of blunder,
inadvertence, or ignorance will cede to a systematic catalogue of rules and
explanations. The catalogue turns the matter under investigation from an
impression of subjective and personal misachievement into findings of ob-
jective configuration and interpersonal concatenation. The network of the
bilingual Latin-Hebrew alphabet in the fragment of the *Cambridge Hebrew
Grammar*, the polyglot Latin-Hebrew-Judaeo-French-Old-High-German al-
phabet in "Linguarum Cognitio," the brief textual samples and illustrations
of punctuation, pronunciation, and syllabophony as well as the onomas-
tic etymologies identify Roger Bacon as an empiricist scholar who trusted
speaking informants and oral information no less than he did writing au-
thorities and scripted documents. Bacon as a late-mediaeval philologist and
expert used to draw on various and heterogeneous sources.

In all likelihood, Roger Bacon gathered the essentials of his "Hebrew"
in Northern France rather than in England. The north-western melting-
pot of Ashkenaz surrounded him with a diversity of languages as well as
with many processes of language amalgamation. On the one hand, the
Carolingian Empire had created the peaceful coexistence of Romania and
Germania, with Latin operating as a coordinating factor in everything ec-
clesiastical, educational, judicial, commercial, and international.[21] On the
other hand, Northern France formed one of the main centres of Ashkenazic

Jewry. From Gershom ben Yehuda's *yeshiva* at Mainz in the late tenth cen-
tury, Rashi's Talmudic Academy of exegetic studies at Troyes in the second
half of the eleventh century, and the ben Meir and Kalonymide families with
their Rhenish *Bet Hamedrash* learning at Speyer, Worms, and Mainz (שׁוּם),
language cognition served the Rabbinic ideals of cosmopolitan education.[22]
Rashi alone passed on some two thousand French loanwords into German,
many of them documented at their earliest occurrence. In Roger Bacon's
day and age, habits of Franco-German mind and speech lived on among
Rabbinic Jews in the outstanding Halakhic scholars Meir ben Barukh of
Rothenburg (1215–1293) and Mordekhai ben Hillel (1240?–1298). Meir ben
Barukh's *Vademecum* or diary holds evidence of the scholarly exchange be-
tween Romania and Germania from 1237 to 1256.[23] The span includes the
1240–1247 period of Bacon's stay at Paris. In the course of the cultural ex-
change, German rabbis would attend French schools, and vice versa. Alert
minds and polyglot speakers made for wide understanding and high levels
of education. According to the *Vademecum*, thirteenth-century Germania
and Romania hosted both French words in Hebrew transliteration and spir-
itual debates between Jews and Christians. Meir ben Barukh's *Vademecum*
opened a literary vogue with the highest circulation of diaries between 1290
and 1300.[24]

The present state of research on the cross-Channel ties and cultural
interchange in the Middle Ages between England and the Continent, be-
tween Jews and Christians, of Hebrew with Middle English, Old and Middle
High German, or Yiddish as well as of Hebrew with Old Northern French
and Judaeo-Northern French largely rests on uncoordinated studies of the
various disciplines. Expert scholars in Germanic, Hebrew, Romance, or
Yiddish philology, historians, Judaists, palaeographers, philosophers, and
theologians have reported on research projects and investigations from their
specific angles. Only with the revival of Jewish Studies in Israel, in Eng-
land, on the Continent, and worldwide do research projects begin to focus
on the origins and the situation of the Hebrew-Romance-Germanic-Yiddish
catchment area and melting-pot of pre- and proto-Ashkenazic Jewry.

Unwittingly, Solomon A. Birnbaum's *Yiddish: A Survey and a Gram-
mar* (Manchester, 1979) broke fresh ground for investigating Roger Bacon's
acquisition and cognition of Hebrew. After a Biblical city, Ashkenazim Jews
in Northern France called their European homeland Tsarphat.[25] They grew
to speak and write the Tsarphatic variant of Judaeo-French. Birnbaum was
able to trace some ten Tsarphatic manuscripts in Cambridge, London, and
Oxford for the period between 1182 and 1397. Owing to persecutions and

expulsions in the West, Tsarphatic Ashkenazim Jews migrated to the east in the fourteenth century, giving up Tsarphatic and picking up West and Central Yiddish speech and script.[26] In contrast to the *scriptio defectiva* or consonantal literation of Hebrew, Tsarphatic conformed with the *scriptio plena* of Yiddish. Aiming at Hebraification, Tsarphatic or Judaeo-Northern French transliteration rendered both consonants and vowels. Of course, the exchange of the one language medium for another did not go without some prior or posterior contact in culture and communication. This give-and-take from East to West and vice versa entailed the consequence that the Jews in Northern France started absorbing Old High German and proto-Yiddish sources and components as early as the ninth century — early enough for Roger Bacon's Hebrew studies in the Romance-Germanic-Semitic melting-pot of Northern France.[27] At its initial stage, Ashkenazic Hebraifications of manuscripts mirrored Tsarphatic traits.[28] Apart from the research on Tsarphatic, Roger Bacon's *Cambridge Hebrew Grammar* and "Linguarum Cognitio" yield a promising contribution to the expansion and regional infiltration of Yiddish. Indirectly, Bacon's "Hebrew" may shed light on the currently debated rise of proto-Yiddish in the Western area of the Rhineland or the Eastern area of the Danube Basin or in both areas simultaneously.

ROGER BACON AND "HEBREW"

Roger Bacon's conception and cognition of language and languages were deeply rooted in the Roman tradition of Donatus, Priscianus, Cassiodorus, and Alcuin. In his comparative studies, Bacon viewed language as something static, constant, uniform, invariant, identical, and ubiquitous. He could not see the core of problems such as regional diversity (dialect), individual stamp (idiolect or sociolect), temporal change (chronolect or dia-chronics). Far from the modern demands for the consistency, stringency, or systematics of linguistic description and notation, he still lacked a good eye for the mechanism of covariation or alternation (synchronics).

   Naturally, Roger Bacon's overall conception affected his attitude towards language learning, usage, and teaching. He did penetrate and know how to keep asunder the substantial literation of Latin proper and the derivational transliterations of Latinized Indo-European languages. Yet, he failed to grasp the fundamentals of the Semitic language branch and the deep structure of Hebrew. Instead, he put the adopted surface structures of Hebraifying transliterations on a level with genuine literations of Hebrew.

Bacon's idea of a uniform "Hebrew" written or spoken at various places and in various times practically covered both literacy and orality. As a consequence of his empiricist views and methods of research, his conception of "Hebrew" presupposed some *koine* with an omnipresence and interchangeability among all Jews as perfect transmitters and informants of identical language characteristics. His "Hebrew" merged all sorts of Jewish information on Hebrew letter-names into the two polyglot alphabets. Insular post-Anglo-Norman Conquest Jews of Ashkenazic or Sephardic provenance, Tsarphatic or Judaeo-Northern-French informants including the Old- or Middle-High-German- and proto-Yiddish-speaking representatives of the Rabbinic interchange with the Rhineland, Hebrew native speakers from the Holy Land and the adjacent Oriental countries in the Age of Crusades would all serve without differentiation or exception as heralds of the Hebrew-language world.[29] In the linguistically blurred relief of the Northern French catchment area and in a seemingly uniform shape of partly Hebrew and partly Hebraified letters, a mixture of Latin, Romance, Semitic, and Germanic components must not discredit an otherwise closed system of the Hebrew alphabet. Upon detailed historical and mnemonic reconstruction, both the fragment of the *Cambridge Hebrew Grammar* and "Linguarum Cognitio" present a polyglot but substantially sound and well-structured "Hebrew" alphabet.

The conclusive evaluation of Roger Bacon's "Hebrew"-Latin alphabets demands a cautious interpretation of their various and polyglot facets. The complex, multilayered, and heterogeneous systems, subsystems, schemes, mnemonics, and items gathered from correct as well as from incorrect sources blur the path of the friar's studies and knowledge of "Hebrew." If a combination of causal logic and inductive reasoning or speculation can make a contribution to methodology and philology, a string of facts, concatenations, arguments, and conclusions can help to construe the historical evolution and relative chronology of the two polyglot alphabets.

The scribe of the two-line "Hebrew" macroalphabet in the fragment of the *Cambridge Hebrew Grammar* misconstrued and miscopied the *connexiones* or subsets of the Hebrew alphabet. Roger Bacon took no visible pains to correct the confusion in the manuscript. The Latin terminology and transliteration of the sound-values look rather conventional, elementary, rule-and-school-abiding, dependent, and narrow in source and ideas. As a whole, the draft lacks critical perspicacity and competence; it mirrors a receptive and imperfect knowledge of Hebrew in an earlier composition. The three-line "Hebrew" micro- and macroalphabet in "Linguarum Cognitio"

arranges the *connexiones* in their consistent "Hebrew"-Latin duplication, specifies the letter-names by means of the Norman-French or Anglo-Norman diacritics, and adds the final letter-shapes of the KaMNaPeTS consonants. Author and scribe realize the allophonic sounds of K and P. With all its traces of a mixed provenance and composition, the polyglot "Hebrew" alphabet in the "Linguarum Cognitio" version signalizes critical perspicacity and competence; it looks more substantiated, supplemented, and elaborated thanks to comparison and circumspection. The presentation betrays a more comprehensive, advanced, considerate, and perfect state of language acquisition and cognition in a later composition. Judging by the objective potential and possibilities of the late thirteenth century, Roger Bacon's subjective achievement certainly deserves no blame but high praise.[30]

NOTES

[1] For critical editions of Roger Bacon's texts, see John Sherron Brewer, ed., *Fr. Rogeri Bacon Opera Quaedam Hactenus Inedita I*, Rerum Britannicarum Medii Aevi Scriptores (Rolls Series) 15, London, 1859, rpt. Wiesbaden, 1965; John Henry Bridges, ed., *The 'Opus Majus' of Roger Bacon III*, [1893], rpt. Frankfurt/Main, 1964; Edmond Nolan and S.A. Hirsch, eds., *The Greek Grammar of Roger Bacon and a Fragment of His Hebrew Grammar*, Cambridge, 1902.

[2] Brewer, ed. cit., 65–66: ". . . in linguarum cognitione sunt tria; scilicet ut homo sciat legere et intelligere ea, quae Latini tractant in expositione theologiae et philosophiae et linguae Latinae. Et hoc est facile . . . Sed aliud est . . . quod sciat transferre . . . Tertium vero est difficilius utroque, scilicet quod homo loquatur linguam alienam sicut suam; et doceat, et praedicet, et peroret quaecumque, sicut in lingua materna." For explanatory and supplementary comments, see S.A. Hirsch, "Roger Bacon and Philology," in A.G. Little, ed., *Roger Bacon: Essays Contributed by Various Writers on the Occasion of the Commemoration of the Seventh Centenary of His Birth*, Oxford, 1914, 101–51: 102, 115–16, 139; A.G. Little, "Roger Bacon," Annual Lecture on a Master Mind, *Proceedings of the British Academy 1928*, rpt. Nendeln (Liechtenstein), 1977, 265–96. Roger Bacon does not mention the three-month period assigned for learning the Hebrew alphabet at a *heder* or elementary school.

[3] For the contributions to the Mediaeval Studies symposium at Cologne, see Paul Wilpert, ed., *Judentum im Mittelalter: Beiträge zum christlich-jüdischen Gespräch*, Miscellanea Mediaevalia: Veröffentlichungen des Thomas-Instituts an der Universität Köln 4, Berlin, 1966.

[4] Matthias Thiel, *Grundlagen und Gestalt der Hebräischkenntnisse des frühen Mittelalters*, Biblioteca degli Studi Medievali 4, Spoleto, 1973.

[5] Hans H. Wellisch, *The Conversion of Scripts: Its Nature, History, and Utilization*, Information Sciences Series, New York, 1978.

[6] Sarah Larratt Keefer and David R. Burrows, "Hebrew and the *Hebraicum* in Late Anglo-Saxon England," *Anglo-Saxon England* 19, Cambridge, 1990, 67–80.

[7] For praise and blame, see Bridges, ed. cit., ix; Nolan and Hirsch, ed. cit., 201 and 205 note 5; Hirsch, in Little, ed. cit., 142–51; Wellisch, op. cit., 157 notes 38 and 39.

[8] Solomon A. Birnbaum, *Yiddish: A Survey and a Grammar*, Manchester, 1979, 107 note 2.

[9] For mediaeval Hebrew studies as well as for the insular state of research and knowledge, see Wilhelm Bacher, *Die Anfänge der hebräischen Grammatik* and *Die hebräische Sprachwissenschaft vom 10. bis zum 16. Jahrhundert*, enlarged by *Bibliographie der Schriften Wilhelm Bachers* compiled by Ludwig Blau, Amsterdam Studies in the Theory and History of Linguistic Science, Series III: Studies in the History of Linguistics 4, Amsterdam, 1974; H.P. Palmer, "The Jews in England in Medieval Times," *London Quarterly Review* 155 (1931): 226–38; E.F. Sutcliffe S.J., "The Venerable Bede's Knowledge of Hebrew († A.D. 735)," *Biblica* 16 (1935): 300–06; Jacob R. Marcus, *The Jew in the Medieval World: A Source Book 315–1791*, Westport, CT, 1938, rpt. 1975; Montagu Frank Modder, *The Jew in the Literature of England to the End of the Nineteenth Century*, New York and London, 1960; Charles Singer, "Hebrew Scholarship in the Middle Ages among Latin Christians," in Edwyn R. Bevan and Charles Singer, eds., *The Legacy of Israel*, Oxford, 1969, 299–304; H. Michelson, *The Jew in Early English Literature*, New York, 1972; Richard Dobson, *The Jews of Medieval York and the Massacre of 1190*, York, 1974; Cecil Roth, *History of the Jews in England*, 3rd ed., Oxford, 1978; Haim Hillel Ben-Sasson, *Geschichte des Jüdischen Volkes*, Volume 2: *Vom 7. bis zum 17. Jahrhundert: Das Mittelalter*, München, 1979; Keefer and Burrows, op. cit.; Robin R. Mundill, "English Medieval Ashkenazim-Literature and Progress," *Aschkenas* 1 (1991): 203–10; Robert C. Stacey, "The Conversion of Jews to Christianity in Thirteenth-Century England," *Speculum* 67 (1992): 263–83.

[10] For a detailed discussion of the Donatist and Priscianic canon of Latin grammar, see "*Nomen* and *Potestas* of Medieval Letters," in A.M. Simon-Vandenbergen, ed., *Studies in Honour of René Derolez*, Gent, 1987, 684–708. For the mediaeval setting and potential of Hebrew studies, see "Roger Bacon und das 'hebräische' Alphabet," *Aschkenas* 2 (1992): 15-48 and "Roger Bacon and Phonetic Transliteration," *Folia Linguistica Historica* 12 (1992): 57–87.

[11] Nolan and Hirsch, ed. cit., 202.

[12] Bridges, ed. cit., 91.

[13] Reproduced from MS. Vat. Lat. 4086, f. 15v by kind permission of the Biblioteca Apostolica Vaticana, Città del Vaticano, dated 16 May 1989.

[14] Reproduced from Hans H. Wellisch, *The Conversion of Scripts: Its Nature, History, and Utilization*, Information Sciences Series, New York, 1978, p. 156 by kind permission of John Wiley & Sons, Inc., New York, dated 5 March 1992.

[15] Reproduced from Edmond Nolan and S.A. Hirsch, eds., *The Greek Grammar of Roger Bacon and a Fragment of His Hebrew Grammar*, Cambridge, 1902, p. 202.

[16] For the complete Latin microalphabet and pansystem as conventionalized and internalized in Romania, see page 165 above.

[17] Reproduced from the triglottal chart of the Latin, Greek, and Hebrew alphabets in *Byrhtferth's Manual* (A.D. 1011), now edited for the first time from MS. Ashmole 328 in the Bodleian Library by S.J. Crawford, EETS o.s. 177, Oxford, 1929, rpt. 1966, p. [196A].

[18] For the Second or Old High German Consonant Shift, see Stefan Sonderegger, *Althochdeutsche Sprache und Literatur*, Sammlung Göschen 8005, Berlin, 1974, 29–32; Jechiel Bin-Nun, *Jiddisch und die deutschen Mundarten*, Tübingen, 1973, 78; Herbert Penzl, *Vom Urgermanischen zum Neuhochdeutschen*, Grundlagen der Germanistik 16, Berlin, 1975, 79–83; Aleksander Szulc, *Historische Phonologie des Deutschen*, Sprachstrukturen A: Historische Sprachstrukturen 6, Tübingen, 1987, 94–103.

[19] For the Talmudic mnemonicon SaSSaTSaReSH in the anonymous *Sepher Yetsirah*, see Bacher, op. cit., 21; for the transposed mnemonicon SaSSaSHaReTS, see

William Chomsky, ed., *David Kimḥi's Hebrew Grammar (Mikhlol) Systematically Presented and Critically Annotated*, New York, 1952, 11.

[20] Birnbaum, op. cit., 150 and note 2: "The letter šin/sîn stands for [s], a spelling that survived into the nineteenth century. It was inherited from Zarphatic" (original in italics). "Medieval French had no [ʃ], the modern *ch* was then still [tʃ], so no šin was needed in the Zarphatic spelling system." For the adaptation of the Hebrew alphabet to the phonological structure of German and for the demands of Yiddish and the superfluous letters respectively, see Bin-Nun, op. cit., 125.

[21] For Latin communication in both Romania and Germania, see Max Hermann Jellinek, *Über Aussprache des Lateinischen und deutsche Buchstabennamen*, Sitzungsberichte der Akademie der Wissenschaften in Wien: Philosophisch-Historische Klasse 212:2, Wien and Leipzig, 1930, 3–66: 17.

[22] For the Talmudic and Rabbinic studies at the Rhenish cultural centres, for the ben Meir and Kalonymide families at Speyer, Worms, and Mainz, for Gershom ben Yehuda's *yeshiva* at Mainz, and for Rashi's Talmudic Academy at Troyes, see Moritz Güdemann, *Geschichte des Erziehungswesens und der Cultur der abendländischen Juden während des Mittelalters und der neueren Zeit*, Wien, 1880, rpt. Amsterdam, 1966, "X.–XIV. Jahrhundert," 178–98: 114; Gershom Scholem, "Jüdische Mystik in West-Europa im 12. und 13. Jahrhundert," in Wilpert, ed. cit., 37–54: 39, 45; Herman Hailperin, *Rashi and the Christian Scholars*, Pittsburgh, 1963.

[23] For Meir ben Barukh of Rothenburg's Talmudic studies, his high esteem in scholarly circles, his *Vademecum*, and for the Franco-German lexis in twelfth- and thirteenth-century exegesis, see Güdemann, op. cit., 114 and 170; Colette Sirat, "Le Vademecum d'un rabbin allemand du xiiiᵉ siècle," in Wilpert, ed. cit., 92–98: 92–93.

[24] Sirat, loc. cit., 94.

[25] Birnbaum, op. cit., 33: "The regions which today form northern France were called by the Jews *Tsarfat* (a town mentioned in the Bible, English *Zarephat*), hence my name Zarphatic for the language of the Jewish community in northern France and for their type of Hebrew script. From here some migrated eastward to those parts of the German speech territory which are now its west-central and southern regions."

[26] For the Zarphatim as the immediate ancestors of the Ashkenazim, see Birnbaum, op. cit., 58, 115, 118–19.

[27] For the Romance, Judaeo-Latin/Zarphatic, and Old French influences upon proto-Yiddish and Yiddish, see Max Hermann Jellinek, *Über Aussprache des Lateinischen und deutsche Buchstabennamen*, Sitzungsberichte der Akademie der Wissenschaften in Wien: Philosophisch-Historische Klasse 212:2, Wien and Leipzig, 1930, 3–66; Raphael Levy, "The Background and the Significance of Judeo-French," *Modern Philology* 45 (1947): 1–7; Birnbaum, op. cit., 56, 58, 67; Leo Fuks, "The Romance Elements in Old Yiddish," in Dovid Katz, ed., *Origins of the Yiddish Language*, Winter Studies in Yiddish 1, Papers from the First Annual Oxford Winter Symposium in Yiddish Language and Literature, 15–17 December 1985, Oxford, 1987, 23–25; Paul Wexler, *Three Heirs to a Judeo-Latin Legacy: Judeo-Ibero-Romance, Yiddish and Rotwelsch*, Mediterranean Language and Culture Monograph Series 3, Wiesbaden, 1988; Franz J. Beranek, *Westjiddischer Sprachatlas*, Marburg, 1965; Jechiel Bin-Nun, *Jiddisch und die deutschen Mundarten*, Tübingen, 1973; Dovid Katz, "Hebrew, Aramaic and the Rise of Yiddish," in J.A. Fishman, ed., *Readings in the Sociology of Jewish Languages*, Leiden, 1985, 85–103; Dovid Katz, "Preface" and "The Proto Dialectology of Ashkenaz," in Katz, ed. cit., 1–5 and 47–60; Solomon A. Birnbaum, "Two Methods," in Katz, ed. cit., 7–14; Alice Faber, "A Tangled Web: Whole Hebrew and Ashkenazic Origins," in Katz,

ed. cit., 15–22; Nathan Susskind, "A Partisan History of Yiddish," in Katz, ed. cit., 127–34; Erika Timm, *Graphische und phonische Struktur des Westjiddischen unter besonderer Berücksichtigung der Zeit um 1600*, Hermaea: Germanistische Forschungen, Neue Folge 52, Tübingen, 1987; Josef Weissberg, *Jiddisch: Eine Einführung*, Germanistische Lehrbuchsammlung 27, Bern, 1988; Marvin I. Herzog et alii, *The Language and Culture Atlas of Ashkenazic Jewry*, Volume I: *Historical and Theoretical Foundations*, Tübingen, 1992.

[28] Birnbaum, op. cit., 67. For the minimal changes in the insular type of Zarphatic script during the short period between the Anglo-Norman Conquest (1066) and the expulsion of Jews from England (1290), see Solomon A. Birnbaum, *The Hebrew Scripts 1: The Text*, Leiden, 1971, 296.

[29] For Roger Bacon's view and definition of Jewish informants, see Brewer, ed. cit., 434: "Doctores autem non desunt; quia ubique sunt Hebraei, et eorum lingua est eadem in substantia cum Arabica et Chaldaea, licet in modo differant. Suntque homines Parisius, et in Francia, et ulterius in omnibus regionibus, qui de his sciunt quantum necesse fuerit in hac parte." For the generic term *moderni Iudei* in his fragment of the *Cambridge Hebrew Grammar*, covering all sorts of Jewish authorities and informants, see Nolan and Hirsch, ed. cit., 204. With regard to Bacon's particular preference for empirical analysis, induction, and cognition, see Wellisch, op. cit., 155 and 158–59 respectively: ". . . perhaps the first modern scientist, preferring firsthand knowledge and experiment to mere bookish wisdom and scholastic disputations on the writings of Aristotle . . . " and "Bacon's work must be considered the beginning of the systematic transliteration schemes for non-Roman alphabets. He designed definite phonetic values to each letter, based on the actual pronunciation by native speakers of the languages and on a thorough knowledge of their grammar and syntax."

[30] The present writer wishes to acknowledge the constructive criticism as well as the encouragement received from Professor Joseph Geiger and Professor Edward A. Levenston on the occasion of reading the draft version "Roger Bacon and the 'Hebrew' Alphabet" at the Institute of Languages, Literature and Art of the Hebrew University of Jerusalem on 27 March 1988. Further thanks go to Professors Paul Clogan, James E. Cross, Hans-Jürgen Diller, John Finlayson, Johan Gerritsen, Stanley S. Hussey, Ian Kirby, Conrad Lindberg, Saara Nevanlinna, Florence Ridley, Beryl Rowland, Richard J. Schoeck, Douglas Wurtele, and Arne Zettersten as discussants inside and outside the lecture-room at Ottawa on 1 August 1992.

[Note: The Hebrew font contained in this article is typeset in Joel Hoffman's hclassic font.]

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