

JUAN ACEVEDO

Alphanumeric  
Cosmology From Greek  
into Arabic

*Forschungen  
zum Alten Testament 2. Reihe*

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**Mohr Siebeck**

*Juan Acevedo*

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The Idea of *Stoicheia*  
Through the Medieval Mediterranean

Mohr Siebeck

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# Contents

Acknowledgements. . . . .	V
Notes to the Reader. . . . .	XIII
<i>A. Transliterations.</i> . . . . .	XIII
I. Hebrew Transliteration . . . . .	XIII
II. Arabic Transliteration . . . . .	XIV
Abbreviations . . . . .	XV
Introduction. . . . .	XVII
<i>A. The Concept</i> . . . . .	XVIII
<i>B. Overview</i> . . . . .	XIX
<i>C. Survey of Scholarship</i> . . . . .	XX
<i>D. Methodology Matters</i> . . . . .	XXIII
I Defining the Concept. . . . .	1
Chapter 1: Notes on Early Alphabetic Cosmology . . . . .	3
<i>A. Starting from Aristotle's 'Lexicon'</i> . . . . .	3
I. First Glimmerings . . . . .	8
1. Etymology. . . . .	8
2. The Definition . . . . .	11
3. Atoms and Letters . . . . .	12
II. Platonic Corpus . . . . .	12
III. The Constellations . . . . .	13
IV. Latin Correspondences . . . . .	14



<i>B. Greek Grammarians</i> . . . . .	15
I. The Opening Anacoluthon . . . . .	17
II. Simplicity and Pedagogy . . . . .	18
III. The Semitic Origin. . . . .	18
1. Nature-given or Created . . . . .	20
IV. More Etymologies . . . . .	20
1. Number and Order. . . . .	21
2. Walls and Ramparts. . . . .	22
3. What about <i>γράμματα</i> ? . . . . .	23
V. Attributes of the <i>στοιχεῖον</i> . . . . .	24
VI. The Four Cosmic Elements . . . . .	25
1. Why Twenty-Four? More Cosmic Correspondences . . . . .	26
2. The Moon and the Stars . . . . .	27
3. The Planets . . . . .	28
4. Astrological Correspondences . . . . .	29
5. Microcosmic Correspondences . . . . .	30
VII. Graphical Layout . . . . .	31
VIII. Sanchuniathon and the Snakes . . . . .	32
<i>C. Latin Grammarians.</i> . . . . .	33
<i>D. Conclusion.</i> . . . . .	36
Chapter 2: On the Tracks of Arithmetical Cosmology . . . . .	38
<i>A. Number and Letter</i> . . . . .	38
I. Isopsephism, Onomatomancy and Gematria . . . . .	42
1. Choeroboscus on the Names of Numbers. . . . .	46
<i>B. Reckoning and Science of Numbers</i> . . . . .	48
<i>C. Pythagoras and Pythagoreanism</i> . . . . .	51
1. <i>Lore &amp; Science</i> and Further Developments. . . . .	53
2. Imitation or Participation . . . . .	56
3. On Creation and Order. . . . .	57
4. The Pythagorean <i>Logos</i> . . . . .	58
5. The Fundamental Decad. . . . .	58
I. Philolaos. . . . .	60
1. Fragments of Philolaus. . . . .	61
II. ‘Pythagorean’ Milestones . . . . .	68
1. Nicomachus and his <i>Introduction</i> . . . . .	72

III. Nicomachus' <i>Introduction</i> Tables . . . . .	74
D. <i>Conclusion</i> . . . . .	91
II Alphanumeric Cosmology in the Abrahamic Scriptures .97	
Chapter 3: Jewish Sources and Exegesis. . . . .	101
A. <i>Tanakh and Translations</i> . . . . .	101
I. Genesis – Creation by Speech. . . . .	101
1. Psalm 33:6. . . . .	104
II. Exodus – Bezalel. . . . .	105
III. Counting the Glory. . . . .	107
IV. The Potter of Light . . . . .	108
V. Acrostics . . . . .	109
VI. Summary . . . . .	112
B. <i>Philo</i> . . . . .	113
I. On the Making of the World. . . . .	114
1. Archetype and Noetic Creation . . . . .	117
2. The Model is Λόγος. . . . .	118
3. Numbers: the Tetrad and the Decad . . . . .	119
II. Chapter Summary: Philo in Perspective. . . . .	120
Chapter 4: Christian Sources and Exegesis. . . . .	122
A. <i>Letters-Numerals of the Christic Word-Number</i> . . . . .	122
I. <i>Mysteria litterarum</i> : Textual History . . . . .	124
1. <i>Mysteria litterarum</i> – the text . . . . .	125
2. 22 or 24 Letters. . . . .	127
II. Apocryphal Gospels. . . . .	128
III. A Spiritual ABC in Monastic Literature . . . . .	129
IV. Measure, Number, Weight, and Augustine. . . . .	130
Chapter 5: Hermetica, Magic and Gnostic Sources. . . . .	135
I. Who is Hermes?. . . . .	137
II. Thoth and the Letters in <i>Philebus</i> . . . . .	139
III. The Creation Elements in the <i>Hermetica</i> . . . . .	141

IV. Magic Phonemes . . . . .	143
V. Magical Papyri . . . . .	144
VI. The Twenty-Four Alphabetic Names of Gods . . . . .	148
<i>A. Gnostic Writings</i> . . . . .	151
I. <i>Evangelium Veritatis</i> . . . . .	152
II. <i>Marsanes</i> . . . . .	154
III. Marcus the Valentinian . . . . .	156
<i>B. Conclusion</i> . . . . .	161

## Chapter 6: Alphanumeric Cosmology in Islamic Scripture and Exegesis . . . . . 163

<i>A. Introduction</i> . . . . .	163
I. The Linguistic-Logical Aspect . . . . .	165
<i>B. Starting Point and Influences</i> . . . . .	167
I. The Arabic Alphabet Order . . . . .	170
1. The Arabic Letters as Numerals . . . . .	172
<i>C. The Development of the Science of Letters</i> . . . . .	176
I. ‘Alī: The Common Source . . . . .	176
II. Letters in the Ḥadīth Literature . . . . .	177
III. The Two Branches . . . . .	180
IV. Some Key Texts . . . . .	185
1. <i>Jawāmi‘ al-kalim</i> . . . . .	185
2. ‘A limit and a summit’ . . . . .	186
3. ‘Beyond utterance’ . . . . .	187
<i>D. Back to Basics: Philosophy &amp; Physics</i> . . . . .	188
I. The <i>Metaphysics</i> . . . . .	189
II. Jābir and ‘The Element’ . . . . .	193
III. The ‘Element’ of the Foundation . . . . .	194
IV. The Balance of the Letters . . . . .	195

### III World Construction: Systems of Cosmic Design . . . . . 199

#### Chapter 7: *Sefer Yetsirah*: The Bright Jewel of

Alphanumeric Cosmopoiesis . . . . . 201

*A. Selections from the Text* . . . . . 205

I. The Thirty-Two Wondrous Paths of Wisdom . . . . . 207

II. The Three Modes of Inscribing . . . . . 209

III. The Absolute Numerations – *Sefrot*. . . . . 211

IV. The Twenty-Two Elemental Letters . . . . . 214

*B. The Title: ‘Creation’ or ‘Formation’?*. . . . . 217

*C. Authorship and Conclusion* . . . . . 219

#### Chapter 8: Alphabetic Consecration & Metaphysical

Foundation . . . . . 221

*A. The Abecedarium in Church Dedication* . . . . . 221

I. The Roman *Gromatici*. . . . . 224

II. Christening the Land: *mensuratio/γεωδαισία* . . . . . 226

1. Rabanus Maurus . . . . . 227

*B. The Celtic Connections* . . . . . 228

I. Eriugena. . . . . 228

Ramon Llull . . . . . 229

*C. Psellos: Letters and Matter* . . . . . 232

I. Aquinas and the Second ‘Signified’ Matter . . . . . 234

*D. Dante and Hildegard*. . . . . 236

#### Chapter 9: Islamic Systematisation and the Sublime Letters

That We Were . . . . . 239

*A. Abū Ḥātim’s Letter Cosmogony* . . . . . 240

*B. A Pure Brotherhood*. . . . . 242

I. How Pythagorean are the *Ikhwān*? . . . . . 244

II. Magic Squares in the *Epistles* . . . . . 245

III. Music: Prosody: Grammar. . . . . 247

IV. ‘Letters’ in the *Rasā’il*. . . . . 248

V. <i>Risāla al-Jāmi‘a</i> – The Comprehensive Epistle . . . . .	250
C. A ‘Sufi’ Interim . . . . .	252
D. <i>Al-Būnī and The Sun of Divine Sciences</i> . . . . .	255
I. The Letter-Elements in <i>al-Būnī</i> . . . . .	256
II. The First Paragraph . . . . .	257
1. The Basics of Letter Cosmology . . . . .	257
2. Letter-Number Relation . . . . .	258
3. Joining the Letters . . . . .	259
III. ‘Magic’ Squares in the Light of Alphanumeric Cosmology. . .	260
E. <i>Ibn ‘Arabī</i> . . . . .	261
I. The Place of the Letters . . . . .	263
II. Letters and Numbers . . . . .	265
III. The Three Modes . . . . .	266
IV. The Living Letters . . . . .	266
F. <i>Conclusion to Part III</i> . . . . .	268
Conclusion . . . . .	270
A. <i>Conceptual Conclusion: Echoes and Ramifications</i> . . . . .	270
I. Art, Artistry and the Arts . . . . .	270
II. The Universe as Book . . . . .	271
III. Physics and Modern Physics . . . . .	273
IV. Linguistics, Psychology and Cosmology . . . . .	275
V. Metaphysics and Theology . . . . .	276
B. <i>Historical Conclusion: The Alphanumeric End</i> . . . . .	277
Appendix A: Latin Grammarians . . . . .	283
Bibliography . . . . .	287
<i>Primary Sources</i> . . . . .	287
<i>General Sources</i> . . . . .	292
Index . . . . .	316

## Notes to the Reader

Translations are mine throughout, except where otherwise stated, in order to preserve consistency as far as possible in literalness and terminology. In view of the semantic complexity of the study, I have often taken the liberty to force an overly etymological translation to bring out a particular aspect of a word.

### A. Transliterations

Single Greek words are indistinctly used in transliteration or Greek script depending on the context. Running Greek text is never transliterated.

Hebrew and Arabic running text is left in the original script, while single words or short phrases are transliterated according to the tables below. Vocalisation is only used in specific contexts according to need, as when a given passage is studied in depth.

#### I. Hebrew Transliteration

My transliteration combines the two current varieties (פשוט ‘simple’ and מדויק ‘precise’) of the Academy of Hebrew Language, 2007, and it is almost identical to the ‘General-Purpose Style’ in the *SBL Handbook of Style* (2nd edn, 2014).

א	a	ז	z	מ	m	ק	q
ב	b/v	ח	ḥ	נ	n	ר	r
ג	g	ט	ṭ	ס	s	ש	sh
ד	d	י	y	ע	‘	ת	t
ה	h	כ	k/kh	פ	p/f		
ו	w	ל	l	צ	ts		

## II. Arabic Transliteration

The transliteration follows the current usage of Brill's *Encyclopedia Islamica* and the *Oxford Journal of Islamic Studies*.

أ	<i>a</i>	ح	<i>ḥ</i>	س	<i>s</i>	ت	<i>t</i>
ب	<i>b</i>	ط	<i>ṭ</i>	ع	‘	ث	<i>th</i>
ج	<i>j</i>	ي	<i>y</i>	ف	<i>f</i>	خ	<i>kh</i>
د	<i>d</i>	ك	<i>k</i>	ص	<i>ṣ</i>	ذ	<i>dh</i>
ه	<i>h</i>	ل	<i>l</i>	ق	<i>q</i>	ض	<i>ḍ</i>
و	<i>w</i>	م	<i>m</i>	ر	<i>r</i>	ظ	<i>ẓ</i>
ز	<i>z</i>	ن	<i>n</i>	ش	<i>sh</i>	غ	<i>gh</i>

## Abbreviations

BNP	Cancik, H., H. Schneider, C. F. Salazar and D. E. Orton, eds., <i>Brill's New Pauly: Encyclopaedia of the Ancient World</i> .
DELG	Chantraine, P., <i>Dictionnaire étymologique de la langue grecque: histoire des mots</i> .
DGWE	Hanegraaff, W. J., <i>Dictionary of Gnosis &amp; Western Esotericism</i> .
DK	Diels, H., and W. Kranz, <i>Fragmente der Vorsokratiker</i> .
DNP	Cancik, H., H. Schneider and A. Pauly, eds., <i>Der neue Pauly : Enzyklopädie der Antike</i> .
DSS	Buck, C. D., <i>A Dictionary of Selected Synonyms in the Principal Indo-European Languages</i> .
Du Cange	Du Cange, C. D. F., ed., <i>Glossarium mediæ et infimæ latinitatis</i> .
EALL	Versteegh, K., et al., eds., <i>Encyclopedia of Arabic Language and Linguistics</i> .
EH	<i>Mawsū'a al-hadīth al-sharīf (Encyclopaedia of Hadith)</i> .
Ernout-Meillet	Ernout, A., and A. Meillet, <i>Dictionnaire étymologique de la langue latine</i> .
GALex	Endress, G., and D. Gutas, <i>A Greek and Arabic lexicon: Materials for a Dictionary of the Mediaeval Translations from Greek into Arabic</i> .
GLK	Keil, H., ed., <i>Grammatici latini</i> .
Klatzkin	Klatzkin, J., <i>Thesaurus philosophicus linguae hebraicae (Otsar ha-munahim ha-filosofiyim)</i> .
LBG	Trapp, E., ed., 'Lexikon zur byzantinischen Gräzität'.
Lisān	Ibn Manzūr, <i>Lisān al-'arab</i> .
LS	Lewis, C. T., and C. Short, eds., <i>A Latin Dictionary</i> .
LSJ	Liddell, H., and R. Scott, eds., <i>A Greek-English Lexikon</i> .
<i>Munjid</i>	<i>al-Munjid fī al-lughā</i> .
Nock-Festugière	Nock, A. D., and A.-J. Festugière, eds., <i>Corpus Hermeticum</i> .
OLD	<i>Oxford Latin Dictionary</i> .
PGM	Preisendanz, K., and A. Henrichs, eds., <i>Papyri Graecae Magicae. Die griechischen Zauberpapyri</i> .
RE	Pauly, A., and G. Wissowa, eds., <i>Paulys Realencyclopädie der classischen Altertumswissenschaft</i> .
RIS-Beirut	Ikhwān al-Ṣafā', <i>Rasā'il Ikhwān al-Ṣafā' wa Khullān al-Wafā'</i> .
RV	Mansfeld, J., ed., <i>Die Vorsokratiker</i> .



Schol. in Dion. Thrax	<i>Scholias in Dionysii Thracis Artem grammaticam.</i>
SQ	Nasr, S. H., C. K. Dagli, M. M. Dakake, J. E. Lumbard and M. Rustom, eds., <i>The Study Quran: A New Translation and Commentary.</i>
Tāj	al-Zabīdī, M., <i>Tāj al-‘arūs min jawāhir al-qāmūs.</i>
TDNT	Kittel, G., G. Friedrich and G. W. Bromiley, eds., <i>Theological Dictionary of the New Testament.</i>

## Introduction

At the beginning of this research, as is so often the case in philosophy, there is a feeling of wonder, and there is Plato.

Before entering into the details of the creation of the elements, in the dialogue that bears his name, Timaeus mocks earlier philosophers who referred to the elements as στοιχεῖα (*stoicheia*), ‘letters’, observing that those στοιχεῖα ‘are not even syllables’ of reality,<sup>1</sup> meaning by this that these ‘so-called elements’ (τὰ καλούμενα στοιχεῖα) are already compounds and far from elemental. The pun is involved, and in its complexity it establishes a grammatical model of the cosmos, and naturally, in this model, the letters of the alphabet are the smallest parts of reality. I had barely been exposed to the puzzling and fascinating cosmological doctrines of the *Timaeus* when I first read these lines, but I had already had some acquaintance with the Hebrew *Sefer Yetsirah*, the *Book of Formation*, where the divine Artist creates the universe by means of letters and ‘numbers’, and the family air between these two works, so distant from each other chronologically and culturally, made a strong impression on me. As I now try to find a concise way to introduce this research work, it occurs to me that it could be safely said to be ‘an attempt at uncovering the links or tracing the pathways between *Timaeus* and *Sefer Yetsirah*.’ Perhaps by unfolding what is implicit in such formulation, the introduction will be made clearer.

Coming from Plato means not only that this letter cosmology generated much speculation among his Greek successors, but also that through direct translation and indirect influence, it would generate a wealth of treatises and commentaries in Latin, where the word *elementum* is attested with the same combined meaning since Lucretius and Cicero,<sup>2</sup> and then through Syriac translations and directly in Arabic and Hebrew – this is part of the story I mean to tell in the following pages. So it can be said that this is a

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<sup>1</sup> *Timaeus*, 48b8.

<sup>2</sup> See below, p. 14.

work on the Platonic tradition, and it is a work about the transference of knowledge from Greek antiquity to the Mediterranean High Middle Ages, and thus from Greek into Arabic, Hebrew and back to Latin.

‘From *Timaeus* to *Sefer Yetsirah*’ means also from a philosophical metaphysical discourse to a discourse pertaining to mystic doctrines of an Abrahamic religion, and so this can also be considered a work on comparative philosophy and comparative religion. But this is all too general, and the reality is that my research in these pages follows a very narrow thread through a long and winding road, ‘struggling with every care,’ as Aby Warburg intended, ‘to cast light on one single obscurity, thereby illuminating the great general development pathways in all their interconnections.’<sup>3</sup> In fact, it would also be fair to inscribe this enquiry within the Warburgian understanding of cultural history, *Kulturgeschichte* and *Kulturwissenschaft*, as a very broad field with room for art, the sciences and religion to be studied in their interplay and interactions. I should like to note here that as part of the preparation of this work, I conducted a preliminary survey of ancient and medieval iconography related to the alphabet and other aspects of my theme. The reader will be acquainted in the following pages with some of the fruits of this survey, but I would expect, and it is a promising desideratum, that a thoroughly conducted iconographical enquiry shall bring to light many more works of interest and relevance to the subject at hand.

### A. The Concept

Any dictionary of Ancient Greek will give two main meanings for the word στοιχεῖον, that of ‘letter’ and that of ‘element’; κδ’ στοιχεῖα means ‘the 24 letters’, but δ’ στοιχεῖα means ‘the four elements’. In addition to this grammato-physical duality, letters were used from the sixth century BC and down to the High Middle Ages to represent numbers: Greek, Hebrew and Arabic alphabets were used in very similar ways for all sorts of arithmetical purposes, from everyday calculations to advanced mathematics. The joint usage of the same notation by language and numbers allowed naturally for

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<sup>3</sup> A. Warburg, ‘Italienische Kunst und internationale Astrologie im Palazzo Schifanoja zu Ferrara’, in *Gesammelte Schriften: Die Erneuerung der Heidnischen Antike* (Leipzig/Berlin: Teubner, 1932), 479.

certain practices halfway between linguistics and mathematics which are quite alien to our contemporary experience of ‘number’ and which I think can be accurately called *alphanumeric*. These practices were rooted in a subtly different perception of the boundaries between letters and numbers, and this is why this work is also an attempt at ‘a wider semiotics of writing’<sup>4</sup> in which the alphabet is considered not just a graphic device, but a very tight-knit integration of phonetic, graphic and numerical values<sup>5</sup> which when combined determine the extent of its applications in other fields. This is also why this work is concerned with grammar as much as with arithmetic, and with phonetics and prosody as much as with calligraphy, in a synthesis that may be best characterised as ‘alphanumeric cosmology.’<sup>6</sup>

## B. Overview

The examination of this triune concept of letter-number-element, and its elaboration in ancient and medieval scholarship will be the object of the book chapters. It is a work in two phases and nine chapters which follow rather loosely historical chronology: first a defining phase, specific, descriptive and idiographic (Part I), restricted mostly to the Graeco-Latin tradition, and then a comparative phase, illustrative, synthetic and cosmopolitan (Parts II and III).

PART I establishes the object of my research in all its dimensions: Chapter 1 is the most textual based of the book. It is devoted to the grammatical aspect, and it runs mostly as a series of glosses to passages from philosophers and to the commentaries on the grammar primer attributed to Dionysius Thrax. Chapter 2 deals with the arithmetical aspects, with a special emphasis on the Pythagorean tradition, and in

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<sup>4</sup> D. K. Psychoyos, ‘The Forgotten Art of Isopsephy and the Magic Number KZ’, *Semiotica* 2005, nos. 154-1/4 (2005): 209.

<sup>5</sup> Cf. J. Lougovaya, ‘A Perfect Pangram: A Reconsideration of the Evidence’, *Greek, Roman, and Byzantine Studies* 57, no. 1 (2017): 186.

<sup>6</sup> Other denominations used in very closely related works include ‘letter mysticism’, ‘numerology’, ‘letterism’, ‘Ḥurufism’. Even though some are lexically simpler to use, they have the disadvantage of being one sided or culturally and historically charged. Of course, new and descriptive compounds are possible, like ‘alphanumericism’, or reclaiming the rare ‘stichology’, but I would not like to be responsible for proliferating neologisms.

particular on the fragments attributed to Philolaus and on the *Introduction to Arithmetic* by Nicomachus of Gerasa.

PART II includes four chapters, mining the scriptural traditions of late Hellenistic and early medieval periods, incorporating the views of evolving, growing and nascent Abrahamic religions. Chapter 3 studies Jewish Biblical and Rabbinic texts, and Chapter 4 does the same with early Christian sources. Chapter 5 tries to deal in unitary fashion with the very heterogeneous body of late Hellenistic Hermetic, Gnostic and magic texts, and Chapter 6 looks at the Qur'ānic and related Islamic exegetical literature.

PART III, in three chapters, explores some specific cases of Abrahamic alphanumeric cosmology in a dually understood 'theurgic' dimension: as the creative act of the world-making deity, and as the divinely oriented work of man; hence this part includes texts more closely related to cosmogony, liturgy, magic, and alchemy. Chapter 7 focuses on the basic structure and concepts of the above-mentioned *Sefer Yetsirah*; Chapter 8 looks at certain Celtic and Scholastic Christian practices and doctrines; and finally Chapter 9 follows the alphanumeric elements through major Islamic philosophical texts, including the *Epistles of the Brethren of Purity* and some texts by Muḥyī al-Dīn ibn 'Arabī.

The time span covered by the research is given, roughly, by the two ends of what I suggest we may call the 'alphanumeric age,' between the late sixth century BC, when numerals and letters first coalesced in the Greek Milesian system, and the twelfth century AD, when the introduction of the Indo-Arabic numerals around the Mediterranean was becoming generalised and letters and numbers ceased to have a single 'body.' This will be discussed in some more detail in the final Conclusion.

### C. Survey of Scholarship

Aside from excellent specialised works on Jewish, Islamic and Hermetic alphanumeric cosmology, there is a remarkable dearth of English-language literature on this topic in general. There are two major contributions, both originally in German and never translated into English. The one closest to my research, though second in chronological order, is Franz Dornseiff's 1922 monograph, *Das Alphabet in Mystik und*

*Magie*.<sup>7</sup> Dornseiff himself expresses in his introduction the desirable opening towards more Eastern sources than he could include. I hope that this book will at least in some ways be a contribution towards fulfilling his wish, as it is also an updating of sources regarding these topics of alphanumeric symbolism and alphanumeric speculation broadly speaking. The second major landmark is Hermann Diels' *Elementum*,<sup>8</sup> a comprehensive historical lexicological work, tracing the history of the words στοιχεῖον and *elementum* in great detail, and of the many variations of the 'letter simile' (*Buchstabengleichnis*) and the 'lettercase simile' (*Schriftkastenbild*, assuming a set of moveable printing types).

Dornseiff's work became an undisputed reference work for the subject and had no direct continuators, while Diels' prompted several kinds of partial refutations and additions on different fronts. Lagercranz (1911),<sup>9</sup> Vollgraff (1949),<sup>10</sup> Koller (1955),<sup>11</sup> Burkert (1959),<sup>12</sup> and Schwabe (1980)<sup>13</sup> were explicitly in dialogue with Diels mostly about the Greek term, while Rogge (1923),<sup>14</sup> Sittig (1952),<sup>15</sup> and Coogan (1974)<sup>16</sup> focused on *elementum*.

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<sup>7</sup> F. Dornseiff, *Das Alphabet in Mystik und Magie*, Stoicheia, Studien zur Geschichte des antiken Weltbildes und der griechischen Wissenschaft 7 (Leipzig: B.G. Teubner, 1922). Notably, the original publication belonged to a series called 'Stoicheia: Studies for the History of Ancient Worldview and of Greek Scholarship.'

<sup>8</sup> H. Diels, *Elementum: eine Vorarbeit zum griechischen und lateinischen Thesaurus* (Leipzig: B. G. Teubner Verlag, 1899).

<sup>9</sup> O. Lagercranz, *Elementum: eine lexikologische Studie, I*, vol. 1 (Akademiska bokhandeln, 1911).

<sup>10</sup> W. Vollgraff, 'Elementum', *Mnemosyne* 2, no. 2 (1949): 89–115.

<sup>11</sup> H. Koller, 'Stoicheion', *Glotta* 3/4. No. 34 (1955): 161–174.

<sup>12</sup> W. Burkert, 'ΣΤΟΙΧΕΙΟΝ: Eine semasiologische Studie', *Philologus: Zeitschrift für antike Literatur und ihre Rezeption* 103 (1959): 167–197.

<sup>13</sup> W. Schwabe, 'Mischung' und 'Element' im griechischen bis Platon: Wort- und begriffsgeschichtliche Untersuchungen, insbesondere zur Bedeutungsentwicklung von Stoicheion (Bouvier Verlag H. Grundmann, 1980).

<sup>14</sup> C. Rogge, 'Nochmals lat. elementum', *Zeitschrift für vergleichende Sprachforschung auf dem Gebiete der Indogermanischen Sprachen* 51, no. 1 (1923): 154–158.

<sup>15</sup> E. Sittig, 'Abecedarium und elementum', in *Satura: Früchte aus der antiken Welt*, by O. Weinreich (Baden-Baden: Verlag für Kunst und Wissenschaft, 1952), 131–138.

<sup>16</sup> M. D. Coogan, 'Alphabets and Elements', *Bulletin of the American Schools of Oriental Research*, no. 216 (1974): 61–63.

Lumpe (1962)<sup>17</sup> gives a brief account summarising much of Diels from the perspective of conceptual history. Balázs (1965),<sup>18</sup> barely cited elsewhere, gives what I consider an important insight into the metric and prosodic associations of the Greek. Druart (1968)<sup>19</sup> has examined very carefully the use and scope of στοιχείον in Plato's works, complemented by the more recent work by Laspia, who gives a very useful summary of the *status questionis*.<sup>20</sup> I should also mention here an important recent work by Weiss<sup>21</sup> which takes Dornseiff as starting point, and a very stimulating new Heraclitean contribution by Lebedev, which should inform every new account of the story of the term.<sup>22</sup>

Drawing variously from the above, the following have elaborated more on aspects of the concept itself and less on the philological aspect. Ryle (1960)<sup>23</sup> deals with logic and the Platonic theory of forms; Lohmann (1980)<sup>24</sup> with mathematical related terms; Vogt-Spira (1991)<sup>25</sup> studies the phonetic-written duality, and Crowley (2005)<sup>26</sup> treats specifically

<sup>17</sup> A. Lumpe, 'Der Begriff "Element" im Altertum', *Archiv für Begriffsgeschichte* 7 (1962): 285–293.

<sup>18</sup> J. Balázs, 'The forerunners of structural prosodic analysis and phonemics', *Acta Linguistica Hungarica* (Budapest) 15, nos. 1–2 (1965): 229–86.

<sup>19</sup> T.-A. Druart, 'La Notion de « stoicheïon » dans le « Théétète » de Platon', *Revue Philosophique de Louvain* 66, no. 91 (1968): 420–434.

<sup>20</sup> P. Laspia, 'L'exkursus fonologico del Teeteto e la testualità platonica. A cosa pensiamo quando parliamo di 'elementi' e 'sillabe'?', in *Platone e la teoria del sogno nel Teeteto. Atti del Convegno internazionale Palermo*, ed. G. Mazzarra and V. Napoli (Sankt Augustin: Academia Verlag, 2008), 188.

<sup>21</sup> T. Weiss, *אותיות שנבראו בהן שמיים וארץ (Letters by which Heaven and Earth Were Created)* (Jerusalem: Bialik Press, 2014). A comprehensive English work by the same author was published as I completed my research, T. Weiss, '*Sefer Yeşirah*' and *Its Contexts: Other Jewish Voices* (Philadelphia: University of Pennsylvania Press, 2018).

<sup>22</sup> A. Lebedev, 'The Metaphor of *Liber Naturae* and the Alphabet Analogy in Heraclitus' Logos Fragments', in *Heraklit im Kontext*, ed. E. Fantino et al., *Studia Praesocratica* 8 (Walter de Gruyter, 2017), esp. 251–253.

<sup>23</sup> G. Ryle, 'Letters and syllables in Plato', *The Philosophical Review*, no. 69 (1960): 431–451.

<sup>24</sup> J. Lohmann, 'Mathematik und Grammatik', *Beiträge zur Einheit von Bildung und Sprache im geistigen Sein. Festschrift zum 80* (1980): 301–313.

<sup>25</sup> G. Vogt-Spira, 'Vox und Littera: Der Buchstabe zwischen Mündlichkeit und Schriftlichkeit in der grammatischen Tradition', *Poetica* 23, nos. 3/4 (1991): 295–327.

<sup>26</sup> T. J. Crowley, 'On the Use of *Stoicheion* in the Sense of "Element"', *Oxford Studies in Ancient Philosophy*, no. XXIX (Winter 2005): 367–394.

Aristotle's usage. Among encyclopedic articles, I have found Kittel's<sup>27</sup> and Blössner's<sup>28</sup> particularly orientating.

My primary intention in this new research on an old theme is to go back to the original texts and to expand the range of texts examined; in particular to study the semantic analogies found in Hebrew and Arabic, which with Greek and Latin constitute the main scholarly languages of the Mediterranean Middle Ages. This expansion of the field of vision is of course made possible by profiting from the insights of all the above scholars.

As may be surmised, given such precedents, this work pertains initially to philology or historical linguistics, and more specifically to lexicology, since it begins with the study of one word in one particular language, but the reader will quickly notice that στοιχεῖον was not the real object of my study, but merely one of the names of my object of study, and it was valuable only because of its synthetic semantic power, and due to its place in the history of Greek philosophy. Because this is in fact the study of a polysemy, the words themselves, στοιχεῖον or *elementum* or *sefirah* or *ḥarf*, are only important as facets of the 'jewel' (Ar. *jawhar*, jewel = essence, οὐσία), or as gateways into the fullness of the concept. By studying the words, we see more clearly the aspects of the concept, which in turn allows us to identify other terms used for one or other aspect of the same root concept, in what is already part of a semantic enquiry, the history of an idea, or a dogged exercise in *Begriffsgeschichte*.

#### D. Methodology Matters

Methodologically speaking, harking back to Ernst Robert Curtius, my starting point is then from 'the scientific technique which is the foundation of all historical investigation: philology,' not however with philology as an end in itself,<sup>29</sup> but more specifically, in the line of one of my basic

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<sup>27</sup> *Theological Dictionary of the New Testament*, ed. G. Kittel, G. Friedrich and G. W. Bromiley, 7 vols. (Grand Rapids, Mich.: W.B. Eerdmans, 1985), s.v. στοιχεῖον (hereafter cited as TDNT).

<sup>28</sup> N. Blössner, 'Stoicheion', *Historisches Wörterbuch der Philosophie* (Basel), 1998.

<sup>29</sup> E. R. Curtius, *European Literature and the Latin Middle Ages*, Bollingen Series 36 (Princeton University Press, 2013), 42.



references,<sup>30</sup> assembling a diachronic semasiological study – exploring the etymologies from the first historical occurrences of the concept, and following from then onwards the shifts in meaning.

This alternating approach between word and concept is perhaps what Gadamer means when explaining, ‘what conceptual history can do is to travel the way from word to concept and back again, keeping the path clear,’ for ultimately, ‘just as music is inconceivable without overtones, the conceptual language of philosophy is only entitled to opinions by the concord of its overtones, which restore the vague, abstracted field of a given concept to the natural power at its origin.’<sup>31</sup> It is precisely this travelling to and fro (a μέθοδος proper) between concept and terms that I intend to pursue, keeping the questioning open and paying attention to the conceptual overtones.

Thinking of ‘keeping the questioning open,’ I also agree heartily with Gadamer’s observation that ‘the purpose of enquiry in conceptual history can hardly be that of achieving a clearcut historical elucidation [...] but it should rather be the case that through the enquiry are ascertained the limitations of such elucidation.’<sup>32</sup> This in fact brings to mind the following words addressed by Ernst Cassirer to Warburg in 1926 referring to the Kulturbibliothek:

May the organon of intellectual-historical studies which you have created continue to ask us questions for a long time.<sup>33</sup>

Regarding the cultural-historical aspects that at once frame and are determined by the concepts studied, I have tried to focus on the continuity and comparability of the philosophical tradition, striving for the ‘intuitive perception of an essence’ instead of trying to ascertain ‘genetic causes, currents, influences.’<sup>34</sup> Inasmuch as the concept of philosophy that I

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<sup>30</sup> Burkert, ‘ΣΤΟΙΧΕΙΟΝ’.

<sup>31</sup> H.-G. Gadamer, *Die Begriffsgeschichte und die Sprache der Philosophie*, Arbeitsgemeinschaft für Forschung des Landes Nordrhein-Westfalen: Geisteswissenschaften 170 (Wiesbaden: Springer Fachmedien, 1971), 18.

<sup>32</sup> *Ibid.*, 13.

<sup>33</sup> E. Cassirer, *The Individual and the Cosmos in Renaissance Philosophy*, trans. M. Domandi (University of Chicago Press, 2010), xiii.

<sup>34</sup> H. Corbin, *The Concept of Comparative Philosophy* (Ipswich: Golgonooza Press, 1981), 2.

am obliged to take as my departing point here is ‘the multifaith and plurilinguistic thread of medieval philosophy,’<sup>35</sup> this is also a work on comparative religion, or at least on comparative theology and mysticism, since alphanumeric cosmology falls neatly within their ken.

In view of the philological starting point, that aims at drawing as much knowledge as possible from a single polysemy, and in view of the nature of the deeply entwined and interdependent medieval civilisations,<sup>36</sup> my approach to the comparative method is a carefully balanced exercise in *untranslatability*. I shall try to ‘observe the flexibility of a religious pattern’ as it is ‘adopted and transformed across a wide range of chronological, linguistic, and religious boundaries.’<sup>37</sup> The basic idea was expressed by Humboldt: ‘different languages are not so many designations of a thing: they are different perspectives on that same thing.’<sup>38</sup> This means that in each language, most words do not simply denote a reality, but rather express a synthesis of related meanings.<sup>39</sup> A fitting illustration is that of a jigsaw puzzle piece. Every language would be a different cut of the underlying picture of reality, and so, even though the final image is always the same, the pieces/concepts of each puzzle/language tessellate in different ways. ‘Concepts are more than words, but how they fit between words, discourses, languages and vocabulary is an unresolved issue.’<sup>40</sup> I shall be comparing the many words from Greek, Latin, Hebrew and Arabic sources with the sole aim of revealing the underlying unitary concept that manifests in so many varied ways. In doing so, I expect I will not be too far from the guidelines (*Arbeitsregeln*) laid out by Reichardt for the discipline

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<sup>35</sup> J. Marenbon, ‘Mauro Zonta and the Unity of Medieval Philosophy’, *Mediterranea. International Journal on the Transfer of Knowledge* 3 (2018): See.

<sup>36</sup> See R. Wisnovsky et al., eds., *Vehicles of Transmission, Translation, and Transformation in Medieval Textual Culture*, vol. 4, *Cursor mundi* (Turnhout: Brepols, 2011), 1–2.

<sup>37</sup> *Ibid.*, 22.

<sup>38</sup> Cited in B. Cassin et al., *Dictionary of Untranslatables: A Philosophical Lexicon*, Translation/Transnation (Princeton University Press, 2014), xix.

<sup>39</sup> A remarkable early precedent for this awareness is found in the Jain logical principle and religious doctrine of ‘non-one-sidedness’, *anekāntavāda*, or multiplicity of viewpoints (*Concise Oxford Dictionary of the World Religions*, s.v.).

<sup>40</sup> M. van Gelderen, ‘Between Cambridge and Heidelberg. Concepts, Languages and Images in Intellectual History’, in *History of Concepts: Comparative Perspectives* (Amsterdam University Press, 1998), 233.

of conceptual history,<sup>41</sup> when he considers that one of the primary tasks at hand is that of ‘the reconstruction of conceptual fields’ (*Begriffsfelder*).

Ultimately, it is my intention to expose, by unravelling the linguistic complexity, what Nietzsche called the *Geistergespräch*, the conversation of minds, as it unfurls through the centuries and cultural worlds from antiquity to the High Middle Ages, ‘a conversation about fundamental human questions going on between authors ancient and modern.’<sup>42</sup>

The advised reader will note that the whole work tends towards music and practically calls for it at every turn. At this extreme point of my compilation, as I try to sum up and reconsider the entire project, I silently ponder the influence of the many hours of J. S. Bach that I listened to during the writing of this book, in particular the Goldberg Variations. Indeed, the greatest personal benefit I may have reaped from this research work has been a remarkable sensitization to music (the *musica elementorum*, perhaps), as welcome as unexpected in its ways and its reach. It is my sincere wish that the reader will be able to attune to this strong musical undercurrent of my work.

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<sup>41</sup> See Gelderen, ‘Between Cambridge and Heidelberg’, 232–3.

<sup>42</sup> R. Goulbourne, ‘Conversations with the Dead in Early Modern France’, *The Modern Language Review* 108, no. 1 (January 2013): 95.

Part I

## Defining the Concept

## Introduction to Part I

This first part, tracing the foundation of the research, is mainly based on two texts chosen in the first place because of their seminal historical importance: one section of Aristotle's *Metaphysics*, and one section of Dionysius Thrax's *Art of Grammar* (Τέχνη γραμματική). Both these main sources are read carefully and considered in the light of their commentary traditions, while later in the book I consider some of their translations into Semitic languages.

## Chapter 1

# Notes on Early Alphabetic Cosmology

### A. Starting from Aristotle's 'Lexicon'

The *locus classicus* for the semantic speculation on στοιχεῖον, and effectively the first historical account of the use of the term, is the definition given in book Δ or the 'Lexicon' of Aristotle's *Metaphysics*,<sup>1</sup> a book of central importance for ancient and medieval commentators of Aristotle.<sup>2</sup> I will now go in detail through the various parts of this definition, following the precedent of Diels, whose comprehensive history of the word in Greek and Latin is still the basic indispensable reference.<sup>3</sup>

As I go through each section of what is really a collection of five complementing definitions, I will start taking note of the properties of the στοιχεῖον as they crop up. A list of such properties will be of the greatest usefulness for the comparative phase of this research in order to recognise the same concept in different contexts and languages. As a visual aid, I shall henceforth use this sign P on the margin to indicate the occurrences of the properties, which will be then listed together at the end. Without willing to jump ahead, I would like to note that most of the meanings that may seem to be strained out of these lines have been actually brought out over the centuries in the translations of στοιχεῖον into Latin and the Semitic languages.

- 1 στοιχεῖον λέγεται ἐξ οὗ σύγκειται πρῶτου ἐνυπάρχοντος ἀδιαιρέτου τῷ εἶδει [εἰς ἕτερον εἶδος], οἷον φωνῆς στοιχεῖα ἐξ ὧν 'Element' means a primary *immanent* component, formally indivisible into another form. The elements of an utterance, for example, are the component parts of that

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<sup>1</sup> 1014a26.

<sup>2</sup> Y. Halper, 'Averroes on Metaphysical Terminology: An Analysis and Critical Edition of the Long Commentary on Aristotle's *Metaphysics* Δ' (PhD diss., Dept of Philosophy, Bar-Ilan University, 2010), 9.

<sup>3</sup> Diels, *Elementum*.

σύγκειται ἢ φωνὴ καὶ εἰς ἃ δια-  
ρεῖται ἔσχατα, ἐκεῖνα δὲ μηκέτ'  
εἰς ἄλλας φωνὰς ἐτέρας τῷ εἴ-  
δει αὐτῶν, ἀλλὰ κἄν διαιρηται,  
τὰ μέρια ὁμοειδῆ, οἷον ὕδατος  
τὸ μέρος ὕδωρ, ἀλλ' οὐ τῆς συλ-  
λαβῆς.

utterance into which it is ultimately divis-  
ible, and which are not further divisible  
into other phonemes formally different from  
themselves. If an element is divided, the  
parts are formally the same as the whole:  
e.g., a part of water is water; but it is not so  
for the syllable.<sup>4</sup>

In this first definition, several adjectives are predicated of στοιχεῖον, but the basic initial description is ἐξ οὗ σύγκειται, 'from which there is composition,' so the first property we have is that στοιχεῖον is a *component*, a constituent like a piece of a puzzle. Elements are systemic; they do not exist in isolation.

Next, πρῶτον is used: elements are 'first things', they are *primordial*. There is in this some overlap with the word ἀρχή, which implies *origin* and *precedence*, that is a *cosmogonic* or generative, and a logical *causal* meaning. The elements are origins and causes, and this is related to the next property.

A fine point made in the definition is the use of ἐνυπάρχον to characterise στοιχεῖον as a distinctly '*immanent*' principle. In apparent contrast to ἀρχή or αἰτία, στοιχεῖον is 'consubstantial' to entities, not only underlying them, but also – to elaborate on the etymology of ἐνυπάρχω – *in-under-lying* and determining them from within themselves. It should be noted, however, that the distinction between στοιχεῖον and ἀρχή, far from being clear, has a long history and is rather undecided in the Aristotelian corpus,<sup>5</sup> as shown for instance in *De gen. et corr.*, 329a5:

Ὅτι μὲν οὖν τὰ πρῶτα ἀρχὰς καὶ  
στοιχεῖα καλῶς ἔχει λέγειν, ἔστω  
συνομολογούμενον.

Let it now be agreed that it is right to  
call the primary beings 'principles' and  
'elements'.

The next attribute of στοιχεῖον found in the first definition is ἀδιαίρετος

<sup>4</sup> Emphasis mine. Cf. the translation and comments in Crowley, 'On the Use of Stoicheion'.

<sup>5</sup> About the complications arising from Aristotle's presumed attempt at a unified elemental theory, see M. Kurdzialek, 'Elementum – Die Deutung der aristotelischen Definition des στοιχείου durch David von Dinant', in *Sprache und Erkenntnis im Mittelalter: Akten des VI. Internationalen Kongresses für mittelalterliche Philosophie*, Miscellanea Mediaevalia, 13/2 (Berlin, New York, 1981), 580–584.

τῷ εἶδει, 'indivisible in form'.<sup>6</sup> This means that the elements are *simple*, uncompounded, and Alexander of Aphrodisias clarifies in his commentary P (354.26ff): οὐ γὰρ κατὰ τὸ ποσὸν, *not as regards quantity*. The addition of τῷ εἶδει, 'regarding the form' or 'essentially', reinforces the ambiguous initial πρῶτον, like τὰ πρῶτα in the above quotation from *De gen. et corr.*, in that it has the effect of leaving the 'materiality' of the elements *undecided*. Τὰ πρῶτα can refer to bodies just as well as to some P indeterminate manner of being. This subtlety did not escape Alexander, who contrasts it with the following paragraph of the definition, as I shall do now.

- 2 ὁμοίως δὲ καὶ τὰ τῶν σωμάτων στοιχεῖα λέγουσιν οἱ λέγοντες εἰς ἃ διαίρεται τὰ σώματα ἔσχατα, ἐκεῖνα δὲ μηκέτ' εἰς ἄλλα εἶδει διαφέροντα: καὶ εἴτε ἓν εἴτε πλείω τὰ τοιαῦτα, ταῦτα στοιχεῖα λέγουσιν. Similarly, those who speak of the 'elements' of bodies do so referring to the parts into which bodies are ultimately divisible, and which are not further divisible into other parts different in form. And whether they speak of one or more than one such, they call them 'elements'.

In this second definition the στοιχεῖα are unequivocally corporeal principles, and Alexander notes that this refers to the atomists or to Empedocles 'who had everything else generated by the four' (Ἐμπεδοκλέους τῶν τεσσάρων τᾶλλα γεννῶντος). Thus, according to this, the elements are *corporeal* and their implicit *generative* power is made explicit by the verb P γεννῶ of the commentary.

- 3 παραπλησίως δὲ καὶ τὰ τῶν διαγραμμάτων στοιχεῖα λέγεται, καὶ ὅλως τὰ τῶν ἀποδείξεων: αἱ γὰρ πρῶται ἀποδείξεις καὶ ἓν πλείοσιν ἀποδείξεις ἐνυπάρχουσαι, [1014b] αὗται στοιχεῖα τῶν ἀποδείξεων λέγονται: εἰσὶ δὲ τοιοῦτοι συλλογισμοὶ οἱ πρῶτοι ἐκ τῶν τριῶν δι' ἑνὸς μέσου. The term is applied with a very similar meaning to the 'elements' of geometrical propositions, and generally those of demonstrations; for the first demonstrations which underlie the many other ensuing demonstrations [1014b] are called 'elements' of demonstrations. Such are the primary syllogisms consisting of three terms with one middle term.

This meaning of στοιχεῖα as the principles or axioms of geometrical demonstrations (διαγράμματα), is precisely the meaning of the word in the

<sup>6</sup> The appendage εἰς ἕτερον εἶδος has been convincingly shown to be 'a misguided later addition' in M. E. Kotwick, *Alexander of Aphrodisias and the Text of Aristotle's Metaphysics* (California Classical Studies, 2016), 72–4.



title of Euclid's famous work. According to this definition, the elements are *axiomatic* and *fundamental*, just as the geometric axioms which underlie and buttress Euclid's edifice. Burkert<sup>7</sup> observes that for Menaechmus, στοιχεῖα here refers to the postulates, and this is for him the meaning of Euclid's title.

It may be observed that these meanings are already contained *in nuce* in the verb ἐνυπάρχω we had encountered, and that the various definitions would seem to develop and amplify a few basic notions. This is precisely Crowley's point in rejecting 'the common assumption that the use of the term *stoicheion* in physical, metaphysical, or more generally cosmological contexts, in the general sense of principle of body, is a metaphorical derivation from some other use of *stoicheion*.'<sup>8</sup>

It is also made clear, especially by the mention of the primary syllogisms, that the elements are *organic* or interdependent, and *integral* in the sense of necessary to make a whole complete. Referring to this definition, Burkert<sup>9</sup> explains they are 'mathematical formulations which complement each other in order to perfect a system and which are logically inherent in each other.' In the *Poetica*, Aristotle illustrates this clearly: στοιχεῖον μὲν ἐστὶν φωνὴ ἀδιαίρετος, οὐ πᾶσα δὲ ἀλλ' ἐξ ἧς πέφυκε συνθετὴ γίγνεσθαι φωνή, 'στοιχεῖον is an indivisible utterance; not just any, though, but the one upon whose combination arises a composite utterance.'<sup>10</sup> Though never so explicit in Greek grammatical tradition, this is the quality eventually called *articulatio* in Latin grammar, upon the translation of συνθετὴ φωνή as *vox articulata*.<sup>11</sup>

4 καὶ μεταφέροντες δὲ στοιχεῖον καλοῦσιν ἐντεῦθεν ὃ ἂν ἐν ὄν καὶ μικρὸν ἐπὶ πολλὰ ἢ χρήσιμον, διὸ καὶ τὸ μικρὸν καὶ ἀπλοῦν καὶ ἀδιαίρετον στοιχεῖον λέγεται. ὅθεν ἐλήλυθε τὰ

Following from the above, the term 'element' is also applied metaphorically to any small unity which is amply serviceable; and so that which is small and simple and indivisible is called an 'element.' Hence it comes about that the most universal things are ele-

<sup>7</sup> Burkert, 'ΣΤΟΙΧΕΙΟΝ', 191–92.

<sup>8</sup> Crowley, 'On the Use of Stoicheion', 369.

<sup>9</sup> Burkert, 'ΣΤΟΙΧΕΙΟΝ', 192.

<sup>10</sup> 1456b22, cited in Vogt-Spira, 'Vox und Littera', 305.

<sup>11</sup> Cf. the reference to Boethius in U. Eco et al., 'On Animal Language in the Medieval Classification of Signs', in *On the Medieval Theory of Signs*, Foundations of Semiotics 21 (Amsterdam: John Benjamins B.V., 1989), 28–9, 32.

μάλιστα καθόλου στοιχεῖα εἶ-  
 ναι, ὅτι ἕκαστον αὐτῶν ἐν ὄν  
 καὶ ἀπλοῦν ἐν πολλοῖς ὑπάρχει  
 ἢ πᾶσιν ἢ ὅτι πλείστοις, καὶ τὸ  
 ἐν καὶ τὴν στιγμὴν ἀρχὰς <καὶ  
 στοιχεῖα> τισὶ δοκεῖν εἶναι.

ments; because each of them, being a unity  
 and uncompounded, underlies many things –  
 everything rather, or very many things. And  
 so it is that also the unity and the geometrical  
 point are seen by some as first principles <and  
 elements>.

From this definition we retain two complementary attributes: the elements are small, or rather *minuscule* (Alexander: ἐλάχιστα πάντη) like the geometric point, and they are universal, most-encompassing or *pervasive*.<sup>P</sup> Like the geometric point, in spite of being dimension-less, they are boundlessly present.<sup>P</sup> They are also very interestingly called ἐπὶ πολλὰ χρήσιμον, i.e. useful and used in many ways, and reliable; one could say *operative* and *helpful*. They are like reliable tools, which brings to mind<sup>P</sup> how, according to Hebrew lore, ‘The Holy One, praised be He, said, “I need workers.” And the Torah said to Him, “Let me provide you with twenty-two workers, the twenty-two letters which are in the Torah.”’<sup>12</sup>

Something else to note in this definition is how the last line equates ἀρχαί and στοιχεῖα. In fact, most manuscripts only have ἀρχὰς here, but Alexander has the addition καὶ στοιχεῖα which I have reproduced. As we have seen above, the difference between the two words is rather blurred in Aristotle. Only a few paragraphs before these lines, in 1013b20, the definition of ἀρχή makes of it a genre including φύσις, στοιχεῖον, διάνοια, προαίρεσις, οὐσία and τὸ οὐ ἕνεκα !

- 5 ἐπεὶ οὖν τὰ καλούμενα γένη καθό-  
 λου καὶ ἀδιαίρετα (οὐ γὰρ ἔστι λό-  
 γος αὐτῶν), στοιχεῖα τὰ γένη λέ-  
 γουσί τινες, καὶ μᾶλλον ἢ τὴν δια-  
 φορὰν ὅτι καθόλου μᾶλλον τὸ γέ-  
 νος: ᾧ μὲν γὰρ ἡ διαφορὰ ὑπάρχει,  
 καὶ τὸ γένος ἀκολουθεῖ, ᾧ δὲ τὸ γέ-  
 νος, οὐ παντὶ ἡ διαφορὰ. ἀπάντων  
 δὲ κοινὸν τὸ εἶναι στοιχεῖον ἐκά-  
 στου τὸ πρῶτον ἐνυπάρχον ἐκά-  
 στου.

Now, since what are called genera are  
 universal and indivisible (there being no  
 account of them), some people call the  
 genera ‘elements’, and these rather than  
 the *differentiae*, because the genus is more  
 universal. For wherever the *differentia* is  
 underlying, the genus also follows; but the  
*differentia* is not always where the genus is.  
 What is then common to all cases is that  
 the ‘element’ of every thing is that which  
 is primary and inherent in it.

<sup>12</sup> Quoted in C. Bandt, *Traktat 'Vom Mysterium der Buchstaben': kritischer Text mit Einführung, Übersetzung und Anmerkungen*, Texte und Untersuchungen 162 (Berlin: Walter de Gruyter, 2007), 73, from the Midrash *Tanhuma Yelammedenu*.

- Ⓟ With this final genus simile the elements are characterized first as ἄλογα, ‘unaccountable’, ‘*indefinable*’, ‘unexplainable’, simply ‘countless’, or perhaps ‘irrational’ in the mathematical sense, which is a synonym of ‘incommensurable’;<sup>13</sup> then secondly, in their function of genera, they are characterized as categorial or generic, as if each ‘element’ were a *genarch*, something made very explicit in acrostic compositions, where every στοιχείον begins and determines a verse or a section of the text. It is in this combined sense that Kahn speaks of ‘categorial genera, the final answer to the *What-is-it?* question for an item within each category’.<sup>14</sup>

I have dissected at length the above lines not only because they summarise for the first time in history the various meanings of our concept, but also because they contain much that will eventually inform every discussion on the topic across cultures and centuries. And because of this, they will be of use to us as a touchstone when moving forward through the more general and specialised literature.

### *I. First Glimmerings*

If we step back from Aristotle now, to examine the origins of the passage just analyzed, two strands are immediately discernible, 1) the word στοιχείον itself, and 2) the concept which eventually would be *par excellence* expressed by this term. These two strands of enquiry have to do with the etymology and the semantics.

#### *1. Etymology*

The first occurrence of a related root in Greek literature comes from *Iliad* 23, where in verses 358 and 757 the chariot racers are said to stand μεταστοιχί, explained by the scholiast as ἐπὶ στοῖχον, ἐπὶ τάξιν, ‘in a row’, ‘in order’.<sup>15</sup> One of the main aims of Burkert’s article was precisely to ‘establish the root στοῖχος conclusively, through the widest possible

<sup>13</sup> Famously in a letter simile in *Theaetetus* 202b3, τὰ μὲν στοιχεῖα ἄλογα καὶ ἄγνωστα εἶναι, αἰσθητὰ δὲ, ‘the στοιχεῖα are not rational or knowable, but they are perceptible.’

<sup>14</sup> C. H. Kahn, ‘Questions and Categories’, in *Questions*, ed. H. Hiz (Dordrecht: Springer, 1978), 251–2.

<sup>15</sup> *Scholia in Iliadem (scholia recentiora Theodori Meliteniotis, e cod. Genevensi gr. 44)*, Repr. 1966, vol. 2, Les scolies genevoises de l’Iliade, ed. by J. Nicole (Geneva: Georg, 1891), 23.757.

sampling, as the semantic origin of στοιχεῖον.<sup>16</sup> This characteristic of the στοιχεῖα is often mentioned in the grammatical literature, but it is not made quite explicit in the *Metaphysics* definition: they are *sequential*, gradual in the sense of Lat. *gradus*, a step, related to στείχω, to walk, and to στίχος, a line of verse, or a line in general.

The first ever use of the word itself seems to come from a third-hand report by Plutarch of the cosmology of the obscure Petron of Himera,<sup>17</sup> sometimes also identified to a 'sage from the Red Sea',<sup>18</sup> who posited the existence of 183 worlds (κόσμοι) arranged in the form of a triangle, with one at each vertex and sixty along each side, which are said to be next to each other and to κατὰ στοιχεῖον ἄπτεσθαι – which we could gloss as 'to cohere in orderly fashion', 'like an ABC.' A French translation gives 'ils se touchent les uns les autres par leurs éléments fondamentaux.'<sup>19</sup>

The reference to this extraordinary cosmology appears twice in Plutarch's dialogue.<sup>20</sup> Initially one of the characters presents it and adds: ἄπτεσθαι δὲ τοὺς ἐφεξῆς ἀλλήλων ἀτρέμα περιούντας ὥσπερ ἐν χορείᾳ, 'they hang on to each other in a row, going round in circles, gently, as in a dance,' but a few lines down, the narrator, presumably Plutarch, comments that he himself does not know what to make of the κατὰ στοιχεῖον ἄπτεσθαι.<sup>21</sup> Now, János Balázs, who makes a strong case for the musical-rhythmical origin of στοιχεῖον, points out how Petron's 183 worlds are 'contiguous in a choric dance with one another.'<sup>22</sup> Balázs also points out that 'the verb στείχω meant not going in general, but procession

<sup>16</sup> Burkert, 'ΣΤΟΙΧΕΙΟΝ', 169.

<sup>17</sup> See Diels, *Elementum*, 62–3; Vollgraff, 'Elementum', 91 ff. The uncertainty is directly related to the dating of Petron. Diels himself, presenting this as the earliest ever textual evidence, writes that 'he *seems* to appear in the sixth century BC' [my italics].

<sup>18</sup> See C. Macris, 'Pétrôn d'Himère', in *Dictionnaire des philosophes antiques*, ed. R. Goulet, vol. 5, 1 (Paris: CNRS éditions, 2012), 246–263, which is the best recent treatment and adds significant details to Petron's profile.

<sup>19</sup> Plutarch, 'Pourquoi les oracles ont cessé', in *Oeuvres morales de Plutarque*, trans. D. Ricard, vol. 2 (Paris: Lefèvre, 1844), 328.

<sup>20</sup> At 422b3 and later 422d7.

<sup>21</sup> See H. Diels and W. Kranz, *Fragmente der Vorsokratiker*, 6th ed., Repr. 1966 (Berlin: Weidmann, 1951), 28 (hereafter cited as DK).

<sup>22</sup> Balázs, 'The forerunners', 233. This article seems to have escaped the notice of Burkert and others. See also, along similar lines, the more recent Laspia, 'L'exkursus fonológico del Teeteto', 204.

in *well-ordered ranks*,’ and he establishes associations with the Greek appreciation of dance as the all-encompassing artistic form. Perhaps we should further specify and instead of simply considering the elements to be ‘gradual’, we might say they are choreutic, or even *dancey*. A similar usage in a cosmological context is found in *Sch. to De divinibus nom.* 256,22, «ἀλληλουχίαι δὲ τῶν ὁμοστοίχων» εἰσὶν αἱ τοῦ κόσμου **κατατάξεις** ἐκ μιᾶς οὐσίας τῆς ὕλης εἰς σώματα πληθυνθεῖσαι στερεωμάτων καὶ οἰονεὶ σειρὰ ἀλλήλων ἐχόμεναι, the ‘interconnections of those who have the same element’ are the *orders* of the universe, which from one essence are multiplied into solid bodies of the matter, and which hold to each other ‘like links of a chain.’<sup>23</sup> Even further on the musical aspect, in later Greek alchemical literature, Stephanus of Byzantium would describe how ‘Orpheus made melody with rhythmical sounds so that the symphony should re-echo the co-ordinated movement of the elements,’ where the elements are called ὁμοσταγεῖς οὐσίαι, the ‘co-ordinated essences.’<sup>24</sup>

In any case, eschewing Petron as a dubiously dated testimony, if we are looking for a completely certain earliest testimony to the use of the word, we must also dismiss Anaximander<sup>25</sup> and other pre-Socratic authors whose *ipsissima verba* are not preserved,<sup>26</sup> and acknowledge that στοιχεῖον first occurs in Aristophanes’s *Ecclesiazusae* (651), ὅταν ἦ δεκάπουν τὸ στοιχεῖον, ‘when the shadow of the gnomon is ten feet long.’ And thus we can see how the earliest certain recorded meaning of στοιχεῖον has to do with gnomonics, referring to the shadow cast on the sundial, and by extension to the module of its advance.<sup>27</sup> This powerful image combines different meanings contained in the etymology: it is a walking shadow-line, and it walks in circles, determining events as it progresses.

<sup>23</sup> *Ioannis Scythopolitani prologus et scholia in Dionysii Areopagitae librum 'De divinis nominibus' cum additamentis interpretum aliorum*, vol. 4,1, Patristische Texte und Studien 62, ed. by B.R. Suchla (De Gruyter, 2011), 236; in spite of some common ‘sociological’ readings, the medieval commentaries agree in giving to ὁμοστοιχος here a physical sense.

<sup>24</sup> F. Sherwood Taylor, ‘The Alchemical Works of Stephanos of Alexandria, part 2’, *Ambix*, June 1938: 126–27.

<sup>25</sup> See DK, 11ff.

<sup>26</sup> Cf. Druart, ‘La Notion de « stoicheion »’, 422, ‘si les textes doxographiques utilisent le mot stoicheion, les citations probables des Présocratiques, elles, l’ignorent.’

<sup>27</sup> Cf. Vollgraff, ‘Elementum’, 102.

# Index

- ‘Abd Allāh ibn ‘Abbās, 180  
‘Abd Allāh ibn Mas‘ūd, 180  
*abecedarium* rite, 221–224, 228, 264  
*abjad*, 29, 171ff  
Abraham, 125, 206, 219, 221, 224  
Abū Bakr al-Šiddīq, 180  
acrostic, 145, 146, 148, 166, 271  
Adam, 107, 218  
*ahl al-bayt*, 176  
*ahl al-kitāb*, 164  
Ahmad, Saiyad Nizamuddin, 172n  
alchemy, 84, 192, 197, 256; Bezalel,  
197; cosmic, 162; elixir, 196;  
gematria, 45; harmonics, 193;  
Hermes, 138, 196; Islamic, 193ff;  
isopsephy, 196; Jābir, 193ff;  
linguistic, 28; linguistics, 253;  
magic, 218; *mīzān al-ḥurūf*, 196; of  
meaning, 28; Pythagorean, 156;  
scattering of knowledge, 194;  
*sīmiyā*, 196; *tsaraf*, 215; *al-ustuquss  
al-uss*, 194  
Alexander of Aphrodisias, 5, 7  
Alexander the Great, 98  
Alexandria, 98  
‘Alī ibn Abī Ṭālib, 176–177, 180, 195,  
267  
alphanumeric age, XX, 277–281  
alphanumeric cosmology, XIX, XXV  
alphanumeric scission, 252, 277, 280  
alternation, cosmic, 115  
‘*amā*’, 264  
*amr*, 99, 163, 257, 264n, *see also* λόγος  
Anaxilaus of Larissa, 156  
Anaximander, 10  
Andrieu, Michel, 221, 228  
angels, 104–105, 113, 154, 178;  
ordered in ranks, 23, 174  
apocryphal gospels, 128–129  
Apollo, 30, 271  
Apuleius, 73  
Aquinas, 142, 235–236, 268; *Summa  
Theologiae*, 235, 237, 280; *De  
divinis nominibus*, 123  
Arabic (language), XXIII, 179; Arabic  
alphabet, 170–171; Arabic letters as  
numbers, 172–175; letters, 241, 253  
ἀρχή, 4, 7, 11, 18, 41, 89, 122, 157, 192  
archetype, 32, 76, 83n, 84, 117ff;  
Judaism, 112; Philo, 117; seal,  
117–119  
architecture, 87, 122, 132, 167, 194,  
218, 221–225, 236, 247, 257;  
cosmic, 276; Gothic, 280  
Archytas, 54, 80  
Aristarchus of Samothrace, 15  
Aristophanes, 10  
Aristotle, 55, 57, 61, 72, 99, 194, 280;  
*archê*, 66; categories, 59, 65;  
*Categories*, 60; corpus, 4, 53, 234,  
235; *De gen. et corr.*, 4, 5; decad,  
58–59; description, 188;  
*Metaphysics*, 226n; *Metaphysics*,  
3–9, 50, 53, 56, 58–59, 189–193,  
210, 235; μίμησις, 56; *Physics*, 189;  
*Poetica*, 6; *Rhetoric*, 191;  
*Sophistical Refutations*, 64;  
στοιχείον, definition, 3–8, 13, 18,  
23, 182, 210  
ἀριθμοὶ ψιλοί, 212  
*arkān*, 190, 195, 249, 251  
art, 229, 246, 270  
*articulatio*, 6

- articulation, 165, 285  
*Asclepius*, 136, 142  
 Asclepius of Tralles, 74  
 ἄσκημα ὀνόματα, 144  
 al-Ash‘arī, Abū al-Ḥasan, 164  
*asmā’*, see Divine Names  
 Astarābādī, Faḍl Allāh, 269  
 astronomy, 125, 133  
*atbash*, 158  
 Athanasius, 162  
 atomism, 12, 12n, 14, 196; ἄτομος, 15  
 ‘Atṭār, 166  
 Augustine, 228; *De diversis  
 quaestionibus*, 123  
 Averroes, see Ibn Rushd  
 Avicenna, see Ibn Sīnā  
*awliyā’*, 267  
  
 Bach, Johann Sebastian, XXVI  
 Baeck, Leo, 207, 211–212  
 Balázs, János, XXII, 9, 182  
 Bandt, Cordula, 124–125  
 Barsanuphius, 129  
*barzakh*, 167, 188, 263  
 Bedouins, 168, 169  
*Begriffsgeschichte*, XXIII–XXV, 57,  
 100, 193, 270, see also polysemy,  
 semantics  
 Ben Azzai, 107  
 Ben Barzillai, Judah, 209  
 Ben Nissim, Judah, 216  
 Berschin, Walter, 222n  
 Bezalel, 105–106, 113; alchemy, 197  
 Bitton-Ashkelony, Bruria, 130  
 Blössner, Norbert, XXIII  
 Boethius, 15, 71, 73–92; *aetas  
 Boethiana*, 92; *De consolazione  
 philosophiae*, 93–94; *Fundamentals  
 of Music*, 69–70  
*Book of Jubilees*, 125, 127  
 bridge, 81, 82, 274  
 Brisson, Luc, 234–235  
 al-Būnī, Aḥmad, 252, 255, 255ff, 262,  
 268; *Corpus Bunianum*, 255; *Shams  
 al-ma‘arīf*, 255ff; *al-Uṣūl  
 wa-al-ḍawābiḥ*, 261  
 Burkert, Walter, XXI, 6, 8, 15, 21, 26,  
 51, 53, 53ff  
 Burnet, John, 11  
 Burnett, Charles, 277n  
 Bücheler, Franz, 44  
  
 cadastre, 236  
 Calcidius, 71, 234  
 calligraphy; Arabic calligraphy, 164,  
 177  
 Casewit, Yousef Alexander, 267n  
 Cassiodorus, 73  
 Cassirer, Ernst, XXIV  
*Catena*, 122  
 Chantraine, Pierre, 116n  
 Charlton, William, 234  
 children, 18, 128, 272  
 Chittick, William C., 263  
 Choeroboscus, Georgius, 46–48  
 Chomsky, Noam, 49n  
 Chrisomalis, Stephen, 39n, 41, 46  
 Christian monastic orders, 281  
 Church Fathers, 114, 122, 223  
 Cicero, XVII, 14  
 Clement of Alexandria, 114  
 Codex Vigilanus, 278  
 Colpe, Carsten, 136  
 Companions of the Prophet, 176  
 comparative religion, XVIII, XXV  
 computation, 49n, 55, 105, 123  
 conceptual history, see  
*Begriffsgeschichte*  
 constellations, 13  
 Coogan, Michael David, XXI  
 Coomaraswamy, Ananda K., 57n  
 ‘co-ordinated essences’, 10  
 Cornelli, Gabriele, 53, 60  
*corpus incorporeum*, 276  
*Corpus Hermeticum*, 136, 138, 141ff  
 cosmogony, 218  
 Coullaut Cordero, Jaime, 256  
 craft, 132

- craftsmanship, 29, 67, 76, 83, 105, 108, 109, 115, 116, 123n, 142, 150, 159, 197, 249
- creation, 161; verbs, 218
- creation verbs, 106, 141
- cross, 222–224; bilingual alphabetic cross, 223; decussate crux/*crux decussata*, 222, 225; St Andrew's, 223
- Crowley, Timothy J., XXII, 6, 13
- Curtius, Ernst R., XXIII, 92
- Dā'irat al-ahruf al-abjadiyya*, 259
- Daniel, 110–111
- Dante Alighieri, 237, 264
- De Groot, Jean, 66
- De Rossi, Giovanni Bautista, 224, 226n
- demiurge, 23, 29, 94, 106, 109n, 118, 123n, 132, 217, 247, 270, *see also* craftsmanship; literary, 275; magic, 181, 271
- Democritus, 12, 196
- Diels, Hermann, 9n, 11, 13–15; *Elementum*, XXI, 3
- Dillon, John M., 112
- Dionysius the Areopagite, 213; scholia, 10
- Dionysius Thrax, XIX, 73; *Ars grammatica*, 15–16, 169; scholia, 16ff
- Divine Names, 103, 109, 113, 148n, 173, 178, 187, 217, 255, 258n, 262; *al-Kātib*, 173; *Khāliq*, 83; *Mudabbir*, 265; *Mufaṣṣil*, 265; *al-Muṣawwir*, 217, 251; *Ṣāni'*, 83; *τεχνίτης*, 83; *Tsayyar*, 217; *Yotser*, 108, 217
- division for dominion*, 226
- division for orientation*, 208
- Djebbar, Ahmed, 229n
- Domninus, 213
- Donnolo, Shabbatai, 209
- D'Ooge, Martin Luther, 74, 84
- Dornseiff, Franz; *Das Alphabet in Mystik und Magie*, XX, XXI
- Druart, Thérèse-Anne, XXII, 13
- al-Du'alī, Abū al-Aswad, 177
- ductus*, 183, 208
- Dunash ibn Tamim, 209
- duplex liber*, 185
- 3 *Enoch*, 102, 110, 113, 125
- Eastern origins, 239
- Ebstein, Michael, 183
- ἐκμαγεῖον, 234, 264, 276
- element, *see also elementum*; στοιχεῖον; ambiguity, 11; 'ascending' and 'descending', 142; concept of, 11
- elementum*, XVII, 14, 33–36, 141; as letter, 14, 35, 283
- Empedocles, 5, 11
- Enoch, 137, 138
- Ephesian letters, 143, 147, 239
- Eriugena, John Scotus, 228–231, 268
- ἔρμα, 138
- etching, 117
- Euclid, 13, 192; *Elements*, 6, 192, 278
- Eudemus of Rhodes, 12–13
- eurhythmy, 246n
- Eusebius of Caesarea, 32
- Exodus, 105–107
- Fahd, Toufic, 172n
- Fakhr al-Dīn al-Ṭurayhī, 185
- al-Fārābī; *Kitāb al-Ḥurūf*, 189
- Fates, 179n
- Fibonacci, 279
- Ficino, Marsilio, 140
- Fowler, David H., 48
- Förster, Niclas, 156
- Gadamer, Hans-Georg, XXIV
- Galen, 192, 195
- Garrido, Pilar, 255
- Geistergespräch*, XXVI
- gematria, 42, *see also* isopsephism
- Genesis, 101–104, 107, 122, 218, 230
- γεωδαισία, 226, 260
- al-Ghazālī, Abū Ḥāmid, 175n, 254, 255
- gnomon, 10, 66–67, 76n



- γνῶσις, 150, 152  
 Gnostic writings, 151–162, *see also*  
     Marcus the Valentinian; *Evangelium*  
     *Veritatis*, 152–154; *Marsanes*,  
     154–155  
 Gnosticism, 112, 151, 161  
 gold, 19, 238  
 Gothic style, 70, 280  
 γράμματα, 16; identified to στοιχειῶν,  
     16–18, 20, 23  
 Greek (language), XXIII  
 Gril, Denis, 183  
*groma*, 224, 225  
 Gruenwald, Ithamar, 204  
  
*habā'*, 264  
 Ḥadīth literature, 176–179, 185; *Kutub*  
     *al-sitta*, 177; *Musnad Aḥmad*, 177;  
     *Riyāḍ al-ṣāliḥīn*, 177; *Ṣaḥīḥ Muslim*,  
     178; Shī'ī hadīths, 180, 187  
 Halevi, Judah; *Kuzari*, 209, 210  
 Hallum, Bink, 245n  
 Ḥamuvayī, Sa'd al-Dīn, 255  
 Hanegraaff, Wouter J., 136n  
 Hani, Jean, 109n  
 al-Harawī, Abū 'Ubayd, 186  
 harmony, 15, 58, 63, 81, 110n, 175,  
     245; acoustic harmony, 231  
 Hayman, A. Peter, 204, 206n, 209, 213  
*hayūlā*, 174, 249, *see also* matter  
 Hebbelynck, Adolphus, 124  
 Hebrew (language), XXIII; four  
     alphabetic wheels, 216  
 Heraclitus, 12  
 Hermes, 19, 20, 30, 33, 72, 137–138,  
     150, 196, 218, 225, 271, 273n;  
     Hermes Trismegistus, 135, 140, 149  
*Hermetica*, 135–136, 141; 'practical'  
     *Hermetica*, 150  
 Hermetism, 135, 136n, 144; Gnostic  
     writings and, 152; magic texts and,  
     150–151  
 Herodotus, 19n  
 Hexameron, 101, 103, 218  
 Hicks, Andrew, 63  
  
 Hildegard of Bingen, 238  
 Hilgard, Alfred, 16  
 Hippolytus, 43–44  
*ḥisāb al-jummal*, 45, 172, 253, *see also*  
     isopsephism  
 history of ideas, *see Begriffsgeschichte*  
 Holzhausen, Jens, 136, 142  
 Homer, 189; *Iliad*, 8, 16  
 Horace, 15  
 Huffman, Carl, 51, 53, 60; *Philolaus*,  
     61ff  
 Humboldt, Wilhelm von, XXV  
*ḥurūf*, 174, 264n, *see also* *abjad*, 'ilm  
     *al-ḥurūf*; *al-'ilal*, 183; as  
     prepositions, 76; numerals, 248;  
     *ṣawt wa-hurūf*, 164; translation, 91,  
     191, 241  
  
 Iamblichus, 71, 98, 235, 245; *Vita*, 72n  
 Ibn 'Arabī, Muḥyī al-Dīn, XX, 184,  
     252, 261ff, 268; *al-Futūḥāt*  
     *al-makkiyya*, 255, 262, 265ff; *Kitāb*  
     *al-mabādi'*, 262; *Kitāb al-mīm*  
     *wa-al-wāw wa-al-nūn*, 265;  
     *Tarjumān al-ashwāq*, 268  
 Ibn Barrajān, 241n, 254, 262n  
 Ibn Ezra, Abraham, 107, 260, 278  
 Ibn Ishāq, Ḥunayn, 192  
 Ibn Manzūr; *Lisān al-'arab*, 171  
 Ibn Masarra, 184, 254, 262n  
 Ibn Nadīm, 189  
 Ibn Rushd; *Tafsīr Mā ba'd al-ṭabī'a*,  
     189  
 Ibn Sab'īn, 229n  
 Ibn Sīnā, 73; *Risāla al-nayruziyya*, 253;  
     *al-Shifā'*, 191  
 Ibn al-Qifṭī, 243, 260n  
 Idel, Moshe, 229n  
 Ifrah, Georges, 277n  
*Ikhwān al-Ṣafā'*, 242–252, 262, 265;  
     *Rasā'il*, XX, 73, 183, 242ff, 280  
 'Ilīyūn, 173  
*'ilm al-ḥurūf*, 166–176, 182, 184;  
     Adam, 248; alchemy, 194, 196;  
     Astarābādī, 269; *Cratylus*, 196;

- elements, 241; Jesus Christ, 264;  
prepositions, 189, 257; two  
branches, 184
- images, 145
- imitation, *see*μίμησις
- impression, 32, 112, 116
- informatio*, 266, 276
- initiation, 14n, 44, 152, 167, 168, 180,  
265; ‘Alī, 176; religion and magic,  
147
- ink, 163, 174, 179, 183, 185, 242, 257,  
*see also* typography
- International Phonetic Alphabet, 25,  
140n
- inversion, cosmological, 87, 115
- Irenaeus of Lyon, 156–160
- Isaiah, 108, 111
- Isidorus of Seville, 73; *De natura  
rerum*, 94
- isopsephism, 42ff; living practice, 45
- Jābir ibn Ḥayyān, 193–197; corpus, 183,  
194, 197; the ‘Geber problem’, 193;  
*Kitāb al-uṣṭuquṣ al-uss*, 194–195;  
*Kutub al-mawāzīn*, 196–197
- Ja‘far al-Ṣādiq, 180, 240, 241
- jafr*, 172, *see also* isopsephism
- Jeremiah, 108, 219
- Jerome, St, 114
- Jesus Christ, 122, 128, 146, 153, 227,  
264, 265, 273; alpha and omega,  
126; as Islamic prophet, 264; λόγος,  
122; name, 157, 159
- Job, 219
- Jospe, Raphael, 209
- Kadelbach, Ada, 110n
- Kahn, Charles H., 8
- Kalvesmaki, Joel, 44n
- Karr, Don, 201n
- Keil, Heinrich, 34
- al-Khalīl ibn Aḥmad al-Farāhīdī, 169
- khawārij*, 165, 265
- al-Khwārizmī, Muḥammad ibn Mūsā,  
279
- Kittel, Gerhard, XXIII
- Klein, Jacob, 49
- Koller, Hermann, XXI
- Kraus, Paul, 191
- Krishna, 273
- Kutsch, Wilhelm, 74
- Kyranides*, 149
- Lagercrantz, Otto, XXI
- Lallot, Jean, 17
- Lamennais, Hugues-Félicité de, 270
- Lamentations Rabbah, 110
- language, XXV; Middle Ages, XXIII
- language of the birds, 166
- Laspia, Patrizia, XXII
- Latin (language), XXIII
- Leibniz, Gottfried Wilhelm, 55n
- letters; atoms, 12; cosmogonic role of  
the alphabet, 23; γράμματα, 16, 17;  
origin, 20; Phoenician origin of the  
alphabet, 18; semitic origin, 19
- ‘lettrism’, XIXn
- liber mundi*, 185
- Liebes, Yehuda, 207, 213
- light, 27, 108, 109, 201n, 231, 238, 241,  
267
- literature, 275
- liturgical literature, 221–222
- Llull, Ramon, 229–230
- logic, 84, 248
- λόγος, 25, 46, 82, *see also* ratio;  
Abrahamic, 99; Christ, 76;  
cosmopoietic, 236; descent, 126;  
design, 84; Hermes, 137; instrument,  
209; *logos*-less elements, 142; noetic  
model, 118; numerical, 234ff; order,  
120; Philo, 115ff; Pythagorean, 58ff;  
reckoning, 142; St John, 122ff; the  
Word, 162; vs ἔργον, 143
- Lohmann, Johannes, XXII
- Lory, Pierre, 253, 254n
- Lovejoy, Arthur Oncken, 112
- lucida materia*, 238
- Lucretius, XVII, 14, 36; *De rerum  
natura*, 14n

- ludic aspect, 44, 272  
 Lumpe, Adolf, XXII  
 Luz, Christine, 145, 281  
 Luzzatto, Samuel David/Shadal, 107
- Macrobius, 71  
*mādda*, 175, 188, 195; ink, 183, 257  
 magic, 27; 24 letters, 149; and ABC, 147; architecture, 167; cosmic language, 166; cosmogony, 181; cosmopoiesis, 271; critique, 167, 218; divinatory, 40; graphic, 145; Hermes, 150, 271; isopsephy, 44; linguistics, 253; *melothesia*, 31; numerology, 131; phonemes, 143ff; religion, 256; religious status, 147; science, 151; *sīmiyā*, 172; Solomon, 167; Tarot, 272; transmutation, 218; utterances, 143, 145; vowels, 145, 155; *wahm*, 241  
 magic square, 245, 251; compendiousness, 260  
 Magical Papyri, 144ff  
 Maimonides, 217, 280  
*makhraj*, 265  
*manṭiq al-tayr*, 166  
*maqādir*, 178, 188  
 Marcion of Sinope, 152n  
 Marcus the Valentinian, 152, 156–161  
 Marinus, 99, 192, 213  
 Marquet, Yves, 244, 250  
 Martianus Capella, 73  
 Mary, the Virgin, 237–238  
 Masi, Michael, 84  
*materia*, 234, *see also hayūlā, mādda; mater*, 233; *signata*, 235, 249  
 matter, *see hayūlā, mādda, materia, ὕλη*  
 Mayer, Toby, 254n  
 Māzandarānī, Muḥammad Ṣāliḥ, 187n  
 measure, 131, 236, 242; forms, 188; ritual, 226  
*melothesia*, 30, 158  
 Melvin-Koushki, Matthew, 254n  
 Menaechmus, 6  
 Menninger, Karl, 38, 41  
*mensuratio*, 226, 260  
 Merlan, Philip, 81, 211–212  
 metallurgy, 105, 137, 215  
 metaphysics, 188  
 Metatron, 148  
 Middle Ages; languages of, XXIII  
 μίμησις, 26, 56, 117, 270; liturgical, 57  
*mīthāl*, *see* paradigm  
*mīzān*, 66n, 165n, 194, 195, 197n  
 monastic literature, 129–130  
 monotheism, 98, 99  
 Moschopoulos, Manuel, 260  
 Moses, 105, 114, 116, 118, 125; Decalogue, 208  
 ‘Mundus-Annus-Homo rota’, 94–95  
 Muḥammad, Prophet, 83n, 163, 163n, 169, 195, 267  
*Mysteria litterarum*, 124–129, 147, 156
- Nag Hammadi Library, 152ff  
*na’l al-nabī*, 83n  
 al-Nasafī, ‘Azīz al-Dīn, 186  
 navigation, 86n, 208  
 Neo-Platonism, 13, 55, 71–72, 92, 135, 212, 228, 230  
 New Testament, 13, 223; Revelation, 126; St John, 58, 122, 269; St Matthew, 123, 126  
 Nicomachus of Gerasa, 71, 73, 98, 105, 174, 245, 274; *Introduction to Arithmetic*, XX, 72–92, 260  
 Nietzsche, Friedrich, XXVI  
*niḡām*, 253  
*nomina; barbara*, 143; *defixa*, 144, 147  
*nūr Muḥammad*, 267  
 Nussbaum, Martha C., 50, 62  
*nutq*, 165, 166, 209
- Odeberg, Hugo, 102  
 Old Testament, 223  
 oneiromancy, 272  
 onomatomancy, 172  
 onto-images, 146n  
 order, *see* τάξις

- Ordines Romani*, 221, 228  
 Orpheus, 10, 72n  
 Orphic literature, 148  
 οὐσία, 7, 10  
 Ovid, 15  
  
 Palamedes, 132  
 palindrome, 145, 146, 148  
 pangram, 145, 271, 274  
 Panofsky, Erwin, 280  
 paradigm, 81, 83, 87, 115, 188, *see also*  
     archetype  
 Paramelle, Joseph, 124  
 participation, 56, 59  
 Pecorella, Giovan Battista, 17  
 Pelagius, 231  
 periodic table, 274  
 perlative, 86n  
 Petron of Himera, 9  
 Philo of Alexandria, 71, 72, 83,  
     113–121, 123, 142, 196, 209; *De*  
     *cherubim*, 115; *De mutatione*, 119;  
     *De opif.*, 113–114, 114ff  
 Philolaus, XX, 54, 57, 60–61;  
     Fragments of, 61–68  
 philology, XXIII, XXV  
 Philoponus, John, 74  
 philosophy, XXIV; comparative  
     philosophy, XVIII  
 φύσις, 7, 20, 24, 65, 66n, 67, 141, 142  
 Planudes, Maximus, 278  
 Plato, XVII, 12, 13, 48–50, 72, 99, 274;  
     corpus, 12–13, 77n; *Cratylus*, 64,  
     196; *Epinomis*, 80, 107; *Phaedrus*,  
     33; *Philebus*, 68, 139–141, 208, 241;  
     *Respublica*, 48, 49, 189; scholia, 48;  
     *Theaetetus*, 8n, 13, 143; *Timaeus*,  
     XVII–XVIII, 14, 54–55, 57, 71, 81,  
     93, 94, 111, 114, 116, 141, 196, 223,  
     234, 238n, 247, 270, 276  
 Platonism, 64, 71, 92, 99, 161, 212,  
     214, 216, 274; Middle Platonism,  
     116, 121; Sufism and, 254  
 play, 44, 272  
 playing cards, 272  
  
 Plotinus, 71, 162, 211, 213, 249  
 Plutarch, 9  
 polysemy, XXIII, XXV, 17, 122, 188  
 polytheism, 99  
 Porphyry, 72  
 pre-Socratics, 10, 13, 15  
 prepositional metaphysics, 76, 86  
 pricking, 83  
 printing, 32, 117, *see also* typography  
 Priscian, 35  
 Proclus, 99, 192, 212, 235, 245, 250,  
     274; *Theologia Platonica*, 64  
 προκέντημα, 83  
 Prometheus, 20  
 Proverbs, 110  
 Psalms, 101, 104, 107–109  
 Psellos, Michael, 232–233  
 Pseudo-Plutarch, 11  
 Psychoyos, Dimitris K., 42  
 Pythagoras, 21, 44, 46, 49, 51, 52, 57,  
     58, 71; letters' shapes, 23; στοιχειά,  
     origin and nature of, 23  
 Pythagorean physics, 56, 59  
 Pythagoreanism, XIX, 11, 44, 46,  
     50–60, 63, 65, 76, 92, 104, 196, 214,  
     223, 280; 'arithmetic'  
     Pythagoreanism, 68; *Ikhwān al-Ṣafā'*  
     and, 243–245; New Pythagoreanism,  
     71, 135, 156; Philo, Plato and,  
     113–114; Platonic Pythagorean  
     arithmetic, 71  
  
 Qalonymos b. Qalonymos, 73, 74  
 quicksilver, 137  
 Quintilian, 15  
 Qur'ān, 22, 125, 163n, 253; *āyāt*, 164;  
     exegesis, 179, 186, 256; as *kalām*  
     *Allāh*, 164; as *kitāb*, 173–175;  
     letter-number and, 173, 175, 182ff;  
     letters of the suras, 180–182;  
     Qur'ānic theurgy, 256, 257;  
     recitation of, 164, 175, 178, 258;  
     revelation of, 163, 169; Sura 1,  
     *Fātiḥa*, 178; Sura 36, *Yā Sīn*, 163n,  
     180; Sura 55, *al-Raḥmān*, 195; *umm*

- al-kitāb*, 178
- Rabanus Maurus, 227–228
- Rashi, 102, 106, 108
- ratio, 46, 58, 173; archetypal, 76;  
 geometry, 58; music, 58, 63;  
 Philolaos, 66
- ratio*, 81, 82, 86, 93, 123; demiurgic,  
 123; four meanings, 123; translation,  
 84
- al-Rāzī, Abū Hātim, 240–242
- al-Rāzī, Fakhr al-Dīn, 165
- receptacle, 234, 238, 276
- resonance, 160
- rite, 132, 224, 226, 245
- ῥιζώμα, 11
- Rogge, Christian, XXI
- Rousseau, Adelin, 156
- Rūmī, Jalāl ad-Dīn, 255, 280
- Runia, David Theunis, 114, 116n
- Ryle, Gilbert, XXII
- Sa'adyā Gaon, 73n, 204, 209, 212, 214,  
 262; *Commentary*, 216, 217n; *Kitāb  
 al-mabādi'*, 210
- sainthood, 166, 265, 267
- Schofield, Malcolm, 59
- scholasticism, 280
- School of Chartres, 70
- Schwabe, Wilhelm, XXI
- Sebokht, Severus, 278
- Sefer ha-Bahir*, 268
- Sefer Yetsirah*, XVII–XVIII, XX, 73,  
 86, 125, 130, 201, 223, 240, 268,  
 270; *Hilkhot Yetsirah*, 218; *Sod  
 ha-Ibur*, 219; text, 201–205
- sefirah*, 205, 206, 211–213, 268; *beli  
 mah*, 212, 214; tally, 107;  
 translation, 214
- Segol, Marla, 205, 218
- semantics, XXIII, 3, 8, 20, 28, 37, 46,  
 64, 100, 107, 119, 122, 130, 163n,  
 178, 188, 190, 195, 239, 272; matter,  
 233, 234
- semioticity, 271
- Septuagint*, 101, 105, 218
- Sergius, 35
- Servius, 225
- Shah-Kazemi, Reza, 267n
- sharī'a*, 218
- shekhinah*, 238n
- Shem, 220
- Shīrāzī, Mullā Ṣadrā, 185
- Shī'a Islam, 176, 177, 180, 267;  
 esoteric Shī'ism, 183; Ghulat, 187;  
 Ismā'īlīs, 184, 187, 267
- Sībawayh, 169, 177n
- al-Sijzī, Abū Naṣr, 165
- Sisyphus, 20
- Sittig, Ernst, XXI, 15
- snake, 32, 33, 196, 276
- Solomon, 109, 166–167
- spell/spelling, 141, 147–149, 161, 170,  
 175, 253; cosmogonic, 273
- Speusippus, 54
- stamp, 32, 87, 112, 116, 117, 119, 127,  
 174, 230
- stars, 43
- Stephanus of Byzantium, 10
- stoichedon* style, 226, 260, 270; and  
 Hebrew, 31
- στοιχείον, XVII, *see also* element;  
 alphanumeric duality, XVIII–XIX,  
 21–22; ἀρχή, 7, 18, 192; cosmology  
 and, XVII, 9; defined, 11;  
 etymology, 8–10, 20–23; identified  
 to γράμμα, 16–18, 20, 23;  
 intermediary nature, 20;  
 musical-rhythmical origin of, 9;  
 number and order, 21; primordiality,  
 18; as principles, 12–13
- Stoics, 116, 121
- Stroumsa, Guy G., 98n
- Stroumsa, Sarah, 124n, 128
- Sufism, 176–177, 180, 183, 184, 252ff,  
 268, 281
- al-Sulamī, Abū 'Abd al-Rahmān, 254
- sunna*, 218
- Sunni Islam, 176, 179, 184
- surveyors pegs, 276

- Sviri, Sara, 183  
 symbolism, 271  
 symmetry, 246n
- Taaautos/Thoth, 33, 138–141, 182, 208  
*tabdīd al-‘ilm*, 194  
*tafsīr* literature, 179, 185  
 Talmud, 101n, 104, 106, 113, 217;  
   Gemara, 101n  
*Tanakh*, 101–113, 210  
*tartil*, 175  
*taṣawwur*, 276n  
 τάξις, 8, 16, 21, 22, 24, 27, 38, 50, 57,  
   59, 109, 116, 126, 128, 130  
 Tegmark, Max, 274  
 τέμενος, 224  
 Tetraktys, 11, 158, 160  
 Thābit ibn Qurra, 73n, 74–92, 245, 260  
 Theano, 59  
 Thomann, Johannes, 172n  
 Thomas of Sutton, 236n  
 al-Tirmidhī, 179  
 al-Tirmidhī, al-Ḥakīm, 254  
 Torah, 7, 86, 107, 125, 216; creation of,  
   102  
 al-Tustarī, Sahl, 254, 262n  
 ‘two books’, 185  
 typography, 112, 115, 127, 230  
 τύπος, *see* stamp, typography
- Uhlig, Gustav, 15  
 ὕλη, 10, 59, 75, 82, 115, 174, 233, 235  
*‘ulūm al-ḥarf*, 181, 184, *see also* ‘ilm  
   *al-ḥurūf*
- unfolding, 131n, 134, 142  
 Urvoy, Dominique, 229n  
*ustuqus*, 190ff, 244; etymology, 190;  
   translations, 192
- Vajda, Georges, 212, 213n  
 Van Bladel, Kevin T., 136n  
*verbum*, 123, 238  
 Viltanioti, Irini-Fotini, 62, 67  
 Vitruvius, 223  
 Vogt-Spira, Gregor, XXII  
 Vollgraff, Wilhelm, XXI  
 Von Fritz, Kurt, 51  
 vowels, 154  
*Vulgate*, 101, 105, 218
- waqf*, 245, 260, 261  
 Warburg, Aby, XVIII  
 weaving, 133  
 weight, 131, 197  
 Weiss, Tzahi, XXII, 273  
 Whorf, Benjamin Lee, 28n, 275  
*wilāya*, 267  
 Wolfson, Elliot R., 204  
 Wortmann, Dierk, 148  
 writing; divine origin, 20
- Yates, Frances, 229, 230  
 YHWH *Tzeba’ot*, 22  
*yotser*, 108, 217
- Zeno of Alexandria, 213  
 Zeus, 42; Zeus Stoichadeus, 21, 22  
 Zhmud, Leonid, 62  
 Zosimus, 193