Full text of "Voynich Manuscript: An Elegant Enigma"

The Voynich Manuscript:
An Elegant Enigma

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Fail Georfe G. Meade. Maryland

jJsTrZ Ul r Z\‘, COm iTl ‘ nd ? 4k ' S " * ran ' tht inclusion. but Jots nor make rbt conclusion c

eZJ.Z TtZ/° ”7 "* "* ° n ,ht ,nUut,on °f tnah - ***** **>* ***** discovers „ by rbt path of

experience Therefore reasoning Joes not suffice, but experience Joes.

Roger Bacon. Opus M*|us (Burke ■

I

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Foreword

The history of my connection with the Voynich manuscript is as follows: in 1951 Mr. William F. Fri
me to che manuscript and 1 spent my spare time in studying the combinations of the most com monk o
wrote a report of my work for Mr. Friedman, I should mention that che only parr of the manuscript
me at the time was the rwenty pages at the end which contain no illustrations. In fan he deli bera
control — he told me nothing other than the information about the manuscript contained in the book
Bacon by Newbold. On the strength of this study \ came to the rather definite conclusion that the
arrived at merely by the substitution of single symbols for lecrers whatever the language involved

Subsequently about twelve yean ago I read a paper to the Bain more Bibliophiles covering the histo
and some of the attempts to decipher it. This paper, almost unaltered, was printed in an internal

In the fall of 1975 I read a paper on the subject to a group of colleagues. As this occasion was r
within the organuation. it attracted quite a large audience and the attention of some of those who
study of the manuscript

From the time when Mr. Friedman s health began to fail* 1 have acted as a sort of unofficial coord
some of the people who have been working on the problem, and when Miss Mary Dlmperio told me of he
suggested that she should assume this respomibility.

She has written a far more comprehensive and more scholarly survey of the problem rhan mine and ir
become the definitive background of future work in this field.

To mv knowledge rhere have been three rather extensive analyses of the script of che manuscript, b
me, and by Captain Prescott Currier. Of these, I believe Captain Currier s to be far the most comp
reached similar conclusions at any rate in some aspens, and I find myself quite unable to accept a
it takes account of these analyses.

John H. Tiirman
24 November L9^6

Vll

Introduction

The reader may well wonder. "Why still another paper on the Voynich manuscript/" So much has been on that most studied, most curious, and most mysterious manuscript upon which so many researchers faculties in vain. Perhaps a few words of explanation might be useful in setting the stage for the motivation for this monograph.

As a relatively recent newcomer to the ranks of Vovnich manuscript students. 1 have unwittingly re mv predecessors, rediscovering their sources, repeating their experiments, growing excited over th excited them, and learning onlv later that all these things had already been tried and had failed, no wish to impiv that I regret any of my efforts. In fact, I little suspected, when I was first in Voynich manuscript at Brigadier Tilcmans lecture in November 1975, that I would spend ail mv spare vear on an intellectual and spinrual journey spanning so many centuries and ranging over so many a philosophy, and philology, I have thoroughly enjoyed every moment of mv investigations, and would price.

The fact remains that, in spite of all the papers that others have written aboui the manuscript, t no compete survey of all the approaches, ideas, background information and analytic studies that h nearly fitfv-five rears since the manuscript was discovered by Wilfrid M Vovnich in 1912. Most of written either to advance or to refute a particular theory, providing in passing a brief glance at sweep rhem out of the way. Some presentations provide good treatments of some aspects of the probl Voynich 4 1921), Newbold (1928), Tiltman (19681. and Krischcr f 1969K Much vital information, howe only in unpublished notes and papers inaccessible to most students. I have felt that it would be u information I could obtain from all the sources I have examined, and to present it in an orderly f resulting survey will provide a firm basis upon which ocher students may build their work, whether text or simply to learn more about the problem.

This monograph will be arranged in four mam sections. First I will present a survtv of alt the bas the givens r . u it were. Second, 1 will try to cover all the pnmarv avenues of attack and the inf the external characteristics of the manuscript itself, the drawings, and the text. Third. I will s decipherment and other substantial analytic work carried out by various researchers. Fourth. 1 wil collateral and background topics which seem likely io be useful. An extensive bibliography is incl papers on the Vovnich manuscript itself and on a variety of related topics.

1 wish to express my appreciation for the generous aid of John H. Tillman, without whose encourage graph would never have been completed. I wish also to thank Stuart Buck. Edwm S. Spiegelrhal. and who proofread my manuscript and offered many helpful mutisms and suggestions.

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Chapter 1

The Known Facts

l A The Manuscript As Found

It set ms important first of all to distinguish dearly between the givens — the incontrovertible t
of the manuscript— and the lush growth of conjecture that has accumulated around the few meagre ce
dear physical description of the codex itself is provided by several authors. The entry in the cat
(antiquarian bookdeaier and owner of the manuscript for a number of vears) provides an excellent*
figure 1 S. In brief, the mysterious manuscript consists -in a^amaU quarto volume, with leaves of
nine by six inches, some multiply folded. Most pages contain, in addition to copious text in the u
call the “Voynich script" throughout this paper), colored pictures of considerable variety, whose
conjecture. Most appear to represent plants, astrological or cosmological material, and pharmaceut
show human figures surrounded by bizarre objects in scenes of undetermined import. The text and dr
in considerable detail in Chapters 3 and 4.

The manuscript has no cover; the first page contains only four brief paragraphs of text without pi
apparent crude attempt at rubrication by means of enlarged and embellished initial characters in r
a few lines of writing near the top. in a different script or mixture of scripts than the bulk of
svmbols from the Voynich script, and a scattering of sketthv drawings of animals, people, and othe
the upper left corner. Some leaves in the body of the manuscript also contain jottings (largely il
apparently differing from the majority of the text. These atypical scraps of writing will be dealt

We have one other bit of concrete data to exploit: a letter, found between the pages of the manusc
Vovruch. Figure 2 shows this letter, and figure 3 provides its translation from Latin as prepared
bv him (1921, p. 27). The letter was written bv Joannas Marcus Marci in Prague to accompanv his gi
Athanasius Kircher, S. J., in Rome. The letter adds the following solid facts to our knowledge t'a
of Vovruch, which he describes in interesting detail in the work cited above) :

The manuscript was in the hands of Joann us Marcus Marci (A.D 1 595-1667 L official physician to E
of Bohemia (A. D. 1352-1612). in the vear 1665 or 1666.

It had previously been in the possession of one or more other persons, otherwise unidentified, pro
court of Rudolph II.

It passed from the possession of Marci to Athanasius Kircher in 1665 or 1666. and remained m his h
unknown period of time.

It had been sold to Rudolph by an unidentified person at in unstated time for the large sum of 600
information provided to Marci bv a Dr. Raphael Missowskv (A.D. 1580-1644), who was a familiar at t
Rudolph and his successors.

Another nugget of information was wrested from the enigmatic pages of the manuscript itself as a r
accident. A mishap during photographic reproduction of the manuscript revealed a partially erased
page. Examined under infra -red light* this signature was found to be "Jacobi 1 Tepenece”, that of
Voynich as jacobus Hordckv de Tepenecz (d. 1622), This man was director of Rudolph s botanical gar
laboratory' He did not acquire the patent of nobility with the title “de Tepenecz until after 1608
additional fact: the manuscript was in the hands of another familiar at Rudolph's court at some ti
1608 to 1622.

The last bit of concrete evidence we have is the place where the manuscript was found bv Voynich i
was kept secret for some years, in the expectation chat Vovnich might wish to return and purchase

was ultimate! v revealed to be the Villa Mondragonc, in Italy not far from Rome. The following is concerning Mondragone. gathered bv John Tiltman:

■A villa in Fraurau near Rome, buih bv Cardinal Aliemps jboui 1570, In I Pope Oregon Kill nued fro bulJ reforming the calendar. The villa apparently continued in the AUempi tamih. at in U>2() j Ure library to the Vatican Ltbrarv In 1B65 rhe vilL became a Jcimi College which iinallv Joscd in 1 Td

1

This. then, is all we realfv know for certain about the enigmatic codex: what observant students h itself, acid the letter that accompanied it when found. (So far as I can discover, no scientific s carried out on the inks, pigments, or parchment; and no attempt has been made to examine rhe pages hidden writing.) Upon this meagre foundation of fact, an imposing edifice of deduction and guesswo through creative research and persistent scholarship, first by Wilfrid Voynich, and then by a succ Later sections of this paper will deal in fuller detail with that conjectures, manv of which seem value ro future students of the manuscript.

L2 The Knoum History of the Manuscript

A set of solid bench marks can be assembled from the sources described above, and summarized as fo

The manuscript was in the hands of some unknown person who brought ir ro Rudolph's court some time

It was in the possession of Jacobus de Tepenecz for some time after 1608 and before his death in 1

It was held for some time by another person, unidentified, who willed it to Joannus Marcus Marci s or 1666.

ft was sent by Mara from Prague, during 1665 or 1 666. ro his old teacher. Athanasius Kirrher. in

It did not tfr n reenter recorded history until it was discovered bv Wilfrid Voynich at the Villa lealv in 1912.

After the death of Vovtuch m 1930. the manuscript remained in the estate of his widow (author of a Tbt Gadfly, which enjoyed great popularity in the Soviet Union). Mrs. Vovnich died in July I960. M friend and companion of Mrs. Voynich over many years, was co-owner of the manuscript

It was purchased on July 12* 1961. by Hans P Kraus, New York antiquarian bookseller, for 524,500

Kraus valued the manuscript at $ 100,000, and later at 5 1 60,000; he tried repeatedly to find a b Finally, in 1960. he presented it to the Bcinecke Rare Book Library of Yale University, where it n manuscript 408, and valued at $125,000 ro $500,000. according to different sources. (Information c history of the manuscript was obtained from Tiltman 1968 and from unpublished notes kept bv Miss N Mr. and Mrs. Voynich J

Chapter 2

Avenues of Attack on the Problem: A Survey

In this chapter 1 will attempt to cover as much as possible of the great variety of conjecture, re investigation chat has been carried out by a wide range of scholars, from Voynich down to rhose of arranged this material under a selection of topics relating to important characteristics of the ma date, original language, authorship. etc.L which have excited the curiosity and exercised the inge students. I can lay claim to a knowledge of only a small part of the work that mav now be in progr done in the recent past; many people have undoubtedly carried on their work alone, and their ideas known only to their immediate colleagues and* acquaintances. Anv dav now. a new announcement of su upon the world from one of these students. 1 hope that the present summary, however incomplete, ma together more information about (he manuscript and its researchers than has hitherto been availabl

2J Conjectures Concerning the History of the Manuscript

Soon after his discoverv of the manuscript, Vovmth undertook j verv competent und thorough investi He turned up a wealth of interesting data, and succeeded in piecing together a plausible sequence the blank spots between the known benchmarks. He traced che origin of the manuscript to Roger Baco learned Franciscan scholar and philosopher, renowned in later times for his occult powers. Of Roge be said below (see Sections 2,2.2* 3.1 and Chapter 7), Voynich stated that he had fastened upon Ba candidate for authorship by a process of elimination, assuming, as he did. a thirteenth cemurv dat before he saw the letter from Marci mentioning che similar belief held by someone at the court of statement of his reasoning while examining the manuscript at the castle where he found it is worth

Evtn a nett'Uirih' brifl nifniiuiiiin til che velium upon which tt wai written, the callifriphi. t me u the date of in origin the Utter part of the thirteenth tenturv The drjwingi indicated n tn be ophv. 1 tosuJv cunudereo the question of puuibk. authorship of the work ind the mmci of onh two th have written un such i vanetv of utbiem occurred to me: first, Albertus MagfiLts. whom t at once e hu ccciesiajtica] and political pminon was such chat it could not have been neceuirv for hi tn to second I v. the Franciscan Friar, ftoprtr Bacon, an infinite iv greater scholar, who had been pers scientific discover'd had been mtvepresented as black magic. Moreover, for mans rears he had been and he himjcif referred in his works to the ncceuirv of hidmje his great secrets in cipher | 1021

Vovmch continues, relating his discovery of the Marri letter as follows:

It was not until some omc after the manuscript came into mv hands chic 1 read che document bearing was attached to the front cover. Because of tts Uie due l had regarded it at of no consequence, a examination of che rninuscnpt ‘ |P 416.|

He must have been gratified indeed to find his conjectural attribution of the manuscript to Bacon corroborated.

Next. Vovmch turned his attention to teasing as much additional information as he could from the f uncovered a quantity of fascinating detail concerning the personages mentioned in the letter and o been associated with the manuscript, many of them familiars of Rudolph 11 and members of his court Rudolph, the scientific and pseudo- scientific movements that grew up around him* and the astonish spies, charlatans, and other flamboyant personalities that converged upon Prague during Rudolph's valuable area for study. The work published on this topic by Bolton (1904) is quite out of date, a fails to do justice to the subject in the light of today's scholarship. Evans (1973) provides a de on Rudolph and the elaborate and interesting culture surrounding hts court. Evans makes a untaiiii Voynich manuscript, but docs not add anything to our knowledge of its origin.

Here, in brief, is my chronological outline of the hypotheses Voynich put forward to fill the gaps the manuscript, and to suggest further lines of investigation to complete the picture (all informa from Vovmch 1921).

Latter half of the thirteenth centurv. The manuscript was penned by Roger Bacon, as a record of hi
sctence or magic.

– 1538.' The manuscript rested in some monastic library m England until the dissolution of the rel
time of the Reformation; this destruction began in 1538.

– 1547? Many Bacon manuscripts (some say mi many as 1200 all told) were collected bv Dr. John Dee,
mathematician and astrologer (of whom more will be said below in Chapter 8) He obtained these. Voy
through his association with John Dudley. Duke of Northumberland, who amassed a large fortune thro
spoliation of religious houses during the Reformation. Our manuscript could have come into Dee's h
according to Vovnich. While it was in Dee s possession, he made vigorous attempts to decipher it.
a much later letter (dated 1675) quoting Arthur Dee. John Dee's son. to the effect that he had see
much time over a book “all in hieroglyphicks" (on this matter, see also Section 8.9 below),

1584-1586. John Dec, failing in his attempts to decipher it. carried the manuscript to Prague on o
Rudolph's court between 1584 and 1588. It was, then, to Dee or someone representing him that Rudol
ducats which was his price for the manuscript. It was probably also Dec who convinced Rudolph or o
Roger Bacon's authorship; Dee was to a considerable degree obsessed with Bacon throughout a large
had a large pan in disseminating knowledge of Bacons work and refurbishing the reputation of the t
condemned bv tht Church and his contemporaries to centuries of neglect. Dee even claimed to be a d
(whose real name. Dee claimed, had been “David Dee" and nor Roger Bacon at all).

–*1608? Rudolph made various artempts to get the manuscript decrypted by his stable of scholars an
endeavor, he may have committed the manuscript, for working purposes, into the keeping of Jacobus
name was written on it, and who may have kept it after Rudolph’s abdication in 161 L and the subse
dissolution of the Emperor s extensive museum and collections. Since de T e pc n ecz was ennobled
written his name on the manuscript in the form we see before that date.

– 1622. de Tepenea died in 1622, and we have no evidence for the history of the manuscript between
appearance in the hands of its next known owner, Marri

– 1644? According to the Marri letter, the manuscript was in the possession of an unknown owner, m
Marci and Kircher. for some unknown period; indeed, it may have passed through several hands durin
have come into Marri's possession sometime before 1644, since Marri was able to discuss it with Dr
that vear. Voynich suggests fp 419) that "research into the Bohemian State Archives will lead to t
intimate friend of Marri and also of Kircher who had the manuscript between 1622 and 1 644.

– 1665/6. During the time between 1644 and 1665 or 1666. we are reasonably certain that the manusc
possession of Joannus Marcus Mara, and that it then passed into the hands of Athanasius Kircher. W
did with it while thev had it. we do not know.

– 1912. Vovnich savs, “mv own impression is that Kircher left the manuscript to someone at the cou
he had patrons and friends, and it probably remained in the possession of a member of the Farnese
manuscripts, it was removed to the collection in which 1 found it."' (p, 430.)

Later researchers have added only a few details to this chronology so ingeniously ferreted out by
(1975, p, 347) suggests that Kircher himself may have deposited the manuscript directly into the V

John Manly (1921b, p. 188) claims that “it is dear that Marri did not possess the manuscript in 16
Kircher in Rome", since he would naturally have given it to Kircher then. He alio reports that Mar
work entitled “Idearum Operatirium Idea", mentions as his mother-in-law one Laura, daughter of Dio
who became director of Rudolph’ s Imperial Museum. Manly implies that Misserone could have been th
who bequeathed the manuscript to Marri. Finally. Manly provides the interesting bit of information
Rudolph's payment for the manuscript, would be the equivalent of $14,000 in 1921. and he contribut
regarding de Tepenecz: this scientist was obliged to flee the country during disturbances that too
well have parted with the manuscript then, since it apparently remained in Prague.

Robert Steele, an eminent historian and Baconian scholar who has edited many of Roger Baton s work
1909-1940), concurs with Voynich in connecting the manuscript with John Dee. He says, “Mr. Voynich
right in his conjecture that it was sold by Dee to the Emperor Rudolph at the close of the six te
Roger Bacon, and that it was probably the book containing nothing but hieroglyphics' of which Dee'
Thos. Browne * (Steele 1928b, p 563.)

2.2 Authorship and Purpose

2*2,1 A Hoax, a Forgery, or Nonsense*

Mary students have had, at times, an uncomfortable suspicion that the mysterious codex upon which
effort had been spent might be a fabrication, its teat representing nothing meaningful or orderly
decipherment and transit non Wilfrid Voynich seems to have felt that the manuscript was unquestion
production of a thirteenth -century author, and specifically of Roger Bacon. Dr. Albert H. Carter
historian of the Armv Security Agency) states the opinion shared bv most students who have grapple
when he says. 'So much time and so much expense in vellum of excellent qualiry went into it. it ca
conceivably the work of a wealthy and learned, if deranged* person, but not a hoax” f 1946, p. I)
Tiltman, one of the most faithful and thoroughgoing of the manuscript s students, expresses his co
authenticity: "I do not believe the manuscript is completely meaningless, the ravings or doodlings
believe it is just a hoax — it is too elaborate and consistent for either. , . , About the worst t
forgery for gain. . . , I regard this as rather improbable- -.V <195 1 , p. 1 h

In a more recent presentation, Tiltman reiterates these judgements, refusing to accept suggestions
contains only “meaningless doodlings". He continues* "There is more sense to the idea that the wor
think is highly unlikely* especially if Captain Currier's ideas are correct " (Tiltman 1975 ; the
concern? his findings of multiple "hands” in the text, for which see Section 6.8 below.) Erwin Pa
of medirval and Renaissance studies, added ihe weight of bis learning to this view: 1 should like

that the Voynich manuscript, whichever its place of origin, date and purpose, is certainly a perfe
(1954. p 3). Finally, Elizabeth Fnedman, wife of William Friedman (prominent crvptologist and stud
manuscript) and a distinguished scholar and cryptologist in her own right, expresses a similar opi

competent to judge the manuscript . . . were — and still are — agreed that it is definitely not a
psychotic but is a homogeneous, creative work of a serious scholar who had something to convey " (

At least one recent researcher has spoken out in favor of an opposing view, stadng that the manusc
and may contain a considerable quantity of meaningless "dummy" text intended merely to fill it out
Robert Brumbaugh (1974, 1975, 1976) claims that the book was expressly and calculatedlv designed b
century opportunist in order to fool the Emperor Rudolph into parting with the large sum of monev

spend to obtain it. To this end, the text was provided with a wealth of apparently easy ''keys", a pherable material on the last page to convince Rudolph's experts that it would prove to be readabl a reasonable amount of effort. Faked "evidence" was also planted on the last page, according to Br secret book closely to Roger Bacon — that exciting and mysterious possessor of impressive scientif whom John Dee had been busilv raising interest to a fevered pitch at Rudolph's court.

In spite of all this, Brumbaugh shares the view that the manuscript is not totally meaningless. He underlying text . . , and sooner or later, by collaborative work* it will be read. There is no way it could be anything from a standard botany textbook to formulae for the Elixir of Life deriving f p. 354). Father Theodore C. Petersen, another dedicated long-term student of the manuscript who po background of learning in hiitory and philology, expresses his view thus: "There is agreement that manuscript obeys uniform rules which are constant and unchanging throughout the whole 246 extant q writing — indicating that the script contained an intelligible meaning for its writer" (1953. 1)-

Newbold, Feely, and Strong, the three other principal claimants (besides Brumbaugh) to some degree deciphering the manuscript, all accepted it as a genuine and serious production either of the thir ccnturv. William Friedman also, while not to my knowledge associating the manuscript with anv spec as a valid document with some content capable of being deciphered and read.

Some students of the manuscript, and others who disclaim any interest in it, have advanced the vie have no value for science or for the study of human thought. Tiltman. in his early report to Fried case imagine there is anything historically or scientifically important contained in the manuscrip of his deep and long -continued interest in the problem and his firm rejection of the theory that meaningless or fraudulent. Elizebeth Friedman indicates that the lack of serious interest in the m scholars was. on at least one occasion, a cause of disappointment to her husband in his research: many serious- minded academics, who are apt to scoff at the idea that its solution would be of anv learning — as did a great foundation to which Friedman once applied for a grant for the detailed s the opinion of the board, a solution would not advance human knowledge. The manuscript probably co board said." (1962)

J must confess that J cm see link justice m the reasoning of those academics' who dismiss the Vovn hand, after what cm onlv be the most superficial attention , Even if it is. in fact, a fabrication Rudolph 11. an under standing of who wrote it. its passage from one to another of Rudolph s famili tn the remarkable congeries of religious and political aco vines at Prague in those omes could pro the history of thought, it is not the intrinsic importance of a work that matters so much as its p events and meanings. If the manuscript is a compilation, however "deranged" or idiosyncratic, draw alchemical, or medical works, it his at least as much intrinsic interest and "scientific'' import thought as do other similar manuscripts which are readable, and concern onlv one topic (i.c.. they alchemical, or medical). Reputable scholars apparently see no wane of a me m studying plaintext ma and mav spend much of their lives so occupied

The Vovnich manuscript appears to be unusual in that n combines in one book at least four differrn apparently with some attempt to integrate them into a single system. If read, it could provide a h theory or doctrine interrelating all these disaplines, at least in the beliefs or practices of one even if the text is totally meaningless (a possibility that seems to me highly unlikely), a deciph manner per mining an understanding of the code, cipher, or other concealment system employed shoul for the history of crrptology. and perhaps also for the stud? of alphabets and writing interns. In finding that the manuscript was a hoax or a forgery: I might also accept the presence of a Large a text, to pad out the length of the document or to act as "cover'' text within which a shorter mess

however, see anv justification for dismissal of the manuscript as trivial or unworthy of careful a
assess its value for human knowledge onlv efier we have read it. or at least learned quite a lot m

2.2.2 Who Wrote It, and Why?

Roger Bacon (A.D. 12I4/-1292/) as Author. Voynich, as we have seen above, was certain of Bacon's a
the outlet. His reasoning, presented above (Section 2.1) need not be recapitulated here. William R
be decipher ol the secret book, maintained chat Bacon wrote it. as a diary of novel scientific res
Church. He intended the book, according to NewboJd. for his favorite pupil John, or for some other
providing the recipient with an oral key subsequently lost The first chapter of the book describin
presents an excellent sketch of Roger Bacon's life, writings, and thought, indicating that he had
the thirteenth -century friar and his works f 1928. pp. 1-28). J. Malcolm Bird (1921 J accepts New
the attribution to Bacon, in favor of which he provides a lengthy justification.

At least two other objective and painstaking researchers agree that there is no conclusive evidenc
authorship of the manuscript bv Bacon (whether it is in his autograph hand or represents a later c
Manly (prominent literary scholar who later refitted Newbold's solution) expressed his opinion thu
"That the manuscnpi is Bacon s. or even that it dates from the thirteenth century, cannot then be
evidence, but there is no evidence against this tradition, and the appearance of the manuscript it
189). Tikman concurs with this view: "There is as yet no solid evidence that the manuscript is not
copy of a work by him" (1968, p. 13). A number of prominent Baconian scholars accepted, indeed hai
Newbold's claim to have proven that Bacon was the aurhor (Canon 1929; Gilson 1928), For further di
question, see Chapter 7 below.

Roger Bacon Not the Author. Others are just emphatic in their rejection of Bacon either as the scr
anv comem in the manuscript. The objections of some revolve around their rejection of an earlv dat
apparent unwillingness to consider it as a later copy of Bacon s work. They ate opinions of expert
around J 300. and therefore much too late to have been a work by Bacon, or even likely to have bee
Bacon's works that have come down to us were made m the fourteenth and fifteenth centuries). Still
authorship not. apparently, in general, but specifically as a pan of their emphatic rejection of N
his attribution of the manuscript to Bacon, along with such impossibly anachronistic activities as
compound microscope and telescope, and their use to observe events within a frame of reference com
Bacon's times. Erwin Panofrky has slated flatly that "The Roger Bacon theory is in mv opinion at v
available facts and has been convincingly disproved bv Mr. Manly" (i.e„ in Manlv's articles demoli
theories) (1954. p. 2). Dr. Charles Singer, eminent historian of science, said in a letter to Tik
came to the conclusion that all suggestion of a knowledge of the microscope [again referring to Ne

was simph nonsense " Final I v. Lvnn Thorndike has. with characteristic emphasis, stated his opini
one chance in fifty char Roger Bacon had anv connection wirh the production of the Vovruch manuscr

Anthony Askham as Author. Dr. Leondl C Strong (whose claims to a decipherment of the manuscript ar
Section 5.} bebw). insisted that the author was a sixteen di-century physician named Anthonv Askha
had published several almanacs, astrological works, and an herbal. (Tiltman has ferreted out refer
as early printed books: see Askham I34Ba, 1548b, 1530. 1552, and 1553J Strong claimed, further, to
Askham s name on folio 93 of the manuscript No other student has accepted this theory, and Strong
the text have been emphatically re jeered

Other General Suggestions Regarding Authorship. Dr. Carter claimed id see evidence of "a copvist a

1 h He mentions duplication among the zodiac diagrams, there being in fact two leaves showing the
showing the Bull, Taurus, (These diagrams are, in actuality quite different when examined carefull
' duplications" arc onlv superficial; the pairing of diagrams for these two zodiac signs clearlv h
known only to the author of the manuscript J Xh. Singer, in a letter to Tiltman f 1 2 November, 19
that the origin of rhe manuscript was somehow related to Rudolph's court and to John Dee. While he
specify the nature of the connection, one gains the impression that he may have had in mind an ide
discussed above. Panofskv states the following view; "Mv idea always was that the manuscript was w
quack trying to impart what he considered secret knowledge to his son or heir" 1 1954. p 21,

2.3 Provenience and Underlying Language

England. Medieval Latin. Voynich, as we have seen* traced the manuscript to Roger Bacon, in the En
thirteenth century. He probably also, therefore, assumed the underlying '‘plaintext" to be the med
used by Bacon in all his surviving works. Newbold (1928, p. 44) also gives the manuscript an Engli
his opinion on “the judgement of experts" not further identified, based on the parchment, ink and
proposed decipherment produced a form of medieval Latin. The language which Feely fl 94 3) claime
the manuscript was also Latin, but in a system of abbreviated forms not considered acceptable bv o
unanimously rejected his readings of the text

England. Medieval English. Leonetl Strong (1945) maintained that he had deciphered rhe text as med
we will see in Section 5*3 below, other students have rejected his theory and the plaintext he pro
medieval English and as a correct decipherment of the Voynich text.

Unspecified European, Latin. Elizebeth Friedman (1962) states that her husband, William Friedman,
qualified experts that “the country of origin is definitely European; it might be England, France,
Germanv." She adds, further, that "the text is based upon a written language that is probably Lati
learned and scientific discourses of that period, but may be medieval English, French. Italian, or
seem to Leave us with a discouragingly wide choice, indicating that the ' experts" could fix upon
narrow the area of their search.

Italy. Hellmur Lehmann-Haupt. Bibliographical Consultant to H. P, Kraus (owner of the manuscript b
1969), suggested in a letter to John Tiltman dated I November, 1963 that Italy was a likely countr
"While both palcographicaJly and historically speaking, Italy is as likely i place of origin as an
there is no evidence that the manuscript must have been made in Venice, or elsewhere in Northern I
it comes from Central or Southern Italy is soil open, and this could very well mean exposure to th
that Arabic should be considered as a candidate for the underlying language. Robert Steele suggest
on the last page may be "perhaps in a North Italian hand" (1928b, p. 564). Brumbaugh draws evidenc
some of the drawings for his theory of a relatively late date and a European provenience. Thus, in
circular diagrams, he says "Sagittarius wears a Eft tenth -century Florentine archer s hat in his
retouched over the month name)" (1975. p. 349).

Germany or Eastern Europe. Charles Singer, in a letter to Tiltman dated 12 November, 1957, states
manuscript is "of Germanic origin", and "connected with John Dee and that sort of movement. " He g
statement of this view in another letter to Dr. G. M. J. Flemming, undated but obviously written a
‘The judgement that I formed upon the manuscript was that it was of the sixteenth century, of Sout
possibly related to Prague and John Dee." Singer also suggests that Czech. Polish, or some other E

I

language should be considered to underlie the teat. Fortunately for students of the manuscripts, w

sufficient! v burdensome, he considers Magyar "highlv unlikely."

Doth Singer (in the letter to Flemming) and Panofsky (1954. p. 2), mention a reading of some scatt
Last page as High German; this reading was proposed, apparently in a private communication, bv Ric
Kenyon College. Dr. Salomon suggests that a portion of the text in a mixture of scripts should be
o ', representing a medieval prescription meaning "(If such and such a condition prevails), then t
This ’"prescription”, which breaks off in mid -sentence, Salomon sees as continuous with the prece
suggests an interpretation in German also for the brief words found on folio 66t. near a figure of
if sick or dead, and surrounded by several ambiguous objects. He reads the text as "der muisteiJ",
endowment of a widow with household goods on her husband s death.

2.4 Date of Origin

Thirteenth or Fourteenth Centurv. Voynich (1921, p 415) assigned the manuscript to the latter half
century, as we have seen above. New bold stated thar in the judgement of experts.” a study of parc
drawings placed the manuscript in die thirteenth century. (1928. p. 44). Petersen says, "T agree w
juxtaposition of a herbal with (he kind of astrological tables found here indicates a fairly early
thirteenth centurv manuscripts of St. Hildegardt of Bingen show drawings illustrating the influenc
and elementary celestial forces upon the vegetative and animate life of the earth. The fourteenth
1906 has somewhat similar astronomical drawings' (1955, p 2). Steele provides the following intere
the benefit of his expen knowledge and personal familiarity with medieval manuscripts (and in part
Bacon): 'The usual methods of dating a manuscript (mil us. the writing cannot be placed, the vellu
thirteenth century, but not impossible, the ink is good. Only the drawings remain, and owing to th
style the difficulty of dating is but increased. It is strange that the draftsman should have so c
or Renaissance influence" (1928b, p. 565).

Fifteenth Century. Hugh O'Neill, a prominent American botanist, published an identification of cer
New World species: "The most startling identification. . was folio 93. which is quite plainly the
Helianthus Annuus L. Six botanists have agreed with me on this deter nu nation. This immediately r
when the seeds of this plant were brought to Europe for the first time (by Columbus on his return
Again folio 10 Iv shows a drawing which does not resemble any native European fruit, but suggests
genus strictly American in origin, known in Europe onlv after the above date. . , . It seems neces
manuscript as having been wrinen after 1493” (1944. p. 126) Other scholars, however, completely re
.identification of the sunflower and p ep p er plant, and ire as emphatic in their claim that none
manuscript are of New World origin. Helmut Lehmann- Haupt (bibliographical consultant to H. P. Kra
to Tiltman dated l November. 1963, that "there is a near agreement on the date of the CIPHER manus
little after, the vear l40G."

Sixteenth Century. Panofsky adds his voice to these suggesting a late date for the origin of the m
not for the sunflower [as identified by O'Neill] . . .1 should have thought that it was executed a
However, since the style of the drawings is fairly provincial, a somewhat later date, even the fir
century, would not seem to be excluded. I should not go lower than ea. 151 0–1320 because no influ
Renaissance style is evident. The above date is based on the character of the script, the style of
as are in evidence on certain pages, for example folio 72 recto | probably referring to the costum
representations]." (1954. p. 1). Eliaebeth Friedman states the consensus of expert opinion at the
"Paleographic experts agree that the nature of the drawings, the writing, the ink and vellum, etc.
manuscript is certainly of later origin than the thirteenth century. The female figures, for examp
characteristic of that period but are of a later, rotund, period. Some experts suggest that the pr
wrinen was 1500, plus or minus twenty years" (1962),

A. H. Carter reports the similar judgement of Miss Nil! (a friend of Mrs. Voynich who accompanied
examined the manuscript in (1946): "The style of the drawings, especially the conventions of the l

women, suggest to Miss Nili, quite properly, that the manuscript is far later than the thirteenth
There is nothing Gothic' or angular about them. They are fac and rotund and suggest in their style

realism of a later period. The coloring of the illustrations may well support a Uter date than the

P-»-

Among those agreeing on a sixteenth * century date for the manuscript is Dr. Charles Singer, who s
Tillman (12 November. 1957), "The date of the manuscript would* in my opinion* be somewhere in the
1320 or perhaps a little later. . . We hive already seen that he connects the origin of the manusc
Prague. Leonell Strong makes an interesting suggestion, that "The format and use of certain peculi
of the Italian d or di and eh respectively) are evidences that the author was probably familiar wi
Leonardo da Vino's 'Anatomy' (written about 1510)" (1945. p. 608)* Strong’s identification of Anth
author of the manuscript also leads him to place it in the sixteenth century, since Askham s known
from 1525 on.

Robert Brumbaugh presents perhaps the most detailed and specific evidence for a sixteenth -century

plain to me from the outset that this is not a thirteenth century 1 manuscript, and I doubted whet
experts ever had accepted it as an autograph. work by Roger Bacon. Detail after detail pointed to
than 1500. * , .Sagittarius wears a fifteenth -century Florentine archer s hat in his medallion (t
month name). A clock, tucked away in folio 85 l has a short hour and long minute hand* a style not
fifteenth century. . . Jn short, this manuscript is at earliest a compilation of about 1500" (1975
points Brumbaugh employs to bolster his argument depend upon his own decipherment and associated s
of the symbols with numerals* etc.; I have omirted these, retaining only his more objectively base
discussion of the "dock", see 33*6.)

Finally, Jeffrey Krischer obtained, in the course of his research, the opinions of a number of exp
concerning the date and provenience of the manuscript (see Section 6.7). He reports their judgemen

Profeuor G iki Cwutibk (proftwr of medieval history, Harvard University), in looking over ph«o«aij
roamacTipi as jiateemh century and iuggemd thir the script might be a form of private lanftiage mo
powerful document from the general public Science in this period represented: power and if one inu
plana and bdoficii and astrological phenomena, then dm line of reasoning u quite acceptable The da
in the sixteenth century by Mr Rodney Deimti (curator of manuscripts in Houghton Library of the Ha
identified the script to be m the ttyle of the sixteenth century immtnjif script, Another dating o
Laddert Dr Ludden determined the date « being m the period 1475 to 1 550 His mettiod of dating if
drawings; ihe features of the nude figures; the HvJiiation of the botanical drivings/ | Kmdier J 9

In consideration of this review of many pronouncements made by scholars and experts, I have made a
summarizing their opinions. Jc is crude* but it may aid the reader in bringing some order out of t
judgements that have accumulated over the years during which the mysterious manuscript has been st
shown below, I have arbitrarily assigned a score of "2" to such statements as "in the judgement of
consensus of opinion", and a score of " 1" to the opinion of a single writer, without attempting t
detail*

dates score

1250-1399 5

1400-1350 12

To mv mind, this summary of expert opinion does, in fact, lend considerable weight to a relatively manuscript.

Chapter 3

Avenues of Attack: The Drawings

3. 1 Relationship of the Drawings to the Text

If has been suggested bv some students* baffled and exasperated bv repeated, futile attempts to ma pictures as a wav of cribbing into the text* that there may be no necessary connection between the on any given page. The pictures, some have proposed, may be a "blind", introduced to mislead the w further conceal some dangerous secrets of a totally different character Most serious students of t certain, however, that text and pictures were drawn together and form a related whole. Eiixebech F example. "There can be no question that the same scribe wrote the text and made the drawings, as a would readily agree" { 1962).

Dr. A, H, Carter concurs in the above opinion: "Because the same ink and the same kind of penstrok illustrations and because the text forms an integral and unified pan of manv of the illustrations, same pc son wrote the text and drew the illustrations" f 1946. p. 1). Tikman feels that we have a belongs to the illustrations* "in the complete absence of evidence to the contrary" f 1968. p U) have studied the manuscript with care* the text seems to be intricately interwoven in and around t to have rendered a dose collaboration necessary between scribe and draftsman if they were, in fact cases, text strings are written on parts of pictures (for instance, as labels on the objects calle students in folios 99r and 102v2, and in the segment* and cells of the intricate diagrams on fohos astrological and cosmological drawings.

3*2 Nature and Characteristics of the Drawings

The impression made upon the modern viewer first coming upon a photocopv of the manuscript It he f most frequently met the eye of students), is one of extreme oddity, quaineness, and foreignness — unearthliness. To the reader who has seen pictures of more typical illuminated medieval manuscript different indeed from what he expects to find m such a book. For me. at least, after working with for some weeks* the initial impression of ' 'queerness" lost its prominence and gave wav to other, which mav be summed up as follows:

Homogencirv of Stvie. The drawings and text of the entire manuscript seem to me to form a consiste of one school or group of closely related persons if not of a single person.

Craftsmanship and Pragmatism. The scribe (or scribes) seems nor to have been motivated bv design o more than bv what we. today, would consider realism. Manv of the plant folios and some cosmologica 1 Iv, 16v. 33v* 41v* 49r, 68v2, 67 r 1 , 67r2, and 6Svl) present a stalwart, bold fehcitv of compo architectonic in its quality, and {to me) quite pleasing. The impression which I receive is emphat rather than art.

Structural Regularity. I gain a persistent impression of the presence of rules and relationships, own "logic”* however erratic and bizarre it might appear when compared to prescm*dav concepts. The forms in the script and its matter -of- fact, rather austere style all confirm this impression of construction in my mind. As 1 will try to show below, there appears to be a similar quality in the conventionalized forms are used almost as symbols and combined to build up more complex symbolic s this quality of const ructed ness," there is a persistent tectonic element of style in the drawing dimensional forms* symmetry, and connectedness of parts.

Idiosyncratic, Individual Quality. As has been noted by others, the manuscript seems to stand tota even remotely comparable documents. No one. to mv knowledge, has so far discovered anvthmg else at the viewer as a very strong and definite statement* completely independent of any known si vie or deliberate, designed production of an individual or a small group working alone. (This apparent is due simply to our failure to discover the other documents or philosophies related to it, but it se such parallels would have been recognized bv the many eminent medieval and Renaissance scholars wh

manuscript*. In Section 3-2-3 I will discuss some other manuscripts that have been mentioned as po Voynich manuscript.

The above ire my own impressions of the visual qualities of the manuscript; we will see bdow how s have reacted to it,

3*2* / Provenience and Style

Voynich communicates his impression of the contrast between this manuscript and the other, more tv manuscripts wuh which it was found: "It was such an ugly duckling compared with the other manuscri decora Dons in gold and colon, that my interest was aroused at once " (1921. p. 413 k Dr Carter pr description of the man user: pi, with considerable emphasis on the draftsmanship, pigments, and sr as follows: "The illustrations arc done with great care, not with attention to providing a pleasin attention to accuracy of detail. They arc, as Mns Mill pointed out. the kind of drawings that a sc himsdf. not illustrations designed to enhance the beauty of the book" f 1 946, p. Ik

Students disagree to some extent on the quality of the drawings as accurate portrayals of their ap There is also considerable disagreement in ot surprisingly) about their esthetic quality. To some, they seem clumsy, inept, and childish. An anonymous author in Scientific American takes a critical "These pictures are crudely drawn in by a person who obviously was somewhat lacking in artistic ab thirteenth -century scribe" (1921, p, 432)* Again, the same author expresses a similar opinion a f was not a great success as an artist, his efforts sometimes remind us of the crude outlines we pro draftsman what we want and how we want it" (p 439). Charles Singer, in his letter to John Tilunan. expresses a similar contempt for the represen cation* I and artistic quality of the plant pictures botanical at all but of the kind one makes when doodling or the children make of plants."

As will also be noted in the discussion of the script bdow (4.1,1), while many students have brief the drawings as a factor in their judgements concerning the date and provenience of the manuscript any real faro to back up their remarks beyond a vague reference to "experts" not further identifie Steele remarks, it is strange chat the draftsman should have so completely escaped all medieval an (1928b, p, 563). Carter { 1946) refers to the "rotundity" of the human figures and the lack of "Go for a date later than the thirteenth or fourteenth centuries. Panofsky (1934. p, 1) assesses the

provincial" : he also states that there is no evidence of influence from the Italian Renaissance s one has made or documented a really careful and systematic attempt to contrast and compare the sty manuscript drawings to other manuscripts of various origins and dates such as could answer some of

3*2*2 Pigments and Inks .

Dr. Carter provides a detailed description of the pigments. This deserves to be quoted in full, in length, since few students ever get to see the manuscript in any other form except black and white

Some of the colon appear to be colored ink or water color, tome a kind of era ton. and Kune an opa There are many colors, the ink i* pnd uroit brown, there it an amber. like ink. like Bfimh-tan lea blue mk or water cdor: an opaque aquamarine, a food stronje red. carmine rather thin scarlet or ve browns of the sunflower illustration are like those , only a little faded, of the Van Gogh sunflow red that looks like a bloodstain about a week old: a dirty green: an opaque green, a kind of green huts. intetuitY. value, and feature, a red that looks like (set rouge in color and tenure; a thick scrape wtth wt finger nail; a red ink iust tike ordmarT red ink today, a blue that qsarkks wuh any

Some of the colon are flowed on as wrth a brush: so me have left pigment-borded contours at where Some mar have been blotted (with doth?! Some were applied with strokes of the quill, and tome were blunt quill which had become furry on the end U a wooden stylus does after r ep ea ted use." | Gar

3.2*3 Relationships to Some Other Illustrated Manuscripts .

My sources have disappointingly little to sav on chu topic. One gams the impression, whether justl quality of the pictures and the difficulty of identifying with any certainty what they portray, ha familiar with more conventional medieval manuscripts to throw up their hands in disgust after the "herbal" pictures of complete plants and the astrological diagrams associated with recognizable zo

the most immediate promise tor comparisons ro other herbal or astrological drawings. Panofskv (19 problem as follows: "Manuscripts in plain Language remote lv comparable to the Vovnich manuscript least four kinds: first, herbals: second, cosmological and astrological treatises; third, medical the term, fourth, possibly, treatises on alchemy," He suggests that the mystical drawings of a thi Opicmus de Canistris. may be worth examining as comparable astrological and cosmological works. Fa p. 2). mentions the visionary writings and drawings of St, Hildegarde of Bingen as possibly compar the fourteenth -century Vatican manuscript 1906 as similar to some of the astronomical drawings,

Tihman states his considered opinion: "To the best of mv knowledge no one has been able to find an with am other medieval manuscript or early printed book. This h all the stranger because the range illustration on the subject of the plant world from the early Middle Ages right through into the s seventeenth centuries is verv limited indeed" i 1968. p. Ill, Elizebech Friedman expresses her own views when she states flativ, "So far as is known, there is no , . . kev or crib," (19621 (For th used bv cryptanalysts, a "crib " is a parallel or comparable text in a known language that can be unknown text as the three parallel inscriptions in different scripts on the Rosetta Stone were emp Egyptian hieroglyphs. A crib can also take the form of a guess as to the subjen matter, or individ found at certain places in an unknown text, 1

Opicmus de Camstris lA.D. 1296-ca 1336). R Salomon i 1936) describes the visionarv and mystical dr

monk an shows extensive illustrations of them. Born in Pavia, Italy. Opicmus had a difficult and u injured his head as a child, a mishap which mav have had a central part in the later episode of il recorded in the remarkable book of drawings studied bv Salomon. The draftsmanship is verv delicate artistic quality totally different from that of the Vovnich manuscript. The designs are extreme! v manv concentric circles, intersecting arcs and lines, and bands densely packed with tmv sets of nu them show careful! v -drawn human figures with well-drafted maps of the world and other, smaller h them or interlocking with their outlines.

Maps and architectural plans are a prominent feature of Opirinus' productions, as are Biblical sym standing for the Four Gospels, and the signs of the zodiac One drawing shows his entire autobiogra the year l 335 or 1336 (when he drew the pictures), all packed onto one page. They are all cioselv text, in verv tmv. near letters: the text is primarily about Opicmus himself (his feelings, his si events in his life, etc,) represented in symbolic wavs interwoven with religious symbolism and quo patristic writings The onlv real similarity to the Vovnich manuscript drawings is the encyclopedic manv disparate elements symbolically within a structural and semantic unit. The appearance and srv productions are totally at variance with these of our manuscript: Opicmus was a trained artist and produced an earlier book of beautiful architectural drawings of his native town. Pavia, as well as religious Tracts.

St. Hildegarde de Bingen f A.D, 1098-1 179). St. Hildegarde. abbess of a convenr in Germany, was g propheev and mystical vision. She produced several books describing and illustrating these visions causes and cures of disease. Her drawings appear considerably more like those in our manuscript on relatively provincial and crude." and have none of the delicacy and professional quality of Opicmu Hildegarde s drawings have some of the same symbolic, "constructed" quality as those in the Vovnic show rather different elements of content, however: animal heads and recognizable figures of Chris example. Some of the drawings appear ro have banks of ravs, clouds, or flames similar to those on folios.

There rs little or no text or labelling within anv of the illustrations I have seen of Hildegarde explicated in connected ten elsewhere in the books. Their symbolism, as explained there, is entire sun dike ball of flame represents Christ s burning love: three smaller stars above it are the T ri people preaching the Gospel or using words to do the work of the devil, etc.). The designs have a abstract quality similar to many Vovnich pictures, and some have similar arrangements of small cel bands around a circle. It is amusing to note, after all the pontifical ions of experts about rotun Gothic sttrle in the Vovnich manuscript, that Hildegarde s twelfth -century human figures are well plump, and lively. (For a good discussion of Hildcgarde's works and reproductions of manv drawings 1-58J

13

In spue of all the above pomes regarding general similarities. 1 cannot see anv reilltr close kins and those of the Voynich manuscript. The main import of the comparison with Opicinus and Hildegard demonstrate that such individualized, encyclopedic* symbolic works were by no means uncommon in th astrological manuscript (Vatican 1906) referred to by Petersen is not really very similar to the V ft refill study of the numerous illustrations of this and other simitar manuscripts (in Sax I 1915 parallels to the cosmological or astrological diagrams in our manuscript. Most such medieval astro human figures* figures of animals, and other clearly recognizable graphic elements which are much abstract style of the Voynich drawings.

33 Content oj Specific Classes of Drawings

At the risk of bonng some readers, I will go into the appearance of the drawings in some detail in paragraphs: for various reasons, it is not possible to reproduce many of these folios for inclusio description must suffice to convey some idea of their content to the reader who cannot obtain acce manuscript. None of the sources 1 have studied has accorded much attention to most of these diagra content in any way, excepting for a few passing mentions of details on this or that folio which so useful or suggei ve in connection with a particular theory of his own. Therefore, 1 hope the reade through the following somewhat length? discussion of individual drawings, and my attempt to come t specific content and detail. Figure 4 provides an overview and classification of the folios accord matter

33* l Herbal Drawings.

At first glance* the numerous illustrations of whole plants, usually accompanied by one or more pa to offer the best hope of a successful attack on the enigma. Other students have bent their effort relating some, at least, of these drawings to known plants of to illustrations in other herbais, w described as disappointingly vague and ambiguous. Elizabeth Friedman summarizes the most substanti attempts as follows: 'Although a well-known American botanist. Dr. Hugh O Neill, believes that he American plants in (he illustrations, no other scholar has corroborated this, all agreeing that no indigenous to America. Sixteen plants, however, have been indisputably identified as European by t Holm. The remainder are composite: i*e** the root system belongs to one plant, the stem system to flowers to still others. A few show imaginary root or flower structures*" (1962) Unfortunately* si appeared in a newspaper, there was no citation of the reference to Holms substantial discoveries; to turn up a published source for this information. Petersen appears to have obtained a detailed l from some source, and noted many of them on his transcript. In spite of Mrs. Friedman s emphatic a of Holm s findings* later writers such as Tiltman (1968, 1975) do not seem to accept them as any m O'Neill.

Many scholars seem to question O'Neills dramatic identification of the sunflower plant on folio 93 see good reasons* also* for questioning his "capsicum' or pepper-plant identification; the picture among the small* sketchy drawings arranged in rows near to a pharmaceutical jar"* possibly represe herbal mixture. (For a discussion of these "pharmaceutical' drawings* see Section 3-3-2 below.) Th pepper fruits could as easily be leaves, drawn according to the curious, blocky convention habitua the manuscript, to be discussed further below. This impression is supported by the fact that they red. The "pepper ' identification was exploited by Brumbaugh in his decipherment; he suggests chat pe pper" g r e en rather than red was a matter of deliberate concealment (1974* p. 546). Many stu identifying the plant pictures; they are probably the most closely -studied drawings m the manuscr identifications compiled by Petersen in his hand transcript includes identifications he attributes O'Neill* and Holm (Petersen 1966)*

At this point* I would like to pursue a brief digression concerning the idiosyncrasies of style in shown tn the herbal folios. For what they are worth. I will present my own subjective, and admitte the hope chat they mav stimulate others to examine these drawings more closely and reach their own parts frequently have a curious blocky, chunky, rough- hewn look* with platform-like structures su

defining a sharp change of plane. To mv eve. this characteristic convention causes some of the str

had been molded out of plastic: see, for example, the root crowns in folios 44v, 45r, 45v, 3 7v, 2 and manv others too numerous to list. They seem to be provided with one or several circular platfo inverted cones with flat, disk -like tops, from which the stems protrude, often encircled by a nag their point of emergence (see figures 5-7 for some typical details from these drawings).

An analogous structural peculiarity may be seen in the leaves of folios I5r 8 Sr, lOOr. 10iv2 (som pharmaceutical' rather than "herbal 1 ' drawings): they seem to end in similar platform -and -gask root structures of folios 3v. 22v, 45r, 45 v, 54v, 65r. and others, rubers are shown strung along block v arrangement, like sea ions of pipe fined together. In folio 53r, they even seem rectangula blocks (figures 5~7 show some examples of these forms). I cannot guess at the significance which m sive element of style, but an understanding of it may well be important in interpreting the drawin The same sryhstic convention is apparent in the "pipes," "tubes, 11 and cloudlike structures in th human figures (folios 75r and following) ,jo_ be, discussed more fully in 3*3.5 below,

A somewhat similar block v, rough appearance is seen in some herbal drawings in other manuscripts, copied over and over again from some much earlier source by successive scribes. This is the case, Anglo* Saxon medical manuscripts based on the drawings of Dioscorides. Illustrations I have seen o herbal artribured to Arnaidus of Vilianova, entitled "Traaatus de Virtutibus Her bar urn". have th some of :he Vovmch manuscript folios fcf also Tiltman 1968, figure 6). If, as this would imply, ou copies ac manv removes from some earlier source, we should still be able to recognize them bv thei the page and their struaure (number of stems, fruits or flowers, rough shape of leaves and roots. Tiltman pointed out (1968, p. II), the different sets of illustrations for earlv herbals were rela pictures were used again and again over many centuries by successive compilers,

I think, rather, that this angular quality is a feature of the scribe's personal srvle, and mav ev significance. It is executed quite boldly and uncompromisingly, and does not seem to be an uninten or clumsiness: the scribe definitely intended the plant parts to appear as he showed them. I offer draftsman of these pictures was more accustomed to, and interested in, making mechanical or struct illustrating natural objeas.

Another point should be raised here* concerning the presence of animals and human faces attached t the roots of some plants: for animals, see folios 25v, 49r; for faces, see 33r. 55v. 89rL Some roo appearance of animal or human bodies, with the main plant stem emerging where the neck would be: s 89vl (lions,*), and 46v (a bird with spread wings: an eagle/). Some roots resemble the foot or fee and toes (e,g,. 89rl). There are known parallels to this practice in a number of earlv herbals. Fr supposed to provide an antidote to or protenion from the bite of some venomous creature, the anima near the plane, almost as a mnemonic device to emphasize the association. The Vovmch manuscript ex similar purpose, except that in many cases the animal seems to be eating, hanging from, or burrowi happily to be a target for its ill effects. Perhaps the intent is horticultural, implying that the found with the plant, and feeds on it. Alternatively, and most probably (to mv mind), the meaning common in alchemical manuscripts. (For examples of animal forms, sec figures 8 and 9.]

The faces attached to some plant roots (see 33r, 89rl). and the suggestions of eves, horns, snout (see 38r. 28r, and figure 9 for examples), are considerably harder to explain. Tiltman (1968) cite barnacle goose and the mandrake, well known to all students of earlv herbals. Some such personific mingling of plant and animal life into one form, may be involved in the Voynich manuscript. The pl engender or nourish an animal, or to possess some animal or human qualities like those imputed to case, J would like to suggest that these two signal oddities — the curious sculptural modelling of of animal and human forms among plants parts — should receive more systematic study in comparison in known herbal and alchemical manuscripts (an interesting parallel in an alchemical manuscript da century will be noted in Section 8.8 below).

Another curious structural feature of manv plant folios is the rigidly and mechanically symmetrica
stems and leaves. For example, the stems rising from the root crowns in folios 5r, 22r, 35 v, 4Gr.
arrangement of the mam roots in folios 2r, Hr. 1 lv, I4r. 14v, 22v, 45 v. (and others) all exhibit
crossing one another or twining together in a curious knot- like manner (see figures 5 and 7). Lea
a rhythmically symmetrical pattern, for example in folios 3r, !3v, 22v. 29r. 4Lr, etc., which seem

Id

mechanical, in harmonv wirh the architectonic quality exhibited elsewhere. This qualm is present e
'(rum that grow from these strange molded -plasuc " plants; the flower on tulio 00 v 1, for exampl
metal spikes, rigidly fixed together; flowers in folios 3v. 6r. 56v. 90r2. and OOr look like the h
6s, (Again. some striking parallels will be mentioned in the alchemical manuscript discussed m Sec

3.3-2 Pharma cent tea l Dra wings.

The pages in this section of the manuscript show rows of small, sketchv plants or plant parts, whi
structure — roots or leaves—ai the expense of the remainder. Thev are so abbreviated as to appear
shorthand symbols referring to plants already illustrated more fully m ocher folios, or to plants
scribe and his colleagues. A determined effort bv several students to relate these sketches to the
verv successful, however.

The other salient feature of these pages is the presence of objects that have been said to resembl
drug containers. On some folios (e.g.. 99r and 1G2 v 2L the fars are ’labelled” with phrases or wo
unfortunately almost illegible in the photocopy at mv disposal because the pigment filling the bod
tends to obscure the writing. In other cases, a ‘ label" seems to appear near the jar which probab
recipe” it stands for. A similar "label” appears near each small plant sketch in the rows; it is h
which of several neighboring plants is means bv each 'label”. One or more paragraphs of text are p
of pictures. The jar u usually at the left margin of each such row, irremtibJv suggesting that the
used co make up the compound prescription symbolized bv that jar. The design of the* pars is verv
many fined cylindrical sections decorated bv geometric designs, fanev cm hellish menu around the e
elaborate hnials or handles on the top (some of the latter resembling, to the irreverent modern ev
an automobile hoodk see figure 15. The ornamentation and the "pipe -section* "structure is similar
cans + from which some figures emerge on astrological folios (see below, 3 3 31 and to some of the
structures in the folios featuring human figures isee 3*3-5 J.

3*33 Astrological and Astronomical Drawings,

Prominent among the drawings are a series of circular designs apparently clearly related to the mo
each provided with a central medallion showing a zodiac symbol A recognizable, if oddly-spelled. m
written in what most students agree is a different and later hand than that of the Vovnich script.
these month names. The page for January and February (Aquarius and Capricorn 1 is missing, having
the manuscript was found bv Voynich The srudent's first hope of gening anywhere through the known
months or zodiac signs is soon disappointed, since there is apparently little die in the diagrams
associated with conventional astrological diagrams and horoscopes.

Most of the diagrams have approximately thirty female figures shown around the periphery in one, t
some of the figures are free-standing, while others appear to emerge from vertical or horizontal o
some of which are decorated with a variety of heraldic -looking devices. Some of the figures are n
or fully clothed; the clothing visible on some of the figures includes veils, hats, crowns, and dr
elaboration, which should be traceable to a particular place and time with a little research. A fe

Petersen on his hand transcripts, may well be male rather than female. A careful study of the appa
distinctive designs on their "cans" mav provide a due to identification of the beings, or permit c
on different diagrams. Some of the 'cans" have crencllarions like castle battlements. Figure 1 1 s
numbers of figures on the different rows in each diagram; these arrangements mav correspond to som
davs of the month important for medical practice; for example, the "Egyptian days" or "critical da

The months of April and May with zodiac signs Aries and Taurus, stand out in contrast to the rest
two circular medallions (folios 70vl. 7 lr. 7Lv. and 72r 1). and each has only fifteen figures, a
same month were intended somehow to complement each other, an idea supported bv the fact that the
colored in one case and dark-colored in the other. An amusing matter for iperial note is the fact
is enjovmg a meal. Aries is dining with evident relish on the leaves of a small shrub, and Taurus
equal determination to the conrents of a son of manger or feed box carefully and realistically pla
details, in my view, support a horticultural, medical, or agricultural context rather than a magic

this can be anlv an impression. Ac anv rate. I find it a pleasing indication of the sen be s praem
approach 10 bis subject matter, whatever its meaning mav one dav prove to be

A number of other drawings in which the sun. moon, and stars are prominent! v featured mav be prov
astronomical. J will attempt to present, in the following paragraphs, a sketch of the principal st
these, since it is impossible to reproduce most of them in this paper. Figure 12 provides a summar
elements in these diagrams along with the ’cosmological*' diagrams to be discussed in the next sec

Folio Girl shows a central face, probably representing the moon, surrounded by a rwdve-poimed star
rav is decorated with stars, the other filled in with solid pigment. I n the contmuationof the pai
raw single words or phrases in the Vovaith script alternate with groups of one or two small stars.
text surround the whole, with a decorative marker indicating what mav be a starting position Folio
somewhat similar plan, showing a widely -smiling sun face in the center of a system of seventeen d
phrases of text alternate with groups of from one to four small stars. A single outer ring of text
separators.

Folio 6lt2 is a complex circular design based on twelve-major divisions. In its center is an eight
bv a ring of eight words. A dashed line indicates a starting point (.'I, Twelve moon faces, all fa
next ring outside the central area; each is accompanied bv a text string. Twelve pie-shaped segmen
from each of the twelve moon faces. Seven of these contain additional words, and all contain parag
segment contains a phrase, apparently written in darker or heavier fashion, in its outer extremity
three hres, (of which the middle one appears to be in heavier ink), is seen beneath the circular d

Folio 6Srl shows a roughly circular field of stars, with words or phrases in the Vovmch script wri
rop is a larger circular medallion with a sun face, surrounded by a ring of text: a similar, balan
face, also surrounded bv text, appears at the bottom There are at least twenty -eight stars with l
cut off in the photocopy). Some of the stars also seem Larger or differently-colored than others,
some significance in the doctrine of the scribe. Folio 68r2 appears to show a related or companion
circular field of stars; in this case, however, only the twentv-four stats in a central cluster ar
bottom, the moon face at the top of the star field in this diagram. Attempts to cross-match the ri
moon, or the labels of individual stars on the two folios have so far been fruitless. Folio 68v 1
sun. with a diadem or headband, surrounded bv small flames or ravs. A set of sixteen large double
central face, one side dark and the other filled with small stars. This seems similar in form to f
to it in the sun-moon pairing that seems to form a basic theme in the cosmological or alchemical d

manuscript. The continuations of the rhirtv-rwo separate segments containing the ravs contain alte
fields of small stars. Two outer rings of text surround the whole, with starting positions indicat

Folio 6Sv2 shows an eight -painted, sun-like center surrounded by eight petal-shaped ravs; bevond
separated by four centrifugal lines of text. There is a further subdivision into eight segments, s
centrifugal text hnes emerging from the points of the central ‘ petals/’ Four fields of small star
segments. A single text ring surrounds the whole, its starting point shown bv a vertical line.

Finally, folio 68r3 displays a moon face within a system of eight major pie-shaped radiating segme
alternating fields of small stars and centrifugal lines of text, separated bv further subsidiary l
that of 68 v2 just described. A single ring of text surrounds the periphery, in which no starting

It should be apparent that there is a systematic content of some sort in these diagrams. It mav re
night and day. times or events governed by different daises of stars, or effects of the sun and mo
seasons, ages of man. winds, directions, etc. (to name some of the entities that are grouped bv ‘f
and medicine) A group of seven small stars together in one segment of 68r3 las noted also bv other
represent the Pleiades. Surely a careful and determined analysis of this wealth of structured cont
study of medieval doctrines should turn up something of use to us in interpreting the meaning of t

5 3.4 Cosmological or Meteorological Drawings.

There remain manv diagrams based on a fundamentally circular plan which show radiating segments, p
elements, cloud and vapor dusters, and a central star-like or sun-like medallion. Text words and s
written along many of the cells and rays, and in concentric circular bands around them, with start
some cases, bv vertical lines or decorative markers. Figure 12 shows a survey of the numbers of ma
the astronomical diagrams, lr seems likely that a systematic attempt to correlate numbers of relat

IT

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interesting parallels among known medieval cosmological interns Number in itself had a magical sig
medieval and Renaissance philosophy, probably originating in Pythagorean doctrines. Medieval magic
elaborate parallel tables of "correspondences/' comprising lists of like- numbered things chat cou
threes* fours* up to elevens and twelves. In th* Pythagorean philosophy of sacred or magical numer
seven* nine* and rwelve were considered especially important. Figure 14 show* some sets of element
Agrippa { 19701; figure 35 shows elements important in the Cabala (see Section 8.7), and figure 34
lists of elements from Galenic medicine *

One very curious, and also (to my ere l very attractive diagram on folios 85-86r2 la portion of th
multiply folded page) shows a central sun face surrounded by four major segments. A line of text w
indicating a starting place runs around the central sun This is in turn surrounded by a sort of sc
four human figures may be seen; these figures seem clearly to represent a child* a boy* a man. and
over his cane. Over the head of each figure is a copious paragraph of teat The four main segments
spouts of vapor that emerge beyond an outer circular border containing a nag of teat, and recurve
segment to the left of their point of emergence. This drawing seems iikeiv to be related to the fo
man. the four humors* etc** as shown m figure 34; it appears that these associations might provide

text within its four sections-

The general plan of the "four ages" diagram just described is highly reminiscent of a figure from medical rainiiscrinc (Caius College* Cambridge* MS. 428* fo* 50* Grattan 1952* p. 941. The Anglo-S four human figures holding jars from which four spouts fall toward the center of the circular meda four mam segments. A small central arde shows another human figure receiving the effects of these rmg of text in very dumsy and illiterate Latin* illegible tn the illustration. An outer ring of te contains another Laboriously copied Latin sentence* Quartuor humores bishina partes liquores effun sic michrochosmi/' On either side of the four large figures are more Latin words* some illegible* humors* properties, and elemenp Tcolera rubta* " "caUdiii," "sicca*" '"sanguis*" "ealidm*" "humidu "humida;' V'terra*" "frigida*" "sicca")* Figures of this sort are very common in medieval astrolog manuscripts, and refer to the central doctrine of the 'microcosm'' or “small world" of the human b recapitulate in numarurc the elements and relations of the larger universe or " macrocosm." The us diagrams shows i human figure with lines conneuing its parts with ocher words or pictures supposed affecting them in the stars* weather* etc. (cfSaxl 1915 and 1927; &ober 19481*

Another very remarkable diagram on folio 67 v 2 seems to stand in a class mil bv itself* unlike an manuscripts, It suggests a meteorological theme, based on four major divisions that may be the sea rush in from the four corners, half- concealing for. perhaps* giving birth to or supporting.') two (Newbold interpreted one or more of these features as a "solar eclipse ") A dotted line extends in sun on the upper left perhaps indicating the starting point of the chronology or story* A sun wirh occupies the center* More vapor puffs squirt out centrifugal! v between the four outer ones* and L bands leading to both sets* Strangest of ail* the four outer corners are occupied by roughly circu balloon-shaped objects strung along pipes or bands to form simple* angular, geometric figures lan these forms* m the lower left corner of the page, shows four balloon-faces in a U-Uke arrangement superimposed on a arde with three segments colored blue, green, and red; as we will see below* thi occurs elsewhere in the manuscript, and may represent a conventionalized map of the inhabited worl interpretation that suggests itself for these geometric figures is that of cruaal conjunctions of figures, associated with the four seasons* directions* winds* ages of man. or other important even doctrine beinp expounded in this enigmatic work. The stringing of circles or dots (although not fa geometrical arrangements is seen in Picamx (Ritter and Plessncr 19621* where the intent is to show constellations to be employed as magical characters I see 8.4). Somewhat similar characters made u on lines are seen in alchemical manuscripts as well as m some magical alphabets (see 8.8 and 9*4. Another unique diagram* folio 57v. shows five concentric circles of text with a fiindv -indicated the upper left. In the center are four human figures* shown from the waist up; four bands of text the figures from a central scalloped medallion, and four more text lines are disposed between che their raised hands seem to point at. grasp, or support these. The structure of eight bands of text similar to chat of many other diagrams in che manuscript. This, too, is the diagram chat contains

enigmatic svmbol* repealed four times around the second of its concentric text rings. It is one of repeating lists anywhere in the text, and has been subjected to much attention bv students as a po Folio 68v3 is the drawing referred to bv Newbold as a spiral nebula/' A central circle is divided through the center; the upper half ts again bisected by a line from top to center This plan resemb figure in the center of folio 85-86v3 (for which see below). A word or phrase is written in each o longer paragraph in the lower semicircle. A ring of text surrounds this figure, with a starting po major outer segments are separated bv gracefully-curving bands of text, within these are watery or fields containing curving rows of stars on the same spiral plan. From the top center of each waw o text bands spiral ourward. in the same plan of two sets of four elements we have seen so frequentl

outer ring of text surrounds the whole, its start dearly marked by a decorative sign. This design, structure, may also refer to the seasons, ages, humors, or the like. It may abo have a geographica the ^ svmbol occurs elsewhere in medieval iconography as a form of symbolic map of the inhabited w

Folio 7 Or I shows a six-pointed star with^*a. words of, text between its points It is surrounded eight tarefuilv-drawn cell-like objects, alternately empty and occupied bv pairs of dots, and a ri foam -like spouts emerge from a watery held surrounding the inner circle. Mine bands of text arc w from the interstices of these waves. Three concentric rings of text surround the whole. There is l understanding this drawing other than a possible focus on water as an element or moisture as a pro health, and the numbers six. nine, and fifty -eight.

Folio 69r also shows a central six-pointed star; five single characters and one digraph are placed ring of text surrounds this central medallion. Beyond are fonv-five pipe -like, elongated ravs clo heavier tines separating them into irregular groups of one. two, and three rays. Text lines are wr one of these rays, and there is a ring o: text surrounding all. Folio 69v is somewhat similar, wit having small stars between its points. Twenty -eight pi pc-like things emerge radially from the ce phrase written above the mouth of each as though issuing from it. Three rings of text run around (

A small moon face occupies the central field of folio 85-86v4; five frothy or bubblv concentric ri waves run around the center The heads, arms, and shoulders of four human figures rise from the mid Their arms are raised, and their hands are holding indistinguishable objects, one of which mav be surround the whole, with a clearly-shown starting point on the left

Folio 85-86v3 contains a verv strange drawing dominated bv four complex structures shaped rough l emerging from the corners of the page and extending inward toward the center. The upper left cone grapes, douds, or cells; from its tip. directed tow ard the center, a spurt of some substance issu human figure emerging from the duster beside it. The upper right structure is like a broad tube ma or waves in crosswise rows: from it a large gush of vapor or wind emerges toward the center, and w vigorously The rwo lower objects are more elongated in form and seem to be made up of la vers of l interjecting crosswise rows of cells. One gives forth a large jet of specks like snow or rain aime with a human figure half revealed as if peering around one side of the jet and flinging out a smal outstretched right hand. The remaining cone, in the lower right corner, emits no jets of vapor, bu on its apex, as if on a nest; bending over the seated bird are three branch -like structures on su occupy the four sides of the page between the large spouts, and a fifth paragraph is placed in the

It seems possible that the four jets may represent the Four Winds converging upon the earth, and t several others of this section, may be concerned with the seasons and the weather. The nesting bir migrating, bird would be explicable within this frame of reference. A scribbled diagram of a circl © , like that in folio 68v3, occupies the otherwise empty center of the page; next to it and scraw disorderly scribbling that resembles ta re less! v -written Arabic script. This scribble is closel left center of folio 66v. where it also seems to be associated with a rrudelv- formed geometric fi of these scribbled phrases ,)

Finally, folio 70r2 shows a central face, probably a sun, surrounded bv eight large segments conta small ring of text runs around the center, and four more lines of text surround the whole. The out pairs: the outer pair has a common starting point indicated by a double vertical, while the inner stan shown by a single vertical. A paragraph of text accompanies the design on the upper right cor

The above lengrhv. but still verv incomplete discussion of these interesting cosmological diagrams justice to the amount of information available in them for the student witling to accord to them t

careful and mtemati c examination. I belitve ic has been tuo read it v assumed bv mast students th Vovmch manuscript were too weird and nonsensical to warrant this attention. The research must awai someone who has access fas I do nui have* 10 a large number of medieval manuscripts, or facsimile thorough invest! canon, pursuing some of the striking itonographical elements in the drawings, rni parallels that could provide an understanding of the teat,

3. Jp3 Drawings F Maturing Human Figures,

The drawings on folios 75 r and v and "*6v through 8-iv are probable the most mvsterious and bizar enigmas with which the Vovnich manuscript confronts us. Thev show sequences of human figures, almo and female, and las has been very frequently and somewhat arthlv noted bv other students > quite p form. Most of them have distended abdomens and bulging hips: thev certain! v do not present an app beauty to the modern American eve. The impression is rather one of agricultural fertility, materna nourishment, or something on a similar pragmatic plane. Many of the figures seem to have long hair veils in spire of their otherwise complete lack of clothing. Their poses are iiveiv. expressive, a

The female figures are shown variously sitting, standing, king, or otherwise disposed in or on cur tubes, pipes, eo? I -scuttles, puipiu. pods, or platforms. These obi ecu are drawn in the same chu architectonic sol iitv as was noted above in connection with the plants. In fact, some of them loo seed pods, and root or stem structures of these verv plant drawings. Note, for example, the two st somewhat resembling mines or bombs trailing fuses, crossed on folio 83v, to mv eve. they close! v on the plant in folio 90r 1. A structure on folio 79v of three pipes surrounding a larger central of the same plant on folio 90rl. Similarly, a tripartite structure on folio 77v made up of three n connected by pipes, with three tuber -like objects hanging from the central swelling, looks to me with three main stems connected by underground roots or stolons (see figure 15 for examples I.

Some of the female figures seem to be holding spindle-shaped objects that could be fruits or seed structures that coil around the figures (and into which, or from which, thev appear to be transmit or liquid) could well represent plant para such as roots or stems in schematic form. Abo to be rem dusters, puffs and spravs of vapor emerging from the numerous vents of these pipes, and the substa liquid in which groups of female figures seem to be sitting, standing, or moving about. Some form moisture, or sap seems to be of primary importance in the doctrine expressed bv these pictures. In the left of a descending line of figures: 82v. at top right and also two more below, center), arc openings in some of the little scenes These look a great deal like rainbows, although without seei can only guess: most of the arcs seem to have four or five separate concentric segments with a dar discussion of an alchemical drawing containing a pipe with multiple vents emitting vapor, in a sry these folios, see Section 8.8).

Another important detail to be noted in several of the drawings of this section is a small cross w example, at the top of folio 75 r. serving as a focus for diverging rays: on 75 v to the right wit 7gr at the focus of a grape- or cloud -like duster at upper left; and on 79v, top, at the focus of head of a figure who also holds a cross in her hand). These symbols are quite small and unobtrusiv form a central focus or origin for rays descending upon the female figures. The obvious interpreta illumination or influence promoting the fecundating, nourishing, or healing vinues of the humors c represented bv rhe female figures. The crosses provide an unmistakably Christian frame of referenc expounded by the scribe of the manuscript — a point not specifically remarked upon by other studen

Whit are we to make of these strange drawings/ A possibility that immediately occurs to me is that doctrines of Galenic humoral medicine, with its four "digestions" and various byproducts at differ

nourishing or curative properties of the plants or prescriptions of the herbal and pharmaceutical a system of therapeutic baths; this was a common feature of medieval medicine: warmth and moisture in themselves, healing forces. It is amusing to note in this connection that Roger Bacon, an his m Accidtnitum Senecturis (Bacon 192Ba), recommends perfumed oils, warm effusions, and the applicatio occulta' such as lign-aioes, "heart bone of a stag." and viper s flesh. (This medical work was a c compilation of earlier medical sources such as Galen. Pseudo- Aristotle, and numerous Arabic write and exploited bv later physicians; little in it. however, was original with Bacon.)

Brumbaugh (1975 i has seen in these pictures a recipe for the 'Elixir of Life/' designed to look i Bacon's medical treatise, his work entitled BpsstoU de Mtrabilt Potestate Artis et Naturae, and versions of bs alchemical writings were the only fragments of his writings well-known in the sixte f 1 954, p. n, suggests that the human figures may represent ''astral spirits" transmitting the in stars into plants and other living things. Singer, in his Letter to TiUman. 12 November 1957, puts though related, suggestion: "Mv own feeling — again very vague — about the little figures of nude organs of the body is that they are somehow connected with the ' archaei" of the Faraceisan or Spa fit in well with mv suggestion about John Dee and Bohemia." Note that Singer sees the tubes, pulpi figures sit as "organs of the body, rather than as the plant parts they recall to me. Figure 1 3 s numbers and grouping of female and male figures on the folios of this section.

3.3.6 Network of Rosette s t Folios 85-86ri~4 t vl-2 .

This elaborate am v of circular medallions coven severai-segmena of a Large, multi ply- folded pag no study or mention bv students: this mav be partly because us complexity and bizarre character bo overburdened bv the "queerness" to the modern eve of so much else in the manuscript. The failure o much attention to these designs is also probably due to the poor quality of the photocopy availabl photocopy made from Father Petersen's original copv is so dark, and the numerous scraps of text wn hard to read, that it is almost unusable,

A phorostatic copv which I recently obtained from the Beinecke Library reveals the details of this very dearly There are nine elaborate circular designs, m three rows of three each. The central des larger than the others, and contains six pharmaceutical "jars" arranged in an oval pattern with st the medallions are veils of cell-like or fibrous structures that link each cirde to its immediate shows a structure like a castle and other small buildings around its periphery; the castle has a h call central tower. The center of this figure contains a circular field of stars and a spiral arra outer corner of the page, is a smalt cirde containing a © diagram with Voymdi text "words" within opposite corner of the page is the small "clock-face" mentioned bv Brumbaugh i about which more wi the other two corners are sun faces surrounded by wavy ravs. Some of the medallions have petal-lik filled with stars, recalling features of the cosmological and astronomical folios discussed previo provided with curious structures like bundles of pipes or gunbarrels clustered around the peripher outlines. This complex assemblage of symbols deserves far more attention than it has so far receiv could provide some enlightening synthesis or frame of reference for individual diagrams elsewhere

A mention should be made here of Brumbaugh's identification of a "clock face" among these diagrams circle, surrounded by eight!/} designs vaguely resembling Roman numerals, and what may be a small extreme left side of the structure. In the center of this circle is a triangular arrangement of tw small spheres strung on them, at their free ends and at their intersection. While it is true that superficial resemblance to a clock face, it seems possible to me that it may also represent a star and the similar alchemical characters mentioned above Section 3 *3.4. The two "hands'' look to me

be of equal length, and the hands" are not centered on the "clock face"' as one would expea. but r
entire triangular structure is centered in the circle. An exactly similar triangular symbol with t
frequently among the star spells of Picamx . and was used bv alchemists io mean arsenic, orpiment.
1922. Tables IV. XXXXHL XXXXVh

3-3*7 Small Marginal Designs.

There are small drawings of people. ammaLs, and other less easilv -identifiable objects on some pa
already been noted, contains a drawing of a man lying on his back clutching his stomach as if sick
bv various indeterminate small objects. The Last pge. 116v. has several sketches of people, animal
shapes in its upper left corner. Most of the pages filled with text (folios 103 and following} hav
with extensions like tads, to the left of each paragraph. These paragraphs, as has been pointed ou
probablv comprised approximately 365 originally, thereby providing one "star reape' " for each dav
of astrological predictions or prescriptions.

3-4 Meaning of the Collection of Drawings as a Whole

Voynich stated his impression on fine seeing the manuscript, that ' the drawing] indicated it to b
natural philosophy' (1921, p. I). Eliiebech Friedman says: 'The 'botanical' and largest section of
pages) is probably herbaLutk in character, and the manuscript mav constitute what is now called a
Panofsky provides another dear summary: "So far as can be made out before the manuscript has been
would comprise: first, a general cosmological philosophy explaining the medical properties of terr
plants, by celestial influences transmitted by astral radiation and those spirits' which were freq
occult powers of the stars to the earth; second, a kind of herbal describing the individual plants
conceivably, magical purposes, third, a description of such compounds as may be produced bv combin
various ways" (1954, p 1}. He confesses that he is unable to suggest any known medieval parallel s
doctrines into one compact book. (There were, in fact, a number of very large encyclopedic works o
covered a somewhat similar range of toptn: an obvious example that comes to mind is the work of Al
contemporary of Roger Bacon.)

Petersen provides a similar view of the manuscript as a whole: The illustrations in the manuscript
certain that the text deals with medicinal plants and their use in medieval remedies. The drawings
illustrate astrological matters, and possibly the medieval theory of vital spirits functioning as
small nude figures)' . . . . Might not the 324 separate short paragraphs or sentences (folios 103-
subject index or table of contents or list of recipes/" 1 1953. p- 1) Brumbaugh sees the manuscri
of Life ", designed to interest the Emperor Rudolph 11 bv a forger who wished to make it appear to
Bacon. An 'encydopedic sequence of drugs", possibly compiled from a variety of earlier manuscripts
astrological lore; the folios featuring nude female figures may deal. Brumbaugh chinks, with "the
the theology of psychic reincarnation, or the topical application of the elixir". (1975. pp, 348-

In studying the dnwings in the different sections of the manuscript, I have come to feel strongly
symbolic, artificial, and conventionalized graphic or mnemonic "language" that uses the same repre
call to mind particular key concepts on different folios and in various combinations with one anot
"alphabet" or ihorthand seems in man? wavs closely similar in its philosophy to the -interesting s
script (to be dealt with in Chapter 4). For this reason, I believe tbiE a careful, painstaking, an
the drawings and their component graphic elements, indexing and cross- matching all the forms, mig
involved. An experiment using modern computer CRT terminals with graphics capabilities so perform
worthwhile, if earned out within a carefully -reasoned theoretical framework (ue.. to pursue and i

theories previously developed bv the student concerning meaningful relations among the forms!. Mor
6 9 regarding the use of computer techniques tn studying the manuscript.

Chapter 4

Avenues of Attack: The Text

4.1 Nature and Characteristics of the Voynich Script

However complex and interesting the drawing! are. the script in which the bulk of the manuscript i
undoubtedly the most intriguing pan of the elegant enigma. It has a deceptively flowing, rhvthmic
practice and familiarity on the pan of the scribe or scribes. The script seems like a reasonable,
system of writing, with a Kook of ease and natural flow. On closer inspection, the surface appeara
and a still more seductive and- captivating charaaer. emerges^ in the form of an intricate but str
ligaturing or compounding of simple forms to build up more complex outlines. Whatever else may be
value of the manuscript as a whole to science. [am convinced that an understanding of the constru
cannot fail to be of great interest in the study of human thought. It appears to be a tour de forc

4* LI Provenience and Style.

Unfortunately, although many students mention the style, calligraphy, and appearance of the script
judgements of the date and origin of the manuscript, they provide linie real evidence or detail to
Nowhere among the sources I have examined have I seen any really factual or complete discussion of
sources mention, in passing, the possible derivation of the Voynich symbols from ’’Roman minuscule
in.d.) states that "the text is written in a beautifully symmetrical script that slightly resemble
1 500 V (p. 48).'

4. L2 Relationships to Knoum Scripts and Character Sets.

Attempts to link fhe origin of the Voynich symbols to other systems of writing have been many and
study of known alphabetic, syllabic, or ideographic scripts has turned up nothing remotclv similar
symbols have distant parallels in some compendia. Several symbols resemble earlv forms of Arabic n
pointed out by more than one student of the manuscript, for example, bv A. W. Exell (of the Botani
Natural History Museum), in a letter to Tiltman. 30 August 1957, and by Robert Brumbaugh (1974. 19
shows a comparison of some Voynich symbols and various forms of early Arabic numerals extracted fr
f 1915) that look similar in my opinion. (See also Secrion 8 JO for a discussion of the history of
Some form of substitution cipher may be involved, of course; thus, the fact that a given Vovnich s
form of "7" or "4”. for example, need not imply that it actually stands for that number in the tex
numerals were often employed in a wide variety of codes and ciphers, as we will see in Chapter 9

Similarities are also clearly apparent between some Voynich symbols and certain Latin abbreviation
limes during the Middle Ages. These relationships have been investigated and exploited by several
and Feelv. Figure 17 shows a selection of Latin abbreviations extracted from Cappelli (1949) and s
that resemble them in my opinion. A general similarity was apparent to me. and was also noted, ind
by Tiltman. between certain commonly -occurring looped symbols standing above the line and the dec
letters with tall stems in the top line of a manuscript illustrated in Cappelli (Table IV h Some a
various kinds that might throw some light on the Voynich script will be discussed in Chapter 9

4. L 3 Attempts to Decompose the Symbols into Elements.

It has been concluded by most students that the Voynich script includes at least some compound sym

have been made to arrive at a rationale to explain the ligatures and resolve them consistently int
students have proposed that the symbols may have been built up from elementary strokes in a manner
upon which thev supposed that the Chinese writing system was based. Tiltman suggested th?t mission
East, who had studied the Chinese system, might have brought back a description of it which then m
fifteenth- or sixteenth -century scholar ro design the Voynich script (unpublished notes) A. W Exe

Tillman. 50 August 19V* refers to a theorv (not further specified j that earlv Arabic numerals wer
three, four or more strokes in a similar Oriental manner: he suggests a sketch \ and incomplete co
Vovnich svmbols and conventional numerals along these lines. No one has* to mv knowledge, worked o
of this kind in sufficient detail to test it out as a hypothesis.

In this connection, it is interesting to note that Roger Bacon provided extensive information conc
highly interesting section of the Opus Maps on geography and the customs of foreign peoples* He st
closely questioned several missionaries and travellers recently returned from visits to these far-
manv foreign peoples and customs arc clearly recognizable, although some are fabulous and distorte
A dear description of Buddhist monks at worship, even including a garbled version of Om mane pad m
particular l v striking The following is his description of writing in China The people in Carhav
same instrument with which punters palm, forming in one character groups of letters* each group re
this method characters are formed with many letters together, whence reasonable and natural charac
of letters, and have the meaning of sentences.'' (Bacon 1928b. p. 389.1

The compound Vovnich symbols are not easy to "uke apart' in am consistent and unambiguous wav: ibe
smoothly blended to form a single flowing outline. Figure 18 shows some examples of apparently com
suggestions regarding their decomposition. Some symbols which appear to be simple at first sight m
compounds: for example. mav be made up of r L and *\ and mav be a combination ot ^ .me

^ Mv own feeling is chat we need not go as far afield as the Orient to explain these complex outli
Latin abbreviations tn common use throught the Middle Ages has the same character. An abbreviated
preserves one or two letters of a word and distorts or combines them to form a single sinuous, con
Some of the parts of such a compound form may then be pamaJlv disconnected and used in abbreviatio
similar words. The distorted and truncated scrips of words are usually combined with over lines, s
tails* and slant Lines which mark the form as an abbreviation* or stand for a set of missing lette
features has a counterpart in the Voynich script: a horizontal stroke seems to connect manv svmbol
mark often appears above certain svmbob, and characters are frequently shown standing above or in
infixes or superfixes; long tails curve up or slant down from letters at the ends of words and lin

It is mv feelmg that we need not look beyond the system of Latin abbreviations, familiar to all le
Ages and Renaissance throughout Europe, combined with earlv forms of Arabic numerals and some comm
astrological svmbob* to find the inspiration for the design of the Vovnich script Unfortunately fo
has exhibited a truly remarkable ingenuity in blending and distorting these elements so as to make
writing svsiem* fundamentally independent of and distinct from any of its sources, so that our rec
known symbols has not helped us to unlock the secret of the script. It is interesting to note that
superfixes or infixes with other ligatured characters may also occur next to them in ordinary sequ
fuJIv shown ligature must, therefore* provide some distinct element of meaning. (For example, is C
How does vr differ from “ « V Is " 5ft equivalent to Tf cr m crV or neither.')

Most crvptanalvnca 11 y -oriented students of the manuscript have put considerable effort into ana
attempting to devise a working transcription alphabet for use in crvpunalvuc and computer studies.

adopted different theories regarding the decomposition of the symbols into elements* and the ident
of a single symbol* Some* Uke Tiltman and the First Voynich Study Group* arrived ai a relatively s
basic symbols, regarding all the rest as secondary compounds. At the other extreme* Currier* Krisc
Group included a number of obvious compounds m their working alphabet to produce a considerably lo
Currier 's alphabet and the others based on it embody a theorv about the svmbol " k “ and its occu
two. or three immediately preceding certain ending svmbols ‘ and own transcription alphabet

includes an attempt to allow for some relatively rare ligatured elements in addition to those in t
Figure 1 9 shows several different transcription alphabets.

4-L4 Variant and Embellished Forms of Symbols.

While all have agreed that a relationship of some sort exists among certain families of similarly
have associated them differently depending on their theories regarding the exact nature of the kin
Considerable interest has centered on the four looped symbols" ^ M t ff * * -4^ "that are all foun

superfixes over the svmbol ‘ CT " as well as alone. An interesting bit of evidence for the identit
thus, bv analogy* the ocher pair T and as wellL may be seen on folio 57r* where a sequence of seve

repeated four times around a circular band. It is so rare to find anv sequence in the Voynich manu
portion of itself that this example is almost unique. Figure 24 shows the tour repeated segments a
instances, the symbol ” with only one loop, occurs in the ninth place, while in the other two. we

clear loops in the corresponding position. Since all the other symbols appear identical, the concl
the single- and double -looped forms art functionally the same. Countervailing against this conclu
symbols are always made quite clear lv and distinctly, with either one or two loops; there are rar
marginal forms with vestigial or careless! v- formed loops. In anv case, there is an obvious famil
among the four looped symbols, as shown bv their simiiaritv of form, their entering into similar c
assuming a similar function and positions in the structure of text words.

Embellishments are relatively few m the Vovnich rest. Figure 20 show s some variant and decorative
various students have tentatively identified them; many of the assumed identifications arc mv own
decorative extensions and flourishes are quire attractive in a bizarre and idiosyncratic wav. Smal
hatching along lines, don arranged tn rows .-and exaggeration or. prolongation of loops are freque
embellishments are. for the most part, highly resttained. and not at all the extravagant, disorder
ex pea of a deranged mind. It should be noted also that the ornamental extensions rareiv. if ever,
with writing or drawings nearby, and that it is rare in general for writing or drawings to cross o
text, except in a controlled and orderly manner

The curious embellishments appear to exhibit the same rhythmic, pragmatic, and compact character a
aspens of stvle throughout the manuscript. A particularly notable and amusing decorative flourish
disconnecting of the two loops of the character " Jf ", so that one stem and loop is translated ho
neighboring word, sometimes with several intervening curlicues: figure 20 provides a number of exa
in some cases, the intent mav be to combine two separate occurrences of " 'into one decorative flo
be some element of meaning in the practice, although it is scarcely frequent enough, especially in
of paragraphs, to support such a conclusion.

4.2 Other Scripts. and Hands

On certain pages of the manuscript are found isolated phrases and sentences in scripts and bands j
be different from, and probably later than, the bulk of the text (although none of the sources I h
definitive evidence supporting a different date or authorship for these scattered text strings) Pe
(a friend of Mrs. Vovnich) had made a thorough examination of all the apparently extraneous passag
Miss Nill . has listed all words or passages which appear to be wruten rr different ink from char
text and the drawings throughout the manuscript. (She noted also that the original text seems to s
and correction anvwhere,) Miss Nill declares that the last page is written tn the same ink as the
H953. p, I), Unfortunately, no copv of Miss Nill* list has survived m the material to which 1 have
following summary from mv own examination of the photocopy available to me.

Folio lr. There are very faint and barely legible traces of alphabetic sequences in the left and r
visible ai all in the photocopy 1 have studied, but Petersen shows them clearly m his hand transcr
those of the ordinary ABC ", with some slightly distorted or odd forms. The two sequences appear t
fragmentary state, it is hard to tell whether they are consistently associated with the lines of V
center of the page.

Folio 1 7 r. A line of writing in a verv small, crabbed hand crosses the top center of the page. I
my eye. the letters resemble Greek symbols. The writing becomes fainter and harder to read toward
fades out completely. In the upper right corner, there is a faint, scribbled symbol like a shield
crossed with lines. It is interesting to note that John Dee liked to use Greek letters to conceal
personal diary; the svmbofs on this page, however, do not seem to spell anything that might be an

Folio 66r. A small scattering of letters, which again look to me like Greek svmbois. arc to be fou
corner of the page near a small picture of a man lying on his back. Above the " Greek" letters is
Vovnich script. Prof. Richard Salomon of Kcnvon College has suggested a High German interpretation
svmbois, claiming that they stand for "der musz del", or the mussteil' , referring to an obligator
goods from a man to his widow'.

Folio 66 v. In the lower half of this page (which shows a plant drawing accompanied bv three text
scribble or doodle that slants downward toward the left. A rough oblong figure sits to the right a
markings here resemble a similar scribble in the center of folio 85-S6v3 fsee below some pontons o
appearance of Arabic script.

Folio 85-S6v3. In the center of this cosmological diagram there is another doodle similar to that
circle is bisected by a horizontal line, and the upper half bisected again by a perpendicular; a l
something like Arabic script crosses part of this circle and extends to the left of it.

Folio 87 r. To the left of the lower leaves of the plant drawing is a crude star-like doodle of in

Folio 1 16v. The several lines of text in a mixture of symbols on the last page of the manuscript
studied br many researchers as a possible 'key” to the text. Figure 23 shows several transcription
different students along with a reproduction (admittedly poor! of the photocopy at my disposal. Th
crabbed, and faint. It is interesting to note the differences among different students' interpreta
The numerous ambiguities and obscurities have nor prevented several students from basing extensive
rather arbitrary readings of the tiny, distorted letters.

Folio gatherings. In the lower corners of certain pages are numbers added in what appears to be a
These numbers correspond roughly to sets of eight pages. Those discernible in the photocop v I hav
figure 22. with the page number associated with each. The numerals are interesting in themselves,
forms; they art accompanied bv symbols for Latin abbreviations, one of which, ^ " for *us exact! v

common fvmbol in the Voynich script.

Folio numbering. At some point during the eventful history of this manuscript, someone added numbe hand corner of the pages. These numbers agree with the present order of the pages, and show gaps w apparently been lost since the numbering was done but before the finding of the manuscript bv Voyn dated the folio numbers to the sixteenth or seventeenth century; they may well have been added by court. The forms of the numbers do not differ significantly from modern forms.

Month names in astrological diagrams. The name of a month has been written into the central medall diagram associated with a recognizable zodiac sign. These month names are considered bv most stude different ink and hand than that of the main text. Figure "10 shows details of these medallions an word in the Vovnich script is seen next to the two scaly fishes of the Pisces medallion (folio 70r word with the month name or zodiac sign have so far been fruitless. No one has made any progress, determined attempt, to idendfv the language or provenience of the month names, despite the fan tha few clearlv recognizable and comprehensible bits of text in the entire manuscript.

43 Linear Sequences that Look Like "Keys”

Several pages of the manuscript are provided with columns or circles of single symbols or short wo arranged in some sequence that may be an index or key. Brumbaugh has exploited these sequences ext of decipherment (set Section 5,4); according to him, the multiplicity of "keys”, although associat attempt at mystification on the pan of the scribe, still provide some valid and useful information list of these, insofar as I can identify them; some of the "key” sequences are also mentioned abov

Folio Ir. The two parallel alphabetic sequences in the left and right margins, described above, ha function as keys; a suspicion enters mv mind, however, that they are the result of some larcr woul It is surprising, considering the number of people who must have attempted to read the manuscript elsewhere, that there are not far more doodled numbers, letters, and lines on its pages.

Folio 49v A clearlv discernible verticil list of twemy-six Voynich symbols runs down the left marg accompanying a particularly decorative "herbal' folio showing a cvclamen-like plant. Figure 24 sho exhibits a partial repetition in three cycles.

Folio 57 v, Seventeen symbols, some quite complex or unusual in form, are repeated four times arou concentric circle from the outside in a cosmological diagram. The four sequences are shown in para rare instance of sequences repeating almost exactly in the manuscript; in fra. I believe it is the

Folio 66r, In the left margin is a rather complex sequence of single symbols associated with isola lines of a text paragraph, all in the Voynich script. Brumbaugh employed these sequences ai "equat correspondence between the letters and the words (see 5 4 below). As is frequently the case in thi

horizontal association of the scattered letters and single words is not verv accurate , and neithe related to the lines of the paragraph.

Folio 69r. Between the points of a central star are six Voynich symbols.

Folio 76r. A string of nine Voynich symbols is seen in the upper left margin, spaced out verticall with certain lines of a text paragraph.

To my knowledge, no one other chan Brumbaugh has direcred much attention to these sequences. No co
or numeric order can be traced from one to the next. They may be conventional abbreviations standi
or objects known to tht scribe or scribes. Their presence as a salient feature of the text indicat
capable of employing single symbols or pairs of svmbols to stand for some sets of concepts. See fi
many of these "key ' sequences

4-4 Cryptanalytic and Stylistic Attacks on the Text

Students who have approached the Voynich text from the point of view of the professional cryptanal
at firsr by a deceptive surface appearance of simplicity* only to bog down sooner or later in an e
paradoxes and enigmas that reveal themselves one by one as analysis proceeds. Eltzeberh Friedman h
conose %ummarv of the frustrations awaiting the crvpcanaivse in the Vovnich manuscript. I cannot i
compleumess. and succinctness of her remarks, and so will quote them at length in the following pa

"WtaE ii ftfieriliv ihr inuiat rnenon of a professional cipher expert to ihr manuicnpt' At first e
*erv c*iy tv >olve. became ih* "ait item* to be in word tenrth* and word repetmons «ar*d our ckarb

A single frequent* table mould be made at once of a portion of text . just as Foe did in the Gold
deciding brw manr different itmboli there are m the manuscript, and this it neither simple nor eas
single umbol often appears to be a composite made up of perhaps fwo or three symbols

If a frequence table is made lor a piece of ten amounting to about 500 consecutive words" twhirh c
presents the character tin r rouph appearance of a frequence table for a simple substitution ciphe
frequency; a few hive i verv low frequency; the rest are of varying but medium frequencies. Beude
there are also mint repeated sequences of two. three, ur more words

The first impression, cherefiae. n that here is a simple substitution Cipher, However, the deciphe
no solution based on inch a theitrv is reached Trials in Latin. Greek. German. Italian, etc . viel
substitution.

"Bur then the possibility of transposition, of combined substitution -transposition . or of multip
for the reason that there is entirely too much repetition. We find thousands of repetitions ol thr
throughout the text.

For example, in nineteen lines of teat. a. certain three -character group appears nxrv*si* times A
words . the whole manuscript is quite homogeneous, the "words in all sections are verv much alike

’Indeed, sometimes, and nut too rtrelv, one finds the same word" appearing three times in successi
Gertrude Stem s A rote is a ruse is a rote, , ." Also, there are thousands of cases m which, two w
differ from each other bvonlv «ie character. as in English, the words strike and stroke. wore and

There have been several attempts to anal vie the Voynich texr using computers Unfortunatelv. for a
Iirric progress has resulted from these efforts, with the sole exception (to mv knowledge) of the
(see Section 6.8). Cryptanalytic studies have included monographic, digraphic, and trigraphic fre
samples of vinous sizes, based on several different transcription alphabets. Reverse alphabetic so
endings of words, and word indexes have provided an analysis of different occurrences of the same
comparison of their contexts. The difficulties of arriving at an alphabet, transcribing a sufficie
gaming access to enough computer time have hampered students in their efforts over the vears. Most
computer srudi es were never earned far enough to result in any solid gain in knowledge. More will
regarding certain specific computer studies and some methodological considerations relating to the

general.

While relatively few have had access to computers, manv students have made extensive hand studies first described the apparent precedence order of characters within words, and demonstrated the pre symbols, in certain combinations, for the beginning, middle, or ending portions of words. Petersen complete manual concordance of the text, and studied occurrences of ligatured and compound forms o

4*4*1 Phenomena in the Text Which Mast he Accounted for by Any Theory ,

The following list of characteristics to be explained bv anv good crvptanalvuc theon summarizes th researchers, notably the Friedmans and Tiltman: it includes alio some observations which 1 have ad of the text.

fl) The basic alphabet of frequently occurring svmbols is small las few as fifteen according to so probably no more than r went v* Five L

(2 1 The basic forms are compounded or ligarured to create a Large variety of complex svmbols.

(3 1 The symbols are grouped into words*' separated bv spaces (although some researchers have expr about the consistency of this spacing i

\4) The number of different words seems surprisingly limited.

(3 I The words are short, averaging around four or five svmbob in length, words over seven or eigh are rare, as are also words consisting of a single symbol. Even two-letter words are relatively un pointed out that normal English text also presents an average word- length of about five character there are many one* and rwo-lcfrcr words, and a great many words of ten to fifteen characters in l different pattern from that seen in the Voynich text.)

t6\ The same word " is frequently repeated two. three, or more times in immediate succession.

(7) Many ' words' ‘ differ from each other bv opiy one or two svmbols. and such 'words often occu succession/

18 j Certain svmbob occur characteristically at the beginnings, middles, and ends ol "words . and sequences.

(9i Certain svmbols appear verv rarely, and onlv on certain pages, indicating some special functio

(10) There arc very few doublets (repetition of the same letter rwice in succession J. and these i svmbob " " and " * v *\ ocasionally also " ^ ", and "O'". ^

lllf Verv few svmbob occur singly las one-letter words") in running text; these are primarily “ C

U2I "Prefix*', like elements are tacked in front of certain 'words ' that also occur commonly with prefixed elements are \ and " 9 *

i 1 3 1 The svmbol 4^* occurs almost invariably followed bv O". and joined to it bv an extension o the ' " ; the resulting compound svmbol is rarelv seen elsewhere than at rhe beginning of words

(14 1 On most herbal folios, the first line of the first paragraph begins with a verv small set o
- ff •- and " these are usually immediately followed bv " CT ^ ", " © '* 9

^ or sr No trace can be found of the alpha bencitv that would be expected if the herbal paragraphs
with the names . ot plants in alphabetical order as was usual in many early herbab.

(13) Single 'words' occurring as labels next to stars, "drug containers ', plant sketches, or othe
various drawings verv rarely begin with the four looped svmbob; instead, they often start with " O

and occasionally ** " and " <T V

4*4*2 Cryptanalytit Hypotheses,

In the Vovnich manuscript, we are confronted by a situation with many unknowns. In spite of the di
efforts of many talented researchers over the half-century since its discovery, we soil have verv
the large area of uncertainty defined bv these unknowns. We still are ignorant of the underlying l
no due to the nature of the cipher, code, or writing system: we do not know when, where, or bv who
written; we cannot even be certain of the subject marrer, or the purpose for which it was compiled
paragraphs, I will attempt to list, as completely as possible, the hypotheses that a conscientious
regarding the nature of the Vovnich cert. In some cases, information turned up bv researchers can
some of these hypotheses, as Elixeberh Friedman has suggested in the passage quoted above. Some th
capable than others of explaining the phenomena observed in the text, A systematic consideration o

On the marter tit repeated wnrtii. j colleague has pointed nut (*■ me that r»u or threr repetition
utuirmniim in t.hine*r and in other, umibr Eastern Janauagn This it due in pan ti> the lack of rhe
prepositions, arm lei. ttt.. in these idficuaitev and m part to methods ul word budding and cum po

serve as j good foundation for the discussion of solution attempts in Chapters 5 and 6 Such a surv
picture of the true magnitude of the problem which this enigmatic manuscript presents ro the crvpt

The crvptanalvtic possibilities to be dealt with are related to three principal factors, which 1 w
letters: P. the nature of the underlying plain text; E. the correspondence or substitution between
Vovmch script elements; and T, other v a reformations that might have been carried out on the plai
substitution of Voynich svmbols. In the following paragraphs, several possibilities will be listed
factors; each such individual hypothesis will be designated by the letter fP. £. or T) followed bv
assume that the reader is familiar with certain basic terminology and concepts of crvpiologv, such
code and cipher, substitution and transposition. These concepts have been clearly defined and expl
obtainable general works on crvptanaksts.

P. The Nature of the Plain Text.

P.l Normal Lao n text.

P.2 Normal text in some other^naturaiianguage.^.

P.3 Code or synthetic language with a mixture of ideographic and natural language characteristics endings added to code svmbols i.

PA A pureiv ideographic system like picrographs. with virtually no features of natural language pr
E. The Nature of the Subsniution.

J:. i One plain text symbol is replaced bv one Vovmch symbol.

E,2 One plain text symbol is replaced bv two I three I Vovmch symbols, but always bv the same numb

E.3 Two (three), but always the same number of plain text svmbols are replaced bv one Vovnich svm

E.4 Two (three* plain text symbols are replaced by two (three) Vovnich symbols.

E.5 Mixed length units li.c.. one. two. and three .letter strings) are involved in either or both script,

E.6 Each plain text unit has a set of variant or alternative Voynich symbol counter pans, from whi choose at will,

E.7 Whole words or concepts are represented bv single Vovnich svmbols or bv mixeddength Vovnich st shorthand),

E.S Polva Iphabettc substitution, or the cyclic use of a series of substitution alphabets accordin
T Transformations Other Than Substitution.

T. 1 No plain text letters dropped, added, or moved.

T.2 Vowels dropped.

T.3 Words abbreviated arbitrarily, and represented only bv certain letters.

T.4 “Dummy" characters, or nulls inserted into the text.’

T.5 Letters or syllables transposed within words (as in Pig Latin).

T.6 Letters anagram med or transposed over longer stretches of text,

T.7 Plain text concealed in a much longer "dummy* or "cover text, most of which is meaningless.

T.8 A Tnthemian or Baconian system, involving the use of some binary or ternary characteristic (do letters, tails up or tails down; ligaturing or lade of it; etc..) as the true message carrying fea dots" and "dashes" of Morse code, applied to a "cover" text or "carrier" text which is meaningless As will be shown in Chapter 9. ail of the above possibilities were known and used bv early practit well within the fifteenth and sixteenth centuries. Roger Bacon mentions a number of them man often work entitled "De Mirabili Potestate Arm et Naturae" (Bacon 1859) The methods he lists include mad geometric figures combined with dots, shorthand C ars noiona ' or Tvronian Hand), and dropping vow plaintext. In alchemy treatises attributed to him. Bacon is also thought by some to have employed substitution (one plain text character to one cipher character), and concealment of a short messag meaningless "cover" text.

Using the scheme of individual hypotheses designated by letters and numbers presented above, we ca

number of compound hypotheses embodying various choices in vinous combinations. J will nor attempt

In notes mi4c bv Mils NHL companion of Mrs Vormdi. she reports that John Manly had expressed his o
March 20. 1920 ih*t the text of iht manuscript represents j simple cipher disguised bv the use of
about the unit date. Manly stated t according to Miss Nitli that frequent v counts he had made bas
si in pie cipher disiruised bv extensive use of nulls*

Urge ser of possibilities; instead. I will mention a few that seem to be ruled out bv the evidence
unlikely, and a few others that seem more consistent with what we know of the text and thus more w

Hypotheses Rendered Unlikely by the Evidence.

Simple Substitution on in Otherwise Unaltered Natural Language Text, As Elixebeth Friedman and oth
observed, the text probably does not represent ordinary Latin or anv other natural language enciph
substitution of Voynich symbols for single tetters (that is. in terms of our scheme. P.1 or P.2 an
words, the many sequential repetitions, the rarity of one- or rwo4etter words, the rarity of doubl
militate against simple lubscniaon. So also docs the strange lack of parallel context surrounding
"same" word as shown by word indexes. In the words of several researchers, 'the text just doesn't

An Ideographic or Symbolic Representational Scheme. At the other extreme, a srstem involving our h
purely ideographic or pictographic system, preserving no trace of endings, grammatical forms, or a
alphabetic strings) is equally unlikely. This possibility is ruled out by the salient beginning, m
demonstrated by Tilcman and since repeatedly confirmed The prefix-like en Does and the obvious sim
also indicate that there is some degree of language-like structure, involving umts smaller than wh
Voynich text.

PolvaJphabetit Substitution. Hypotheses involving E.S (the cyclic use of several different subset
to some rule) is rived out, as noted bv EUzebeth Friedman, because there is far too much structure
Polyalphabetic iv? terns, like the well-known Vigcnerc table, are explicitly designed to obscure t
repetitions in natural text which provide helpful break -in poinu for the would-be decipherer. The
occurrences of Voynich characters throughout a sample of text are also too “rough'’ — that is. som
while others are very common — for a polyalphabetic system, which obviouslv. with its many alphabe
oui“ the frequency distribution for the text as a whole.

Transposition Systems. Systems involving anagram mmg or transposing letters over arbitrary sequenc
also unlikely for a number of reasons; first, the many repetitions of similar strings of character

-JoYr*c9 +ofl\-r<j “ lnd re ««««• the numcrous lhort

words used as labels or captions; and third, the difficulty, ambiguity, and tedium of such methods
text, together with the difficulty of reading and deciphering what was probablv a reference work t
than one person.

Some Hypotheses Worthy of Further Consideration. Having narrowed the field somewhat bv setting asi
possibilities as unlikely, we can concentrate our attention on certain others that seem more promi
suggest certain general considerations that appeir relevant to the nature of the wrmng system in t
method of concealment was used would have had to be relatively easy to empiov and to remember. The
(estimated at 250,000 characters) militates against any elaborate, multi -stage process such as th

The ease and naturalness and the cursive quality of the writing also argues against any tedious an enciphering operations (unless, of course, we assume that the ennre manuscript had been copied fro

The recent research of Prescon Currier (ice Section 6,S below) indicates quite dearly that there w scribes or scholars who worked on different folios of the manuscript. This implies that the system its joint use by several persons — a very important new bit of information. As has apparently been bv most students, the script was almost certainly written from left to right; this is shown by the circular diagrams, the presence of starting markers on the left, the slant of the writing around c lines on a page. Finally, it seems reasonable to me that there must have been other documents writ one or more code books or dictionaries in use among the small secret society of scholars who emplo always a chance that such materials will turn up some day to throw some new light on the enigma. C factors and what is known about the behavior of characters in the text, the hypotheses below seem to repav further investigation.

Laun Text With Vowels Dropped. Dropping vowels from Latin produces text having very different char those of normal Latin Text. Single Latin letters may be represented by single Voynich symbols, or. length units; possibly variants a choice of more than one Vovmch svmbol to stand for a given Latin included, as well as nulls (dummy, meaningless letters chosen from a small set of alternatives and throughout the text). Such a concealment system may be represented in our scheme of hypotheses as or E.5) and possibly also E.6 and T.4). These combined operations could all be carried out easil

scribe after some praaice and familiarity with the system. The resulting text would be verr diffic unfamiliar with the method, and relatively easy for the initiate. A problem arises in dropping vow many important small words like "de" and “ad'\ "ef and "ut'\ 'sif and 'est'* become indistinguisha consisting only of a single vowel disappear entirely. This might not be a serious problem for read what (he text was about and were closely familiar with it.

Abbreviated Latin Words, Conventional Latin abbreviations, represented bv mixed-length Voynich cha code -‘like entities, possibly with the added complications of variants and nulls, presents anothe and E + 5 or E.7; optionally also E,6 and T.4), This, too, would be easv to learn and to remember, inmate within the secret circle, but highly difficult for anvone outside it to penetrate,

Latin Text. Enciphered bv Simple Substitution. Concealed in a Longer Dummy Message. This hypothesi and T.7) would explain the many strange repetitions of highly similar words in close succession; o a pan of the actual message, while the rest are nonsense sequences made up, like meaningless babbl conceal the true cipher string. The scribe, faced with the task of thinking up a Urge number of su would naturally tend to repeat parts of neighboring strings with various small changes and additio the next message -bearing word or phrase. This theory would also explain the frequent illogicality sequential structure in stretches of text which has so frustrated irudenn.

A Svnthetic Language or Code fP.3 and E.7; optionally also E.5 and E,6 and T.4). The most likek hy opinion involves a simple code based on a small glossary of a few hundred Latin words related to p astronomy, weather, and other topics of interest to the scribes of the manuscript. The root or bas represented bv one. two. or three Vovnich Symbols standing for a page number or column number on a philosophical subject category as was usual in early universal or am final languages. (See Section grammatical forms could then be represented by the strings of symbols in ctrutn preferred orders n others at the ends of words. This, too, was a common feature of early svnthetic languages. The add variants for bases and affixes, and the insertion of nulls, all common practices in earlv codes us would provide a complex concealment system exceedingly hard to penetrate for the outsider, while s inmate to use. With some practice, it could be memorised almost Like a natural language, especiall was as small as seems likely from the evidence,

A svstem of this kind would require one or more copies of a code book or dictionary to be consulte language. In Seaton 9.2, an early Vatican code (Silvester 1526) which cxactlv fits the above descr some derail. Currier's findings concerning the differences in certain charaaer frequencies and com of text in two different " hands'' are highly significant in this regard. A possible explanation i variants in preference to others, or employed the svstem of endings" a little differently, in cont scribe. These and other hypotheses will be discussed further from various points of view in Chapte

Chapter 5

Major Claims of Decipherment

The survey to be presented here will be quite brief* except m the case of the most recent claim, b Yale University. The solutions put forward bv Newbold* Feeiv. and Strong have been thoroughly deal in treatments published in relatively accessible -source*. T will -provide only a rapid sketch of work* for the sake of completeness, for students new to the problem* and for methodological reason

5.J Newbold

Pro:. Wilham R. Newbold was among the first scholars to whom Wilfrid Vovnich gave copies of the ma after us discovery, in the hope of getting it deciphered and translated. Newbold* a student of med science, published hts first presentation in 1921. He worked on the manuscript and on other alchem Roger Bacon for several more years before his sudden death. Worksheets and notes ot hts research w bv his friend and literary executor. Prof. Roland G. Kent (Newbold and Kent 19281. Newbold was fam of esoteric mystical philosophy developed bv the medieval Jews in Spain and known as the Cabala (o the sentences in a mixture of scripts on folio 1 I6v, and was immediately struck bv a phrase "mich mult as * * . portas'' (as he read it), which he translated 'Thou wait giving me manv gates' , (Fo folio 1 16v, see figure 23)- The word "gates" (Larin "portae" or "portas") was used in the Cabala refer to all possible combinations of the letters of the Hebrew alphabet, taken two at a time Assu following Voynich, that Roger Bacon was the manuscript s author. Newbold brought to bear evidence familiar with certain aspens of Cabalistic lore; he rites references in Bacon s Greek Grammar and on Hebrew (Bacon 1902L as well as his comments concerning concealed writing (for which see Section evidence of this famiiiarirv.

Starting with this due* Newbold examined some other works on the subject of alchemv attributed to to have discovered a cipher used by Bacon for concealing messages within innocent-appearing Latin designated T.7 in Chapter 4). He maintained that a variant of this method had been employed in the well. Thus* Newbold ascribes two different, but related* cipher systems to Bacon: first* a 'Latin alchemv treatises, and second, a more complex "shorthand cipher' used in the Vovnich manuscript.

5. L / The Latin Text Cipher.

In the Latin alchemical manuscripts, a message was hidden, according to Newbold, within Latin word arranged as to appear to be a treatise on alchemy or on a related topic. Alchemy texts were always and nonsensical to the uninitiated (and. one suspects* to many would -be initiates as well) : such ideal cover " for a secret message. Each pair of visible Latin letters in the cover text stood, in Cabalistic "gates' for a single underiving plaintext letter. In this svsrem, 484 letter-pain f twe umc) were generated, so that each of the twenty-two letters of the plaintext alphabet could be rep

rwo variants"* or alternative cipher pain. A restriction was placed bv Newbold on this large numbe that pairs chosen to substitute for a plaintext letter in a word must have the first member of one member of the preceding pair. For example, if "uni us" were to be enciphered, it might be represen the doubled letters would then be dropped, giving oritur"* a good Larin word (see Newbold and Kent Manly 193L p, 34 ff for a fuller explanation)* Added complexities were introduced to provide a cov be acceptable Latin and would not (at least in an alchemy text) arouse suspicion. These added step substitution* and on top of that, a rearrangement or anagramming of letters within passages of fif ten characters of text (our method T.6 L

5 . L2 The Shorthand Cipher,

As described bv Newbold (Newbold and Kent 1928, p. 106 l there were six steps to be followed in de Vovmch text;

1 Transliteration identifying the shorthand characters, and transliterating them in order.

2 Syllabification: doubling ah but the first and last characters and arranging the resulting stnnc member of each the tame as the last member of the preceding pair

3- Commutation: In anv pair where the second member is one of the ' commuting set ' C O. N\ M. L . change the first member according to a “conversion alphabet* provided bv Newbold. Where the first commuting letter, change the second bv a * reversion alphabet* provided: where both are commuting each bv the indicated alphabet.

4. Translation; assigning to the commuted pairs their alphabetic values (bv lookup in a table)

3. Reversion: Changing ' Alphabetic, values! m' phonetic xalucs" (the exact nature of this step is

6 Recomposition: Anagramming the letters to produce meaningful text.

The shorthand * referred to in step 1 was supposedly based on an ancient Greek system of abbreviat applied to each character of the Vornith script as inspected under a reading glass and broken up i curves and lines. Extensive tables are provided m the back of the book to enable the student to ca reversions, convei sions. translations, and so forth.

Newbold and Kent provide good illustrations of a number of folios from the manuscript, chosen from drawings: decipherments of the text on these folios are also presented* which bear little or no re example, a tale concerning two ancient Romans ts read on a page with an astrological drawing (foli folios are read as describing procreative or gynecological matters, with at least some apparent ju tubes, spermatozoa, etc.) in the drawings. This seems to be a frequent reaction on the part of mod female figures on folios 75 ff. Other drawings are taken as recording the appearance of a comet (f of a spiral nebula (folio 68v3l. and an annular eclipse (folio 67v2).

The claims of Newbold were hailed with great enthusiasm bv Vovmch and many others, who wrote numer and commentaries (Bird 1921. Garland 1921, McKeon 1928). Roger Bacon enjoyed a spectacular, if bri sun. while he was credited with the invention of the compound microscope and telescope, and the an twentieth -century scientific discoveries. Catholic writers exulted in oriumph on the one hand ove vindication of medieval scholastic philosophy, and frU over one another on the other hand in their

excuse, and minimize the persecution and neglect inflicted upon the thirteenth -centurv "forerunne
his superiors in the Franciscan Order (Reville 192L Walsh 1921 J. Even a number of prominent Bacon
specialists in medieval philosophy accepted Newbold s claims uncritically, and manfully strove to
anachronisms into their knowledge of Bacon 1 work and thought (Carton 1929. Gilson 1928). Some les
were taking a harder look at Newbold's theories, and expressing their doubts (Steele 1928: Thorndi
Salomon 1934).

At the same time another scholar* Prof. John M. Manly, a professor of English ac the University of
interested himself in the manuscript, and had been (according to his own words I 'dabbling'' with
times . Manly was a friend of Newbold's, and had corresponded with him: Newbold had discussed his
with Manly over some time, In 1921. Manly published articles in Harpers Monthly Magazine (192 lb)
Revieu of Renews (1921a). expressing a mildly favorable or neutral reaction, but also giving voice
cautions. After Newbold's death in 1926. and the posthumous publication of his work in the book ed
published another, much more outspoken article in Speculum (19311. emphatically disproving and rej
theories.

This is how Manly expresses his views in the Speculum article: "The more I studied the nature and
system attributed to Bacon, the more clearly did 1 see that it was incapable of being used as a me
was indeed not Bacon's work but the subconscious creation of Professor Newbold's enthusiasm and in
Professor Newbold mv conclusions and gave my reasons for them in several letters* , , /" (1931, p.
explain that, while he would not have chosen to make a point of attacking his late friend's work,
to set the record straight in view of the unquestioning acceptance accorded to the theory by so ma
He says, "One of the most eminent philosophers of France, Professor Gilson, chough bewildered bv t
accepted the results; Professor Raoul Carton, the well-known Baconian specialist, in rwo long arti

and results with enthusiasm; and American chemists and biologists have been si mi lari v impressed
truth therefore demand a careful examination of the claims of the Newbold cipher" Ip 347*. (See Ca
1928*)

Manly' makes the following flat statement at the outset: *Tn my opinion* the New bold claims are e
should be definitely and absolutely rejected" fp* 347)* He explains that the tiny Lines and curves
Greek shorthand symbols were due simply to cracking of the ink on the rough surface of the parchme
of Newbolds method. A second telling attack is focussed by Manly on the sixth and final step, invo
letters in stretches of fifty-five or one hundred and ten text characters. He demonstrates the ama
sentences, even including rhyming poetry, that can be generated from a single short passage bv ana
he considers a sentence in one of the aiehemv treatises attributed to Bacon: "innpium quaedam care
cum sun responsionibus et e«. * * .** From this sentence. Newbold had obtained the following: "Dc
despioc mixta prinapia lumejnj"- Since each letter of the original sentence, in Newbold s ' Latin
number of alternative equivalents, a huge number of possibilities present themselves for selection
anagramming begins. This is the sentence for which William F. Friedman, working in cooperation wit
Newbold’ s theory, obtained the anagram "Paris is lured with loving Vestals. . . /*, simply bv cho
equivalents and a different arrangement among the many possibilities. For a full discussion of the
and the aitfalis of Ncwbold s theory, see Manlv 1931. pp. 330 ff and Friedman and Friedman 1959.

Man. v s article in Speculum succeeded in laying to rest Newbold's theories, and Friar Bacon retur
accustomed scholastic obscurity* consigned to even deeper darkness in an over -reaction on the par
against his illusory role as originator of twentieth -century scientific instruments, and observer
gynecological secrets 600 years in advance of their appointed time. (Note, in particular* the sava

"debunking " attitude toward Bacon expressed bv Thorndike 1916 and 1923-195SJ It seems probable al controversy over Newbold’s work, the amount of publicity it received, and its complete destruction its uncritical acceptance by majiy prominent experts who presumably should have known better, caus wash their hands of the manuscript and to steer clear of anv serious involvement with the problem Newbold’s impressive reputation and knowledge of medieval philosophy could be made to appear so de after so many rears of painstaking effort, it is easy to understand the reluctance of other schola and peace of mind on the problem.

5-2 Feely

Eluebeth Friedman 11962) describes Fedy and his claim to a solution of the manuscript as follows ’ R ochester lawyer. Joseph Martin Fee) v* published a book entitled Roger Bacon's Opher: The Right the author oi Shakespeare's Maze t Deciphering Shakespeare, and other items catalogued in the Frie the heading Cryptologic Follies. " However unacceptable his results may have been, he started his manner, according to his description of them in his book: coming upon the manuscript through the p Kent book* he did frequency' counts on Roger Bacon’s Latin in several works, including De Perspect and Commuma Naiurahttm l concerning natural science).

Feely noted that the leaders"’ fby which he apparently meant the highest-frequencv letters) m Baco the letters "E. I, T, A, N, U. S ’, and he attempted to make a parallel analysis of lener frequenc assumption of simple substitution four hypothesis P. 1 and £. I and T. 1). From these studies he m at cribbing" various words that might be related to the drawings and their accompanying text in th remarks with obvious exasperation chat the Latin in Bacon’s manuscripts was highly abbreviated: he have been reduced in length by thirty-five percent through this practice. He comments, also with e the differences between medieval and classical Latin. These difficulties apparently frustrated and researchers to a considerable extern, and perhaps drove him to the much eaiier and less demanding possible "cribs" in the text*

Fed vs attempts at cribbing apparently met with some success. On folio 78r, shown in Newbold and K V), Feely found his first break into the text. This page is one of those showing nude female figur liquid. Feely assumed that two cloud- or grape -duster objects at the top corners of the page (see of these > were ovaries" and that the channels leading down from them and joining m the middle of transmitting "ova ' into the two "sacks ' below. In the " sacks," according to Feelv. the "ova " w standing in the liquid. There are "labels" in the Voynich script next to each cluster, the section

stream of mvstenous Jubilances from them, and the pooh into which thev pour. Feelv obtained his fi to call the results of his cribbing) bv a studv of these labels and an attempt to assume various L represent. Figure 25 shows the results he obtained from these initial researches,

His initial "dews' provided Feely with a number of letter substitutions for common symbols in the he then employed m an effort to puzzle out the remainder of the text on the same page. It should b had access to a complete photocopy of the manuscript; he carried out all his work on the illustrat 1928. The plaintext which he obtained was a crude, abbreviated pseudo- Latin, which he translated on gynecological topics for folio 78r. On folio 68v> (Newbold and Kent 1928. Plate XXII). he claim Greek words, and to have deciphered a mysterious reference to a statue of Memnon (Feely 1943. p 37 Feelv claimed to have found the personal diarv of a scientist observing living cells under magnifi jottings" of an carlv researcher, hidden in cipher from the hostile eyes of religious authorities Although he hedged a bit at coming out flatly in favor of Roger Bacon as author of this scientific

that his decipherment tended to support and confirm Bacon- s authorship. Figure 25 shows the alpha result of his studies (probably by successively cribbing and then guessing at letters to fill in t until he produced something like Linn. etc., in a cut -and- try fashion). Like manv other students as containing manv compound symbols built up from simpler forms Unfortunately for Feelv. however, accepted his soiui.on as valid. Tiitman. summing up the general opinion, dismisses Feelv s efforts unmethodical method produced text in unacceptable medieval Latin, in unau then tic abbreviated for

5. 3 Strong

Professor Leonell C Strong, a highiv respected medical scientist in the field of cancer research a interested in the Voynich manuscript when he saw O "Neill's article f 1944) dating the manuscript the riddle of the enigmatic book in the context of a long-enduring interest in Renaissance literat he attempted without success to obtain copies of the text for study. He was forced, finally, to ca same wav as Feely had. on the basil of illustrations of individual folios in published works conce course, he published a brief article claiming a solution to the mystery (19451. His decipherment w been termed a "peculiar double system of arithmetical progressions of a multiple alphabet. indicat manuscript author was familiar with ciphers described bv Tnthemius. Porta, and Seleni" iMcKaig nd.

Strong s decipherment resulted in what he claimed to be a form of medieval English; he attributed Anthonv Ascham, brother of the better -known Roger Aseham or Askham. a tutor to the children of th Tudor in the sixteenth century. Anthony was a physician and astrologer; he published several alman astronomv. and .an herbal lAskbam 1548a. 1548b. 1550. 1552. 155J). As described by NfcKaig in.d., efforts produced text presenting "an extremely candid discussion of women's ailments and practical bed — you might call it a sixteenth -century equivalent of the Kinsey Report". He identified an he recipes, and ran a laboratory experiment to test the effectiveness of the prescription for that pu comprised pitch from the nit bark of pine trees, honey, and "oil of spindle. 1 * Strong claimed th in his experiment to have caused spermatozoa to lose their motility, thereby verifying its effecti of the contraceptive (Strong and McCauley 1947, p, 9001. The details of his crvptanalvtic work and decipherment, however, have apparently never been explained, and remain problematical

Strong s plaintext, of which he provides several examples in his articles (Strong 1945. Strong and been rejected bv other scholars as completely unacceptable for medieval English. The reader mav ar conclusions from the following sample: "When skuge of run e-bag rip. sco uogon kum sli of sc mosur bent, stokked kimbo-elbow crawknoi. This astonishing string of letters is translated bv Strong thu the veins rip (or tear the membranes l the child comes slyly from the mother issuing with the leg whik the arms, bent at the elbow, are knotted {above the head) like the legs of a crawfish." (Stro mind, at least, this seems a highly unlikclv thing for any writer of any age to have said, whether strange to me, also, that so many students have become obsessively preoccupied with gynecological of the text. The presence of the scattering of quite unexceptionable 1 matronlv little nude figure seems to me an entirely insufficient justification for this obsession.

Nothing further has been heard from Dr. Strong in support of his theories, to mv knowledge, even t manuscript has now been accessible to scholars at Strong s own University, Yale, for a number of v Eltzrbeth Friedman, "experts said that what he produced was not medieval English. As for his ciphe about it. but what he did sav made no sense to crvptoiogiscs ' (19621.

5 . 4 Brumbaugh

Robert 5. Brumbaugh, a professor of medieval philosophy at Yale University, became interested in t

manuscript during the thirties, and when it was donated bv H. P. Kraus to Yale, he was drawn bv an to look at if (Brumbaugh 1975. p. 348). He was also struck bv O' Neill's identification of America (1944). Brumbaugh published an article in Speculum (1974) announcing that he had solved the mvster some labels on plant pictures in the pharmaceutical folios as well as what he refers to as star ma p, 348). He also states that he has dea phered the name of Roger Bacon in the "kev ' sentences on the manuscript as a deliberate forgery for the purpose of fooling Emperor Rudloph 11 ot Bohemia in sum of money he paid for it.

Scaring that the complete solution will take a lot more study. Brumbaugh still claims that extensi on astrology, with some botanv. and frequence studies of samples throughout the text show that my (1975. p, 348). He makes tons id cn We-ttse of like sequences of symbols in the margins of folios and 76r. and in the second ring of 57 v. as well as the sentences on 1 16v; these sequences, while misleading, sail provide aid in penetrating the cipher, according to Brumbaugh. The text on folio be enciphered using what he calls, without further explanation, a standard thirteenth <enturv ciph

sees confirmation for this in the paired sequences in left and right margins of folio lr. in which substitution of two normal alphabets, with "a" of one set against "d" of the other. Using this cip rearrangement of syllables, Brumbaugh obtains "RODGD BACON” from a portion of folio ll6v which he "MICHI CON OLADA BA' (note that this is the beginning of the same text string that Newbold read as DAB AS MULT AS . . PORT AS") He suggests that the name was * planted " in such a manner as to be e Rudolph s experts and thus to attract and delude them into accepting the anrihunon of the manuscri

On folio 66r. Brumbaugh sees a set of "formulae in the words and letters scattered down the right formulae, he suggests, serve to equate symbols to other symbols bv a son of "crvptanthmetic." of w examples (1975. pp 350-351). I must confess that, while those he explains are convincing enough, t formulae” remain somewhat mysterious to me m the absence of further clarification. Using these equ recoveries of labels for plants (which he "cribbed ' bv exploiting word patterns with repeating l "pepper." "pa" in "papaver.” etc.), he sets up a four-bv-mne table of correspondences: he savs tha a standard alchemist * or astrologer s cipher, well known m the trade” (1975, p. 35 1), and he f the words quadnx nomx' which he sees as referring to this four-bv-ninc structure. Figure 2b shows Brumbaugh recovered it.

All the Vovmch svmbols. Brumbaugh suggests, stand for forms of the numerals zero through nine tor the function of zero; if anv. is not made dear in hts presentation). The encipherment, as he sees which first replaced Letters bv numerals using the four-bv-nine box. collapsing the letters of the and then substituted choices among several different fanciful designs for each numeral in order to designs chosen from modern and archaic numeral forms. Greek and Latin letters, and several cursive 35 3). It will be noted that this process involves multiple variants in both the Vovmch script and involves first recognizing the numeral underlying one of its variant forms in the Vovmch script, t cwq. three, or four possible choices of plaintext correspondences, when this has been done for a w sequence of letters is selected from among the choices.

An example of the application of this method to a portion of folio 1 16v will serve as an illustra Brumbaugh singles out a sequence of eight Voynich svmbols from rhe mixed text on this page. | use he reads as High German: "valsch ubren so rum ga nichr and translates as the above is false so do Identifying the eight Vovmch svmbols with numerals according to the correspondences he has set up explain anywhere in his papers except in verv fragmentary form), he obtains the digits "0 2 0 2 7 their multiple plaintext equivalents from the mne*bv-fotir box, he produces the following:

0 202 733 9

A B A B G C C I

J K j K P L L .

V R V R Y W W -US

37

He selects among the few pronounceable alternatives * AKABYLLUS. ARAKYLLUS, AKARYCCUS. L r RUBYLLL
ARABYCCUS, etc..) the word ' ARABYCCUS". which he sees as a reference to the Arabic numerals under
In his first article f 1974), he presents a number of other examples of his method drawn from plan
folios. In most cases, the choice among pronounceable possibilities ts quite limited, a phenomenon
theory.

The plaintext produced by Brumbaugh s decipherment is described by him as 'an artificial language,
not very firmly based there: its spelling is phonetically impressionistic: some sample passages se
To add to the decipherer s problems, 'the upper cipher key changes slightly every eight pages ' 1
asserts, plausiblv enough, that such ambiguities, while rendering « cipher system unsuitable for m
customary and expected in magical, astrological and alchemical texts of the times in question.

Tiitman (1975) makes these critical comments regarding Brumbaugh s theories: '"The idea that the m
forgery is not original to him. I suggested it as an uncomfortable possibility tn 19)1 . ... He cl
the script are really digits in variant forms and that the kry is a fro* providing single digit su
digit represents two or three letters .... All this is so ambiguous that it can only be justified
of confirmatory evidence, but he supplies hardly any evidence at all aid 1 remain quite unconvince
alone in assuming the symbols to be numbers in various forms. This has been suggested several time

Mv opinion on a careful study of Brumbaugh"! two published papers is chat his theories are quire p
such evidence as lie presents. His proposals are based in. and explain, more of the observed pheno
what is known of its history than chose of anv other decipherer. I have made two painstaking attem
as possible of the variant forms for numerals he mentions in his articles, tn so far as l can gues
frequentK cryptic references. From the fragmentary set of correspondences I havt thus obtained. J
decipherments of other plant labels and isolated text strings wuh mixed results. A lot of them are
sec, and some are suggestive of Latin or pseudo-Larin words; many are very similar (as would be ex
repetitiveness of the text). There is fust enough plausibility in the process to lead one on. but
satisfied. Figure 26 shows my very conjectural attempt to reconstruct Brumbaugh's variants with th
rune-by-four matrix, and a sample of his decipherments of plant labels.

A new article by Brumbaugh has recently appeared in the jottmtl of she I mnd Cavnatdd \nsmutts* Un
London (1976). In this article. Brumbaugh up that his recent research has convinced him even more
rectness of ha decipherment

Chapter 6

History of Other Substantial Analytic Efforts

6.1 The Forms in Which the Manuscript Has Been Studied

The Voynich manuscript was for a long time held in private hands, first by its discoverer, Wilfrid
widow, and finally by H. P. Kraus. Because of its great financial value, its owners were understan

unlimited access to it or reproduction of it;* although they 4rrqu end y cooperated with serious s
mystery In the first few years after his discovery of the manuscript, Voynich made vigorous and re
students in it. and Newbold was introduced to the problem through his efforts. It is possible that
Newbold's researches, and the disappointment occasioned by their failure may have resulted in an a
and of greater restriction on the pan of the owners in providing access to the manuscript in subse

As we have seen in the previous chapter, Feelv and Strong were able to study the text on lv throug
published works of Newbold and others. The manuscript has come before the eyes of many other stude
form of phocostatic copies. The copies used bv Friedman, Tiltman. Krischer. and Currier, and the c
derive ultimately from a photocopy made by Father Petersen of Catholic University on April 29, 19}
photostats provided by Mrs. Voynich. Tiltman fin a report of Petersen's work made in conjunction w
papers after his death in 1966), states that ' virtually all copies of the manuscript in private h
Petersen's photostats/' The pages I have studied are, in fact, copies of copies at four or five re
accompanying the copy m the Friedman collection) provides this interesting account of the photocop
at char rime, and how they came into existence:

On 2 1 Mav 1944 W| illiam J Ft . | Fjricdmin j wrote a lertcr ro the widow of Dr. Wilfrid M Vuvmch
famous manuscript, requesting a phofosrenc copv The requeir was granted and a complete copv was ma
provided bv Mrs Vormch. In her kner dated 31 May 1944, she stated tbit photostanc copies were exrr
York Public Librarv, another is in the British Museum . another was given to Dr Petersen of Carbol
scholar whom Mrs. Vormch did not idenufv: fmallv Mrs. Vormch hersell had a copv. With the copv tn
appear to be in all si a copies in the world

In general, (he photocopies I have seen provide a degree of definition and clarity' which is quire
penstrokes, guidelines on diagrams, and other fine details show up very well, and the text is dear
everywhere. Certain deficiencies should, however, be mentioned, since they may have had a definite
effect, however slight, on the research carried out by many students. First, the complete lack of
copies inevitably results in a loss of some meaningful information. This may be important not only
in understanding the meaning of other drawings, but even in isolating some details against a dark
everything is seen only in shades of grey, writing or small designs within colored fields are some
same difficulty can anse in cases where the photocopy is very dark, so that the grev background ob

A second defect of the photocopies available to me applies primarily to the large, multiply -folde
had to be made in pieces, their over -a II relationship to form a whole is often very difficult to
see the complete system of drawings as they appeared in the original form. Worse vet. in some case
been obscured by being out of focus around the edges of a page, or has been partly cut off, so tha
that was on some pages in the original. This is notably the case for the large, intricately folded
complex system of inter -related circular diagrams.

Another feature of the photostats 1 have studied, while not constituting as much of a hindrance to
problems already mentioned, is annoying and at times confusing to the student. There are numerous
underlines, and other |omngs and scribbJmgs of modern researchers on many pages. Among these are c

I informed b\ Mr James GiUoglv. who has studied ihu copi. ihaT it is incomplete, comprising onlv a
made up primarily of plant folios.

remains of at least one previous computer processing project, including circled words and paragrap

of rhc reset, and legends such as start here . omit punch' . and punch just this." in some cases, cross the text and drawings in such a wav as to obscure or confuse some features of the original G have indulged their characteristic and apparently irresistible habit of underlining patterns and r triumphantly noted their guesses about the meaning of the diagrams I "the four ages of man/' "the "Sagittarius — archer"), While one can empathize with the momentary joys and sorrows of one s pred struggled with the enigma, most of these jottings are trivial at best, and at their worst serve on difficult of the task I, for one, would prefer to see nothing more on the pages than what Wilfrid viewed them in 1912,

A final unavoidable disadvantage of working with copies is the inability of the student to venfv o concerning the faint, parti all v-erased writing in other scripts and hands discussed in Section 4 examination of the original, perhaps aided bv special chemical or photographic techniques to revea writing more fully, we cannot make the most of the opportunity they provide for a crack in the smo So little "crib" information is available; the scribe or scribes were so consistent in "encipherin leaving no clues "in the dear", that we need every precious bit of added information we can glean atypical scribbling*, whatever their source.

Such, then are the photocopies with which mosr of the students have worked whose researches will b chapter The first problem facing the analyst has been the attempt to arrive at a firm set of eleme alphabet" for the Voynich text. We have seen in Section 4,1 and figure 19 the wide differences bet alphabets adopted bv different students. Armed with a list of svmbols that satisfies him at least has then set about the task of making counts, indexes, concordances, and other anal vies, cither b fortunate as to have access to computers, bv machine Some students have copied or transcribed larg hand; this is a good wav to get the "feel" of the text, and to become familiar with the svmbob and remainder of this chapter, several major analytic efforts will be reviewed. These studies, while n derisive break-in or decipherment. have in manv cases added substantial I v to our knowledge about informative also from a methodological standpoint, and deserve the attention of anv serious studen from the work of his predecessors rather than blind Lv repeating it.

6,2 First Voynich Manuscript Study Group, 1944-46

Afrer the debunking and rejection bv scholars of the three major solutions claimed bv Newbold. Fee William F . Friedman decided to mount a large-scale effort against the manuscript with the aid of well -constituted team of researchers. This group, made up of scholars engaged in war work in Wash i according to Elixebeth Friedman 1962) "specialists in philologv, paleography, ancient, classical Egyptologists, mathematicians, and authorities on other sciencesdepined in the manuscript." Awaiti dose of their service to the Government during World War 11, thev agreed to get together after wor Friedman s direction and focus char talents on the mvstenous manuscript.

The group was called together by Friedman in Mav of 1944, On the rwenth-sixth of May. sixteen peop meeting of what was termed an extracurricular undertaking. Friedman provided an outline of the man and previous solution attempts, and the attendees examined the photocopy lent to them bv Dr. Peter copy were distributed to those present, and plans were made to work up a standard list of the svmb alphabet in Roman letters with some digits and special characters {punctuation, etc.) for processi accounting equipment. Figure 19 shows the list of svmbols and English equivalents thev arrived at. approximately biweekly intervab through June; transcription of text and study of the script contin background topics (Athanasius Kircher s work. John Dee s activities, studies of medieval Latin, et discussed.

Meetings seem to have been somewhat less frequent and regular thereafter, or at least considerably m the manures I have seen. Nevertheless, in September 1944 an "IBM run" had been made (on tabulati machines, since no programmed computers were in general use at that time) In subsequent months, mo

transliterated and machined, in December 1944. meetings were resumed.” implying that a hiatus of s
elapsed during which the group had not been meeting. A new enthusiasm was communicated to the atte
impetus provided to their efforts (according to the minutes) bv William Friedman s presentation of

synthetic language developed bv Wilkins’ Mee 6.6 and 9.3 below for further details. Studies ot thi
word beginnings and endings, lecrer frequencies, number of different symbol*, and word lengths see
found in the Vovnich text.

During January and February, the group continued co work on IBM runs and frequent v tabulations. T
unfortunately, no record of their work after this time in the materials available to me. although
continued sporadically into 1945 and 1946. It is hard to telL in the absence of anv summary of the
they succeeded in processing bv machine and what analyses thev performed on it. Judging bv the pri
rhai were preserved in our records, thev transcribed and keypunched an impressive amount of text a
characters, or 1663 thirty -character lines. The tabulations of results and anv report of rhe anal
from the file, if thev ever existed in final form. Subsequent students have had to repeat, over an
transcription and machine preparation, as if it had never been done bv others.

Eiiiebeth Friedman presents the following perspective on the outcome of the First Vovnich Manuscri
"Because the preliminary work of transcribing the lext into, machine- processable symbols could on
hours, demobilization was practically complete before the manuscript was readv for final studv, Th
disbanded and returned to their universities or research projects. Their considered opinion as eo
general nature of the manuscripts, based on their extracurricular work, are still valid todav i I9

63 Theodore C Petersen

Father Petersen (1 883-19661 was a teacher and priest at St. Paul i College and Catholic Universit
details are largely drawn from unpublished biographical notes and a survey of Petersen's work on t
by Tiitman afrer Petersen’s death in 1966.1 He had one hundred and twenty -two sheets of photosrat
1931 from Mrs. Voynich's copy at a cost of $25.00 Thereafter he spent considerable time, especiall
time of his death, in a painstaking and thorough study of the manuscript. His work included a comp
corrected by reference to the original, which he examined in the New York Guarantee Trust safe dep
kept until Mrs. Voynich's death. A note on the front page of this transcript attests to the fan th
1944. Tiitman 11975) reports that the task of copying the approximately 250,000 characters of text
rears.

Petersen was a scholar of wide learning in ancient languages and history, and compiled a quantity
interesting information about religious, astrological, and mystical manuscripts and ocher sources
Vovnich manuscript. He also directed considerable attention toward identifying the plants depicted
The pages of his transcript are copiously annotated with these gleanings and commentaries In addit
Petersen made (also by hand) a laborious and complete concordance of the entire manuscript, showin
reference to all the pages where it occurred and several words preceding and following each occurr
in the absence of a complete computer index, this concordance can be of great value to students of

in his scholarly and wide-ranging background research. Petersen studied the works of Ramon Lull an
Bingen, magical manuscripts such as Picatrrx. astrological, alchemical, and herbal writings, and t
Magnus and Roger Bacon. There is. unfortunately, nowhere in the material available to me am report
may have held, or conclusions he mav have reached concerning the decipherment of the manuscript. A
were given to William Friedman; they were inventoried at Friedman's request by Tiitman. and arc no

Friedman collection at the Marshall Library in Lexington. Virginia.

6.4 Second Voynich Manuscript Study Group , 1962- 1963

In 1962, Friedman succeeded in interesting computer specialists at the Radio Corporation of Americ
effort to studv the entire manuscript bv computer. The first meeting of a new study group was held
According to the minutes. Mrs, Friedman presented background data on the history of previous work
information on the manuscript. Mr. Friedman then gave a presentation on the 'Salient External Feat
Characteristics oi the Manuscript/' The group worked together, again " extracurricular! v" and wit
over the next several months. A small team of ‘ dedicated wives' 1 (as they were described by a pa
were hard at work transcribing and keypunching a quantity of text, using facilities provided by RC

Ambitious plans were laid for an impressive set of computer runs, intended to involve, according t
studied, at least 2000 thirty-three character records, or upward of 66.000 characters of text. The
specifications, and all the other paraphernalia of a full-scale computer attack, which (had it bee
have provided students with a powerful tool for research. The computer runs planned included studi
sequences fn -graphs") from one to six letters in length; single words and sequences of words in t
occurrence of letters at different positions within words; words in different positions within sen
called "le tt e r permutations' whose nature is not dear to me from the documentation. This plan w
complete computational- linguistic analysis of the Voynich text.

I cannot determine how many characters of text were actually machined, and whether anv processing
There is dear evidence in the records chat programs had been written to generate the computer file
processing, and that detailed specifications had been set up for performing the sorts and tabulati
plans were still being pursued to complete transcription and machining of text. Figure 1 9 shows t
used bv the RCA group to represent the Voynich script characters. Unfortunately, the second midy g
fate as the first: higher management at RCA decided to terminate even the minimal "extracurricular
resources, and the group was forced to disband before any definitive results could be obtained.

6,5 William F. Friedman

A specialist m generics and biology who became one of the world s foremost cryptologists, Friedman
student of the Voynich manuscript from the early twenues on. He worked with John M. Manly in resti
New bold's claims. Elizebeth Friedman (1962) provides an amusing account of the sport she, her hu
together in demonstrating other J 'decipherments" that could be had from Newbold s text using his
different arbitrary and subjective choices and arrangements of letters at certain stages of the pr

In 1944, as we have seen earlier in this chapter, Friedman brought together the gathering of war -
formed the First Voynich Manuscript Study Group. Their work, unfortunately cut short before it cou
ahead y been described, Elizebeth Friedman has this to say concerning her husband's enduring inter
never flagged up to the time of his death in November, 1969: "Through the years since I92L Friedma
interest scholars and cryptologic experts in the problem, besides giving it what spare time he cou
this writer. Friedman s studies have produced a theory which constitutes a logical basis for an at
solution of this baffling manuscript" (1962).

Friedman published a statement of his theory, in the form of an anagram, in a footnote to an artic
topic in the January 1959 issue of the Philological Quarterly (Friedman and Friedman 1959), At the
deposited a statement in dear English in the archives of the Quarterly's editor. He did this in or

claim to the idea, which he could not yet work out in detail and prove sufficiently to publish. Th
appeared in the footnote: PUT NO TRUST IN ANAGRAMMATIC ACROSTIC CYPHERS. FOR THEY ARE OF

LITTLE REAL VALUE — A WASTE— AND MAY PROVE NOTHING. — FINIS." (Friedman and Friedman 1959, p
19). In his article* he sates that an anagram of this length is possible, though extremely difficu
one would have to know something of what it said. In this way, Friedman planned to have a cryptogr
thus triumph, even from the gra ve, over any later discoverer of the same idea.

The theory which Friedman concealed in the anagram has since become known to a number of students,
to be no further real secrecy concerning its nature. Tiltman had later independently reached the s
6.6 below), namely that the text of the manuscript was written in a synthetic language built up on
classes of words with coded endings or other affixes, Friedman's and Tiltman s researches into kno
have been mentioned above, and more will be said on the topic in 6.6 and in Chapter 9.

* 6.6 John H, Tiltman

Brigadier Tiltman. a professional cryptologin of long and distinguished experience, was introduced
of the Voynich manuscript in 1950 by William Friedman, who provided him with copies of several fol
section of the manuscript, consisting of text without drawings. Tiltman quickly carried out. by ha
statistical studies on the text, concentrating his efforts on the most frequent symbols and their
demonstrating a "precedence" structure of symbols within words and the orderly behavior of charact

“middles/ and 'coders' of words, has remained one of (he most solid and useful findings gleaned bv
manuscript during many years of study. In 1951, Tiitman prepared an informal report in the form of
communication to his friend William Friedman, in which he summed up his work (Tiitman 1951k The ne
paragraphs will briefly review some of the salient points in that report.

Tiitman directed hii attention toward the behavior of the seventeen commonest symbols in the manus
shows his transcription alphabet. He notes the ordering of characters within words in such a way c
entities Like stems and affixes. Certain symbols most often begin words, and duster there with cer
exhibit a preference for the ends of words, where they cluster in certain arrangements with other
structure of repeated "V and “C" symbols after and “0". and before ^ if*’, A table of these bl-

endings \ as found by Tiitman, is shown in figure 27. He mentions also the frequent sequential rep
phrases such as 1 ft? *? "■ ”5? •?«£ . etc., repeating the suggestion of a friend of his that thes

repeated groups might stand for Roman numerals. (for example, "*t^) " might be "iij", and J might

While mentioning this idea as an interesting possibility, Tiitman points out thir it does not work
it nil! leaves us with too many unsolved problems. In any case, the ordering of symbols within wor
Tiitman. and since confirmed by others, presents us with a phenomenon which must be satisfactorily
decipherment theory.

As he stated in his 1951 report to Friedman. Tiitman had independently arrived at the same theory
underlying the Voynich script that Friedman himself had earlier developed. He states this theory t
formed the opinion, which you held much earlier than [.that there was no cipher involved ar all (i
sense of the word) and rhat the bans was more likely to be a very primitive form of synthetic univ
developed in the form of a philosophical classification of ideas by Bishop Wilkins in 1667“ (1951.

convinced, from his study of the behavior of symbols within words and words within lines of text, not be explained by any simple substitution system. In pursuit of confirmation for his theory, he search to trace back the concept of ’ universal 1 ' and “synthetic" languages to a time that might of the Vovnich manuscript (1550 or earlier).

Fnedman. as we have seen above, had turned up two interesting synthetic language systems: one deve John Wilkins (1641, 1668a. 1668b). and another of somewhat later date devised bv George Dalgarno (Tiitman studied these two languages carefully, looking for stvhsac and statistical similarities to systems were probably of too late a date to have been used by the author of the manuscript, they m been based upon, an earlier system that could have been so employed. Tiitman concluded that both W languages were much too systematic to account for the phenomena in the Voynich text. He postulated that employed a “highly illogical mixture of different kinds of substitution'* { 195 1, p. 2).

Looking back further in history for a still earlier form of 'universal language ”, Tiitman discove "Universal Character", devised by one Cave Beck (Beck 1657). This system looked somewhat promising hardly early enough in date; it was certainly ’illogical" and “mixed " in us methods. The words of were assigned numbers from one to 3999, in rough alphabetical order, creating a crude four -digit the language. A subset of about one hundred and seventy -five common words could also be represent groups in addition to the basic four -digit code groups, constituting, in effect, a set of variant trigraphs all began with Y or ' Y\

Code groups representing nouns in Beck s syitem were preceded by the letter V\ and adjectival grou Synonyms (e.g T1 “to think" and "to cogitate") had the same four -digit group assigned to them. Pl ' Y . or sometimes, an “ 8 ". after the digit -group. Verbs might have up to three letters prefixe certain forms. The digit -groups themselves could be written also in letters, each digit being rep < consonant- vowel, vowel -consonant, or consonant- vowel- consonant). This variation, intended bv pronounceable forms for the code words, constitutes from a cryptographic point of view a substitut mgraphs for the digits, to provide a set of variants. Finally, because of the arbitrarily mixed le a separator was required to show where one word ended and the next began. Tiitman points out that group »r in the Voynich text could stand for a plural "s " followed bv a word separator as in Beck

Tiitman discovered another, sbJ] older “synthetic language" proposal by a man named Johnston, deve direction of a Bishop Bedell about 1641. No detailed description of this system has survived, unfo more will be said about synthetic and universal languages in general. I will also present, in Sect

I

findings in tracing the evidence for the existence of similar synthetic languages or codes back co well into the fifteenth or ar least mto the eariv sixteenth ccnturv.

In later reports (1967. 1968. 19751. Ttkman describes his other principal line of research on the spent some time in England in 1957 consulting experts on early herbals and medical manuscripts, an down in origin for the plant illustrations. He presents an excellent overview of the history of ea illustrations f 1 967. 1968). Summing up his own end others failure to discover any dear parallels manuscript, he lays. To the best of my knowledge no one has been able to find anv point of connect medical manuscript or early printed book. This is all the stranger because the range of writing an of the plant world from the early Middle Ages right through into the sixteenth and even seventeent

limited indeed. ... In general, the illustrations in the early printed herbah are limited to two o
woodcuts copies over and over again in more and more degenerate form" (1 968. p. 11).

Aside from the substantive contributions Tiitmans research has made to our knowledge of the manusc
important result of his work should be mentioned. Over the many years of his association with the
a coordinator and contact point for students interested in the manuscript and desiring information
studies carried our on it by others. His papers and presentations have provided many researchers w
the subject, and have motivated a number of students to take up an interest in the manuscript. It
reader who has persevered this far in reading this lengthy monograph that the puzzle of the Vovnic
complex challenge, and can best be approached by cooperative research, building on the earlier fin
orderly scientific enterprise. Tikman’s publications and communications have provided such a found
which newer scudenu can advance, without being forced to exhaust their resources needlessly repeat
others have already accomplished.

6.7 Jeffrey Krischer

Knscher. a man of very broad interests and talents comprising mathematics, computer science, medic
became interested in the manuscript and made a computer analysis of the text as a research project
at Harvard University This research was described in a paper which received a limited circulation
students of the manuscript (Krischer 1969V In Pan 1 of his paper, Knscher provides a brief sketch
claims by New bold. Feelv, and Strong, and reviews some general information about the history and
manuscript. In Pan II. "Statistical Analysis." he presents an interesting discussion of the proble
transcription alphabet and a description of the alphabets used by Newbold. Currier, and Tikman. He
several srvlostaristical techniques which might usefully be applied to the Vovnich text.

Krischer 's approach eo the computer study of the manuscript is uniquel v interesting because he e
of programs developed for machine processing of Chinese characters on the Digital Equipment Corpor
computer. As Krischer states, this set of programs was general enough to permit its application to
The symbols (following Curriers alphabet) were drawn on a cathode ray tube "scope" display attache
computer. The text "could then be transcribed by pointing with a light pen to the corresponding ch
each character of the script" (Krischer 1969, p. 4). This method of transcription was more direct
laborious hand copying and keypunching required by other computer studies. The PDF- 1 system also
editing and correction of the transcribed text from the scope. The output of computer runs could b
Strom berg -Carlson 4020 equipmcnr to produce a graphic reproduction of the Vovnich characters, th
cumbersome and distorting artificial Romamzationa that all ocher students have had to resort to. T
fed direcrlv into the computer, where it could be subjected ro any desired manipulation or statist
two percent, or 5500 out of the 250.000 characters in the manuscript, were machined by Knscher in
his own statement ip. 53). His frequency counts are shown in figure 28: it mav be noted that they
discrepancy for which I can find no explanation.

In Section III of his monograph. Krischer discusses some statistical tools for comparing different
language text. He selects three such techniques as potential Jv useful in comparing the Voynich te
languages. These statistical tools are: 1) a statistic or "characteristic" * V, describing the de
in the sequences of characters m the text; 2) a statistic representing the "entropy" or degree of
text, having a characteristic value for each natural language; and 31 Markovian analysis, a wav of
that anv particular letter will be a successor to anv other particular letter in a string of text.
measures, which have proven effective in other srvlostatistical researches, mav be useful in helpi

underlvinc lanpuaje of the Voynich text. (In this approach, he assumes first, that the method ot C encipherment has not obscured anv of the charanenstics of natural lancuajte plaintext, and. second natural language does, in fact, underiv the text. As we have seen in Section 4.4 above, neither ot taken for granted, and in fan. thev are both counter -indicated bv much of the evidence, as noted Friedman, and others. I

The "k ' statistic and the 'entropv measure were computed bv Knscher for characters and for words sample he machined He states, however, that these are of no use without parallel measures for Lati language text for comparison. He also considers his own text sample much too small for the useful ' Markovian Analysis " method, which would, he states, require at least five times as much text, o time of writing his paper. Krischer planned to carry out further studies; l cannot find anv record however This promising and interesting computer project, which pointed out a wav ol testing some i about the ten. seems to have been terminated, like so roanv of the others, before it came close to

6.8 Prescott Carrier

Captain Currier* a prominent professional eryptologist and close associate of Friedman and Tiliman researches and became an enthusiastic student of the puzzle, Tiltman f 1 97 Si sums up Curriers re manusc ipi as follows: “Since his retirement - . seven years ago Captain Currier has spent a great own an J vies of the manuscript He holds the view that there are at least mo different handwriting In everv case the two sides of a leaf recto and verso are m one and the same hand . Further his an are significant differences in their content* as in the frequency of symbols associated with one a came to prepare this lecture.] saw at once one difference between the content of the A and B page his account of suffixes following a number of the common roots the suffix 8G lorgj ^ 1 occurs eigh pages and 334 times in twenty- five B pages. ,,.Mv own feeling is that the two ’languages" express bv two scribes of the same rather loose set of rules to similar texf \

Currier was able* in 1973* to have computer studies made comparing two careful l v-chosen matched hand A and the other in hand B* both selected from the herbal folios. The results of the snidv cle significant differences between the samples. In the course of subsequent hand studies* Currier has further conclusions regarding the contrast between material in hands A and B. and he is still purs investigation He has extended his studies to other sections of the manuscript in addition to the h documented in four unpublished papers (Currier 1970-1976* D'Impcno 1976k

6*9 Some Comments Regarding Computer Methods

The subject of computers as tools in huma rustic research* and specifically m the attack on the Vo rhat holds a special interest for me since 1 am a computer programmer bv profession and mv academi classical philology There are several wavs the computer can aid in the studv of the Vovmch manuscr text 'processing undertakings. These arc; 1) a data processing function, permitting the marupuJat in larger and more significant sample sizes than can be dealt with bv hand* 2) an exploratory data allowing us ro apply various indexes* counts* and ocher selection* display, summarizing and tabula explore the data and show up any patterns or regularities it may contain as an aid to hypothesis s hypothesis -tasting function, for investigating various specific theories we mav have developed as from exploratory hand and machine studies.

Most of the use of computers bv students of the manuscript falls in the first (data processing! an reduction) categories While these are both useful and neceisarv in their place* the third use of c hypothesis -testing, seems in mv opinion to be the most powerful and the most Iikelv to produce so contributions to our knowledge of the problem. A significant example of this effective use of comp recent study of hands A and B* discussed in the previous section. Gurnet had developed his idea ab inspection of the manuscript before he came to the computer specialists to seek their aid* He had

l will presume to paraphrase as follows: “If* m fact* there is a real and significant difference b
of pages that look different to me. then thev will have different distributions and clusterings of
requested onlv certain carefully- planned machine runs, to be made only on rwo matched samples of
other variables constant in so far as was possible. The computer runs riearlv confirmed his theory

differences he had postulated between the two samples: a result that might never have been obtaine
machine processing applied indiscriminately to masses of unselected text.

In mv opinion, this is the best wav the computer can serve us at this stage in our research on the
obvious and easier data processing and data reduction displays have been made again and again by v
disappointing results. It seems evident that, if anything new is to be learned from computer runs,
more carefully -planned selection of the data, or some more specific and sophisticated manipulatio
concealed patterns in the internal structure of words and sentences, in response to a particular t
crvptologic nature of the text, or some theory about its possible content or provenience. It is al
machining more and more data in very general ways, with no guiding principle for selection and int
to process data bv machine today frequently far outrun our planning and imaginative capabilities.
often with manv feet of printouts that tell us little or nothing, since we still have no meaningfu
most demanding aspects of scientific work is the framing of useful questions, and the design of ex
useful answers. We need to apply this scientific approach to our study of the manuscript, and espe
computers. In hand studies, the limitations of patience and a me on the part of the investigator e
the more wasteful activities, or at least prevent their assuming wasteful proportions, but the com
these limitations and. alas, to carry out wasteful activities on a grand scale.

Chapter 7

Collateral Research: Roger Bacon (A.D. 1214?- 1292?)

The necessarily brief and sketchy review in this chapter cannot approach an appropriate treatment
thirteenth -century scholar whose name his so frequently been associated with the Vovnich manuscri
the discussion of Bacon s possible authorship of the manuscript in Section 2.2,2 above, there is n
supporting or denying his connection with the work, however indirect. Nevertheless, anvone interes
find, indeed, anvone who cares about the history of Western thought) should learn as much as possi
only because he was so evidently a man worthy of closer acquaintance. He is especially appealing t
would be, if his works were made more accessible) in chat he has told us. in a forthright and inge
about himself in his own writings; in fact, almost all that is known about him today originates in
contemporaries rarely, if ever, mentioned him in surviving records. Bacon’s own voluminous writing
varied specialized studies of his life and work made bv scholars of the nineteenth and twentieth c
insight i.ito those problematical relationships between wisdom and science, God and Narure, human
technology, which still confront us today, however we may attempt to disguise them by recasting ch

7.1 Works By and About Roger Bacon

Bacon $ life and works have been described and analyzed in a number of mayor studies, though I bel
say that, up to the present, no truly complete and definitive treatment has been attempted. Few of

translated into any modem language; much remains unedited and unpublished even in the original Lat
exacerbated the problem by reworking and re-using his writings over and over again, so that it is
many fragmentary works that survive are copies or revisions of parts of other works, and which are
The condemnation of his doctrines bv the Franciscan Order, and the resulting suspicion and fear on
contributed to the confusion, since many scholars quoted or copied his works without daring to men
consequence of these many obscurities and difficulties. Bacon’s works are not all accessible to th
sole exception of a translation into English of the Opus Majus (Bacon 1928b).

Scholarly studies of Bacon's writings have been carried out primarily from verv specialized and na
one extreme, historians of science have been interested in Bacon as a part of their search for pre
experimental methods: at the other extreme. Catholic philosophers and scholars have examined his p
various technical points concerning medieval Scholastic philosophy. Emile Charles (18611, despite
provides a remarkably clear, fair, but sympathetic general presentation, expressed in elegant scho
bv a quahtv of learning formidable in its thoroughness and dedication. A careful reading of this e
recommended as a starting point for anyone interested in Bacon. Later writers are indebted to Char
information presented in their volumes and for much of its interpretation as well. A much more rec
Easton (1952) is also to be recommended unreservedly; his approach is remarkable in its imaginativ
analysis and its creative extrapolation from the few available facts to develop a striking picture
clear perspective cm his thought. James Blish (the well-known Science Fiction writer prominent in
Trek series) has written a very fine fictional biography (1971), based primarily on Easton's study
recommend to the interested reader,

I have attempted to obtain and read every serious work concerning Roger Bacon which I could find,
fuller understanding of his contribution to knowledge and his possible association with the Voynic
bibliography appended to this monograph, (while it cannot claim to be exhaustive, and does not eve
have examined, since some appear likely to be of Little value to the reader primarily interested i
should provide access to most of the major works on Bacon in English as well as many in other West

7.2 Bacon f J Life and Works

Bacon spent most, it nor all. of his adult life as a scholar or teacher. He studied and then* havi
Am Decree, taught at the Universities of Oxford and Paris in the 1230 s and 1240 s. The newly redi
natural philosophy by Aristotle occupied a central focus of intellectual excitement at the time. A
preserved among Mohammedans along with other sources of Greek learning* while they were forgotten
immersed in rhe barbarism of the Dark Ages and the obscurantism of the early Church: translated in
accompanied bv a wealth of commentary bv Mohammedan and Jewish philosophers* these new weilsprmgs
science brought about an intellectual revolution in thirteenth -century Europe. The task of attemp
differences between the philosophy of Aristotle and his pagan commentators, on the one hand, and t
other-worldly viewpoint of the Church Fathers forming an integral pan of Christian doctrine, on th
preoccupied the attention and strained the resources of thi net nth -century thinkers.

Bacon was one of the first scholars capable of lecturing on the newly, revealed Aristotelian Natur
commentaries. He was evidently a good teacher, and must have enjoyed his years at the Universities
manuscript, apparently representing a student s long-term collection of notes or transcripts of Ba
works of Aristotle, covering several years, has been edited by Steele {Bacon 1909-1940). Another m
described bv Steele (1933). represents notes bv a student in other, much more elementary courses o
and similar topic v given bv Bacon.

At some point in his University studies. Bacon suddenly seems to have changed the course of his th from the promising and rather successful career he had been making for himself as a teacher, he ap course of self-study, seeking out obscure scholars interested in the 'natural science" of the day astrology He became particularly preoccupied with " expert memurn": an approach to nature that inv systematic comparison and analysis of other s reports on natural phenomena* along with a son of in and -error investigation of phenomena in order to understand them better. The "sdentia experimenta not at all like our modern, controlled laboratory experimentation, with its vast armament of equip models: nevertheless* is had the same fundamental orientation toward the external, objective world in open-minded curiosity. Bacon also began so place great emphasis on knowledge of languages other particular Greek. Hebrew, Arabic, and other original languages of the Bible and the Greek and Arab bv Bacon as the sources of wisdom revealed bv God.

Bacon wrote extensively on a variety of topics, notably on optics and the transmission of light: g astrology; language, translation, and Biblical criticism; the reform of the calendar and of educat A prominent feature of his works was an emphasis on the utility of these arts and sciences for the good of the Church. He was. first and foremost, a "mission oriented' thinker, and constantly reite of any knowledge without a moral goal and frame of reference. For him. rhe motivation of science a found in the mission of the Church. He asserted the methodological unity of science, philosophv. a interested, to a degree unusual for his time, in methodology as such. It is interesting to note, a and as insistently of the "beauty " of philosophv and science as of their utility f for example, i phrase quoted bv Frankowska (1971. p. 36), from Bacon s CommunU Naruruha . he says he wishes to c Perspective quia hcc est pukhrior alii*. . . because it is more beautiful" than other sciences)

Some rime in the 1 240's Bacon decided to join the Franciscan Order, for reasons he never discusse scientifically-oriented modern writers have speculated about this course of action, which appears distant land often irreligious) viewpoint, to have been a fatal mistake on his part. He never seem well with his superiors, and incurred some degree of discipline or confinement on at least two occ severity of these punishments, sec Fcrei 18911. In 1267. he was asked bv Pope Clement IV to send c philosophical writings to Rome, and in response, produced the Opus Maps. Opus Minus, and Opus Trrt known works). Clement s death in 1268 destroyed anv hopes Bacon might have had of achieving recogn his educational and intellectual reforms, although he apparently made several subsequent attempts PnrtcjpaU. or encyclopedic work on human knowledge, that was probably never completed. Again impri restricted bv his Order in 1278. he produced little further until his death in 1292 lor* some clai extant writings and fuller treatments of his biography mav be found in Charles (1861). Easton { 1914).

7.3 Survival and Significance of Bacon's Work in Later Times

The thirteenth -century Friar Roger, a: has been noted bv jevera! writers, has been overshadowed a far ^rearer acclaim accorded bv our age to his namesake, Francis Bacon, who is credited with the i scientific method. Roger Bacon seems to have been regarded by manv recent writers as a sort of exa stubbornly refuses to be stuffed into any of their favorite pigeonholes. Scientific writers are im science" because he did not provide diagrams and specifications of his constructions and laborator day scientist would be expected to do. Students of Scholastic philosophy find him an indifferent p omitted entirely from a number of modern survevs; in others he is passed over with a few ambiguous \ 1930) provides a dear and not overiv favorable examination of Bacon's positions on various typic comparison with a number of his other, more conventional, contemporaries, Manv writers seem unable

Bacon was a religious mystic on the one hand, or an iconoclastic positivist and empiricist on the

Roger Bacon' s main difficulty was undoubtedly his inability to be a "team plaver he did not allv school of thought accepted in his time, and in fact launched violent and outspoken attacks upon mo contemporaries. He frequently referred to them as a "stupid crowd/' and castigated them for their this uncompromising combativeness was probably the real cause of his condemnation, however it mav rationalized. He was apparently trying to articulate ideas for which his own age had no words, nu understanding; our age has dearly swung so far to the opposite, positivistic pole that we have eve comprehension for the synthesis he was trving to form. Bacon went his own wav. building his own am philology, and natural philosophy based on Greek, Arabic, and Jewish writings and borrowing from a living colleagues (Robert Grosseteste. Adam dc Marisco, Peter de Maricounh He rejected the Scholas by Peter Abaelard. in favor of his "scienda experimemaitsT and he minimized the importance ot logi disputation, so dearly loved by his contemporaries. On the other hand. Bacon's "experimentum ' inc reported "experiences" of the Greek and Arab philosophers, comprising fables and superstitions con the virtues of viper's flesh, the influences of the stars, and flying dragons; stranger still to t "experimentum" included Divine illumination and mystical insight from God. Thus, Bacon succeeded a alienating all of his colleagues in his own time, and m confounding all of his would-be admirers i

Condemned by his Order and prevented from writing or teaching. Roger Bacon was marked out tor obli superiors and fellow scholars. His voluminous works were apparently ignored, but exploited indirec his immediate successors who feared to mentioned him bv name His name was apparently even erased f his works Bv the end of the fourteenth centurv, however. Bacon began to enjov a gradual revival or work on medicine (Bacon 1928a) was transparently pirated and plagiarized to good effect bv some la This, together with his Eptstoia de Mirahili Potestatt Artis et Naturae (Bacon 1859 », and several alchemical works (Bacon 1603; Singer 1932) were quite popular, and served to provide the Francisca formidable reputation for vast occult powers, John Dee was a devoted disciple of Roger Bacon, and a new Renaissance of his reputation and writings. It has been suggested that Francis Bacon was int at Mortiake. Dee s home, through the extensive library of Bacon s writings Dee had lovingly and as have even gone so far as to suggest that Francis was far more indebted to "a certain monk in a cel

From the late 1800 s on into the early twentieth century. Bacon had another revival, being hailed forerunner of modern experimental science and technology. Much was made of his predilection for "e emphatic rejection of the ideas and methods of his contemporaries. Newbold's claim to have deciphe manuscript, and to have discovered evidence there of Bacon s invention of the telescope and micros this wave and added briefly to its momentum. Catholic writers hailed the Newbold theory as a "vind centurv science " (ReviHe 192 L Walsh 1921). Rudvard Kipling wrote an interesting short storv cal m which Roger Bacon was a central figure (Kipling 1926; I am indebted to Brigadier Tiltman for poi me). Typical of the effusions of some considerably less gifted writers is an article bv Grove Wils Great Men of Science i 1942); overflowing with pathos for the persecutions visited upon Bacon s "s witch-hunting Church, this embarrassingly dreadful dose of purple prose even credits Bacon with th engine in his "laboratory,"

Predictably enough, the pendulum swung rapidly to the other extreme, aided considerably bv the deb theory bv Manly and Friedman Lvtm Thorndike (1916. 1921. 1929, 1923-58) went further than most in divest Roger Bacon of any claim to respect as a philosopher or a scientist. In Thorndike s monumen

Vltfjpfi’ and Experimental Science *1923-58'. he dismisses Bacon as a superstitious medieval monk, completely devoid of inv trace of the modern scientific outlook, and thus not worth v of the atten

While he deals almost as harshh with all the medieval writers he discusses in his work. Thorndike seems to be a shade more savage and thoroughgoing. undoubted Iv in an over -reaction to the effusi of Bacon by some earlier writers

Steele (19211 provides what seems to me to be a verv fair estimate of Bacon's place in history; h qualified to assess Bacon s works, having edited more of them than most other Baconian scholars. H perspective, based on Bacon's stated plans for his unfinished Scrrptum FrinapmU "In estimating Bac men of his own time it is important to remember, first of all. the complete originality of his sch unfinished though it most probabh was . . , was as distinct in kind as in form from the works of h contemporaries Bacon s schematic arrangement was nor onh unparalleled among the writers of his tim

absolutely new Nothing like it had been devised since the time of Aristotle. . The whole svseem of recast, ... It mav be that the framework of his scheme owed something to Al Farabi s Dt 5c/>iacii> conception and execution its originality is manifest" Ipp. t4 1-142).

A very interesting recent study bv a Polish author, Malgorzata Frankowska 119711. presents a verv documented and supported assessment of Roger Bacon s contributions to knowledge and his influence modern thought. She provides several detailed examples of Bacon s approach to empirical science; h of rainbows in ti e Opus Map* j, for example, clearly supports a conclusion that he fullv shared m analytic mental habits of the modern scientist (Frankowska 1971, pp. 85-87; cf Bacon 1928b. pp. 5S equipment, the data* and the sources at his command were woefully deficient, he used the reports o carefully -planned observations in a doselv -reasoned, orderly manner to eliminate various competi up confirmatory evidence for one particular explanation of the observed and reported rainbow pheno

It is interesting to note that, in spite of his later explicit rejection of the Scholastic Method. e x pe n use of it in his earlier lectures f 'Quaesoones ') on Aristotle, and he was evidently a s developed form of analytic disputation (see Steele 1933). At the heart of the Scholastic Method wa (constating* typically* of quotations from Biblical and Patristic authorities and from Greek and A those sources favoring and those opposing a given point at issue were matched in an orderly wav, f ' resolution' attempting to reach a conclusion from all the evidence. This method, when ikil fully and sail is a powerful tool of analysis, and differed essentially from modern scientific thought o [quotations from "authorities ' rather than empirical measurements) and its purpose (the resoluti rather than technical and empirical questions In his analysis of the rainbow. Bacon put to good us Scholastic Method as applied to the strongest and best data he could obtain

Roger Bacon s principal contribution to knowledge, according to Frankowska. involved the nature an science. Rejecting the presentations of ocher writers* which she regards as onesided (even m the c of Bacon she sees as overemphasizing the religious and mystical side of his nature)* she assesses the following considered tribute: "Bacon was the first to consider in such a large w*y the theoret with science, he was also the first who had the vision of the uturv of science* based on the units purpose Moreover, he was the first to originate theoretical reflections concerning the nature of s aims— reflections which were to find mature expression much later* m the time of Frauds Bacon and 134). She concludes chat "The thought of Roger Bacon lies at the source of both the empiricism of mathematical method of Descartes (p. 136)* and recommends* as have other scholars before her. a sy study to demonstrate and prove the influence of Roger Bacon s writings on the better -known later

Until his works have been edited, translated, and systematical I v studied as a whole, on their ow background of his known sources and contemporary thought* no definitive evaluation of Bacon s cont knowledge is possible. He remains, for most moderns as for his own contemporaries, an enigmatic an who determinedly refuses to be filed away in any convenient cubby -hole.

7 A Was Roger Bacon Associated With the Voynich Manuscript ?

Coming now to the question of Bacon s possible authorship of, or connection with, the Voynich manu
anything, can we concluded I feel, although ! cannot support mv view with anv definite evidence* t
highly unlikely, nor only because of the great disparity of dates between Bacon's life in the thir
probable origin of the manuscript tn the fifteenth or sixteenth century. J base my opinion also on

gained from a careful study of what is known about his life and his writings, including an attempt
inadequate) to sample his own published works m the original Latin. I feel, in sum. chat Bacon was
have produced a work such as the Vovnich manuscript, even during his periods of imprisonment or pe

Far from being a rebel or iconoclast in any modern sense. Bacon was clearly a deeply, even passion
accepted the beliefs of his Church. He chose to become a member of the Franciscan Order, and chose
the rest of his life, in spite of repeated harassment* and disappointments. He claimed repeatedly
human knowledge was to serve God. uphold the Catholic Faith, convert unbelievers, and defeat the e
technology!) of Antichrist. He was also fascinated, as we have seen, bv mathematics, methodology,
however inadequate the data and techniques available to him may have been

Bacon, in short, docs not seem to me to be the sort of man to have created a magical manuscript, s
ambiguous and curious as the puzzle before us. Almost al) of his authenne writings that have come
scholarly treatises in medieval Latin, quite uncompromising in their forthright and rational quali
draftsmanship, and trained assistants in' the computation anddrawing up of tables and diagrams. In
is there any indication of a real personal interest in biology or botany, although he praised, in
agriculture and husbandry. His medical work was a faithful and complete compilation of information
drawn from other authorities, and not original with him. His approach to astronomy, astrology, and
and conventional, oriented toward methodology and terminology; it provides no frame of reference w
understand the Voynich manuscript s idiosyncratic Zodiac diagrams and other drawings decorated wit
symbolic pipes, “cans.' and tubs.

It seems to me much more likely that the Voynich manuscript is a product of the sixteenth century,
alchemy, and perhaps, as suggested bv Brumbaugh, ascribed to Bacon because of his reputation for o
otherwise unidentified, mysterious manuscript was apt, in the past, to be attributed to Bacon, esp
or alchemy and was provided with bizarre diagrams.) Rather than ascribing such a work as this to a
conservative, and learned man such as Roger Bacon, I can far more easily imagine a small heretical
adepts and illuminab. perhaps in Germany or Eastern Europe, concealing their strange and probably
secret book of the kind we see in the Voynich manuscript, I urge the interested reader to explore
Bacon listed in the bibiiographv at the end of this monograph, and. especially, to read some of Ba
the Opus Mafuj. the sole work accessible in English J. and thus reach his own conclusions.

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Chapter 8

Collateral Research: Medieval and Renaissance Cosmology and

Iconography

The rtmainim: chapters in this monograph art intended to provide a verv broad ‘brush survey of som that mav be relevant to the problem of the Vqvnich manuscript As wc have seen in Chapter 2, it see of mans students that she manuscript can be dated to late medieval or earlv Renaissance times, and provenience, k seems, therefore, char anv sertotrc student should gain some understanding ot the s methods of representation, and other features of those periods that can put into proper Conte*: th manuscript itself, and perhaps give us some leads roward an interpretation of the drawings and the of the work is a whole. I urge the reader 10 consider the present sketch v treatment as a mere app verv beautiful and curious prod nets of human art and wisdom that have survived the iconodasm and reaction on the one hand, and scientific positivism on the other

8 ,/ Ars Memorativa : The Art of Memory

Probablv the best and most genera* treatment of the Art of Memorv is that of Yates \ 1906;. Much o below is taken from that excellent study. and I recommend the book to anv reader who wishes to lea before pencil and paper became the trusty and abundant companions of everv scholar and bureaucrat, found to organize and remember the details of complex presentations such as legal cases and public philosophers, lawyers, and statesmen of ancient Greece and Rome prided themselves on their highly memories, which were so cultivated and emphasized as to be virtually eidetic m character An import tradition tor the Middle Ages was the Ait Htrtnntum, attributed bv medieval writers to Cicero \ Tu described a mnemonic svirem supposed I v devised bv Simonides of Ceos \ BO. and regarded as a vita

Art of Rhetoric.’ itself an essential feature of ancient and medieval education.

In the memorv svstem ascribed to Simonides, the orator went to a quiet, well -lighted place such a forum, or some other structure provided with a series of distinct niches, columns, stairs, or othe scenic elements. He walked about there, systematically rehearsing the ideas of his presentation, a upon the successive scenic units so as to associate with each a kev word or sentence of his speech w-eird. striking, and colorful visual image that would serve to remind him of the ideas later in t memorv images ” were to be chosen from such sources as Greek and Roman mvthoiogv and legend

This svstem of place -memory ‘ gave us our modern word ' topic/' from the ropoi or places constitu feature, (The medieval Stations of the Cross which have survived mto current Catholic usage today place-memorv svstem associated with vivid visual imagery). Greek and Roman orators boasted ot the artificial memories \ and competed to see who could remember the longest senes of words or ideas — hundreds and thousands — bv means of such mnemonic methods. In addition to the Ad Htrenntum . anot Cicero. De Orarore, described a similar memorv svstem. A work bv Quintilian, dating from the first dear directions for choosing Memorv "places ' and constructing images to be stored in them and ass one wished to memorize.

With the advent of Christianity, the Memorv An became a major resource tot preachers and religious spreading of the Christian Faith. Of the rwo great mendicant Orders of the Middle Ages — the Domin Franciscans — each had its own favored Memorv Art for preachers. The Dominicans employed the class above, with colorful images drawn Irom pagan mvthoiogv and other barbaric foreign sources * in a m seems to us startlingly and amusingly inappropriate i as mnemonic tags for Christian teachings.

The Franciscans followed a different tradition instituted bv Ramon Lull i A.D L235- 1315>. a flamb personality whose life and works arc well worth studying for their own intrinsic interest isee Pee

and 1966 pp, 173-198: Rossi 1961). Instead of using images. Lull s art employed a set of revolving

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simple geometric figures marked with letters of the alphabet, which were manipulated in a combinat
or other elememes were rotated against each other to produce all possible combinations of the lette
stand for ideas such as L ‘God'\ ' Evil". € 'Man'\ "the Soul *; for lists of sms and virtues: or f
elements one wished to remember and meditate upon in sequence Lull, a ‘native of Majorca, was prob
mvstical Jewish tradition of the Cabala (see 8.7 below) and also bv the Mohammedan mystical philos
interesting to note that Lull's combinatorial method of systematically listing and considering all
few basic elements is a very powerful and valuable mental tool. Shorn of its medieval and religiou
modern logic and science, and is useful to computer programmers, for example, in analyzing events
problem f I made use of it for the scheme of crvptanalvtic hypotheses in Section 4,4,2 L It also u
of cryptographic devices involving rotating discs.

The great Divtna Commedta of Dance, and the iconography of medieval cathedrals with their ‘sermons
striking embodiments of the encyclopedic Memory Art. still valued bv and familiar to educated peop
Renaissance there was a great efflorescence of richly elaborated mnemonic systems, Giuho Camilla t
built a wooden memory "theatre" embellished with colorful images and provided with drawers in whic
and other papers could be filed, using a "place" system of memory, the images represented such thi
Cabalistic "Sephiroch." names of angels, and ocher magical and mythological elements. Giordano Bru
1548-16001 haf entered the Dominican Order and studied their Memory Art: leaving the Order later a
a career as a Hrrmetic Magus i which Led ultimately to his death at the stake i. he continued to b
mnemonics and taught hts own elaborate mnemonic svsrern to wealthy parrons as a wav of earning a l
reconstructed bv Yates H966, pp. 199-230) from Brunos work De Umbris idearum (Bruno 1582), involve
memory wheel which had thirty mam segments, each subdivided into five smaller ones, the w hole arr
Lull's figures so that rings within it routed independently.

The mam segments of Bruno's wheel were labelled with twenty-three Roman, four Greek, and three Heb
total of thirty. Each of these could be combined with, or subdivided among, segments for the five
combinations Aa. Ae, At, Ao, Au. Ba. Be, etc. Images shown within the segments and associated with
of the wheel represented elements such as the thirrv-six decans (see 83 below), the seven planets,
the moon, plants, birds, animals, stones, metals, etc., in a vast and all-embracing synthesis. Thi
to be merely a memory device: it was basically a svstem to permit the operator to attain encyclope
knowledge coupled with the magical powers of a Hermetic Demiurge Bruno founded a mvstical sea in G
Giordanistf : their beliefs were probablv akin to those of the later Rosi crucians and Freemasons.
of Bruno s philosophy, which was in many wavs similar to hts own. The mnemonic an had a last magni
work of Leibniz, in his design of a set of "notae" for use in a "universal calculus. The medieval
Am undoubtedly formed the conceptual foundation and precedent for the synthetic and artificial lan
fashionable m Renaissance and later times (see 9. 3)

An interesting detail concerning a lost An of Memory attributed to Roger Bacon is mentioned bv Yat
fn). and bv Hajdu 11936, pp. 69-70). Yates says. "There n a rumour that Roger Bacon wrote an ars m
but this has not so far been traced," Hajdu refers to a work bv C. O Revendow (1843. p* 41 1, whic
older work by Von Aretin (1806). which latter I have, un form na tel v. been unable to crack down.
may be summarized as follows: Bacon had written a T racks t us dr Aru Mtmoranva. to be found in a
this manuscript, never printed, has not so far been discovered. While Bacon was not known as a tea
was reported by Aretin to have employed a method based on that of "the classical authors (presumab

Quintilian J.

Weuacoct f 1953. p 92) provides another very tantalizing reference to this lost mnemonic art of Ro magical method employed bv him to teach the elements of Greek and Hebrew grammar Bacon claimed on occasions that he could teach the essentials of Greek and Hebrew to the first comer within three d student to read and understand foreign words in scriptural texts. Characteristically, Bacon backed forthright and combative statement. "Dabo caput meum si deficiam" f T will forfeit mv head if I fa unable so far to discover the sourer to which Westacon refers: a work, supposedly in preparation i and Evelyn Jaffe. to be published in the Medieval and Renaissance Studies of the Warburg Institute the magical art of language teaching employed bv the Admirable Doctor.

Encyclopedic mnemonic systems such as those described above constituted, in effect, a sort of univ language, associated with single letters and clusters of tenets from a mixture of alphabets, and u

represent a variety of subject categories This is che primary source of their relevance to our pre Vovmch manuscript. Some such svsrem might well underlie the code-Uke structure of words demonstrat Vovmch text. Manv of the circular diagrams in the manuscript, with their rows of cells in concentr pictures or labels or bits of text, are also reminiscent of the diagrams of LuJL CamiUo. Bruno, an

8.2 The Hermetic Tradition

A set of philosophical and mystical doctrines of great conceptual richness and beaurv. the Hermeti primary importance during the late Middle Ages and rhe Renaissance. The besr single general treatm again, bv Frances Yates f 1964). Another good clear overview, from a less sympathetic but still fa Shumaker (1972). The Hermetic writings, composed bv various anonvmous Hellenistic authors around A represented an eclectic amalgam of Platonism-. Stoic ism. Jewish and Persian philosophy, and a cer Egyptian religious elements The doctrines became known to the Middle Ages when a monk named Leonar brought to Florence a Greek manuscript of what came to be called the Corpus Htrmettcum , It was tr command of Cosimo de' Medici during the years 1 462 — 63 bv Marsilio Fictno iwho was himself to be considerable prominence through his magten- medical system of astrological images and doctrines). Corpus Hffmtttcum, published in 147 L was explosive in its popularity and influence, and founded a which was to be of central importance in European thought.

The Htrmtnc a las the entire collection of Hermetic wrinngs is called 1 were attributed to Hermes legendary ancient Egyptian seer or god (identical with the Egyptian god of wisdom. Thoth). regarde channel of Divine illumination, and a contemporary or predecessor of Moses. Festugiere (1944-541 p considered the most scholarly edition and commentary on the Hermencu: Scott (1924-361 gives an Eng although Yates apparently does not consider it accurate (1964. p. 22 fnl. The Hermetic Tradition frame of reference for astrology, magic, alchemy, and all the occult sciences which held a predomi thought for manv centuries: this philosophy, as it was interpreted bv Renaissance thinkers, probab science and technology as well. The Hermetic doctrines frequently emphasized the almost limitless mind, as partaking of the Divine Mind or Nous, It seems probable that the present albencom passing science may be traced in pan to an origin in the Promethean doctrines of Hermeticism. regarding ma Demiurge, capable of standing beside God as co-regent of the natural universe John Dee. Cornelius Bruno, Marsilio Ficino. Giovanni Pico Della Mirandola. Giovanni Battista Porta, Trithermui — these figures of late Medieval and Renaissance philosophy drew their inspiration from the springs of the What was the nature of these philosophical and mystical doctrines, that gave them their power over

during some of the most creative centuries of Western history.' Modern scientifically-oriented wri
find it hard to understand their appeal. It is amusing to note that Shumaker, m his Preface, frank
bewilderment at the enthusiasm of his young students, who rush up to the podium to question him ea
Htrmetinsm In a highly interesting personal confession, he discusses his own adverse reaction to t
difficulty in comprehending the " irrational' point of view on reality embodied in them, and his i
with the positivistic attitudes of modern science with which he is so much more comfortable.

So that the reader unfamiliar with them may gain an idea of the impact and beauty of these writing
paragraphs of an excerpt translated bv Yates (1964. pp. 23-24 L drawn from an account of the creat
of man in the Ptnumdtr (one of the books of the Corpus Hermetrcum).

(The will of God first broughi forth i second creative power, or Nous-Demiuree. who in turn faihiu
envelop the HAubir world with their sphere*. J Now the Nous. Father of all being*. being life and
himself. whom hr lowed a* hi* own child. For the Man was beautiful, reproducing rhe image of his F
Form that God fell in love and xavc over to him all his works. Now. when he saw the creation which
fire, the Man wished also to produce a work, and per man on to do this was given hrm bi rhe Father
sphere, in which he hid full power, the Man ut the works of his brother, and the Governors tell in
a pare in their own rule Then, having learned then essence and having received participation in th
the periphery of rhe circles and w know the power of Him who retgm above che trre

Then Man. who had full power over the wurki of mortal hemp and of animals, learn across the armatu
through their envelopes, and showed to the Nature below the beautiful form ot God When she saw tha
be a iky and aJI the entre* of che Governors, joined id the torm o! God. Nature imiird with love,

nrurvekwsh beiuutul torm of Man, rcrttcred on the water and his shadow on tht earth. Ami he. havin
in Nature, reflected in the water, he loved her and wished to dwelt with her The momenr he wuhed t
to inhafei the irrational form. Then Nature havint received her Juvcd one. embraced him. and thev
love. ‘

83 Astrology and Astronomy

Such a vast and complex area of symbolism is covered bv the medieval and Renaissance disciplines o
ascronomv that onlv the briefest possible summary can be presented in these paragraphs, I will con
salient matters of possible relevance to the Voynich manuscript and in particular upon certain set
svmbols that might conceivably underlie some of the sequences of text strings in cells of the astr
diagrams. Good general discussions of the subject may be found in Shumaker f 1972), Wedel (1920),
Boll and Bczold (1931k Allen (1941). and Duhcm (191 3-1959), A detailed catalogue (with numerous i
Latin astrological manuscripts of the Middle Ages may he found, in Saxl (1915 and 1927 k

The twelve months of the vear. the houses* of the zodiac signs* the association of these with Caba
celestial spheres and the 'Sephiroth, ' names of angeb and demons, etc*, all form sequences of twe
Another set of astrological svmbols is that of the fifteen major fixed stars that enter into the z
path of the sun across the skv [see figure 29). The star names are of obviously Arabic origin l tr
bv the Arab commentators on Greek works such as the Aimagist of Ptolemy). A twenty-eight element s
be ot relevance to the Vovmch manuscript is that of the stations or "mansions" of the moon. Figure
of these stations taken from two major sources.

An important series of thirty -six svmbols is that of the "decam/ "prosopok or 'faces* 1 of the zo

of which each sign has rhree. had their origin in ancient Egyptian sidereal gods of time, associat route of the sun among certain constellations and stars. These beings were regarded as powerful de ruled over the celestial spheres; they were often called the "horoscopes." Each exercised powers o * n ^lyptun medicine, and each was associated with one of the "nomes" or geopolitical divisions of Gufldel f 1936) and Seznec f 1953) provide a detailed summary of the history of the names, images, thirty-six celestial beings, from Egyptian times through classical anciquirv into the Middle Ages and ultimately into the Renaissance and into modern astrology. Each decan. following Egyptian prac a vivid graphic image; these colorful symbols were often depicted in Renaissance mosaics and fresc as memory images tn the nchlv embellished artificial memories' of Renaissance magi such as Giordan shows some stages of the development of decan names from Egyptian through Coptic and later times. collected and studied the Coptic decan names with a view to their possible relevance to the zodiac manuscript. Unfortunately, there seem to be no cases of thirry-six elements in these diagrams, or and astronomical diagrams (see figures II and 12), and the decan images bear little relation, eith Egyptian or later Renaissance forms, to the nude female figures in the manuscript.

8,4 Magical Systems

I have not found anv single work chat covers all of the systems in a scholarly manner, though sepa 3 num ber of the major traditions Shumaker (1972) provides a good survey of Renaissance systems un heading White Magic. Thorndike (1923-58) presents extremely detailed (if also rather brusque and u individual summaries of the magical philosophies of many ancient and medieval writers. Walker (195 coverage of some late medieval and Renaissance systems. Yates (1964) deals thoroughly with Giorda other philosophers of magic. Ritter and Plessner (1962) cover the Picatrix magical writings with g Seligmann (1948) and Dc Givrv 11971) make available numerous illustrations of magic alphabets, dia talismans, etc. Mathers 1 1974) covers the Solomoman and Mathers (1975) the Abrameiinian schools o magic. It is amusing to note chat many of these works have recently been reissued in paperback to enthusiastic surge of public interest in the occult. The following paragraphs will include onlv a systems, with ar indication ot their character and possible relevance to the Vovnich manuscript

8.4 J Picairix.

A comprehensive compendium of astral and sympathetic magic. Picainx was influential from the fifte European thought. Probably of Hellenistic and Arabic origin, it was translated from Arabic into Sp Alfonso the Wise, in 1256, but did not become available in a Larin version until the fifteenth cen conglomeration of images, seals, characters, and incarnations based on astral and planetary demons name Pjcatrjx. according to Ritter and Plessner (1962), is a medieval garbling of an Arabic name B turn be derived from the Greek “Hippocrates/" The work includes hvmns. pravers. and incantations t celestial bodies; charms for all manner of purposes (to chase a wav mice and flies, prevent a swee find loir objects. discover hidden treasure, cause people to quarrel or to make up, etc J. Many of “characters ’ are referred to as “Indian"" or “Egyptian”. in fact, hieratic or hieroglyphic svmbol are recognizable in some cases, as are Egyptian elements in spells shown in Roman letters i see fi

I have been unable 10 find, in a careful studv of Ritter and Plessner s translation, anything that diagram or svmbol in the Vovnich manuscript, with one interesting exception. The “astral ' or plan form of geometric figures made up of line segments interspersed with circles or dots representing reminiscent of the odd geometrical figures adorned with faces on folio 67v2. As we will see below, common in alchemical works as well land mav have had a common origin in astral magic 1

8.4*2 Solomonian Magical Tradition.

The Jewish historian Josephus, in the first centurv AD. mentioned a book of incantations for summo to King Solomon. A book called the ""Testament nf Solomon" refers to a magic ring given to Solomon conferred upon him power over various demons (whose names and functions are listed 1 Medieval writ books of Solomon, and a CUvicula Salomonis and SigiUum Sahmorsts (Kev and Seal of Solomons are men pamphlet written m 1456. The version translated by Mathers U974) is said to dare from the fifteent Solomoman magical tradition was the best known of all medieval magical systems. S. L. MacGregor Ma of this and the Abrameltman writings as well f 19751 was an interesting figure in his own right: j magician and head of the Rosicrucian Order of the Golden Dawn at the end of the nineteenth centurv system depended heavily on Jewish Cabalistic sources, it features Hebrew characters and other symb some of those in Ptcatnx. and arranged in similar circular "seals'* or magical diagrams Like mosr magic, it involved purifications, a devout religious frame of reference seeking power and guidance angels, and elaborate ceremonials with incense, robes, a special room or ‘oratorv and special furn to be little in this apparatus that even suggests any diagram or svmbol in the Vovnich manuscript.

£. 4-3 Abramtlinian Magical System .

The magical books of Abramelin were translated bv Mathers f 1975) from a French manuscript in the T Arsenal dating from the seventeenth or eighteenth cemurv. This, in turn, claims to have been tra Hebrew manuscript dated 1458, One Abraham the Jew, born 1362. is supposed to have obtained the map Egyptian magician named Abra-melin. the magical system presented is said to be based on, but not i Cabala, Abraham wrote the description of this philosophy for his vounger son. having presented his compendium of the loftier and more highly-regarded Cabalistic tradition. The Abrameliman system is ceremonials, purifications, incenses, draperies, etc., as well as in its general character, to the briefly above The seals and charms, however, are considerably more verbal and abstract, and more e appearance; instead of circles and pentades. they consist entirely in "magic squares' containing R Hebrew -sounding words. Long lists of demons and their functions are provided, along with detailed and working with these demonic powers.

The pragmatism of some of the advice is remarkable, even startling to the unsuspecting modern read writings for the first time, I cannot resist quoting some examples; "It is not necessary w observe send a wav rhe Spirits, because they themselves are onlv too glad to be far a wav from vou. (Mathe "Communicate unto them fthe evil spirits) also the Form in the which you wish them to appear. .You before to have demanded this from vour Guardian Angel, who knoweeh better than vou vour nature and who understandeth the forms which can terrify vou. and those of which vou can support the sight ip

once again inmr on The absolute necessity in occult worktni of being courteous, eten to the Evil S is insolent and overbearing will speed* l v iai himselt open to obsession bv a Spirit ot like natu his ultimate down fall/' I p. 102)

Four familiar spirits were assigned to each operator in constantlv rotating six* hour shifts, he c and is advised to keep them busy and out of mischief. He can, however, also give them time off whe them co do. "The familiar spirits are verv prompt, and thev art able to execute in most minute det mechanical nature, with the which therefore it is well to occupy (hem: as historical painting: in weapons; , . /* ip, 362h There is an irresistible realism and psychological sophistication about a forces upon the reader the belief that the magical operator was interacting with an actual force o within his own mind. In fact, the accepted modern theory of magic, on which present-da c magicians operations, locates the powers being capped bv the magician in the depths of his own subconscious

In spite of the great intrinsic interest possessed bv this magical tradition, it too seems, unfort

related to the drawings and general character of the Vovruch manuscript.

8 - 4-4 John Dee's System of Spiritual Magic *

John Det. wi h his server Edmund Kellev. developed an elaborate magical apparatus involving con ve comm unit i Don with, angels or good spirits. Since, as we have seen, some students feel that Dee connection with the origin of the manuscript, hu magical philosophy should be of particular releva regarded his magic as a devout religious undertaking that would bring him into closer con tan with more equivocal personality, mentally unstable, of a violent and avaricious temperament, and avidlv means to get wealth and power. His mam interest seems to have been in alchemy, and tn a life-long the secret of making gold. To whit extent Kellev victimized and deceived Dee cannot be guessed, bu considerable, since all of the ” angelic “ messages were recaved bv. and transmitted by Kellev. De confessed, no ability whatever to see the visions in his crystal or hear the angel voices, and was on Kellev On the other hand, some writers have suggested that Dee was subtle exploiting Kellev for tolerated his treachery and his ill-natured outbursts for this reason h is hard to imagine, in anv men could have invented so elaborate and remarkable a system wirhour the knowing cooperation of th

Dee s angel names arc reminiscent of Cabala, and have a strong Hebrew flavor: his magical svstem a said bv Deacon f 1968) to be quite distinct from anv other well-known Cabalistic or Hermetic tradi synthetic language of great complexity, in which Urge volumes of text were communicated to Dee and angels, and which employed an invented alphabet: this language and alphabet mav be of relevance to Vovnich manuscript. They will be described, along with the practices and circumstances accompanyin Dee and Kellev, in Section 9.4 below Dee s connection with the Rosicrueian movement, his philosoph nature of the "hieroglyphic" manuscript in his possession will be discussed in Seen on 8.9, For mo Dee i angelic magic, see Casaubon (1659), Deacon fl968L Dee f 1963, 1968 j, Fell- Smith (1904), Fr) os ten (1965).

8.5 The Galenic Medical T radition

Galen, according to Thorndike (1923—58), wrote a voluminous medical encyclopedia f twenty books o each) about A,D, 129 These works are not well known to modern readers, and are described by Thornd inaccessible ", The humoral svstem of medicine, ascribed originally to Hippocrates, was elaborated Arabic commentators such as Haly ben Rod wan, R hazes. Haly Abbas, and Avicenna The tradition was Europe over a long period of time, and survived in some form up until quite recently: it continues concealed forms, in much modern "folk" medicine. Good general treatments of earlv medical historv and Underwood (1 962). Singer (1928, 1959L and Taylor fl 9221.

Jn the Galenic system, food was processed bv the human body through four stages or disgesiioos", e produced a nourishing product to be passed on to the next stage, and a waste product to be excrete vellow (or ruddy I bile, black bile, and phlegm — were the excreta of certain stages of digestion.

choleric," phlegmatic/' and sanguine which soil survive in our language to describe temperament or survivals of the names of the four humors. Each of the humors had certain "natural qualities", whi

the human bodv. temperament, and mind These were combinations of cold, warm, wet. and drv. Dependi balance among the four humors in the constitution of a particular individual, he was said to have

Disease arose, according to the Galcmc theory, from a serious imbalance among the humors and their Similarly changes in this balance accounted for the different cons rinse to ns of vouch, maturin', differed also with the seasons, and in the constitutions of the sexes; different foods, herbs, and important effects on the balance of the humors and their qualities, and were considered to have ch their own. The celestial bodies each had a crucial influence on the organs of the human bodv, the other dements of the theory. The "microcosm" or "small world" of the human body was held to reflea relations and influences at work within the macrocosm" or universe as a whole

The medical treatments employed bv the Galenic phvsiaan took careful cognizance of the positions o bodies, and certain "critical days" were singled out, on which certain treatments could not safelv t purgative 1 expedients acting upon particular humors were an important part of therapy For examp betony were supposed to draw and purge phlegm and water; rhubarb acted on choler < yellow bile!; a melancholy (black bile). Blood was purged bv the obvious method of opening a vein and bleeding the ("phlebotomy"), Thus, the Galenic physician was a skilled practitioner of "cathartic and phlebotom

Heat and moisture were hrghlv important in the Galenic therapies. Heat was the principle oflifr. g earlv vouch, it was thought to become gradually exhausted and cooled with advancing age. Old age i coldness and drvness, so that warm baths and applications of warm oils and unguents were recommend Another sovereign remedy for the bad effects of old age was the contact or embrace of a young pers the aged person to regain some of his lost hear and moisture by contagion from the superabundance The roval road to health could lead, thus, to a warm puppy, or better soil, a youthful maiden. Ast lore were obviously also of great importance in Galenic therapy; the phvsiaan almost had to be a p well. The "medical month" consisted of rwentv -eight dan fa number which recurs in the diagrams of manuscript) , and the influence of the moon was of considerable importance through its effect on m

Roger Bacon, in his medicinal work (Bacon 1928a). provides an extremely complete, dear, and detail astrology as it related to medicine (and WichingTon, in hts preface to rhe work, gives an excellen Galenic doctrines and Bacon's contributions and sources as well). Figure M shows some saltern feat m "fours" ; some of the terms mav well underlie the labels and text strings in certain cosmologica in the manuscript, and possibly tn the zodiac diagrams also. They mav be involved in the "human fi the omnipresenr puffs of vapor or foam could well represent the humor or qualities, the digestions degrees of coldness, warmth, wetness, and drvness may even be concealed in the text of herbal foli mentioned in anaent and medieval her bah as properties of medicinal plants.

8,6 Ars Notoria; Demonic and Angelic Magic

I have found relatively little material directly concerning this topic, although it is mentioned t works cued in Section 8 1 above. Yates (1966) describes it as a magical art of memory, using ' sh and regarded as a verv black kind of magic. Walker H958) discusses certain systems of "spiritual m derail Thorndike (1923-58) characterizes An Notoria as an an designed to gam knowledge of and to c God bv the invocation of angels, using mystical characters and prayers; he also dismisses all the jumbles of diagrams and magic words" without telling us much more about it. The essence of the Ars been the use of angels 1 and demons names, and an attempt to exploit these intermediaries as chann power from God Tnthemius (S$eg*nographia w 1606). the Solomoman and Abramelmian magical systems,

John Dee s magical practices all made hetvv use of invocations directed to demons and spina. Figur names from various systems, and figure 32 provides some examples of the seals, talismans, and diag and control these beings. The spirits were intricately connected with the four directions, the ele and other cosmological entities, and so mav have been named on some of the Vovmch manuscript folio

8,7 Cabala

The nmutal Jewish philosophy known as Cabala lor Kabbalah l developed in Spain during the Middle A cemurv book called the Zohar. originating in Spam, was an important source of Cabalistic lore for

depended heavily on manipulation of the letters of the Hebrew alphabet and lists of sacred words,

verbal' and abstraa in character, in contrast to the iconic, visual qualm of mam other magical sys and of angels and the Hebrew letter s were employed in wavs strong! v suggesting to us. today. cry fact, the manipulations of the Cabala mas have inspired at least some eariv cryptographic devices* prominent feature of the system, Ten basic elements called the ’Sephiroth ' were essential to the supposed to represent the powers or attributes of God. and were associated with other entities < t etc.J in a typical medteval table of correspondences (see figure 35 1 The Hebrew letters were all numerical values and a Cabalistic method called M femama” permitted alternative words havtne the s be substituted for sen uf names such as the Sephirorh Another Cabalistic art called temurah ' invo sacred words.

Most of the major magical svstems of later times made at least some use of Cabala. Hebrew lure and and alphabet were regarded, because of their Biblical association, as especially holv* ancient, an the imagery and "feel” of the Vovnidi manuscript does not seem verv close! v akin to the dry. abst atmosphere of Cabala, the importance of the doctrine and of the Hebrew words originating in it to make it worthwhile for a student of the manuscript to be at least superficially familiar with it. New bold attempted to use a Cabalistic principle involving all combinations of the letters of the a time as a pan of hts decipherment method. This, in itself, seems to have been an tmrenmus and ra hypothesis, however mistaken it has turned nut to have been General coverage of Cabala rtuv be fou Mathers f 195 U, and ^JTaiie i 1929i.

8,8 Alchemy

The topic of alchemv has been dealt with bv many writers in mans different wavs. Shumaker t 19^2j M 95 3 1 present good general treatments, and Thorndike i 1925-58* discusses alchemv in passing as of various ancient and medieval practitioners. Singer 11928-311 provides a comprehensive catalogue manuscripts, and an equally comprehensive listing of alchemical terms and symbols mav be found in Ashmoic 0652* presents a large and valuable collection of old manuscripts, permitting the reader t feeling for the nature and scvle of their texts and illustrauom.

The origin of alchemv apparently cannot be traced back to anv one source with am certainn It was a Egyptians. Babylonians. Jews, and perhaps even to the Hindus and Chinese. Medieval writers ascribe Trismcgmus. and much of the alchemical lore that came down to the Middle Ages probably had its sou Alexandrian Greeks in rhe eariv Christian era. ft was transmitted to Europe from the Arab world th 1 144 of a work entitled ' B<iok of the Composition of Alchemv Interest in alchemv was long-lived, seventeenth centurv when it began to decline: the eighteenth centurv is regarded as the end of its Ashmole lA.D 1617-1693. founder in 1683 of the Ashmolean Museum in Oxford, the first public museum British Isles), was perhaps the last prominent enthusiast for alchemv.

The doctrines of alchemv covered a verv broad range of technical practices and natural phenomena; disentangle its intimate intermingling of Galenic medicine, philosophical and religious mysticism mythology, astrology, botany, /oology, miner a log v and primitive chemistry. It was an all -embra philosophy as well as a more or less operational set of techniques. There were two main forms of a was the actual attempt to create new compounds or substances bv chemical operations, and prominent

attempt to produce or multiply gold. It arose, in all probability, from eariv metal-working and sm through the ages from eariv man in the Near East. Theoretical alchemv. on the other hand, was a ph about the nature of the universe and of matter: an eclectic amalgam of Gnosticism, Neo- Platonism. doctrines, and pagan mythology There was no hard-and-fast line drawn between these two branches of each practitioner of alchemv struck his own preferred balance between the smoke, smells, and gadge the quiet of the study or the oratory of the magus.

It was customary for an adept m alchemv, especially one who claimed to have attained some praaical son" or heir to whom he would pass on his wisdom at his death. Elias Ashmole was ’’adopted' in thi alchemist named WjlJiam Backhouse: Ashmole himself apparently never attempted the laboratory opera alchemv bur contented himself with reading and collecting manuscripts and studving the symbols and aic hem v Almost all alchemical writings were routinely couched in a highly mysterious, deliberate metaphorical language, codes and ciphers were commonly employed in the manuscripts, and extreme se

In essence. us tar as modern writers Have been able to guess from the convoluted secret writings t u sj alchemy was based on a rheorv involving a fundamental constituent of all nature called the fi individual objects gained their characteristic identities that made them what they were instead of the addition of qualities such as the cold* moisture, dryness and heat of Galenic medicine. In ord into another object, one must remove the "qualities ' of one nature, get back to the neutral first on" the qualities" of the desired nature (usually those of gold). This process involved elaborate m the alchemist s ' laboratory' that might occupv months or vears. cmplov the services of manv hel incredible amounts of monev and effort. Practical alchemv was a feasible hobbv for onlv the riches

The laboratorv operations included a lone list of activities which are variously rand, needless to m the manv alchemical treatises. Thev are described bv terms such as calcination* solution, putrer fermentation, exaltation, and projection. The products ©! these processes And their appearance and glassware" or vessels were described in wildb metaphorical wavs (a biack residue was ' the raven' corrosive acid was "the green lion' . ocher substances were called the snowv swan ", the toad that dragon ', etc.). Substances were referred to as "medicine, ' "menstrual fluid.' "blood. " etc., or parts of the human bodv. Metaphors were taken from human social life T marriage' or wedding." ' co and "burial"), and religion ("the passion of Christ, " "resurrection. purification. redemption"! I name a anv natural or artificial object or process could appear as a cover -word" for some alchemi

Et is mv own opinion that the Voinich manuscript could well be. at least in part, an alchemical tr hypothesis explains the secrecv and mvsienousness of its form, the difficulty of deciphering u or am' conventional herbal or astrological illustrations of the times, and rhe apparent encyclopedic fact, the onlv two drawings 1 have found chat have anv dose kinship in stvle or treatment to those illustrations in Ashmoie s Tbeatmm Chemicum Brttannicum i 1652). These are: a drawing of a plane, and a ivmbolic represent a non of an alchemical operation on p 350 Both of these are in a group of collection which are identified, alas, only as ' anonvmi The text, in paired lines of Old English Christian mystical platitudes, astrological matters, etc. in the usual wildlv heterogeneous conglo much farther toward the "theoretical" or philosophical end of the spectrum than the practical.

The plant figure has manv of the odd sivlistic features of the Voynich manuscript 5 herbal folios: arrangements of leaves and flowers; the "molded plastic", block v. or sculpturesque forms: the pla having a "cut out" look on which the plant is sifting, verv similar in stvle to some root forms on plant folios.

The other figure has elements resembling some of those in the folios showing nude human figures in doud-like form at the top. from which conventionalized ra vs emanate, represents God. immediately man or angel breathes into rhe mouth of a bulbous alchemical vessel, his breath is clearly indicat the vapors or liquids are shown passing through the elaborate "plumbing ' on the Vovmeh manuscript are a sun [with a face) above and within a crescent moon: from each of these, vapors or emanations through the vessel. The round botiom of the vessel is provided with seven spouts, spaced around it and the vapor emerges from all ot these and trickles down over two nude, plump human figures locki hands; these figures, while bener drawn than the Vovmeh manuscript nudes, are short- legged and "h tummies, in a verv similar stvle. Two dragons standing on their heads and a toad complete the comp seven spouts on the vessel is so close to that of similar spouts and vents on the pipe-iike forms aimost indistinguishable, and the symbolic use of conventionalized forms to create a new synthetic meaning also seems closely akin to the methods ot the Vovmeh manuscript s scribe or scribes While identified onlv as anonymous in Ashmole s collection, 1 have discovered some highly similar figure thev are associated with the writings of George Ripley, a fifteenth -cent urv alchemist who produc strong Christian flavor (Philalethes 1678, Rrplev 159L E756L De Rola (1973. figure 64 1 shows a fi second described above, citing us source as De Errorrbuj* bv John Dastin f British Museum. Eg ere

In anv case, k seems likeiv that a thorough examination of alchemical manuscripts and their illust repav the efforts of am - student who could gam access to them.

83 The Rosicruda n Movement and John Dee

While Dr John Dec has already been mentioned quite frequently in this monograph, it remains to pro discussion of his thought, his writings, and his connection with the Rosicrucian movement, a philo

mav. itself, have some bearing on the Vovmch manuscript There are a number of good treatments of J thought, nocablv Deacon (1968). Fell-Smith (1904). and French (1972). Yates (1972) covers the earl movement verv thoroughly, and deals with Dee in that context. Dee s private diary (Dee 1842) and a m his large collection \ James 1921) are of considerable (though leu general) interest.

The Rou crucian movement, centering m the Palatinate region of Germany but having wide-ranging rep other European countries, was essentially an attempt to liberalize religious and philosophical thi heritage of the Hermetic tradition with Christian mysticism and a generous admixture of alehcmv. C medicine The Rosicrucians were fanatically secretive. The authors of the original Ron crucian 'man the Confeino, both reproduced in translation in Yates 1972) never revealed their identities. Thev ' brotherhood/' and appeared to invite new adherents; all attempts on the part of would-be recruit founders seem to have been fruitless and certainly received no open response (although there may h concealed contacts and acn vines behind the icenesh

The Rosknidan doctrines, like those of alchemy to which they are dosciv akin, manifested a highly convoluted use of symbols and imagery. To the amalgam of devices familiar tn alchemy, the Rosicruc symbolism related to the prominent conflict between Protestant nations and leaders, organized arou Palatine of the Rhine, and married to Princess Elizabeth, daughter of James 1 of England) and the house of Habsburg These quasi -political symbols with religious and mvstical overtones included th Palatine lion, the red rose, images related to the Order of the Garter/' and svmboh taken from or Dee s writings, especially his Monas Hieroglyphic* (Dee 1564. 1964 L

John Dee. according to Yates, 'belonged emphatically to the Renaissance Hermetic tradition, brough

new developments, and which he further expanded in original and important directions' (1972. p. x
page, she describes Dee s contributions as follows: 'In the lower elemental world he studied numbe
applied sciences. . . . in the celesnal world, his study of number was related to astrology and al
Hiero%lyphica he believed he had discovered a formula for a combined cabahsi. alchemical and mathe
would enable its possessor to move up and down rhe scale of being from the lowest to the highest s
supercelestial sphere Dee believed that he had found the secret of conjuring angels by numerical c
tradition /'

Dee s influence was earned to the European continent, where he made extensive visits from 1 58 3 o
to Yates, verv active tn surring up new movements in Central Europe, though his work there has bee
than his life in England. It would seem that Dee was somewhat of an intellectual leader in Bohemia
bui in a religious reform movement, the nature of which has not yet been investigated and explaine
discussed in Yates treatment of Dee and the Rosicrucians probably look place after the Voynich man
existence. It seems to me verv likely, however, that there is some kinship between the philosophy
and the Rosicrucian tradition. Because of the known association of the manuscript with Rudolph's c
with Dee. and the obvious similarity of its secretive, synthetic symbolism to that of the Rosier u
scarcely afford to ignore anv of this highly in t ere sti ng material.

A brief word should be said concerning the "hieroglyphic manuscript ' which Dee was reputed to hav
possession, and which some wnters have identified with the Voynich manuscript. The letter written
Browne to Elias Ash mole, and reporting the words of Arthur Dee. John Dee's son. concerning this m
quoted bv Fell-Smith (1904) as follows: "The transmutation [to gold) was made by a powder they had
found in some old place, and a book lying by it containing nothing but hieroglvphicb; which book h
bestowed much time upon, but I could not hear that he could make it out.' (p. 311). Arthur Dee. bo
apparent! v eight years old it the time he saw the events he describes.

Another history related bv Fell-Smith probably records the origin of the manuscr ipt and the powde
have been wandering in Wales. . .when he stumbled upon an old alchemical manuscript and two casket
a mysterious red and white powder/' (p. 77). It was Kelley, in anv case, who brought the powder an
when thev first became acquainted. In fact, one gams the definite impression chat Kellev's origina
our (under an assumed name at first) was to gain his assistance, and probably his monetary backin
out the meaning of the manuscript and to use the powders to make gold

Dec s diary, as edited by Halliwell (Dee 1842) provides no further information concerning the manu
] os ten. however, in a highly interesting recent article U965J. describes a portion of the diary
source separate from the remainder; this excerpt does, indeed, contain considerable information on

great detail an incident during the time when Dee and Kelley were engaged in communication with th
instructed them, through Kellev, to destroy all their precious books and occulta, including the hi
the powder. This sacrificial act, intended to be a test of their high purity of purpose and submis
their placing the objects into a furnace (undoubtedly a pan of the furnishings of their alchemical
them to be consumed by the fire.

This ceremony or bit of sleight of hand (for it was apparently an elaborate deception, either work
some purpose known only to his unbalanced and unscrupulous mind, or else perpetrated bv both men f
common purpose upon a third party) was duly accomplished: the next dav. all the "destroyed arcana
reappeared, to be rediscovered whole and undamaged bv Kellev in the ashes of the furnace. The desc
ceremonial burning includes a tantalizing glimpse of the hieroglyphic manuscript itself, which is

written m letters "larger*' than those of usual writing, and to have been stored in a velvet bag o

On his break with Dec in .Prague. Kellev kept most of the magic powder; what ultimately became ot reported in any of the sources 1 have consulted. It seems likely that Kelley kept that also (since from the beginning) and subsequently sold or relinquished it to Rudolph. Unfortunately, the mere c book as being "in hieroglyphics" is not enough to warrant a secure identification with the Voynich if not most, alchemical treatises were couched in secret characters. It was more usual, however, f mterm xcd with Latin or some other more familiar letters after the fashion of a rebus. It also see have been familiar with ihe alchemical symbols, and would have had no trouble in making some sense little success he may ha ^attained in making gold according to their instructions. Section 9.4 pro discussion of alchemical symbols, and figure 42 shows some examples.

8.10 The History of the Hindu* Arabic Numerals

In view of the strong possibility that some, at least, of the Vovnich symbols may be early forms o should be said about the origin and development of these numerals in Europe. Figure 16 shows a sam numeral forms that bear a resemblance to some Vovnich script characters. Two good general studies numerals are Hill (1915) and Smith and Karptnski (1911). The original birthplace of the numerals i they could have come from Egvpt, Persia, China, or Mesopotamia. Their history can. however, be cie then in their very gradual adoption in Europe. The Hindu system of numerals, including place value "zero", was transmitted to the Arabs at a relatively early date. Smith and Karpmski trace the firs numerals to a visit A.D. 77 £ bv a Hindu astrologer to the court of the Caliph, where his astronom into Arabic. Ocher Arab math en> a no a ns (among them Al-Khowarazmi, who gave his name, in the fo algorithmi/' to arithmetical calculation using the new numerals, and ultimately to our modern algo tables and computations on that translated work.

Arab writers continued to use the new numbers, consistently referring to them, and the arithmetic "Indian" well into the thirteenth century. The adoption of the numerals into Europe is hard to pin Karpmski attribute it to the travels of merchants and traders in Spain, where Arab influence was s or tenth century. Numerous visits to the Near and Far East were made bv traders and missionaries t Ages: the travels of the Brothers Poli were unusual only in the thoroughness of their documentatio have aroused in modern times. These travelers brought back many bits and pieces of foreign lore, s the wealth of its detail and vividness of description. The Hindu* Arabic numerals undoubtedly beca through these accounts. One form of the numerals, employed in conjunction with the abacus, became under the names " characters " or "apices," and involved unusually bizarre and ornate varieties of

The adoption of the new numbers in Europe was an extremely slow matter. They seem to have been kno by some writers for a considerable time before they came into anything like general use. They were merchants for the practical calculations of commerce until surprisingly late. Leonardo Fibonacci o did much to introduce the numerals to Europeans. His Liber Abaci, written in 1202 and rewritten in new numbers and used them as they would be employed in the usual computations of business. The met were rejected both by the conservative mercantile class and bv university circles, according to Sm The bankers of Florence were forbidden to use the new numerals in 1299, and "the statutes of the U required stationers to keep the price lists of books non per Ctfm, sed per iiteras Claras'", Ip. 1

Still the new system made some headway from 1275 on. It is interesting to note that the common fol European nations Like Germany rarely used Arabic numerals before the sixteenth centurv. The invent pencils, and modern methods of multiplication and division did not come about until quite recently

developments that, according to Smith and Karpmski, rcallv made the new ' algorism'" attractive an use. Before that time, the Arabic numerals were employed primarily on coins, for numbering the pag for dates, Thev are often found intermingled in bizarre wavs with Roman numerals: e.g,. "’IVGjj" f "NFCCCC^O" for T45G': and ‘M.CCCCSii ' for "1482". In the early and transitional phases tif their numerals or "ciphers * were regarded as incomprehensible, mysterious, strange, and well-suited for secret writing systems.

8 . 1 1 Medieval and Renaissance Costume

The clothing of some of the human figures on the pages of the Vovnich manuscript should afford us dare and provenience of the work. Unfortunately, the drawing is so sketchy, and the figures are so detail that there is disappointingly little to go on. A wide vanerv of hats and headgear are in ev otherwise entirely nude , these include a variety of diadems, tiaras and crowns as well as wide-br shanters, and hats provided with ribbons, veils, or plumes falling over the wearer's -Shoulder or perhaps also men includes a sort of long pleated robe with wide sleeves (see Virgo and one of the Verv common ts a kind of knee-length. pleated tunic belied at the warn isee Sagittarius, figure 10 were common during the fourteenth, fifteenth, and sixteenth centuries throughout Europe, There see more extreme styles; the tall conical hats or rwo-horned headgear for women: the exaggeratedly puf ruffled collars for men in style after about 1550: or the curly-coed shoes, very short tunics over codpieces that were the height of fashion somewhat earlier. The garments shown, however sketchiiv. manuscript folios seem quite simple and restrained on the whole, and provide relatively little dec to me, from an admittedly superficial study, to be consistent with a date between 1 450 and 1550 (well -illustrated treatment of sixteenth-century costume). Some typical hat and dress forms from t shown m figures 10 and J7,

Chapter 9

Collateral Research: Artificial and Secret Languages

Laic medicv.il and Renaissance philosophy included a vigorous imeresr m synthetic languages of mam variously intended tor concealment of secrets. expression ot mystical religious ideas, abbreviated text, nucr Ungual communication, and an encyclopedic mnemonic representation of human knowledge. A throughout these chapters on collateral research, 1 can present here onlv the barest suggestion of interested reader

9.1 Brachygraphy: The History of Shorthand

The ancient Greeks employed a svstem ot abbreviations called Tironian Hand or Notation, ascribed t Tiro in the first centurv before Christ i see Rose 1874* Allen 1889, Boge 1973*. New bold attempte abbreviations in his decipherment method , as we saw in Chapter 5. Manv later svstem s of abbrevia medieval times were inspired bv. or based on. this earlv Greek svstem, Figure 38 show's an interes shorthand svstem derived from the Greek methods: its strokes are made up of pans of the letters a forms of the Hindu -Arabic numerals This mtem. caJled "Notana Aristoteiis by its author, an Englis thirteenth centurv* is of interest because of the resemblance of some of its symbols to the Vovruc mv opinion, due to the derivation of both from earlv numeral forms i . These symbols acted as base were added to form words, Roger Bacon was reported bv johnen l L940. p. 34 i to have been familiar Notation, which he called *'ars no tat on a \

Cappcih 11949) presides a summary of the history ot Latin abbreviation systems and cherr developme mto medieval times, The Roman svstem made use of several devices single letters could stand for en words could also be truncated or contracted* usually being provided with a mark or symbol showing omitted i a tail or curlicue extending upward or downward* a line or curve above certain letters, shows some Latin abbreviations used in the Middle Ages that resemble characters of the Vovnich scr works dealing with the histon of shorthand and covering the earliest systems are Gmlieni ' l%8i an Alston t 1 966 j provides a bibliography of works on the subject.

Most earlv European or English shorthand systems I have examined are designed around simple lines dots, dashes, circles, hooks* etc,, are attached ar various positions to form compound symbols sta ot these earlv systems were not phonetic. " i.e,* thev made linie or no attempt ro show the sound spelling conventions as modern systems do In fact, the earlv systems tended more toward an ideogra representation of ideas, although alphabetic elements were also involved. All of the systems were requiring the memorization of vast arrays of arbitrary symbols that were difficult to write accura reader can only wonder how anvone ever managed to learn or remember their large numbers of rules a the tinv docs and hooks with sufficient precision to permit distinguishing them later in attemptin written These methods certainly seem to have required far more effort chan ordinary wrtnng.

Duthie f 1970) provides an interesting comparison of three major systems in existence dunne Eliza one of them mav have been employed ro record some of the texts of Shakespeare s plavs during actua must have been usable to some extent.] will summarize below, in highly abbreviated form. Duthie s systems seem typical of the methods available in the sixteenth and earlv seventeenth centuries Tha apparently, not simply for Transcription of speech as modern systems are employed. but also for ra as a concealment method* and as a sort of elegant, philosophical mode of representing ideas' .

9 */*/ Characterie (Thomas Bright* circa 1 5S8)*

Figure 38 shows the basic strokes and the subsidiary elements to be added to each in Bright s syst base symbols consisted of a vertical line with a distinguishing hook, curlicue* etc., on its top;

in four different positions I vertical, horizontal, slanted left, slanted right). In addition, to twelve additional squiggles could be added, making 864 combined symbols tor use to represent commo called "characteral! words' 1 Other words not in this basic list were expressed bv ' associating t antonvms to a "cbaracrerall word 11 . and prefixing to it the first- letter base svmbol of the act determinant (see the examples in figure 58 1. As Duthte remarks, this ivstem was primitive and cum burden on the memorv of its user, and producing forms which were verv easv to garble and confuse

9*1.2 Brachy graphic (Peter Bales* circa 1590).

Bales ivstem employed ordinary Roman letters in combination with dots, commas, and accent s i coll Bales eictlcs ‘L which had to be very carefully and accurately placed around the letters to avoid combinations of letters and "utiles* 4 produced symbols for a basic list of common words as in Bri synonyms and antonyms were shown bv using the base-word symbol with an extra stroke on the right o method required the memorizing of over 500 different srmboh; great precision in the placement of t mandator v in order to avoid garbles. Jt does not seem to have been any more practical than Bright

9 - 13 Stenographic (John Willis, 1602).

Duthic finds Sonographic the best of the three, and considers it to be the foundation ot modern sh
38 shows the twenrv-six basic strokes, called "unchangeable particles . these were partly phonetic
largely suppressed in writing words. A circle added to the foot of a stroke provided an h sound, a
clockwise positions around the basic stroke stood for vowels. Abbreviated forms of words were buil
dementi in a manner somewhat like modern methods, Willis svstem is. in fact, verv much like the la
f which mav well have been derived from ill, Duthie judges chat Stenographic could have been emplo
careful speech in condensed form, but not for rapid verbatim reporting. If is interesting to note
Steganographie as well as Stenographic, and considered it appropriate for concealment of secrets.

In summary, it seems unlikely that any of these svstems or others related to them are closelv akin
The onlv clement among the Vovmch symbols that bears anv resemblance to the dots, dashes, hooks, a
carlv shorthand methods is the hook or curlicue that appears frequently over the double-c'" charac
C^t There seems to be no visible structure of auxiliary marks added to a recurrent set of base sym
considerably more reasonable, in mv opinion, to look for relationships between the Vovmch characte
abbreviations, with some earlv numeral forms (see Section 4.1.2 and figures 16. 171-

9.2 Steganography: The Early History of Cryptology

There are records of ciphers in ancient Egypt and Rome: substitution ciphers of various kinds, som
alphabets or geometrical symbols, were known from the early Middle Ages. Roger Bacon was greativ i
writing, and much has been made {bv would-be decipherers of the Vovmch manuscript) of Bacon s sta
m his Epuiola de Secret! s Openhus Artu et Naturae, He recommends, for the concealment of great an
prevent them from being abused bv the common herd of mankind, the use of the following expedients;
verses (or incantations I; 2) fables and enigmas; 3) leaving out certain letters, especially vowel
Chaldeans, and Arabs do to make their secrets harder to readM; 4) mixing letters of different kind
astronomer Ethicus hid his knowledge bv a mixture of Hebrew. Greek, and Latin letters i; 5* employ
one s own culture ; 6 j creating characters from one s own imagination { this last being, accordin
good method, used bv Artephius in his Book of the Secrets of Nanire\\ 71 using geometric figures c
signs instead of alphabetic characters: and finally 8) the "notory art." which Bacon thought was t
art of writing as briefly and rapidly as one desires. Bacon claimed to have used some, at least, o
writings

This highly interesting and rather complete compendium of earlv cryptographic devices from the pot
Mirabiiis has understandably inspired many students of the Vovnich manuscript to seek some or all
pages, and to see in it a result of Bacon's practice of his own recommendations. A considerable li
ciphers attributed to Bacon in alchemical works (Hime 1904. 1914, 1915: Steele 1928a. 1928b; Manly
anagram, in which Bacon is supposed to have hidden a formula for gunpowder, is explicated variousl

debunked bv others fwho dismiss it as a- supers nous rale about a split willow branch that magical
careless misreading bv an ear h editor of a sentence in a manuscript j.

A variety of cryptographic methods are described bv other early writers, Ramon Lull (Yates I960, R
Trithemius 1 1564, 1606), Porta (1563), Agnppa 1 1970), and Athanasius Kircher (Kircher 1631- McC
all credited with svstetns which arc essentially forms of ciphers and codes or could be used as su
cryptography, and made use of it in his missions for his roval patron, Elizabeth of England, accor
Many early svsrems involved substitution ciphers, using inverted or distorted characters, geometri
alchemical and astrological symbols, Latin abbreviations, etc,, in hybrid conglomerations. There w

more sophisticated techniques Lists of apparently innocent words all starting with a given letter codewords for that letter, so that an innocuous-appearing sentence consisting of five Latin words word that carried the true message. Correspondents each having a copy of the code book containing words i made-up words, names of angels and demons, stereotyped religious platitudes, etc.) could u means for concealing simple messages in letters isee. for example, Trithemius 1564, pp, 48ff.l, Ra geometric figures marked with letters could be employed to produce digraphs l Aa. Ab. Ac. . ♦. Az. could be made to stand for words or concepts, A number of early cryptographic systems employed cip fixed and one rotating alphabet (e,g,. Alberti, m the late fifteenth century, and Silvester and Po Silvester 1526. p 7 : Porta 1563, pp ^3, 79. 83: and Meister 1902, 19061

Ant -cher ear It cryptographic device concealed a message within a much longer "dummy" text bv som bv the correspondents. Alchemy treatises, which were expected to be enigmatic even at best, were i brief message in this wav A related concealment svstem employed groups of rwo or three leners in v the presence or absence of some apparently decorative or accidental characteristic (small and larg underlines, or strokes added to some letters and not to others, shading, etc.). These groups could of a message bv a variety of conventions: for example, in a triliteral system described bv Trithem about 1500. a set of groups AAA, AAB, AAC ABA. ABB. ABC, . . „ CCA. CCB. CCC could provide twenrv- for the letters of the alphabet and a few additional characters. The twenty- seven distinctions co abstractly bv anv three states of three things, arranged m all unique combinations (three differen printing, etc.). The famous cipher of Francis Bacon (about 1600) is of this type, differing from T that if used groups of five 'elements, made up of two distinctions or choices, and employed more s concealing the distinctions m a cover text.

An impressive variety of cryptographic methods, exhibiting a surprising degree of compJextiv and s use at an earlv date in the service of the Papal court and the courts of Italian Princes, A number described in Meister 11902. 1906). Pasini (1 87 3 K Sacco (1947). and Alberti 11568) Meister (1 history of earlv Italian ciphers, the earliest dating to 1 226 from the Venetian Republic and othe during the fourteenth and the fifteenth centuries. Meister (1906) traces to the year 1326 or 1327 device called a ' nomenclator." consisting of a small list of code words or syllables standing for employed in Church or State correspondence {"Pope \ '* horses'*, "soldiers' . stereotyped honorifi titles, etc,]. Meister describes a number of remarkably complex and advanced systems in use for Pa the fourteenth and fifteenth centuries. These employed variant substitution elements ! manv altern standing for the same plaintext element), often drawn from fanciful, foreign, or invented alphabet made use of "nulls ' U list of alternative dummy symbols having no meaning in themselves but throw conceal patterns, and further confuse the would-be decipherer). All these devices could be employe nomenclator." really a primitive small code, plus an elaborate svstem of monographic, di graphic, with a correspondingly varied set of nulls as well. Figure 39 shows a sampling of some earlv Itali

Of particular interest because of its relatively earlv date is a system described by Jakob Silvest based on a Latin dictionary; a code consisting of Roman numerals was assigned to the columns of wo dictionary. As an alternative, to further confuse the decipherer, a set of digraphs in random orde be used instead of, or intermixed with, the Roman numerals to designate the column. Within each co words, arranged in roughly alphabetical order, were indicated bv Arabic numerals. Latin endings we letters or digraphs The alphabet employed is made up of invented and foreign symbols of great vari large set of choices could be scattered through the text. Figure 40 shows a sketch of the mam feat and two short samples of text enciphered in it Unfortunately, Silvester s book does not provide en

dictionary or other aspects of the srstem to support a complete invest) canon of its relationship

Vovmch text, nor docs it provide anv loop samples of enciphered text that might be studied statist

The reader who remembers the remarks of Tillman concerning the " beginning -middle -end " structur Voynich text, and the comments of Tiltman and Friedman regarding universal and synthetic languages possibilities of this earlv code system in accounting for the phenomena they had in mind I sec als above, as well as 9.) and the Appendix below l. Friedman and Tiltman made strenuous attempts to tr svntheuc languages back to a dace sufficient! v earlv 10 be contemporary with the Vovmch manuscrip is mv opinion that the earliest history of such languages can indeed be found bv searching in two cryptographic systems, and second, in the medieval and Renaissance Ars Memoraeiva. Yates I 1966. p work of Francs Bacon. Comenms. Bmerfeid. Dalgarno. and Wilkins directed toward the development of u.e„ a svstem of signs like Chinese characters, supposed to be directly" related to their referent hieroglyphs, and independent of the spelling or sound of words). She traces this undertaking back ear her tradition of metnorv art. citing the work of Rosu (I960 1, A complex cryptographic svstem Silvester could well form the basis of the Vovtuch text. It is interesting to note that a copy of Museum Library, dated 1616. is autographed bv. and had presumably been in the possession of John D

p 2),

9.3 Pasigraphy: Universal and Synthetic Languages

Ac che time during the late Middle Ages and earlv Renaissance when Latin was no longer functioning for learned internal communication and the vernacular languages were beginning to be employed more scholars began to be concerned about finding a substitute to fill the need for a universal languag travellers, whether merchants or missionaries, were bringing news from the Far East of writing sys employed ideographs and characters that could stand for ideas as wholes, rather than representing through an alphabet. Thus there arose a number of efforts directed toward the development of a uni real character’ which would in some manner bypass the multiplicity of vernacular tongues and repre the same wav for all nations.

This undertaking was not reallv a wholly new idea, in fact, it was solidlv based in the encycloped the Middle Ages Yates (1966» examines the work of Francis Bacon and others in the seventeenth cen search for a universal language Leibnitz, as Yates shows, was a last great exponent of the ancient of Memory into the creation of the infinitesimal calculus f Yates 1966. pp 378 ff.i.

The earlr synthetic languages had much in common with cryptographic codes As a foundation, a class was set up for words or ideas to form a framework of what were called " svnearegoremata. “ The wor each author according to his own philosophical bent and purposes; while intended to be independent the scheme often involved numbers or codes assigned to the words of a Liun dictionary. Some of the and straightforward, but many others seem forbiddingly abstruse and philosophical to the modern re devised b\ an anonymous Spanish Jesuit in 1653 called an "amhmetjcus nomenclator." a class was set relating to the elements ; this class was assigned Roman numeral l. Arabic numerals were used to s

within the class, e.g., 1 Fire. 2. Flame, 3. Smoke 6. Wind. 7. Breeze. .... 12. Water, etc,, f see

ff. i. Dalgarno s svsrem involved twenty classes of words or ideas, represented bv capital letters class "Ens. Res ; H for Spmrus, U for Homo. ' etc. (Dalgarno. 1661 1.

John Wilkins, inventor of a svstem of real character " around the year 1 668. set up for tv classe 1 Transcendental. General 2. Transcendental. Mixed"; .... 5. God. the Creator"; 6 "The World. Crea The Elements . etc These philosophical classes embodied the concepts about the nature of the unive rimes, and deriving from medieval foundations. Under each such class, subcategories were set up fo species Differences were shown bv vertical and oblique lines attached on the left of the basic sym

species bv an adjunct symbol attached on the right. Grammatical information lendings, etc. > was s attached to the compound symbol. Wilkins svstem had a spoken as well as a written form.

Groves 1 1846* and Kircher f 1663) provide summaries of a number of earlv svntheuc language system ifives a verv complete treatment of synthetic languages of all types, including religious, cryptog as well Dalgarno s svstem is described m Dalgarno i 166 h. Comemus m GeissJer ! 19591. Other syste Wilkins I 1641. 1668a, 1668b) and Top f 16031. These invented languages are of interest to student manuscript for several reasons- First, two dedicated and expen crvptologisis who devoted vears of

manuscript — Friedman and Tilrman — arrived independently at the hypothesis that a synthetic langu underlie the Vovnich text. Second, the structure of the early universal languages \s base or root or more characters to single out the species or individual word, and finally characters standing t agrees very well with the "beginning- middle-ending struaure found bv Tillman in the words of the as we have seen in the previous section. the methods employed in some earlv codes used bv the Papa similar, and date to a ume sufficiently earlv to be contemporaneous with the origin of the manuscr

9.4 Magical and Religious Languages and Alphabets

There remains for discussion another large group of synthetic languages which mav have a bearing o Voynich manuscript. Tndcr this heading I have lumped together a number of different secret or myst various types: alchemical or philosophical svstems; languages purporting to be revealed bv. or use God, angels or demons: svstems of svmbols used in magical incantahons. prayers, and spells. Bausam excellent overview of all these made-up languages: including universal languages and the neologism schizophrenics and other mentally disturbed persons or persons in temporarily abnormal mental stat ecstasy or inspiration 1. Gessmann i 19 22) lists a large number of the words and svmbols empluved phvsiaans. and astrologers.

94 - / Magical Languages.

We have already taken some glimpses of magical svmbols and writing in the discussion of magical sv Most such svstems included talismans, seals, diagrams, and devices \ daggers, swords, candlesticks with letters in a variety of bizarre alphabets. De Givrv (197 1) and Seligman (1948) prov ide co figures drawn from a wide range of sources and dates. Mans of the alphabets appear to be based on more or less garbled and distorted forms: Mathers (1974* pi. XV) shows several of these Hebrew wri ("Alphabet of the Magi/ Celestial Writing, ' "Malachim " or "Writing qf the Angels." and 'Passing Some svmbob in Pkatrix are called "Indian," and mav be distortions of Devanagari or some ocher Ind Other Pkatnx characters are clear iv Arabic, and others still are similar to Egyptian Hieroglyphic Egyptian words seem discernible in some of the incantations of the Hermetic writings tFestugicre L osergariach/' in a "true name of Hermes Tnsmegisrus" mav contain the words wjr ka re . strong is t Pkatrix also emplovs the "star picture writing made up of circles strung on lines and curves menti 3.3-3 and 8.4- It is interesting to note that two of the mystical Hebrew alphabets, the Writing of ot the River" also consist of small circles strung on lines m this fashion. Figure 4 1 shows some from various sources.

While interesting and suggestive, tew ot the magical svmbols discussed above seem to bear am direc anything in the Vovnich script or drawings, with perhaps one exception. The Puamx "star pictures, alphabets, and certain alchemy symbols all are strikingly similar to the strange geometric figures four corners ot folio 67v2. It is also possible that the small design which Brumbaugh sees as a "d

character ", which is quite common in the Pkatnx spells and also in the other writing svstems ment

94.2 Alchemical * Medical, and Astrological Symbols.

Gessmann 1 1922) presents a large collection of the svmbols and code words used bv medieval alchem scholars and philosophers. Figure 42 shows a selection of these sufficient to indicate their gener includes some that appear similar to certain Vovnich script characters. It was apparent! v a commo employ these svmbols. interspersed in Latin text, as a son of secret shorthand for alchemical prod few of these signs are somewhat similar to Vovnich svmbols. most of them are not, and chev offer d in our task. Of course, if a dear relationship were evident between alchemical svmbols and the Vov Rudolph s court would have had little trouble in deciphering it, and the mvsten would not have per unsolved

The use of pravers and incantations in medical manuscripts is interesting in that manv of the spel foreign to the compilers and users of the recipes; their verv foreignness increased the potency of Another feature of these spells which mav be relevant to our purpose is their repetitiveness; one. often repeated several times in a row . either exactly or with minor differences, in a manner remi

nr* anv stretches of Vovnich text The oldest surviving Anglo-Saxon medical manuscripts exhibit num practices (see Grattan and Singer 1912, Storms 1948). Some of the spells are distortions of Old Ir Irish missionaries (e.g., “Gonomil orgomi) marbumil marbsai ramun. . . a spell against ' black bla Singer 1952. p. 64). Some are garbled bits of Greek liturgy (e.g„ Stomen cal cos. Stomen meta fotu patera eae vo cae agion pneuma. . Grattan and Singer 1952, pp. 49-50).

There are some interesting survivals in the Anglo-Saxon manuscripts of pagan Roman pravers. for ex hvmn to the Earth Mother, ' Dea Sanaa Tellus. Rerum Naturae Parens , . . (Grattan and Smger 1952. Numerous relics of pre-Christian Anglo- Saxon religious rites and beliefs are discernible. Names o snatches of Biblical texts were employed as charms. Some spells combined garbled Greek. Hebrew, an impressive -sounding conglomeration that must have had a strong psychological impact on the patien eltheos mur O ineffabiie Omiginan. . . sother sother miserere mci deus mini deus mi Amen AJleluiah bowels' . Grattan and Singer 1952, p. 189). Even the word Abracadabra.'' which has come down to mo symbol for magical mum bo- jumbo, had a place in Anglo-Saxon medicine (the word "ABRACADABRA* was written repeatedly on a parchment and applied to the patient Grattan and Singer 1952. p 10).

9 - 4-3 Mystical and Religious Languages,

St. Hildegarde ?f Bingen i A.D. 1048-1 179). whose visions have already been examined briefly for the Vovnich manuscript (see Section 3 2 3). was also gifted with the mvsttcal ability of * speakin have been found preserving a series of "carmina (songs or hvmns) by Hildegarde in an ignota lingua sang or reared such compositions while under the sway of her mvstic visions. An invented alphabet Hildegarde s language: the letters are obviously distortions of Latin letters for the most part. B number of examples of words from Hildegarde s language, preserved in a son of glossary written dow contemporaries. In many cases, associations with German and Latin are apparent, as is the use of i endings. Figure 43 shows the alphabet and some samples of transliterated words.

Bausani (1970) mentions other, similar mystical languages employed by Elizabeth von SchOnau fa con Hildegarde. also m religious life, and a frequent correspondent with her), and Christiana von Tron habit of uttering melodious and incomprehensible words from ” between her chest and her throat " w

religious ecstasy. The mystical Sufi sea within Mohammedanism also developed a highly complex synt Balaibalan.” provided with an extensive set of grammatical and svntanical rules and a large lexico some examples of this language. The possibility cannot be ruled out that a made-up language of thi Voynich script, devised by an exceptional individual under the power of religious inspiration.

9 - 4-4 The Enochs an Language of John Dee.

Deacon (1968) presents a dear and detailed description of the secret language which Dee and Kelley received as a revelation from the angels through the ‘scrying glass." He also provides a highly in angelic conversations'* carried out bv Dee and Kelley during the early 1580 s (Deacon 1968, pp. 13 (1659) describes these conversations in great detail, in a work based on Dee's diaries and manuscr bv Elias Ash mole. The following account is drawn from these two sources. I strongly urge any inte access to Casaubon s work and read it in hill (there is a copy in the Fabyan Collection, Library o and remarkable account, and the present brief summary can by no means do si justice.

As we have seen above (Sections 8,4.4 and 8.9), John Dee was never able to p er c eive ihe visions angels voices. For these offices he relied entirely on Kelley, who was evidently a highly unstable personality. How much of what went on in ihe amazing seances reported in the diaries was invented make himself indispensible to Dee or to gain a decisive influence over him, is a matter open to qu Dee was using Kelley rather than the other way around, and that both were engaged in cryptographic for the English Crown under cover of Dee's astrological and demonological activities. In any case, spirit communications were received and recorded seems so complex and demanding as to be almost un evidently often became impatient with the effort involved, and Dee had to plead with him and impor continue: one gains the impression that Kelley was never nearly as interested in the angelic commu would much have preferred to focus his energies on the making of gold.

\

Dunne (he seances • mam of which took place during a visit w the court u f the Polish Count Lasks Rudolph s court m Prague/, Kellev sat before rhe crystal and reported what he saw and heard to Dee occasionally putting questions to the spirits through Kellev Kellev often saw rhe angels themselve beings as well, often moving through elaborate scenes and anions as on a stage (walking along a ro crossing streams, ere h He describes rheir faces, gestures, manner, dothing. and acn vines m remar Casaubon s account provides extensive information concerning the setting, preparations, apparatus, during these sessions, as well as a verbatim account of the visions rhemseives From p. 75 on, he r of a sei of cipher matrices or ' tables to Dee and Kellev bv the angels. Kellev saw the matrix in standing nearby, pointing to its squares with a wand; Kellev then read them off to Dee. who made a their own later use Mam such “tables' were transmitted bv the angels, the set called the “Book of comprised fort v- nine tables, each having fern-nine rows and for tv -nine columns Ultimately at l books of tables and rext were dictated to Dee and Kellev bv the spirits.

Along with the tables, the angels dinned long lists of vocabulary words, each list followed bv a p that used the words, much like an everv-dav elementary language lesson During this process. Dee of penetrating questions concerning affixes, structure, similarities he noted between words or pans o for and obtained repetitions of things he had not heard right or questioned for some reason. Casa recounting this a marine linguistic research, for all the world like a series cl sessions between informants.

Deacon (1968) provides the following description of the wav running texr was dictated “Each of th had in front of him consisted of a large square subdivided into forty-nine bv forty-nine small squ ol the Enochian alphabet These letters were in apparently random order. Kellev would look mio the angel pointing to one these small squares tn a replica of the table in the crvstal and would call reading) Dee would find the square in his table and write down the relevant letter. . . The result Enochian written backwards. It is almost impossible to believe that this could be faked, especiall there were nifietv -eight tables to choose from for memorizing, if one was faking it." (pp 1 50- 1 individual words are clearly shown written backwards I with the Last letter first), and the order paragraph sem as a unit is also backwards, so that the last word sent is the first word of the pas 43, 44, and 45 show the alphabet and some examples of Enochian text; lit mav be noted that certain the text are not represented in the alphabet, a fact which is nowhere explained in the sources)

Enochian. according to Deacon, is unique and different from anv other Cabalistic language or magic to see how it could have been plagiarized from anv other secret writings. Robert Hooke, a prominen scientist and a member of the Roval Society held the view that Enochian was essentially a cryptogr device, like a code. Deacon claims that Enochian is a bona fide language, and can be learned with unpublished manuscripts le.g.. Libn Mystertorum, Sloane ms. 3188, British Museum!, and from Casaub The Rosicrucian Order of the Golden Dawn (England. L875) adopted Enochian and employed it in thei mav verify for himself in the samples shown in figures 44 and 45 that words having a constant mean w.thom additions. ' OD‘\ and ; THIS”. "are", and ICHISGET arc nor": 'TAl'SGf AT. the earth , CHRISTGOS . let there be . etc. Whatever its relevance to the Vovrnch manuscript, this amazing acc field linguistics among the denizens of the spirit world deserves a careful study bv modern psycho

Chapter 10

Collateral Research: Early Herbals and Materia Medica

The historv of herbals, botany, and materia medica is a major area of study which no student of th can afford to ignore. As we have seen in Sections 3 3 1 and 3-3-2 above, many researchers have mad link the herbal and pharmaceutical drawings to those in orher medieval and Renaissance medical wor number of good general works on early herbals are available to the student: Arber f 19531. Rohde ! (1927) cover the history of earlv herbals in general, with a strong emphasis on Old English herbal provides a large collection of beautiful illustrations of earlv botanical, magical, and medical dr treatment of these topics. Cockayne (1866) and Grattan (1932) cover the Anglo-Saxon herbals ver\ trace their history and sources. Excellent treatments of the historv of medicine mav be found in S (1922). and Thorndike (-1963L while Thorndike J 1923-38) provides extensive detail on the work of among other scientists Tiltman (1968, pp. 1 1-13 1 gives a brief bur very useful sketch of the ear botanical illustration in relation to the study of the Voynich manuscript. The following survey, d while high I v abbreviated, mav serve to introduce the reader to the subject and its literature

The eiriiesc beginnings of botanical drawing and description are to be found in Greece, as is true learning and philosophy. Aristotle was said to have written a treatise on plants: this work was ap earlv date, and was not among the works of Greek learning preserved bv the Mohammedans and transmi scholars through them Aristorle's pupil Theophrastus of Eresus. however, produced a work which ser Greek "rhizotomiscs* ("root -diggers'*, frequently ignorant and superstitious gatherers of medicin pharmacists, physicians, and medical suppliers of their davh In the first century B.C. a highly ta learned member of this class of rhizotomists named Craieuas compiled an herbal containing the firs

drawings. Crateuaj (132-63 B.C) was physician to Mithridaces VI Eupator, King of Pontus in Asia Mi illustrated with pictures apparently drawn with great care and arttstrv from life, each accompanie the medicinal effects and uses of the plant.

While no manuscripts of Crateuas' work have survived, a revision or extract of it has been preserv original drawings, in the Materia Medica Lrbri Qutnque of Dioscondcs Anazarbcus. a physician attac Army in Asia during the first century A D. (Dioscorides 1939* Dioscondcs' text and mans of the dra reproduced in a beautiful manuscript herbal presented in AD 312 to Juliana Amcia. daughter of a Ro manuscript, called the Juliana Amcia Codex, is preserved in Vienna, and a part of a facsimile mav Tiltman '1968k in the Garden Library of Dumbarton Oaks. Biedermann 119721 and Singer (1927. 1928) number of illustrations of these exquisite drawings, whose lifelike and artistic quality are judge of manv. if not most, subsequent herbals well into the Middle Ages. In spite of its earlv date, th constitutes a major high point in the historv of earlv herbals. reached bv few others tor many cen

The first known herbal in which plants were described tn alphabetical order was that of Pamphiluis A.D 100, Manv earlv herbals also empioved an alternative arrangement dealing with plants tn an ord part to which their medicinal effects pertained, usually starting at the head and finishing at the Saturalis Histone (A.D 771 compiled a massive enevdopedia comprising thirty -seven books covering of the dav. This collection of magical and superstitious beliefs. Old Wives' tales, myths, and obs beasts, plants, medicines, metals, minerals, and a hosr of orher topics was greatly influential in based on Dioscondcs' long-lived work was compiled bv Apuleius (or ' Pseudo -Apuleuis , as he is fr distinguish him from the author of The Golden Ass\ about A.D. 400. This work. The Herbarium of Apu became one of the most widely known and copied of the earlv herbals; it survived m some form into and Renaissance, and was among the first illustrated printed herbals.

Aside from the above-mentioned "" high -spots * and a few ocher influential works, there was littl plants, and almost no attempt to study or draw plant life from nature, or to make any objective, e effects atter the fashion of the modern scientist. The Greek herbals and their Latin translations again, their drawings becoming more and more debased and distorted in the process. The names of th originally illustrated, were of course those of the Mediterranean region or of Asia Minor: ancient seem never to have realized or understood that very different plants grew in different places. The

dead or moribund ancient languages, and couched in ancient forms chat were no longer understood, w along with the drawings.

The monks in English and Continental monasteries did the best rhev could to match the garbled pict and their exotic names against the flora of their own monastery gardens and countryside * As a res of synonyms for plant names in various languages were compiled and attached to the herbals ro serv cannot help wondering how many hapless patients lost their lives through the inevitable m i side n as medicinal species. Singer { 1928, p. 1 85 1 sums up the state of affairs in his discussion of t the impatient hindsight of the modern scientist, he points to it as an instance of over a thousand applied to 'a futile work with its unrecognizable figures and its incomprehensible vocabulary

The Latin and vernacular herbal* of the West were thus, for the most part, simplv translations or Greek works, A Latin translation of Dioscor ides' herbal became the basis for many later medieval her bah have been intensively studied by scholars, and are of particular interest because of the m thev preserve, in more or less superficially Christianized form. The Leech Book of Bald (Roval 1 2 one of the earliest and most interesting of the Old English herbal*, dating from the tenth century

of pagan magical spells and practices. Another early herbal preserving pagan survivals is The Lacn
tenth century (Harleian 585, British Museum). A Saxon translation of the Herbarium of Apuleius ext
and another Saxor translation of a work of the Salernitan medical tradition in Italv. called Pen D
the eleventh cent ; rv, were also highlv influential among early English herbals; see Grattan and
i 1866). and Storms (1948). and see also the brief discussion in Section 9.4.2 of pagan charms fr

Singer 1 1 928) traces the history of botanical illustration tn some detail. During the Middle Age
number of schools or traditions of plant illustration came into existence. Most of the drawings we
diagrammatic, produced with little or no rhoughr of observing nature at first hand or even of revi
knowledge which must often have contradicted what the compiler saw in the sources he was copying A
exceptions provide some relief from the stereotyped rigidity of most plant drawings in medieval he
from Bury St. Edmunds in the twelfth century included some naturalistic drawings among a majority
The compiler apparently did his best to identify the ancient and garbled figures of foreign plants
plants in his garden; where he succeeded, he attached the local plant name to a copied drawing. Wh
match for an English plant among the drawings, he made a new one to fill the gap. The stylization
an extreme in the thirteenth century, according to Singer, when thev deteriorated into geometrical
within a gold frame. Albertus Magnus tA.D. 1206-1 280') included in his encyclopedic works a secti
compiled from a Pseudo -Aristotelian work, and Albertus is credited with some first-hand observati
with which he dealt.

In preparing herbal as well as other manuscripts, it was the practice of the medieval sen be or co
text of each paragraph for a drawing, usually of a shape and lize matching the corresponding pictu
copying. The illuminator then supplied the pictures, if the patron or owner of the manuscript had
Singer ascribes a major advantage" (from our modern point of view) to the illuminator over the scr
was relatively unlearned, and thus freer from the stifling rigidities of tradition binding the scr
Singer judges the figures in some medieval herbal* to be in advance of the text in naturalism and
fresher and livelier spirit. The illuminators made some attempt to show local plants rather than c
exotic originals in the ancient sources. In some cases, the holes left by the scribe were never fi
owner ran out of money before he could hire the services of an illuminator): sometimes thev were f
pictures of a different size or shape that did not fit into the spaces very well. It is interestin
practice, whereby a scribe left spaces to be filled later and separately bv an illuminator, with t
drawings and text in the Voynich manuscript.

After the low point reached during the thirteenth century, herbal illustration increased in natura
throughout the fourteenth and fifteenth centuries tar least as fudged by the modern observer). Som
are remarkable for the life-like and artistic qualm of rheir illustrations; reproduced bv Singer 1
which insects (a dragonfly, beetles, caterpillar*, etc.) are shown sitting on the plants, all repr
indistinguishable to the casual eve from a good modern drawing. Among the better illustrations arc
(made bv Hans Weidm) in Otto BrunfeLs Herbarium Vi vat Esc one j. compiled in 1530. The text, unfo
below the standard set bv the pictures: copied from the durable herbal of Dioscorides. it describe
completely inconsistent with the local plants tn the drawings, from the Rhine region in Germany. A

produced in 1542 bv Leonhard Fuchs fA.D 1501-1 566* called De Histona Stirptum presents a set of r
plane identifications and an outstanding senes of woodcuts bv Albrecht Mever based on a study of n
modern herbal is judged by Singer to be that of William Turner in 155 1 : it is described as the f
in our modern sense. Rembert Dodocns of Holland also produced a fine herbal in 1554; the famous He
(1633) was based on Dodoens work, but employed for i u illustrations a magnificent set of 1300 woo
in 1590.

As Tiltman and other students of the Vovmch manuscript have noted, they have had little success in drawings to anv of the limited traditions of plant illustration touched upon above, or indeed to a manuscript. There is a very general similarity of feeling or design in some Vovmch manuscript draw pictures in this herbal or chat one. There is also a superficial similamv of stvie between some Vo and some of the very debased, distorted products of successive recopving in earlv herbab (although Voynich manuscript plants mav well be deliberate rather than a result of degradation through copvm been notably unsuccessful in discovering any source from which such .copies might have come). Ther comparisons to convince anv student that he has found a counterpart or original for a Vovmch manus other herbal manuscript. There ts always a possibility; of course, that some manuscript or early p close! v akin to those in the Vovnkh manuscript mav yet be turned up bv some diligent researcher. shown in figure 36 seem, at least to my eye, considerably closer in stvie and feeling to the plant manuscript than most, if not all. of the herbal illustrations I have seen in mv own admittedly lim mv feeling that we should certainly include alchcmv works in our investigations, ever chough they deal with plants as such, but rather as symbols for alchemical entities (the sun, moon, metals, ch

Chapter 1 1

Concluding Remarks: Some Suggestions for Further Research

In dosing this monograph on the Vovnich manuscript. I would like to suggest some lines along which problem might profitable- be directed. These suggestions include efforts aimed at gathering more d manv unknowns m the problem; and efforts designed to achieve a more rigorous, complete, and scient we now have.

1 LI Paleographic and Other Scientific Studies of the Manuscript

in mv opinion, it is of primary importance that the inks, pigments, and vellum of the manuscript b scientifically and compared to Those of other manuscripts bv paleographers and art historians: and manuscript be studied under special lighting and otherwise treated to bring up traces of erased, f far as 1 have been able to discover, no such research has ever been carried out. Further, there ar of the present owner of the manuscript (the Seine eke Library at Yale› to make anv such studies in Nevertheless, onlv studies such as these can offer anv hope of satisfactory answers to manv of our up crucial new information that might completely alter the complexion of the problem I hope that s studenr will be able to arouse interest in a scientific physical studv of the manuscript, obtain f necessary wheels in motion to accomplish the research and make its results known to other students monograph knows of anv such scientific studies already carried out on the manuscript, 1 hope he wi

1 1.2 Uncovering More of the Manu script's History

As we saw m Chapters 1 and 2. Wilfrid M. Vovnich succeeded in ferreting out a considerable quantit interesting information about the history and previous ownership of the manuscript. In his hisronc he indicated manv promising leads for others to pursue. Everv known or suspected owner of the manu researched in depth; renewed attempts should be made to locate correspondence, libraries, and othe pertaining to or belonging to these people, and to track down anv references to the manuscript and Someone should certainly trv to locate the Villa Mondragone or other places where papers and manus might now be preserved, in the hope of finding additional records relating to the manuscript lior Athanasius Kircher or bv the unknown previous owner who wrote co Kircher about the manuscript). Th

Rudolph's Court at Prague should also be a promising source of correspondence or notes concermne t
Background sleuthing of this nature is certain to provide us with at least a few new 1 nugget of i
transform the problem or. at least, reduce the discouraging number of unknowns that now confront u

1 L3 Collateral Research

While all the most obvious sources have apparently been examined, as well as some more obscure one
possible parallels to the Voynich ten and drawings, it still seems worthwhile to keep up the hum a
less accessible sources. I believe that alchemv writings, in particular. deserve closer attention,
thoroughly studied bv Vovnich manuscript researchers as have herbal, medical, and astrological sou
earlv cryptographic writings of the fourteenth through the sixteenth centuries might also rich I v
determined, thorough, and painstaking attempt to search through manuscript collections and earlv p
anv of the topics iketched in Chapters 8 and 9 of this monograph could still turn up a new and ill
for a student specifically searching for a parallel to the Vovnich manuscript It seems to me highl
manuscript scribe! j) and illuminator! s) never wrote or drew anv other work in their lives; there
somewhere a drawing of similar stvle that might give us a due to their identity or place of origin
the Vovnich script among someone s papers,

1 1.4 A Comprehensive Machine File of the Text

in Chapter b, we saw that several abortive attempts were made to carry our computer studies of the
Vovruch teat. Out of the approximately 250.000 characters of text in the manuscript, most students
samples ranging from 5000 to 25.000 characters in length. Cumcr has probablv dealt with the larges
anv student, and his transcription alphabet appears to be the most practical choice for machine pr
mv own transcription in favor of Currier's, in spite of the fact that I had alreadv placed some 19
magnetic tape using mv own alphabet before 1 came upon detailed descriptions of his research.! Fat
concordance of the entire manuscript, made bv hand, is preserved in the Friedman Collection at the
Lexington. Virginia, where tt is not easily accessible to most students.

It would be of great value, in mv opinion, to have a complete machine file of the corpus, in Curne
including identification of "hand." ‘ language/ and the apparent subject matter f herbal, pharmace
as well as anv other property which students have found to be statistically significant. This file
wide variety of studies, to help in forming and testing hypotheses concerning the text, and explor
' hand' and "language phenomena discovered bv Currier as well as other matters. Smaller, carefully
be formed from the entire corpus for anv specific purpose.

1 1.5 Scientific Hypothesis Formation and Testing

Hypotheses about the nature of the text should be based on all the known phenomena, and on a caref
corpus ol text inor just one section or a few pages here and there l . The hypotheses should also
to explain all the phenomena clearh demonstrated bv other researchers (Tillman s "beginning -middl
Curner s languages" and "hands *; the repetitive patterning of ’words/’ etc.). Finally, the hypoth
with, and bear some relation to. what is known of the nature, background, and history of the manus
think we should entertain not just one hypothesis, but a set of alternative theories that seem cap
large part of the data. Having set up such a bodv of reasonable hypotheses, we should design "expe
samples selectively drawn from the entire corpus (all made accessible to computer processing in on
as suggested above): samples such that we can attempt to confirm or discern firm each of our theor
This research will, of necessity, also involve parallel studies of text in Laun. in certain other
languages of various types

In the absence of anv cribs, parallel texts, or other breaks into the text via external or collate

success lies in an orderly and cooperative scientific approach to the entire bodv of text and all wav, perhaps we can some dav achieve a solution whose satisfying completeness and appropriateness elegant enigma of the Voynich manuscript.

78

“THE MOST MYSTERIOUS MANUSCRIPT IN THE WORLD"

THE ROGER BACON CIPHER MANUSCRIPT

(BACON, ROGER ?.) Cipher manuscript on vellum. Text written in a secret script, apparently based on Roman minuscule characters, irregularly disposed on the pages. 102 leaves (of 116; lacks 14 leaves), including 7 double-folio folding leaves; 5 triple fc iio folding leaves; and one quadruple folio folding leaf. With added signature marks (of the XVth or XVlth century), and foliation (of the XVTth or XVIIth century) 1-11, 15-58, 65-75, 75-90, 95-96, 99-108, 111-116. With about 400 drawings of botanical subjects, including many of full-page size; 55 drawings of astrological or astronomical subjects, plus about 550 single star-figures; and 42 (biological?) drawings, most of which include human figures. The drawings colored in several shades of green, brown, light yellow, blue, and dark red. Large 8vo (c.250 x c. 160 mm.). Old limp vellum covers (now detached). From the libraries of John Dee (?), the Emperor Rudolph II (reigned 1576-1611); Jacobus Horcicky (Sinapius) de Tepenecz; Joannes Marcus Marci of Cronland (1666); Athanasius Kircher, S. J.; and Wilfrid M. Voynich. Accompanied by an Autograph Letter signed by Joannes Marcus, presenting the book to Athanasius Kircher.

No place or date, (XVth century, or earlier?).

An enigmatic mediaeval manuscript, which for over forty years has baffled the scholars and cryptographers who have attempted to wrest its secrets from it. It has been termed by Professor John M. Manly, who made a detailed study of it, “the most mysterious manuscript in the world.”

Pig- 1. — Entry for the Voynich Manuscript from H. P. Kraus Catalog

f Reproduced from Tilrmtft 1 968 i

79

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St

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tvtivm +& 4 mi'ifim* &•"*' •*' /»»<■•* /ttfU-r A/.

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» ,*< l&tjrJSt , wtf »*■*£#£- *<

v^Uvt-vi.- *' *« ** «*/ /*«V ArV^x- Mi

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Fig. 2*— -Letter Found with the Manuscript

fTiltfiun 1 %S1

60

REVEREND AND DISTINGUISHED SIR :

FATHER IN CHRIST:

This book, bequeathed to me bv in intimate friend. 1 destined for
vQu. mv verv dear Athanasius, as soon as it came into mv poscssion.
for J was convinced it could be read bv no one excepr yourself.

The former owner of this book once asked vour opinion bv letter,
copying and sending vou a pomonof the book from which he believ ed
vou would be able to read the remainder, but he at that time refused
to scndThe book itself. To its deciphering he devoted unflagging toil
as is apparent from attempts of hts which I send vou herewith, and he
relinquished hope only with his life. But his toil was in vain, for such
Sphinxes as these obev no one but their master, Kircher Accept now
this token, such as it is and long overdue though it be. of mv affection
for vou. and burst through its bars, if there arc anv. with vour wonted
success.

Dr. Raphael, tutor in the Bohemian language to Ferdinand III.
then King of Bohemia, told me the said book bad belonged to the
Emperor Rudolph and that he presented the bearer who brought him
the book 600 ducats. He believed the author was Roger Bacon, the
Englishman. On this point 1 suspend judgement ; it is vour place ro
define for us what'view we should take thereon, to whose favor and
kindness I unreservedly commit mvself and remain

At the command of vour Reverence.

JOANNES MARCUS MARC I,
of Cronland

PRAGUE. 1 9th August. 16 61'

6 "

Fig. 3— “Translation of Letter

fTiInruri l *>66 i

SI

Folio No*

Description

Folio No.

Description

Ir

text only; (1) (2)

(74)

l missing)

Iv-llv

herbal

7V.v

human figures

i 12)

(musing*

76r

text onlr i 1 <

13r-5“r

herbal

76v-84v

human figures

Pr

(2)

8 V86r 1

text onlr

49r

tl>

85/86r2

cosmological

S7v

cosmological; (1)

85/86r3

net of rosettes

58r.v

text onh

85/B6r4

net of rosettes

p£)_64l

(missing '

85/86vl

net of rosettes

t>V*v

herbal

8V86v2

net of rosettes

Obr

textual* . i 1 m 2 >

8*5/860

cosmological

btn

herbal

83/86v4

cosmological

67rLv!

astronomical

8^/86v5.v6

text unh

07r2

astronomical

87r.v

herbal

07 v2

cosmological

88r.v

pharmaceutical

68r 1 .v I

astronomical

89rl.vl

pharmaceutical

0 8r2.v2

astronomical

89r2.v2

pharmaceutical

08r3

astronomical

90rl.vl

herbal

08 v 3

cosmological

90r2.v2

herbal

0%>

cosmological

(91-92)

f missing J

T 0r 1

cosmological

93r-96t

herbal

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astrol Aries i dark i

99f- 1 02v2

pharmaceutical

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103-1 16r

text onlv, scan

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1 16v

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'2rl

astrol.: Taurus (dark)

-

-2vt

astrol . Libra

T 2r2

astrol. Gemini

i 1 » Kev-hke sequences

7 2v2

astrol . Virgo

-2r3

astrol Cancer

1 2 > T ext i n extra neous sen pcs

astrol.: Leo

-3r3

astrol Scorpio

■*5*3

astro! Sagittarius

Fig. 4.— Lilt of Folio Numbers and Apparent Subject Matter
{Foliation of Petersen Photocopy)

82

f •(.#

ioiva.

Fig. 5,— Some Details from Herbal and Pharmaceutical Folios

fKafrawa ftflu a phavcopf)

S3

Fig* 6, —More Dttub from Herbal and Phtnutenbcti Folios

84

Fig, 7.— Derails from Herbal Folios

|Mm (« • finxufnfi I

85

86

Fig. 9-— Details from Herbal and Pharmaceutical Folios

(Redrawn from a photocopy)

87

rfv

foiic 70Yl

4«lu 73-0

folio Hr

4rntic 73*3

■foUo TSv

folio 72*- J.

-f.l.o 72 vi

12*2

Fi* 10*— Some Zodiac Mtdillioai tad Mootb Niao

i IUdri*n from ■ plWMyl

88

Folio

Sign

Month

Rings of Figures (From Center)

Sum

First

Second

Third

7 lr

Aries 1 li^htJ

April

5 [h

all c

10 il>
all c

i*

70vi

Aries * dark)

April

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n and c

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Taurus 1 light j

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n and c

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Taurus t dark >

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3 111

all c

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n< hats

is

-It 2

Gemini

June

9 i hi

all n

1 b r 3 (
4 c. rest n

s 1 3 »

n. hati

30

72r3

Cancer

July

7 <3)

n. hats

1 l f3>
n. hats

12 i 3 ■-

n. hats

30

-2y 3

Leo

August

L 2 (3*

alt n

18 t}t

all ti

30

72v2

Virjfo

September

12 1 3i

all n

18 1 3 -

all n

3o

72vl

Libra

October

10 i 3 1
n. hats

20 i3)

n. hats

Ml

"3r

Scorpio

November

lo 1 3)
air n

16 fji

all n

■+ 1 3 1

all n

M)

"3v

Sagittarius

December

10 (31

akin

16 1 3)

all n

4 1 3i

all n

Ml

Capricorn

January

missing

n -= naked
c *= clothed

“4 r

Aquarius

February

missing

7()v2

Pisces

March

10 1 2)
n. hats

19 iU
n. hats

20

* 1 > vertical cans" 1 2 » horizontal cans

OJ no ' cans"

Fig. 11. — Groupings of Hunan Figures in Astrological Drawings

89

Folio

Elements in Rings (inside Outward)

Central

First

Second

Third

Outermost

VTv

b 1 2 sets of
4 phrases)

4 phrases

4 paragraphs

68 (4 times
17 symbols)

4 paragraphs

67rl

moon

24 [1 2 double
ravi)

24 (12 double
ravs >

67 v l

sun

34 (17 double
rays)

12 phrases

tw2

6- pointed
star

8 words

1 2 moons
and phrases

7 words

l 2 paragraph*
1 2 phrases

6"v2

sun in square

4 eencnpe*
tal spouts

4 centrifu-
gal spouts

fo»rl

none

star field
29 words

sun at rop
moon below

&8vl

moon

16(8 double
ran)

1 6 (two sets
of 8)

68r2

none

irar field
24 words

moon ar top
sun below

6Bv2

sun

H (4 double
ravii

4 radial
phrases

H phrases

6(fr5

moon

H (4 phrases
4 star sets'

4 radial
word pairs

69r

6' pointed
star

6 letters

45 pipes
21 phrases

-

6 L A

8- pointed
star

2b pi pes
and words

'Orl

6- pointed
star

6 words

38 cells

9 waves

9 radial
words

'Or 2

sunl f)

8 segments

8 subdivi-
sions

tfV86r2

sun

4 quadrants

4 spouts

85/86' i

4 tones
from corners

4 paragraphs

H5/86w

moon

5 froth v
rings

4 human
figures

Fig. 12. — Groupings of Elements in Astronomical and Cosmological Folios

Folio

AU

Fignm

Female

Male

Subgroupings

75r

14

14

—

2 mbs: top. S bottom 6

75v

29

29

_

2 tubs: top 10. bottom 19

76v

5

4

1?

scattered

77r

4

3

u

scattered

77 v

7

7

_

scattered

78r

15

15

_

2 pools: iop7. bottom 8

78v

9

9

–

one big tub wtrh 7 "windows'

79r

7

7

–

scattered

79v

4

4

– 1

scattered; 5 animals also

80r

16

15

1 ?

3 rows: 10.4.2

80v

12

12

–

scattered

Sir

13

13

—

2 tubs: top 7, bottom 6

Slv

16

16

—

one big tub

B2r

15

15

—

4 Uttered ; 11 in large pool

1 82v

7

7

—

scattered

83r

5

5

—

scattered

83v

4

4

—

scattered

84r

33

33

—

3 cubs: 12, 10. 11

84v

15

15

—

2 cubs: top 7, bottom 8

total

230

227

Fig. 13. — Groupings of Elements in Humic Figure Folios

Stogie

Dual

Ternary

Archetypical

IOD

I AH

PATER

World

EL

SADAI FI LI US
SPIRITUS SANCTUS

Intellectual

ANIMA

ANGELUS

INNOCENTES

World

MUNDI

ANIMA

MARTYRES

CONFESSORES

Celestial

SOL

SOL

MOB ILIA

World

LUNA

FIXA

COMMUNIA

Elemental

LAPIS

TERRA

SIMPUC1A

World

PHILOSO-

PHORUM

AQUA

COMPOSITA

DECOMPOSITA

The Minor

COR

COR

CAPUT

World

(Man)

CEREBRUM

PECTUS

VENTER

Infernal

LUCIFER

BEEMOTH

MALEFIC1

World

LEVIATHAN

APOSTATAE

INFIDELES

M* — Some Medieval Tables of Correspondences: Ones, Twos, Threes

iSrtexm d — d Wr Agnpy L970 ^ IMffl

92

f*lia Ififr

-f4«e

■^»lie iol ri

^*Uo Blr

Fig. 1 $ — Details from Pharmaceutical and "Human Figure" Folios

93

Diftii

1 3th
century

14th

century

13th

century

16th

century

Similar

Voynich

symbols

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cx

8

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^ d

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? 2

&

9

9? ?*

1

?

?

? 1

0

o 0- ^

C

| * «>

O

O

Fif 16 . — Comparison of Voynich Symbols and Early Arabic Numerals

tN am nl farmi redrawn from Hill

Voynich

symbol

Similar Latin Abbreviation

Voynich

symbol

Similar Latin Abbreviation

r~

CT

r-o

r~n.

7>

C* cum, con

ft ra, ri, cri

^ co. quo

cxl

r~9 cus

fJL ^ onus ^ cor

r>

P -ur. -tur. -cr

r

^ P -ter

0
t m/,

L ^ ter. m-. im- |

\fi) -um

iA4^ -rum. —mum, -nmm

Z

£ cun. con, cum. quon

^ ere, cer. car, cere

l

c\

a

^ t- termi

f ^ l cere

A*, A cire

7f

1” qu “T

At

-nd. -m-

^ -rum, -mbrus

fj -Of, -turn, as

7 7

(super -
sen pc)

^ cer

A cn

} , p rae

°,JE one

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^ eius

^ -etam, -ent

— (u— * -nd-

ff

forii, folio
(“f fiat

Fr fr

)“C -mbrus

propter

?

^ con. cum. com

^ Cj -us. -os. —IS* —5

Ftg. 17. — Companion of Voynich Symbols with Latin Abbreviations

I L*un tbfarcrutKwii taiwrc (ran CippcLh I94SM

95

Two Elements

Three Elements

Larger

loitiil

Symbol

Final

Symbol

Compound

Added

Symbol

Compound

Compounds

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Miscellaneous Compound Forms:

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Fig. 18,— Some Compound sod Ligatured Form)

96

Tiltmin

First Study
Group

Second
Stud? Group

Kirschcr

Currier

Dlmpcrio

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E

DZ

HZ

*

if

rr

?

a

0

0

rt»)

S

4-

*

c

nt

A

\

(ft

ft

A

*

space

ptra

P

F

H

0

A

R

K

2

0

L

N

M

8

4
E
C
T

5
1

PZ

FZ

HZ

DZ

V

Y

+
o

9
8
2

if

j?

ff

#*

CT

r*

c

*

A

U

"X

lit*

7

X*

w?

v)

»0

nO

IWV>

IT

ot

space
line end

4

0

9

8

2

B

P

V

F

#

8

%

@

S

z

c

A

E

I

Y

J

U

K

G

Q

D

N

M

W

H

L

R

T

C

J

*

-ff

Jf

tr 1

W

Hf'

(Iff

iiv>

m3

o

rr

rr

tr

»A

*

in J

iijf

iff

*

;

x*

««

mr

iii{f

/u/f

P

9

ft

ft

a

eft

pra

stare

line

wan

line

end

space

4-

```
s

?

x

I

e-r

V

V
*IE

*

c :
v 1

x< ;
"R. :

*/

'*j

«r

mV

0

u)

vxO :

v\\0

% |

*

strf j

wi 5 i

«f i

spec j
line ■
```

```
end !

■s'


4
0

5
9
2
E
R
S

P

B

F

V

Q

w

X

V
A

C

J

G

H

I

T

V
0
D
N

M

3
```

J

K

L

5

6
7
/

para

end

Fig. 1 9- — Transcript ioo Alphabets of Several Researchers

g.F £ f| * T-f- 1 J 1 ** f ^ -v.no 4

■ f* 'f P

<rr A <?x r^T (-% <r^ c-

Fig. 20. — Some Embellished sod Variant Forms of Voynich Symbols

98

A

. v V”\‘

' xs~

‘A-A

• T." ..lirti 'Ff::> C y

-i- nncyVriin c£*V,! ,.'.2 + rc+ ciY creVC*f -poyrflP 3 t

r (- f -.nariX r rnc .■ yc t’ W T <* t-

*• ft f ^ \

«v** Vfti'wcV vOrfp |o Tn*m jn: mio o

Folio 17r (Petersen)

Fig. 21. — Details Showing Fragments of Writing in Extraneous Scripts

cn-(-

99

FoUo

Marking

lotcrpretadoD

8v

first (primus)

I6v

2 9

second

2 4v

y?

third

32v

K?

fourth

40v

T?

fifth

48v

6*f

sixth

56v

A m f

seventh

66v

s u >

eighth

67rl

y *?

* - *

ninth

70vl

to"?

tenth

, 72y1

eleventh f

83r

9

j

84 v

»3 ? ,

thirteenth

85/86v3

I* 4

fourteen ch

90vl

II 9

fifteenth

1 *

—

sixteenth

96*

ia’

seventeenth

/ !

» m m

eighteenth

I02vl

r9

nineteenth

I03r

twentieth

**■ 22.— Folio Gathering)

100

MM

-V- ■’■ft' c£Vv' 4 .V >v

v ‘^ VV 1 '"■" e

$

r --n- t-,

"Key " Sentences. Folio ll6v (Photocopy 1

f mtcj^iron -f-VMwrrpd. ■+• rt + ray <rcvc-f-

fur t ^arix +- mon^ j* vvc T 4«* r ^

a.’v bu ,# vot-cV* v(jftp (o -nim joj*mic^ q

7>ovra^ i-

Petersen's Hand Transcript

witch* coh olaJo.

*“ \wilriK nontx •••

o^’W &ccj v*)scb ubren so «i'm go. h/cJrf a.

Brumbaugh's Reading (Brumbaugh 1975)

iwubi4o* t>lai«b<xs mulKs 4fc ftcr cere porfxs
4i’y ^Udrix meri* «JiC4 maria,

•*• u a Uoi litre* s*» m*n ^af miJ\ o

Ncwbolds First Reading (Newbold 192 $, p. 73]
c

miebi+o* olatUba J -f n%/ m Hc *S -4 -ft f-+c"cr cert -f portal *1 if"'
S'x ^»jerix ■+ •’o('rx+ v\x + *bf * -t n ^ + ric+ +
oCo^-t't^o^ aj»r*h So nim *,'4f> o

Newbold’s Second Reading (Newbold 1928. p, 108)

Fig. 23.^Sonie Different Readings of Folio 116*

101

0

0

0

o

- ^©Tf^ercfj-

A

S

A

rf

rf

A

rf

f rt *<«;•*•

*■ noMtft.-'

2

*

?

A

A

A

A

ft C J * **

0 Screed# *••

X

X

X

X

/

llA-e? < •••

rf

rf

rf

rf

/

*4-® rfn

Jf A«Ty*

f

&

*

rf

$

f

*

V

AxV^***

12^

liA

i£a

[>v

0—

V

If

tf

4f

A t?*£**-

f

?

?

it 2®,0"‘

*=

V*

V5-

l^ntj —
^ ett jrf •••

&

&

J

9

9

7

nc*A ■**

r

c*

<r

c*

*••

A© If ***

r

V'

K

Cvdical

Sequence, Folio 57v

f 3 rfA*rf**

O <^e tTn y * *•

rr •Tfrxj' -

?

7

r

9

If

2

*

o

2

7

c

J

?

*

Folio 76v

oK CoS A* *"

A* If ft J ***
rr e?fer ^ **

2-

^•Tfc c e <
o rr *rf'

t ■

octoftte-J ■* *

^ rfc**?"
Vet «8 o»£"-

*ff

© r~t ®n * ■**

2 o ■ ••

9 e~t oft<© •**

C otk •• ■

9 xj-« *

$ effttf*'*)’--

y O fckD"*

c •’*

rf cl# A , “

Folio 49v

?4t*^

2*jt?

-*>?

♦ 2*A-
? ftkOy-
A Atfj*-

^ t*r«*i;-

g

o lm#J{***

S ^ ^ ^

*ta

A 1 »<W*V"
»<* a 2- **
rf

A OJl •“

-rf

rf %*S-

**! I tf~

Trtu>fe-

1**? 4

^ r*«—

t~ Tf**"*?-

T ?W<*"
^riu»t'-

f*uD-

i“*7-

«•<"

8^9

*

?rc^

**?

If

4*^

o

u, Y

«•*-

Folio 66r

Fig. 24.— "JC«y"*Like Sequence

102

"Ovary * Label* (Folio 78r)

O tf cc % 2

F H MM I N

hm jnfunduntur

"lmmisaintur " or ImdsaiUfinir

"Sack" Labcb

0 hf o S ^ Jk y o ^ J

FESTOIN STN UTUT NTR ’Festo m(i>ino

* utuntur

O If O. ? ^ £

F E S T S N "F«avi sunt"

A

%

L

cr

V

1

ST

c

C

C

M

ND

or

UM

p

D

H

N(UNT)

r

DER

v?

TINC

tf

E

6

OfFVBI

V

ER.RE.E

frf

UND

■ 0

F (BVO)

t

P

If

PER

s

UNDR

G.H

n

R

rr

RUM

*

PERM

H,G

ft.

S

r* to

rr rr

HUM

EM.ME

!

I

' T

</

ME

&

MER

■If

NE

t

EX

nJ

-M

u?

-N

ctf tc % ft % } o

F E MM 1 N IN O

Upper Tube Label

S ft o 9

] S T S N F UNDU NTR
Lower Tube Label

JcccSft^^

I M M C I S N NTR

Fig. 25.— Feeiy'* Initial "Clews 11 anti Cipher Alphabet

{Adapted I™ Fed, tW. p? IU4-J1I

??

o

*>

L

C

mr

p

X

A.

0

tk

-7

?

rr

}

1

2

3

A

3

6

7

%

9

A

B

c

D '

E

F

G

H

i

J

K

L

M

N

0

P

Q

R

S

T

U

us

V

W

(X)

X

Y

z

Deciphering Mains

f Vormch MtmboU in epprr row* rrconur ward bi tht writer from Bnunbivjrh i im I

Pimm;

I

ABCDEFGHI J

K

L M N 0 P Q

' Gph«r:

12345 6789 1

2

3 4 5 6 7 8

Flam:

R STUVWXYZUS

uO

5 'S 1

0 < 6 < ec J

! Opher:

2 A 6 8 1 35 799

A R A B Y C C US

Enciphering Alphabet

(an

'1.

P E (P) P E E QfU) ? ? O Q US p

^ « no cr ± ? 9

P A P (E) R ^ US P A L E (V) US

From "Key" Sequence. Folio 1 16v
<*?) »

A P (A) (V) A Y J S VLCER
. A A

1 U> -

« o era Sc* i 0

V R E (V) A PA SPA ft

? « iTf y oi^d, if

PACLUS PJPERHELAj GALER

Decipher menu of Plant Labels on Folio lQOr

* Fig 26 . — Brumbaugh’s Results

rBmnU»i^h 1914)

(Question marks an d letters in parentheses indicate places where there is some doubt as to interp
of the characters by Brumbaugh. Vovnich characters are as seen and transcribed bv the writer 1

104

Roots

Suffixes

ott-. rffC

- <X\)

-a^ -av\^ *&\\w

olf- , e¥-

- ^

-ftN? '<\w^ -aav^

-

“O.VV^-lVV^

- ^

rc -

- »£

?

C-t -

- c ?

tc ^ cct^

g-

?-

_

C.C^C> Ct-C-%^

Fig 27-— TiUroan's Division of Common Words into “Roots 1 ' and "Suffixes"

(Tilimu 1911 1

105

" _

Voynich

Symbol

Currier
Language A
(Herbal)

Currier
Language B
(Herbal)

Krischer
(fo. 103-116)

DTmperio

(Herbal,

Astronom.)

4

290

257

233

368

0

2249

1373

729

3389

2

884

1250

406

1333

?

1231

1529

464

1893

2

205

151

41

425

X

663

496

250

(all)

1005

?

531

495

201

(all)

971

CT

1315

752

376

1373

415

289

93

557

516

376

187

734

75

108

47

154

if

595

801

267

865

21

63

6

53

&

165

51

13

266

£

42

12

7

49

86

100

15

106

7

9

2

29

900

1085

546

1470

c

769

1390

730

1094

t

16

8

2

! L

216

IX

4

1

0

835

HX

1

0

0

<f

167

MX.

0

0

0

23

1 r>

22

45

35

IL

689

Hf*.

8

24

11

“t

12

Mr*

3

2

1

<T~

2

0

38

3

4

0

tP

82

73

38

7

up

UtP

455

18

286

22

153

0

C –

3

36

If

78

99

23

7

13

Iff

6

5

1

tiff

1

1

1

turf

0

0

0

d

13

7

1

Jf

5

5

11

i

td _ 2

Totals

11709

11168

4896

18137

Fig. 28, — Monographic Frequency Counts of Some Students

106

Hermetic (Festugiere 1944-54)

Agrippa (1970)

Hermetic (Festugiere 1944-54)

Aldebaran

Caput Algol

Acharnahar

Alchoraya

Pleiades

Aldebaran

Caput Algol

Aldeboram

Hayok

Alhaiot

Hircus

Ascherhe Aljemaniya

Alhabor

Canis Major

jed Algeuze

Algortieisa

Canis Minor

Rigel Algeuze

Cor Leonis

Cor Leonis

Sohel

Ala Corvi

Cauda Ursae

Ascherhe Asschemalija

Alchimech Alaazel

Ala Corvi

Cor Leonis

Alchimech Abrameth

Spica

Lion's Tail

Benenays

Alchameth

Alramech

Alfeca

Elpheya

Alahzel

Cor Scorpionis

Cor Scorpionis

Centaur

Vultur Cadens

Vultur Cadens

Vultur Cadens

Cauda Capricorni

Cauda Capricorn!

Mouth of Southern Fish

Fig. 29- — Names of Fifteen Fixed Stars

Pica (fix (Riner and Flessner 1962)

Agrippa (1970>

1

Al-Saratmn

Alnath

2

AJ-Butain

Allochaim

3

AJ-Turaija

Athoravc

4

Al-Dabaran

Aldebram

5

Al-Haqa

Alchacava

6

Al-Han a

Alhanna

7

Ai-Dira

Aldimiach

8

Al-Narra

Ainu a

9

Al-Txrfia)

Alcharph

10

Al-Gmbha

Algebh

n

Al-Zubra

Aaobra

12

Al-Sarfa

AJzarpha

1 13

AJ-'amwa'

AJ Havre

14

Al'Simak

Azimeth

15

AJ-Gafr

Algapha

16

Al-Zubaru

Azubene

17

Al-lklil

Alchil

18

AJ-Qalb

Alfob

19

Al-Saula

Achala

20

Al-NaYaim

Abnahava

21

A] -Baida

Abeda

22

Sa d AJ-Dabih

Sadahacha

25

Sa d Buu

SabadoU

24

Sa d Al-Su’ud

Chadezoad

25

Sa d Al-Ahbija

Sad a la bra

26

- Ai-Far] Al-Muqaddam

Ft hagai Mocadcn

27

Al-Farj Ai-Mo ahhar

Aihaigalmoad

JJ

AJ-Risa'

AJchalh

Fig. 50* — Stations of the Moon

1

Zodiac

Sign

Egyp 1

(Roman Times)

"Hermetic

(200- 300 BC)

Coptic
(400 AD)

Aries

1

2
3

Xotu-Har

Xont-Xre

Si-Ket

'fi.e*T+wr r

XevTyC/»<r
e rt Ktr

X°VT4/*e ,
XovTfWC
»•*■*<*•

Taurus

1

2

3

Xau

Arat

Remen- Hare ■

frJj ou

JS V/Htv'WS

Gemini

1

2

3

ThowJk

Uaret

Phu*Hor

O0 «p L y

rrt rr (.**>&

i t n # ' *

v

ou

daCoft-

Cancer

1

2
3

```
Sopdet

Sea

Knum

a!if l.o~ <- T
Jty ou f •$„_

n*i&L%

<tlT

Xyfev/i*S

Leo

1

2

3

Xar-Knum

Ha-Tet

Phu-T«

X *•«/»* 5
*arm

,_*our»r

Virgo

1

- 2
3

Tom

Usrc-Bikoc

Apowt

’<00 4*/

ppo<r*tts *
```

Tid/4

olev-reptcdr

*- o<r a

Libra

1

2
3

Sobxos

Tra-Xom

Xont-Hmr

we^r/i(^s

X *v-r^r *•

Scorpio

l

2

3

Spi-Xnc

Sesme

SiSesmc

A4<r

eWr^-5

. rtr >* ,

Sagittarius

1 /

2

3

Hrt-Ua

Sesme
Korn me

<r^V«5

T«w^h*5

X 6t'<r£.p

^Aout^

rtc/us

KO/V4*

Capricorn

1

2
3

Smat
Srat
St -Seat

Tii?f

5 '/

fc rr t re*
£tri*tv"3

•vUr

#~|*40

J <

Aquarius

1

2
3

Tra-Xu

Xu

Tra-Biu

j /

co-tf

c- o <r “

^oyoi>/H»0s

rrn*i/ r

”

rrTLft 10 ^

Pisces

l

1 2
! 3

L ■

Biu

Xont-Har

Tpi-Biu

t*tvw

j— U/* «*J

f*Coa ,

y^ov T*f£
rr-nflido

fig . 31<— Names of ibe Thiny-Six Deem ns

IGundet I9>6.pp 77ff I

i

u

ft

t

C

L

Ft

ft

1

£

1

M

1

A

1

£

1

A

r*

u

Q

1

A

u

A ch»rm id cause any
spirit to appear in the
form of a serpent

2ft

\

2.4

3

l

2. O

24

M

*

2<*

a

o

Square for use during
angelic invocation

A/

&

&

0

T

£

(Z-

A

S

o

6-

A

A.

A

<?

0

5

A

A

£

r

©

£

£

fJ

A Chaim for divers
virions

Three Magic Squares from Abrnnelin

(Mk ten 1971)

I

Fig, 32. — Some Magical Scab and Talismans

Some of John Dee's Angel Names (Deacon 196#)

Spirits of the Hours
{Agrippa 1970)

Aethyrc

Governors

Seven

Great An cels

0*7

Night

L. Lil

Occodon

Pascomb

Valgars

Sabathiei

Madinuel

SemeLiel

Nogahel

Corabiei

Lavanael

Zedekid

(Governors
of the

"watch rowers"
or seven
circles of
heaven}

Yajrn

ianof

Nafrua

Sales

Sadedali

Thamor

Ourer

Tamic

Neron

layon

Abai

Natalcm

Bcron

Btrol

Thami

Athir

Math on

Rani

Netos

Tafrac

Saffur

Agio

Caierva

SaLam

2. Ain

Doagnii

Piscaina

Diaiiva

3. Zorn

(etc.)

<30 in all)

Samapha
Virooli
And n pc

(etc.)
(90 in all)

Names of Planetary Spirits

Abramelio (Mothers 1973)

de Giary

(1971J

Pica true

(Ritter* Pleas oer
1962)

4 Superior
Spirits

8Sub-

Pnncej

Saturn

Anrron

Ashtl

Lucifer

As ur oth

Juptrcr

Beth or

Rufija'ii

Leviathan

Magoth

Man

Phaleg

Rubijail

Cata a

Asmodeus

Sun

Och

Bail

oilll 1

Beelzebud

Venus

Hagith

Bin il

BdiaJ

Onem

Mercury

Ophtel

Harqil

Paimon

Moon

Phuel

Saljall

Ariton

Amaymon

Fig. 33. — Some Demon and Angel Names

111

Fig. M'— Elements of Gileaic Medicine

Humor)

Element)

Qualities

Condition)

Tempera*

menu

Colors

Seatons

Agei

Winds

Zodiac

Signs

Blood

Air

Hot-Moist

Liquid

Sanguine

Bed

Spring

Childhood

S

Ariet

Taurus

Gemini

Yellow Bilt

Fire

Hot-Drjr

Gaseous

Choleric

Yellow

Summer

Youth

E

Cancer

Leo

Virgo

Rlaclt Bilt

Earth

Cold- Dry

Den it

Melancholic

BUck

Autumn

Maturity

N

Libra

Scorpio

Sagittarius

Phlegm

Wsier

Cold 'Moist

Solid

Phlegmatic

White

Winter

Old Age

W

Capricorn

Aquarius

Pisces

Sephiroth

Attributes of God

Spheres

K ether

Hokhmah

Binah

Hood

Gevurah

Rahimin

Netseh

Hod

Yood

Malkuth

The Supreme

Wisdom

Intelligence

Love, Mercy

Power, Writh

Compassion

Eternity

Majesty

Basis

Kingdom. Glory

Pnmum Mobile

Ogdoad (Fixed Scars!

Saturn

Jupiter

Mars

Sol

Venus

Mercury

Luna

Elements

Fig. 3 5 . — Some Elements of Cabala

113

Fig. 36. — Two Alchemical Drawings

114

Fig- 37 .“Some Costume Elements in Voynich Manuscript Drawings

115

cl f ? or f z Lx

n 3 Z ?

<r / s 3 S 5 7 T 2 T va >

Notana Aristotelis, England, Thirteenth Century

LMh*vi p M>

1 1

r i r

i r i r ? 1

*t f 1

i r tt r

a b

c d e

f g h i k m

n o

p r s i u

k

i

z v

y

w

Base Characters

J L

J V J L J

t <i b

.4 U

Twelve Auxiliary Marks Added to (he Foot of Base Svmbol "A H *

!

|

: J

abound

about

rT

forget (remember + F)

1

(antonym)

j

d

|

also

— ^ appenaine

•2

abandon f A+ forsake)

1

— ^

anger

(synonym)

-

‘'Character a 11 Words *

Other Words

Thomas Bright's Charaaerie

iDuthir 14701

: A

n “7

C L J +■

>

/

0

u

a

b d

e f g h

* i*

k.e.q I m n

(

/ w

— /<=.—

V)

>» Y z. X

* o

j

p q(u)

r s c u

V w

X v z Ch

] .n

*n

n <v 0«

b

ba

l

be

bi bo bu

sh

^ A

^ ^ progressive

abound

i -•

rebellion

res pea

words m hill

abbreviated words

John Willis' Stenographic

r

i

f Dithtr 14701

1

~-4-

Fig. 58.— Early Shorthand Systems

116

R S T U X Y

ABCDEFGHJKLMN OPQ

e i/T4z*i-£‘-r / /? + %X 3 *■

Nomendator;

PAPA

°T

VENETI

We

CARDINALIS

Q

3P

MONACHUS

an

REX FRANCIE

Is

ANTONIUS PONT IS

p ro

MON5 PESULANUS

«3

FLORENTINI

P e

e+c.

A Cipher of Parma, 1379 iMnn iwe.p itm

A B C D E F G

1 7 7 V i *

© ^

*: 1-

H I L M N 0 P Q

3 J. >0 4 4 ? C*

X TT -A-
T

R S T U
^ H 3 u

f H

X

con

r

Null*: "F C.D If ip C# /"(? m 0 ^2p @ p °f* « R

Sample of 1

Cipher text ...

p t o v i d e aturperdompa p a m d c p a cri...
A Venetian Cipher. 1411^ fs*m> iw. p, »

b”c D E F G H I L M N O P O R S T uT7

r ^ P!1»»3 7 >

=» V +

* J

quo

A
?

-«- n +

PQ RS I UAJ 17

- , , , + 7T^rt!

4 7 * «

T 9

r y

Nulls:

■5K* Q 33 44 T TTT

Doubled:

Syllables:

°3

BB

>= +

CC

DD

FF

b3

GG

43

LL

NN

"3 7 3 ^3

RR SS TT

— B « Xf) Ff 4-0 °

QUA QUE QUI QUO_ QUU

(Thu system also included a "nomenelitor' . or set of code words)

Code of Urbtno. 1440 (One of 72 similar codes) rsucro iw7, P 6 \

JL

Fig 39- — Some Early Italian Cryptographic Systems

117

Word
Desif -

Word Matrix or Chan: Column Di

aiguators

tutor

1, BD

11, AF

111. DL |

| HI!. CL

V. AC

VI. BA

j

AUDIO

BONUM

CEDO

D1LIG0

EXPELLO

FALLO

>1

AMO

BELLUM

CONFERO

DORMIO

EXPUCO

FALSUM

m

ASPIC10

BENEF1CIO

CONCLUD

DONO

EXTOLLO

FALLACIO

m\

AGNOSCO

BIS

COMMENDO COCEO

EXIMO

FRAUS

V

ALEXANDER

. BESTIA

CONS1GNO

DOCTRINA

EMO

FORSAN

vi

AMOR

BELLIGERO

CONDEMNO DOLUS

EMULO

FORIS

APPETO

BACULUS

COMMODO

DOLOR

EQUUS

FORAMINA

etc.

etc

etc.

etc.

etc.

etc.

etc.

Ending Codes
Nouns:

Cue And N umber Gender

Singular Plural

Nominee A G Masculine

Genitive B H Feminine

Dative C I I Neuttr

Accusative D K

Vocative E L

Abiadve F M

BB

CC

DD

Verbs:

Mood

Indicative

Passive

Imperative/ Optative
Subjunctive

Infinitive

N

O

P

Q

E

Tense

Present

Imp er fec t

Perfect

Pluperfect

Future

S

T

V

X

Person

1

2sg

5*&

1 pi

2 pi.

3 pl

Y

B, P

Be

V Y

60, 33

Sample* of Coded Text:

F & . C • Bnvg , £i*

Pondfcx l e ro pe? amavit ju to turn.

fit. I . t>L - *** 0A- n-»*7j * CL- ^ty*. AP. xv.k*^

Bona cotuiiia faciunt domino* beato*

Fig. 40. — Jakob SiKeiier’i Code
(so™- n». Mjo 2 H-M)

SYMIes*

"Indian” characters to make
Saturn grant a wish.

iKFrixtrtvFrfZFtn-F *■ 'XT%tuY
J l« "b 1 1 <¥>S 1 1 v|vtv|v|vl/nil(

"Efypcian" characters "from Geopatra", to protect one from a king.

A charm to chase away mice.

JC AVkX-WsW

Charm to bring
a lover.

'C }

LJ*> '

An "Egyptian” prayer to Venus.

<• 1 ZLi + 'rJc? tt f" X y

Charm to chase
away wolves.

Some Charms from Picatrii (tm »d

19621

X/SCtT# 2THS/A 3-EK

ANARH£TA PIA fOTc>R t>Rio/V 5ARA&
2AM0A/1 • AL/^RHi ■ OHoDoS* SCItS

Some Spells from the Keys of Solomon idcCi*™ 1971. P toai

TA AULA. Ta ALLA o/V AHJD *VOfft£L
5UA ALLR TMUQotJ j ft ^Luoti

OU tf-tU-ftTi/V VAHH£-AUA/

AOA STApfldU ALlft SuU^flTl

aua KAHlR

Charm from i Seventeenth Century "Gritnotrc de la Cabale" in the Bibliothequc
de I * Arsenal , \ & Gnnr, 1 97 1, p. 11 2)

Fig. 4L— Some Magical Spells sod Invocations

4 4

Jupiter Tin

e

Alum

8

White Arsenic;
Copper Plate

e 1

Soapstone

Red Ats«ik:
Mercury; Vitriol

White Arsenic

i v

Potash

Quicklime

I

Burned

Copper

To Distill

'

Orpimeru

Urine

II

f

LCfullU

Month

H*

Bismuth

o

Oleum Tartan
Sennerti

*, *?

Sail

if

To Prepare

Fig. 42 . — Some Alchemy Symbols

fGiwwii 1«Z1

r B 2

a b c

B 9

d e

r 3

? *
h i

j~ i

k 1

3fi 9

m n

S S 1

r «

L S ^

*?> W

w*

o p q

r i

t u

X *

2 et

est

Aigoux – God
Di vciiz – Devil
lminots – Man
I spam z – Spirit

Viniz – Woman
Luzeica – Light
Ciizia – Church

Gnuimbuz – Cherry Tree
Muximbuz – Nut Tree
Arreien * – Arch bi sh op

pholianz

St Hildegarde's Alphabet and lgnou Lingua

rMmctr L902.E.LOMH1 19701

>> V 3

13

I

1

*

\j>

a b

c

d

e

f

%

09 1

<

a

3-

X*

n

h i

i

m

n

0

P

ir a

"L

j

a

r

?

q T

S

t

u

X

z

John Dee s Enoehtan Alphabet • (

Dam 1968]

Fig. 43.^-Two Mystical Religious Languages

M1CMA

Behold.

GOHO

Faith

P1AD

your God

2IR

1 am;

COMSELH

« circle

AZIEN

on whose hands

BIAfi

are

OS LON DOH

12 kingdoms

N0R2

six

CH1S

are

OTHIL

the icau

GI GI PAH

of living breath;

IJNDL

the rest

CHIS

are

TA PU IN

as sharp sickles.

Q MOS P1_FH

or the horns

TELOCH

of death ;

QUIIN

wherein

TOLTORG

creatures of the earth

CHIS

art.

I CHIS GE

to are not (sic)

(E)M

except

OZIEN

mine own (hand)

DST

which

BURGDA

sleep

OD

and

TORZUL

shall rise.

IU

In the first

EOL

] made you

BALZARG

stewards

OD

and

HAALA

placed you

THILN OS

in seats 1 2

NETAAB

of government:

DLUGA

giving

VOMZARG

unto any one of you

LONSA

power

CAPMIALJ

success; veiy,

VORS

over

CLA

456

HOMIL

the true ages

COCASB

of ome;

FAFEN

to the intent that,

IZIZOP

from the highest vessels

OD

and

Ml IN O AG

the corners

DE

of your governments.

GNETAAB

you might work

VAUN

my power.

NANAEEL

pouring down

PANPIR

the fires of life

MALPIRGI

continuously

CAUSG

on the earth

PILD

Thus

NOAN

you are become

UNALAH

the skirts

BALT

of justice

OD VOOAN

and truth.

DO 01 AP

In the name

MAD

of the same, your God

GOHOLOR

lift up,

GOHUS

Isay.

AMIRAN

yourselves

MICMA

Behold

JEHUSOZ

His mercies

CACACOM

flourish

OD DOOAIN

and name

NOAR

is become

MICAOLZ

mighty

AAIOM

amongst us;

CASARMG

in whom

GOHIA

we say

ZODACAR

move.

UNIGLAG

descend

OD

and

IM UA MAR

apply yourselves unto me

PUGO

as unto

PLAPL1

the partaken

ANANAEL

of his secret wudotn

QAAN

in your creation

Fig. 44 — A Sample of Enocbiio Text

[Cuuba !«*.*. *4)

122

YARRY

To the providence

LNIBM

One season

ID OIGO

of him that sitteth

OUCHO

lei it confound

on the HoW Throne

SYMP

another

OD

an d

OD

and

TORZULP

rose up

CHRISTGOS

let there be

1AODAF

in the beginning

AGTOLTORN

no creature

GOHOL

saying

MIRC

upon.

CAUSGA

the earth.

Q

or

TABAORD

let her be governed

TIOBL

within her

SAANIR

by her parts;

L£L

the same.

OD

and

TON

All

CHRISTGOS

let there be

PAOMBD

her members

YRPOIL

division

DILZMO

let them differ

TIOBL

in her

ASPIAN

in their qua lines

BUSDIRTILB

that the glory of

OD

and

her

CHRISTGOS

let there be

NOALN

may be

AGLTOLTORN

no one creature

PAID

always

PARACH

equal

ORSBA

drunken

A SYMP

with another.

OD * •

and

CORDZIZ

The reasonable crea -

DODRMNI

vexed

cure of the earth.

ZYLNA

in itself.

or man.

BL ZAP TILB

Her course

DODPAL

let them vex

PARM GI

let it run

OD FIFALZ

and weed out

PIRIP SAX

with the Heavens.

LS MNAD

. one another

OD

and

TA

as

QURJST

an handmaid

BOOAPIS

let her serve them.

Fig. 45. — Another Sample of Enoch ian Text

fCmuhon 1619. p 203 1

(The * teener of V uvd J train the alphabet of fig 4 3 u tux explained]

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