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"THE FRAGMENTS OF ERATOSTHENES OF CYRENE"

Thesis submitted for the Ph.D. Degree

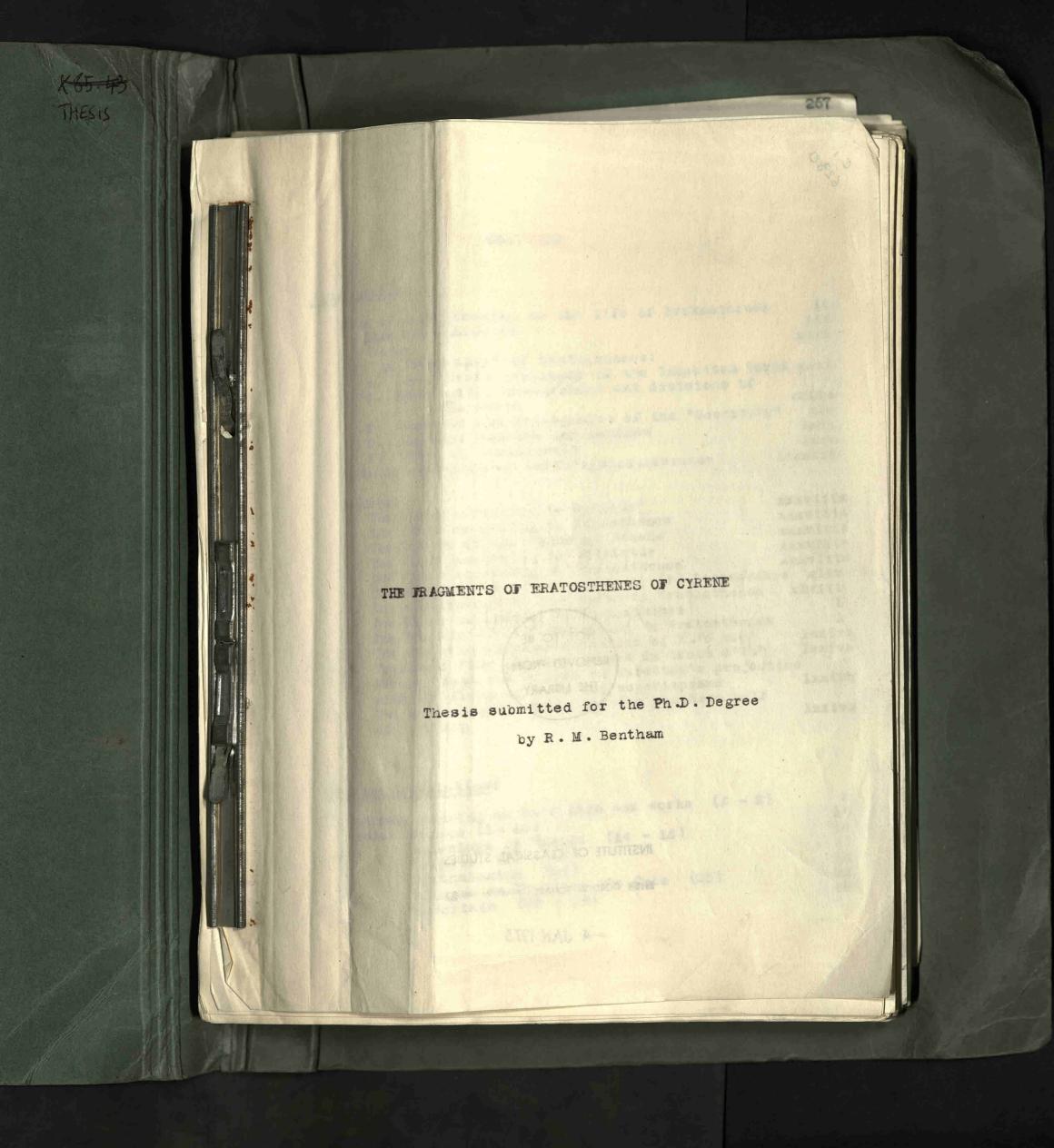
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Part 1: Introduction

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Introduction

Table of I Life

II Work

III The

B. 5

c. c

D. 3

Tuble of

Figures:

1. The

3. The

4. The

5. The

7. The

8. The

9. The

10. The

12. Euro

with

02 1

Text and th

Fatract

Poems:

CONTENTS

ntroduction:	
Table of dates bearing on the life of Tratosthones	11
Table of dates decine on	111
	xiii
	34
The same of the sa	TO YVAT
n. Spherioity, mass are month of the	XXXXX
	* 11v
C. Contents and arrangement of the "Geography	lxii
D. The map: sources and me ineds	lxxv
Table of estimates of earth's oirounference	lxxxiii
Table of datient ods of the	
Figures:	Axxviiia
WELL WARRANT ALSO TO THE TOTAL OF THE PARTY	xxxviiis
TARREST TO LO LIBER DE LA LINE DE	xxxvilib
3. The Temple of the Winds at Athons	xxxv111k
4. The Finds according to Aristotle 5. The Finds according to Pratesthenes 7. The Finds according to Pratesthenes 8. The Finds according to Pratesthenes 9. The Finds according to Pratesthenes	XXXVIIIC
	as xliv
The state of the s	
	1
	lxxiv
9. The "Arctic Circle" accountraction of W.'s map	lxxiv
10. The traditional reconstruction du trace d'F."	
	lxxiv
with the frame of E.'s map superimposed	
13. The mathematical basis for the southern half	lxxiv
of T.'s map	
Text and translation:	
T to life and works (A - S)	2
was a sa was will all the same was a same	14
Poems: Hermes (1-13) Anterinys or Hestod (14 - 16)	18
Erigone (17 - 23)	18
an a show I so see \$ 11th [A. A.]	22
Thi gram on Doubling the vace	22
Uncertain (26 - 29)	400

The state of the s

Platonic progre (30 -The Siev The Eigh Ariston Good and Wealth a Letters Old Come Grammati Baton (1 Arsinoe Chronogr Olympio Geograph - Home diffic explor apart of wri mythe (133 -Book measur and ec as isl length arbitr (164 -Book ! and S.

Notes on the

S.E. w: finish: (187 -

Life and Hermes Anterinys Erigone Epithalan Epigram

Platonicus (Doubling the cube - proportion and	
progression - the scale - eternity and the soul)	
(30 - 38)	26
The Sieve (Classification of numbers) (39)	44
The Eight-Year Cycle (40 - 41)	46
Ariston (42 - 43)	48
Good and Evil (44 - 47)	60
Wealth and Poverty (48 - 49)	52
Letters (50 - 51)	54
01d Comedy (32 - 91)	58
Grammatica (92 - 100)	78
Baton (101)	82
Arsinoe (102)	82
Chronography (103 - 121; doubtful, 122, 123)	84
Olympic Victors (124 - 132)	96
Geography: Book One (Valuation of Previous "Geographe	T 55 00
- Homer and Hesiod - Jason, early explorers and the	17
difficulties - effect of Alexander's expedition on	
exploration - discovery of the spherioity of the es	rth.
spart from slight unevenness of surface - valuation	
of writers on physical geography - arguments agains	
mythe and travellers' tales, e.g. Megasthenes)	
(133 - 163)	104
Book Two (Sphericity of universe, and of earth -	A Property
measurement of sun's distance, circumference of ear	th
and ecliptic - zones - situation of Inhabited World	
as island in one quarter of globe - the Winds -	MED
length and breadth of Inhabited World - division in	ito
arbitrary contents, or Greeks and barbarians, wrong	()
(164 - 186)	140
Book Three (Division of Inhabited World into N.	
and S. halves - division into "Seals", beginning fr	om
S.B. with India and passing westwards, then from N.	E.
finishing with N.W. Europe and British Islas)	
(187 - 285)	172

Notes on the Text:

Life and works	269
Hermes	280
Anterinys (or Hesiod)	286
Frigone	288
Bpithalamium	291
Epigram on Doubling the Cube	292

Who hall modered - hadro sort portional successful There are the thursday and a serveriore and the same of the same of the same of the same of Tennes to the entrangential properties of plant to the contraction a transfer that the real first the state of the late of the second will be seen to be a second with the second sec . To not what the respect to the second and it does . . . Charles Markatal has separed a factor to the care and I

Platoni
The Sis
The Eis
Aristor
Good ar
Wealth
Letters
Old Cor
Gramma
Baton
Arsinos
Chronos
Olympic
Geogra

Uncerta

Index of

Index of

Index of

Bibliogra

	294
Uncertain poems	296
Platonicus	309
The Sieve	311
The Eight-Year Cycle	312
Ariston	314
Good and Evil	
Wealth and Poverty	314
Letters	315
Old Comedy	316
Grammatica	329
Baton	331
	332
Arsince	332
Chronography	342
Olympic Victors	346
Geography: Book One Book Two	361
Book Three	377
2008 1111 00	
	433
ndex of authors	
ahiggl names	437
ndex of geographical names	
A	458
ndex of personal names Troit	
	465
iblicaraphy	

Project of the control of the contro

Seegraphy: Book One escap lautiquerous le sobul



Deter benefits on the life of Systembours accepting to the district westernistes.

There is described from the second se

INTRODUCTION

normal description 200 Endage 192 Endage

- - the contract of Problem in Problem in the Person of Considering

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INTRODUCTION

Birth of Eratoskhe

Dates bearing the chief authorit

Arrival at Athena

Death of Zeno

Death of Arsinoe 1

Accession of Euerg

Arrival at Alexand

Birth of Philopeto

Death of Callimech

(Death of Zenodotus (Appointment of Ere (thenes as libraria

Accession of Epiph

Death of Eratosthe

X As successor to

Dates bearing on the life of Bratosthenes according to the chief authorities.

Ay 125124 16 216-1	Busch	Kneack	Thelames	Jacoby
Birth of Bratoskhenes	276	284	273	296-2
Arrival at Athena	265	264		256
Death of Zeno	264	262-1	264-256	262-1
Death of Arsinoe II	250	f his hir	and the ente	
Accession of Euergetes	monther in	245	ariana was Sare Katamatan da	
Arrival at Alexandria	252-1	245	245-4	246
Birth of Philopetor	Cres this		244	etson ala Avete eco
Death of Callimachus	245		236-5	
(Death of Zenodotus and Appointment of Eretos-	236-3		235-4	
(thenes as librarian.		9		246 ^X
Accession of Epiphanes			204	
Death of Eratosthenes	195	204_2	192	214-3

X As successor to Apollonius Rhodius (no mention of Zenodotus)

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As little is known about the life of Erabsthenes as about that of Shakespeare. In both cases there are traditions in plenty, but few facts. Little can be induced about either from his writings, and in the case of Eratosthenes we have not even a corpus of admittedly genuine work.

At first sight the account given by Suidas is reasonably complete, even to the Clympiad of his birth. Yet even this definite statement has been questioned, and the omissions are meny. Suidas makes no mention under the name of Eratosthenes of his librarianship at Alexandria, whereas under that of Apollonius Rhodius he does; while his account of the writing of Eratosthenes is, as we shall see later, misleading. The account of his death by self-starvation is in sharp contradiction with the epigram which describes him as yielding gracefully to gentle old age.

The date given by Suidas is, however, the only detailed guide we have. This places the birth of Eratosthenes in the 126th Olympiad, or 276-2 B.C. He is said to have died at the age of 80 (by Suidas), 82 (by Ps.-Lucian), in his 81st year (by Censorinus). According to Vitruvius he died in the 12th year of Ptolemy Epiphanes, who came to the throne somewhere between 206 and 203: this agrees sufficiently well with the foregoing. Thelamas, basing his calculations of the accession of Epiphanes in 204, places his birth with some precision between April and June 273, his death between April and June 192, but few scholars would care to bind themselves within such narrow limits.

Born and given his early education at Cyrene in North

1 Fr. A.

2 Fr. B.

3 Fr. G.

22.4. Fr. J.

5 Fr. F.

6 See Bursch: de Bibl. Alex p.29, nn.gr. 10.

7 Geog. d'E. p. 26-28.

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⁸ Fr. H,42.

⁹ Fr. 42,43.

¹ Fr. 25.

² Fr. 102.

Africa, perhaps, as Suidas says, under Lysanias, Bratosthenes proceeded to Athens as one would now to Oxford or Cambridge. How long he stayed there and what he did is quite uncertain, for there is a natural tendency to associate him with all the scholars of the period; of whom, as he himself seems to have written8, there was a very considerable number. We may accept Ariston the Peripatetic, for not only does Suidas mention him but Bratosthenes wrote a book about him". He appears also to have studied under Arcesilas and Apelles, the Academies, and Bion the Cynic. One thing, however, is quite obvious from his own writings, if we may rely on them sufficiently at second hand, and that is that he was not attached or particularly attracted to any single school. It was probably at Athens that he dev veloped the taste and ability for mathematics which never left him, and it is reasonable to suppose that some of his literary works, such as the poem "Erigone" and the mathematical - philosophical work "Platonicus" may have been published there. It is at least fairly certain that he had established sufficient as reputation to attract attention as for away as Alexandria when he was summoned there, probably at the instance of his fellowcountrymen Callimechus.

Shen this happened is not clear, but the consensus of conservative scholarship points within a few years either way of
245 B.C. when Eratosthenes was about thirty. At Alexandria he
spent the remainging half-century of his life, partly as tutor
to the young Ptolemy Philopator¹, later in attendance of Queen
Arsince III², and from the death of Zenodotus in about 235 B.C.
as the librarian in charge of the two libraries, already great
and expanding. All this time he was producing original work,
in all the fields of literature and

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⁸ Fr. H,42.

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³ F. Susemihl: Ges-Leipzig 1891 (

⁴ W.Busch: De bib. Schiverin 1884

⁵ G.Knaack: Pauly

P.Jacoby: Die Fr 241: Berling,

⁷ Fr. 42.

science practised at that time. About 194 B.C. he died, probably in the course of nature as described in the epigram. Eratosthenes was, as Strabo frequently complains, no Stoic, to consider it his duty to commit suicide at the end of a long and useful life, nor yet so unbalanced as to fall into frantic despair at the thought of gradual blindness. Suidas ascribes the same self-destruction to Aristarchus: it is not impossible that two librarians out of three should starve themselves to death, but when an alternative account is at hand it seems unlikely.

Though Susemihl³, Busch⁴, Thalamas and others agree on most points of this account of his life, it has been seriously called in question by some scholars. Basing their attack principally on the statement by Strabo that Eratosthenes was veocipally of Zeno, Knack⁵ puts back the date of his birth to at Teast 284 B.C. Jacoby⁶, assuming that pxc' in Suidas is a copyists error for pxc', even to 296-3. The point of the argument is that propagate mean a pupil, that Zeno died in 262-1, and that even Bratosthenes can hardly have studied in a philosophical school before the age of 15. This hypothesis deserves serious attention, for Strabo was almost certainly writing with the "Geography" of Eratosthenes beside him if none of the other works, and, though frequently opposing his statements, apparently reports them with a reasonable degree of honesty. There are, however, objections. Strabo himself at this point? is not quoting Eratosthenes, but complaining that, although he was prophysical of Zeno, he has not mentioned

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³ F. Susemihl: Gesch. der Griech. Litt.im der Alexandrinerzeit: Leipzig 1891 (I, pp. 409-12)

⁴ W.Busch: De bibliothecarus Alexandrinis qui feruntier primis: Schiverin 1884.

⁵ G. Knaack: Pauly-Wissowa Encyclopedia s.v. "Eratosthenes"

⁶ F. Jacoby: Die Fragmente der Griechischen Historiker, 241: Berling, 1929.

⁷ Fr. 42. to move of city pulls, Extended of gate cold

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8 E.A.Knight: Erat Culture: London

9 Wilamowritz: He

1 Ambros.e.22 (p) quoted by Buse

VI

certain Stoic philosopers, whom Strabo considers he ought to have mentioned. Although the word γνώριμοςan be and frequently is used in the sense of "a pupil", it need mean no more than "acquainted with", and it is by no means impossible that Eratosthenes might have gone to Athens and seen or spoken with Zeno before his death. Moreover, as Thalamas has pointed out, the sources for Zeno's death vary widely, and may be taken as placing it anywhere from 264 to 256 - the latter date making it quite possible for γνώριμος to be used in the more technical sense. In any case, it must be remembered that Strabo is indulging in Stoic special pleading, and might easily have stretched the facts a little, implying nothing more than close association with Zeno's school and personal influence. The whole theory involves the assumption that Vitruvius's statement is also false.

There is a further argument against the death of Eratosthenes, seconding to Knaack in 204-2 and to Jacoby in 214-213. In the quotation from his "Arsince" reflections are made upon the character and behaviour of Philopator which could hardly have been published until some time after his death; and Philopator died in 205-4 B.C. The older explanation of the passage as referring to Arsince and Euergetts is used by Busch as proving the very early presence of Eratosthenes in Alexandria, Arsince having died about 250 B.C. Even Jacoby after Wilemowritz concedes that trefers to Arsince III Philopator, while reserving judgement about its date of Writing and publication.

The statement of Tretres, that Brathosthenes worked on the library catalogues of plays with Alexander of Aetolia and Lycophron, has also been urged by Busch as evidence of his early presence in Alexandria, and it has even been suggested that he spent a short

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⁸ E.A. Knight: Eratosthenes as a Representative of Relienistic Culture: London N.A. Thesis 1930.

⁹ Wilamowitz: Hellenistische Dichtung I, p.207

Ambros.c.22 (proteg. ad Arist. schol. et schol de Plauto); quoted by Busch, of cit. p.25, Ritschl of cit. p.7.

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² F.Ritschl: Die Ptolemaern: B

³ Wilemowritz: 1

⁴ Fr. 93.

VIII

time in Alexandria before his visit to Athens. There is, however, no reason to suppose that both these men were dead by 245 B.C., the date suggested above for his removal from Athens to Alexandria; though Susemihl places it in 235.

There is now very little doubt that Erstosthenes directly succeeded Zenodotus as Chief librarian, the former theory of Ritschl2 and others that Callimachus came between being adequately dealt with by Busch and generally accepted. There can be little doubt that Callimachus was the intended successor, not only on account of his literary eminence but for his outstanding work in cataloguing the libraries, but the evidence is that he died before Zenodotus: according to Thalamas, Zenodotus died in 235.4 B.C., Callimachus a little before; according to Busch, Zenodotus in the 136th Olympiad (236-2) and Callimachus in 245. As a matter of ordinary probability, it seems reasonable to suppose that Callimachus suggested his promising young countrymon to PtolemyIII Euergetes for a post in the rapidly growing library, that he served under Callimachus with other more or less eminent men, and, when Callimachus predeceased Zenodotus, succeeded to his place. This would have the advantage of adequately explaining the use by Suidas of the phrase μαθητής.. Καλλιμάχου τοῦ ποιητοῦ. Many scholars have agreed with Wilamovritz that it was as tutor to Philopator that Eratosthenes was originally summoned to Alexandria, and that there was some connexion between the posts of royal tutor and librarian. The former idea is scarcely tenable as Philopator was not born before 244 B.C., and Eratosthenes held that a child should not begin its education until the age of seven"; the latter, for Zenodotus being the first librarian no tradition of the kind could possibly

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² F.Ritschl: Die Alexandrinischen Bibliotheken unter den ersten Ptolemaern: Breslau, 1838.

³ Wilsmowritz: Wellevistische Dichtung, I.p. 165.

⁴ Fr. 93.

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There can, then, be no final agreement upon the exact dates of the life of Bratosthenes, although the main outline is clear. Of his principal works and achievements the doubt is not so great, although even here different emphasis and interpretation have produced pictures of the man some of which must be distorted. A disproportionate amount of attention has been paid by some critics to the nicknames by which Eratosthenes was known to his contemporaries. It appears to be forgotten that en apparently uncomplimentary nickname may be merely a sign of affection, that some ninknames, such as "Little John", are deliberately "lucus a non lucando", while others arrive so casually that even their owners have forgotten their origin. Indeed, the most likely attribute of anyone possessing a number of nicknames of any kind is personal popularity. Bratosthenes was known as "Pintethlos", which can hardly be interpreted as anything but "ell-rounder", whether with an added suggestion of insufficient specialization can hardly be expressed with certeinty: it is, however, well to remember that the moxim under ayav had not lost its force even in the Hellenistic age, and that polymathy was admired at Alexandria. His title of "New Plato" can hardly be described as anything but complimentary without destroying the meaning of language, whether it referred originally to his "Platonicus" or to his eminence in geometry. Strabo's remarks that he was a mathematician among geographers and a geographer among mathematicians, and not a real philosopher, surely arose from his Stoical entipathy to mathematics, and his irritation, mentioned above, that one who had once seen the light should bave deliberately turned his

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⁶ Herodotus VII 7 Frr. 25.31.

⁸ See Ritschl,

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back on it. The name "Beta" has been taken much too seriously. It could be a jealous jibe of opponents, but it bears more the mark of a family joke, and it is well to bear in mind the story told by Herodotus⁶ of the generals after Salamis, each of whom awarded the first prize to himself and the second to Themistocles. A possibility that seems to have occurred to no one is that it was simply a reference to his being the second Librarian.

tunately first-hand evidence. To the modern mind it is his geographical work, and especially his measurement of the earth's circumference, that tends to obsure all else. To Bratosthenes it no doubt appeared to have some importance, since he devoted three books to it while to most subjects he gave only one; but there can be little doubt that in literary matters it was his much longer critical works, "The Old Comedy" and "Chronography; that he regarded as his maeter-pieces, while in science there is no doubt at all that he considered his highest achievement to be the "doubling of the cube"?. That was his claim to immortality, and it was to that that he raised a monument and wrote an epigram "more enduring than brase".

and outlook of Eratosthenes. He was a scholar in the strictest possible sense; he had control of libraries containing, according to Tzetzes, over 40,000 (the Serapeum) and nearly 500,000 (the Brucheum) volumes at the time when they were catalogued by Callimachus, and including Aristotle's own collection which had been acquired by Ptolemy Philadelphus; yet he was no mere consumer and producer of books,

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⁶ Herodotus VIII, 123.

⁷ Frr. 25,31.

⁸ See Ritschl, op.cit, p.22.

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⁹ Fr. L, and no

¹ Strabo, Books

² Fr. 270.

³ Fr. 167.

in the manner which later made the term "Alexandrian" a reproach. Even his mathematical studies were not the purely theoretical kind of Plato and the normal Greek. He was a friend, associate and correspondent9 of the applied mathematician in excelsis, and, if all other eveidence were lacking, the fact that Archimedes treated him as an equal in mathematics would suffice to indicate his quality. His geographical work was in fact revolutionary and is still bearing fruit to-day. It was based upon, if it did not contain, a great deal of important mathematical and scientific research, and must therefore he have been written late in his It consisted, as we shall see below, of a masterly adaptation of mathematical principles to pitifully inadequate factual information, a magnificent attempt which brought upon him the sneers and opposition of Hipparchus1. A century and a half later Bratesthenes was one of the chief authorities that Julius Coesar carried with him on his campaign in Goul and Britain2. On top of all this, the references now existing to the "Geography" are, to those of the other works, out of all proportion to its actual size. In view of all this, it is important to remember that Strabo refers to the individual books of the "Geography" asonouvopata or "essays". If this is the author's own name for them, it suggests that he regarded the whole work as tentative and suggestive, and, like many other authors, differed widely from posterity in estimating the relative value of his own works. As for his measurement of the earth3 that was an approximation and he knew it, but the "gadget" on the memorial at alexandria was fit in his opinion to rank with the inventions of Archimedes though the pure mathematicians had nothing but contempt for a practical solution not reached with ruler and compasses.

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¹ Strabo, Books I, II, passion.

² Fr. 270.

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4 Fr. 134 - 14 5 Fr. 23.

It is always a temptation to trace "influences" in the work of any great writer, but quite apart from the fact of having almost all our sources at second hand there is not much to be gained in the case of Bratosthenes. His was an independent and original spirit. He irritated Strabe by insufficient reverence for Stoicism, and his manner in writing of his old master Ariston is scercely respectful. He was not a "real philosopher" - that is to say, he neither followed nor founded a school. He was subject to some of the normal limitations and preconceptions of the Greeks, as will be seen particularly in relation to his geographical work; he would otherwise scarcely have been human. He was, in fact, no revolutionary for revolution's sake, but if a new idea seemed better than an old one he was ready to adopt the new. In none of his works this so well exemplified as in his remarks on Homer, which it must have required some degree of moral courage to publish; but they opened the way for the "higher criticism" of Aristarchus and Aristophanes.

Two men there were who commanded his respect and must, to some extent at least, even if without his knowledge, have influenced his work; his master and fellow-citizen Callimachus, whose maxim beyon known and fellow-citizen Callimachus, whose maxim beyon payd known fellowed (in its more obvious sense) in nearly all his works, and to whose writing it is possible, though unnecessary, to trace a slight similarity in the only two complete elegrac couplets we have, those on wine; and his correspondent Archimedes, whom Bratosthenes had sufficient intellect and sense of proportion to recognize as his superior in the imaginative scientific application of mathematics.

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⁴ Fr. 134 - 147.

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It has been shown that there can be no certainty in the chronology of Eratosthenes's life. The following dates are, however, assumed here as approximate:

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Arrival at Alexandria	245
Birth of Ptolemy Philopetor	244-3 WASSEL SHEET NO NEEDS
Death of Collimachus	236
Death of Zenodotus and appointment of Erotos-thenes as librarian	235×
Accession of Ptolemy Epiphanes	205-4
Death of Bratosthenes	194-3

This date is adopted by Susemihl (loc. at.) for the arrival in Alexandria.

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WORKS WORKS All that can be said with certainty about the works of Bratosthenes is that they were numerous, and covered almost every field of learning. So far as can be determined from the extremely slight fragments that remain of his verses, he wrate verse because (a) it was the fashion to do so, and (b) some kinds of didactic writings were normally put into verse, not only in earlier times by people like Parmenides, but later by Lucretius. The longest fragment, that on the zones, is first class verse but hardly poetry, while the spigram' on wine is at a competent level. His prose writings are, even at second-hand, very much more voluminous. A fairly close guess may be made at the original style by studying some of the longer quotations in Strabo: according to the custom of antiquity these are likely to be very nearly if not absolutely verbatim, and from them it may be gathered that the language used by Eratosthenes was as simple and lucid as might be expected of one whose chief interest was in applied mothematics.

It is was easy enough to make generalizations about the contents of the prose works of Eratosthenes. The difficulty erises when a serious attempt is made to sort out the few certain quotations, the many certain allusions and the welter of possible allusions into definite works with known titles. For us, his chief work is the "Geography"; but, as will be seen later, even in dealing with this it is impossible to state with certainty of many references to which book of the three they belong, or even whether they belong to the "Geography" at all. The preparation of a "text" of the Works of Bratosthenes is, therefore,

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a matter of assessing probabilities, and of fitting a jig-saw of increasingly battered pieces round a lamentably few fixed points. The personal element enters so much into the selection and arrangement that it can never be definitive.

The history of the reconstructed text of Eratosthenes is the history of its editors and commentators, most of them German. A bibliography of commentaries would require a book of its own, a feat actually performed by Thalamas, although even he treats the subject only from the point of view of the "Geography": a complete bibliography would contain the names of most critics of repute in England, France and Germany. Few, however, have made any substantial attempt at reconstructing the text. Anchor in 1770 made a good beginning which he did not follow up, and Seidel in 1789 made a somewhat half-hearted attempt at collecting the geographical fragments. It was not until 1822 that Bernhardy published the remarkable work which still remains the only attempt to gather the complete remaining works of Eratosthenes into one book. At the age of twenty-two he produced a corpus of fragments which, though naturally not perfect, has provided a starting-point for research until to-day, and was not afraid to express his views in forcible, though at times turgid, Latin.

The prose extracts have been augmented by Bergk³, Muller⁴, Hiller⁵ and, most recently, Jacoby⁶, but the most important contribution is that of Hugo Berger, in his monumental collection of and commentary on the "Geography". Occasional fragments, notably that on the "wind-rose", have been contributed by individuals and will be noted in their places. On the verse side, notable contributions

- 8. A. Thalamas: Etude Bibliographique de la Geographie d'Eratostheme: Versailles, 1921
- 9. L. Ancher: Diatribe in fragmenta geog. Eratosthenis, Göttingen, 1770
- 1. C. F. Seidel: Eratosthenis geographicorum fragmenta: Göttingen, 1789
- 2. G. Bernhardy: Eratosthenica: Berlin, 1822

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- 3. J. Bergk: Analectorum Alexandrinorum: Marburg, 1846
- 4. 0. Miller: Geographi Graeci Minores: Paris, 1855
- 5. E. Hiller: Der Thatovinoc des Eratesthenes: Philol. XXX, 168-173
- 6. F. Jacoby: Die Fragmente der Griechishen Historiker, 241;

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TA commis

Bernhardy has some scathing things to say of Fell, and his like, who swelled the number of titles by assigning separate works to every subject mentioned separately by any subsequent writer as baving been treated by Eratosthenes. Although it is undesirable to join "isti titulorum serutstores", with their 28 (Fell), 38 (Gale) or 49 (Fabricius) titles, it is nevertheless desirable to attempt some classification. While such titles as typically and and apply the dismissed as entirely the training the same of the passed over so easily. It therefore seems reasonable, before discussing individual works, to divide them up as follows:

- A works so frequently mentioned as to be beyond reasonable doubt;
- B works whose separate existence is doubtful, but for which a case can be made out;
- C works whose separate existence is unlikely or whose authorship is doubtfully attributed to Bretosthenes. Land to be a first the consecutive of the consecuti

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- 7 F. Csann: de Eratosthenis Erigona, carmine elegiaco: Gottingen 1846
- 8 B. Hiller: Bratosthenes carminum reliquise: Leipzig 1872
- 9 Quoted by Sir Frank Fletcher, in his Presidential Address to the Classical Association 1946.
- l Based on an emendation of έν τῶ περί πλούτου by Vossius, accepted by Fell.

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All the above, although their claims to consideration differ widely, are well-established titles. Before discussing them separately it will be well to make some observations.

Suidas, in his list of writings? does not appear to wish to give an exhaustive list of titles. His φιλοσοφά και ποιήματα και Ιστορίας, κ.τ.λ., is a kind of characteristic jumble intended to give an atmosphere of polymathy. No mention is made either of geography or of mathematics: this is sufficient in itself to discredit it as a reliable and full bibliography, and perhaps to indicate something of the relative estimation in which the contributions to learning of Eratosthenes were held in antiquity.

The whole subject of titles is greatly complicated by the habit of citing books, or possibly even smaller parts of a major work, as ev tolc sept In the same way as the when avopov were detached from the Iliad or separate incidents from the Odyssey.

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4 Fr. 25 5 Fell and Fabr 6 J.L. Heiberg: p.68. Further, there was nothing to stop any writer from treating the same subject in different works, any more than there is nowedays to prevent, say, a scientist from publishing some new research in an article in "Neture" and embodying the same material in a standard work later. We know, as surely as anything can be known in this connexion, that Eratosthenes did this in some instances. The "sones" of the "Hermes" were at least mentioned in the "Geography", and the use of the sookagov , whatever its original prose form, is repeated in the epigram4. The significance of this will be noted aspecially in discussing the contents of the "Geography". Leaving this work saide for separate treatment, we may now proceed to examine the other works under their individual titles.

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There can be no argument about the existence of this work, which is cited by name repeatedly and appears to have consisted of one book only. Its contents, however, are almost entirely a matter of conjecture. Bernhardy made no real attempt to separate it from the other philosophical writings and it can be argued that his descretion was commendable. Biller produced the arrangement of fragments which is kakkamas partly followed below, holding that the book contained the "doubling of the cube" and some general work on proportion, including the musical scales: these have been ascribed to a purely hypothetical work magnification.

Oluge 5, but from a mathematical point of view are perfectly relevant to a work on proportion.

J. L. Heiberg⁶ describes the "Platonious" as "a kind of

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5 Fell and Fabricius. See Bernhardy p.172-3

6 J.L. Heiberg: "Science and Mathematics in Classical Antiquity" p.68.

1 Million the Chromocraphic cap Protectiones: Bern, 30172, 984, 62.

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XVIII -

commentary on the "Timeeus", agreeing with Hiller more or less on the contents but stressing that the musical doctrine is in opposition to the Pythagorean teaching. Knasck, in Pauly's encyclopedia, detaches the lamblichus fragment on the relation of soul and body and ascribes it with dogmatic effrontery to a supposititions Eratosthenes, a Nec-Platonist.

It may well be that this work, which Birzel surmised took the form of a dialogue with Plato as the central figure, was at least partly responsible for the micknome of "The New Plato"; but it is hardly possible that Bratosthenes should have received this merely for restating Plato's views, and if it is to be classed as a commentary it must at least have been constructive. The arrangement of fragments adopted below brings out some close pepellels with the Timacus.

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Helberg states (los.cit.) that the "contents of" On Meens" are entirely unknown". If it were not cited twice separately by name it might well be supposed that it was an alternative title to the "Pletonicus". Hiller considers it a different work, though overlapping in contents: Eneck that it contained the more elaborate geometrical theorems in proportion of which summaries were given in the Pletonicus. In the absence of other evidence it may be retained smong the accepted works.

Χρονογραφίαι and 'Ολυμπιονίκαι.

These works, by simost universal consent, were of major size as well as importance, and it can scarcely be doubted in the light of the quotations that the influence of Eratosthenes in establishing the principal dates of ancient history had lesting effects. Niesel has insisted, while conceding its importance, that the "Chronography" as and hank kasisiss, which ear was of one book only and confined to a sketch of principle. This view he based on a

7 Fr. 38 8 Hirzel: Der Dialog I 405 ff 9Pappus: VII 636,24 and 672,5. 1 B. Niese: Die Chronographie des Bratosthenes: Herm. XXIII, 92-102.

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2 Harpocratio: Es 3 Wachsmuth: De I Univ .- Progr. 1

4 Plut. Lyourgue, 5 Fr. 122.

6 Syne. p.91c,fr. 7 Fr. 79,485 single reference². Wachsmuth³, however, disposed of this view, and the plural title bears him out. Bernhardy treats the two works as one.

We may, then, take it that both works were on a considerable scale and based opmuch careful research: certainly they commanded respect among the immediate successors of Eratosthenes, thoughthe publication of Apollodorus fifty years later put what might be called the rivel university of Pergamus shead. The "Chronographies" was a "popular" work, enlivened by anecdotes, and it is more possible that its composition was prompted by the revision of the Egyptian calendar by the Decree of Canopus in 238. In working out his framework of dates, as Jacoby points out, Eratosthenes used not only the Olympic records but those of the kings of Sparta4 and, possibly, those of ancient towns. 5 Syncellus6 attributes to Bratosthenes research in and translation from the Egyption records of the kings of Thebes: these both Wachemuth and Jacoby dismiss as a later fabrication. There is nothing that can be called conclusive external evidence either for or against this judgment, but as there is no mention elsewhere of this work and Syncellus attributes it to Bratosthenes st second hand through Apollodorus the balance appears to be in favour of it.

Περί τῆς ἀρχαίας κωμωδίας.

This work, of the "polymathic" type beloved by Alexandrians and especially by Erstosthenes, consisted of not fewer than twelve books. Its contents ranged over textual criticism, higher criticism such as discussion of the authorship of plays from the dates of performances,

2 Harpocratio: Εθήνος. (Fr. 115) ... έν τῷ περί χρονογραφιῶν.

3 Wachsmuth: De Bratosthene/ Apollodoro, Sosibio: Leibzig. Univ.-Progr. 1891-2, 3-18. (net in B.M.)

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1 Fr. 102. 2 Archimedes Vol. and the meanings and uses of words. Its arrangement seems not to have been based on any system, but to have been built up piecemeal in the manner of a notebook. According to Streeker8, in this work Bratosthenes opposed his judgment to Lycophron, Buphronius, Duris and Callinachus.

Γραμματικά It has been thought by many that Eratosthenes received his name γραμματικός from his general contributions to scholarship and in particular for the "Old Comedy". Bernhardy includes all critical fragments under this heading. There are, however, many points of literary criticism attributed to him which could hardly belong to a work on Comedy, and the fact that Clement of Alexandrias definitely mentions two books with the title γραμματικά seems conclusive. Ansack (Pauly) believes in the existence of the work.

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RESIDENCE OF STREET

This, presumably brief, biographical sketch is represented for us by one of the few direct quotations. Its intimacy gives in a few words a vivid picture of the author's privileged position at the court of alexandria, and also of his views on the character of Philopator.

Περί πλούτου καὶ πενίας.

The references to this work establish it as a philosophic exercise of no particular value.

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Lave From the fact that retters from Archimedees to Sratosthenes were current it is fairly safe to deduce that letters of Bratosthenes were also available to the public. The there the letter from Bratosthenes to Ptolemy on the Doubling of the Cube is genuine or not, the form is a common one and not unnatural for the publication of new scientific work. It is not impossible that such feats as the measurement of the earth might have been originally stated in this way. There is no evidence of the form in which the "Sieve" was published, but the fact that Archimedes wrote at least one letter to Bratosthenes propounding a mathematical problem suggests at least a

- 8 Strecker: De bycophrone, Euphronio, Eratosthene comicorum interpretibus (Diss. Greifswald, 1884)
- 9 Fr. I
- 1 Fr. 102.
- 2 Archimedes Vol.II (Teubner): p.426 & p.528.

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3 Ath. X.p. 418A () 4 Verg. Geog. I, possibility that the "Sieve" was included in a letter from Eratosthenes to Archimedes. Whether the "Letters" were ever published in a book is uncertain, but it seems likely and one reference in Athenaeus supports this view.

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These three titles have been established with some approach to certainty as those of the main poetical works of Fratosthenes. Bernherdy included all references to verse under the heading "Nercurius, poema", expending considerable ingenuity in dispersging other titles. Cosnu, however, showed that the "Arigone" at least was written in elegiacs, and later "iller produced what is still the standard edition of all the poems. His order is for the most part followed below.

The general theme of the "Hermes" is well known, being similar in its beginning to that of the Homeric Hymn. The birth of the god was described, followed by his invention of the lyre. He then ascended into the heavens, and was astonished to find that the "music of the spheres" corresponded with that of his own instrument. Erstockness went on to make remarkable and insignative use of this opportunity to draw a picture of the earth and its zones as seen from a distance, a picture of the earth and its zones as seen from a distance, a picture so familiar to our atlases that it is now difficult to appreciate how striking it must have been when new. That it was worth Virgil's while to plagiatize the passage two centuries inter is some indication of its power over the ancients. How long the peen was and its subsequent centents are utterly unknown: Bernhardy thought the "winds" were also treated, and the whole matter is complicated by confusion with the

3 Ath.X.p.416A (Fr.50) DES WE have; but in sector likely thet 4 Vers. Geog. 1, 235-9. And class post for likely thet

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The "Erigone

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"Catasterismi" (q.v.) It is, however, fairly certain that at least some star-degends were included. Hermes, being the god of invention, was a natural subject for a scientist, and in his Egyptian guise of Tot, or Trismegistus, was especially connected with the Royal family. Thalamas suggests that the poem was an adroit courtier's work. Of all the works lost to us, perhaps the greatest loss is the "Hermes".

The "Erigone" is a star-legend. Icarius was presented with wine by Dionyous. Some peasants to whom he offered it became insensible, and their companions, thinking it was poison, killed him. When the victims recovered the others, overcome by remorse, buried the body. His daughter, Erigone, was guided to it by her little dog, and hanged herself. Icarius, Erigone and the dog became the stars Bootes, Virgo and the Dog Star. From the fact that the scene is Athens, and that the conception is a lettle primitive, it may be conjectured that the poem belongs to the earlier period of Eratosthenes.

"Retribution, or Hesiod" has given rise to much dispute. Bernhardy states with great vigour that there was no such work, and alters Εριννύι to Ηριγόνη 5. He also altered the letters ένηπόδω to έννάτη 'Ολυμπιάδι6, and assigned the fragment giving the story of Hesiod to the "Chronographies". Gottling, however, followed by Bergk and Hiller, emended to έν 'Ησιόδω, and there can be lettle doubt that the two titles apply to the same poem.

Of all the poetic fragments, only the couplets 7 on wine are quoted for purely poetical reasons, the others being adduced on linguistic or scientific grounds. It is hardly fair to pronounce judgment on what we have; but it seems likely that Bratosthenes, though a first class poet for Alexandria, was not more

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⁵ Eratosthenica, p.157. Fr.16.

^{6 &}quot;p.241. "Contest of Homer and Hesiod": Loeb, "Hesiod and the Homeric Hymns", p.588.

⁷ Fr.23.

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8 Schwarz: Rhein. 9 Frr. 119-121; 1

1 Fr.43. 2 Fr. H.

3 Sext. Emp. adv.

4 Heerenius, de f Bernhardy p.19

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It has been suggested that Eratosthenes, besides mentioning Alexander and his followers in connexion with the development of geographical knowledge, also wrote a philosophical work on his upbringing and the sims of his policy to which Plutarch and perhaps Strabo had access. It would be quite possible, if there were any definite evidence of its existence, to assign to this work all the passages dealing with these subjects, including those describing Alexander's attitude to Eastern dress and perhaps even that on the diversion of mankind into Greeks and Foreigners. The treatise is, however, nowhere cited by a separate title, and in the absence of positive evidence it seems better not to accept it.

Aριστων, Περί άγαθῶν (καῖ κακῶν), Περὶ άλυπίας.

The first of these is mentioned once only as a separate title, the second a number of times, including once by Strabo coupled with the termμελέται 2. The only mention of the third is that in Suidas.

As Eratosthenes apparently studied under Ariston, it is by no means impossible that he write a short memoir of him; although the single fragment we have is by no means complimentary. In any case, Ariston being the originator of the art of fine definition of "indifferents" between the Stoic extremes of good and bad3, the subjects of the two must at least have largely overlapped. It has been suggested that περί άλυπίας was in fact part οfπερί πλούτου καίπενιάς but

- 8 Schwarz: Rhein. Mus. XL, 252 ff.
- 9 Frr. 119-121; 162.
- 1 Fr.43.

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- 2 Fr. H.
- 3 Sext. Emp. adv. Math. VII, 12; XI, 64.
- 4 Heerenius, de fontibus et auct. Vitarum Plutarchi, p.37; Bernhardy p.196.

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5 Fr.101.

6 Hirzel: Dielog

7 Wilamowitz: Ant

8 Bernhardy: p.20

XXIV

the subject seems rather more akin to περί άγαθῶν καί κακῶν. There is no evidence for its separate existence.

which Bernhardy unhesitatingly places "inter lexicographi mendacia". No one else, even Diogenes Laertius, mentions such a title; and while hesitating to use Bernhardy's violence we may well assume that it is a collective term to cover all or most of the philosophical treatises. Strabo's term palatasuggests that there may have been more of these, if it is taken in its usual sense of "academic dissertation". It need not, however, mean anything more precise than the English work "essay", and could easily be a wague term to cover haterogeneous short works, including those to which reference has been made under ¿πιστολαί.

To this title also there is one reference only 5. This has given rise to a large number of conjectures, all of them entirely lacking in solid foundation. Some of the conjectures are as follows.

(a) Hirzel⁶ thinks the Baton indicated was the comic pact, a friend of Arcesilaus at Athens and sharing the philosophical views of Bratosthenes.

(b) Kneack (Pauly-Wissows) agrees with Hirzel, suggesting that the work was in the form of a letter.

(c) Wilamowitz? thinks the passage refers to the "Geography", and that the Baton indicated is the historian, of Sinope.

(d) Menagius emends πρός Πλάτωνα , and identifies with Πλατωνικός

Discretion advises to follow Bernhardy and leave the matter "in medio".

5 Fr.101.

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6 Hirzel: Dialog 410

7 Wilamowitz: Antig.v.Kar.28,2.

8 Bernhardy: p.202.

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2 Fr.176, note.

3 Fr.176

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These two titles are included by Strecker as those of sections of "περί τῆς ἀρχαίας κωμώδίας". By the second century A.D. they were apparently treated as separate books, but their nature and arrangement are such that they must have been at least sequels or appendices to the major work; and, as the "Old Comedy" contained twelve books at least, these may well have been sub-titles of two of them.

The second of the two references to this work itself casts some doubt on its genuineness. Knaack includes it, for some reason, with the "chronographical" works, whereas from the title it can only have been an astronomical treatise, presumably early, on the intercalary system of the Athenian calendar and the eight-year period used before the Metonic cycle was introduced. There is nothing inherently improbable, but rather the reverse, in the idea that Eratoathenes wrote a short book on this subject: the evidence is, however, insufficient for a definite juagment.

Although there is no positive evidence for a separate treatise on this subject, for the Achilles Tatius fragment is much too vague, it seems more than likely that one existed. The passage we have from Galen may be either a summary of a treatise or an adaptation from the "Geography" (q.v.)

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⁹ Pollux X,1. Erjan com Acc Erstensinens i Dicky Min LVIII

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The vagueness slender foundation dimensionnum might of Eratosthenes in "Platonicus". Repísub-heading of an same way as GREUD a letter or other saved up all

4 Macrobius: Somn 5 Nissen: die Erd

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6 Hero: Dioptric 7 Osann: op.cit.

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Μετρήσεις and Περί τῆς ἀναμετρήσεως τῆς Υῆς: The phrase "in libris dimensionum" used by Macrobius4 has prompted a number of scholars to believe in the existence of a specific work on measurements in two or more books, including the measurement of the earth, the distances of the sun and moon and possibly other examples of applied mathematics. Nissen⁵, the most thorough of this school, assigns to it such subjects as the lengths of the day and year and the position of the arctic circle and the tropics. Thelemas disagrees with this view in the letter rather than in the spirit: while dismissing the title μετρήσειμε embraces with all possible emphasis the theory that, in a treatise entitled περί τῆς ἀναμετρήσε-ας τῆς γῆΣτα tosthenes placed all his major mathematical work on the circumference of the earth, the zones and the winds.

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In justification of this he stresses the prefix ave-as meaning the "dividing up" not only of the earth's surface but of the wind-rose. He even places under this title the measurements of the sun and moon, and assumes that Berger was unacquainted with the Hero fragment, which had been quoted by Osann?. The natural inference of this doctrine would be that the "Geography" was a comparatively unimportant pendant to this major work.

The vagueness of the two fragments lends an extremely slender foundation for such a superstructure. "Libri dimensionnum" might apply to any of the voluminous writings of Eratosthenes involving mathematics, including much of the "Platonicus". περί τῆς ἀναμετρήσεως τῆς γῆς could easily be a sub-heading of an individual book of the "Geography" (in the same way as GMEUOYPapigg the "Old Comedy"), or the title of e letter or other short work. The suggestion that Eratosthenes saved up all

4 Macrobius: Somn. Scip. I. 20. Fr. 166.

5 Nissen: die Erdmessung des Eratoskhenes: Rhein. Mus.LVIII 231-245

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7 Osann: op.cit. p.39. Fr. 195, and note.

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8 Catullus LX,

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his astronomical and mathematical discoveries to publish them in one work would be contrary to normal practice either in his time or to-day. While hesitating to follow Bernhardy's vehement declaration that "nullum dimensionum opus Eratosthenes unquam extitisse certissime concluditur", we may suggest that a good deal more positive evidences is needed to prove that either of these titles is that of a major work.

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Hiller attempts to show that the reference to an "Bpithalamium" is corrupt, and really refers to the "Erigone": in this view he follows Bernhardy. There is no other evidence either positive or negative, but there seems to be no adequate reason for assuming that Eratosthenes did not write such a poem. Indeed, if his "all-round" reputation and the circle in which he lived are taken into consideration, it is extremely likely that he did so. Bergk's quotation of Catullus for the mention of a vine in an epithalamium is hardly necessary to support it, the image of the vine's being "married" to the elm or other tree being a commonplace of ancient poetry.

8 Catullus LX,50.

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XXVIII

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This title involves two problems:

(1) whether Erantosthenes wrote a work of this title;

(2) whether the work we have is that which Eratosthenes wrote. The answer to the first has not yet been satisfactorily answered, but the balance of scholarly opinion gives a decided negative to the second. The various views which have been expressed, in some cases at great length, may be very briefly summed up as follows.

Rataμερισμώ and the Venetian scholiast to ματάλογοι . Fell discovered the present document in the Bodlian Library and published it, in 1672, under the title of ματαστερισμοί. It is quite certain that Eratosthenes did write about mythical persons who were elevated to the heavens. He did so in the "Hermes", although it is unknown to what extent, and the "Erigone". It would be quite possible for any of these "titles" to fefer to the "Hermes" itself. The whole question is complicated by the fact that Hyginus is adapted from some work attributed to Eratosthenes.

Bernhardy believed that the present ματαστερισμοί was a translation back into Greek from Hyginus which was adapted from the "Hermes". Bursian refuted this, in the words of Hiller, "argumento gravissime firmissimoque". Osann pointed out that the "Vita Arati" is preceded by the ματαστερισμοί the codices, and that the order of the constellations is the same. He held that it was put together from Scraps of the "Hermes". Letronne believed that the writers of the ματαστερισμοί and Hyginus both used the "Hermes" as well as other sources. The most generally accepted theory now, supported by Bergk, Bursian and Hiller,

9 Ach. Tat. 24

1 Schol. Nom. Il. XXII, 29.

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2 Boehme: Rh. N 3 Fragmente des

4 Frr. 239,252 d

XXIX

is that Erstosthenes did write a prose work, which may possibly have been called a prose work, although this title is not mentioned in any ancient sufficient and that the present work is based uponx it. Certainly Bernhardy's painstaking list of linguistic faults makes it unlikely that a real could have written it. Beehme agrees with this Alientinos

The four references to this work, which mention up to the thirty-third book, are all in Stephanus of Byzantium. Fell accepted it as authentic, while Gale attributed it to Gallisthenes of Sybaris on the ground that Prusias (mentioned under Booscephalae) was not yet alive. He confused him with PrusiasII, Prusias I living 237-192 B.C. Berger³ thinks that Eratosthenes lived long enough after Booscephalae to have written it, and that the unspecified references in Stephenus may also belong to it4. Thalamas remarks that the Gauls were a topical subject, and mne that would attract Bratosthenes, but is content to leave the matter "en suspens". There is certainly nothing impossible or even improbable in the idea of a work on Gaul, perhaps based on Pytheas but it is hardly credible that our Eratosthenes, whose works apart from the "Old Comedy" occupied from one to three books each, would have run to thirty-three or more on such a subject. Jacoby and Kneack therefore attribute the work to another Eratosthenes, also of Cyrene. This completely arbitrary procedure, though unpalatable, is difficult to oppose without assuming four separate and identical mistakes in Stephanus. This other Eratosthenes may be the "son of Agacles" mentioned in fr. K.

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² Boehme: Rh. Mus. XLII pp.286-309

³ Fragmente des E. pp.336-7

⁴ Frr. 239,252 & etc.

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5 Fabricius, Bi Bernhardy, p

Πρός Αράτου φαινόμενα.

Fabricius agreeing with Petau⁵, observes of this great work that, as Hipparchus is mentioned in it by name and the month of July is also mentioned, Eratosthenes (or Hipparchus) could not possibly have written it. He adds also as evidence the use of the word λεμτροπόδιον, a late Greek name for Orion.

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It is generally considered now that these points are accounted for by later interpolation, but universally admitted that, although Hipparchus may have written some of it, Eratosthenes did not. Knaack merely mentions it as "sicher ein PsetOpepigraphon".

In the text, the following arrangement will be used for the sake of convenience. Where and when the works were written is almost entirely a matter of conjecture, but these marked x are perhaps more likely to have been written in the Athenian period.

Poems	<u>Mathematics</u>	Philosophy	Literature & Grammer
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5 Fabricius, Bibl. Gr. IX, p.120; Petaw, Uranologion, p.256; Bernhardy, p.165.

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6 Frr.152,164 etc

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III

The "Geography" of Eratosthenes

A - Marly Greek Geography of the Inhabited World

Han is an egoist by nature, and "cogito, ergo sum" the natural starting-point for all his constructive thought. Even the modern man, brought up on Copernicus and Einstein, thinks in his ordinary life of the sun's revolution round the earth, of his own arakarar kake country and environment as the centre to which all the rest of humanity is to be related. When he consciously thinks he knows these things are not really so, but the habit of countless millennia is not easily thrown off.

All Greek geography before Eratosthenes is based not only on the assumption that Greece was the centre of the inhabited world but on a number of other preconceptions of which the Greeks themselves were not conscious. As we shall see, Eratosthenes himself, although he broke with some of these preconceptions, by no means succeeded in freeing himself of all.

To all primitive peoples the earth on which we live appears as a flat surface. The gradual realization that this is an illusion arises from the study of astronomy rather than of geography, and the point at which it first appeared in Greek thought is a matter for further discussion. Before Eratosthenes, the business of the geographer and historian, whose characters were largely identified, was with the inhabited world, or "occumene", and even centuries later we see Strabo emphasizing this point at Eratosthenes's expense.

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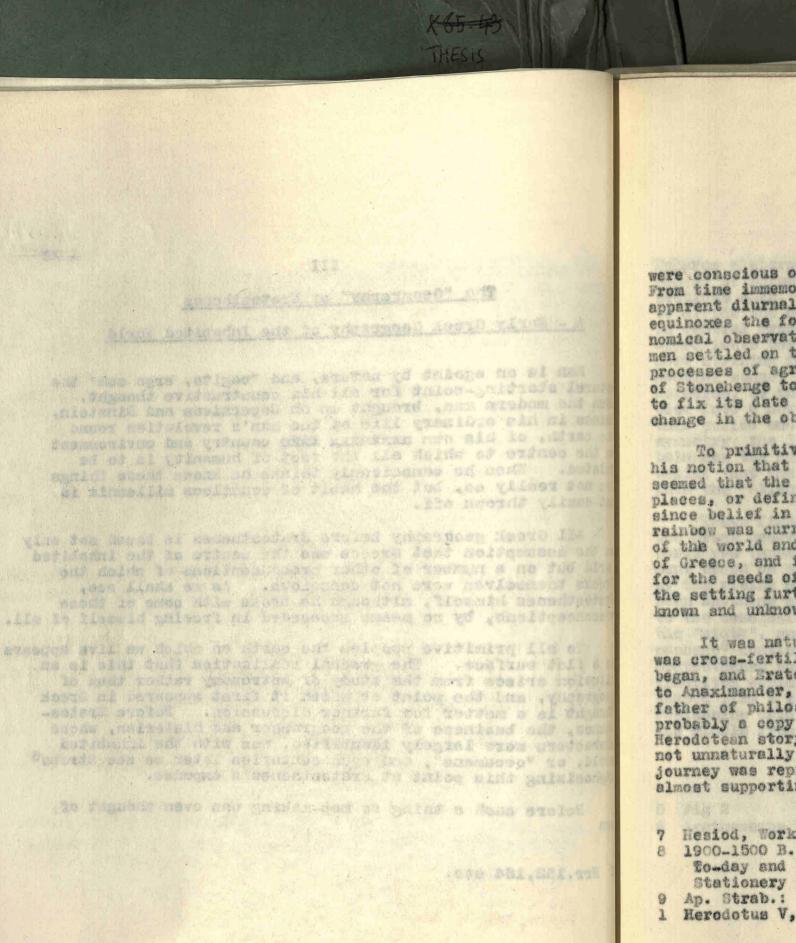
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9 Ap. Strab.: 1 Herodotus V,

IIXXX

were conscious of the more obvious celestial phenomena. From time immemorial the sun has measured not only, by its apparent diurnal movement, the day, but by its solstices and equinoxes the four equal seasons of the year? Barly astronomical observations of this kind were necessary as soon as men settled on the land, for purposes of measuring out the processes of agriculture; and the orientation, for example, of Stonehenge to the summer sunrise is sufficiently accurate to fix its date within four centuries by calculating the change in the obliquity of the ecliptic.

To primitive man, with his limited range of travel and his notion that the world on which he lived was flat, it naturally seemed that the summer and winter risings and settings were places, or definite points of the horizon. It is not so long since belief in the possibility of reaching the foot of the reinbow was current. To the Greeks, Greece was the centre of the world and Dephi with its sacred the centre of Greece, and it is within this framework that we must look for the seeds of Greek geography; the history of which is simply the setting further and further back of the limits of the known and unknown.

It was naturally in Asia Minor, where Greek imagination was cross-fertilized by Oriental wisdom, that systematic science began, and Bratosthenes himself ascribes the first Greek map to Anaximander, the fellow-citizen and perhaps pupil of the father of philosophy himself. Thales of Miletus. It was probably a copy of this map that features in the famous Herodotean story of Aristagoras and Gleomenes. Gleomenes, not unnaturally, was deluded by the fact that three months journey was represented by a few inches of bronze plate into almost supporting the Ionian

7 Hesiod, Works and Days, passim.

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^{8 1900-1500} B.C. Sir Norman Lockyer, quoted in "Stonehenge: to-day and Yesterday" pp.67-8, by Frank Stevens. H.E. Stationery Office, 1936.

⁹ Ap. Strab.: fr. 149. 1 Herodotus V, 49-50.

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5 Fig 2 6 Agethemerus

Bohorus elaborated by Timosthenes5. Here the vaque open spaces of Boreas and Notus have been subdivided into four sections each, those of Zephyrus and Eurus into two, so as to divide the outlook from the centre, or roughly anywhere in central Greece, into twelve equal parts each with its approximate berbaric tribe except the west. Perhaps the most striking feature of this errangement is that the equinoctial sunset is already identified with the Pillers of Heracles, so that the whole inhabited world is divided lengthwise into a northern and a southern land-mass. All through this period and beyond can be observed the Greek passion for symmetry: the Ister (Danube) balances the Nile, the Black Sea balances the Red, and to this may likewise be traced the chronic belief that the Caspian Sea, like the Persian Gulf, opened into the "Atlantic".

These figures may efford an explanation why it was that the Greek geographers united in believing that the inhabited world was (approximately) oblong: it was an a priori statement based on the fixing of the "four corners of the world" by the rising and setting of the sun. It can scarcely have been enything else that led, according to Agathemerus, Democritus to the conclusion that the "length" was one and a half times the "width", and Dicaearchus to agree with him. "Eudoxus", the passage continues, said that the length was double the width, Eratosthenes that it was more than double; Crates, that the inhabited world was semicircular, Hipparchus that it was shaped like a table, others that it was like a tail. Posidonius said that it was the shape of a sling, broad in the middle from north to south, narrow

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3 Fr. 176, fin.

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3 Herodotus, IV Fig.1.

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Anaximander was followed by Hecataeus, who is on the whole regarded as the father of both geography and history. No details are known about either of these maps, but a certain amount may be inferred from Herodotus, who describes the known world to the extent of his knowledge, dividing it into cosets; "trects", or "districts" (axtai). Here may be seen the four definite directions known to the early Greeks, the summer and winter sunrise and sunset, with the half-way points of the equinoxes corresponding with our east and eest. Already at this time the names of the winds were used for vague directions, all the space between the summer rising and setting being given to Boreas and all that between the winter rising and setting to Notus. Just as the risings and settings were regarded as places or fixed points, not as directions which remained constant for any situation, so the winds were imagined as originating from definite countries. Hone of these ideas had yet been reduced to a hard and fast system, but apparently the Ionians regarded the inhabited world as lying roughly within a rectangle whose corners were the risings and settings, marked out upon a flat disc entirely surrounded by water. Herodotus himself laughs at the perfectly circular maps current in his time3, but this was merely a fairly obvious way of limiting the unknown as well as the natural impression of the world as viewed from a height. A century or so later the inhabited world was still regarded as lying within a rectangle within the disc, each side of the rectangle being enclosed by unknown tracts inhabited by unknown but certainly existent tribes grouped for convenience under the four headings of Scythians, Indians, Ethiopians and Celts4. Early in the third century we see the simple plan of

2 Fr. 176, fin.

4 Fig.1.

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³ Herodotus, IV, 36; and even Aristotle, Meteor V,13.

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8 Fr. 187.

Frr.152,164; Hip. ap. Str

towards the east and west, yet so that the eastern part towards India is wider then the west." In all this may be seen the preconception of symmetry, perhaps especially in the last statement, where there is an obvious effort to force unwilling material into a Procrustean bed.

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Further definition of the inhabited world, though exactly how much it is impossible to say through lack of first-hand evidence, was given by Dicaerchus. Taking the same dividing line through the Pillers of Heracles, he defined it, again according to Agethemerus, as passing "through Sardinia, Sicily, Peloponnesus, Caria, Lycia, Pamphylia, and Taurus right through to Mount Imaus. Of these districts he named one the northern, the other the southern". Apart from his wisdom in not attempting to define this διάφραγμα any more exactly, the most remarkable point about this statement is its nearness to truth in the absence of astronomical observation and any but the vaguest and most approximate measurements. It was, in fact, good enough to be accepted almost as it stood by Eratostheness. The main contibutions of Eratosthenes to geographical science, as will be seen later, were those for which he was censured respectively by Strabo and Hipparchus!: first, setting the inhabited world where it belonged on the spherical earth; and second attempting to lay the foundation, though with woefully inadequate material, for establishing at least the cardinal features of his map by astronomical and mathematical calculation. So far as the inhabited world was concerned, Eratosthenes was content, perhaps unconsciously, to accept the framework of his predecessors

7 Agethemerus I,5. 8 Fr.187. 9 Frr.152,164; C.65 etc.

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in its main outline. It is significant that, even according to Strabo, it was not an entirely new map that he set out to produce, but a readjustment $(\delta_1 \delta \rho \theta \omega \sigma_1 \zeta)$ of the old.

Down to the latest publication on Greek geography (W. W. Hyde, "Ancient Greek Mariners": New York and Oxford, 1947) it has been supposed that the original contribution of Eratosthenes to this readjustment was the introduction of a "prime meridian" for use as a vertical co-ordinate2. A careful examination of the fragments shows no evidence for this view: the only examples of measurement from meridians are those quoted from Hipparchus, and the measurements attributed direct to Eratosthenes are related only to the "diaphragm", as will appear below. His purpose in carefully establishing his one meridian was principally, if not solely, to establish the "breadth" of the inhabited world and hence the frame for the map, whose construction began from the eastern boundary. The meridian itself is not the centre of the map in any sense, and the real centre of measurement is not Rhodes, where it crosses the diaphragm, but Alexandria; it happened to be the one meridian which Eratesthenes could ascertain with any degree of accuracy, and it is indeed remarkable how nearly accurate, in the circumstances. it was.

The only other "meridian" definitely attributed to
Eratosthenes is that of Rome-Carthage, passing through the
Sicilian Strait. This amounts to little more than saying
that Rome is "opposite" to Carthage, as the Danube (later
the Dnieper) was opposite to the Nile; and it divided off
the western Mediterranean into a neat unit.

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² Fr. 177. Strabo G. 120 describes this method, but certainly does not ascribe it to Eratosthenes.

³ Strabo C. 70, 81, 82, 86-89, 91. (The "meridian of Thapsacus and Babylon" is an invention of Hipparchus).

⁴ Fr. 266.

⁵ Herod. II, 34.

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7 Arist. Met 8 Fr. 176. Fr. 176. Vitr. de

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In the meantime attempts had been made to systematize the "winds". It is important for the modern mind, used to the successive bisections of the compass-card which lead from four cardinal points to eight, sixteen and thirty-two, to remember the uneven division of the ancient "wind-rose" by the risings and settings of the sun. It was this that led directly to the division of the circle into twelve, with varying names for the winds. Perhaps the oddest part of this variation is the oscillation of the winds Boreas and Eurus from the, to the modern mind, cardinal directions of North and East to North-north-east and East-south-east6. The most important reconstruction before Timosthenes is that of Aristotle7; whereas Timosthenes was working out his directions from Greece as a centre in a flat (for geographical purposes) inhabited world, Aristotle was considering the winds from the point of view more of what we should call physical geography, having in mind the spherical earth. Apart from the fact, however, that he does not give a local habitation to each name, his general principle seems to be the same, and so far as can be seen the ancients seem to have been somewhat worried by the fact that, if the observer moves any considerable distance he has to work out a new wind-rose with reference to his new "horizon".

It was left for Eratosthenes8 to produce a wind-rose which was free from these objections and equally true, like the modern compass-card, for any point north of the tropic; that is to say, for the whole inhabited world. He did this by relating all directions, not to fixed points on the horizon but to a single direction, the south, which is fixed and ascertainable all the year round. He then divided the whole circle into eight in such a way that each whole segment (not the dividing line) faced one of the eight chief points of the compass. It is on this principle that the Temple of the winds at Athens is constructed, though again the names of the winds on the eastern side vary curiously.

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⁶ Figg. 1-5. 7 Arist. Met. 2, 6; fig. 4.

⁸ Fr. 176. 9 Vitr. de Arch. I, 6, 4-5; fig. 3.

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Whether Eratosthenes used this momentous idea in the construction of his map is and seems likely to remain uncertain. Berger, entirely lacking any evidence at all and not knowing the fragment of Eratosthenes cited here, builds up an elaborate argument for his having done so. As the theory is based on a wind-rose for the "horizon" of Rhodes, it falls to the ground of itself. It is difficult to see how, with the method used by Eratosthenes of starting at the eastern end of the map and fitting everything north or south of the diaphragm, such a rose could be used. There is no trace whatever of anything correspondingwith the method of triangulation by compass-rose and parallelrulers, and it seems more likely that, in separating the idea of general direction from fixed points on the horizon, Bratosthenes was emphasizing his relation of the inhabited world to its place on the spherical earth.

1 Berger: Fragmente des Eratosthenes, pp. 211, 212.

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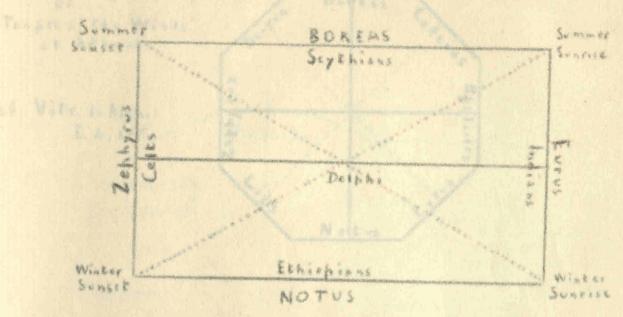
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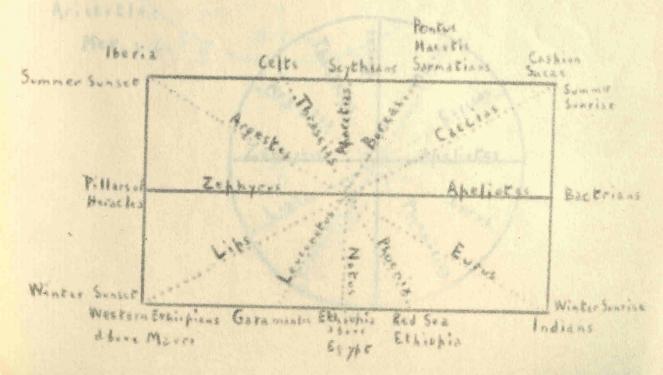
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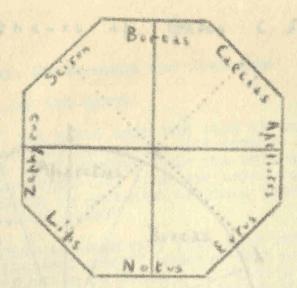
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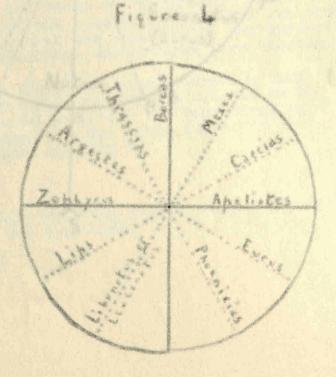
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B - Sphericity, Measurement and Divisions

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"And the Spirit of God moved upon the face of the waters.... And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament.... And God said, let waters under the heaven be gathered together into one the waters under the heaven be gathered together into one place, and let the dry land appear".

All philosophies must of necessity find some place for an explanation of the physical world, whether as a mystical account of a personal Creation in Genesis or Plato's Timacus, account of a personal explanation exemplified by the or as a purely mechanical explanation exemplified by the Ionian philosophers and the present hypothesis of the spiral Ionian philosophers and the present hypothesis of the spiral nebula. In order to understand the attitude of Eratosthenes nebula. In order to understand the attitude of mysical world it is essential first to consider, however to the physical world it is essential first to consider, however briefly, the thoughts of his predecessors on the subject.

As we have already seen, the Ionian philosophers believed that the "inhabited world" was flat, and inscribed in a that the "inhabited world" was flat, and inscribed in a circle. Gradually the study of "geography" became appropriated to the study of the inhabited world and its contents, risted to the study of the inhabited world and its contents, and separated from that of its relation to the universe as a and separated from that of its relation to the universe as a and separated from that of its relation to the universe as a and separated from that of its relation to the universe as a and separated from that of its relation to the universe as a and separated from that of its relation to the universe as a and separated from that of its relation to the universe as a series of the inhabited world and its contents, whole. It was Eratosthenes who brought them together again.

Now Theles, the first lonian philosopher, came to much the same conclusions about the earth's origins as the criter of Genesis. Water, he said, was the beginning, or foundation (αρχη) of everything, and the earth floats on the water?. The lonians' mechanical genesis is

2 Aristotle: Net.I,3; De Caelo II,13. (Diels Fragmente der Vorsokrateker, vol 1.pp.9,10).

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due, according to Burnet3, to an eddy or whirlpool effect of the centre. He is reputed to have predicted an eclipse And the Spirk of the sun, but can hardly have been aware of the causes of NOO BEEN **** STOP eclipses. The eddy, in other works, has nothing to do with sters which were u the spherical rotations introduced into cosmography later, dif svods ster for but refers to rotation in a plane. His successor Anaximander old webau aveter on made what looks like a considerable advance upon, this hypothesis: soit tol bun , soil (1) the universe developed from an indeterminate at stoot matter4; (2) the earth is cylindrical in form, and its depth is one third lagonofing fix of its breadth5; (3) "the earth swings free, held in its place to moistantion of by nothing. It stays where it is because of its equal distance idayaq a To Jacoba Its shape is hollow and round, and like a ir as a purely neck from everthing. stone pillar. We are on one of the surfaces, and the other is learn butloublers on the opposite side". Anaximander believed further that the rebula. In order earth participated in the (plane) rotation; that interaction to the physical wor of hot and dry, cold and moist was responsible for physical

> Anaximenes was, to a present-day eye, on some points retrograde. Hisapyn was "air", or vapour, which produced the other elements by condensation and rartfaction. One of the words he used, veo, a or breath, has continued in philosophic language ever since, though the "spirit" of the Stoic pantheism to the Spirit or Ghost of the New Testament. The disc earth rested on this vapour "because of its breadth" , and so did the other heavenly bodies. These did not pass right under the earth in their rotation, but round it, "as a cap turns round our head"9. The earth

effects and objects; and that the heavenly bodies consisted of wheels of compressed air, or vapour, containing fire which

3 J. Burnet: Early Greek Philosophy, ed. 3; London, 1920.pp61-2.

4 Simpl. Phys. 24,13; Arist. Phys. III, 4. (Diels p.17)

5 Ps.-Plut Strom. Pr. 2 (Diels p.17) 6:7 Hippolyt, Ref. I.6. (Diels p.16)

8 Ps.-Plut. Strom. fr.3 (Diels p.17)

9 Hip. Ref. I,7;4-6. (Diels p.23)

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1 hip. Rof.I.

2 Plac.II,8,1 3 Nip. Ref.I,

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5 W.A.Heidel: 1937. p.74

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23. - Pint. Strom. 1r. 5 (Biela p.17)

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alone of long productions that the error of recommend the

itself was shaped "like a table", and the northern parts, being "higher" than the souther, obscured the sun and other bodies during the night.

This notion of the flat earth was later adopted by Anexagores and the atomists Leuciffus and Democritus. According to Anaxagoras the earth "remains puspended beacause of its size and because there is no vacuum"1. The changing seasons, with the changing elevation of the sun, are due to e tilt, ogynhidic, of the (flat) earth to the south2. The heavenly bodies, however, are large flery stones. The sun Illuminates the moon, and is eclipsed by it3. These last points show en intervening Pythegorean influence.

It is not necessary here to discuss at length the individual tenets of Pythagoras, Philolaus and others, for the general body of doctrine known as "Pythagorean" is in its main essentials sufficiently clear. The sun, meon, planets, earth and "counterearth" revolved round a central fire in a spherical universe contained by the sphere of the fixed stars4, each emitting a note in the divine scale, orappovic . This is in the main a mystical dogma, having more to do with the theory of music and number than with every-day life; yet it is none the less a definite physical theory as well. As Heidel has pointed out, in all the texts we have concerning the Pythagorean philosophy there is none that states in so many words that the earth is a sphere. This has elways been assumed by scholars, although in fact there would be nothing in the theory of bodies rotating to imply, in itself, that the bodies were themselves spherical: indeed, the fact implicit in the theory that the side of the earth on which we live is always turned away from

1 Hip. Ref. 1,83. (Diels p.384) 2 Plac. 11,8,1... έγκλιθήναι πως τον κάκακ κόσμον έκ του αυτομάτου

3 Hip. Ref. 1, 8, 3. (Diels.p. 384) πρός το μεσημβρινόν.

4 Stob. Mcl.1,22,10.

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5 W.A. Heidel: The Frame of the Ancient Greek Maps: New York 1937. p.74.

the central fin a disc, at less The same point who lays down w universe is spl the same of the statement we ha whole universe, Plato's Phaedo be an enormous situated in dep mystical discus It is not, howe original about is distinctly I perhaps Pythage to have placed disc theory, th introduced the reasons which o that a sphere, shape for the h

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6 Op. cit. p. 7 Parm. ap. Si

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8 Plat: Phaed 9 Arist. De C

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Stab. Hol. L. Cho Hrang of the Distant Greek Mage: New York 1057- p.78.

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the central fire would more naturally suggest, if not a disc, at least something like the drum of Anaximander. The same point is put forward by Meidelt with regard to Parmenides, who lays down with even more emphatic dogmatism that the universe is spherical?, but of whom we have no text stating the same of the earth itself. The first really unequivocal statement we have of a spherical earth, as distinct from the whole universe, is, as Heidel himself points out, that in Plato's Phaedo8. This account, which describes what must be an enermous sphere containing a number of "inhabited worlds" situated in depressions in its surface, is part of a mythicomystical discussion about the immortality of the human soul. It is not, however, suggested that there is anything new or original about the idea, and the whole atmosphere and centext is distinctly Pythagorean; so that it would seem that, although perhaps Pythagoras and his early followers, who are thought to have placed the earth in the centre, still adhered to the disc theory, the later Pythagoreans must have eventually introduced the sphere. This they would do, not for any reasons which could be called scientific, but on the ground that a sphere, being the perfect figure, is the most suitable shape for the home of man.

By the time we reach Aristotle all doubts have disappeared. The earth is a sphere, at rest in the centre of the universe, on very similar grounds to those of Anaximender - because everything "tends to the centre by nature". Aristotle offers the proofs which are now conventional, from the visible changing horizon, and from the curved shadow seen in eclipses, though surprisingly not the most obvious

Op. cit. p.

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1 Arist. Nub. 2 Aristotle. D

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one to the modern child, that of the ship gradually "rising" into view over the horizon. It is fairly obvious from the manner of exposition that the sphericity of the earth was by now an accepted hypotheses, at least among philosophers, as it has been ever since.

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By Aristotle's time some attempt had even been made to estimate the size of the earth? He himself does not say whose estimate was the 400,000 stades that he puts forward as the outside limit for the earth's circumference, but it seems likely that it was that of Archytas, who is mentioned by Aristophanes and by Horace3 as a measurer of the earth. There is no trace of any earlier estimate, and the earth of Plato's Phaedo would have to be much greater in size if it were accepted as a serious physical account, whether his own or developed or adapted from the Pythagoreans. Aristotle does not mention either whether the estimate was reached by scientific means or sheer guess-work, though as apparently a first attempt and an outside estimate it is in any case extremely creditable. It is at least likely that it was an attempt to employ the means used to arrive at the next estimate, attributed to Dicaearchus, of 300,000 stades. The method was based on the assumption that the spherical earth was concentric with the spherical Thus the arc enclosed by any two radii of the earth on the earth's surface would be equal to that enclosed on the celestial aphere by the same radii produced. By noting the fixed star vertically overhead at two fixed points on the earth's surface at the same moment, ora a from almost sum was conseited of for hervets to had

tend the efficer on earth or in teach 1 Arist. Nub. 202.
2 Aristotle. De Caelo II,14 fin. γεθος άναλογίζεσθαι πειρώνται τῆς
3 Horace, Odes. I, 28,1. "Te maris et terras numeroque γουσι είναι

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4 Berger: Ges

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corresponding moment in different years, and by measuring the angle subtended by these stars at the earth's centre, it would become known what arc of the earth's circumference was represented by the distance between the two points on its surface. The two points employed were Symme and Lysimachia, and the arc was found to be 1/15 of the great circle.

As Syene and Lysimachia were 20,000 stades apart, the whole circumference was reckoned to be 300,0004. If we consider the complete impossibility of (1) taking an accurate vertical sight (20 measuring with anything but the wildest approximation the celestial angle, not at the centre of the earth but on its surface (3) obtaining anything like an accurate straight measurement between two places so far apart, the result is emazing in its nearness to fact.

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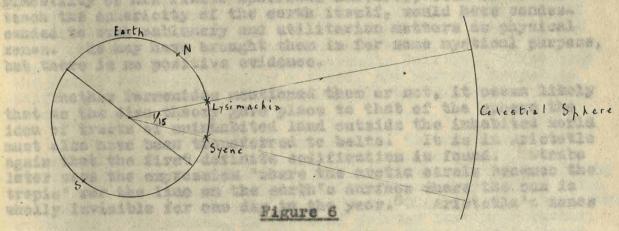
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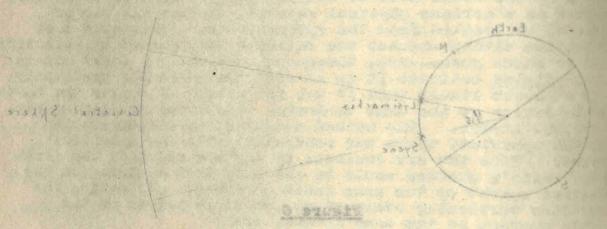
Ever since man was conscious of the heavens he had considered them as a sphere, rotating on an axis and necessarily possessing an equator. To the Greek, however, "Artic Gircle" was not a fixed line either on earth or in heaven, but the circle within which all the stars were visible, without setting, to any particular observer. The tropics were, naturally fixed with ever-increasing accuracy. Now

4 Berger: Gesch. der wiss. Erdkunde der Griechen: vollli,p.44.

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5 Achill. Tat.

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8 Fr. 182.

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as a result of the Greek way of looking at the inhabited world, bounded by more or less straight lines to north and south beyond which normal human life was impossible because of increasing cold or heat, similar lines began at some indeterminate time to be applied to the spherical earth. The conception of "zones" was attributed by later writers to Parmenides5, but Heidel6 has pointed out that there is no evidence for this at all near to his own time, and that the idea may have been due to a misunderstanding of his mysterious orepeval or garlands?. These were, in a sense, zones or rings in the heavens skin to Anaximander's rings of compressed vapour, and serving much the same purpose. It is defficult to believe that Parmenides, wrapped up as he was in the mystical unity and mimobility of his finite spherical universe, even if he did teach the sphericity of the earth itself, would have condescended to such sublunary and utilitarian matters as physical zones. He may have brought them in for some mystical purpose, but there is no positive evidence.

Whether Parmenides mentioned them or not, it seems likely that as the disc theory gove place to that of the sphere the idea of tracts of uninhabited land outside the inhabited world must also have been transferred to belts. It is in Aristotle again that the first definite codification is found. Strabo later uses the expression "where the arctic circle becomes the tropic" for the line on the earth's surface where the sun is wholly invisible for one day in the year. Aristotle's zones the distriction to worthook politics overthing a chronole,

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5 Achill. Tat. 153A. Fr. 170. loom and condens of the contract 6 W.A.Heidel: The Frame of the Ancient Greek Maps: p.72.

7 Plac. II, 7,1 op. Stob. Ecl. I, 22.... την μεν έκ τοῦ άραιοῦ, την 8 Fr. 182.

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⁹ Arist. Met.

¹ Fr. 170.

² Strabo. C. 9' 3 Diog.II,1.

are "under" the celestial zones described by the revolution of radii from the centre of the earth to the celestial zones, and there they have remained ever since, with the same names latinized, in our modern atlases. Even in Aristotle's time it was still thought that the torrid zone was completely uninhabiteble, for he points out that life could not exist south of the tropic, where the sun's shadow falls to the south in midsummer9. Syene in upper Egypt was known to be at or about the tropic, yet the Ethiopians were far south of there to say nothing of Merce on the Nile. The only real disagreement about the zones was to a modern mind somewhat trivial: whether they should be considered as five or six in number, the answer depending on whether the whole belt between the tropics should be counted as one, or as divided into two separate belts by the equatorl. The matter was not so trivial as it appears at first sight, for it is a question of treating the whole gaobe as one, or as two separate hemispheres. was also a minority, including apparently Polybius, which made the number seven, introducing a third, but narrow, temperate belt at the equator2. This point will be referred to again later.

an entirely new method. Fully realizing, no doubt, the difficulties and inaccuracies inherent in the method previously described, he evolved a method involving one observation only, and one capable of being taken with, for the period, considerable accuracy. The gnomen, or vertical pointer casting a shadow, was, according to Greek tradition, first introduced by Anaximander, but it is at least probable that Thales, who imported so much from Babylon, had used it before him. Its principal use was for determining solstices and equinexes, though the length of the shadow was also used for rough indication of time. It seems to have been Bratosthenes himself who first saw the immense possibilities of this simple

9 Arist. Met.II,5,10-1a.

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2 Strabo. C. 97.

3 Diog.II,1. εδρεν δε και γνώμονα πρώτος και εστησεν έπι τών σκιοθήρων έν Λακεδαίμονι.

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to take o'deres the problem of the corporation also by is entirely new method. Italy realizing, we doubt, the Tienties and insecuration interest in the method orevious; bootived, he evelved a series involving one deservation only, aldereblence , being one tol , asle mount juited to eldingee and in mourage, the gammon, or vertical pointer cesting a shadow, -ireal to break tradition, tiret istraduced by thenimiles, but it is at least probable that the it is at it and imported tagionive mil trom backet it being bit molydes moul House edt datonit jaskeniupa bus sublisien guinlagetab wel ees eu leagth of the shedow was also uded for reach indication of time. eds wer forth one tiswain conditioners and over of amount simila sind to selfilificed earny

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Bratosthen has been said a to have used a ground, tested off in all dire hemispherical b placed hollow s given as his, l of the earth's the tropics, it scale marked or that the only I circle was 1/60 device is unknown of Hipparchus, in terms of the

Using this modern writers ference of the summer solstice illuminated, w were on the san

4 Hip. ad Pha 5 Marc. Capel

6 See below, 7 Hipp. ad Ph

8 Fr. 167.

James V. L. L.

instrument for the calculation of latitude. Pytheas, a Massilian explorer of whom more will be said later, had already recorded a very careful and accurate axerx observation of the shadow-to-gnomon relation at his own town4, but there is no evidence that he knew how to evaluate it even though he must have had at least an inkling of its significance.

Eratosthenes is said, and it is in agreement with what has been said above about his practical outlook on mathematics, to have used a variant of the simple six-foot pointer on a level ground, tested for flatness by pouring on water until it ran off in all directions equally. This consisted of a perfectly hemispherical bronze bowl, with a pointer equal to the radius, placed hollow side uppermost5. If we judge by the readings given as his, 1/50 of the complete circle for his measurement of the earth's circumference andll/83 for the distance between the tropics, it weems unlikely that there was any definite scale marked on the inner surface, for it is reasonably certain that the only regular unit into which Bratosthenes divided the circle was 1/60 6. Whether any of his successors used this device is unknown, but it may be noted that all the observations of Hipparchus, the real founder of trigonometry, are recorded in terms of the right-angled triangle7.

modern writers have described in detail, measured the circumference of the earth? Assuming (1) that Syene, where at the summer solution there was no shadow and a well was wholly illuminated, was on the tropic (2) that Syene and Alexandria were on the same meridian

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4 Hip. ad Phaen. Arati, 178D; Strab C,63.

5 Marc. Capella 6,596. 6 See below, Section 38.

7 Hipp. ad Phaen. Arati, pp.1818,178D.Strab.C.63.

8 Fr. 167.

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Mip. ed Pherst. Arett. 1962; Skrub Didba Ward. Ougelia 6.596. The below. Seetion ST. Mipp. ad Duson. Arett. on.ldiv.1962.Garab.O.65. Fr. 167: (3) that the sur a solstitial res covered 1/25 of as the figure sh of the earth and 1/50 of the meri Suene to Alexand at 250,000 stade can be no doubt

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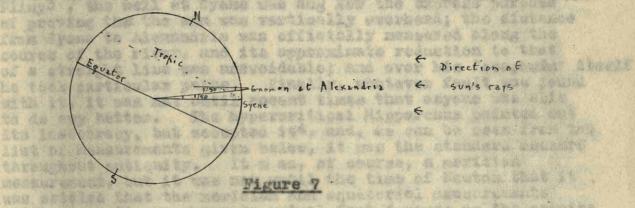
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9 Fr. 167 1 Strab. C. 87

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(3) that the sun's rays are parallel to each other, he took a solstitial resding at Alemandria. The gnomen's shadow covered 1/25 of the hemisphere, from which he calculated, as the figure shows, that the alternate angle at the centre of the earth and hence the arc from Syene to Alexandria was 1/50 of the meridian great circle. Taking the distance from Suene to Alexandria at a round figure of 5000 stades, he arrived at 250,000 stades for the circumference of the earth. There can be no doubt at all that he realized that all his data were



approximate, and it was probably he himself who adopted 252,000 as a more convenient figure with which to work than 250,000, with the obvious advantage of being divisible by sixty. Much serious work has already been spent on indicating the "mistakes" of his method, but it must be remembered (1) that in his own time it was known that the "phenomenon" at Syene was observable over a circle of 300 stades radius9 (2) that Bratosthenes knew perfectly well that even his latitudes were approximate, and was willing to accept an error of 400 stades in his main diaphragml; a fortion he was fully aware that the "meridian" through Alexandria and Syene was unlikely

9 Fr. 167 1 Strab. C. 87. Fr. 188.

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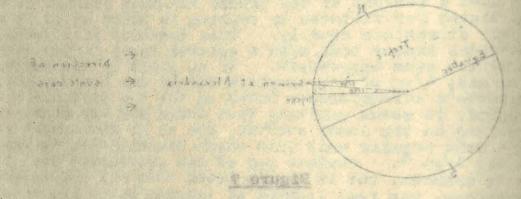
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to be anything (3) that accord than the earth? had not noticed rays could not Eratosthenes to the best data h matters within Pliny3 , the we of proving that from Syene to A course of the r of a straight l he took particu with it, it was to do any bette its inaccuracy, list of measure throughout enti measurement, bu was settled tha differed. Its value of the st certainty, but seventh in exce the cancelling but a most rema

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2 Fr. 166 3 Pliny II, 1 4 Strab. C.13

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to be enything resembling exactitude. (3) that according to his own reckoning the sun was much larger than the earth2, and hence he must have realized, even if he had not noticed the fenumbra in the gnomon's shadow, that all rays could not be parallet. What one would expect a man like Eratosthenes to do, and what he seems to have done, was to take the best data he could, and exercise the utmost care over matters within his control. Thus, if we are to believe Plinyo, the well at Syene was dug for the express purpose of proving that the sun was vertically overhead; the distance from Syene to Alexandria was officially measured along the course of the river, and its approximate reduction to that of a straight line was unavoidable; and over his "scaphulm" itself he took particular pains. Finally, whatever fault was found with it, it was not until recent times that anyone was able to do any better. The hypercritical Kipparchus pointed out its inaccuracy, but accepted it4, and, as can be seen from the list of measurements given below, it was the standard measure throughout entiquity. It was, of course, a meridian measurement, but it was not until the time of Newton that it . was settled that the meridian and equatorial measurements differed. Its nearness to setual fact depends on the precise value of the stade, which cannot be stated with absolute certainty, but at the most probable it amounts to about oneseventh in excess; which, however much was swed to luck in the cancelling out of errors, can hardly be called anything but a most remarkable achievement.

Whether it was the measurement of the earth that suggested to him a work on geography or the other way round cannot

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3 Pliny II, 183 ff

4 Strab. C.132.

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5 Strab. C. 49,6 6 Strab. C.64,65 7 Gemin. Isag. C

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be known, but it is on the shape and size of the earth, and its consequent divisions, "A that his "Geography" is firmly based. To Strabo, My Hard that the business of the geographer was with the inhabited world, Eratosthenes's insistence on the sphericity of the earth, spart from minor irregularities, was superfluous"; but to us, used to the arrangement of a modern atlas, there can be nothing more natural than to begin by placing the earth in the solar system and to proceed by way of its major physical characteristics, zones, winds and currents, to the major physical divisions of the earth and finally to "political" geography.

Eratosthenes, like Aristotle, recognized the possibility of a habitable zone in the southern hemisphere, but neither seems to have seriously examined the possibility of its being actually inhabited. As for the existence of another continent or "inhabited world" in the northern, Eratosthenes himself seems to have rejected it6. His division into zones is similar to Aristotle's, but he seems to have been the first to define them exactly7: the two frigid zones as 6/60 each, the temperate as 5/60 and the two halves of the torrid as 4/60 each of the great These proportions were calculated by close approxicircle. mation to the N

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7 Gemin. Isag. C.13: fr.172. Macrob. Somn. Scif. II, c.

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8 The earth i regarded a

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actual positions of the tropics and the "arctic circle", and cross-checked, for the first time, with the measurements in stades of the inhabited world used by Eratosthenes and his estimation of the earth's total circumference. "Artic circle" again does not mean the same as the modern term, which in the language of Bratosthenes would give proportions of 4/60 - 7/60 - 4/60, but the circle "under" the celestial "artic circle" of an observer at knodes or anywhere on the "diaphragm" 5/60 north of the equator. If we visualize the observer at any point on the earth's surface as able to see, for all practical purposes, exactly helf of the celestial sphere with its pole exactly overhead8, he will, at latitude 360 N., be able to see at all times 360 beyond the north pole; that is to say, his "antic circle" will include all the stars within 360 of the pole. If a cone be imagined on the Aristotelian model composed of radii drawn from the earth's centre to this circle on the celestial sphere, it will intercept on the earth's surface 36° from its pole the circle which bounds Bratosthenes's frigid zone (fig.9)

It has been siready mentioned that there were geographers who believed in the existence of a narrow temperate belt at the equator itself. Eratosthenes himself is coupled by Strabo9 with Polybius as one of these. According to Berger this is a sheer mistake on the part of Strabo, who meant to write Posidonius: the passage from the "Hermes"2, the only firsthand Eratoethenic writing on zones we have, shows quite clearly that Eracosthenes believed in five zones only. It is conceivable that Eratosthenes might have changed his mind between the two works. It is unlikely that, in a didactic poem, he should have expressed views different from those he really held merely because he

8 The earth in comparison with the celestial aphere was regarded as having in practice no magnitude: poor ov h yh pev squique oboa ... (Cleon. Cycl. theor. 1,8;43)

1 H. Berger: Fragmente des E. p.85.

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A. Herger: Fragmente des M. p.83.

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was writing in verse. A more likely explanation, not previously put forward, is that Strabo's introduction of his name is not a mistake in the sense offered by Berger, but based on a genuine misunderstanding of Eratosthenes's meaning. Eratosthenes knew perfectly well that human life was possible south of the tropic; the town of Merce's and the southern extremities of Indie were, on his own showing, well to the south. Futher, he knew the upper course of the Nile, 5 with its double bend, better than it was known in modern times until late in the nineteenth century, and was even familiar with the rains in Ethiopia which produce its floods. It is at least possible that he had some inkling of the high land in Kenya, through which the equator does pass and which in fact possesses a "temperate" climate. If he mentioned this in his book, Strabo may well have leapt to the conclusion that it implied a whole temperate zone inside the tropics.

Having dealt with the terrestrial sphere and its physical conditions, Eratosthenes proceeded to place on it the inhabited world by inscribing an equator, a meridian, a tropic and an "artic circle". The four-sided figure enclosed by the "artic circle", the tropic and the two haves of the meridian was to circle", the tropic and the two haves of the meridian was to form the frame for his map; the map would overlap here and there, but in the main it would lie within this modern development of the old Ionian rectangle. It is not without significance that Strabe describes the new map as a "rectification" (01000001) of the old. The main point of Eratosthenes's work is that which of the old. The main point of Eratosthenes's work is that which strabe considered trelevant, the attempt to reconcile the flat map with the sphere. The inhabited world, he insists, lies on a figure (the temperate zone) rather like a spinning-wheel or truncated cone, and we must always

3 Frr. 177,181.

4 Frr. 177,187,194.

5 Fr. 216.

6 Fr. 216, note.

7 Strabo. C. 113. Fr. 173.

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It was, no doubt, this strong consciousness which induced him to use the curious term "seals" (oppayios)8 for the main divisions of the inhabited world. One can imagine him, with the terrestrial globe in his mind's eye, drawing the "diaphragm" and the main meridian, then the boundary lines, beginning to pick off piecex by piece, from right to left, as though with some gigantic jig-saw puzzle. Seals, in the ordinary sense, have irregular surfaces and may be of any shape, but they are all roughly convex. Eratesthenes was vividly conscious both of the theoretical sphericity of the earth and of its practical irregularity.

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8 Frr. 188,190 etc.

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C - The Contents and Arangement of the Γεωγραφικά.

At first sight the reconstruction of the three books of the reoxpanied at least in outline, appears reasonably easy. The fact that each book is referred to as a sensrate heory each book is referred to as a separate . ὑπόμνημα , or essey, suggests that the divisions were clear-cut and that the books were not published at the same time. Strabo even gives us the starting-points of the second and third books: the second book, he says9, contains a general adjustment of geographical science on mathematical principles, whose only fault is that it goes into too much detail; the third a similar sajustment of the "old maps", based on a division of the inbabited world into northern and southern halves. There thus appears to be a simple prima facie case for a straightforward division into (1) history of geography down to the author's own time, accompanied by critical evaluation (2) "physical geography", in the modern sense, based on the spherical earth in the spherical universe and working down through the "zones" to ocean currents and winds and the position of the inhabited world (3) description of the inhabited world, based on the division into "Seals".

This simplification, tempting as it is, breaks down in practice, and a glance at the different reconstructions produced by different scholers is sufficient to show how very slender the evidence is for what Erstesthenes really wrote. For most of the fragments which can be attributed with any certainty or probability to the work we have only Strabo's evidence, and although he must have been writing with a copy before him it is important to remember that he very rerely gives an ungerbled extract from the first two books. As Strabo was a fervent Stoic, we have a disproportionate number of quotations from the criticism of Homer,

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2 Frr. 199,203 3 Fr. 136. whom he felt bound to defend. Being not only a Stoic but personally averse from or unable to cope with mathematics, he omits all references but the slightest to such mathematical concepts as the size of the earth, the zones and the "winds". He"defends "Eratosthenes against the even more mathematically-minded Hipparchus, and subsequently attacks him himself on similar grounds?. A number of points come to us only in the form of a defence by Strabo against attacks by Ripparchus. Finally, after using Eratosthenes's "seals" for the southeastern part of his descriptive geography he abandons him altogether except for occasional references. Even so, the quotations from the third book far outweigh those from the first two put together.

The few direct quotations we have from Bratosthenes show him to be a sufficiently succinct writer. If we assume that the three books were, if not of exqual, at least of comparable length, and that what we have of the third book constituted at most a quarter of it, the gaps in our remains of the first two are enormous. It is scarcely necessary, indeed, for Strabate keep on reminding us of his insistence on such points as the unreliability of Homer and sphericity of the earth for us to realize that not only masses of detail but whole slabs of material have been omitted because they did not aquare with Strabo's notions of what consititutes geography - a utilitarian science for the guidance of generals, statesmen and merchants3, with a certain degree of entertainment and culture to make it palatable. It is not, then, possible to adduce Strabo's silence as positive evidence for the absence of any specific subject from the suppopted. His faint reference to the size of the earth as well as its shape gives good reason to suppose that Eratosthenes had a good deal more

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to say about it, and the same applies to his apparently contradictory references, mentioned above, to the zones; but if Bratosthenes introduced a detailed exposition of his wind-rose Strabo may well have thought it so irrelevant as not to be worth mentioning at all.

The solution to the problem would be a good deal easier if we could be certain that Eratosthenes himself was uniformly methodical and orderly in his exposition, and that, for example, the sudden introduction of the shape of the earth into the middle of the history of geography was a digression on Strabis own part, as he appears to admit4; but although, in a short quotation, Eratosthenes is lucid and concise, there seems sufficient reason to conclude that in a longer work he may not have been so. It has already been pointed out that his longer works were few, and these not continuous or homogeneous. The "Old Comedy" was a series of extracts and annotations, the "Chronography" a series of dates and events. Strabo's accusations of lack of order are too definite to be wholly without basis, and there can be little doubt that Eratosthenes did in fact turn from the immediate subject from time to time to ride a hobby-horse or insert an afterthought. It is essential to bear in mind that the three ways in which reference is made to the work, year paging, the page of the variable imply a somewhat informal manner rather than an elaborately polished text-book; that the conditions of composition before the days of paged books were hardly conducive to rigidity of order; and that even so the general outline of the work, after allowing for the varying interpretations of modern scholars, does show a tolerably methodical development of the subject though there can be no final certainty about the detailed order of

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many of the fragments. Further, the term ὑπόμνημα for each book suggests that they were published separately; and this alone would account for a good deal of repetition and recapitulation. In the absence of other evidence, it is reasonable to suppose that Strabo's criticisms follow the main lines of Eratosthenes.

At this point it will be helpful to consider the views of the three leading authorities of the past centumy side by side, bearing in mind that Berger assumes that the hypothesis of the spherical earth was still a major matter of dispute5, and that Thalamas assigns everything connected with measurement of the glabe (as opposed to the oraclashos 6 world) to the separate work σταδιασμός 6. the he could approprie the purposite the college of the con-

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- 5 H. Berger: Fragmente des E., pp. 53-6.
- 6 V. suh. p.26.
- 7 Pauly-Wissowa, s.v. "Eratosthenes"
- 8 Etude bibliographique, pp.185-187.

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There are several points not satisfactorily covered by any of these summaries, though on general grounds Knaack's reconstruction seems the solution nearest to the truth. Apart from any other consideration, if Thalamas believed that our fragments represent only one quarter of the third book, it is difficulat to imagine how he though Bratosthenes filled up the second; or, in view of Strab's slight but explicit references, how he could assume, even supposing the existence of the comprehensive mean account of the from all reference to the size of the spherical earth, its surface and zones.

The chief point unexplained is the apparent major digression in the first book on the sphericity, apart from its irregular surface, of the earth. At first sight this appears a simple anticipation of Book Two, as Strabo himself seems to imply; but if we bear in mind what has been already indicated as the chief contribution of Eratosthenes to geographic science, the bringing together the geography of the flat inhabited workd with the sphere on which it is situated, it is an essential partof a historical survey. It is at least likely that Strabo did not appreciate the significance of the first appearance of these; and in the same way Berger was led to suppose that it was the spherical hypothesis itself which was at stake.

9 Frr. 164, 171 etc.

1 Frr. 152 -160.

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If, however, we suppose Bratosthenes to hage started with his history of the geographers of the flat inhabited world, to have passed on to the history of theoretical sphericity, and thence to the practical implications and the researches which had taken place into the comparatively insignificant irregularities of the earth's surface, the whole book becomes intelligible if not, in its excessively fragmentary state, coherent. The measurements of mountains, the prevented cutting of the Isthmus by Demetrius3 become relevant; and when Strabo brings himself up with a jerk; "I shall return to the order of argument from which I digressed4; it is Strabo who has digressed rather than Eratosthenes. Berger is misled into introducing at this point the zones: it is not impossible that they may have been mentioned here, but they do not become really relevant until the question of placing the inhabited world arises, and the general import of the passage in Strabo implies rather the general doctrine of sphericity than measurement and detail.

The other important points which it is necessary to discuss bridgly here are (1) the measurement of the earth (2) the sun and moon (3) the winds. It has already been stated that each of these subjects may have been treated in a separate short work, possibly in the form of eletter or letters to Archimedes or is or some other physicist. There is no evidence whether this is true or untrue of any of them, though Thalamas concludes, with that "Gallica levitas" which Bernhardy attributes to Gossellin, that all these and more, including the zones and measurements of mountains, appeared in Thei drafterphotos and nowhere What, however, in the absence of evidence it is reasonable to suppose is that whether they had been published or not in another form it would be hardly possible for Eratesthenes to write a geographical work without some mention of them. Strabo repeatedly dos a second Coulogs 1888: Ingermore Source be map? Grepor no? " howeverevery

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complains of the amount of technical detail which Eratosthenes keeps inserting, not about his proper business, the unhabited world, but "that both the earth, including its liquid content, and the heavens are spherical" There is, as has been pointed out above, plenty of room; and some of the undesirable detail may well have included, not merely a summary, such as is given by Gleomedes, of the geometrical proof of the earth's measurement, but a few remarks on the earth's position in the universe and its relation to the sum and moon. These fragments, included in the "Geography" by Bernhardy, have been ejected by subsequent editors: again, there is no evidence, but judged prely by relevance the balance of probability supports them.

In Section 3A the relevance of the "winds" to the geography of the inhabited world has already been made clear. The achievement of Eratosthenes was to detach the "wind-rose" from a particular point on the inhabited world and make it universal, and it is scarcely likely that in a book in which he was describing the relations of inhabited world to earth, he would omit some mention of the "winds". It has already been said that Berger, who was not acquainted with the Galen passage, built up on the single statement of Achilles Tatius an ingenious hypothesis that Bratosthenes, using Rhodes as his centre, adapted the wind-rose to the construction of his map, but this is now obviously untree.

It is now possible, within a reasonable margin of probability to summarize the arrangement of the corpagind as follows, and it is on this plan that the fragments are placed in the text.

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7 Fragmente des E. pp.211,212.

8 Uranlog. 158B: ἐπραγματεύσατο δέ περί ἀνέμων και Έρατοσθένης.

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9 Fr. 191 1 F.J.Coresil pp.36-31. sent suit to extricate wops inserting, nor orid, but "that bo To surveyed edt in ou lo viusia span all have included, o and borroof on and lo ed o few remerks or ont of notices to the ditore: again, ther relevance the balance

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Book Two an et his elegenithe works of prevenue publications

The position of the earth, its shape, size and division into zones. The situation of the inhabited world in the temperate zone, and the possibility of sailing round the far side. Its shape, length and breadth. The winds. Unsuitability of division into continents and of men into Greek and foreigner. Book Three has seen drawn on a first preject on a first

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IXII

That Erabsthenes was a man of encyclopaedic learning and catholic tastes is evident enough. As Librarian of Alexandria he had access to the most complete collection of records in existence9: among the half-million or so books in the two libraries there must have been a large assortment of the publications known as περίπλους and παράπλους (coasting voyage round bays and guifs of along straight shores) (descriptive geography) a voyage roads of (itinerary wfth foods nightly stages marked on royal records on all kinds of government business) (Egyptian royal records on all kinds of government business) He had also at his disposithe works of previous philosophers and scientists, including Aristotle's own library which was transferred to Alexandria by Ptolemy Philadelphus. In these circumstances it would be almost reasonable to say that the sources used by Eratosthenes for his map comprised the whole of Greek literature and science up to his time. Indeed Gossellinl even improved upon this by asserting with apparent conviction that he had access to ancient maps based upon a correctly curved projection; that he misunderstood them and copied them as though they were drawn on a flat projection, and then destroyed the evidence. Who the mysterious people were who not only surveyed the whole inhabited world but had sufficient command of mathematics to project a curved surface on a flat map Gossellin leaves to the imagination, with the suggestion that they were Chaldeans or Babylonians.

What is more to the present purpose is to note, not the impressive list of Greek explorers and discoverers from Homer to the middle

9 Fr. 191 1 F.J.Gossellin: Geographie des Grees analysée (Paris 1790) pp.36-51, and passim.

Sonn une the west Castern nunries : of the third cer elsewhere, but mentioned by Br As has been exploration confurther and fur From the middle knowledge had for He himself had but had deliber a fleet from th were used by Ar as the only rea Aristobulus and left records. of Alexander's eastern part of Bratosthenes ce Selevous Nicato the Far East Er Ctesias and Pat supplemented Ne as far as the h accurate measur "Bematists", or end Beeton6. Ptolemies, part hunting: Aristo while Strabo qu Ptolemy II. Phi and Ptolemais I 2 See Bibliogs 3 Fr. 211 4 Fry. 165, 1 5 Mrr. 175,185 6 Plin. VI 63 Hip. an. Ota Rion, ed Arch restern questas as the independent period preside the wanted on the correction of the third century, which can be studied in detail elsewhere, but those who were clearly used or actually mentioned by Bratosthenes himself. he was because of copying the Wiste book

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As has been mentioned above, the process of Greek exploration consisted of setting the boundaries of the unknown further and further back from Greece as the focal centre. From the middle of the fourth century an enormous increase of knowledge had followed the marches of Alexanders armies. He himself had not been content with purely military excursions but had deliberately organized exploration. Nearchus eailed a fleet from the Indus to the Persian Gulf. His records were used by Arrian, and were also available to Bratosthenes3 as the only real authority for that coast. Gallisthenes, Aristobulus and Onesicritus were also with Alexander, and left records. Other exploration was undertaken at the command of Alexander's successors, and helped to fill in the southeastern part of the map. Megasthenes and Deimachus, whem Eratosthenes censures4, were embassedors respectively of Seleucus Nicetor and Antiochus to Palimbothra, or Patna. For the Far East Eratosthenes himself preferred the records of Ctesias and Patrocles, while Androsthenes of Thases and others supplemented Mearchus on the Bersian Gulf. Inland exploration as far as the hiver Jaxartys was provided by Deodamas, and accurate measurements of roads and stages by the well- nown "Bematists", or "pacers" employed by Alexander, Diegnetus end Beeton6. Exploration of the Red Sea was promoted by the Ptolemies, partly with the utilitarian purpose of elephanthunting: Ariston was sent by Ptolemy I, Semmias by Ptolemy III, while Strabe quetes fourteen men mentioned by Artemidorus under Ptolemy II. Philo fixed than by gnomen the latitudes of Merce and Ptolemais Boitheras, 7 which were edopted by Eratosthenes.

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² See Bibliography

^{3 92, 211}

Fry. 165, 294 word Ornect minoris, vol I, p.156: Perts 1885 5 Prr. 175,187,225 (Patrocles): 211 (Androsthenes)

⁶ Plin. VI 61.
7 Hip. zh. Strab. 6777 ratie was 120. 414/g, and was accepted.
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1 Geog. I,15,2. 2 C.Miller: Geo

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3 Fr. 270

4 Fr. 271. 5 Strab. C.115, by Hipparchu

6 Hipp. ad Arat

Fr. 223.

Such was the wealth of information at hand for the southeastern quarter of the inhabited world. Two centrales later Strabo "cannot say anything better"8, and quotes Eratosthenes in extenso for all this district. For the Mediterranean coasts Eratosthenes followed the work "On Harbours", by Timosthenes, so closely indeed that he was accused of copying the whole book together with its preface. This book was still quoted as authoritative by Ptolemy the mathematician and geographer nearly four centuries latterl. There was also in existence a by Nymphodorus, of Syracuse. For the western districts Lycus of Rhegium and Timaeus the historian are also quoted by Agathar-For the rest of the world Strabo was under the impression that he had better authorities, and abandoned Bratosthenes except for sporadic reference. It is, however, interesting to note that Julius Casear took Eratosthenes with him as one of his chief guides for his campaigns in Gaul and Germany and, in a work published after personal travel in north-eastern Europe and Britain itself, quotes him as an authority without censure3. The main apparent reason for Strabo's abandonment of Bratosthenes and reversion to inferior authorities, especially for the coastline of Spain, Portugal and France, is the degree of trust placed Eratosthenes in Pythess4. It is possible that Eratosthenes, the practical mathematician and astronomer, was so much impressed by the extraordinarily accurate reading (presumably one smong others not recorded) taken by Pytheas of the gnomen's shadow at Massilia and his discovery that the Pole Star was not in fact at the Pole6 that he was led to suppose him a man of great personal reliability; or it may be that his wide reading and innate common sense bred in him an unusual discrimination between the true and the counterfeit. This is shown not only in such points as his preference of the more conservative Patrocles to Megasthenes in the east but in his acceptance of Cerne on the Atlantic coast of Africa? mentioned by Hamne but rejected

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Whatever Pytheas did in fact do, he was the only first-hand authority for northern and western Europe, and for Britain until Julius Caesar, who did not penetrate beyond the S.E. corner of Britain in person. The information which had percolated at second hand by land was sufficiently inscentate to make Strabo's account of these parts inferior, so far as can be determined, to that of Bratosthenes, who simply copied or adapted Pytheas for Spain and Britain and the north; no doubt to a great extent as Herodotus repeated what "the priests" told him, because it was all that was available.

Unfortunately there is no possibility of determining either what Pytheas did or what he said, such fragmentary references as we have to his works being elusively fascinating but so debatable as to be nearly useless. Broche, in the latest specialist publication on Pytheas', persuades himself with a wealth of intoxicating verbiage and exclamations, in the face of all probability, that Pythess was a compound of businessman with an infallible scientist and a mystic in search of the midnight sun; that he possessed at least two triremes that kept up an unswerving average of 1000 stades a day (1.53) that he had anticipated the measurement of the earth's circumference by Eratosthenes (p.29,etc) and hence could navigate with accuracy (M. Broche does not explain how he found his longitudes); that he made the open sea voyage from Finisterre to Brittany or Ushant (ch. XI); he crossed from there to Cornwall, where he inspected the tin-mines9, then along the south and east coasts of Britain by way of the Orkneys and Shetlands to Iceland. To the well-known objection that Thule could not be Iceland because there are no bees north of 6101, he replies that the climate may have changed, that there are hornets there now (p.187). From Thule, he says, Pythess, drunk with continuous daylight, sailed on to the Frozen Sea, then returned greed, and comy and warming and in layel mid-

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Gaston-E. Broche: Pytheas le Massaliote: Paris 1936.

Fr. 278. Cary "Ancient Explorers" p.36.

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² Fr. 285

³ Frr. 175,2

⁵ Agriculti

⁶ Fr. 284.

LXVI

down the west coast, cataloguing the Hebrides but, curiously, not calling at Ireland (XXVI, XXIX); sailed along the north coast of Europe and right into the Baltic to Samland (Estonia)2, which he named Queen (Basine)a because of the quantity of amber found there (XXXII); onwards in search of the opening into the Caspian Sea, supposed to have been discovered by Patrodes3, hoping to return by way of the River Don, which was supposed to have a mouth in the Caspian, and so home by way of the Black Sea and Mediterranean; but having sailed as far as, he "calculated", the meridian of the Don without success, returned instead by way of the north coast of Europe.

It is not possible to deny that Pythags might conceivably have done all this; but if M. Brocke had ever spent a few days h cruising in a modern yacht with a modern rudder, and an auxiliary engine instead of oars, perhaps his time-table would be a little more elastic. If he had studied the tides and currents to the north of Britain, described by Tacitus and by Scott at the beginning of "The Pirate" (where he unquestioningly, like Ptolemy, takes the Mainland of Shetland to be Thule), perhaps he would be less certain that Thule is Iceland. If he had read his texts with a little less romantic imagination and less of Gossellin's "Gallica Levitas", he would remember that Fytheas himself is described as stating that much of what he related was hearsay; 6 and, remarkable as his mathematical and estronomical achievements undoubtedly were, he would not seek to augment them by ascribing to him the discoveries and calculations of later discoverers.

It is very easy to go too far in the other direction, and follow Strabo in dismissing the whole affair as travellers' tales; but things which sounded as absurd as Mandeville or Munchausen than have proved to be no more than truth, sometimes curiously stated, and Cary and Warmington in England,

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³ Frr. 175,226.

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8 1. 159.

LXVII followed by Hyde in America, take a moderate view which at present holds the field. This credits Pytheas with coasting along Portugal and France to Ushant, crossing to Cornwall, circumnavigating Britain and possibly visiting Orkney. Somewhere in North Britain he heard about Thule, probably Norway, but was put off attempting to visit it by personal experience of "stuff like a sea-lung", probably dense fog. From Cornwall he sailed either back to Ushant or shantwise to north France, and from there as far as the Elbe: Basileia, or Abalus, is Heligoland. He then returned to Warseilles, the remark of Polybius which has caused much discussion, that he sailed "all along Europe from Cadiz to the Don" being merely a sneering remark equivalent to "from Dan to Beersheba" or "from China to Peru".

There can be no final answer to these questions, and this is not the place for a full-length discussion of Pytheas's achievements. As, however, he is the only source Bratosthenes had for the northewest, the key-extracts concerning his purely geographical discoveries are quoted below in the text, and essential discussion of details is attempted in the notes on them. commission the heteric of savenings a suggest that he may

Eratosthenes himself, so far as is known, did not travel for the sake of travel. During his residence in Athens he must have done a little travelling in Greece: he certainly claimed to have visited Helice in Achaea and seen the results of the famous earthquake and tidal wave of 273 B.C.

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^{7 &}quot;Ancient Explorers", pp. 33-40; "Ancient Greek Mariners", pp.124-134. Attachante actapathogata was by baseman

^{7. 159.}

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"Anaient Englorere", pp. 33-40; "Ancient Greek Morismue",

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9 Fr. 155

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1 Frr. 156,1 2 H.Berger:

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LXVIII

It is impossible to say for certain how much travelling he did while resident at Alexandria, but it is fairly safe to assume that he himself visited Syene to confirm its position on the tropic. His remarks about the temple of Ammon and its cyster-shells suggest a personal visit, but eyen upon this subject, in which he seems to have been much interested, he is content in the Alexandrian manner to accept most of his data at second hand from Strato of Lampsacus and Kanthus the Lydian. It is possible to conclude that the contents of his map, which was after all more in the nature of a mathematical exercise, were the result of comparison of authorities rather than of personal observation.

For what would be of the greatest possible interest, the amount of indebtedness of Bratosthenes to Dicamohus, there is almost no evidence. It is not even certain whether Dicaearchus was the author of the meridian measurement of \$ 300,000 stades2, or whether his map was one of the "old maps" which Eratosthenes set out to "rectify". Perhaps from the very fact that his work was overtaken and replaced by that of Mratesthenes, it has disappeared almost completely. His probable measurement of the earth, however, and his attempts et measuring the heights of mountains, 3 suggest that he may have anticipated the interest taken by Eratosthenes in the sphericity and irregularity of the earth. This is the more likely in that he was, like Strato, a Peripatetic, and evidently of similar tastes. It is at any rate certain that his "diaphragm", and division of the inhabited world into northern and southern halves, was, as has ware agen. In this way he hand to minimize the sintestian which he maps more well be could not eliminate. Through mouth erec, indeed, his marked is be

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1 Frr. 156,157. 2 H.Berger: Gesch. der. Wiss. Erdkunde der Griechen: Leipzig,

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H.Berger: Gesch. der. Wiss. Blundide der dans 1887. vol III, p.44.

3 Suldas, ε.ν. Δικαίαρχος.... καταμετρήσεις τῶν ἐν Πελοποννήσω όρῶν.

8 St. 178.

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4 Lysimachia destroyed

5 Disposed of Altertums des E. p.

6 Fr. 173.

LXIX

been shown above, based on an already well-established tradition and was accepted almost as it stood by Eratosthenes. The main meridian employed by Eratosthenes was also traditional, but Rhodes, where he makes it cross the diaphragm, is not given as one of the places through which Dicaearchus made his diaphragm pass. Disearchus, however, did use the section of the meridian from Syene to Lysimachia in his measurement of the earth. Nothing more is known about the methods used by Dicaearchus in the construction of his map, and in the absence of evidence it is perhaps permissible to attribute to Eratosthenes the method on which he based his own.

In his first two books, as we have seen Eratosthenes emphasized the necessity of visualizing the inhabited world as part of a spherical surface; but when it came to the actual construction of a map desire could only outrun performance. With all respect to Gossellin and his race of perfect mathematicians, 5 there is no evidence that anyone before Ptolemy succeeded in evolving a method which could give the impression of a curved surface drawn of a plane. Thus, having compared the shape of the inhabited world with that of a "chlamys",6 that is to say, a cape with the lower edge considerably longer than the upper, fitting round the "spinning-whorl" shaped temperate zone like a real cape on the body of a human being, the arctic circle representing neck and shoulders, hetries to lay out the chlamys flat on the ground and copy it on to a place map with straight axes. In this way he hoped to minimize the distortion which he knew wery well he could not eliminate. Over a small area, indeed, his method is as good as any, but as in any flat map, whatever the method of projection, the distortion increases with the

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⁴ Lysimachia, founded 309 B.C. in ἀχμή of Dicaearchus and destroyed 281

⁵ Disposed of by Ukert and Ideler. (See K.Mullenhoff: Deutsche Altertumskunde, I,p.260: Berlin 1870. Berger: Fragmente des E. p.100).

⁶ Fr. 173.

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LXX

size of the area and the consequent reduction in scale. This, no doubt, is why Strabo recommends a map not less than seven feet long if a globe is impracticable.

The use by Strabo of the terms "meridian" and "parallel" has led to a great deal of confusion and misunderstanding. Between Eratesthenes and Strabo Hipparchus had adumbrated, though not put into effect for lack of sufficient data, a system of parallels calculated and cross-checked by three methods (1) gnomonic readings8 (2) length of the longest day9 (3) noon elevation of the sun on the shortest day.1 The spaces between these lines were to be defined and described by their "celestial Phenomena" and what are still called their "climatic" conditions, 2 and were called "climata", or laddersteps. These in turn would be divided by meridians established by the observation of the comparative times of eclipses of the moon. The terrestrial globe would thus be reticulated by imaginary lines corresponding with those which could be much more easily drawn on the celestial, and places on the earth's surface could be placed with absolute certainty and exactitude by observing the points of the heavens under which they lay. This complete and theoretically perfect system could not even begin to be put into effective operation in the time of Hipparchus because of the absence of data, and particularly, in the case of the meridians, because of the impossibility of establishing relative times in different places with any approach to exactitude. He did, however, make a beginning by collecting such data as were available and calculating others, and his suggestions had a lasting effect. in constructing his map on the new the applied which decreasings really assess to have applied

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8 Strabo G. 133,115,87; Hipp.ad.Arat.p.178D.

S. A. Balacas diographic d'Aretolinero, p. 237-C.

Strabo C. 133,134; Hipp.ad Arat. p.178D.

1 Strabo C. 75,135.

2 Strabe C. 132. William Athes drawed open that acomes ale to

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7 Fig. 11 8 A. Thal

LXXI

projection, listed many hundreds of places, not by distances from each other, but by degrees, minutes and seconds of latitude and longitude, thus giving an entirely illusory effect of accuracy: his latitudes and longitudes were in fact worked out in exactly the same way as those of fratosthemes, by calculation of distances from key places whose position was, or was thought to be, known. How wrongly some even of these could be calculated is illustrated by the fact that Hipparchus himself placed Byzantium on the same parallel as Fassilia; it was the reading of Pytheas which was almost exactly right, while that of Hipparchus, or that he adopted, gave a result some two degrees out.

It is, then, in the light of these subsequent developments that the system of Eratosthenes must be considered. Berger was persuaded that Strabo followed Eratosthenes in his parallels and meridians and included them all among his fragments? Muller, followed by Bumbury, reconstructed an elaborate map on twelve meridians and eight parallels6. The real, completely insuperable obstacle to a convincing reconstruction of even part of the map is that we know what it ought to look like; and all modern reconstructions suffer from this defect. Thalamas? wisely refrains from attempting a general reconstruction, confining himself to the features actually given in the fragments we have-the framework of the map and the eastern "seals"; but his assumptions, on the ground that Eratosthenes considers an error of four hundred stades negligible, that the axes represent belts four hundred stades across instead of imaginary lines with a margin of error of four hundred stades, is quite indefensible.

The method which Eratosthenes really seems to have employed

3 Strabe, C. 115 4 Fragmente des Eratosthenes, pp. 169-170, 188-196.

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7 Fig. 11 8 A. Thalamas: Geographie d'Eratosthène, p. 237-8.

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⁵ M. H. Bumbury, Vol. 1, p. 660. 6 V. de St. Nartin: Atlas dressé pour l'histoire de la géographie (plate 2): Paris, 1874.

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9 Frr. 188,

1 Fr. 177.

2 V. sup. se

Fr. 184.

LXXII

is as follows. Taking his one meridian, disphragm and a rectangle 3000 stades across representing the Mediterranean and Taurus, not with geometrical accuracy but roughly, as strabo insists is only proper in geography, he defines the southern and northern limits by the "parallels" of the Cinnamon Country and Thule. He then measures off the breadth of the inhabited world along the "meridian" as follows:

There are no theoretical limits to habitability beyond the ends of the inhabited world, but he measures from India to the Pillers of Heracles and then adds two thousand stades at either end to allow for the bulge of Spain and any possible capes and islands. There was, according to Strabo, the additional reason of making the length exceed twice the breadth, the possible reasons for which have already been discussed.

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3 Fr. 184.

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⁴ Fr. 179 - co more detail

Fr. 180.

⁶ Fr. 187.

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It is noteworthy that most of these distances are in very round figures, those with most pretensions to accuracy being those with Alexandria as the centre; also that the distances weatwards from the Euphrates are measured, not along the diaphragm itself but approximately along the "parallet" of Alexandria, converging with the diaphragm at the Pillars of Heracles.

Exactly which parallels mentioned by Strabo were used by Eratosthenes is not clear, but only two are attributed to him by name. One of these, approximately the "diaphragem" itself, passes through "Caria, Lycaonia, Cataonia, Media, Caspian Gates, and the parts of India next to the Caucasus";4 another, through "Lysimachia, Mysia, Paphlagonia, the district round Sinope, Hyrcania and Bactra". These lines, even if they did not appear in the finished map, he must have used at least in the preliminary stages of drawing. An interesting enticipation of Hipparchus is shown by his method of arriving at the latitude of the "capes of India".6 More modest in his aims than Hipparchus, he made no attempt to utilize meridians in the same way, being no doubt fully aware of the insuperable difficulties in the way of establishing them even withing the rough degree of approximation which satisfied him as a pioneer.

Having thus established his framework and the general lie of the countries, he proceeded to fill in from east to west boundaries, rivers and important towns with, presumably, a pair of compasses, measuring in straight lines from the diaphragm.or places already fixed . What the finished product looked like can only be surmised, and any surmise is bound to be coloured by familiarity with the modern map. We can

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⁶ Fr. 187.

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LXXIV

hazard a guess at the first four Seals, we know that the Gaspian Sea communicated with the Ocean, that Rome was on the same meridian as Carthage, that Africa stopped short just south of the Cinnamon downtry. That the shape and size of Britain, the Person Gulf and Ceylon were greatly distorted; but any honest attempt at reconstructing the map of Fratosthenes, in order to avoid an unconscious tracing of familiar outlines, must consist very largely of straight dotted lines and even more Terra Incognita than the original must have done.

7 Fr. 175 8 Fr. 266 9. Fr. 217 1 Fr. 279 2 Fr. 211 3 Frr. 196, fin.; 198.

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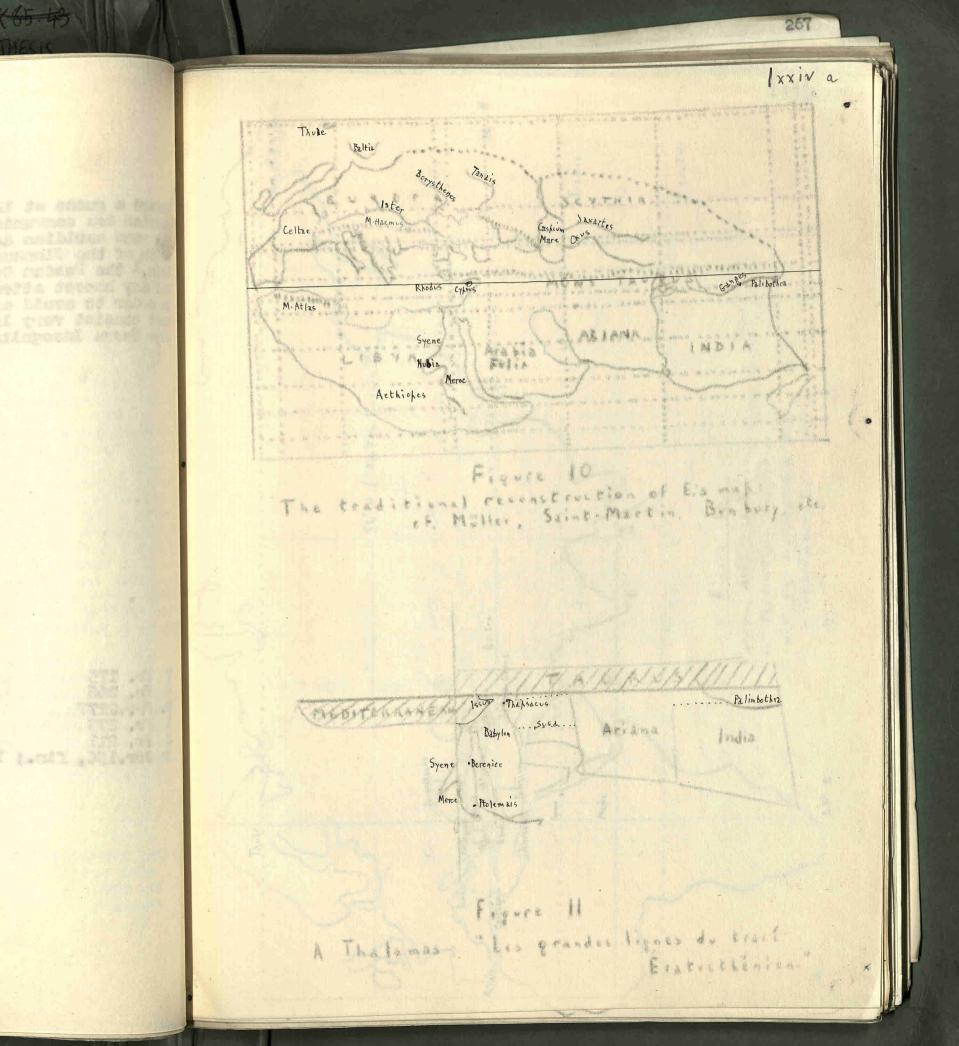
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R - Notes on Measurement

Concerning the methods and units of measurement emplyed by Eratosthenes the evidence is confilicting, and the whole problem has been overshadowed by the inclination of commentators, often unconscious, to look at his work in the light of modern knowledge and read between the lines what is not and is likely never to have been there. We have already seen something of the effect this tendency has had on the interpretation of his map-making.

There is in fact no evidence to suggest that Eratosthenes in his work used any instrument beyond the classical ruler and compasses except the gnomon and the dioptra in some form. The gnomen, or upright shadow-casting pole, has already been mentioned in connexion with his measurement of the earth's circumference. 4 With it, in his favourite form of the Tolos, oxago or "scaphium", be also measured the inclination of the ecliptic by the simple process of finding the difference between the angles of the sun's rays at the two solstices and dividing by two. This gave him a result of 11/83 + 2 of the great circle,6 which he took in practive, as we have seen, to mean 4/60. Hipparchus and his successors, perhaps because of the difficulty of measuring the frankian at the sixtle manufacturing a perfect hollow hemisphere, setting it level, and measuring the fraction of the circle covered by the shadow, preferred to calculate their angles by solution of triangles.7 week made singly by Maritenthious sons birth

services of mountains, though has

The Equinoctial Ring 8

There is no evidence how Eratosthenes knew, apart from counting

- 4 V. sup.p.47 ff.
- 5 Mare. Cap. VI 596
- 6 Fr. 169.
- 7 ad Arot. phaen. 178D, 181D etc.; Strab. C.133.
- 8 Ptolemy, Synt. III.2; 2d. Helma I,p.153. J.A.Repsold: Sur Gesch. der Astrom. Messwerkzeuge: Leipzig 1908.

-3 X, WX.24.1/

B - Notes on Researciant

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To sup. p. 47 fr. 396 Rr. 169. VI. 396

od Arot. phaesa. 1983, 1815 etc.; Streb. 0.138. Palony, Synt. 131,2; 2d. Helma I.p.183. J.A. deponds ut Gooch, der Antrom. Messwerkronger Leibnig 1968. the days, when the there was a very during his own received and methods of old most likely to he bronze ring set is exactly in the place of the required of covered the inside were other device that some of the that they had been inclination of the covered the inside were other deviced that some of the covered that some of the covered that they had been inclination of the covered the covered that they had been inclination of the covered the covered that they had been inclination of the covered the covered the covered that they had been inclination of the covered that they had been inclination.

The Dioptra 9

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9 Ptol. Synt. ed 1 Ptol. Synt. V

LXXVI

the days, when the equinoxes and solftices occurred, but as there was a very accurate revision of the calendar (238 B.C.) during his own residence at Alexandria the priests must have had methods of observation. The simplest, and perhaps the most likely to have been used by Eratosthenes, is that of a bronze ring set in lead on a stone pedestal so as to lie exactly in the plane of the sun's rays on the day of the The ring was square in section, and solstice or equinox. on the required day the shadow of the upper part exactly covered the inside of the lower. By Ptolemy's time there were other devices as well, and the fact that he complains that some of the old rings were no longer reliable suggests that they had been set up long enough for the change in inclination of the earth's axis to become perceptible.

The Dioptra 9

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A by-form of the dioptra was the "regula Hipparchi", which

9 Ptol. Synt. ed. Halma I,1; II,1. Repsold op.cit. 1 Ptol. Synt. V,14: την υποδεδειγμένην υπό τοῦ Ίππάρχου διά τοῦ τετραπήχους κανόνον διόπτραν.

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consisted of a ring fixed on the end of a rod, sighting with another ring sliding along a scale. This was used especially for measuring the apogee and perigee of the moon.

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It is very unlikely that Eratosthenes divided the circumference of the earth further than the "sixtieths" to which reference has been made. The first recorded reference to a division of the zodiac into 360 parts appears in Nypsicles, 2 in the second half of the second century. The system, as applied to the zodiac, appears to have been adopted from the Chaldaeans, but Hipparchus is credited with its application to the circle in general.3 When the further sub-division into minutes and seconds was introduced is not known, but it was in general use by Ptolemy's time. The attribution by Gossellin and others of the use of degrees to Bratosthenes is presumably based on a misunderstanding of Strabo.4 CAPER TO MELLOS MENTAL VICTORIAN CONTRACTOR

Measures of Length

During the past century and a half numerous theories have been put forward concerning the value of the stade.

Gosselling and other French scholars, with an extraordinary perversion of ingenuity, began from the curious assumption that the size of the earth must have been known, and worked out exact valuations on the basis of the various estimates of 400,000, 300,000, 250,000, 240,000 and 180,000 stades to the great circle. Assuming further that the various Lerryth, and thet, an fact, on an amount of the topic of the

2 Hyps. Anaph., ed. Manituis 5,25-31. 3 Iver Thomas: Gr. Math. Works: Loeb ed. 1939. Ip. 48; II, 369-7.

4 Strabo C.132. 5 Gessellin: Recherches sur la geographie systematique et

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Even if we which Gossellin distance in yard in degrees, minu of "Olympic", "I theories have be normal ratio em was eight stades that Eratosthene that 'a schoenus 40 stades, that to one schoemus' that is to say, of 30 stades ead less than eight 81/3 mentioned a

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6 Tab. Jul. Asc 7 Pliny, XII, 53

8 Anonym. Geog. 9 Phot. C. Grad

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Greek maps were merely perversions of a perfect pre-historic map on a curved projection, Gossellin, by employing any values of the stade that happened to fit, proved to his own satisfaction that the measurements in stades given by Eratosthenes and others were originally genuine but had been misinterpreted.

Even if we ignore these flights of imagination, upon which Gossellin based many pages of elaborate tables showing distance in yards, feet and inches and latitude and longitude in degrees, minutes and seconds, there remains the confusion of "Olympic", "Pythian" and "itinerary" stades. Further theories have been evolved from the facts that, whereas the normal ratio employed for conversion into Roman measurements was eight stades to the mile, in one reference it is stated that Eratosthenes and Strabo reckoned 8½; while Pliny says that "a schoenus, by Eratosthenes's reckoning, is clearly 40 stades, that is 5 miles, but some have assigned 32 stades to one schoemus". In another place we have "...29,000 stades; that is to say, 3625 miles, or a little more than 900 schoeni of 30 stades each. "Be Plutarch gives: "The mile is a little less than eight stades, "9 which seems to conflict with the 8½ mentioned above.

One of the most interesting analyses of the whole question was published as long ago as 1839 by W.M.Leake. He reconciles the differences in conversion to Roman miles by assuming a conversion stade of 625 Roman feet, of which there were 5000 to the mile: the Roman foot is 11.652 English inches. If Strabo took this as 600 Roman feet, the figure of 81/3 would be accounted for. Leake pointed out that there is no evidence whatever in ancient writers that the stade varied in length, and that, in fact, as it was the basis of the foot-race, to which they attached great importance as an international sport, it is extremely unlikely that they

7 Pliny, XII, 53.

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⁶ Tab. Jul. Ascal. Script. Metrol.Gr., ed. Hultzsch, I.p.201.

⁸ Anonym. Geog.exp.comp.2.: Geog.Gr.min.II,494.

¹ W.M. Leake: On some disputed questions of ancient geography: London 1857.

should not have this conslusion.

The account explicit and exa "consists of exa fathom measuring of four palms, t to the standard a stade of 606 . in mind that eve with a rough est francs to pounds the relation of was treated even that local vari matter very much to the Greek, at was just as uni Englishmen, an Greek states wo of French, Swis Roman Empire, W may have been d distances given of stades would speaking people

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212 - 108 and 258,000 acades it is acaresty worth while should not have had a fixed standard. Berger also came to The Carlo agen and a star a second this conslusion.2

The account of Greek measures given by Herodotus is explicit and exect. "The stade of six plethra", he says, "consists of exactly one hundred fathoms (opyviai), the fathom measuring six feet or four cubits. The foot consists of four palms, the cubit of six. "8 The Attic foot, according to the standard in the Parthenon, was 12.1375 inches, giving a stade of 606.875 feet (English).4 It is important to bear in mind that even nowadays for practical purposes we are content with a rough estimate for, say, conversion from dollars or francs to pounds, from kilometres to miles. In times when the relation of the diameter of a circle to its circumference was treated even by mathematicians as one-third, 5 it is unlikely that local variations of the stade within a few yards would matter very much. There can be little doubt that the stade to the Greek, and later to the eastern Mediterranean peoples, was just as uniform in its meaning as the mile to the average Englishman, and that any variations of foot and stade between Greck states would not be greater than, say, the differences of French, Swiss and Belgian francs before 1914. Under the Roman Empire, with its exact measurements and milestones, there may have been discrepancies, but in the time 66 Bratosthenes distances given in round figures of thousands or even hundreds of stades would be immediately intelligible to all Greekspeaking people.

Eratosthenes himself, as has been repeatedly pointed out, in the absence of exact data was content to approximate. Having taken all precautions he could, he knew his results were still not capable of exactitude: when he himself probably saw little difference between

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² H.Berger: Fragmente des E. pp.132-7.

³ Herodotus. II, 149.

⁴ W.M.Leake, op.cit.p.82. 5 e.g. Plin.II, 248, where the distance to the centre of

the earth is given as 42,000 stades.

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6 A.Thalamas:

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250,000 and 252,000 stades it is scarcely worth while to quibble over the decimal of an inch. The most recent discussion is that of Thalamas, who concludes that the "itinerary" stade, as measured by the bematists, consisted of 240 paces of 2½ feet theoretically; that each pace would not exceed 70 cm., giving a maximum stade of 168m. or 551 English feet. As we have no means of knowing how the bematists checked their measurements, this conclusion must be regarded with reserve.

In actual fact none of the measurements Eratosthenes gives was straight. The best authenticated is that from Syene to Alexandria, on which the measurement of the earth and his whole map were based; yet even this he took as a round figure, discounting something for the deviations of the river. In other cases also he discounted from itinerary measures in a quite arbitrary way to reach what he considered a just straight measurement. As for distances by water, they were frankly guess-work, especially over the open sea. Herodotus,8 for example, gives the length of the Black Sea as a voyage of 9 days and 8 nights, and takes the day's sail as 700 and the nights as 600 stades: clearly 350 and 250 would be such closer The distance from Rhodes to Alexandria ... was estimates. estimated at 4-5000 stades. Eratosthenes, on the basis of a gnomomic reading and incidentally of his estimate of the earth based in its turn on the distance (a land distance) from Syene to Alexandria, calculated it at 3750.9 Oddly enough Posidonius based his measurement of the earth on this distance, and having made it in the first place 240,000 stades, afterwards in view of Bratosthenes's measurement reduced it to 180,000! The actual distance is somewhat under 400 miles, that from Syene to Alexandria rather over 500.

In ancient times ideas of time and distance inclined to be

6 A. Thalamas: La geographie d'E., pp.155-9.

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8 Herodotus, IV,86.

9 Strabo. 0.126.

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hazy. The Persian royal roads were measured in σταθμού or stages, which naturally varied according to the nature of the ground, and it is likely that the parasang and the schoenus² also varied. The στάδιον, as its derivation suggests, was fixed. Its 600 feet cannot have differed more than a moderate number of feet from 200 English yards. Even the most practised of bematists must have shortened his step a little towards the end of the day or on hilly ground, and most of the distances given by Eratosthenes do not even pretend to be anything but the roughest of approximations. If we adopt the current English practice of taking ten stades as equivalent to one geographical or natitical mile, which itself varies from 6046 feet at the equator to 6108 feet at the poles, 3 we shall arrive at as ancurate results as can be hoped for. On this basis the earth's circumference of 250,000 stades is equivalent to 25,000 mean geographical miles of 6080 feet, 3 or about 28,785 land miles; The actual circumference (at the equator, which to Eratosthenes was the same as along a meridian) is 24,902 miles. 3 The meridian measurement even now is so uncertain that the only standard work of reference which commits itself is Chambers's Encyclopsedia, which gives it as 24,856 miles.

At the meeting of the British Association held in August, 1947, Professor Eva G. R. Taylor, speaking on politics and geography, made the following remarks: "We ourselves are perhaps startled to hear it suggested that the exact size perhaps of the earth may be elevated to the rank of 'top and shape of the earth may be elevated to the rank of 'top secrets' - startled until we remember that success in mechanical warfare depended upon pin-pointing the target - a target

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² Strabo 0.803; Pliny 6,30; Liddell and Scott.

³ Whitaker's Almanac, 1946. 4 "The Times", Aug. 29, 1947.

IXXXI out of sight rou The Perstan royel rivers sees and recourse of the de entre petersity veries proportion to the mount of "Only a mer grounds and the second of the second state of the second o "of the land sur of the order of Att con fuct cannot have callered rule blanch moughap together of such ost of fost from 200 lighten partie. Thron the month read that calculation base miranget elevate a lette with homographe grand those atalians man of Burma wer possibility of the fron term corners willed so to the act to bay of the arc out o but introduced of all husters away for the recommend of a response of Approximations. If we could have quickent "Since Brat our at time of the same as search as the saltoning fet earth a perfect, region of matrices wings delete, with the transmit a lactor of dimensions from by kylic allege to another year to took to to take up and to had proved progr Camparty Nade Car. . Tolk obved by can no billegy storages of only say that th lmew too little HOVER MEDITED BLICE OF FORE SELES OF COURTS AND SEED OF of destroying He dolor business with the population of the section and thought all altatesh we are a man out out and entertable Continuous of his god more transferred matheres with E. a. Then dilette while something is night by the class of the Compers a Day of contractor walles gives to see the william issbill as mention medical despite our 20 articon and th in Protocade die d. E. Tayler, carright on mouthous and tern absolution and Teachings granulated and ocide advantage belo towing out force betakener of town of toll take again cos" de mar mas es estevola en qua Effes act le equal 500 A.D. by Bework First Youngran by Iller belivace - adea. a Joy for and guildhier-hig mags setments business include lates I see II stold 108:8 wells 1008.0 oders elterer's Alement, 1945. APPRELATE VALUE " COULT AND

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"Only a mere fraction, "the "Times" report continues,
"of the land surface had been covered by instrumental survey
of the order of precistion really necessary, and the tying
together of such exact surveys had often been done only by
calculation based on an assumed figure of the earth. If the
map of Burma were much less than the 10 miles or 10 minutes
of the arc out of the true that had been hinted....

Augustication of Hardy to disconstitution

"Since Bratosthenes over two millennie ago assumed the earth a perfect, static appere, and hence deduced all its dimensions from a single measurement, the earth as a globe had proved progressively disappointing. To-day we could only say that the earth was 'earth-shaped' - and we still knew too little of its irregularities to be quite certain of destroying Hollywood from Timbuctoo."

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TIXXXI Todayon and to nature out hower delate to Florvit 347 B.C. contribute dragger francis and the theory ores a give 7400 B.C. TOTALE INCOMENTS IN TO BECATED HEED DAN JORITHE BOOK OF spales and the recommons affine neitherness to represent the time area read entite had aller to are note to very merinalis de la specim de act aunt ene! deme pro manna a 320 B.C. Dicael but believe one atthetits out toto sample of the outle set the required words, and topical and the where a me description of the formation of the state of t ALERO OF THE PARTY OF THE PROPERTY OF THE STATE OF THE TAIL THE TA 240 B.C. managed action of at matricelegate and to sitted one 7100 A.D. Trooppadure hour boung tel margorison 124 A.D. 130 A.D. 77 B.C. 500 A.D. 24 B.C. ?500 A.D. 100 B.C.

LXXXIII Estimates of Earth's Circumference Florvit 400,000 stades 347 B.C. Aristotle: De Caelo 2.14.16. 7400 B.C. (Perhaps adopted from Archytas: Horace Odes I,28,1. ff. Aristophanes, Glouds 202) 300,000 stades 320 B.C. Dicaerchus (?) (method: arc between Syene & Lysimachia, 20,000 stades = 1/15 meridian from observation of stars vertically overhead) Eratosthenes 240 B.C. Cleomedes cycl. theor. 1,8,43 & passim) 7100 A.D. Arrian at. To Philoponed Arist. meteor. 1.32. 124 A.D. 250,000 atades Anon.geogr.expos.com/end.fragm.A, in Geogr.Gr.min.II p.510 Anon.mens.tot.terr.habit. Geog. Gr.min.I.p. 424. Anon.geogr.expos.compend. Geogr -Gr.min.II.p. 494. 252,000 stades Theon Smyrn.de astr.C.3.p.148. 130 A.D. do . campana I (12) p.156. Gemin. Isag.C.13; Uranolog.p.50E 77 B.C. Achill. Tat. isag. Uranolog.p. 154D 500 A.D. Macrob.in Somn.Srif.IIX,6, Strabo passim 24 B.C. 31,500 miles Marc. Capell. VI, 609 7500 A.D. Marc. Heracleot. periph.mar.ext.I,4. 259,200 stades (Geog.Gr.min.I.p.519) 180,000 stades Posidonius. (Strabo 2:2,2) 100 B.C. (Method: difference in elevation of Canopus at Rhodes & Alexandria: based on Eratosthenes's own gnomonic measurement of distance R. to. A.)

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LINE AND MORKS: A - S

A: Suidas

"Ερατοσθένης, 'Αγλαού, οἱ δὲ 'Αμβροσίου, Κυρηναίος, μαθητής φιλοσόφου 'Αρίστωνος Χίου, γραμματικού δὲ Λυσανίου τοῦ Κυρηναίου καὶ Καλλιμάχου τοῦ κοιητοῦ. μετεκέμφθη δὲ ἔξ 'Αθηνῶν ὑκὸ τοῦ τρίτου Πτολεμαίου, καὶ διέτριψε μέχρι 5 τοῦ κέμκτου. διὰ δὲ τὸ δευτερεύειν ἐν καντὶ εἴδει καιδείας, τοῖς ἄκροις ἐγγίσαντα, βῆτα ἐκεκλήθη. οἱ δὲ καὶ δεύτερον ἡ νέον Ηλάτωνα. ἄλλοι Πένταθλον ἐκάλεσαν. ἐτέχθη δὲ ρκς' 'Ολυμκιάδι, καὶ ἐτελεύτησεν κ' ἐτῶν γεγονῶς, ἀποσχόμενος τροφῆς διὰ τὸ ἀμβλυώττειν , μαθητὴν ἐκίσημον Ιο καταλικών 'Αριστοφάνην τὸν Βυζάντιον, οὸ κάλιν 'Αρίσταρχος μαθητής' μαθηταὶ δὲ αὐτοῦ Μνασέας καὶ Μένανδρος καὶ "Αριστις. ἔγραψε δὲ φιλόσοφα καὶ κοιήματα καὶ ἱστορίας, ἀστρονομίαν ἡ καταστερισμούς, κερὶ τῶν κατὰ φιλοσοφίαν αἰρέσεων, κερὶ ἀλυκίας, διαλόγους κολλούς καὶ γραμματικὰ συχνά.

B: Suidas

'Απολλώνιος 'Αλεξανδρεύς' έπων ποιητής, διατρίψας έν Ρόδφ, υίδς Σιλλέως, μαθητής Καλλιμάχου, σύγto some, or sopher Aris Cyrene, and from Athern until Ptole of learning "Beta". Or New Plato" born in the by refraini sight. He phanes of I ohus; his retasthene astronomy of

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LUFE AND MOURS: A - S

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1.

Eratosthenes, son of Aglaus, or, according to some, of Ambrosius, of Cyrene; pupil of the philosopher Ariston of Chios, of the grammarian Lysanias of Cyrene, and of the poet Callimachus. He was summoned from Athens by Ptolemy III, and remained (at Alexandria) until Ptolemy V. Because he came second in every form of learning, though close to the first, he was called "Beta". Others called him "Flato the Second" or "the New Plato", and yet others "the All-Rounder". He was born in the 126th Olympiad, and died at the age of 80 by refraining from food because of the failure of his sight. He left behind a distinguished pupil, Aristophanes of Byzantium, whose pupil in turn was Aristarchus; his pupils were Mnaseas, Menander, and Aristis. Eratosthenes wrote philosophical works, poems, histories, astronomy or "promotions to the stars", works on philosophical sects and on freedom from pain, dialogues, and numerous works on "grammar".

B. Prisoppost arri voiv

Apollonius of Alexandria. An epic poet; resident in Rhodes; son of Silleus; pupil of Callimachus;

οσίου, Κυρηναϊατικού δέ Λυσα-Ο. μετεπέμφθη

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ιητής, διαάχου, σύγχρονος 'Ερατοσθένους και Εύφορίωνος και Τιμάρχου, έπι
Πτολεμαίου τοῦ Εὐεργέτου ἐπικληθέντος, και διάδοχος
'Ερατοσθένους γενόμενος ἐν τῷ προστασία τῆς ἐν 'Αλεξανδρεία βιβλιοθήκης.

Lingswide of Mills and St. Annual

G: Pap. Ox. X 1241 col. II

D: (Ivor Thomas I p. 154)

Proclus in Suclidia Element. II p. 20 init. de Suclide νεώτερος μέν οδν έστι των περί Πλάτωνα, πρεσβύτερος δὲ Ερατοσθένους και Αρχιμήδους. οδτοι γάρ σύγχρονοι άλλήλοις, ώσπερ και φήσιν Ερατοσθένης.

φιλόχορος κατά δὲ τοὺς χρόνους γέτ γονεν ὁ Φιλόχορος Ερατοσθένους, ὡς ἐπιβαλεῖν πρεσβύτη νέον ὅντα Ἑρατοσθένει.

Apollonius of Alexaniria. An epis poets

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TOTAL STATE OF LINE

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locity orlangion occas of 22 .5 such cores is contemporary of Eratosthenes, Euphorion, and Timarchus, in the reign of Ptolemy surnamed Euergetes; succeeded Eratosthenes in the Directorship of the Library at Alexandria. Andrew Term Africa and the angle in

Agend pooley from by fax , so phylly vegarbagil Apollonius, son of Silleus, of Alexandria, surnamed Rhodius, pupil of Callimachus. He also became tutor to the first king. Eratosthenes succeeded him, and was followed by Aristophanes and Aristarchus. Next was Apollonius of Alexandria, called the portrait-painter, and after him Aristarchus. . . . he also became tutor to the children of Philopator. . . . In the reign of the minth king flourished Ammonius, Zenodotus, Diocles, and Apollodorus the Grammarians.

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(Euclid) is junior to Plato's followers, but senior to Eratosthenes and Archimedes. These, as Eratosthenes himself says, were contemporaries. dydbese dvopdesv

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Transporting of Philochorus: Philochorus lived about the work of period of Eratosthenes; as a young man, he encountered Eratosthenes in his old age. to be a garaine priliosocher and bringing himself to be a

Fi Censorinus C. 15 (de anno octoresime primo)

Eratosthones quoquo, ille orbis terrarum mensor, et Kenocrates Platonicus, veteris Academiae princeps, ad eundem annum vixorunt.

G. Dion. Ove. in Scatouth, originals. Scanois Analogical, p. 255

Πρηύτερον γήράς σε, καὶ οὐ κατὰ νοῦσος ἀμαυρή ἔσβεσεν, εὐνήθης δ'ὕπνον ὁφειλόμενον, ἄκρα μεριμνήσας, Ἐρατόσθενες οὐδὲ Κυρήνη μαζά σ'ἐπ'ἀτρύτων ἐντὸς ἔδεκτο τάφων, 'Αγλαοῦ υἰέ φίλος δὲ καὶ εἰν ξείνη κεκάλυψαι κὰρ τόδε Πρωτῆρς κράσπεδον αίγαλοῦ.

Hi Strabo. C. 15

Πρώτον δ'έπισκεκτέον 'Ερατοσθένη, καρατιθέντας άμα καὶ τὴν 'Ιππάρχου πρός αὐτὸν ἀντιλογίαν. ἔστι
δ'δ 'Ερατοσθένης οὖθ'οὖτως εὐκατατρόχαστος, ὤστε μηδ'
'Αθήνας αὐτὸν ἱδεῖν φάσκειν, ὅπερ Πολέμων ἐπιχειρεῖ
δ δεικνύναι· οὖτ'ἐπὶ τοσοῦτον πίστος, ἐφ'ὅσον παρεδέξαντό τινες, καίκερ πλείστοις ἐντυχῶν, ὡς εῖρηκεν αὐτὸς,
ἀγάθοις ἀνδράσιν

δηλοτ δε και ή περί των άγαθων εκδοθετσα δε' αύτου πραγματεία και μελέται και εί τι άλλο τοιούτο τήν 10 άγωγήν αύτου. διότι μέσος ήν του τε βουλομένου φιλοσοφείν και του μή θαρούντος έγχειρίζειν έαυτον είς την δπόσχεσιν

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the A resulting views for exact verby LAS verber Eratosthenes, too, the famous measurer of the world, and Kenogrates the Platonist, head of the Old Academy, lived to the same (81st) year. . Percelor from Stands Stor va Thu St

the more improveded in the cities there

Gentle old age, not enfeebling illness, quenched thy flame, Eratosthenes. The slumber that thou sleepest is thy due after thy lofty cares. Cyrene thy foster-mother has not received thee in an everlasting tomb, son of Aglaus, yot, though in a foreign land, it is as a friend that thou liest hidden by this margin of the shore of Protous.

Designation bill the saching a straig advisor regions

First let us consider Evatosthenes, laying aside for the moment Hipparchus' attack on him. Sratosthenes is not so easy to catch out that we can say, as Polemon tried to prove, that "he never even saw Athens". Nor is he so trustworthy as some people have taken him to be, although, as he says himself, he mixed with very

His method is clearly shown in his published work "On the Good", his rhetorical exercises, and all his writings in this genre; he was half-way between wishing to be a genuine philosopher and bringing himself to come

ταύτην, άλλα μόνον μέχρι του δοκετν προιόντος, ή καὶ παράβασίν τινα ταύτην άπο των άλλων των έγκυκλίων πεπορισμένου πρός διαγωγήν ή καὶ παιδίαν· τρόπον δέ τινα Ιδ καὶ έν τοτς άλλοις έστι τοιούτος.

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It Glemens Alex. Strom. I D. 309 A

Απολλόδωρος δε δ Κυματος πρώτος του Κριτιπου είσηγήσατο τουνομα, και Γραμματικός προσηγορεύθη.
Ενιοι δε Ερατοσθένη τον Κυρηνατόν φασιν, έπειδή έξέδωπεν ούτος βιβλία δύο, Γραμματικά έπιγράψας.

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J. Luciarus Facrob, 27

Γραμματικών δε Ερατοσθένης μεν δ Αγλαοδ Κυρηνατος, δν οδ μόνον γραμματικόν, άλλά και ποιητήν άντις δνομάσειε, και φιλόσοφον, και γεωμέτρην.

Ke Stoons Byze

κυρήνη· έντευθεν ήν Ερατοσθένης Αγακλέους κατς, δ ίστορικός.

Li Archimedes, ed. Heiberg, vol. II D. 528 seq.

πρόβλημα, δπερ 'Αρχιμήδης ἐν ἐπιγράμμασιν εὐ"
ρῶν τοτς ἐν 'Αλεξανδρείς περὶ ταῦτα πραγματευομένοις ζη"
τετν ἀπέστειλεν, ἐν τῷ πρὸς 'Ερατοσθένην τὸν Κυρηνατον
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to grips with this profession, so that he only reached the stage of appearing to be one-providing himself with philosophy as an interlude to the daily round, for a pastime or even an amusement. To some extent he gives the same impression in his other works too.

I MANAGEMENT STATE OF STATE OF THE STATE OF

Apollodorus of Cymes has the first to introduce the title of "critic", and to be called "grammarian". Some, however, say that Eratosthenes of Cyrone was the first, because he published two books with the title

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Among grammarians is Erutosthones, son of Aglaus, of Cyrone. He may be called not only a grammarian, but also a poet, philosopher, and geometer.

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Gyrene: Eratesthenes, son of Agacles, the historian, came from here.

Dodargaory anabelens 27 Shapanganfaur Randus, Errors po

The problem which Archimedes solved in epigrams and wrote in his letter to Eratosthenes of Gyrene for those who concerned themselves with the study of those subjects at Alexandria.

Ma Sympolius p. 91 C. (Chronos, fr. XXIII):

ἄν τὴν γνῶσιν, φησίν, ὁ Ἐρατοσθένης λαβών Αἰγυπτιαμοῖς ὑπομνήμασιν καὶ ὀνόμασιν κατὰ πρόσταξιν βασιλικὴν τῆ Ἑλλάδι φωνῆ παρέφρασεν.

"Ηδη δ'έπ' άρχην είμι της συντάξεως
τους συγγραφετς ενθέμενος, οίς δη χρώμενος
τὸν Ιστορικόν είς πίστιν άναπέμπω λόγον·
τῷ τὴν γεωγραφίαν γὰρ ἐπιμελέστατα
γεγραφότι, τοῖς τε κλίμασι καὶ τοῖς σχήμασιν,
'Ερατοσθένει μάλιστα συμπεπεισμένος-

O: Cicoro ad Att. II. 6:

geographica, quae constitueram, magnum opus est, Ita valde Eratosthenes, quem mihi proposueram, a Sorapione et Ab Hipparcho reprehenditur.

Pr Arrian Hist. Ind. 3. 1:

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Έμοὶ δὲ Ερατοσθένης ὁ Κυρηναΐος πιστότερος ἄλλου ἔστω, ὅτι τῆς περιόδου περὶ ἔμελεν Ἑρατοσθένει.

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Πολύβιος δέ την Εθρώπην χωρογραφών τούς μέν

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things in the Egyptian records and language, and translated them into Greek by royal command.

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I shall now proceed to set out and collate those historians by following whom I can make my history trustworthy. In matters of "climate" and conformation of places I put most confidence in Fratosthenes, who completed his geographical writings with the utmost care.

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I feel very much averse from writing. Not only is the geographical work which I had in mind a great undertaking, but Fratesthenes, whom I had taken as my model, is an object of keen consure to Serapio and Hipparchus.

P.

I myself shall take Eratosthenes of Gyrene to be more trustworthy than anyone else, because he took into consideration descriptive geography.

9.

Polybius, in his descriptive geography of

<u>ΙΙΙ)</u>: ενης λαβών πρόσταξιν

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THE WHAT IN

άρχαίους έθν φησι, τοὺς δ'έκείνους έλέγχοντας έξετάζειν Δικαίαρχόν τε καὶ Έρατοσθένη, τὸν τελευταΐον πραγρατευσάμενον περὶ γεωγραφίας.

X 65.45

*Ερατοσθένης δὲ ὁ Κυρηναῖος, οὖκ οἶδα τί καΘών, τὸ Τιμοσθένους μετέγραψε βιβλίον, βραχέα τινὰ
προσθείς ὡς μηδὲ τοῦ προσιμίου τοῦ μνημονευθέντος ἀποσχράσθαι, ἀλλ'αὐταῖς λέξεσι κάκεῖνο τοῦ οἰκείου προθεῖναι συγγράμματος.

CONTRACTOR OF THE PARTY

Β: Ετντοίοπ. Ν. D. 198. 20: Βιβλιαίγισθος, "Ανδρέας δ ίατρδς ἐπεκλήθη δπὸ "Ερατοσθένους, ὅτι λάθρα αὐτοῦ τὰ βιβλία μετέγραψε.

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* DIRECTOR

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Europe, says that he passes over the ancients but carefully examines those who refute them, Diesearchus and Eratosthenes, the most recent scholar to concern himself with geography.

Eratosthenes of Timosthenes with a few slight additions. He did not even keep his bunds off the wellknown preface, but put it in front of his own work,

2.

when the Line territor out their Property

Andreas the physician was nicknamed by Eratosthenes "bibliaggisthus" (Book-adulterer), because he furtively copied his writings.

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POZMS:

Hormon 1-131

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δρθού · καὶ γὰρ μάλλον ἐπωδίνουσι μέριμναι.

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αί δὲ πέρην 'Αρύαντος έπὶ προχοαίς ποταμοίο.

φωριαμόν δ'όνόμηναν, ο μιν κύθε φώριον άγρην. έν του φωριαμός νικλήσκεται άνθρωποισι. roug, Bus Mass unto 12 Utilities with

. . . βαθύς διαφύεται αύλών . . .

πέλμα ποτιρράπτεσκεν έλαφρού φαικασίοιο.

7.

χρειώ κάντ' έδίδαξε. τί δ'ού χρειώ κεν άνεύροι:

ή χερνήτις έριθος έφ'όψηλοῦ πυλεώνος δενδαλίδας τεύχουσα καλούς ήειδεν Ιούλους Be steadfast

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Hormon: 1-131

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those resolvers much broken by southers on the property and the first of the south of the southo They beyond, at the mouth of the river Aryas. . . .

bushed witch advectors applied for statical moons all and the

They named that which concealed his stolen booty a chest. This is the origin of its being called goptanoc by men.

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at 8do ply ylaners nekers department opens vento out

He se wed on the sole of a light slipper. i plandar Meedenge balangu balang edito editom poor sid

as the representation and fort part of the property of any

Necessity teaches all. What would necessity not teach?

an it line right undersky Betrablic segrators and is to

When the hired reaper, making barloy-cakes in the lofty gate-house, was singing sweet harvest-songs.

πρήνης Γαργαφίης

10.

άγρης μοτραν έλειπον, ετι ζώοντας ξούλους ἡὲ γενειῆτιν τρίγλην ἢ περιάδα κίχλην ἢ δρομίην χρύσειον ἐπ' ὀφρύσιν ξερὸν ἰχθύν

Adhered and prepared to the annual to marris out Lower.

όντω δή τάδε κάντα συν άρμονίησιν άρήρει, όντω δ'έν σφαίρησι κυλίνδετο κύκλω ίόντα ταυτ'ένάτην περί γαζαν

Te 12. Mes parent avenue:

αύτην μέν μιν έτετμε μεσήρεα καντός 'Ολύμκου πέντρου έκι σφαίρης · διά δ'άξονος ήρήρειστο.

agent 13. photos ablav

πέντε δέ οἱ ζώναι περιειλάδες ἐσπείρηντο,
αἱ δύο μὲν γλαυνοῖο νελαινότεραι κυάνοιο,
ἡ δὲ μία ψαφαρή τε καὶ ἐκ πυρός οἶον ἐρυθρή.
ἡ μὲν ἔην μεσάτη, ἐκέκαυτο δὲ πᾶσα περὶ πρὸ
5 τυπτομένη φλογμοῖσιν, ἐπεὶ ῥᾶ ἐ μαῖραν ὑπ'αὐτὴν
κεκλιμένην ἀκτῖνες ἀειθερέες πυρόωσιν·
αἱ δὲ δύω ἐκάτερθε πόλοις περιπεπτηῖαι
αἰεὶ φρικαλέαι, αἰεὶ ὁ ὑδατι μογέουσαι·

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Thomas there.

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They were le red-fish, be the sacred

All these es these revolvabout the es

He came upon of the ophe

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Five encirc two darker one both du This zone w as the flam for the hea as it lies The two on are ever st more, transferentialistic irrespiralizations who is said

They were leaving part of their catch, still living red-fish, bearded mullet, thrush-coloured perch, or the sacred racing fish with gold on its brows.

11. . . . rocciov padaulavė

All these eight fitted in with the notes of the scale, these revolving on their eight spheres were rolling about the earth, which was the ninth.

12.

He came upon it in the midst of all Olympus at the centre of the ophere; it was fixed through the pole.

13.

two darker than blue-green Cyanus,
one both dusty and red as it were with fire.
This zone was in the middle, and was burnt all round as the flames beat upon it.
for the heavenly rays blaze upon it
as it lies right under the Dog Star.
The two on either side, spread about the poles;
are ever stiff with cold, over overdone with water;

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ΙΟ οδ μεν δδωρ, άλλ' αὐτός άκ' οδρανόθεν πρύσταλλος net γαταν πρόκτεσης· κερίψυντος δε τέτυνται. άλλα τα μεν χερσατα τ'άνέμβατα τ'άνθρώποισι. δοιαί δ'άλλαι ξασιν έναντίαι άλλήλησι, μεσσηγός θέρεός τε καὶ δετίου πρυστάλλου sinappd with the bounds Ιδ άμφω εύπρητοί τε καὶ δμανιου άλδήσκουσαι παραόν Ελευσινίης Δημήτερος. Εν δέ μιν ανδρες

άντίποδες ναίουσι

these sevol virus and to admin to the Antorinys (or Hesiod): 14-16: nter flagging was all appealing

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ποι δε πελιδναί πυθεδόνες γάστρην άν' ὑπέτρεφον οὐλοὸν Ελκος . at the alv ylapsets agreement course before cours contrate and

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alat appendiction, and devices 17. sound posts, would not not 'Ιπαριοί, τόθι πρώτα περί τράγον ώρχήσαντο yet it is no concealed th These, then, but there ar in between t both tempere Demoter. Ir

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Then the Io

yet it is not water, but sheer ice from heaven concealed the earth there, and it is frozen all round. These, then, are barren and impassable to human beings; but there are two more opposite to each other, in between the heat and the raining ice, both temperate and growing the rich erop of Eleusinian Demoter. In them live men on opposite sides of the earth.

Anterinva (or Hesiod): 14-16: Fam your by

a a a a a winderly ento . His oyes closmed forth

from their sockets like fire of Mosychlus.

Wine todays has a power that The when

page 107 36vio dark pustules were spreading

the wound all over the belly. * * * * * - pordy the prime of

Budugger in S. grapan affa, private noon

They heard a shrick lasting only a little while.

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ρόσχους και χλωράς κλήματος έκφυάδας
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22.
οίνός τοι πυρί ίσον έχει μένος, εὐτ'ἄν ἐς ἄνδρας
έλθη· κυμαίνει δ'οία Λίβυσσαν άλα
βορέης ήδ νότος. τα δέ και κεκρυμμένα φαίνει
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Enthalantum: 24:
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Wine indeed has a power like fire when it enters into men; it lashes them to fury as the north wind the Libyan Sea. It reveals what is hidden from the very foundations, and scatters abroad all the wits of men.

Spithalamium: 24:

were this more worth of tratable tones of Cyrolic way so tone

. . . . the golden shoot, the cluster of Icarioneia. . .

olan planed boy tested baked make from the estate.

the reappet tadocves the being contract of Exercication, but

Then men have purified themselves theirs, the cold class

Epigrami 25:

Εί πύβον έξδλίγου διπλήσιον, ώγαθέ, τεύχειν φράζεαι, την στερεήν κάσαν ές άλλο φύσιν εδ μεταμορφώσαι, τόδε τοι κάρα, κάν σύγε μάνδρην, ή σιρόν, ή κοίλου φρείατος εύρθ κύτος, 5 τῆδ ἀναμετρήσαιο, μέσας δ τε τέρμασιν ακροις συνδρομάδας δισσών έντος έλης κανόνων. μηδέ σύγ' Αρχύτεω δυσμάχανα έργα πυλίνδρων, μηδέ Μεναιχμείους κωνοτομείν τριάδας δίζησι, μηδ'εί τι θεουδέος Εύδόξοιο μαμπύλον έν γραμματς είδος άναγράφεται. τοτοδε δέ γ'εν πινάμεσσι μεσόγραφα μυρία τεύχοις, βετά κεν έν παύρου πυθμένος άρχόμενος. Εύαιών, Ητολεμαζε, κατήρ, ότι καιδί σύν ήβων κάνθ' δσα καὶ Μούσαις καὶ βασιλεύσι φίλα 15 αὐτὸς ἐδωρήσω· τὸ δ'ἐς ὅστερον, οὐράνιε Ζεῦ, καὶ σκήπτρων έκ σῆς ἀντιάσειε χερός. και τὰ μεν ώς τελέσιτο, λέγοι δέ τις άνθεμα λεύσσων του Κυρηναίου τουτ' Έρατοσθένεος.

Uncertain: 26-29:

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Bolgram: 25:

double the size of a small one, or to change any solid figure correctly into another, this you can do whether it is a stable, a pit, or the broad shaft of a hollow well that you want to alter. Thus can you measure it, when you find between the two rulers the means converging at their extreme ends. Have nothing to do with the clumsy cylinders of Archytas, or with cutting the cone as in the triads of Menaechmus, or with any curved shape described in the figures of the god-fearing Eudoxus. On these plates you can find any number of mean lines, though you start from a slender basis.

A blessed father you are, Ptolemy, in that, being in the prime of life with your son, you have yourself given him everything dear to Muses and to kings too, In the future, heavenly Zeus, may he also receive the sceptre from your own hand.

May this come true: and may anyone who looks upon this monument of Eratosthanes of Cyrone say so too.

Uncertain: 26-29:

26.

They tasted baked meats from the ashes, and selected them as they picked them out.

27.

When men have purified themselves thrice, the gods give

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27.

τρίς δ'άπομαξαμένοισι θεοί διδόασιν άμεινον

28: Plin. Nat. Plat. XXII. #86:

scolymum quoque in cibos recepit oriens et alie nomine limoniam appellavit. frutex est numquam cubitali altier cristis foliorum ac radice nigra, sed dulci, Eratostheni quoque laudate in pauperi cena.

29: Sohol. B V II. I 233: See Alvo Versile

εστι δε ή λέξις (δτρυντύς) *Αντιμάχειος.

χαίρει δε καὶ *Ερατοσθένης ταζς ποιαύταις έκφοραζς.

δς τὸ κολλή ἀντιμαχηστός.

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PROBE WORLS

The east has also admitted the artichoke among the foods, and given it another name, "limonia". It is a bush, never more than a cubit high, with tufts of leaves and a dark but sweet root. Eratosthenes also praises it as a poor man's supper. 10 Vis 1810 (ax 2

re severation aspi rotton Indrawoc: Toy of pour

The expression (ὀτρυντύς, exhortation) is Antimachean. Eratosthenes too is partial to such locutions, e. g. πολλή ἀντιμαχηστύς (much conflict). told show that it will not because its weated a division of

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PROSE WORKS:

Platonicus: 30-38: ecudatol medade meda

30: Theo. Smyrnaeus p. 2:

Ερατοσθένης μεν γάρ έν τῷ ἐπιγραφομένω Πλατωνικώ φησιν, ότι Δηλίοις του θεου χρήσαντος έπὶ άλλαγή λοιμού βωμόν του όντος διπλασίονα κατασκευάσαι, πολλήν άρχιτέντοσιν έμπεσετν άπορίαν, ζητούσιν όπως 5 χρή στερεύν στερεού γενέσθαι διπλάσιον. άφιπέσθαι τε πευσομένους περί τούτου Πλάτωνος τον δε φάναι αύτοῖς, ὡς ἄρα οὐ διπλασίου βωμοῦ ὁ θεὸς δεόμενος τοῦτο Δηλίοις έμαντεύσατο, προφέρων δέ, καὶ όνειδίζων τοῖς Ελλησιν, άμελουσι μαθημάτων, και γεωμετρίας ώλιγωρη-10 nóoiv.

31: Eutocius: ad Archimedis sphaeram et cylindrum (Archim. ed. Heib. III, 88)

Βασιλετ Πτολεμαίω 'Ερατοσθένης χαίρειν. Των άρχαίων τινά των τραγωδοποιών φασιν είσαγαγείν τον Μίνω τῷ Γλαύνω κατασκευάζοντα τάφον. πυθόμενον δέ, ότι πανταχού έματόμπεδος είη, είπεζν.

Μιπρόν γ' έλεξας βασιλικού σημόν τάφου. δικλάσιος έστω, τοῦ καλοῦ δὲ μὴ σφαλείς δίπλαζ' ξηαστον ηώλον έν τάχει τάφου.

Delos biddi construct s great perpl to find a v

do cacha calv.

told them sized altar Delians, b

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duced Mino he learnt tion, he s

An tenny Lagran

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COURSES AND RECORD THE PROSE WORKS & PROPERTY OF A WELF BUREAU

Platonious: 50-53;

The Standarder of the Land of the Standard of the

In his work entitled "Platonicus", Eratosthenes
says that when the god gave an oracle to the people of
Delos bidding them, for the relaxation of a plague, to
construct an altar double the size of the existing one,
great perplexity came upon the engineers when they tried
to find a way to make a solid body double the size of
another solid. They also went to ask Plato about it. He
told them that it was not because he wanted a double—
sized altar that the god had given this oracle to the
Delians, but to call attention to sail to represent the Greeks.

very total and perometer to tend of

Wished and Eratosthenes to King Ptolemy, greeting.

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duced Minos preparing a tomb for Claucus; and that, when he learnt that it measured a hundred feet in every direction, he said: "The shrine you speak of is small for a royal tomb. Let it be doubled in size, but let it not fall short of beauty. Double straightway each side of the tomb."

ραφοιένω

them better

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cylindrum

χαίρειν.

ισαγαγετν

πυθόμενον

ν τάφου.

ή σφαλείς

τάφου.

έδόνει διημαρτηνέναι. των γάρ πλευρών διπλασιασθειούν,

10 το μεν επίπεδον γίνεται τετραπλάσιον, το δε στερεόν οπαπλάσιον. εξητείτο δε και παρά τοις γεωμέτραις, τίνα αν τις τρόπον το δοθέν στερεόν διαμένον εν τφ αυτφ σχήματι διπλασιάσειαν και εκαλείτο το τοιούτον πρόβλημα, κύβου διπλασιασμός, υποθέμενοι γάρ κύβον,

- 15 εξήτουν τούτον διπλασιάσαι. πάντων δε διαπορώντων επί κολύν χρόνον, πρώτον 'Ιπποκράτης δ ΧΤος έπενόησεν, δτι εάν εύρεθη δύο εύθειων γραμμών, ων ή μείζων της ελάσσονός έστι διπλασία, δύο μέσας άνάλογον λαβετν έν συνεχετ άναλογία, διπλασιασθήσεται δ κύβος, ωστε τὸ ἀπόσος
- 20 ρημα αύτου είς ετερον ούν ελασσον ἀπόρημα κατέστρεφεν.

 μετά χρόνον δέ τινά φασιν Δηλίους, ἐπιβαλομένης νόσου,

 κατά χρησμόν δικλασιάσαι τινά των βωμών ἐπιταχθέντας,

 ἐμπεσετν είς τὸ αὐτὸ ἀπόρημα. διαπεμψαμενους δέ, τοὺς

 καρὰ τῷ Πλάτωνι ἐν ᾿Ακαδημίς γεωμέτρας, ἀξιοῦν αὐτοῖς
- 25 εθρεῖν τὸ ζητούμενον: τῶν δὲ φιλοπόνως ἐπιδίδόντων ἐαυτοῖς, καὶ ζητούντων, δύο δοθεισῶν δύο μέσας λαβεῖν, 'Αρχύτας μὲν ὁ Ταραντῖνος λέγεται διὰ τῶν ἡμικυλίνδρων εὐρηκέναι, Εὔδοξος δὲ διὰ τῶν καλουμένων καμπύλων γραμμῶν. συμβέβηκε δὲ κᾶσιν αὐτοῖς ἀποδεικτικῶς
- 30 γεγραφέναι. Χειρουργήσαι δε καὶ εἰς χρείαν πεσείν μὴ δύνασθαι, πλὴν ἐπὶ βραχύ τι τοῦ Μεναίχμου, καὶ ταῦτα δυσχερῶς. ἐπινενόηται δέ τις ὑφ' ἡμῶν ὁργανικὴ ῥαδία, δι'ἡς εὐρήσομεν, δύο τῶν δοθεισῶν, οὐμόνον δύο μέσας,

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πλασιασθεισών, Bè otepedy γεωμέτραις, ÉVOV ÉV TÃ TO TOLOGTOV ι γάρ πύβον, tan opaivtwv int έπενδησεν, ότι Ewy The Exacλαβετν έν συν-. Gote to andan nate ot pegev. αλομένης νόσου. έπιταχθέντας, acrove de, rode άξιουν αύτοις Es 1 bibovtwv o nevas haberr, on threnoxing bon ν καμπύλων de int indic ίαν πεσετν μή ov, nat ravra pravina badia,

vov δύο μέσας,

Evidently he was mistaken, for when the sides are doubled a plane surface is quadrupled, while a solid is multiplied by eight.

Inquiry was made too among geometricians for a method by which a given solid, while keeping its shape, could be doubled in size. This problem was known as "Doubling the Cube", for they assumed a cube and sought for a way to double it. Everyone was perplexed for a long time, and Hippocrates of Chios first realized that if a way could be discovered to find two means in continued proportion between two straight lines, of which the greater was twice the length of the shorter, the cube would be doubled; thus the first perplexity was resolved into another just as great.

Delos, attacked by a plague, were ordered by an oracle to double one of their altars and fell into the same perplexity. They sent to the geometricians of Plato's Academy and thought that they should discover what was being sought. They devoted themselves energetically to the matter and tried to discover a way to find two means between two given lines, and Archytas of Tarentum is said to have found a way by means of half-cylinders, while Eudoxus achieved it by what are called "curved lines". All of them succeeded in demonstrating it by pure construction; but they have not been able to apply their solutions to practical use, except to a small extent Menaechmus, and his solution is awkward.

άλλ' όσας αν τίς έπιτάξη. τούτου δέ εθρισκομένου 35 δυνησόμεθα καθόλου το δοθέν στερεύν παραλληλογράμμοις περιεχόμενον είς κύβον καθιστάναι, ή έξ έτέρου είς Ετερον σχηματίζειν, και όμοιον ποιείν, και έπαύξειν διατηρούντας την δροιότητα, ώστε και βωρούς και ναούς, δυνησόμεθα δε και τά των δγρών μέτρα και ξηρών, λέ-40 γω δε σίον μετρητήν μεδίμνων, είς κύβον καθιστάναι, υκί δίλτης τούτου κλευράς άναμετρείν τά τούτων δεκτικά άγγετα, πόσον χωρεί. χρήσιμον δὲ ἔσται τὸ ἐπινόημα και τοτς βουλομένοις έπαύξειν καταπελτικά και λιθοβόλα δργανα. δετ γάρ άνάλογον άπαντα αδξηθήναι, καὶ 45 τὰ κάχη, καὶ τὰ μεγέθη, καὶ τὰς κατατρήσεις, καὶ τὰς χοινικίδας, και τά εμβαλλόμενα νεθρα, εί μένει και ή βουλή ανάλογον έπαυξηθήναι. ταθτα δε ού δυνατά γενέσθαι άνευ της των μέσων εθρέσεως. THY SE andδειξιν και την κατασκευήν του λεχθέντος δργάνου ύπο-

Δεδόσθωσαν δύο ἄνισοι εύθεται, ών δετ δύο μέσας ἀνάλογον εύρετν ἐν συνεχετ ἀναλογία, αὶ ಡε: δθ΄. καὶ κείσθω ἐπὶ τινος εὐθείας τῆς εθ΄. πρὸς ὁρ΄ θὰς ἡ αε΄. καὶ ἐπὶ τῆς εθ΄. τρία συνεστάτω παραλλη το λόγραμμα ἐφεξῆς, τὰ αξ΄. ξι΄. ιθ΄. καὶ ἤχθωσαν διά μετροι ἐν αὐτοτς αὶ αξ΄. λη΄. ιθ΄. ἔσονται δὲ αὐται καράλληλοι, μένοντος δὲ τοῦ μέσου παραλληλογράμμου

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I myself have invented a simple instrumental method by means of which I can find, if two lines are given, not merely two means but as many as are required. By this discovery I can transform absolutely any given solid bounded by parallelograms into a cube, or from one shape into another, and the like; I can multiply solids, keeping the same shape; I can transform measures of liquid and dry capacity, such as a measure of mediani, into a cube, and by calculating its side measure how many vesselfuls it contains. The invention will be useful also for those who wish to enlarge catapults and stone-throwing engines; for everything has to be enlarged in proportion, thickness, length, and breadth, holes, washers, and cords attached, if it is really intended to enlarge in proportion. It is not possible to do this without finding "means". The proof and arrangement of the said instruments I have appended here for your information.

Given two unequal straight lines, $a\epsilon$ and $\delta\theta$, to which it is required to find two means in continued proportion.

Let $\alpha\epsilon$ lie at right angles to a straight line $\epsilon\theta$. Upon $\epsilon\theta$ construct three (equal) rectangles $\alpha\zeta$, ζ , $i\theta$, and draw their diagonals $\alpha\zeta$, $\lambda\dot{\eta}$, $i\theta$. These diagonals will be parallel to one another. Now letting the middle rectangle $\dot{\zeta}^1$ remain stationary, slide the rectangle $\dot{\alpha}\dot{\zeta}$

του ζι'., συνωθήτω το μέν αζ'. Επάνω του μέσου, το δέ ιθ'. Επονάτω, καθάπερ έπὶ του δευτέρου σχήματος, έως

60 οδ γένηται τὰ αβγδ΄. κατ εὐθεῖαν. καὶ συμπιπτέτω τῷ εθ΄. ἐκβληθείση κατὰ τὸ κ΄. ἔσται δὲ ὡς ἡ ἀκ΄. πρὸς κβ΄. ἐν μὲν ταῖς αε΄. ζβ΄. παραλλήλοις ἡ εκ΄. πρὸς κζ΄. ἐν δὲ ταῖς αζ΄. βη΄. παραλλήλοις ἡ ζκ΄. πρὸς κη΄. ὡς ἄρα ἡ ακ΄. πρὸς κβ΄. ἡ εκ΄. πρὸς κζ΄.

65 καὶ ἡ κζ΄. πρός κη΄. πάλιν ἐπεὶ ἔστιν, ὡς ἡ βκ΄.
πρός κγ΄. ἐν μὲν ταῖς βζ΄. γη΄. παραλλήλοις ἡ ζκ΄.
πρός κη΄. ἐν δὲ ταῖς βη΄. γθ΄. παραλλήλοις ἡ ζκ΄.
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πρός κθ΄. ὡς ἄρα ἡ βκ΄. πρὸς κγ΄. ἡ ζκ΄. πρὸ κη΄.

70 καὶ ἡ ηκ'. πρός κθ'. ἀλλ'ῶς ἡ ζκ'. ἄρὸς κη'. ἡ ἐκ'.
πρός κζ'. καὶ ὡς ἄρα ἡ εκ'. πρός κζ'. ἡ κζ'. πρός
κη'. καὶ ἡ ηκ'. πρός κθ'. ἀλλ'ῶς ἡ εκ'. πρός κζ'.
ἡ αε'. πρός βζ'. ὡς δὲ ἡ ζκ'. πρός κη'. ἡ βζ'. πρός
γη'. ὡς δὲ ἡ ηκ'. πρός κθ'. ἡ γη'. πρός δθ'.

75 καὶ ὡς ἄρα ἡ αε΄. πρὸς βζ΄. ἡ βζ΄. ἡρὸς γη΄. καὶ ἡ γη΄. πρὸς δθ΄. ηθρηνται ἄρα τῶν αε΄. δθ΄. δύο μέσαι, ἤ τε βζ΄. καὶ ἡ γη΄.

Ταθτα οδν έπὶ τῶν γεωμετρουμένων ἐπιφανειῶν ἀποδέδεινται. ἴνα δὲ καὶ ὁργανικῶς δυνώμεθα τὰς δύο 80 μέσας λαμβάνειν, διαπήγνυται πλινθίον ξύλινον ἤ ἐλεφάντινον ἢ χαλκοῦν, ἔχον τρεῖς πινακίσκους ἴσους ὡς

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ών έπιφανειών Δρεθα τὰς δύο Αινον ἥ ἐλεover it and the rectangle 10 below it, as in the second figure, until $\alpha\beta\gamma\delta$ fall in the same straight line. Let this straight line meet $\epsilon\theta$ produced at %

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Thus, since αε:βζ :: βζ:γη :: γη:80,

βg and Ya are the required means to as and 80.

Such is the proof by geometrical plane surfaces. To enable us to find the two means by instrument, a block of wood, ivory, or bronze is pierced through, carrying three equal plates of extreme fineness. The middle plate is fixed, while the others can be slid along in grooves; their sizes and proportions are determined by the indivi-

λεπτοτάτους τον δ μεν μέσος ενήρμοσται, οι δε δύο έκωστοί είσιν εν χολέδραισ, τοτς δε μεγέθεσι και τατς συμμετρίαις ώς εκαστοι εαυτούς πείθουσι. τὰ μεν γὰρ

85 τῆς ἀποδείξεως ἀσαύτως συντελείται. πρός δὲ τὸ ἀκριβέστερον λαμβάνεσθαι τὰς γραμμάς, φιλοτεχνητέον, ἴνα ἐν τῷ συνάγεσθαι τοὺς πινακίσκους παράλληλα διαμένη πάντα καὶ ἄσχαστα, καὶ ὁμαλῶς συναπτόμενα ἀλλήλοις. ἐν δὲ τῷ ἀναθήματι τὸ μὲν ὁργανικὸν χαλκοῦν ἐστι, καὶ

90 καθήρμοσται δε αὐτὰν τὰν στεφάνην τῆς στήλης προσμεμολυβδοχοημένον, δε αὐτοῦ δὲ ἡ ἀπόδειξις συντομώτερον φραζομένη καὶ τὸ σχημα, μετὰ τοῦ δὲ ἐκίγραμμα. δεογεγράφθω οὖν σοι καὶ ταῦτα, ἴνα ἔχης καὶ ὡς ἐν τῷ ἀναθήματι. τῶν δὲ δύο σχημάτων τὸ δεύτερον γέγρακται 95 ἐν τῷ στήλη.

Δύο των δοθεισών εύθειων, δύο μέσας ἀνάλογον εύρετν ἐν συνεχετ ἀναλογία. δεδόσθωσαν αὶ αε΄. δθ΄. συνάγω δὲ τοὺς ἐν τῷ ὁργάνῳ πίνακας, ἔως ἄν κατ'εὐθεῖαν γένηται τὰ α΄. β΄. γ΄. δ΄. σημεῖα. νοείσθω δὴ ὡς

Τοο έχει (vulgo έχη) έπὶ τοῦ δευτέρου σχήματος. ἔστιν ἄρα, ὡς ἡ ἀμ΄. πρὸς κβ΄. ἐν μὲν ταῖς αε΄. βξ΄. παραλλή λοις ἡ εμ΄. πρὸς κξ΄. ἡ κξ΄. πρὸς κη΄. ὡς δὲ αδται πρὸς ἀλλήλας, ἡ τε αε΄. πρὸς βξ΄. καὶ ἡ βξ΄. πρὸς γη΄. ὡσ΄ αθτως. δὲ δείξομεν, ὅτι καὶ ὡς ἡ ξβ΄. πρὸς γη΄. ἡ

105 γη΄. πρός δθ΄. ἀνάλογον ἄρα αὶ αε΄, βζ΄. γη΄. δθ΄.
ηθρηνται ἄρα, δύο τῶν δοθεισῶν, δύο μέσαι. ἐὰν δὲ

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in continued proportion. The continued proportion.

Let the straight lines be as and 86

I bring together the plates on the instrument, until the points α , β , γ , and δ are in the same straight line. Observe how it is in the second figure.

Now since αε || βζ, ακ:κβ :: εκ:κζ :: κζ:κη.

In the same way we can show that $\zeta\beta:\gamma\eta::\gamma\eta:\delta\theta$ thus $\alpha\epsilon$, $\beta\zeta$, $\gamma\eta$, and $\delta\theta$ are in continued proportion. Thus the two means have been found for the

αὶ δοθεζσαι μὴ ίσαι ὧσι ταζς αε . δθ . ποιήσαντες αὐταζς ἀνάλογον τὰς αε . δθ . τούτων ληψόμεθα τὰς μέσας, καὶ ἐπανοίσομεν ἐπ ἐκείνας, καὶ ἐσόμεθα πε110 ποιηκότες τὸ ἐπιταχθέν. ἐὰν δὲ πλείους μέσας ἐπιταχθῷ εὐρεζν, ἔτι πλείους πινακίσκους καταστησόμεθα ἐν τῷ ὁργάνω τῶν ληφθησομένων μέσων, ἡ δὲ ἀπόδειξις ἡ αὐτή.

32: Theo. Smyrnagus p. 127:

*Ερατοσθένης δέ έν τῷ Πλατωνικῷ φησι, μή ταὐτὸν εἶναι Βιάστημα καὶ λόγον. ἐκειδή λόγος μέν ἐστι δύο μεγεθῶν ἡ κρὸς ἄλληλα κοιὰ σχέσις, γίνεται δὲ αὐτὴ καὶ ἐν διαφόροις (καὶ ἐν ἀδιαφόροις) οἶον 5 ἐν ῷ λόγῳ ἐστὶ τὸ αἰσθητὸν κρὸς τὸ νοητόν, ἐν τούτον δόξα πρὸς ἐκιστήμην, καὶ διαφέρει καὶ τὸ νοητόν ἐκιστητοῦ, ῷ καὶ ἡ δόξα τοῦ αἰσθητοῦ. διάστημα δὲ ἐν διαφέρουσι μόνον, ἢ κατὰ τὸ μέγεθος, ἢ κατὰ κοιότημα, ἣ κατὰ θέσιν, ἢ ἄλλως ὁκωσοῦν. δῆλον 10 δὲ καὶ ἐντεῦθεν, ὅτι λόγος διαστήματος ἔτερον τὸ γὰρ ἣμιου κρὸς τὸ δικλάσιον (καὶ τὸ δικλάσιον κρὸς τὸ ἣμιου) λόγον μὲν οὐ τὸν αὐτὸν ἔχει, διάστημα δὲ τὸ αὐτὸ.

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to as and 80, we make as and 80 proportionate to the given lines, take the means, and then relate them to the given lines; in this way we shall have done what is required. If it is required to find more means, we must put on the instrument (one) more plate than the number of means to be found. The proof is the same."

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"difference" and "proportion" are not the same; since proportion is some qualitative relationship between two magnitudes, and this relationship exists both in things of different and things of the same dategories. For example, the "proportion" of opinion to knowledge is the same as that of the thing perceived to the thing apprehended, while the thing apprehended itself differs from the knower in just the same way as the opinion from the perceiver. "Difference" is found only in things which differ in size, quality, position, or any attribute at all. From this it is clear that proportion is not the same as difference; for there is not the same proportion between half and double, double and half, though the difference is the same.

33: Theo. Smyrn. p. 129:

δ δὲ Ἐρατοσθένης φησίν, ὅτι τῆς ἀναλογίας φύσις καὶ ἀρχὴ λόγος ἔστὶ καὶ πρώτη (ἀρχὴ καὶ) τῆς γενέσεως αἰτία πᾶσι τοῖς μὴ ἀτάκτως γενομένοις. ἀναλογία μὲν γὰρ πᾶσα ἔκ λόγων, λόγου δὲ ἀρχὴ τὸ ἴ-

- 5 σον. δήλον δὲ οὖτως. ἐν ἐκάστω τῶν γενῶν ἴδιόν ἐστί τι στοιχεῖον, εἰς ὅ τὰ ἄλλα ἀναλύεται, αὐτὸ δὲ εἰς μηδὲν ἐκείνων· ἀνάγκη δὲ τοῦτο ἀδιαίρετον εἶναι καὶ ἄτομον· τὸ γὰρ διαίρεσιν καὶ τομὴν ἐπιτο δεχόμενον συλλαβὴ λέγεται καὶ οὐ στοιχεῖον. τὰ
- ΙΟ μέν οὖν τῆς οὐσίας στοιχεῖα κατὰ οὐσίαν ἀδιαίρετά ἐστι, τὰ δὲ τοῦ ποίοῦ κατὰ τὸ ποιόν, τὰ δὲ τοῦ ποσοῦν σοῦ κατὰ τὸ ποσοῦν. ὅλως δὲ ἔκαστον κατὰ τοῦτο ἄτομον καὶ ἔν, καθ' ὁ στοιχεῖόν ἐστι συνθέτου τινὸς ἡ μικτοῦ. τοῦ μὲν οὖν ποσοῦ στοιχεῖον ἡ μονάς,
- 15 του δὲ πηλίνου στιγμή, λόγου δὲ ναὶ ἀναλογίας ἰσότης. οῦτε γὰρ μονάδα ἔτι διελεῖν ἔστιν εἰς τὸ ποσόν, οῦτε στιγμὴν εἰς τὸ πηλίνον, οῦτε ἰσότητα εἰς πλείους λόγους. γίνεται δὲ ἀριθμὸς μὲν ἐν μονάδος,
- 20 γραμμή δὲ ἐκ στιγμῆς, λόγος δὲ καὶ ἀναλογία ἐξ ἰσότ τητος, τρόπον δὲ οὐ τὸν αὐτὸν ἕκαστον τόὐτων. ἀλλὰ μονὰς μὲν πολλαπλασιαζομένη ὑφ ἐαυτῆς οὐδὲν γεννῷ ὡς οἱ ἄλλοι ἀριθμοί, τὸ γὰρ ἄξαξ ἕν ἕν· κατὰ σύν-

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mature and origin of progression and the first cause of all orderly arrangements: for every progression consists of proportions, and the basis of proportion 5 is equality. The proof of this is as follows.

Every class of thing has some element into which it can be broken up, while the element itself cannot: it must be indivisible and unsplittable, for anything susceptible of division or splitting is a compound, 10 not an element. Now natural elements are indivisible according to nature, while those of quality are indivisible with regard to quality and those of quantity with regard to quantity. Generally, each element is unsplittable and single in respect of the composition or 15 mixture of which it is an element. Now the element of quantity is the unit, that of size the point, that of proportion and progression inequality. Neither is it possible, with reference to quantity, to divide the unit, nor with reference to size the point, nor can equality 20 be split into a number of proportions. Number originates from the unit, the line from the point, proportion and progression from equality, though all these do not happen in the same way. Unity multiplied by itself

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25 οὅτε κατὰ πολλαπλασιασμὸν οὅτε κατὰ σύνθεσιν.

ἀλλὰ κατὰ συνέχειαν ρυεῖσὰ τε καὶ ἐνεχθεῖσα γραμμὴν

ἀποτελεῖ, γραμμὴ δὲ ἐπιφάνειαν, ἐπιφάνεια δὲ σῶμα.

καὶ μὴν ὁ τῶν ἴσων λόγος οὑκ αὕξεται συντιθέμενος·

πλειόνων γὰρ ἴσων ἔξῆς τιθεμένων ὁ τῆς περιοχῆς λό
30 γος ἐν ἰσότητι διαμένει. διὸ καὶ συμβαίνει, τὴν

στιγμὴν μὴ εἶναι μέρος γραμμῆς μηδὲ τὴν ἰσότητα λό
γου, τὴν μέντοι μονάδα ἀριθμοῦ· μόνη γὰρ αὐτὴ συν
τιθεμένη λαμβάνει τινὰ αὕξησιν. αἶτιον δὲ τοῦ λεχ
θέντος, ὅτι διαστήματος ἄμοιρος ἰσότης, καθάπερ καὶ

34: Theo. p. 168:

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35 ή στιγμή μεγέθους.

side with regard to quality and those of traper dity eldis

δ δὲ Ερατοσθένης φησίν, ὅτι κᾶς μὲν λόγος ἡ κατὰ διάστημα, ἡ κατὰ τοὺς ὅρους αὕξεται, τῷ δὲ ἰσότητι συμβέβηκε διαστήματος μὴ μετέχειν. εὕδηλον δὲ ὅτι κατὰ τοὺς ὅρους μόνους αὐξηθήσεται. λαβόντες δὴ τρία μεγέθη, ὁ καὶ τὴν ἐν τούτοις ἀναλογίαν, κινήσομεν τοὺς ὅρους, καὶ δείξομεν, ὅτι κάντα τὰ ἐν τοῖς μαθήμασιν ἐξ ἀναλογίας κοσῶν τινων σύγκειται, καὶ ἔστιν αὐτῶν ἀρχὴ καὶ στοιχεῖον ἡ τῆς ἀναλογίας φύσις, τὰς δὲ ἀκοδείξεις ὁ μὲν Ἐρατοσθένης φησὶ καραλείψειν.

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25 one is one: but by addition it can be increased right up to infinity; while a point cannot be increased by either multiplication or addition. Instead, by flowing and being moved along it makes a line, the line a plane surface and the plane a solid. Similarly the propor-

ded together, for when a number of equals are added together the proportion of the sum remains at equality.

Thus too it comes about that the point is not part of
a line, not get equality of proportion, though the unit

The reason for this is that equality does not partake of difference, in the same way that the point does not partake of size.

34.

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creases either by a (common) difference or by its terms; but equality does not partake of difference, and can obviously be increased only by its terms. Thus, if we take three magnitudes and the relationship between them, and manipulate the terms, we shall show that all branches of mathematics consist of relationships of some magnitudes or other, and of these the basis and element is the nature of relationship. Eratosthenes says he will omit the proofs.

35: Nicomachi enchiridii harmon. I p. 79 ed. Meursii:

καί προσεκθησόμεθα την του Πυθαγορικού λεγομένου κανόνος κατατομήν άκριβώς κατά το βούλημα τούδε το
του διδασκάλου συντεπελεσμένην, ούχ ώς Ερατοσθένης καρήκουσεν.

36: Ptolemael Harmon, JI, 14 (Westphal, p. 89):

τό μεν οδν πρώτον κανόνιον περιέχει τὰ έναρμόνια γένη· ἐπὶ μεν τοῦ πρώτου σελίδεου, τὸ κατὰ 'Αρχύταν ἐπὶ δὲ τοῦ δευτέρου, τὸ κατὰ 'Αριστόξενον
. . . . ἐπὶ δὲ τοῦ τρέτου, τὸ κατὰ 'Ερατοσθένην, ἐν
λόγοις τῷ τῶν ιε' πρὸς ιθ' καὶ ἔπι τριακοστογδόφ, καὶ
ἐπι τριακοστεννότφ. (laguma)

p. 419	p. 423	p. 433
Kavovsov a	Κανόνιον β΄	Κανόνιον γ'
'Ερατοσθένους	Έρατοσθένους	Έρατοσθένους
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37: Placita Philosophorum (Plutarch ?) p. 884 B:

την του ηλίου πορείαν. Ερατοσθένης (τον χρόνον φησί)

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36) Isabl. co. 1669. Ett. 1. 2. 9001

I shall set out also the summary of what is called the Pythagorean canon, accurately completed according to the wish of this master, and not as Eratosthenes wisunderstood it.

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and ganga, arthuro, wh the lab range and an avenue. The first Canon contains the types of scales: on the first page that according to Archytas. on the second, that according to Aristoxenus. on the third, that according to Eratosthenes, in the proportions 15 to 19, thirty-eighth and thirty-minth,

Ganon 1	Ganon 2	Ganon 3
Eratosthenes'	Eratosthenes.	Eratosthenes*
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According to Eratosthenes, time consists of the sun's journey. went the function with the profession

with the first, I then examine which it is able to a

38: Jambl. ap. Stob. Ecl. 1 p. 904:

σώμα άλλοτε άπ' αλλων τοῦ καντὸς τόκων.

39: The Sieve:

Micomachus Arithmet. I. 13. 2-41

Κόσκινον, ἐπειδὰ ἀναπεφυρμένους τοὺς περίσσους λαβόντες καὶ ἀδιακρίτους, ἐξ αὐτῶν τῷ τῆς γενέσεως μεθόδω ταὐτη διαχωρίζομεν, ὡς δι'ὁργάνου ἢ κοσκίνου τινός καὶ ἱδία βὰ τοὺς πρώτους καὶ ἀσυνθέτους, ἱδία βὰ τοὺς δευτέρους καὶ συνθέτους, χωρὶς δὰ τοὺς μικτοὺς εὐρίσκομεν. ἔστι δὰ ὁ τρόπος τοῦ κοσκίνου τοιοῦτος ἀκθέμενος τοὺς ἀκὸ τριάδος πάντας ἐφεξῆς περισσοὺς ὡς δυνατὸν μάλιστα ἐκὶ μήκιστον στίχον, ἀρξάμενος ἀκὸ τοῦ πρώτου ἐπισκοπῶ, τίτο νας οἰός τε ἐστι μετρεῖν, καὶ εὐρίσκω δύνατὸν ὅντα τοὺς

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There is another sect of Platonists which distinguishes the descents of souls from better places not by dispensations of a Greator nor yet according to divisions into superior races such as gods, angels, spirits, and heroes, nor by districts of the universe; but lays it down that the soul is always in a body, like the sect of Eratosthenes, Ptolemy the Platonist, and others, and removes it in turn from more subtle bodies into shell-like bodies. Its manner of life, they say, partakes to a certain extent of the sensible; at least, it comes into its solid body at different times from different parts of the universe.

-or our bypers us 39: The Siever of the Stand vortice

the formation of these is called by Eratosthenes
the "Sieve"; for taking the odd numbers as they are, mixed
up and undistinguished, by this method of (finding their)
formation we separate them out as though by means of an
instrument or sieve. Thus we find separately the prime
and simple numbers, the secondary and compound, and in
another classification those of mixed character. The
method of the Sieve is as follows:

I set out all the odd numbers in succession, beginning with three, in the longest row possible. Beginning with the first, I then examine which it is able to divide

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δύο μέσους παραλείποντας μετρεΐν, μέχρις οδ αν προχωρεΐν ἐθέλωμεν, οδχ ὡς ἔτυχε δὲ καὶ εἰκῆ μετρούντα, ἀλλὰ
τὸν μὲν πρώτως κείμενον, τουτέστι τὸν δύο μέσους ὑπερβαίνοντα κατὰ τὴν τοῦ πρωτίστου ἐν τῷ στίχψ κειμένου

- 15 ποσότητα μετρήσει, τουτέστι κατά την ξαυτού· τρίς γάρ·
 τον δ'άπ' εκείνου δύο διακείποντα κατά την του δευτέρου
 τεταγμένου πεντάκις γάρ· τον δε περαιτέρω πάλιν
 δύο διακείποντα κατά την του τρίτου τεταγμένου· επτάκις
 γάρ. τον δε έτι περαιτέρω ύπερ δύο κείμενον κατά την
- 20 τος τετάρτου τεταγμένου· ένάκις γάρ· καὶ ἐπ'ἄπειρον τῷ αὐτῷ τρόπῳ. εἶτα μετὰ τοςτον ἀπ'ἄλλης ἀρχῆς ἐπὶ τὸν δεύτερον ἐλθῶν σκοπῶ, τίνας οἰός τέ ἐστι μετρεῖν, καί εὐρίσκω πάντας τοὺς τετράδα διαλείποντας, ἀλλὰ τὸν μὲν πρῶτον κατὰ τὴν τος ἐν τῷ στίχῳ πρώτου τεταγμένου πο-
- 25 σότητα· τρὶς γάρ· τὸν δὲ δεύτερον κατὰ τὴν τοῦ δευτέρου· πεντάκις γάρ· τὸν δὲ τρίτον κατὰ τὴν τοῦ τρίτου· ἐπτάκις γάρ· καὶ τοῦτο ἐφεξῆς ἀεί.

The Mark Market Octaeteris: 40-41: 250 force of the Market State of the State of th

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40: Geminus apud Petavium p. 34 g:

δθεν τὰ "Ισια πρότερον μεν ήγετο κατὰ τὰς χει"

μερινὰς τρόπάς, ὡς καὶ "Ερατοσθένης ἐν τῷ περὶ τῆς ὁκτα"

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evenly. I find that it can divide into those which pass over two intervening numbers, as far as we are willing to go on, not dividing at random and haphazard; and it will divide that which lies first -- that is, the one that passes over two in between -- according to the magnitude of the number lying first in the row, that is, its own magnitude, or three times. The number which passes by two from that it will measure according to the magnitude of that in the second position, or five times, and that two further on according to that of the third in order, or seven times; that two more further on by the magnitude of the fourth in order, or nine times; and so on indefinitely. Next after this, starting again, I pass to the second number and look into which it can divide, and find it will divide into all those that pass over a set of four, the first by the magnitude of the number first in order in the row, or three times; the second, according to that of the second, or five times; the third according to that of the third; and so on in order for ever. The prod to produce the

The Eight-Year Cycle: 40-41:

40.

Therefore the festival of Isis was formerly held about the time of the winter solstice, according to Eratosthenes in his essay on the "Eight Years".

in these very remarks he shows a considerable weakness

41: Ach. Tat. in Arat. Phaen. D. 139:

λέγεται δὲ ἐνιαντὸς ἡ ἀκὸ τοῦ ζωδίου εἰς τὸ αὐτὸ ἀκονατάστασις αὐτοῦ ἐν ἡμέραις τξε καὶ ἐλαχίστω μορίω. ἀκὸ δὲ σημείου εἰς σημετων ἀκοναθίσταται ἐν ὁντὰ ναὶ δεναετηρίδι, εἴ γε γνήσιον ἐστι τὸ σύγγραμμα τὰ ἐρατοσθένους. οὐτος γὰρ ἀνέγραψεν ὅεικνύς, ὡς οὐκ εῖη Εὐδόξου.

Ariston: 42-43:

42: Strabe 0. 15:

αὐτὸς ἀγαθοῖς ἀνδράσιν. Ἐγένοντο γάρ, φησὶν ὁ Ἐρατοσθένης, ὡς οὐδέποτε, κατὰ τοῦτον τὸν καιρὸν ὑφ'ἔνα κερίβολον καὶ μίαν πόλιν οἱ κατ' Αρίστωνα καὶ 'Αρκεσίλαον
5 ἀνθήσαντες φιλόσοφοι. οὐκ ἱκανὸν δ'οἶκαι τοῦτο ἀλλὰ τὸ
κρίνειν καλῶς, οἶς μᾶλλον προσιτέον. ὁ δὲ 'Αρκεσίλαον
καὶ 'Αρίστωνα τῶν καθ'ἐαυτὸν ἀνθησάντων κορυφαίους τίθησιν 'Ακελλῆς τε αὐτῷ πολὸς ἐστι καὶ Βίων, ὅν φησι πρῶτον ἀνθινὰ περιβαλεῖν φιλοσοφίαν. ἀλλ'ὅκως πολλάκις
10 εἰκεῖν ἄν τινα ἐπ'αὐτοῦ τοῦτο. Οἶην ἐκ ῥακέων ὁ Βίων.
ἐν αὐταῖς γὰρ ταῖς ἀποφάσεσι ταύταις ἱκανὴν ἀσθένειαν ἐμ-

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same part of the zodiac, lasting 365 days and a small part of a day. The return from one sign to the next occupies a period of eighteen years, if the record of Eratosthenes is genuine. It was he who wrote about it showing that it was not introduced (the Athenian calendar) by Eudoxus.

Township to an instruction of Aristons 42-43. Baylong wo head approach water

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fell in with very many able men. "At this period"
says Eratosthenes, "there were more philosophers than
at any other in history in the compass of one city,
namely those who flourished in the time of Ariston
and Arcesilaus."

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φαίνει τῆς ἐαυτοῦ γνώμης, ὅς τοῦ Ζήνωνος τοῦ Κιτιέως γνώριμος γενόμενος 'Αθήνησι, τῶν μὲν ἐκείνον διαδεξα- μένων οὐδενὸς μέμνηται, τοὺς δ'ἐκείνῷ διενεχθέντας, 15 καὶ ὧν διαδοχή οὐδεμία σώζεται, τούτους ἀνθῆσαί ψησι κατά τὸν καιρὸν ἐκεῖνον.

43: Athenseus VII p. 281 0:

Καὶ τῶν Στωινῶν δὲ τινες συνεφήψαντο ταύτης
της ἡδονῆς. Ερατοσθένης γοῦν ὁ Κυρηνατος, μαθητής
γενόμενος Αρίστωνος τοῦ Χίου, ὅς ῆν εἰς τῶν ἀπὸ τῆς
Στωᾶς, ἐν τῷ ἐπιγραφομένῳ Αρίστωνι παρεμφαίνει τὸν
δ διδάσκαλον ὡς ὕστερον ὁρμήσαντα ἐπὶ τρυφήν, λέγων ὧδε.
"Ηδη δέποτε καὶ τοῦτον πεφώρακα τὸν τῆς ἡδόνης καὶ ἀρέτης μεσότοιχον διορύττοντα, καὶ ἀναφαινόμενον παρὰ
τῆ ἡδονῆ.

Good and Evil: 44-47:

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44: Stobsel Serm. GXV p. 592, 32. (Gesn. a. 1559):

Ερατοσθένης της ήλικίας έφη το μεν άκμάζον

έαρ είναι, το δε μετά την άκμην θέρος και μετόπωρον.

Χειμώνα δε το γηρας.

45: Harpochatio p. 28:

*Αρμοσταί, οι δπό Λακεδαιμονίων είς τὰς δπηπόους πόλεις ἄρχοντες ἐππεμπόμενοι, ὡς Ἐρατοσθένης ἐν
τοῖς περὶ ἀγαθῶν καὶ κακῶν φησι.

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of his own intelligence: after being acquainted with Zeno the Citian at Athens, he mentions none of his successors, but speaks of those who differed from him and who had no successors as flourishing at that time.

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ARBIT 内部不由于在人员的一个公司的工程的工程的工程的工程的工程的工程的工程的工程的工程。

this "pleasure". At least Eratosthenes of Cyrene, who was a pupil of Ariston of Chics, one of the Stoic school, reveals in his work entitled "Ariston" his master in later life eagerly devoting himself to luxury. These are his words: "I have sometimes detected even him undermining the party-wall between pleasure and virtue, and making his appearance in the home of pleasure."

Good and Evil: 44-47.

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Eratosthenes said that the adolescent part of life is spring, the part that follows adolescence is summer and autumn, while old age is winter.

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Harmosts: Governors sent out to subject states by the Spartans, according to Eratosthenes in his "Good and Evil".

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46: Olem. Alex. Stron. IV p. 496 Ct

Επεὶ οὐ μόνον Αἰσώπιοι καὶ Μακεδόνες καὶ Λάκωνες στρεβλούμενοι ἐκαρτέρουν, ὡς φησιν 'Ερατοσθένης ἐν
τοῖς περὶ ἀγαθῶν καὶ κακῶν, ἀλλὰ καὶ Ζήνων ὁ 'Ελεάτης,
ἀναγκαζόμενος κατειπεῖν τι τῶν ἀπορρήτων, ἀντέσχεν πρὸς
τοὺς βασάνους, οὐδὲν ἐξομολογούμενος ' ὡς γε καὶ τελευτῶν
τὴν γλῶτταν ἐκτρώγων, προσέπτυσε τῷ τυράννῳ, ὁν οἱ μὲν
Νέαρχον, οἱ δὲ Δημύλον προσαγορεύουσιν.

471 Dioc. Laort. VI. 831 populate at all nover

Έρατοσθένης δέ φησιν, έξ Ίππαρχίας περί ής λέξομεν, γενομένου παιδός αὐτῷ (Grateti Gynico), δνομα Πασικλέους, δτ'έξ ἐφήβων ἐγένετο, ἀγαγεῖν αὐτὸν ἐπ'οίνημα παιδίσκης, καὶ φάναι τοῦτον αὐτῷ πατρῷον εἶναι τὸν γάμον.

Health and Poverty: 48-49;

48: Diox. Laert. IX. 66 (de Pyrrhone):

εύσεβως δε και τη άδελφη συνεβίω μαία ούση, κα θα φησιν Ερατοσθένης εν τω περί πλούτου και πενίας, ότι και ούτος φέρων είς την άγοραν επίπρασκεν δρνίθια, εί τύχοι, και χοιρίδια· και τὰ ἐπὶ τῆς οἰκίας καθάροι ἀπ διαφόρως.

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Spartans, accompanies, who bor when he was be out against the finished by be the tyrant, we pemylus.

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It was not only Assopians, Macedonians, and spartans, according to Eratesthenes in his "Good and Evil", who bore torture stoutly. Zeno of Elea, too, when he was being forced to give away some secret, held out against the torments and admitted nothing. He even finished by biting off his tongue and spitting it at the tyrant, whom some name as Nearchus and others as Demylus. ofer wa gwalecornes for 175

Sratosthenes says that a son named Pasicles was born to him (Grates the Cynic) by Hipparchia, of whom I shall have something to say; and when he reached manhood Grates took him to a harlot's house and told him that this was his father's marriage.

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(Pyrrho) lived respectably with his sister, who was a nurse, according to Eratosthenes in his "Wealth and Poverty": he himself used to take birds and piglings to market on occasion and sell them. He even used to do the household cleaning without making any distinctions of a rottor . offy social offr all world

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49: Plutaroh, Themistocles p. 125. S:

δ δε "Ερατοσθένης έν τοῖς περί πλούτου προσιστόρησε, διά γυναικός "Ερετριακής ήν δ χιλίαρχος είχε
τῷ Θεμιστοκλεῖ τὴν πρός αὐτὸν (regem) ἔντευξιν γενέσθαι καὶ σύστασιν.

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Letters: 50-511 San antild micheller

50: Athenaeus X p. 418, At

*Επιστολαίς, Πεμπελον, φήσαι, έρωτηθέντα, τί αὐτῷ δοποθσιν είναι Βοιωτοί, είπεϊν· τί γὰρ ἄλλο ή τοιαθτα
ἐλάλουν, οἰα ἄν καὶ τὰ ἀγγεῖα φωνὴν λαβόντα, πόσον
ἔκαστος χωρεῖ.

51: Athenseus XI p. 482, A:

*Ερατοσθένης δ'έν τῷ πρὸς Αγήτορα τὸν Λάνωνα ἐπιστολῷ ὡς κυαθώδες ἀγγετον τὸ κυμβίον παραδίδωσι, γρό φων οῦτως. Θαυμάζουσι δὲ οἱ αὐτοῖ, καὶ κῶς κύαθον μὴ κεκτημένος, ἀλλὰ κυμβίον μόνον, φιάλην προσεκέντητο. δοκεῖ δή μοι τοιμέν τῆς τῶν ἀνθρῶκων χρείας (ἔνεκα), τὸ δὲ τῆς τῶν θεῶν τιμῆς εἰς τὴν κρῆσιν παρειληφέναι. κυάθω μὲν οὄν οὐδὲν ἔχρῶντο τότε, οὐδὲ κοτύλᾳ. κρατῆρα γὰρ ἴστασαν τοῖς θεοῖς, οὐκ ἀργυροῦν, οὐδὲ λιθοκόλ λητον, ἀλλὰ τῆς Κωλιάδος γῆς. τοῦτον δ'ὁσάλις ἐπικλη.

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Eratosthenes further relates in his work on
"Wealth" that it was through an Eretrian woman in the
possession of the chiliarch that Themistocles first came
into contact with the king and became on friendly terms
with him.

Letters: 50-51:

50.

It is probably for these reasons that Eratosthenes said in his letters that Pempelus, when asked what he thought of the Boeotians, answered: "They just talk nonsense about vessels that receive the power of speech and argue about their respective capacities."

51.

In his letter to Agetor the Spartan Eratesthenes gives the "cymbium" as a cup-like vessel. This is what he writes: "The same people wonder how it is that, when he possessed no cup, but only a cymbium, he possessed a bowl as well. Now I think that he obtained the one for human use, the other for use in honour of the gods. They used at that time not to use a cup at all, or a goblet. They used to offer to the gods a mixing-bowl, not of silver, nor yet inlaid, but of Colian clay. As often as they

10 ρώσαιεν, άποσπείσαντες τοτς θεοτς έν της φιάλης ώνοχόουν έφεξης, τὸ νεοκράτα βάπτοντες τῷ κυμβίῳ, καθὰ καὶ νῶν κορ' όμτν ποιούσιν ἐν τοτς φιδιτίοις. εἰ δἔ ποτε κλεΐον πιετν βουληθετεν, προσπαρετίθεσαν τοὺς καλουμένους κοτύλους, κάλλιστα καὶ εὐκοτώτατα ἔνκωμάτων. ἦσαν δὲ τύλους, κάλλιστα καὶ εὐκοτώτατα ἔνκωμάτων. ἦσαν δὲ

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then poured wine in turn from the bowl, dipping the new mixture with the symbium, as is done even now at our public dinners. If at any time they wished to drink in larger quantities, they placed also in position what are called "cotyli", the most beautiful of drinking-vessels and the pleasantest to drink from. These too were of the same clay".

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Scenographicus: 52-56:

Seventions, Moreover 52: Pollux I. 145: Good a filt mercust

τὸ δὲ κωμύον ἐκπίπτειν τὸν προχὸν ἐμπηγνύμενον τῷ ἄξονι, παραξόνιον, ἡ ὡς Ἐρατοσθένης ἔμ-βολος.

53: Pollux X. 1:

ἐνέτυχόν ποτε βιβλίω τῷ τῶν Ἐνοφῶντος 'Ιππι"
κῶν ἐξηγεῖσθαι λέγοντι. εὐρῶν δὲ . . . τοῦτο 'Ερατοσθένην ἐν τῷ Σκευογραφικῷ λέγειν, ἐπῆλθέ μοι ζητεῖν
τὸ τοῦ 'Ερατοσθένους βιβλίον διὰ τὸ παραγωγὸν τῆς χρήσεως' ὡς δὲ εὖρον μόλις, οὐδὲν εἶχεν ὧν ῆλπισα.

54: Pollux X. 60 (de avadoreig:

παρά μέντοι "Ερατοσθένει έν τοῖς περὶ νωμωδί" ας, ὡς ἔχοιμέν τινα τοῦ ἀνόματος τοῦδε ἀποστροφήν, εὖ" ροις ἀν τοῦνομα ἐπὶ τοῦ σκεύους τοῦ τοῖς βιβλίοις χρησίμου.

55: Erotiani gloss, Hippoor, p. 394:

Χεται. Επικλής φησι, ψυχαί· ούκ όρθως· χεί· αι γάρ είσιν θποδήματος γυναικείου είδος, καθά φησιν Έρα· τοσθένης καὶ Καλλίστρατος έν δ' Συμμίντων. vents the wh

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OLD COMEDY: 52-91: where the water of the words

Scenographicus: 52-56; Application of the second

s Read Not Tree in 52 . On the Notice Filts

The part which is fixed on the axle and prevents the wheel from coming off is called "linch-pin" or, according to Eratosthenes, "peg". mattendary " activities of said of said and any and ability in a l'

armin-paths, tor-many, as 53 walked harbings a manage your

I once came upon a book of Kenophon's, "Horsemanship", that claimed to explain it. When I found that Eratosthenes mentioned it in his "Treatise on Furniture", it occurred to me to look for Eratesthenes' book, because, of the perversion of the usage. When I found it with difficulty, it contained non, of what I hoped for. -nor mention revision y arrays performants efformed to man during a property

controls applicant recognisary and exist is madpuly a contribute any compact. In the work of Eratosthenes on "Comedy", so that . DEFUSAST DET VED we may have some explanation of this word, you may find the word standing for an article of furniture used for books.

55. The Advisor housing owing that

Oheine: According to Epicles, spirits. This is incorrect. According to Eratosthenes and to Callistratus in Book 6 of his "Niscellany", Cheise are a kind of footwear for women.

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56: Hesvohius:

Βασιλίδες. Ερατοσθένης, από του βασιλέως πληθέντος.

Architectonicus: 57-58

57: Schol. Αρ. Rhod. Ι. 567:

Ιστέον, δτι Ερατοσθένης εν τῷ Αρχιτεντονικῷ

μέρη ταθτά φησιν Ιστοδ, Πτέρνη, Θωράνιον, Ήλανάτη,

Καρχήσιον, Κεραία, Ίνρίον.

58: Schol. Ap. Rhod. III. 232:

την δέ κατασκευην των άρότρων 'Ερατοσθένης έν τῷ 'Αρχιτεκτονικῷ καταγράφει.

Mark of March 59: Plut. Moralia p. 785 B: Toward and to

Ιώλον δὲ τὸν τραγφόδν Ερατοσθένης καὶ Φιλόχορος ἱστοροσσιν ἐβδομήκοντα ἔτη γεγενημένον, ὅκτω τραγφδίας ἐν τέτταρσιν ἡμέραις διαγωνίσασθαι μικρὸν ἔμπροσ-Θεν τῆς τελευτῆς.

, belood wor home crast bette Aristophanes: 60-78: Il Lineso bride bell

60: Schol. Eq. 96 3:

μολγόν. Έρατοσθένης μολγόν καὶ ἄμολγόν τὸν αὐτόν (τὸ αὐτό). ἄμολγοὺς δὲ παρὰ τούτοις φησὶ λέγεσθαι τοὺς ἄμελγόντας τὰ κοινά. Ἡσίοδος δὲ μᾶζά τ'ἄμολγαίη.

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Basilides: A woman flute-player's footwear, according to Erstosthenes, derived from "basileus" (king).

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* The Later Committee of the

чат рехротай авменов ф. зо 314 It is worthy of note that Eratosthenes, in his "Engineering", gives the parts of the mast as follows: heel, crow's-nest, top-mast, mast-head, yard-arm, step.

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Eratosthenes describes the furniture of the plough in his "Engineering". remaind and advantages one business for all for the and and and and

-mand what he was a may a see the see and a see the see as a see the s Eratosthenes and Philochorus relate that Polus the tragic actor, when seventy years old, acted eight whole tragedies in four days shortly before his death.

Aristophanes: 60-78:

gos ausgas gosga 13071 kada 100 tha gebased a susga

Molgos (hide, skin): Eratosthenes says that "molgos" and "amolgos" are the same. He says that among these people those who "milk the commonwealth" are called "amolgi". Hesiod, however, uses it of "shepherd's loaf". τος παίδα Διός ρεγάλου ραμασιππον.

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61: Schol. Nub. 448:

Κύρβις οδν ή περιέχουσα τὰς ἱέρὰς Υραφάς στήλη·

η ὡς Ἐρατοσθένης φησὶν ἄξων ᾿Αθήνησιν οὕτω καλούμενος,
ἐν ῷ οἱ νόμοι περιέχονται.

62: Schol. Nub. 549:

δηλον δέ, δτι πρότερος δ Μαρικάς έδιδάχθη των δευτέρων Νεφελών. Έρατοσθένης δε φησι, Καλλίμαχον ές καλείν τατς διδασκαλίαις, ότι φέρουσιν ϋστερον τρίτψ έτει τὸν Μαρικάν των Νεφελών, σαφώς ένταθθα εἰρημένου, ότι πρότε ρον καθείται. λανθάνει δ'αὐτόν, φησιν, ότι ἐν μὲν τατς διδαχθείσαις εἰ λέγεται οὐδὲν ἄτοπον. αὶ διδασκαλίαι δὲ δηλον ὅτι τὰς διδαχθείσας φέρουσι. πως δ'οὐ συνείδεν, ὅτι καὶ ἐν τῷ Μαρικᾶ προτετελεύτηκε Κλέων, ἐν δὲ τατς Νεφέλαις λέγεται. Εἶτα τὸν Θεοτσιν ἐχθρὸν βυρσο-

63: Schol. Sub. 967:

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ούτως 'Ερατοσθένης. Φρύνιχος αύτου του ασματος μέμνηται, ως Λαμπροκλέους δντος, του Μίδωνος υίου ή μαθητου. έχει δε ούτως

Παλλάδα περσέπολιν, δεινάν Θεόν, έγρεμύδοιμον,
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round it; or, according to Eratosthenes, what is at Athens called an "axle", round which the laws are inscribed.

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It is obvious that the "Maricas" was produced before the second edition of the "Clouds". Eratosthenes says that Callimachus reproaches the Catalogueof Stage Productions for containing the "Maricas" two years later ally form afor wa so paveous and than the "Glouds", though it is clearly stated there that wide towns of the party of a it was put on first. "He does not realize," he says, robert 5 penyaga va pror some swell "that if it is mentioned among the productions there is nothing strange about it. Obviously the Catalogeof Pro- we ductions contains (all) that are produced. Surely he must have been conscious that in the 'Maricas' Gleon is already dead, while in the 'Clouds' are the words: 'Then the tanner, hateful to the gods. ... " " " " sover post instruction on a that "spinistels" serves to agt the door of".

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mentions this same song as one of Lamprocles, son or pupil of Midon. It goes like this:

 Καὶ κατά Λαμεροκλέα ὖεστίθησι κατά λέξιν. τὸ δὲ τηλέεσρον βόαμα Κυδίδου τοῦ °Ερμιονέως κιθαρφδοῦ.

64: Schol. Vesp. 239:

τοῦ ποριόρου. πρός τον Λυποφρόνα, πόρπορον λέγοντα ίχθύδιον τι. ἡπάτηται δέ, ὡς φησιν Ερατοσθένης. ἔστι γὰρ λάχανον τι ἄγριον καὶ εὐτελὲς ἐν Πελοποννήσφ. ὡς καὶ ἡ παροιμία. καὶ κόρκορος ἐν λαχάνοισι.

65: Harpogratio. D. 44:

Δενάζων. Ερατοσθένης δὲ ἐν τοῖς περὶ τῆς ἀρχαίας νωμώδίας, πόθεν τὸ πράγμα εἴρηται, δηλοῖ οὐτω λέγων. Λύπος ἐστὶν ῆρως πρὸς τοῖς ἐν ᾿Αθήναις δικαστητίοις τοῦ Θηρίου μορφὴν ἔχων, πρὸς ὄν οἱ δωροδοποῦντες κατὰ δέκα γιγνόμενοι συνεστρέφοντο.

at land Teastrant 66: Schol. Vesp. 704: need eved the

έπαφιέναι τούς κύνας, έπισίζειν. Ο Επασακή πουσο

67: Schol. Veen. 1032:

Κύννης. πόρνης. καὶ Κύνναν καὶ Σαλαβάκχω.

*Ερατοσθένην δὲ ἀγνοήσαντα τὴν Κύνναν, ὅτι πόρνη, οὶ
μἔν τινες προφέρεσθαί φασι κυνός, ὡς ἐΕπιμενίδης οἱ
δὲ πυρός : οὐκ εὖ.

war woulder the pay 68: Argumentum Pacia:

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He puts it also under the heading of Lampocles. "The far-reaching cry" is from Cydides, the bard of Hermione. Tageda wagging a Tare of agreed of bead bead bead so

Lycophron says that "corcorus" is a kind of small fish. According to Eratosthenes, he is wrong; it is a kind of wild herb, cheap in the Peloponnese. The proverb bears this out: "Corcorus also among the herbs.....

Age supposed the representation of the contraction of the contraction

Decazon: In his work on "Ancient Comedy" Eratosthenes explains the origin of the term in the following words: "Lyous is a hero, in the shape of a beast, standing near the law-courts at Athens. Near his statue the receivers of bribes used to gather in tens." -Trend vor 1260 days a vista for verbandin 247 22000 4001 has

in ion laborated and a see 66 marons amphibit bran way "Hisses on": Lycophon and the followers of Eratosthenes say that "episizein" means "to set the dogs at".

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of Cynna: A harlot. "Cynna and Salabaccho" (Knights 765). Some, like Epimenides, say that Eratosthenes, not knowing that Cynna was a harlot, explained it as "of a dog"; others, "of five". This is incorrect.

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It is related in the Catalog of Stage Productions

δεδίδαχεν δροίως 'Αριστοφάνης. Εἰρήνην. ἄδηλον οὖν φησιν 'Ερατοσθένης, πότερον την αὐτην ἀνεδίδαξεν, ή ἐτέραν καθήκεν, ήτις οὐ σώζεται. Κράτης μέντοι δύο εἴπε δράματα, γράφων οὕτως καὶ σποράδην δέ τινα ποιήματα παρατίθεται, ἄπερ ἐν τῆ νῶν φερομένη οὐν ἔστιν.

69: Schol. Arist. Peace 48:

70: Schol. Pag. 702:

άρανιάσας. οξον, ώρανιάσας, ή λεικοψυχήσας, ή άθυμησας. άς φιλοκότην δὲ κάλιν διαβάλλει τὸν Κρατΐνον, μετὰ ἐκλύσεως ἐσκοτωμένον· ఢ ἔσως ἀκολουθεῖ καὶ τὸ ἀρακιάσας· τοιοῦτοι δὲ οἱ λεικοψυχοῦντες· τρέκεται γὰρ αὐτῶν ἡ χροιά. Λυκόφρων δὲ τὸ ἀρακιᾶν ἀντὶ τοῦ ἀχριᾶν. Ἐρατοσθένης δέ, τὸ ὑκὸ ἐκλύσεως ἐσκοτῶσθαι. ὅτι δὲ φίλοινος ὁ Κρατῖνος, καὶ αὐτὸ ἐν τῆ Πυτίνη λέγει σαφῶς.

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that Aristophanes also produced another "Peace". Eratosthenes says it is not certain whether he produced the same play again or put on another which is not preserved. Crates, however, says that there were two plays, and writes: ". . . . some scattered lyrics were inserted, which are not in the one which is still extant.

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He is eating leather-parines: But how could Cleon be eating when he was already dead? Eratosthenes says that the death of Brasidas and Cleon had taken place eight months previously in Thrace.

considered from "CDesty" - 270. cts; and objecting all site

ώρακιάσας: That is, "turning pale" or "losing one's senses", or "being down-hearted". He again accuses Oratinus of being fond of drinking, blind with helplessness. Probably "turning pale" results from this; people losing their senses are like this, for their colour changes. Lycophron says that Graniav is instead or wxpiav but Eratosthenes prefers "blind with helplessness". That Cratinus was fond of wine, he himself clearly states in the "Flask". PER Sapol Bess 1000;

A STATE OF THE PARTY OF

Bonoder 88 obrot the napour das rod alexand σισύρα (goat-skin): Eratosthenes says that, This play "The Corelege" seems to have been per τό δένδρον τό αύτό και άνδραχον και άνδράχην καλούμεν, ούτως φοντο σισύραν και σίσυν έπι του αύτου μετέχεσθαι. και τρίτην προσλαμβάνουσι σισύραν οι κατά Λιβύην, τό έκ των κωδίων τό άμπεχόνιον καλούμενον.

731 Hesvehlus!

νατειλυσεωμένην. δ μέν Λυνόφρων, ναταρτωμένην. Ερατοσθένης δέ, συγκετσθαι την λέξιν έν του είλετν και σεάσθαι.

741 Harpograt. p. 117 (Schol. Ran. 798):

μετον καὶ μειαγωγός. "Κρατοσθένης δ'ἐν

τοτς περὶ κωρωδίας φησὶν οὕτως. Νόμου ὅντος μὴ μετον εἰσάγειν ἀρισμένου τινός, ἐπισκώπτοντες μετὰ παιδίας πάντα τὸν εἰσάγοντα Μετον ἔφασαν εἰσάγειν, ὅθεν

τὰ μὲν ἰερετα Μετον προσηγορεύθη. Μειαγωγός δὲ δ
εἰσάγων.

751 Schol. Ren. 1026: δοπούσι δὲ οὐτοι οἱ Πέρσαι ὑκὸ τοῦ Αἰσχύλου just as we ca and dv8pdxvn and ofouc sha a third form

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follows in han offering to mock in paying MeTor ceived the name in the management of the management of

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just as we call the same strawberry-tree both ἄνδραχνος and ἀνδράχνη, so too they thought that the forms σισύρα and σίσυς shared the same meaning. People in Libya add a third form, too, σισύρνα, meaning a cloak made of fleeces.

se sharpeva order vach Rev ofe vi aronde avagance se

dancing." Eratosthenes says that it is taken in a temporal sense: "Whenever you are weary with

this your sour server 55 Z2. Can poyed so & run douga un

-lavagorosca" bur process . Proceeding to

ng down". According to Eratosthenes, the expression is compounded from "είλεῖν", to roll, and "σεᾶσθαι", to be drawn or pulled. (Lysistrata, 722)

prisoners In a The Washington

peTov and μειαγωγός: Eratosthenes explains as follows in his "Comedy": "As it was the rule not to bring an offering smaller than a prescribed weight, people used to mock in play at everyone as he brought his offering, saying 'MeTov', 'Too small!' Hence the sacrifices received the name of 'MeTov', and he who brought an offering 'Μειαγωγός'."

produced the "Miner Indula" tellure P

This play "The Persians" seems to have been pro-

ally allega, to purp serv

δεδιδάχθαι έν Συρακούσαις, σπουδάσαντος 'Ιέρωνος, ώς φησιν 'Ερατοσθένης έν γ' των κωρφδιών.

76: Schol. Ran. 1263:

των φήφων λαβών. Ερατοσθένης δέ, των ψευδαττικών τινας γράφειν, των ψήφων λαβών, ΐνα καὶ τὰ κεκλασμένα δράματα, έν οἶς τοκαράκαν τοῦτο ἡγνόηται, δοκῆ μὴ σεσολοικίσθαι.

77: Schol. Plut. 797:

ού φάρ πρεπώδες. ἔμφασις τοῦ 'Αριστοφανεί"

ου προσώπου ὁ δὲ λόγος πρὸς τοὺς ἀντιτέχνους πρὸς διασυρμόν, οἱ διὰ τὸν αὐτῶν ὁβολον ἐπειρῶντο τὸν δῆμον πρὸς ἐαυτοὺς ἐπάγειν. Καὶ ἐν τοῖς Σφηξὶ δὲ ἔσεμνύνετο, ὅτι οὑπ εἰσι παρ'αὐτῷ πάρυα ἔπ φορμίδος. φαίνεται μέντοι τὸ τοιοῦτον οὐ διὰ τῶν χορηγῶν γενέσθαι, ἀλλὰ δι'αὐτῶν τῶν διδασπάλων, ὡς καὶ 'Ερατοσθένης ἔπισημαίνεται.

78: Schol. Plut. 3194:

άλλ ἐκούτω τις δεύμο. ὅτι ὁ Λυκόφρων, ὡς
δ 'Ερατοσθένης φησίν, ὥήθη κρῶτον τοῦτον δάδας μτηκέναι. κεκοίηκε δὲ καὶ ἐν 'Εκκλησιαζούσαις αὐτό. ἀλλὰ
γὰρ Στράττις κρὸ ἀμφοτέρων τοῦτων τοὺς Ποταμίους διδάσκων
εἰς Φιλύλλιον ἀναφέρει τὸ πρᾶγμα'

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duced by Aeschylus at Syracuse on the request of Hiero, according to Eratosthenes in "Comedy", Book 3.

76.

τῶν ψήσων λαβών: Eratosthenes says that some of the fake Atticists write "taking some votes", so that even the spurious plays, in which this is really quite unknown, may not appear to be incorrect.

other backer you white visites white the statements has address aby

"It is not seemly": The saying is that of an Aristophanic character, but the argument is a satirical one against his rival playwrights, who tried to attract the people to themselves by petty bribery. In "The Wasps", too, he solemnly declared that in his plays there were no nuts from a basket. It appears that this kind of thing was done, not by the stage managers, but by the authors themselves, according to the implication of Eratosthenes.

-taxab anr Iqaa qqaaqa vara vara vara dayah aan rang

"Let someone bring (torches ready kindled)".

According to Eratosthenes, Lycophron thought that Aristophanes was the first to 'call for torches': he does it
also in the "Assembly of Momen". Actually, Strattis, who
produced the "River People" before both these plays, refers the practice to Philyllius:

Titles shy Sratesinense summate "The Hacre",

Υμετς τε πάντες έξιτ' έπὶ τὸ Πύθιον, δσοι περ' ἐστε, μὴ λαβόντες λαμπάδας μηδ' ἄλλο μηδὲν ἐχομένον Φιλυλλίου.

Cratinus: 1004 vac 34, 56 v vice

791 Athenseus XI p. 501 Diggs geld and re

Κρατίνου δ'ειπόντος έν Δραπέτισιν. Δέχεσθε φιάλας τάσδε βαλανειομφάλους. Ερατοσθένης έν τῷ ένδεμάτω περὶ κωμωδίας τὴν λέξιν άγνοεῖν φησι Λυκόφρονα. τῶν γὰρ φιαλῶν οἱ ὁμφαλοὶ καὶ τῶν βαλανείων οἱ θόλοι παρόμοιοι. εἰς τὰ εἶδος οὐκ ἀρρύθμως παίζονται.

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Beerstan of Dadus and indepresent Lover aid Jenters an

80: Harpograt. D. 119

Μεταλλείς, Λυσίας έν τῷ πρὸς Διοχάρη εἰ γνήσοιος. οὶ μέταλλα ἐργαζόμενοι μεταλλείς ὁνομάζονται. ἔστι δὲ καὶ δράμα Φερεκράτους Μεταλλείς, ὅπερ Νικομαχόν φησι πεποιηκέναι Ἐρατοσθένης ἐν ἐβδόμφ περὶ τῆς ἀρχαίσας κωμφδίας.

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εύθο Λύμειον, το είς Λύμειον, δθεν "Ερατοσθένης μαὶ διά τουτο υποκτεύει τους Μεταλλετς. "Go ou taking

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against Dice mines (péve) also a play Eratosthenes says was wri

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"Go out, all of you, to the Pythian temple, taking neither torches nor anything else connected with Philyllius."

comprehended and the property of the property of the contract of the contract

79.

Gratinus in his "Refugee Women", says: "Take these shields with bosses like bath-houses." In the eleventh book of his "Gomedy" Eratosthenes says that Lycophron does not know the word. The bosses of "bowl-shields" and the domes of bath-houses are similar, and the play on their shape fits the metre well.

- Personal and 5 Phorogrates: 80-81: Layson By Ward The

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METALLETC: Lysias uses the word in his speech against Diochares, if it is genuine. Those who work in mines (pétalla) are called miners (petallata). There is also a play of Pherecrates entitled "The Miners", which Eratosthenes, in the seventh book of his "Ancient Comedy", says was written by Nicomachus.

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"Straight to the Lyceum", i. e. "to the Lyceum".
This (the use of & 000 with an accusative) is an additional reason why Eratosthenes suspects "The Hiners".

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Unidentified Writers: 82-91:

82: Diog. Laort, VII 5: golden peters

Καὶ πρότερόν γε Στωικοί έκαλούντο οὶ διατρίβοντες ἐν αὐτῷ (τῷ ποικίλη στοῦ): ποιηταί, καθά φησι καὶ Ἐρατοσθένης ἐν δγδόμ περὶ τῆς ἀρχαίας κωμφδίας.

William b' steered by a contractive streete

83: Hesvellus:

άλκατον. ὅπλον ή ἀλεξιφάρμανον φυτόν.
*Ερατοσθένης δέ, ὅνομα εἶναί τινος ἀνθρώπου νωμφδουμένου.

1 Store to 84: Heavon Lus: The Paris of Marin of

Παρ'αίγείρου θέα. Ερατοσθένης φησί,

δτι πλησίον αίγείρου τινός θέα (αΐγειρος δέ έστι φυτοδ
είδος) έγγὸς τῶν ἱκρίων. ἔως οδν τούτου τοῦ φυτοδ
έξετείνετο καὶ κατεσκευάξετο τὰ ἰκρία, ἄ ἐστιν ὁρθὰ
ξύλα, ἔχοντα σανίδας προσδεδεμένας οἱον βαθμούς, ἐφ'
οἰς ἐκαθέζοντο, πρὸ τοῦ κατασκευασθῆναι τὸ θέατρον.

85: Photius: Townsell to wate a min

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εύκλεια, και τὰ ὅμοια, μακρὰ ἡ τελευταία.

και παροξύνεται, ἄσπερ και "Ερατοσθένης ἐν ιβ' πε-

86: Athen. IV D. 140 A:

της δέ κοπίδος μνημονεύει καὶ 'Αριστοφάνης

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Unidentified writers: 82-91; va portification a

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In earlier times too the poets who spent their time there (in the Stoa Poecile) were called Stoics, according to Eratosthenes in the eighth book of his "Ancolent Comedy".

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against poison. According to Fratosthenes, the name of a comic writer.

con into two cylinthes, to the Proposerations that believe

says this means "view near a certain black poplar" (the poplar is a kind of tree), "near the benches". The benches were ranged and erected up to this tree, and consisted of upright timbers with planks fastened on like steps. On these people used to sit before the theatre was created.

cicative gonden and deploy. The angior, we an engage

soweig and similar words have the last syllable long and are accented paroxytone, according to Eratosthenes in his twelfth book on

86.

The word works (long knife) is mentioned by

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ριστοφάνης

ή φιλύλλιος έν τατς Πόλεσιν, Επιλυπός τε έν Κωραλίσως, λέγων ούτως πότ αν ποπίδ' οίωσωμ αίὲν Αμυπλατον, παραγγέλλωσι βάραπες πολλοί πάρτοι παὶ ζωμός μάλα ἀδός. διαρρήδην λέγων, μάζας έν τατς ποπίσι παρατίθεσθαι τοῦτο γάρ οἱ βάραπες δηλούσιν ούχὶ τολύπας, ώς φησι Λυπόφρων, ή τὰ προφυράματα των μαζών, ως Ερατοσθένης.

87: Sustath, ad Od. β' p. 1445, 41 = 96. 3:

ηια πυρίως κατά 'Ερατοσθένην δσπρίων καλάμαι. καὶ δισυλλάβως ἐν συναιρέσει μα, ὡς καὶ Φερεκράτης' την γαστέρ ' μων κάχύρων σεσαγμένους.

88: Stymolog. M. D. 682, 52:

αλχος. Ποι κάχος. Εψει και τουτο, κοι κάχος; είς τρα ορφανός και και καρα φερεκρατει, Ποι κάχος και εί μες κανεξευλτερος εκ ταρτάς τρα κοι τες κάχος κου ελλος και εί μες και είνα ποκος; κου άλχος κου κάχος κου έλλος και είς τίνα ποκος; κου άλχος κου κάχος τρα κάι κάι κάι είς τίνα ποκος; κου άλχος κου κάχος τρα κάι κάι είς τίνα ποκος; κου έρλος κου κάχος τρα κάι κάι είς τίνα ποκος; κου έρλος κου κάχος τρα κάι κάι εκ τος εκτικός είς τρα ποκος και είς τίνα ποκος; και είς πάχος και είς τίνα ποκος; και είς τρα ποκος και είς τρα ποκος και είς τος κάι εκτικός είς τος κάι εκτικός είς τος κάι εκτικός είς τρα ποκος και είς τος κάι εκτικός είς είς εκτικός είς τος κάι εκτικός είς είς εκτικός είς τος κάι εκτικός είς είς εκτικός είς τος κάι εκτικός εκτικός είς είς εκτικός εκτικός

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έν Κωραλίσηφ, υπλατον, ιδς μάλα άδύς. τίθεσθαι · ας, ώς φησι Ερατοσθένης. ·

96.3: plav nakánal Φερεούς.

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Aristophanes or Philyllius in the "Cities", and by Epilycus in the "Boy", when he says: "when I carry a long
Amyolaean knife, let many cakes and loaves announce it,
and first rate soup", clearly implying that cakes are
served on knives. Bapak and pake both mean "cake", not
"dough-mut" as Lycophron says, or "dough kneeded ready
for making cakes", as Eratosthenes.

as apassones. Allerged St. Passoyshower gays, as he sale

According to Eratosthenes the exact meaning of its bean-stalks. He gives the pronunciation as is run into two syllables, as in Pherecrates: "Their bellies stuffed with bean-stalks and chaff."

-unit Then the the state of the

Into the sky." Also Aristophanes: "whither away? Straight towards Sicily." Also in Pherecrates: "Whither away?"
You will always find sot attached to the willow. Eratosthenes gets from this combination: "whither, near at hand?" and "To what place?"

wal word of your faced on the temple! means "in

Colling Wines

Tomorana de maio a Carroy, La cavada de la Kapaking.

σάμανα, 'Ερατοσθένης ἀκέδωνε, τὸν φορμόν.

90; Athenaeus II p. 41. D:

Αθηνατοι δέ μετάμερας καλούσι το χλιαρόν. ως Ερατοσθένης φησίν, δδαρή φησι, και μετάμερας.

91: Athenaeus XI p. 499 Es

φησι, λέγεσθαι την πέτασον και την στάμνον ύπο τινων.

Grammar: 92-100:

92: Schol. in Dion. Thrac. D. 725:
δθεν ούν ἀπό σκοπού καὶ Ερατοσθένης ἔφη,
δτι γραμματική ἔστιν ἔξις παντελής ἐν γράμμασι, γράμματα καλών τὰ συγγράμματα.

93: Quint. Inst. Or. I. 1. 16:

Quidam litteris instituendos, qui minores septem annis essent, non putaverunt, quod illa primum aetas et intellectum disciplinarum capere et laborempati posset.....
Sed alli quoque auctores, inter quos Eratosthenes, idem praeceperunt.

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The Athenians call xliapov (lukewarm) μετάπερας (mixed); as Eratosthenes says, "washy" and "lukewarm".

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λάγυνος (flagon): Eratosthenes says it is called by some πέτασος (hat) and στάμνος (jar).

Grammar: 92-100:

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Thus Eratosthenes did not miss the mark when he said that "grammar" is a universal system in letters; by "letters" meaning "composition".

93.

years should not be instructed in reading and writing, because that was the earliest age capable of understanding the necessary studies and of standing the work. Other authorities as well, among them Eratosthenes, have given the same advice.

when body of the thirty of the state of the

καὶ κατὰ κόρρης (and on the temple) means "to

ξαι. δ δὲ Ερατοσθένης ἄπασαν την τῆς κεφαλης κληγήν.
πόρρην γὰρ τὴν κεφαλὴν λέγεσθαί φησι, μεταβεβλῆσθαι
δὲ τὸ σ εἰς τὸ ρ Αττικῶς, ὡς ἔκὶ τῆς μυρρίνης καὶ
τοῦ ταρροῦ· ἔστι γὰρ μυρσίνη καὶ ταρσός.

25: Anecdota Bekk. p. 215:

έπουήρυντος δ έπὶ δμαρτήμασιν ένπεσών τῆς πατρώας οίνίας· ένποίητος δὲ δ ἐτέρῳ δοθεὶς είσποιήσασθαι. οῦτως Έρατοσθένης.

96: Hesychius:

want, anywood (pot) persona and (and) poppying once to be

ήδυντήρες οι άλες. Ερατοσθένης.

97: Hesvehlus:

άγρηνόν. δίκτυσειδές, δ περίτέθενται οί βακχεύοντες Διονύσμ. *Ερατοσθένης δε αυτό καλετ γρήνον ή γρήνον.

98: Athenaeus 1 p. 16 D:

άπολαυστικός δέ έστι παρ'αυτώ και δ των Φαιάκων βίος. Αἰεὶ γὰρ ἡμῖν δαίς τε φίλη κόθαρίς τε, καὶ τὰ ἐξῆς, ἄ ἔπη 'Ερατοσθένης οῦτω δεῖς γεγράφθαι φησίν'.

Οδ γὰρ ἔγωγέ τί φημι τέλος χαριέστερον είναι,
ἡ ὅταν εὐφροσύνη μὲν ἔχη, κακότητος ἀπούσης,
δαιτυμόνες δ'ἀνὰ δώματ ἀπουάζωνται ἀδιδοδ.

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strike on the jaw", or, according to Eratosthenes, any blow on the head. He says that "mopon" means "head", and the g changes to p in Attic; for example pupolvy and ταρσός become μυρρίνη and ταρρός.

άπονήρυντος (publicly disowned) means a man who has been banished for his misdoings from his father's house.

έμεσίητος (alienated) means one who has been given to someone else to adopt. These are the explanations of Eratosthenes.

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480venpec (seasoninge): salt. Eratosthenes.

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drape round them. Eratosthenes calls it γρῆνος or γρῆνος.

(exercise on) on 98. Ameni . rote : rot

up to enjoyment: "Always dear to us is the banquet, and the harp", and so on: these verses Eratosthenes says ought to read:

"I for my part say that no aim is more pleasant,
than when happiness prevails and evil is absent,
when the banqueters along the hall listen to the singer."

νανότητος άπούσης, φάσκων, τῆς ἀφροσύνης. ἀδύνατος γὰρ μὴ φρονίμους είναι Φαίωας, οξ μάλα φίλοι είσὶ θεοτσιν, ὡς ἡ Ναυσικάα φησίν.

99: Schol. Venet. Il. ω'282:

. sogger and prigging become

ή δικλή, δτι εί μή προσέθηκε τον στίχον, οί Θέλοντες συγχεϊσθαι τὰ δυικά καρ 'Ομήρω, 'Ερατοσθένης καὶ Κράτης, Ελεγον αν ἐκὶ τῶν ἐννέα Πριαμιδῶν τετάχ- θαι, τὼ μὲν ζευγνύσθην.

100: Schol. Ap. Rhod. I 482: 00 86 5 86 5 86 5 86

'Αλωιάδας. την περί τούτων Ιστορίαν και
'Όρηρος οίδεν. 'Ερατοσθένης δε γηγενείς αὐτούς
φησι' διὰ δε τὸ ἀνατετράφθαι ὑπὸ τῆς 'Αλωέως γυναικός
μυθευθήναι, ὡς 'Αλωέως εἰσὶν υἰοί.

Baton: 101:

101: Diog. Laert. VIII 89 (de Eudoxo):

να, καὶ κυνών διαλόγους συνθεΐναι.

Aralnos: 102: The best of the first of the contract of the con

102: Athenaeus VII p. 276 A:

δ Πλουτάρχος, κατά το δμοιον, έφη, καὶ έν Αλεξανδρεία τὰ έμὰ Λαγυνοφόρια ἐορτή τις ήγετο, περὶ for it would according to be temperate

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perdest generality or as onthered and the particular "'Evil being absent,'" he says, "means 'intemperance'; for it would be impossible for the Phaeacians, who were, wir bysa protaby the garage was according to Nausicaa, 'very dear to the gods', not to

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Dual: if he had not appended the line, those who would have it that the dual number is confused in Homer, Fratosthenes and Grates, would say that "Tw nev ζευγνύσθην" applied to the nine sons of Priam.

believed whith whith advanta advanta advantation of the volume of the property and the state of the state of

whether do your life and the coney, out av snortane Aloiadae: Even Homer knew the story about them. designations if parthera, nature Eratosthenes says that they were earth-born, but that because they were brought up by the wife of Albeus the legend grew up that they were his sons.

properations, as in Chara to thorse the proble feart sethretely, but the propon who lowling then to the ban-

quet provides the food (8-101.

According to Eratosthenes in his work "Against Baton", he also composed dialogues of dogs.

"And the action of the contraction of the state of the st

colloyes foretale afterior 102 trainschescence of abbanjioons "In the same way," said Plutarch, "in my city of Alexandria too a festival used to be held called the

ής Ιστορεί 'Ερατοσθέημε έν τῷ ἐπιγραφομένω συγγράμματι 'Αρσινομ' λέγει δὲ οῦτως. Τοῦ Πτολεμαίου πτίζοντος

- 5 ἐορτὴν καὶ θυσιῶν καντοδακῶν γένη, καὶ μάλιστα κερὶ τὸν Διόνυσον, ἡρώτησεν Αρσινόη τὸν φέροντα τοὺς θαλλούς, τίνα νῶν ἡμέραν ἄγει, καὶ τίς ἐστιν ἐορτή· τοῦ δ'εἰκόντος, καλεῖται μὲν Λαγυνοφόρια, καὶ τὰ κομισθέντα αὐτοῖς δεικνοῦσιν κατακλιθέντες ἐκὶ στιβάδων, καὶ ἐξ ἰδίας
- εί δὲ τὸ γένος τῆς ἐορτῆς ἥρεσκεν, οὖκ ἄν ἐκοπίασε
- 15 δήπου τὰ αὐτὰ ταῦτα παρασμευάζουσα ἡ βὰσίλεια, μαθάπερ έν τοῖς λουσίν· εὐωχοῦνται μὲν γὰρ ματ'ίδίαν, παρέχει δὲ ταῦτα ὁ μαλέσας ἐπὶ τὴν ἐστίασιν.

Ohronography: 103-123:

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103: Clem. Alex. Strom. I p. 336 B:

"Από μεν Τροίας άλώσεως επὶ 'Ηραπλείδων πάθοδον, ετη δγδοήποντα' εντεύθεν δε επὶ τὴν 'Ιωνίας πρίσιν, ετη εξήποντα' τὰ δε τούτοις εξῆς, ἐπὶ μεν τὴν ἐπιτροπίαν flagon-bear

reards from sorts of sac since asked he was celel that it was reclining or for them wh had brought towards me : The assembly twaghoddrife before them she had app scarcely ha preparation separately,

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Σ Β: ἀναγράφει· οδον, ἔτη ίσιν, ἔτη ἐκιτροκίαν Flagon-bearing. Eratosthenes relates the following story about it in his essay entitled 'Arsince':

"As Ptolemy was founding a festival and all sorts of sacrifices, especially to do with Dionysus, Arsince asked the man carrying the clive-branches what day he was celebrating, and what festival it was. He replied that it was called the Flagon-bearing, and that the people, reclining on straw mattresses, dined on what was provided for them while each drank separately out of a flagon he had brought with him. After he had gone away, she looked towards me and said: "These filthy conditions are natural. The assembly must consist of a mixed crowd, when they set before them a stale and wholly unattractive feast." If she had approved of that kind of festival, the queen would Leave body out base and and and and and scarcely have worked so hard when making just the same preparations, as in the Pitchers. There the people feast separately, but the person who invites them to the banquet provides the food. ** Sranish pavillacanga

Chronography: 103-123:

Eratosthenes records the periods of history as follows: from the fall of Troy to the return of the Heraclidae, eighty years; from then to the colonizing of lonia, sixty years; following this to the guardianship

The transport the amount with the say the transporting swyth chiers 5 την Λυκούργου, έτη έκατον πεντήκοντα έννέα έπι δέ προηγούμενον έτος των πρώτων 'Ολυμπίων, έτη ένατον όντω. ἀφ'ής 'Ολυμπιάδος έπὶ την Εέρξου διάβασιν, ετη διακόσια έννενήμοντα έπτά. άφ' ής έπὶ την άρχην τοῦ Πελοποννησιακού πολέμου, έτη τεσσαράκοντα όκτώ· καὶ ΙΟ έπὶ τὴν κατάλυσιν καὶ 'Αθηναίων ήτταν, ἔτη είκοσι έπτά· καὶ ἐπὶ τὴν ἐν Λεύκτροις μάχην, ἔτη τριάκοντα τέσο σαρα τρεθ' ήν έπὶ την Φιλίππου τελευτην έτη τριάποντα πέντε μετά δὲ ταῦτα ἐπὶ τὴν Αλεξάνδρου μεταλλαγήν, betta bosena men man had an matta esta atte admired bed - Securitar and and the "Compa diller, good tions and the op abrawol

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104: Clem. Alex. p. 337 A:

άπο τούτου (Ήραπλειδών παθόδου) έπι Εύαίνετον άρχοντα, έφ'οῦ φάσιν 'Αλέξανδρον είς την 'Ασίαν medy brad on befrow byad Tippiet μήποντα τέσσαρα (έτη). propagations, as in the Pitchery. There the people fear

105: Clem. Alex. p. 327 B: 010 , V. D. 328 B *Ερατοσθένης δέ μετά το ένατοστόν έτος της

'Ιλίου άλώσεως την 'Ορήρου ήλικίαν φέρει.

106: Dion. Hal. A. R. I. 74. (de anno urbis conditae): Kátwy bě Hópnioc Exampinov nev oby opilei χρόνον έπιμελής δε γενόμενος, εί καί τις άλλος, περί την συναγωγήν της άρχαιολογουμένης Ιστορίας, έτεσιν άποφαίνει δυσί και τριάκοντα και τετρακοσίοις ύστερουσαν 5 των 'Ιλιαμών. δ δέ χρόνος ούτος άναμετρηθείς ταις 'μρα-

Er farnin 3 of Lyourgus, Year, that of years; from t hundred and n of the Pelopo and the defea battle of Lev death of Phil dissolution of

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La taraja Dong Acadda et plant Dividadación Dacagocal of Lyourgus, a hundred and fifty-nine years; to the Leading Augustabec. Ore he eferr of navavec dresse Year, that of the first Olympic games, a hundred and eight Regresoffing neverges, not sac dy vic dueubives voluyears; from this Olympiad to the invasion of Kerxes, two my xbonose spec robe Engineeness, as erem hundred and ninety-seven years; from this to the beginning ord not how o of the Peloponnesian War, forty-eight years; until the end and the defeat of Athena, twenty-seven years; until the battle of Leuctra, thirty-four years; after this to the death of Philip, thirty-five years; and after this to the dissolution of Alexander, twelve years.

104.

From this time (the return of the Heracleidae) to the Archonship of Eugenetus, in whose time it is said that Alexander crossed to Asia. . . . is, according to Eratosthenes, seven hundred and seventy-four (years).

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Eratosthenes says that Homer flourished over a hundred years after the taking of Ilium. onlarguar developed excises, very displayed a apparation and the end.

106.

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Porcius Cato does not give the date by Greek reckoning, but showing as much care as anyone in the collecting the material of ancient history, he shows that it (the foundation of Rome) was four hundred and thirty-two years after the Trojan War. This date, if measured by

τοσθένους χρονοφραφίαις κατά το κρώτον έτος κίκτει τῆς ἐβδόμης 'Ολυμπιάδος. ὅτι δἔ εἰσιν οὶ κανόνες ὑγιεῖς οἰς 'Ερατοσθένης κέχρηται, καὶ κᾶζ ἄν τις ἀκευθύνοι τοὺς 'Ρωμαίων χρόνους κρὸς τοὺς 'Ελληνικούς, ἐν ἐτέρω δεδήλω-ΙΟ ταί μοι λόγω.

X 65 45

107: Serv. Dan. Verg. A 1 273:

Romulum parentem urbis refert (Romae).

108: Schol. Arist. Vesp. 500:

ναι, ως φησιν Ερατοσθένης, έπὶ ἔτη ν΄, τοῦ ἀκριβοῦς διαμαρτάνων.

109: Diog. Laert. I. 119:

"Ανόρων δε δ "Εφέστος δύο φήσι γεγονέναι
Φερεκύδας, Συρίους, τον μεν άστιολύγον, τον δε θεολύγον
.... "Ερατοσθένης δ' ένα μόνον, και έτερον 'Αθηναΐον γενεαλόγον.

-100 end of 110: Quint. Inst. Or. XI. 2. 14: 1. 101800000

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the chronology of Eratosthenes, falls in the first year of the seventh Clympiad. I have shown in another work that the criteria used by Eratosthenes were sound, and have explained the method of checking Roman dates against

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Eratosthenes relates that Rosulus, the father of the city (of Rome), was the (descendant) of Ascanius,

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c days or adher fa-The (Pisistratid) tyranny appears to have lasted, according to Eratosthenes, for 50 years, but this is not o has dover east west "complan of the fi STREET WAS THE TALLY CONDITION OF STREET, BELLEVILLE OF STREET accurate.

por often with went this

poloxed par var vidosou 109. Andron the Ephesian says there were two men called Pherecydes, Syrians, the one an astronomer, the other a theologian. . . . Eratosthenes says there was only one Syrian and a second an Athenian writer of Tecriobland , Threaden genealogy.

170.

There is much disagreement among the authorities whether this poem was written by Glaucond Caryst Leoorates, Agatharchus, or Scopas, and whether this house was at Pharealus, as Simonides himself appears to indicate out overally, Suitan to surprope the sales and the character and supply some again to the

ut ipse quodam loco significare Simonides videtur atque Apollodorus et Eratosthenes. . . . tradiderunt. Representate nexperce, not not by the facultives told

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ίερον πόλεμον Ιστορεί περί αύτου και Θουκυδίδης, καὶ 'Ερατοσθένης έν τῷ έννάτῳ, καὶ Θεόπομπος EV TO ME . Indicate Jest material accounted by Critical

112: Hesychius : also Suidas: 0 1220 eds to

* Ροίκου πριθοπομπία. * Έρατοσθένης έν τῷ έννάτω, των 'Αμαθουσίων βασιλέα· τοῦτον αίχμάλωτον γενόμενον είτα ϋποστρέψαντα πρός ἐαυτόν, τῷ πόλει 'Αθηναΐων πριθάς έππέμψαι φησίν. sempelanticular to amilproven

113: Cicero ad Atticum VI 1:

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Quis enim non dixit, Eŭsokiv tov tão apxaiaç ab Alcibiade navigate in Siciliam delectum esse in mare? Redarguit Eratosthenes; affert enim, quas ille post id tempus fabulas docuerit; num idcirco Duris Samius, homo in historia diligens, quod cum multis COMMUNICATE . erravit, irridetur?

114: Vita Eurip. post Bacchas Elmsleii: έτελεύτησε δέ, ώς φησι Φιλόχορος, θπέρ τά έβδομήνοντα έτη γεγονώς. ώς δὲ 'Ερατοσθένης, οε'.

115: Sorani vita Hippodratis ap. Fabric. Bibl. Gr. XII p. 60 Innouparing the yever phy he kaoc, while 'Hounella

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, vide 'Hpankeisa

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The Sacred War: Thucydides also mentions it. So does Eratosthenes in his minth book and Theopompus in book 25.

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tosthenes in the minth book, king of the "Amathusians"; he was taken prisoner, and afterwards when he returned home sent barley to the city of Athens.

THE THE PER STATE THE

in months and he Plants along

Comedy" was thrown down into the sea by Alcibiades when he was sailing to Sicily? Eratosthenes has refuted this story, adducing the plays which he produced after that date. Surely, though, Duris of Samos, a dareful historian, is not to be laughed at over a point on which he made the same mistake as many others.

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He (Euripides) died, according to Philochorus, aged more than seventy; according to Eratesthenes, 75.

Page, cynhagoe, gibillenacongrate abortano, 2924

Hippocrates was a Coan by birth, the son of

ναὶ Φαιναρέτης εἰς Ἡρανλέα καὶ ᾿Ασκληπιόν τὸ γένος ἀναφέρων, ἀφ'οδμεν εἰνοστός, ἀφ'οδ δὲ ἐννέα καὶ δέκατος.

μνημονεύει δὲ τῆς γενεαλογίας αὐτοῦ ᾿Ερανοσθένης, καὶ
Φερεκύδης, καὶ ᾿Απολλώδωρος καὶ Ἅρειος ὁ Ἱαρσέός.

X 65 45

116: Harpocratio p. 77:

Εύηνος, 'Υπερίδης έν τῷ κατ Αὐτοκλέους. δύο ἀναγράφουσιν Εὐήνους ἐλεγείων ποιητάς, ὁμωνύμους ἀλλήλοις, καθάπερ 'Ερατοσθένης ἐν τῷ περὶ Χρονογραφιῶν ἀμφοτέρους λέγων Παρίους εἶναι γνωρίζεσθαι δέ φησιν τὸν νεώτερον μόνον. μέμνηται δὲ θατέρου αὐτῶν καὶ Πλάτων.

117: Plut. Dem. p. 850 B:

home sent barley to the city of attent.

έπεὶ τόλμαν γε καὶ θάρσος οὶ λεχθέντες ὁπ'
αὐτοῦ (Δημ.) λόγοι τῶν γραφέντων μᾶλλον εἶχον, εἴ τι θεῖ
πιστεύεις Ερατοσθένει καὶ Δημητρίψ τῷ Φαληρεῖ καὶ τοῖς
Κωμικοῖς, ὧν Ἑρατοσθένης μέν φηᾶιν αὐτὸς ἐν τοῖς
λόγοις πολλάχοῦ γεγονέναι παράβακχον.

118: Plut. Dem. p. 860 B:

Ερατοσθένης δὲ καὶ αὐτὸς ἐν κρίκω φησὶ κοί*
λω τὸ φάρμακον φυλάσσειν, τὸν δὲ κρίκον εἶναι τοῦτον
αὐτῷ φόρημα περιβραχιόνιον.

119: Plut. Alex. D. 665, E:

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ή δε 'Ολυμπίας, ως Ερατοσθένης φησί, προπέμπουσε

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win monodes las ,volarouro vár fas voquediska vár Heracleides and Phaenarete, He traced his descent from Heracles and Asclepius, being twentieth and nineteenth in line from them respectively. His lineage is mentioned by Eratosthenes, Pherecydes, Apollodorus, and Areus of Tarsus. Andia verbendi der serve ver is segevalina

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Evenue: Mentioned by Hyperides in his speech against Autocles. Two poets called Evenus are recorded, writers of elegiacs, according to Eratosthenes in his "Chronography", where he says that they are both Parlans. He adds that only the later one is well known. The other of rapeles or again apparatorengments of aplanesses is mentioned by Plato also. Behore dupos allegges apec dalabore, elec approfe, the

Note: Ind And Andreas Transfer The Administration of the Confederated His (Demosthenes) spoken words were bolder and more confident than his written, if we must at all believe Eratosthenes, Demetrius of Phalorus, and the Comic writers. Of these, Eratosthenes says that when speaking he often became like one possessed.

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· Sratosthenes himself also says that he kept the poison in a hollow ring, and that this ring was made for wearing on the arm. " necessary of teacherstranes.

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Clympias, according to Eratosthenes, as she was

τον 'Αλέξανδρον έπὶ τὴν στρατείαν, καὶ φράσασα μόνφ τὸ περὶ τὴν τέμνωσιν ἀπόρρητον, ἐκέλευεν άξια φρονείν τῆς γενέσεως.

X 65 43

120: Plut. Alex. P. 682:

Αλέξανδρος δέ την έντος του Ευφράτου κάσαν ύφ έαυτῷ ποιησάμενος ήλαυνεν έπὶ Δαρετον, έκατον μυριάσιν στρατού ματαβαίνοντα. καί τις αὐτῷ φράζει τῶν ἐταίρων, ώς δὲ γέλωτος ἄξιον πράγμα, τοὺς ἀκολούθους καί-5 ζοντας, είς δύο μέρη διηρημένους σφάς αὐτούς, ὧν ἐκατέρου στρατηγόν είναι καὶ ἡγεμόνα, τὸν μὲν Αλέξανδρον τὸν . δε Δαρετον δπ'αύτων προσαγορεύδμενον, άρξαμένους δε βώλοις άπροβολίζεσθαι πρός άλλήλους, είτα πυγματς, τέλος έπηεκαθοθαι τῷ φιλονεικία, καὶ μέχρι λίθων καὶ ξύλων ΙΟ πολλούς (πολεμίους) δυσκαταπαύστους γεγονότας. ταυτα άπούσας έπέλευσεν αύτούς μονομαχήσαι τούς ήγεμόνας, καὶ τὸν μὲν 'Αλέξανδρον αὐτὸς Επλισεν, τὸν δὲ Δαρετον Φιλώτας. έθεστο δὲ ὁ στρατὸς ἐν οἰωνῷ τινι τοῦ μέλλοντος τιθέμενος το γιγνόμενον, έσχύρας δε της μάχης γενο-15 μένης, ένίμησεν δ καλούμενος Αλέξανδρος, καὶ δωρεάν έλαβεν δώδεκα κώμας, καὶ στολή Περσική χρήσθαι. ταθτα μέν οδν 'Ερατοσθένης Ιστόρηκεν.

121: Plut. Moralia p. 329:
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seeing Alexander off on his campaign, told his privately the secret of his birth, and bade his have thoughts worthy of his parentage.

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After gaining control of all the territory inside the Suphrates, Alexander was proceeding against Darius, who was marching down with a force of a million men. One of his companions told, as something to laugh at, that his followers had divided themselves in play into two parties, each of which had its general and leader; the one being addressed by them as Alexander, the other as Darius. Beginning by throwing at each other with clods, they had gone on to fisticuffs, and finally, inflamed with their rivalry, to stones and clubs, and many had been difficult to calm down. When he heard this he ordered the leaders to meet in single combat. He himself armed "Alexander", and Philotas armed "Darius". The army looked on, taking what was happening as a kind of omen of future events. The battle became intense, and the man called "Alexander" won. He received as his reward twelve villages and the right to wear a Persian robe. ength von topp prodivers

Such is the account of Bratosthenes.

Onic hy "Quapoc OH.N. 209,121,002) disparibations.

Alexander adopted not the Medic garb, but the

άλλα την περσικήν, εύτελεστέραν ούσαν. τα γαρ εξαλλα και τραγικά του βαρβαρικού κόσμου παραιτησάμενος, οίον τιάραν και κάνδυν και άναξυρίδας, έκ του Μακεδονικού και Περσικού τρόπου μεμιγμένην τινα στολήν έφόρει καθάπερ Ερατοσθένης Ιστόρηκεν,

(Uncertain)

122: Schol. Plat.. Rubnik p. 61:

Σιβύλλαι. τετάρτη, 'Ιταλική, ή ἐν ἐρημίς

τῆς 'Ιταλίας τὴν διατριβὴν λαχούσα, ἡς υἰὸς ἐγένετο

Εδανόρος, ὁ τὸ ἐν 'Ρώμη τοῦ Πανὸς ἱερόν, τὸ καλούμενον
Αούπερκον, κ ίσας κερὶ ἡς ἔγραψεν 'Ερατοσθένης.

123: Lactanius I. 6. p. 25:

point themail , who had not a

Sextam (Sibyllam) Samiam, de qua scribit Eratosthenes in antiquis annalibus Samiorum repperisse se scriptum.

Olympic Victors: 124-132:

Topographic and the property of the second was a second of the second of

which because the constant and constant rest and some forests were and

124: Schol. Theog. II 121 a:

λεύκαν "Ηρακλέος. ("Ερατοσθένης έν) "Ολυμ" πιονίκαις φησί τον "Ηρακλέα κατελθόντα είς Αΐδου εθρεΐν καρά τῷ "Αχέροντι φυσμένην τὴν λεύκην καὶ αὐτῷ ἀναστέψασ" θαις ἥν "Ομηρος (Ν.Ν. 389, Ν. 482) ἀχερωίδα καλεΐ.

Persian, which odd and theat the grown, the Eratosthenes and Persian f

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Persian, which was less extravagant. He deprecated the foreversive and Anamahald tapy odd and theatrical parts of the foreign dress, such as the crown, the robe, and the trousers, and according to Eratosthenes wore a kind of robe combining the Macedonian and Persian Pashions. o proposition of the same of t

GREEN WORLS & Sterr Lungertain Sart A ARREVEN WERE MANUEL WAR AND A MANUEL OF SARE AREA MANUEL AND A MANUEL A

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31bvls: A fourth, of Italy; she spent her allotted span in an Italian wilderness. She bore a son, Evander, who founded in Rome the temple of Pan known as the Lupercal. Eratosthenes wrote about her.

123.

A sixth, of Samos, of whom Eratosthenes says that he found mention in the ancient records of the Samians. ogga, 442-347-4574-6572 Valuato 434-3650 TV-6600 V

, oraviva pad olympic victors: 124-132 robust post votes -bays or visopendint or erayethery was Landavery to other

overed the bear of her of the bear of the The white poplar of Heracles: In his "Olympis Victors" Eratosthenes says that when Heracles went down to the kingdom of Hades he found the white poplar growing beside the Acheron, and crowned himself with it. Homer calls it "acherois". Learnes, Woodsays, too, when wen Put up a particularly goed contest, they three to front

125; Schol. Pind. Ol. IX. 1:

Έρατοσθένης δε φησι μή ἐπινίνιον εἰναι τὸ
 ᾿Αρχιλόχου μέλος, ἀλλ' ὅμνον εἰς Ἡρακλέα, τρικλόον δέ,
οὐδιὰ τὸ ἐκ τριῶν στροφῶν συγκετσθαι, ἄλλὰ διὰ τὸ τρὶς
ἐφυμνιάζεσθαι τὸ Καλλίνικε. κερὶ δὲ τοῦ Τήνελλα Ἑρατοσδ θένης φησίν ὅτι ὅτε ὁ κιθαριστής μή παρήν, ὁ ἔξαρχος
αὐτὸ μεταλαβῶν ἔλεγεν ἔξω τοῦ μέλους ΄ ὁ δὲ τῶν κωμαστῶν
χορὸς ἐπέβαλε τὸ Καλλίνικε. καὶ οὕτω συνειρόμενον γέγονε τὸ Τήνελλα Καλλίνικε. ἡ δὲ ἀρχὴ τοῦ μέλους ἐστίν.
Τῶ Καλλίνικε, χαϊρ', ἄναξ Ἡράκλεις.

126: Schol. Eurlp. Hec. 574:

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φύλλοις ἔβαλλον. ἐρατόσθένης φησὶ περὶ τῆς φυλλοβολίας, ὡς πάλαι χωρὶς ἄθλων ἀγωνιζομένων ἀνθρώπων, τῷ νικήσαντι καθάπερ ἔρανον εἰσφέροντες ἔρριπτον τῶν θεατῶν ὅπως ἔκαστος ηὐπόρει. ὅιὰ ὅἡ σύνηθες ἐγίνετο, ὁ κύκλφ περιπορευόμενον ἐπαγείρειν καὶ λαμβάνειν τὸ διδότρενον. οἱ μὲν οὖν ἐμπορευόμενοι διάφορα ὅῶρα, τῶν ὁὲ λοιπῶν οἱ μὲν οὖν ἐγγὸς καθήμενοι στεφάνους ἐπετίθεσαν, οἱ δὲ ἀνώτέρφ τοῦτο ὅπερ ἡν λοιπὸν ἔβαλλον τοῖς ἄνθεσι καὶ φύλλοις. καὶ νῶν ἐπὶ τοῖς ἐπιφανῶς ἀγωνιζομένοις

is not a victo is called "tri strophes, but (fair Victor). says that, whe leader used to the tune, and nike!" Thus inke!" was put

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Eratosthenes sin the Games in the Games in the Games in throw according contribution contribution customary for what was offer would throw six were sitting on the higher them with flo put up a part

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is not a victory ode but a hymn to Heracles, and that it is called "triple", not because it consists of three strophes, but because of the thrice-repeated "Callinike" (Fair Victor). As for the word "Tenella", Eratosthenes says that, when there was no harpist present, the chorus-leader used to say it, outside the song, when taking up the tune, and the chorus of revellers added their "Callinike" Thus it happened that the phrase "Tenella Callinike" was put together. The actual beginning of the song is: "Hall, fair victor, Lord Heracles. . . . "

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They pelted with leaves: On "leaf-pelting", Eratosthenes says that when in former times men competed in the Games without prizes, all the spectators used to throw according to their capacity, as though making a contribution to the winner. Thus it naturally became customary for him to go round about to pick up and receive what was offered. Those who were travelling on business would throw superior gifts, while, of the rest, those who were sitting near used to put garlands on them, and those on the higher benches did what was left for them--pelted them with flowers and leaves. Nowadays, too, when men put up a particularly good contest, they throw in front

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ων ἀνθρώπων, πτον τῶν ες ἐγίνετο, ιν τὸ διδόα, τῶν δὲ ἐπετίθεσαν,

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10 προβάλλουσι ζώνας, πέταλα, χιτωνίσκους, πετάσους, πρηπτδας. ἔως μὲν οδν ἔν ἀγώνισμα κατὰ τὴν 'Ολυμπίαν ἡν,
δαψιλῆς ἐγίνετο ἡ τῶν δωρεῶν δόσις· πολυπλασιαζομέψων
δὲ τούτων ταῦτα ἐμειοῦτο εἰς πολλὰ καταμεριζομένα:
καὶ τέλος ἡ φυλλοβολία κατελείφθη. ταῦτα οὖν περὶ

15 τοὺς χρόνους Εὐριπίδου.

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127: Schol. Odyss. Medicl G'. 190:

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δ δίσκος λίθος ἥν, καὶ "Ερατοσθένης ἔν "Ολυμπιακοτς ἱστορετ, τὸν μὲν σόλον λέγει σίδηρον ἢ ξύλινον
ἢ χαλκοῦν τετρημένον κατὰ τὸ μέσον, καὶ ἔχοντα καλώδιον
ἔξημμένον, ὁδ ἔχόμενοι βάλλουσιν οἱ ἀγωνίζόμενοι. οὕὅ τω καὶ ἔπὶ Πατρόκλω κέχρηται: ὅιό φησι: αὐτὰρ Πηλείὅης Θῆκε σόλον ὅν πρὶν μὲν βίπτασκε. ὅΘεν κατωμάδιον
αὐτὸν λέγεσθαι: ὅσσα δὲ δίσκου οὖρα κατωμαδίοιο πέλονται. διὰ τοῦτο καὶ νῶν ἔφη, τὸν βα περιστρέψας.

128: Athenseus IV p. 154 A:

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Έρατοσθένης δ'έν ερώτω 'Ολυμειονικών τούς Τυρρηνούς φησι πρός αύλον πυπτεύειν.

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του σε Εφώδιων. Ερατοσθένης διά του τ Εφώτιων Σαρτι και κρατι τραί ερατοσο Ερατο γενείωρε του επι of them belts,

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at Olympia, the when they were divided among abandoned.

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The Eratosthenes di bronze, with a holding which in which it is poet says: "The "solos" which comes the term of a discus(-t

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dverydeer matedates actegorales achains arabitases of them belts, flowers, tunics, hats, and shoes.

So long as there was only the one competition, at Olympia, the presentation of gifts was abundant; but when they were multiplied, they grew less as they were divided among many, and finally the "leaf-pelting" was abandoned. Spigorof Spigoror a gray sove see to

All this relates to the age of Euripides. rings the stranger by read by by the fir applyed the s

The state of the s

The discus was a stone. In his "Olympic Games" Eratosthenes describes the coloc as of iron, wood, or bronze, with a hole in the middle and a rope attached, holding which the competitors throw it. This is the sense in which it is used in the story of Fatroclus. Thus the poet says: "Then the son of Feleus gave as the prize the "solos" which formerly (Estion) used to throw." Hence comes the term "throwing over-arm": "As far as the limits of a discus(-throw)." Therefore he adds next: "Whirling it round". There wash wash you show was become forder

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In the first book of the "Olympic Victors", Eratosthenes says that the Etruscans box to the flute. ostrone of Mileton for the whole Privant votofies vir

129.

With without affort." Ephodion: Eratosthenes records Ephodion with a άναγράφει Μαινάλιον περιοδανίκην παγκρατιαστήν. δ 88 Holépay 818 to 88. do long as there was only the one competition,

and programmed 130: Diog. Laert. VIII. 47: 10 paragraph of

καί ετερον (Πυθαγόραν), σωρικά πεπραγματευμένον, ως Διονύσιος Ιστορεί. Ερατοσθένης δέ φησι, καθό καὶ Φαβωρίνος έν τῷ η΄ καντοδακῆς Ιστορίας καρατίθεται, τούτον είναι τον πρώτον έντεχνώς πυπτεύσαντα 5 έπὶ τῆς δγδόης τε καὶ τετταρα ποστῆς 'Ολυμπιάδος, πομήτην και άλουργίδα φορούντα, έκπριθεντα τ'έκ τῶν παίδων, και χλευλοθέντα αθτίκα προσβήναι τοθς άνδρας, nal vinifont. a abidiostia, augra a bus affilia ed at aloc a dilw associa

possess and at all 131: Diog. Laert. VIII. 51: doing gaille

derves fahlorery at frayit bever.

λέγει δέ καὶ "Ερατοσθένης έν τοτς "Ολυμπιονί" καις, την πρώτην και εβδομηκόστην 'Ολυμπιάδα νενικηπέ" ναι τον του Μέτωνος κατέρα, μάρτυρι χρώμενος Αριστοτέλει.

odiniti off as one sa 132: Schol. Menander, Ox. Pap. III 409:

I THE PROVE THE ENGLISH

Αστυάνακτος. του Μελησίου Αστυάνακτος πολλοί σφόδρα των μωρωδιογράφων μέρνηνται. έγένετο γάρ καγμρατιαστής πράτιστος των παθ'αύτον, ήγωνίσατο δε nal πυγμή. Ερατοσθένης δ'έν τῷ τῶν 'Chungiovina' προθείς ρις δλυμπιάδα φησίν. Αστυάναξ δ Μιλήσιος σ' thy septobov duoviti. Mile Bernellines

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409: δάναυτος δγένετο γάρ ίσατο δέ και κιονιμών προ" ήσιος **σ**΄ T, as a Maenalian pancratiast who was victorious in all the games. Polemon spells it with a D.

130.

A second was Pythagoras, who behaved in the Doric manner, according to the story told by Dionysius. Eratosthenes says, and his version is corroborrated by Favorinus in Book 8 of his "Miscellany", that Pythagoras was the first to box on a definite system. In the forty-eighth Olympiad he appeared wearing long hair and a purple robe, was barred from the boys' class, and though jeered at he went on to the men's class and won.

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Eratosthenes says in his "blympic Victors", on the authority of Aristotle, that the father of Meton was victorious at the seventy-first Clympiad.

med role when forms fold wrote 132, who believe the holymine and the best of

Astyanax: Very many of the comic writers mention Astyanax. He became the champion pancratiast of his time, and also boxed. Eratosthenes in his work on "Olympic Victors", setting out the 116th Olympiad, says: "Astyanax of Miletus for the sixth time won the champion-ship without effort."

GEOGRAPHY:

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the games. Polemon applie it with a D.

Book I: 133-163:

133: Strabo G 1:

οί τε γὰρ πρώτοι θαρρήσαντες αὐτῆς ἄψασθαι
τοιοῦτοι δή τινες ὑπῆρξαν: "Ομηρός τε καὶ 'Αναξίμανδρος ὁ Μιλήσιος καὶ 'Εκαταΐος, ὁ πολίτης αὐτοῦ, καθώς
καὶ 'Ερατοσθένης φησί.

134: Strabo. C 16:

χωρίς δὲ τούτων δ 'Ερατοσθένης ἐαυτῷ μάχεται.

μικρὸν γὰρ πρὸ τῆς λεχθείσης ἀποφάσεως ἐναρχόμενος τοῦ περὶ τῆς γεωγραφίας λόγου φησὶν ἄπαντας κατ'άρχὰς φιλοτίμως ἔχειν εἰς τὸ μέσον φέρειν τὴν ὑπὲρ τῶν τοιούτων
5 ἱστορίαν, "Ομηρον γοῦν ὑπἔρ Τῶν Αἰπιόπων ὅσα

- ίστορίαν, "Ομπρον γούν ύπερ το των Αίπιόπων δσα έπύθετο παταχωρίσαι είς την ποιήσιν παὶ περὶ των πατ' Αίγυπτον παὶ Λιβύην, τὰ δὲ δὴ πατὰ τὴν Ελλάδα παὶ τοὺς σύνεγγυς τόπους παὶ λίαν περιέργως ἐξενηνοχέναι, πολυτρήρωνα μὲν τὴν Θίσβην λέγοντα 'Αλίαρτον δὲ ποι-
- ΙΟ ήεντα ξσχατόωσαν δὲ 'Ανθηδόνα, Λίλαιαν δὲ κηγῆς ἐπὶ Κηφισσοτο, καὶ οδδεμίαν προσθήκην κενῶς ἀπορρίπτειν.

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remark, at the says that all ting their lead rate, spread of ned about Ethic Libya, while presign bourhood. Thus he calls Haliartus "gratus" (Il. 2,508) Lil

(II. 2.523) as

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135 Strade 0, 16:

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Book I: 133-163: Toka torodio j vovico poster as a nellection of the variety tale

minima do you may, to 133; idule anything to like for

The first who found courage to tackle it, as Eratosthenes says himself, were men of this kind: namely, Homer, Anaximander of Miletus, and Hecataeus, his fellow townsman, vantvadvez , az larajárgargazonga lan , bo'd an vonde engand vallon corpres whend being throughout

Apart from this Eratosthenes himself is inconsistent. A little before the previously mentioned remark, at the beginning of his geographical work, he says that all writers begin by ostentatiously exhibiting their learning in such matters. Homer, at any rate, spread over his poetry the knowledge he had gained about Ethiopia and all concerned with Egypt and Libya, while particularly Greece and its immediate neighbourhood he described with even excessive care. Thus he calls Thisbe "haunt of doves", (II. 2,502) Haliartus "grassy", (Il. 2,503) Anthedon "distant", " (II. 2,508) Lilaes "by the sources of Cephisus", ay vamores (II. 2,523) and throws away no epithet without effect.

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d od no dress τῷ μάχεται. (δρενος του άρχὰς φιλοτοιούτων ων δσα tav nat' ida nai τηνοχέναι, - 68 noi-

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135: Strabo G. 16:

τούτο μεν δή όρθως αν λέγοις, ω Ερατόσθενες έκετνα δ'οδκ όρθως, αφαιρούμενος αὐτὸντὴν τοσαύτην πολυμάθειαν καὶ τὴν κοιητικὴν γραώδη μυθολογίαν ἀκοφαίνων, ἡ δέδοται κλάττειν, φής, ὁ αν αὐτῆ φαίνηται ψυχαγωγίας χάριν.

136: Strabo C. 16:

δ δ' ἐπήνεγκεν, ὅτι ψυχαγωγίας μόνον, διδασκαλίας δ'ού. καὶ προσπεριεργάζεται τε, πυνθανόμενος τι
συμβάλλεται πρὸς ἀρετὴν ποιητοῦ πολλῶν ὑπάρξαι τόπων
ἔμπειρον ἢ στρατηγίας ἢ γεωργίας ἢ ῥητορικῆς ἢ οἶα
δὴ περιποιεῖν αὐτῷ τινες ἐβουλήθησαν;

137: Strabo G. 298 f.:

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not edification when he asks he poet to be ski or military know that ever que bute to Homer.

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(65-45)

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ov " Ιστρου,

Tavaibac, Bopocoivauc, 'Yrdvicc, Cóciboc, Sappissoviec,

You may be right, Eratosthenes, in saying this, but you are not right when you rob him (Homer) of his great and extensive learning and hold up poetry as a collection of old wives' tales permitted, so you say, to fabricate anything it likes for the sake of entertainment.

-only Ton Varybordevs; 136 dees vor storaby for ,vov !

His actual words were: "For entertainment, not edification." He even labours the point further, when he asks how it conduces to the excellence of a post to be smilled in many subjects, in geographical or military knowledge, in agriculture or oratory, or whatever qualities people have seen fit to attribute to Homer.

one unfamiliar with the 137.

his "Ships" scarcely merits quotation. He expresses approval of the remark of Eratosthenes that Homer and the other ancient writers are familiar with Greek geometric distant places; that they have no experience of long distances or of navigation.

... He points out that, although there are about forty rivers flowing into the Pontus, Homer does not mention any

Ταναίδος, Βορυσθένους, Ύπάνιος, Φάσιδος, Θερμώδοντος,

- 10 "Αλυος" ετι δε Σπυθών μεν μή μεμνήσθαι, πλάττειν δε άγανούς τινας 'Ιππημολγούς καὶ Γαλακτοφάγους 'Αβίους παρά των πεξῷ τοῖς τόποις πλησιασάντων, τὴν παραλίαν δε άγνοεῖν καὶ εἰκότως γε. ἄπλουν γὰρ εἰναι τότε
- 15 την θάλατταν ταύτην, καὶ καλείσθαι, "Αξενον διὰ τὸ δυσχείμερον καὶ την άγριότητα τῶν περιοικούντων ἐθνῶν, καὶ μάλιστα τῶν Σκυθικῶν, ξενοθυτούντων καὶ σαρκοφαγούντων καὶ τοῖς κρανίοις ἐκκώμασι χρωμένων. ἄστερον δ'Εὔξεινον κεκλησθαι, τῶν Ἰώνων ἐν τῷ παραλία
- 20 πόλεις πτισάντων· δροίως δ'άγνοετν καὶ τὰ περὶ Αίγυπτον καὶ Λιβύην, οἱον τὰς ἀναβάσεις τοῦ Νείλου
 καὶ προσχώσεις τοῦ πελάγους, ὧν οὐδαροῦ μερνῆσθαι,
 οὐδὲ τοῦ ἴσθρου τοῦ μεταξὸ τῆς Ἐρυθρᾶς καὶ τῆς
 Αἰγυπτίας θαλάττης, οὐδὲ τῶν κατὰ τὴν ᾿Αραβίαν
- 25 καὶ Αίθισκίαν καὶ τὸν ἀπέανον, εἰ μὴ Ζήνωνι τῷ φιλοσόφφ προσεκτέον γράφοντι·

Αίθιοπάς θ' Ικόμην και Σιδονίους "Αραβάς τε.

ού θαυμαστόν είναι περί 'Ομήρου' και γάρ τούς έτι νεωτέρους έκείνου πολλά άγνοεϊν και τερατο-

30 λογετν· 'Ησίοδον μεν 'Ημίκυνας λέγοντα καὶ Μεγαλοκέφαλους καὶ Πυγμαίους, 'Αλκμάνα δε Στεγανόποδας, Αἰσχύλον δε Κυνοκεφάλους καὶ Στερνοφθάλμους καὶ
Μονομμάτους, καὶ ἄλλα μυρία. ἀπὸ δε τούτων ἐπὶ τοὺς

even of the Borysthenes. Further, not but he inven and Frugal". of the inter district by This was qui those days n "Axenos" (Un and the sava especially t tation of mu of using sku was named "E Maunded citi was unfamili of the ascer sea, which h isthmus bet of district

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even of the best known, such as the Ister, Tanais, Borysthenes, Hypanis, Phasis, Thermodon, or Halys. Further, not only does he not mention the Scythians, but he invents "noble Mare-milkers, Milk-drinkers and Frugal". He has learnt of the Paphlagonians of the interior from people who have approached the district by land, but of the coast he is ignorant. This was quite natural, too, for this sea was in those days not opened to navigation, and was called "Axenos" (Unfriendly) because of its stormy nature and the savagery of the tribes that dwelt round it, especially the Soythian tribes: they had the reputation of murdering foreigners, of cannibalism, and of using skulls for drinking-vessels, Later on it was named "Euxinos" (Friendly), after the Ionians had flaunded cities on the coast. In the same way Homer was unfamiliar with the districts of Egypt and Libya, of the ascents of the Nile and its approaches to the sea, which he nowhere mentions ; nor did he know of the isthmus between the Erythraean and Egyptian seas, or of districts in Arabia, Sthiopia and the Ocean-unless we should pay attention to Zeno the philosopher who wrote: "I arrived at the Sthiopians, the Sidonians and the

There is, however, says Eratosthenes, no reason for surprise about Homer. Even writers junior to him

συγγραφέας βαδίζει 'Ρικαΐα δρη λέγοντας καὶ τὸ 35 'Ογύιον βρος και την των Γοργόνων και 'Εσπεpicov natoiniav nat the said Sconopse Meposica γην, παρ' Εναταίω δέ Κιμμέρίδα πόλιν, παρ Εδημέρφ δέ την Παγχαίαν γήν, παρ "Αριστοτέλει δέ ποταμίους λίθους έξ' άμμου, έκ δέ των όμ-40 βρων τήμεσθαι· έν δὲ τῷ Λιβύο Διονύσου πόλιν είναι, ταύτην δ'ούκ ένδέχεσθαι δίς τον αύτον έξευρετν άλλους δ'αίτιαται ψεύσασθαι περί Γερήνων και του 'Ακακησίου και Δήμου έν 'Ιθάκη, Πελεθρονίου δ'έν Πηλίφ, Γλαυ-45 πωπίου δ'έν 'Αθήνους. τούτοις δέ μιπρά τινα προσθείς τοιαύτα παύεται, τά πλείστα μετενέγκας παρά του Ερατοσθένους ώς και πρότερον έρνήσθημέν, ούν εδ είρημένα, το μέν γάρ τους ύστερον έμπειροτέρους γεγονέναι των πάλαι περί 50 τὰ τοιαύτα καὶ Ἐρατοσθένει καὶ τούτω δοτέον. οι το. ... διότι μεν γάρ διδάξαι, διότι με μεσ των πόρρω της Ελλάδος πλείων ην άγνοια τοτς πρεσβυτέροις ή τοτς νεωτέροις. Σκυθων μέν γάρ (μή) μεμνησθαι κατ'άγνοιάν φασι, 55 μηδέ της περί τούς ξένους άμότητος αὐτών.

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show great ignorated, for example and Pygmies, who of Dog-heads, Bother marvels. of historians a and the dwelling to the land of Cimmeris in Hechemerus, to the solving in the city of Dionysu find it twice.

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show great ignorance and make much use of fable. Hesiod, for example, speaks of the Half-dogs, Big-heads and Pygmies, while Alcman speaks of Web-feet, Aeschylus of Dog-heads, Breast-eyes, Single-eyes, and innumerable other marvels. From these he passes on to the statements of historians about Rhipaean Mountains, Mount Ogyius, and the dwelling-places of the Gorgons and the Hesperides; to the land of Meropis in Theopompus, and the city of Cimmeria in Hecataeus; to the land of Panchaea in Euhemerus, to the river-stones of sand in Aristotle, dissolving in the rain; to the existence in Libya of a city of Dionysus which does not allow the same man to find it twice. For your salmes a characteristic dather market we wanted

Others he accuses of untruths about Gerena, about Acadesius and Demus in Ithaca, about Pelethronius on Pelion and Glaucopius in Athens. After adding more such small points he stops. Most of these criticisms he has copied from Eratosthenes, as I have already mentioned, and they are incorrect; though it is true that we must grant both to Eratosthenes and to him that more recent Writers have acquired more experience than the ancients in such matters. . . . They set out to show that the senior writers were more ignorant than the junior of places at a distance from Greece. They say that it was from ignorance that Homer failed to mention the

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καταθυόντων καὶ σαρκοφαγούντων καὶ τοῖς κρανίοις ἐκκώμασι χρωμένων, δι'όδς "Αξεινος ἀνομάζετο δ Πόντος, κλάττειν δ'ἀγαυούς τινας 'Ιππημολγούς, Γαλακτοφάγους 'Αβίους τε, δικαιοτάτους ,ἀνθρώκους, 60 τοὺς οὐδαμοῦ γῆς ὄντας.

tesatrece will end of 138; Strabo C. 26; Delo-patifewb edd ha

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ναὶ αὐτὸς δὲ ὑπονοήσας τοῦτο ὁ Ἐρατοσείνης, ὑπολάβοι τις ἄν, φησί, τὸν ποιήτην βούτλεσθαι μὲν ἐν τοῖς προσεσπερίοις τόποις τὴν πλάνην τῷ 'Οδυσσεῖ ποιεῖν, ἀποστῆναι δ'ἀξό τῶν ὑποκειμένων, 5 τὰ μὲν οὑκ ἀκριβῶς πεπυσμένον, τὰ δὲ οὐδὲ προελόμενον οὕτως, ἀλλ'ἐπὶ τὸ δεινότερον καὶ τὸ περατωδέστερον ἔκαστα ἑξάγειν.

139: Strabo C. 24: Strabo Constant Land Coll

ούν έπαινεϊ δὲ (Πολύβιος) ούδὲ τὴν τοιαύτην τοῦ Ἐρατοσθένους ἀπόφασιν, διότι φησὶ τότ'ἄν εὐρεῖν τινα, ποῦ 'Οδυσσεὺς πεπλάνηται, ὅταν εὕρβ τὸν σκυτέα τὸν συρράψαντα τὸν τῶν ἀνέμων ἀσκόν.

140: Strabo C. 22: De Lupon over avestra

δ ερατοσθένης δε πρός άμφοτέρας τάς άποφάσεις άπήντηκεν ούκ εν. πρός μεν την δευτέραν

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a control throughtour Markey and a substitution of control and applica-Soythians, their savagery with foreigners, their murdering and cannibalism and their use of skulls as drin-BE CEORGEOGRAPH STANDERS AND STANDERS king vessels, because of whom the Pontus was called the an willy a trimbuco v over a v have on vehracide before Unfriendly Sea, and instead invented "noble Mare-milkers, TOUR OLE | AVE ARE OLD VOLUE VOLUE | drinkers and Frugal ", a most righteous Milk-drinkers and Frugal people, who never existed anywhere in the world. anthe contrate the manufactures of the contrate of the contrat

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Eratosthenes himself had some idea of this. One might suppose, he says, that the poet wanted to place the wanderings of Odysseus in westerly districts, but abandoned his plan partly because he was not accurately informed and partly from deliberate choice, electing rather to exaggerate everything to make it more strange and miraculous. on recyclars were were real sales sares

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Polybius does not approve either of Eratosthenes's remark that one would find where Odysseus wandered when one found the cobbler who sewed together the bag of the winds. For Transport the transport THE BAABOTEBOSPEASA PROFITATION OF THE PROPERTY OF

To a poly a poper work of a der Eratosthenes has opposed both arguments, unsuccessfully. Against the second, he tried at length

ότι πειράται διαβάλλειν φανερώς ψευδή και ούκ άξια λόγου διά μακρών. πρός δέ την προτέραν, 5 ποιητήν τε απαντα αποφήνας φλύαρον, και μήτε τεχνών πρός άρετην συντείνειν νομίσας. των τε μύθων των μέν έν τόποις ού πεπλασμένοις πεφημισμένων, οίον έν 'Ιλίω καὶ "Ιδη καὶ Πηλίω, των δε έν πεπλασμένοις, καθάπερ έν οίς αί Γορ-10 γόνες ή δ Γηρυόνας, ταύτης φησί της ίδίας είναι καὶ τούς κατά την 'Οδυσσέως κλάνην λεγομένους, του δέ μη πεκλάσθαι λέγοντας άλλ υποπείσθαι έξ αύτου του μή συμφωνείν έλέγχεσθαι ψευσομένους τάς γουν Σειρήνας τούς μεν έπι της Πελωριάδος 15 καθιδρύειν, τούς δέ έπὶ των Σειρηνουσοών πλείους ή δισχιλίους διεχουσών σταδίους. είναι δ' αὐτάς σκόπελον τρικόρυφον διείργοντα τὸν Κυμαϊον καὶ Ποσειδωνιάτην κόλκον.

Anoders to what 141: Strabo C. 23: had grown to take

Έρατοσθένης δὲ Ἡσίοδον μὲν εἰκάζει πεπυσμένον περὶ τῆς Οδυσσέως πλάνης, ὅτι κατὰ Σικελίαν καὶ Ἱταλίαν γεγένηται, πιστεύσαντα τῷ δόξῃ μὴ
μόνον τῶν ὑφ "Ομήρου λεγομένων μεμνῆσθαι, ἀλλὰ καὶ
δ Αἴτνης καὶ 'Ορτυγίας, τοῦ πρὸς Συρακούσας νησίου,
καὶ Τυρρηνῶν.

gument; agains a nonsense-mong geography and of further, as some which are not while others a the haunts of tales of Odyss and that those some foundations on the Sirenumbut that they widing the guments of the says on the sirenumbut that they

that the wand bourhood of a upon this op named by Homeracuse), and

to discredit what is obviously false and not worth argument; against the first, he holds up every poet as a nonsense-monger and considers that their skill in geography and crafts is in no way conducive to virtue. further, as some of the stories are located in places which are not fictitious, such as Ilion, Ida and Pelion, while others are located in fictitious places, such as the haunts of the Gorgons or Geryon, he says that the tales of Odysseus's wanderings are in this category, and that those who say they are not fictitious but have At any rate, some foundation are proved to be lying. some, he says, place the Sirens on Cape Pelorias, others on the Sirenussae more than two thousand stades away; but that they are, in fact, a three-headed rock dividing the gulfs of Gumae and Posidonia. begreat, corpression of received to acraros, ac

per for 30 reservative 350 ten 141 to 625 vag ou queun Boos Eratosthenes conjectures that Hesiod found out that the wanderings of Odysseus took place into the neighbourhood of Sicily and Italy, and that it was in reliance upon this opinion that he mentioned not only the places named by Homer but also Etna, Ortygia (the islet off Syracuse), and Tyrrhenia. Interfer 670s 500 prof State alle grand out

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142: Strabo C. 44:

Απολλόδωρος δ'έπιτιμα Καλλίμάχω συνηγορών τοτς περί τον "Ερατοσθένη, διότι, καίπερ
γραμματικός ών, παρά την "Ομηρικήν θπόθεσιν καί
τον έξωμεανισμόν των τόπων, περί ους την πλάνην
φράζει, Γαυδον καί Κόρηυραν δνομάζει.

143: Strabo C. 28:

144: Strabo C. 29:

Επιμένων δε τοῖς περὶ 'Ομήρου ψεθδώς δποληφθεῖσι καὶ ταῦτά φησιν, ὅτι •ὁδὲ τὰ τοῦ Νείλου στόματα οἶδε πλείω ὄντα οὖδ αὖτὸ τοῦνομα, 'Ησίοδος δὲ οἶδε. μέμνηται γάρ. his followers, his scholarship of Homer's plan in which he sa

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(II. 9, 5) E and accuses hi phyrus blows f nerally but of is part of the . . . Thus cuses the poet the west, and

Homer, he adds the Nile has a the river itse tions it.

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Apollodorus, agreeing with Eratosthenes and his followers, reproaches Callimachus because, despite his scholarship, he names Gaudos and Corcyra in defiance of Homer's plan in placing out in the ocean the districts in which he says the wanderings took place.

ryb bor f an han a 143. A dade a alte him to-

"Boreas and Zephyrus, which both blow from Thrace."

(II. 9, 5) Eratosthenes takes this in the wrong sense, and accuses him of making a general statement that Zephyrus blows from Thrace, though he is not speaking generally but of when they meet in the Thracian Sea, which is part of the Aegean itself near the Gulf of Melas.

... Thus he is taking it generally, when he accuses the poet of ignorance that the Zephyr blows from the west, and from Spain, and that Thrace does not extend as far as that.

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Homer, he adds that the poet does not knoweven that the Nile has more mouths than one, or even the name of the river itself, whereas Hesiod does; for Hesiod mentions it.

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145: Strabo C. 30:

Ούν εδ δε ούδε τούτο προφέρουσιν αύτῷ τὸ περὶ τῆς νήσου τῆς Φαρίας, ὅτι φησὶ πελαγίαν, ὡς νατ'ἄγνοιαν λέγοντι.

146: Strabo C. 30:

'Η δ'αὐτὰ ἀμαρτία καὶ περὶ τοῦ ἀγνοεῖν τὸν ἱσθμὸν τὸν μεταξὸ τοῦ Αἰγυπτίου πελάγους καὶ τοῦ 'Αραβίου κόλπου καὶ περὶ τοῦ
ψευδῶς λέγεσθαι

Αἰθίοκας, τοὶ διχθὰ δεδαίαται ἔσχατοι ἀνδρῶν

147: Strabo. G. 802:

φησί δ' Ερατοσθένης κοινόν μεν είναι
τοτς βαρβάροις κάσιν έθος την ξενηλασίαν, τούς
δ'Αίγυκρίους έλέγχεσθαι διά των κερί τον Βούσιριν μεμυθευμένων έν τῷ Βουσιρίτη νομῷ, διαβάλλειν
δ την βουλομένων τοῦ τόκου τούτου των ϋστερον, οῦ
βασιλέως, μὰ Δία, οὐδὲ Τυράννου γενομένου τινὸς
Βουσίριδος προσεκιφημισθηναι δὲ καὶ τὸ

Αίγυπτόνδ' ΐεναι δολίχην δόδν ά_ιγαλέηντε.

τε, προσλαμβάνοντος πρός τοῦτο πάμπολυ καὶ τοῦ

Ιο μηδὲ τὸν ὅντα λιμένα ἀνεῖσθαι τὸν πρός τῷ Φάρφ,

φρουρεῖσθαι δ' ὑπὸ βουκόλων ληστῶν ἐπιτιθεμένων

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against him the fact that he speaks of the island of Pharos as out at sea, as though this were due to ignorance.

146.

norance of the isthmus between the Egyptian sea and the Arabian Gulf, and about the falsity of the words:

"The Ethiopians, who are divided in two, the furthest of men." (0d.1, 28)

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is a practice common to all uncivilized people; but that the Egyptians are condemned for it because of the legends connected with Busiris in the Busirite district, as later writers wanted to accuse this part of inhospitality: in fact, no such king as Busiris ever existed. He also mentions the line that is quoted in addition:

"A distant way and hard, to visit Egypt,"
and says that strong support is lent to the idea by the
fact that not even the existing harbour, the one of Pharos, allowed access, but was guarded by piratical herdsmen who attacked people who anchored there. The Carthaginians, too, were in the habit of sinking any foreigner

τοίς προσορμιζομένοις. Καρχηδονίους δε καταποντούν, εἴ τις τῶν ξένων εἰς Σαρδώ παραπλεύσειεν ἢ ἐπὶ Στήλας. διὰ δε ταῦτ ἀπιστεῖσθαι τὰ πολλὰ τῶν 15 ἐππερίων. καὶ τοὺς Πέρσας δε κακῶς ἡγεῖσθαι τοῖς πρέσβεσι τὰς δδοὺς κύκλφ καὶ διὰ δυσκύλων.

148: Strabo C. 48:

είπών τε τους άρχαιοτάτους πλείν μεν κατά ληστείαν ή έμπορίαν, μή πελαγίζειν δέ, άλλά παρά γην, καθάπερ τον 'Ιάσονα, δνπερ και μέχρι μης 'Αρμενίας και Μηδίας έκι των Κόλχων στρατεύσαι δ άφέντα τάς ναύς, θστερόν φησι το παλαιόν ούτε τον Εύξεινον θαρρείν τινα πλείν, ούτε παρά Λιβύην και Συρίαν και Κιλικίαν.

149: Strabo. C. 7:

φανεροί δὲ καὶ οἱ ἐπακολουθήσαντες
αὐτῷ ἄνδρες ἀξιόλογοι καὶ οἰκεῖοι φιλοσοφίας.

δν τοὺς πρώτους μεθ "Ομηρον δύο φησίν "Ερατοσθένης,
δναξίμανδρός τε, Θαλού γεγονότα γνώριμον καὶ
δ πολίτην, καὶ "Εκαταΐον τὸν Μιλήσιον" τὸν μὲν
οὄν ἐκδοῦναι πρώτον γεωγραφικὸν πίνακα, τὸν δὲ
"Εκαταΐον καταλιπεῖν γράμμα, πιστούμενον ἐκείνου
ἐκ τῆς ἄλλης αὐτοῦ γραφῆς.

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who sailed past to Sardo, or the Fillars. For these reasons, he says, most of the stories about western countries are untrustworthy. The Persians also used to guide ambassadors treacherously by circuitous and difficult roads.

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He says further that those of the most ancient times made voyages for piracy or commerce, not on the open sea but following the land; like Jason who even left his ships behind and marched from Colchis right to Armenia and Media. He goes on to say that in ancient times no one dared to sail the Euxine or coast along Libya, Syria and Cilicia.

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men of good repute and familiar with philosophy. According to Eratosthenes, the first two after Homer were Anaximander, an acquaintance and fellow-citizen of Thales, and Hecataeus of Miletus: the former produced the first map of the world, while Hecataeus left a book which is believed to be his from the evidence of his other work.

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150: Strabe C. 47:

οὐδὲ τοῦτ'εδ 'Ερατοσθένης, ὅτι ἀνδρῶν οὐκ ἀξίων μνήμης ἐπὶ κλέον μέμνηται, τὰ μὲν ἐλέγχων, τὰ δὲ κιστεύων καὶ μάρτυσι χρώμενος αὐτοῖς, οἰον Δαμάστη καὶ τοιούτοις ἄλλοις. . . . δ δὲ Δαμά-5 στης χρώμενος μάρτυρι οὐδὲν διαφέρει τοῦ καλοῦντος μάρτυρα τὸν Βεργαῖον ἢ τὸν Μεσσήνιον Εὐήμερον καὶ τοὺς ἄλλους, οῦς αὐτὸς εἴρηκε διαβάλλων τὴν φλυαρίαν. καὶ τούτου δ'ἔνα τῶν λήρων αὐτὸς λέτει, τὸν μὲν 'Αράβιον κόλπον λίμνην ὑπολαμβάνοντοις τὸς εἴναι, Διότιμον δὲ τὸν Στρομβίχου κι εσβείας 'Αθηναίων ἀφηγούμενον διὰ τοῦ Κύδνου ἀνακλεῦσαι ἐκ τῆς Κιλικίας ἐκὶ τὸν Χόασκην κοταμόν, ὅς καρὰ τὰ Σοῦσα ρεῖ, καὶ ἀφικέσθαι τεσσαρακοσταῖον εἰς Σοῦσα· ταῦτα δ'αὐτῷ διηγήσασθαι αὐτὸν τὸ Διότιμον.

15 είτα θαυμάζειν εί τον Εύφράτην καὶ τον Τίγριν ἡν δυνατον διακόψαντα τον Κύδνον είς τον Χοάσπην ἐκβαλεῖν.

151: Strabo C. 14:

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καθάπερ τοῖς προτέροις μέγα τι ἡ 'Αλεξάνδρου στρατεία, ὡς φησιν 'Ερατοσθένης. ὁ μὲν γὰρ τῆς 'Ασίας πολλὴν ἀνεκάλυψεν ἡμῖν καὶ τῶν βορείων τῆς Εὐρώπης ἄπαντα μέχρι τοῦ "Ιστρου. too great len futing them o them, and add

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Eratosthenes is wrong too in mentioning at too great length men who are not worthy of mention, refuting them on some points but on others relying on them, and adducing them as evidence: I mean men like Damastes. . . .

when he adduces Damastes it is just the same as calling as witness Euhemerus the "Bergaean," or rather Messenian, and all the rest whom he himself names by way of accusing them of writing nonsense. He himself relates one of the idle tales of Damastes: assuming that the Arabian Gulf is a lake, he says that Diotimus the son of Strombichus, when heading an embassy from Athens, sailed up the Cydnus from Cilicia to the river Choaspes, which flows by Susa, and arrived after a journey of forty days at Susa; and that he was told this by Diotimus himself. Then, Eratosthemes says, Damastes expresses surprise that it was possible for the Cydnus to cut across the Euphrates and Tigris and flow into the Choaspes.

20 0 0 151.

much assisted our predecessors (in geographical knowledge) as Eratosthenes remarks. Alexander revealed to us much of Asia and all thenorth of Europe as far as the

Ister.

152: Strabo C. 48:

είκων δε και αὐτός, ὁκόσον κρούβη τὰ τῆς οἰκουμένης εἰς γνώσιν τοῖς μετ "Αλέξανδρον και κατ αὐτόν ῆδη, μεταβέβηκεν ἐκὶ τὸν κερὶ τοῦ σχήματος λόγου, οὐχὶ κερὶ τοῦ τῆς οἰκουμένης, ὅκερ ῆν οἰκειότερον τῷ κερὶ αὐτῆς λόγῳ, ἀλλὰ τοῦ τῆς συμκάσης γῆς " δεῖ μὲν γὰρ καὶ τούτου μνησθῆναι, μὴ ἀτάκτως δέ.

153: Strabo, C. 48, 49:

είπων οδν ό τι σφαιροειδής ή σύμπασα,
ούχ ως έκ τόρνου δέ, άλλ' έχει τινάς άνωμαλίας,
έπιφέρει το πλήθος των έν μέρει μετασχηματισμών
αὐτής, οί συμβαίνουσιν έκ τε ύδατος καὶ πυρός
5 καὶ σεισμών καὶ άναφυσημάτων καὶ άλλων τοιούτων.

154: Theon. Alex. D. 23:

την δε άπό των δψηλοτάτων όρων έπε τὰ χθαμαλώτερα πέπτουσαν κάθετον δείκνυσιν "ΕρατοσΘένης διὰ των έξ ἀποστημάτων μετρουσων διοπτρων σταδίων ι'.

155: Strabo C. 49:

Μάλιστα δέ φησι ζήτησιν παρασχεϊν, πῶς ἐν δισχιλίοις καὶ τρισχιλίοις ἀπὸ θαλάττης σταδίοις κατὰ τὴν μεσόγαιαν ὁρᾶται πολλαχοῦ κόγχων καὶ of the inhabit
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of the inhabited world advanced with the successors of Alexander and already in Alexander's own time, he goes on to his argument about the shape, not of the inhabited world, which would have been more suited to his argument on that subject, but of the whole earth: that, too, must of course be mentioned, but not out of its place.

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Then, after saying that the earth as a whole is spherical, not as though turned on a lathe but with some irregularities, he goes on to mention its many partial changes of shape, caused by water, earthquakes, eruptions and the like.

The Tolvan dollagin by the Southeast and the box

Eratosthenes shows, by means of instruments measuring from distant points, that the perpendicular height of the nighest mountains, to ground level, is 10 stades.

Sron olden br / soose) = 2553v v v3 . arbs Ar plyago

He says that this especially provides a problem: how is it that at distances of two or three thousand stades from the sea, right inland, are seen in many

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δοτρέων καὶ χηραμόδων πλήθος καὶ λιμνοθάλατται,

5 καθάπερ φησὶ περὶ τὸ ἱερὸν τοῦ "Αμμωνος καὶ τὴν
ἐπ'αὐτὸ ὁδὸν τρισχιλίων σταδίων οὖσαν" πολλὴν

γὰρ εἶναι χύσιν ὁστρέων, ἄλας τε καὶ νὼν ἔτι

εὐρίσκεσθαι πολλούς, ἀναφυσήματὰ τε θαλάττης

εἰς ὅψος ἀναβάλλειν, πρὸς ῷ καὶ ναυαγία θαλατ"

10 τίων πλοίων δείκνυσθαι, ἐ ἐφεσαν διὰ τοῦ χάσματος
ἐκβεβράσθαι, καὶ ἐπὶ στυλιδίων ἀνακεῖσθαι δελ"

φίνας ἐπιγραφὴν ἔχοντας Κυρηναίων Θεωρῶν.

156: Strabo C. 49: 000 0 000

ταύτα δ'εἰπῶν τὴν Στράτωνος ἐπαινεῖ
δόξαν τοῦ φυσικοῦ, καὶ ἔτι Κάνθου τοῦ Λυδοῦ,
τοῦ μὲν Εάνθου λέγοντος ἐπὶ 'Αρταξέρξου γενέσθαι μέγαν αὐχμόν, ὥοτ'ἐκλιπεῖν ποταμοὺς καὶ
δ λίμνας καὶ φρέατα' αὐτὄν τε ἰδεῖν πολλαχῆ
πρόσω ἀπὸ τῆς θαλάττης λίθους τε κογχυλιώδεις
καὶ ὅστρακα κτενώδεα καὶ χηραμύδων τυπώματα καὶ
λιμνοθάλατταν ἐν 'Αρμενίοις καὶ Ματιηνοῖς καὶ ἐν
Φρυγία τῷ κάτω, ὧν ἔνεκα πείθεσθαι τὰ πεδία ποτὲ
10 θάλατταν γενέσθαι.

157: Strabo, C. 49, 50:

τοῦ δὲ Στράτωνος ἔτι μᾶλλον ἀπτομένου τῆς αἰτιολογίας, ὅτι φησὶν οἴεσθαι τὸν Εὔξεινον places many she salt water lab round the temp three thousand accumulation of even now, while through the clinave been dedicated of Cyrene."

of Strato the Lydian. According to the Lydian. According to the wells failed: far from the shells and parmenia, Matissons he belies

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ador applied Actalog polytron or about the places many shells of mussels, oysters or scallops, and salt-water lakes? He mentions in particular the district round the temple of Ammon and the road leading to it, three thousand stades long. There is, he says, a great accumulation of oyster shells, and much salt is found even now, while jets of sea-water shoot up to some height. In addition to this, wreckage of sea-going vessels is pointed out, which the inhabitants told him was cast up through the cleft; and on small columns some dolphins have been dedicated inscribed: "From the sacred embassy of Cyrone." japao solu fa và sa vabole vár fal sarà

the report of the board of 56 on offerd ar offer required.

On this point he approves of the opinion of Strato the scientist, and also that of Xanthus the Lydian. According to Kanthus, in Artaxerxes's time a great drought took place, so that rivers, lakes and wells failed: further, he himself saw in many places, far from the sea, shell-shaped stones, pecten-shaped shells and patterns of scallops, and salt lakes in Armenia, Matieni and lower Phrygia: for these reasons he believed that the plains had once been sea. breat, bor bearer of vs. or verliverar all aby one for the

and of the property of the voore Strato touches still more on scientific explanation, and Eratosthenes says that Strato thinks

μή έχειν πρότερον το κατά Βυζάντιον στύμα, τούς αύτον δὲ ποταμούς βιάσσθαι καὶ ἀνοίξαι τούς εἰς/ἐμβάλ5 λοντας, εἶτ'ἐκπεσεῖν τὸ ὕδωρ εἰς τὴν Ἡροποντίδα

- λοντας, εξτ' έκπεσετν το σοωρ ετς την καὶ καὶ καὶ τον 'Ελλήσποντον, το δ'αὐτό συμβηναι καὶ κεριτάν καθ' ήμας θάλατταν καὶ γὰρ ένταθθα τον κατὰ Στήλας έκραγηναι πόρον, πληρωθείσης ὑπό των ποταμών της θαλάττης, κατὰ δὲ την ἔκρυσιν ἀνα-
- 10 καλυφθήναι τὰ τεναγώδη πρότερον. φέρει δ'αἰτίαν, πρώτον μέν ὅτι τῆς ἔξω θαλάττης καὶ τῆς ἐντός τοδόαφος ἔτερον ἐστιν, ἔπειθ'ὅτι καὶ νῶν ἔτι ταινία τις ὕφαλος διατέτακεν ἀπὸ τῆς Εὐτρώπης ἐπὶ τὴν Λιβύην, ὡς ἄν μὴ μίᾶς οὖσης πρότρ
- 15 τερον της τε έντος καὶ της έκτος. καὶ βραχύτατα μὲν είναι τὰ κερὶ τὸν Πόντον, τὸ δὲ Κρητικὸν καὶ Σικελικόν καὶ Σαρδφον κέλαγος σφόδρα
 βαθέα. τῶν γὰρ κοταμῶν κλείστων καὶ μεγίστων
 βεόντων ἀκὸ τῆς ἄρκτου καὶ τῆς ἀνατολῆς, ἐκεῖνα
- 20 μεν έλύος πληρούσθαι, τὰ ἄλλα δε μένειν βαθέα.

 διό καὶ γλυκυτάτην είναι την Ποντικήν θάλατταν,

 τὰς τ' ἐκρύσεις γίνεσθαι είς οῦς ἐγκέκλιται τόπους

 τὰ ἐδάφη, δοκείν δὲ κᾶν χωσθῆναι τὸμ Πόντον ὅλον

 είς ὅστερον, ἄν μένωσιν αὶ ἐπιρρύσεις τοιαῦται.
- 25 καὶ γὰρ νῶν ἣδη τεναγίζειν τὰ ἐν ἀριστερά τοῦ Πόντου, τόν τε Σαλμοδησσόν καὶ τὰ καλούμενα Στήθη

the Euxine in but the rivers and then the the Hellespon our own sea, was broken th vers, and upo salt marsh wa that the beds different lev of submarine bya, as thoug merly one. low, while th extremely doe rivers that I merous and la with mud, whi too the Ponti take place to Heththks, to later on, if indeed, the 1 marsh-land, 1

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Scythian dese

αύτον c/éppál-DESTVORE as nat nesea tov Vat one iv ava-1 8'alTi-रहि है ४-VOV c Edne spoβραχύ-ВЕ Кратиσόδρα ιεγίστων enetva βαθέα. daharray, STOR ITÓROUG Hovrov Shov τοιαύται' epa tou

ύμενα Στήθη

the Euxine in former times had no outlet at Byzantium, but the rivers which flow into it forced an opening and then the water poured out into the Propontis and the Hellespont. The same thing also happened with our own sea, for there too the strait at the Pillars was broken through as the sea was filled up by the rivers, and upon the outrush of the water was formerly, salt marsh was uncovered. His explanation is, first that the beds of the outer and the inner sea are on different levels, and, second, that even now a kind of submarine shoal stretches right from Europe to Libya, as though the inner and outer seas were not formerly one. Also, the parts round Pontus are very shallow, while the Cretan, Sicilian and Satinian seasare extremely deep. The reason for this is that, as the rivers that Flow from the north and east are very numerous and large, the former parts are being filled with mud, while the others remain deep. Therefore too the Pontic sea is the sweetest, and the outflows take place towards the parts to which the beds incline. Hethinks, too, that the whole Pontus may be silted up later on, if the inflows remain as they are: even now, indeed, the left-hand side of the Pontus consists of marsh-land, that is to say Salmydessus, what seafarers call The Breasts, on either side of the Ister, and the Scythian desert. Perhaps the temple of Ammon was also

ύπο των ναυτικών τα περί τον "Ιστρον και την
Σκυθών έρημίαν. τάχα δε και το του "Αμμωνος
ιερόν πρότερον έπι της θαλάττης δν έκρυσεως γενο-

- ποιείν την νων οφοαν επιφανειαν και βοξαν. την κοιείν την κων οφοαν επιφανειαν και βοξαν. Την
- 35 τε Αίγυπτον το παλαιόν κλύζεσθαι μέχρι των έλων των περί το Πηλούσιον, και το Κάσιον δρος και την Σιρβωνίδα λίμνην. Ετι γούν και νύν κατά την Αίγυπτον της άλμυρίδος δρυττομένης δφάμμους και κογχυλιώδεις εθρίσκεσθαι τοὺς βόθρους, ὡς ἄν
 - 40 τεθαλαττωμένης της χώρας καὶ τοῦ τόπου παντός τοῦ περὶ τὸ Κάσιον καὶ τὰ Γέρρα καλούμενα τε- ναγίζοντος, ἄστε συνάπτειν τῷ της 'Ερυθρᾶς κόλπῳ' ἐνδούσης δὲ τῆς θαλάττης ἀνακαλυφθηναι, μεῖναι δὲ τὴν Σιρβωνίδα λίμνην, εὖτ'ἐκραγηναι καὶ ταύτην,
 - 45 ώστε έλώδη γενέσθαι. ὡς δ'αῦτως καὶ τῆς καλουμένης Μοιρίδος λίμνης τοὺς αἰγιαλοὺς αἰγιαλοῖς θαλάττης μάλλον ἡ ποταμοῦ προσεοικέναι.

158: Strado 30. 54. 55:

'Ο δ' ούτως ήδύς έστιν, ώστε καὶ μαθηματικός
ων οὐδὲ τῆν Αρχιμήδους βεβαιοῖ δόξαν, ὅτι φησὶν ἐκεῖ
νος ἐν τοῖς περὶ τῶν ὁχουμένων, παντὸς ὑγροῦ καθεστη κότος καὶ μένοντος τὴν ἐπιφάνειαν σφαιρικὴν εἶναι,

vosoo var goy v formerly by th to an outllow able that the if it was on tance from th sent fame and was flooded b sium, includi even now, whe trenches are as though the round Casius by the sea so the sea retre bonis remaine that the land shores of wha

he does not pounded in he liquid has constant the earth.

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δ σφαίρες τούτο κέντρον έχούσης τη γη. τούτην γάρ την δόξαν formerly by the sea, but is now situated inland owing to an outflow. He surmises further that it is reasonable that the oracle became so famous and well-known, if it was on the sea, while its removal to such a distance from the sea does not reasonably explain its present fame and reputation; that Egypt in ancient times was flooded by the sea as far as the marshes round Pelusium, including Mount Casius and Lake Sirbonis; for even now, when the salt-marshes in Egypt are dug up, the trenches are found to be sandy and full of sea-shells, as though the country and the whole marshy district round Casius and what is called Gerrha had been covered by the sea so as to join the Erythrean Sea; and when the sea retreated they were uncovered, though Lake Sirbonis remained, but subsequently it too broke out, so that the land became marshy. In the same way the shores of what is called Lake Moeris are more like the shores of a sea than the banks of a river.

האוויים בני הוכ הב לצים אני 158. בא הבי הפי האוויים בני האוויים בני האוויים בני האוויים בני האוויים בני האוויים בני

he does not even confirm the theory of Archimedes expounted in his work "Floating Bodies", that when any
liquid has come to rest and remains still its surface
is a segment of a sphere, having the same centre as
the earth. This theory is accepted by all who have

5 σφαίρας ταύτο κέντρον έχούσης τῆ γῆ. ταύτην γὰρ τὴν δόξαν ἀποδέχονται πάντες οἱ μαθημάτων πὼς ἀψάμενοι, ἐκεῖνος δὲ τὴν ἐντὸς θάλατταν, καίπερ μίαν οδσαν, ὡς φησίν, οὐ νομίζει ὑπὸ μίαν ἐπιφάνειαν τετάχθαι, ἀλλ'οὐδ'ἔν τοῖς σύνεγγυς τόποις. καὶ μάρτυράς γε τῆς τοιαύτης ἀμαθίας ἀρχιτέκτονας

10 ανθρας ποιείται, καίτοι των μαθηματικών και την άρχιτεκτονικήν μέρος της μαθηματικής άποφηναμένων. φησί γάρ και Δημήτριον διακόπτειν έπιχειρήσαι τον των Πελοποννησίων ίσθμον πρός το παρασχεΐν διάπλουν τοῖς στόλοις, κωλυθήναι δ'όπο των άρχιτεκτόνων άναμετρησάντων και άπαγγειλάντων

15 μετεωροτέραν την έν τῷ Κορινθιανῷ κόλπῳ θάλατταν τῆς κατὰ Κεγχρεὰς εἶναι, ὥστε, εἰ διακόψειε τὸ μεταξὸ χωρίον, ἐπικλυσθῆναι ἀν ἄπαντα τὸν περὶ Αἴγιναν πόρον καὶ αὐτὴν τὴν Αἴγιναν καὶ τὰς πλησίον νήσους, καὶ μηδὲ τὸν διάπλουν ἀν γενέσθαι χρήσιμον. διὰ δὲ τοῦτο καὶ τοὺς εὐρίπους

20 βοώδεις είναι, μάλιστα δὲ τὸν κατά Σικελίαν πορθμόν,
ὅν φησιν δμοιοπαθείν ταῖς κατά τὸν ώκεανὸν πλημμυμώι τε
καὶ ἀμπώτεσι δὶς γὰρ μεταβάλλειν τὸν βοῦν ἐκάστης
ἡμέρας καὶ νυκτός, καὶ καθάπερ τὸν ώκεανὸν δὶς μὲν
πλημμυρείν, δὶς δὲ ἀναχωρείν. τῷ μὲν οὖν πλημμυρίδι

25 δμοιολογείν τον έκ του Τυρβηνικού πελάγους είς το Σικελικόν καταφερόμενον ώς αν έκ μετεωροτέρας έπιφανείας, ον δή καὶ κατιόντα δνομάζεσθαι, δμολογείν δ'ότι καὶ κατά τον αὐτόν καιρόν άρχεταί τε καὶ παύεται καθ'όν αἰ πλημμυρίδες. άρχεται μέν γὰρ περὶ τὴν ἀνατολὴν τῆς

touched mathe that the inne nuous, has be surface, ever witnesses suc mathematician mathematics. through the I for his exped when they had sea in the Gu reae, so that the narrows a bouring islar passage would narrows have strait, which tides in the each day and twice. v Thus nian sea to though coming called the "d

that it begin

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ν γάρ την δόξαν i, Enetvoc dè goiv, od voniler TC OUVEYYUC TOapxiténtovaç THY doxITENonoi yap nai λοποννησίων Lois, nadubhvai παγγειλάντων attav the μεταξύ χωρίον, or nat abthr the v biánkouv av δρίπους πορθμόν, πλημηυρόι τε έμάστης dic per λημμυρίδι eig to Dinehindy lac, or by iai natà o' o'v at

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touched mathematics at all. He, however, does not think that the inner sea, although he admits that it is continu us, has been brought under the form of a continuous surface, even in adjacent places. He even brings as witnesses to such ignorance men who are engineers, although mathematicians have shown that engineering is a part of mathematics. He says that Demetrius attempted to cut through the Peloponnesian isthmus to provide a passage for his expeditions, but was stopped by the engineers when they had taken measurements and reported that the Marion of A " Eas of the sea in the Gulf of Corinth Was higher than that at Conchreae, so that if he cut through the intervening land all the narrows about Aegina and Aegina itself with the neighbouring islands would be flooded, and in any case the For this reason also the passage would be of no use. narrows have strong currents, especially the Sicilian strait, which he says behaves like the flood- and ebbtides in the ocean; for it changes its current twice each day and night, and like the ocean flows and ebbs twice. Thus the current carried down from the Tyrrhenian sea to the Sicilian corresponds with the flood-tide, as though coming from a higher surface- and it is actually called the "descending" current. It corresponds in the sense that it begins and stops at the same time as the floodtides: it begins about the time when the moon rises and It happens that there are Sypermitians took at least

30 σελήνης καὶ τὴν δύσιν, λήγει δ' ὅταν συνάπτη τῷ μεσουρανήσει ἐκατέρα, τῷ τε ὑπὲρ γῆς καὶ τῷ ὑπὸ γῆς' τῷ δὲ
ἀμπώτει τὸν ἐναντίον, ὑν ἐξιόντα καλεῖσθαι, ταῖς μεσουρανήσεσι τῆς σελήνης ἀμφοτέραις συναρχόμενον, καθάπερ
ἀμπώτεις, ταῖς δὲ συνάψεσι ταῖς πρὸς τὰς ἀνατολὰς καὶ
35 δύσεις καυόμενον.

159: Strabo C. 384:

160: Strabo C. 61. 62: ad dollar 4 11.

Επάνιμεν δ'επὶ τὰ εἰῆς, ἀφ'ῶν παρέβημεν.

τοῦ γὰρ Ἡροδότου μηδένας Υπερβορείους εἶναι φήσαντος,
μηδὲ γὰρ Υπερνοτίους, γελοίαν φησὶν εἶναι τὴν ἀπόδειζιν

καὶ ὁμοίαν ὁ Ἑρατοσθένης τῷ σοφίσματι τούτῳ, εἴ τις

δ λέγοι μηδένας εἶναι ἐπιχαιρεκάκους, μηδὲ γὰρ ἐπιχαιρα"

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sets, and slackens when it reaches either meridian, above or below the earth. The opposite current, called the "outgoing", corresponds with the ebb, beginning when the moon reaches either meridian, like the ebbtides, and stopping when it arrives at its rising or setting. toropiaci and de obe fires perendedes obbiese tros

a van fi . vianosorah puo ibi 159 relaror ravidual vi viaxi

The sea was raised by an earthquake and flooded both it (Helice) and the temple of Heliconian Poseidon Helice was flooded two years before the battle of Leuctra. Eratosthenes says that he saw the place himself, and that the ferrymen told him that on the strait there used to stand a bronze figure of Poseidon holding in his hand a hippocampus, over an analytical substitution of the which caused danger to fishermen. Tentonvidanim ador aredhorgenoqui, vi perridi, ravid d

02 77-203 2360000 four \$ 30 160 cab voredigens, volde, aver I shall return to the order of argument from which I digressed. It's parable for consider out .vogres

Whereas Herodotus says that there are no Hyperboreans, for there are no Hypernotians either, Sratosthenes says that the argument is absurd and resembles the quibble: "There are nonewho rejoice at people's misfortunes, for there are none either who rejoice at their good fortunes." Further, he says it happens that there are Hypernotians too: at least

γάθους κατά τύχην τε είναι και 'Υπερνοτίους' κατά γούν την Αίθιοπίαν μή πνετν Νότον, άλλά κατωτέρω.

161: Strabo 0. 62:

οδν πρώτη διέξοδος αὐτῷ τῶν ὑπομνημάτων τοιαύτη.

"Εξης δὲ λέγει πρός τοὺς φανερῶς πεπλασμένα

"Εξης δὲ λέγει πρός τοὺς φανερῶς πεπλασμένα

162: Arrian. Anab. V. 3: 1. f.:

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οδ γὰρ ἔγωγε "Ερατοσθένει τῷ Κυρηναίῷ πάντη ξυμφέρομαι, δς λέγει πάντα ὅσα ἔς τὸ θετον ἀναφέρεται ἐκ Μακεδόνων πρὸς χάριν τὴν "Αλεξάνδρου ἔς τὸ ὁπέρογκον ἐπιφημισθῆναι, καὶ γὰρ καὶ σπήλαιον δέγει ἱδόντας ἐν Παραπαμισάδαις τοὺς Μακεδόνας καὶ τινα μῦθον ἐπιχώριον ἀκούσαντας ἡ καὶ αὐτοὺς ξυνθέντας φημίσαι ὅτι τοῦτο ἄρα ἦν τοῦ Προμηθέως τὸ ἄντρον, ἴνα ἐδέδετο, καὶ ὁ ἀετὸς ὅτι ἐκετσε ἐφοίτα δαισόμενος τῶν σπλάγχων τοῦ Προμηθέως, καὶ ὁ 'Ηραθιο ἀπέκτεινε καὶ τὸν Προμηθέα τῶν δεσμῶν ἀπέλυσε. τὸν δὲ Καύμασον τὸ ῦρος ἐκ τοῦ Πόντου ἐς τὰ πρὸς ἕω μέρη τῆς

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THE REST TO WOOD WELL SETTING THE WOOD NOT USED AND THE

Next he argues against people whose statements are obviously fictitious and impossible, partly in the guise of myth and partly in that of history: these it is not fitting to mention, nor should he have paid attention to dealers in nonsense in a discourse of this kind. So much, then, for the exposition in the first of his Essays.

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tosthenes of Cyrenewhen he says that everything reported by the Macedonians on sacred matters was grossly
exaggerated to please Alexander. He says that the Macedonians, seeing a cave in the Parapamisus range and
hearing some local talk, themselves made up the story
that this was actually the cave where Prometheus was
bound; that the eagle used to visit it to feast on
his entrails, and that Heracles arrived there, killed
the eagle and freed Prometheus from his chains. He
says further that the Macedonians in this account extended the Caucasus range from the Black Sea towards
the eastern parts of the earth and the country of the

γῆς καὶ τὴν Παρακαμισαδῶν χώραν ὡς ἐκὶ 'Ινδοὸς μετάγειν τῷ λόγψ τοὸς Μακεδόνας, Παρακάμισον ὅντα τὸ ὅρος αὐ15 τοὺς καλοῦντας Καύκασον τῆς 'Αλεξάνδρου ἔνεκα δόξης,
ὡς ὑκὲρ τὸν Καύκασον ἄρα ἐλθόντα 'Αλέξανδρον. ἔν τε
αὐτῆ τῷ 'Ινδῶν γῷ βοῦς ἱδόντας ἐγκεκαυμένας μόκαλον
τεκμημιοῦσθαι ἐκὶ τῷδε ὅτι 'Ηρακλῆς ἐς 'Ινδοὸς ἀφίκετο.
ὅμοια δὲ καὶ ὑκὲρ Διονύσου τῆς κλάνης ἀκιστεῖ 'Κρατοσ-

163: Strabo C. 70:

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Parapamisadae right to India, themselves giving the name of Caucasus to a range which was really Parapamisus for the glory of Alexander, to show that Alexander had actually gone beyond the Caucasus. In India itself, seeing oxen branded with (the sign of) a club, they took this as proof that Heracles penetrated into India. Eratosthems also disbelieves similar stories about the wanderings of Dionysus.

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GEOGRAPHY:

Book II: 164-186:

164: Strabo C. 62:

*Εν δὲ τῷ δευτέρο πειράται διόρθωσίν τινα ποιεϊσθαι τῷς γεωγραφίας, καὶ τὰς ἐαυτοῦ λέγει ὁκολήψεις. . . . τὸ μὲν οδν τὰς μαθηματικὰς ὑποθέσεις εἰσάγειν καὶ φυσικὰς εδ λέγεται, καὶ ὅτι εἰ αφαιροτείδης ἡ γῆ, καθάπερ καὶ ὁ κόσμος, περιοικεῖται, καὶ τὰ ἀλλὰ τὰ ποιαῦτα. καὶ περὶ τοῦ σχήματος δ'ἐν τοῖς ἐξῆς διὰ πλειόνων καταδεικνὸς ὅτι σφαιροτείδης καὶ ἡ γῆ συν τῆ ὑγρῷ φύσει καὶ ὁ οὐρανός, ἀλλοτριολογεῖν ἄν δόξειεν. ἀρκεῖ γὰρ τὸ ἐπὶ

165: Euseb. Praep. Ev. XV. 53:

Ερατοσθένης τον ήλιον απέχειν από της γης σταδίων μυριάδας τετραποσίας παι δηταπισμυρίας, την δὲ σελήνην ἀπέχειν της γης μυριάδας οη σταδίων.

166: Macrobius in Somn. Scip. I. 20. 8.109

Eratosthenes in libris dimensionum sic sit:
Mensura terrae septies et vicies multiplicata mensuram solis efficiet.

over ection of own basic assided, of math sound, and all spherical, liround, and so of the earth shows that bo and the heave to be wander!

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In Book Two he attempts a kindoof general correction of geographical practice, and explains his own basic assumption His introduction, indeed, of mathematical and scientific principles is sound, and also his statement that, if the earth is spherical, like the universe, it is inhabited all round, and so on In discussing the shape of the earth in his succeeding argument, when he shows that both the earth with its liquid content, and the heavens also, are spherical, he would appear to be wandering from the subject. A short statement would be enough. THE YES MUNICIPAL CHOI TOLVOY, NOT EXEL OUTSE, THE

TOTAL TOTAL THEOR 165. THOUT WE WE OF CHE THERE

Eratosthenes says the sun is four million eight hundred thousand stades from the earth, and the moon seven hundred and eighty thousand.

TOO TATOO STEPHENE VOO. 166.

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In his books of measurements Eratosthenes says: "The measurements of the earth, multiplied twenty-seven times, will give the measurement of the sun." is verbloslip sygreand. It is said that this

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I, 20. f. 109

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167: Cleomed. oyol, theor. meteor. I. 10:

- 10 'Υπό τῷ αὐτῷ κεῖσθαι φησι μεσημβρινῷ Συήνην καὶ 'Αλεξάνδρειαν. ἐπεὶ οὖν μέγιστοι τῶν ἐν τῷ κόσμῳ οἱ μεσημβρινοί, δεῖ καὶ τοὺς ὑποκειμένους τούτοις τῆς γῆς κύκλους μεγίστους εἶναι ἀναγκαίως. 'Ωστε ἡλίκον ἄν τὸν
 διὰ Συήνης καὶ 'Αλεξανδρείας ἤκοντα κύκλον τῆς γῆς ἡ
- 15 έφοδος ἀποδείξει αύτη, τηλικούτος καὶ ὁ μέγιστος ἔσται τῆς γῆς κύκλος. Φησὶ τοίνυν, καὶ ἔχει οὕτως, τὴν Συήνην ὑπὸ τῷ θερινῷ τροπικῷ κεῖσθαι κύκλῳ. 'Οπόταν οὖν ἐν καρκίνῳ γενόμενος ὁ ῆλιος, καὶ θερινὰς ποιῶν τροπάς, ἀκριβῶς μεσευρανήση, ἄσκιοι γίνονται οἱ τῶν
- 20 ωρολογείων γνώμονες άναγκαίως, κατά κάθετον άκριβη τοῦ ήλίου δπερκειμένου· καὶ τοῦτο γίνεσθαι λόγος έπὶ σταδίους την διάμετρον. Εν Αλεξανδρείς δὲ

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Among the scientists there have been numerous opinions about the size of the earth. Those of Posidonius and Eratosthenes are preferable to the rest. The latter showed its size by a geometrical approach, but Posidonius's method is simpler. Each man took certain premises, and arrived at his proof by means of deductions from the premises. ...

geometrical approach, and appears to contain an e-

under the same meridian. Now as meridians are
the great circles of the celestial sphere, the
terrestrial circles corresponding with them must
necessarily be great circles. Thus whatever this
experiment shows to be the size of the terrestrial
circle passing through Syene and Alexandria, this
will be the size of the terrestrial great circle.
Now Eratosthenes says, as is indeed the case, that
Syene lies beneath the circle of the summer tropic.
When, therefore, the sum is in the sign of the Grab
at the time of the summer solstice, at the exact moment when it reaches the zenith the fineers of sundials
necessarily lose their shadows owing to the fact that
the sun is vertically overhead. It is said that this

τῆ αὐτῆ ἄρφ ἀποβάλλουσιν οἱ τῶν ἀρολογείων γνώμονες σκιάν, ἄτε πρὸς ἄρκτφ μάλλον τῆς Συήνης ταύτης τῆς

- 25 πόλεως πειμένης. Υπό τῷ μεσημβρινῷ τοίνυν καὶ μεγίστω κύκλω τῶν πόλεων κειμένων, ἄν περιαγάγωμεν περιφέρειαν ἀπό τοῦ ἄκρου τῆς τοῦ γνώμονος σκίας ἐπὶ τὴν βάσιν αὐτὴν τοῦ γνώμονος τοῦ ἐν ᾿Αλεξανδρείς ἀρολογείου, αὕτη ἡ περιφέρεια τμῆμα γενήσεται τοῦ
- 30 μεγίστου των έν τῆ σκάφη κύκλων. ἐπεὶ μεγίστο κύκλο
 δπόκειται ἡ τοῦ ὡρολογείου σκάφη. εἰ οδν ἐξῆς νοήσαιμεν εὐθείας διὰ τῆς γῆς ἐκβαλλομένας ἀφ'ἐκατέρου
 των γνωμόνων, πρὸς τῷ κέντρῷ τῆς γῆς συμπεσοῦνται.
 ἐπεῖ οδν τὸ ἐν Συήνη ὡρολογεῖον κατὰ κάθετον ὑπο-
- 35 κειται τῷ ἡλίφ, ἄν ἐπινοήσωμεν εὐθεῖαν ἀπὸ τοῦ ἡλίου ἤπουσαν ἐπ'ἄκρον τοῦ ἀρολογείου τὸν γνώμονα, μία γενήσεται εὐθεῖα ἡ ἀπὸ τοῦ ἡλίου μέχρι τοῦ κέντρου τῆς γῆς ἤκουσα. ἄν οὖν ἐτέραν εὐθεῖαν νοήσωμεν ἀπὸ τοῦ ἄκρου τῆς σκιᾶς τοῦ γνώμονος ἐπὶ τὸν ἥ-
- 40 λιον ἀναγαγομένην ἀπὸ τῆς ἐν ᾿Λλεξανδρείς σκάφηςς ἄντη καὶ ἡ προειρημένη εὐθεῖα παράλληλοι γενήσονται, ἀπὸ διαφόρων γε τοῦ ἡλίου μερῶν ἐπὶ διάφορα μέρη τῆς γῆς διήκουσαι. εἰς ταύτας οὖν παραλλήλους οὕσας ἐμπίπτει εὐθεῖα ἡ ἀπὸ τοῦ κέντρου τῆς γῆς ἐπὶ
- 45 τὸν ἐν 'Αλεξανδρείς γνώμονα ἤκουσα, ἄστε τὰς ἐναλλάξ γωνίας ἴσας κοιεῖν· ὧν ἡ μὲν ἐστι πρὸς τῷ κέντρῳ τῆς γῆς

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abyl valeyo happens over In Alexandria sundials thro to the north the (same) me are from the of the finger will be a seg since the boy circle. If produced from will meet in since the sur the sun, if v from the sun line from the coincide with straight line the shadow in the former at fall from di parts of the centre of the

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YVEROVEC ύτης της uv nat αγάγωμεν σκίας λεξανδρεία Tal TOU fore nunda EEAG VON-* έκατέρου godvtai. ov Sno-700 γνώμονα, TOT NÉVIDOU howher dv nσκάφης ενήσονται, α μέρη άλους ic yhis ent ac évallag ywriac क्षेट्र भीद

word standard and educated, of the the header the five happens over a belt three hundred stades across. In Alexandria at the same time the fingers of the OF SERVICE OR SERVICE sundials throw a shadow, as this city lies further to the north than Syene. Now as the cities lie under the (same) meridian great circle, if we describe an are from the end of the finger's shadow to the base of the finger in the sundial in Alexandria, this are will be a segment of the great circle in the bowl, since the bowl of the sundial lies under the great circle. If then we go on to imagine straight lines produced from each finger through the earth, they will meet in the centre of the earth. Therefore since the sundial in Syene lies vertically under the sun, if we suppose a straight line falling from the sun on the top of the finger, the straight line from the sun to the centre of the earth will coincide with it. If we then suppose another straight line drawn to the sun from the endor the shadow in the bowl at Alexandria, this and the former straight line will be parallel as they fall from different parts of the sun upon different parts of the earth. Now the straight line from the centre of the earth to the finger at Alexandria cuts these straight lines, which are parallel, making the alternate angles equal; one of them being at the

κατά σύμπτωσιν των εύθείων, αὶ ἀπὸ των ωρολογείων ἤχθησαν ἐπὶ τὸ κέντρον τῆς Υῆς, γινομένη· ἡ δὲ κατὰ σύμπτωσιν ἄκρου τοῦ ἐν 'Αλεξανδρείς γνώμονος καὶ τῆς ἀπ'ἄκρας

- 50 αὐτοῦ σκῶς ἐπὶ τὸν ἥλιον διὰ τῆς πρὸς αὐτὸν ψαύσεως ἀναχθείσης γεγενημένη. καὶ ἐπὶ μὲν ταύτης βέβηκε περιφέρεια ἡ ἀπ'ἄκρου τῆς σκιᾶς τοῦ γνώμονος ἐπὶ τὴν βάσιν αὐτοῦ περιαχθεῖσα· ἐπὶ δὲ τῆς πρὸς τῷ κέντρῳ τῆς γῆς ἡ ἀπὸ Συήνης διήκουσα εἰς 'Αλεξάνδρειαν. 'Ομοιαι τοίνυν
- 55 περιφέρειαι είσιν άλλήλαις, αι έπ' ίσων γε γωνιών βεβημυται. δν άρα λόγον έχει ή έν τῷ σκάφῷ πεντημοστόν μέρος εὐρίσκεται τοῦ οἰκείου κύκλου. Βεῖ οὖν ἀναγκαίως και τὸ ἀπὸ Συήνης εἰς 'Αλεξάνδρειαν διάστημα πεντηποστόν κοστόν εἶναι μέρος τοῦ μεγίστου τῆς γῆς κύκλου. και
- 60 έστι τούτο σταδίων πενταπισχιλίων. δ άρα σύμπας πύπλος γίνεται μυριάδων είποσι πέντε. παὶ ἡ μὲν 'Ερατοσθένους ἔφοδος τοιαύτη.

168: Cleomed. I. 10:

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Τίθεται δὲ καὶ χειμεριναῖς Τροκαῖς ὡρολογεῖα εἰς ἐκατέραν τῶν κόλεων, καὶ ἐκατέρων σκιᾶς ἀκοβαλλόντων, μείζων μὲν ἡ ἐν 'Αλεξανδρείφ εὐρισκεται ἀναγκαίως, διὰ τὸ κλέον ἀφεστάναι τοῦ χειμερινοῦ τροκικοῦ τὸν κόλιν ταὐτην. λαμβάνοντες οὖν τὴν ὑκεροχὴν τῆς σκιᾶς, καθ'ἢν ὑκερέχεται ἡ ἐν Συήνῃ ὑκὸ τῆς ἐν 'Αλεξανδρείφ, εὐρίσκουσι καὶ ταύτην μέρος κεντηκοστόν

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ζς ωρολογεία αποβαλierai avarov Troning oxhv the ev 'Aleγοστόν

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centre of the earth, at the meeting-place of the straight lines produced from the sundials, the other at the meetingplace of the top of the finger at Alexandria and the line drawn from the end of its shadow to the sun through the point of contact. The latter angle is subtended by the are drawn from the end of the finger's shadow to its base, while the one at the centre of the earth is subtended by the arc from Syene to Alexandria. Therefore these ares are equal to one another, subtending as they do equal angles. The proportion of the angle in the bowl its own circle is found in fact to be one fiftieth; therefore the distance from Syene to Alexandria must be one fiftieth of the terrestrial great circle, and this distance is five thousand stades, Thus the whole circle contains two hundred and fifty thousand . Polonies . Assigned . Inbroa soul

This is the approach of Eratosthones. Advov. .. sept 35 got designed adags adam stage

-la phrho da phy vis 168. vavoyby whrho ran prov At the winter solstice sundials are set up in each of the two cities, and, when each throws a shadow, that at Alexandria is necessarily found to be greater as this city stands further from the winter tropics. If then the amount is taken by which the shadow at Syene is exceeded by that at Alexandria, it is found that this too is one fiftieth

του μεγίστου των έν τω ωρολογείω κύκλων. Καὶ ουτω καὶ ἀπὸ τούτου γνώριμον γίνεται, ὅτι πέντε καὶ
10 εἴκοσι μυριάδων ἐστὶν ὁ μέγιστος τῆς γῆς κύκλος.

169: Ptol. magn. synt. I. 10:

κατελαβόμεθα την άπό του βορειοτάτου πέρατος έπὶ τὸ νοτιώτατον περιφέρειαν, ήτις ἐστὶν ἡ μεταξὸ τῶν τροπικῶν τμημάτων, πάντοτε γινομένην μξ΄ καὶ μείζονος μὲν διμοίρου τμήματος, ἐλάσσονες δὲ ἡ δίσους τετάρτου. δι'οῦ συνάγεται σχεδὸν ὁ αὐτὸς λόγος τῷ τοῦ Ἐρατοσθένους, ῷ καὶ ὁ Ἰππαρχος συνε χήσατο. γίνεται γὰρ τοιούτων ἡ μεταξὸ τῶν τροπι κῶν ια' ἔγγιστα, οἴων ἐστὶν ὁ μεσημβρινὸς πγ΄.

170: Achill. Tat. Isag., Uranolog. 1 1570

Πρώτος δε Παρμενίδης περὶ τῶν ζωνῶν ἐκίνησε λόγον. περὶ δε τοῦ ἀριθμοῦ αὐτῶν πόλλη διαφωνία τοῖς μετ'αὐτὸν γέγονεν. οἱ μὲν γὰρ ἔξ αὐτὰς εἰπον, ὡς Πολύβιος καὶ Ποσειδώνιος, τὴν διακεκαυμένην 5 εἰς δύο διαιροῦντες. οἱ δὲ πέντε παρέλαβον " ἄσπερ "Ερατοσθένης, καὶ ἄλλοι πολλοί, οἰς καὶ ἡμεῖς κατη κολουθήσαμεν. περὶ δὲ οἰκήσεων πάλιν, καὶ τῶν ἐνοικούντων, καὶ ὁνομάτων, γέγονε πολλὴ ταραχή, καὶ περὶ ἀντιχθόνων καὶ ἀντιπόδων.

of the sundla this fact too great circle (stades).

I have the between the degrees and more quarters. That of Erate made use; for approximatel contains 83.

question of agreement am some, like F there are si Others, like There has as habitability

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οτάτου πέρατος v h ustato nz nat ८ है मैv & autòc apxoc ouve-OV TPORT G EY'.

B. 157C. Zwvav Ensvace διαφωνία αύτάς είσκεκαυμένην cabov. Gonep huste nathnai Tav rapaxh.

of the sundial's great circle. Therefore from this fact too it is clear that the terrestrial great circle is two hundred and fifty thousand

spor one par ft , avigagheses effice verbar voroge

I have taken the arc from the northern limit to the southern, that is to say the segment between the tropics, as measuring altogether 47 degrees and more than a half, but less than threequarters. Thus this estimate nearly agrees with that of Eratosthenes, of which Hipparchus also was made use; for the distance between the tropics is approximately 11 of the units of which the meridian contains 83. prayly is a same as another in or low against

NOVAL VOT GIOTAS OF VOCATOLDS . 198 VALOUE VOTOON Parmenides was the first to bring up the question of the zones. There has been much disagreement among his successors about their number. Some, like Polybius and Posicolus have said that there are six, splitting the torrid zone into two. Others, like Eratosthenes and many others, whom I yself have followed, have taken them to be five. There has, again, been much disagreement about their habitability and inhabitants, about their names, and min, corresponding with the selectial pole, to

171: Strabo C. 97:

εν δ', ωσπερ 'Ερατοσθένης φησίν, ή υποπίπτουσα τῷ ἰσημερινῷ ἐστιν εϋπρατος, παθάπερ παὶ Πολύβιος δμοδοξεῖ πολό πρεῖττον τρίτην εὕπρατον ταύτην ποιεῖν στενήν τινα, ἢ τὰς ὑπὸ τοῖς
δ τροπιποῖς εἰσάγειν.

172: Geminus, 51. A:

άναμεμετρημένου δέ τοῦ μεγίστου κύκλου των έν τη γη κατά τον έν τῷ κόσμφ μεσημβρινόν καὶ εύρημένου μυριάδων, κα" και σταδίων, β', της διαμέτρου μυριάδων η' καὶ σταδίων, δ', διαιρουμένου τε τοῦ μεσημβρινοῦ 5 κύκλου είς μέρη ξ΄, καλεϊται τὸ ἐν τμῆρα ἐξηκοστόν. ο γίνεται δο στάδια. έαν γάρ μερισθώσιν αί κε' μυpidose nat tà B' ordoia sie pépa g', vivetat to égaποστόν σταδίων, δσ'. Εστιν οδν τά μεταξό των ζωνών διαστήματα τούτον άφω, ισμένα τον τρόπον. των μέν κα-ΙΟ τεψυγρένων ζωνών δύο το πλάτος ένατέρας αύτων έξηνοστών 5', άπερ είσι στάδιοι μέν, μεσ'. των δε ευμράτων δύο ζωνών το πλάτος ένατέρας αψτών έξηκοστών, ε', ά γίνεται στάδιοι μέν, κα΄. της δε διεκεκαυμένης ζώνης το κλάτος έξημοστών η', ώστε άπό του ίσημερινου έφ' ένάτερα πρός Ι5 τους τροπιπούς έξημοστά είναι δ; ά γίνεται στάδια μέν, ,: ζω'. γίνονται οδν άπο μέν τοῦ πόλου τοῦ έν τῷ γῷ, ός κείται κατά τον έν τῷ κόσμω πόλον μέχρι τοῦ έν τῷ

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about Antichthones and Antipodes. " Description of

-30 whook or va vor bron 171. 38 56

NOT, DE METTER MOTE TOW BY TO MOORY APARTMON, SPOK TOY

neath the equator is temperate, as Polybius also admits. It is much better to make this a third temperate zone, though narrow, than to include the zones under the tropics.

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The great circle of the earth, correspending with the colestial meridian, being measured and found to be 252, 000 stades, and its diameter 84, 000, if the meridian is split into 60 parts, each part is called a sixtieth. This works out at 4, 200 stades, for if 252, 000 stades is divided into 60 parts, the sixtieth works out at 4, 200 stades. The distance between the zones, then, are defined the following way: the breadth of each of the two frigid zones is 6 sextleths, making 25, 200 stades; the breadth of each of the two temperate zones is 5 sixtisths, making 21,000 stades; while the breadth of the torrid zone is 8 sixtieths, so that from the equator in some and each direction to the tropics is 4 sixtleths, making 16, 800 stades. So from the terrestrial pole, corresponding with the celestial pole, to

γῷ ἀρητικοῦ, στάδιοι μὲν κεσ΄ ἀπὸ δὲ τοῦ ἐν τῷ γῷ ἀρητικοῦ, ος κεῖται κατά τὸν ἐν τῷ κόσρφ ἀρητικὸν, πρὸς τὸν

- 20 ἐν τῷ γῷ τροπικόν, ος κεῖται κατά τὸν ἐν τῷ κόσμῳ θερινόν τροπικόν, στάδιοι μἔν, κα΄. ἀπὸ δὲ τοῦ θερινοῦ τροπικοῦ μέχρι τοῦ ἐν τῷ γῷ ἰσημερινοῦ, ὅς κεῖται κατά τὸν ἐν τῷ κόσμῳ ἰσημερινόν, στάδιοι, ιζω΄.
 πάλιν ἀπὸ τοῦ ἰσημερινοῦ πρὸς τὸν ἔτερον τροπικόν,
- 25 , ιζω'. ἀπό δὲ τοῦ τροπικοῦ πρός τὸν ἀρκτικὸν στάδια, κα', ἀπό δὲ τοῦ ἀρκτικοῦ πρός τὸν ἔτερον πόλον, κεσ'. ἄστε σθνάγεσθαι τὸ μεταξύ τῶν πόλων διάστημα μυριάδων ιβ' καὶ σταδίων, ζ'. ὅπερ ἐστὶν ἤμισυ τῆς περιμέτρου τῆς γῆς.

173: Strabo, C. 112:

νοείσθω δή πεντάζωνος, καὶ ὁ ἱσημερινός
τεταγμένος ἐν ἀὐτῆ κύκλος, καὶ ἄλλος τούτῳ παράλληλος, ὅρίζων τὴν κατεψυγμένην ἐν τῷ βορείῳ ἡμισφαιρίῳ, καὶ διὰ τῶν πόλων τις τέμνων τούτους πρὸς ὁρθάς.
5 τοῦ δὴ βορείου ἡμισφαιρίου δύο περιέχοντος τεταρτη-

- μόρια τῆς γῆς, ἄ ποιεῖ ὁ ἱσημερινὸς πρὸς τὸν διὰ
 τῶν πόλων, ἐκατέμψ τούτων ἀπολαμβάνεται τετμάπλευραν χωρίον, οὸ ἡ μὲν βόρειος πλευρὰ ἤμισυ τοῦ
 πρὸς τῷ πέλφ παραλλήλου ἐστίν, ἡ δὲ νότιος τοῦ
- ΙΟ ίσημερινού ήμισυ, αὶ δὲ λοικαὶ κλευραὶ τμήματά εἰσι τοῦ διὰ τῶν κόλων, ἀντικείμενα ἀλλήλοις, ΐσα τὸ μῆκος. ἐν θατέιφ δὴ τῶν τετιακλεύρων

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the arctic circle is 25,200 stades; from the arctic circle, corresponding with the celestial arctic circle, to the terrestrial tropic corresponding with the celestial summer tropic, is 21,000 stades. From the summer tropic to the terrestrial equator, corresponding with the celestial equator, is 16,800 stades. Again from the equator to the other tropic is 16,800; from the tropic to the (ant)arctic circle 21,000, and from the (ant)arctic circle to the other pole 25,200 stades.

Thus the distance between the poles comes to 126,000 stades, which is half the circumference of the earth.

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the equatorial circle be drawn on the sphere, and another parallel to it, bounding the frigid zone in the northern hemisphere. Let there be a circle through the poles, cutting these at right angles. Then, as the northern hemisphere contains two quarters of the earth, formed by the equator and the circle drawn through the poles, in each of these a quadrilateral is separated off, of which the northern side is half of the parallel adjacent to the pole, the southern a half of the equator, and the other two are segments of the circle through the poles, opposite to each other and equal in length. In one of

τούτων (δποτέρω δ'οβοέν αν διαφέρειν δόξειεν) ίδρυσθαι. φάμεν την καθ ήμας οίκουμένην, περίκλυστον θαλάττη και Is conviav vhow.

Strabo C. 113:

Προκείσθω δή ή μεν νήσος έν τῷ λεχθέντι τετραπλεύρφ. δετ δε λαβείν το μέγεθος αυτής το φαινόμενον, ἀφελόντας ἀπό μεν τοῦ δλου μεγέθους τῆς γῆς τό ήμισφαίριον τό καθ ήμας, άπό δὲ τούτου τό ήμισυ, 5 ἀπὸ δ'αὖ τούτου πάλιν τὸ τετράπλευρον, ἐν ῷ δἡ τὴν ο Ιπουμένην πετσθαι φαμεν. άνάλογον δέ παι περί του σχήματος υπολαβείν δεί, το φαινόμενον τοίς υποκειμένοις έφαρμόττοντα. άλλ' έπείδη τό μεταξύ του ίσημερινού καὶ τοῦ ληφθέντος παραλλήλου τούτω πρός τῷ πόλω τμή-Ιο μα του βορείου ήμισφαιρίου σπάνδυλός έστι το σχήμα, δ δὲ διὰ τοῦ κόλου δίχα τέμνων τὸ ἡμισφαίριον δίχα τέμνει και τον σπόνδυλον και σοιεί το τετράπλευρον, έσται δηλονότι σπονδύλου έπιφανείας ήμισυ το τετράπλευρον & έπίπειται το 'Ατλαντικόν πέλαγος. ή δ'οίπουμένη Ιδ χλαμυδοειδής έν τούτω νήσος, έλάττων ή ήμισυ του τετραπλεύρου μέρος ούσα. φανερόν δέ τοῦτο έκ τε γεωμετρίας αύτο γάρ το διά θάλπος ἀρίμητον τοθ τετραπλεύρου, πλάτος μεν έχον δυτανισχιλίων καὶ δυταποσίων σταδίων, μήπος δὲ τὸ μέγοστον μυριάδων δώδεκα 20 και έξακισχιλίων, όσον έστιν ήριου του ίσημερινου.

these quadril ference which like an islan

PATRIC V YOU ON Lot I have descri separating fr hemisphere, i quadrilateral By similar re about its sha tions. But between the next to the circle through also cuts the quadrilatera Atlantic lie The inhabite th18, as 1t This is prov the quadrila eight thousa hundred and

is to say ha

) 18p0σθαι. Θαλάττη καί

(BEVTI TETid varvo-THE YHE ήμισυ, 8h Thy sepi tou some inévois σονισαμη - hat who δ σχήμα, δ Sixa Té-EUPOV. d rerpanheub'olnovnévn TOT TET-TE YEWHEntov tos nai ontaыч оббена

Eptvov.

these quadrilaterals, and it would appear to make no difference which, I say our inhabited world is situated, like an island washed all round by the sea.

not you war thicks " " are seed to love for the

Let the island, then, lie in the quadrilateral I have described. We must take its size as it appears, separating from the whole size of the earth our own hemisphere, from this one half, and from this again the quadrilateral in which I say our inhabited world lies. By similar reasoning we must also make our supposition about its shape, fitting what is evident to our assumptions. But since the segment of the northern hemisphere between the equator and the circle drawn parallel to it next to the pole is a spinning-whorl in shape, and the circle through the pole, cutting the hemisphere in half, also cuts the spinning-whoel in half and thus forms the quadrilateral, clearly the quadrilateral on which the Atlantic lies will be the shape of helf a spinning-whori. The inhabited world will be a cloak-shaped island within this, as it is less than half the size of the quadrilateral. This is proved by geometry too. . . . For the part of the quadrilateral which is uninhabitable because of heat, eight thousand eight hundred stades in breadth, and a hundred and twenty-six thousand long at its maximum, that is to say half of the equator (is by itself more than

μετζόν έστι τοῦ ἡμίσους τῆς οἰκουμένης, καὶ ἔτι κλέον ἄν εῖη τὸ λοικόν.

174: Hipp. ap. Strab. I. C. 56:

καὶ γὰρ κατ'αὐτὸν 'Ερατοσθένη τὴν ἐκτὸς Θάλατταν ἄκασαν συρροῦν είναι, ὥστε καὶ τὴν ἐσκεριον καὶ τὴν 'Ερυθρὰν Θάλὰτταν μίαν είναι.

175: Strabo 3. 74:

της 'Ινδικης δυνατόν, ως φησιν ό των τόπων ήγησάμενος τούτων Πατροκλης.

176: Galon: Είς το 'Ιπποκράτους περί Χυρων 'Υπόμνημα 0. 5681

ή μεζς δὲ ἐν τῷ διαγράμματι κατά τὸν Κυρηναικὸν Ἐρατοσθένην τὸν κόσμον εἰς τέσσαρα διαιρήσομεν,
εἰς τὴν ἀνατολῆν, δύσιν, μεσημβρίαν καὶ τὴν ἄρκτον,
καὶ τοὺς πρώτους τῶν ἀνέμων ἐν τούτοις Θήσομεν.

- 5 είτα τους άλλους τους έν τῷ μεταξύ ὅντας τέσσαρας.
 &ς ἀναμέσον τοῦ ἀπηλιώτου καλουμένου καὶ νότου κατὰ
 τὴν χειμερινήν ἀνατολήν εὖρον. ἀναμέσον δὲ τοῦ
 νότου καὶ τοῦ ζεφύρου κατὰ τὴν χειμερινήν δύσιν τὸν
 λίβα. ἀναμέσον δὲ τοῦ ζεφύρου καὶ τοῦ ἀπαρκτίου
- 10 τον καλούμενον καθρον. ἀναμέσον δὲ τοῦ ἀπαρκτίου τε καὶ ἀπηλιώτου βορράν. ἔστω τοίνον ἐν τῷ ἰσω ἐπιπ πέδω κέντρον τὸ α, τοῦ δὲ γνώμονος τοῦ ρ σκιὰ ἡ πρὸ τῆς μέσης ἡμέρας ἡ ο, ἀφ'οῦ β, ἀπὸ δὲ τοῦ α κέντρου

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In these dividended the wind call is Eurus; between is Lips; between

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Бико задада эрода энт 174 от часно и чат чалада чрода

Even according to Eratosthenes himself the outer sea is entirely continuous, so that the western sea (the Atlantic) and the Erythrean (the Indian Ocean) are one.

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לפי של דם ל אמו דם אלעד פע פעשם יות בסכ דם בלפת פונ

CHITTICS INC. OF WhYERE Also he says it (the northern outlet from the or votostly in sould be forwards or Caspian) provides a possible route for sailing round from India, according to Patrocles who governed these districts. ward to e, and sorgreov oquetov da ditore, av to between

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In my diagram I shall divide the world into four, like Eratosthenes of Cyrene: east, west, south, and north. In these divisions I shall place the chief winds, and afterwards those in between, four in number. Thus, between the wind called Apeliotes and Notus, by the winter sunrise, is Eurus; between Notus and Zephyrus, by the winter sunset, is Lips; between Zephyrus and Aparctias is the wind called Caurus; and between Aparctias and Apeliotes is Boreas.

Now on the level plane let there be a centre A. Let the shadow O of the gnomon R before mid-day fall on the point B. With centre A and radius AB describe a

πρός το της σπιάς σημετον ο β άχθω πύπλος. άνατεθέντος

15 δὲ τοῦ γνώμονος, ὅπου καὶ πρότερον ἢν, ἀναμένειν χρὰ ἔως ἄν ἐλάττων γένηται. καὶ κάλιν αὐξανομένη τὴν πρὸς τὴν μέσην ἡμέραν τὴν κ σκιὰν τῷ πρὸ τῆς μέσης ἡμέρας σκιῷ τόην ἐργάζεται καὶ ἄπτεται τῆς τοῦ κύκλου γραμμῆς τῆς γ, τότε δὲ ἀπὸ τοῦ β σημείου καὶ τοῦ γ γεγράφθω κατὰ

20 χιασμόν γραμμή, άφ'οδ τό δ. Επειτα πάλιν κατά χιασμόν άφ'οδ τό δ καὶ τό κέντρον άχθω γραμμή πρός τό πέρας είς τὰς αξ γραμμάς, αὐτη γὰρ ή γραμμή ἐνδείξεταί σοι τὴν μεσημβρινήν τε καὶ άρκτικήν χώραν. λαμβανέτω δὲ ἐξῆς ὅλου τοῦ κύκλου τὸ δεκαεκταῖου μέρος καὶ τίθεσθον τὸ

25 κέντρον έν τῷ μεσημβρινῷ γραμμῷ, ἦπερ τοῦ κύκλου ἄπτεται κατά τὸ ε, καὶ ποιητέον σημεῖον ἀπ'ἀριστερῶν καὶ δεξιῶν, ἀφ'οὸ τὸ η καὶ τὸ θ. ἄσαύτως δὲ ἐν τῷ ἀρκτικῷ χώρς κατά τὴν γραμμὴν τὴν ἀρκτικὴν τὸ κέντρον θετέον ἀφ'οὸ τὸ ζ καὶ ἀπὸ τῆς δεξίᾶς καὶ εὐωνύμου σημεῖα ποιητέον τὰ ε

30 καὶ κ, καὶ ἀπό τοῦ η εἰς κ καὶ ἀπό τοῦ θ εἰς ι διὰ τοῦ κέντιου ἄχθωσαν γραμμαί. τὸ μὲν οδν διάστημα ἀπό τοῦ η πρός τὸ θ τοῦ νότου πνεύματος καὶ τῆς μεσημβρίας ἔσται χωρίον, τὸ δὲ ἀπό τοῦ ι καὶ κ τῶν ἄρκτων. τὰ δὲ λοιπὰ μέρη ἀπό δεξίας τρία, ἀπ'ἀριστερᾶς δὲ ἴσον ἀριθμὸν

35 διαιρετέον ΐσως τὰ μὲν πρός τὴν ἀνατολὴν πρός τὸ λ καὶ μ, καὶ ἀπὸ δυσμῶν πρός τὸ ν καὶ ο. ἀπὸ τοῦ μ πρός τὸ ο, ἀπὸ δὲ τοῦ λ πρός ιὸ ν κατὰ χιασμὸν ἀκτέαι γραμμαί.

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άνατεθέντος VELV XPH EUC την πρός την iépac oniq papping the афвы ната nata Xiaonov τό πέρας είς र जा कीए ÉTW DE ÉÉNG θεσθον τὸ ιύκλου απτεται iv nat begiav, grang xweg τέον ἀφ'οδ τὸ οιητέον τὰ ε दि । है। वे पठि thua and too h μβρίας Εσται rà 82 hoind άριθμόν poc to a nat ,0 or soan 4 co.

Ypappai.

circle B. After replacing the gnomen in position, wait while the shadow shortens toward mid-day, when it lengthens again and becomes equal to the shadow before mid-day, and meets the circumference of the circle at G, then from the points B and G draw straight lines intersecting in the point D. New John D and the centre and produce to the opposite side of the circle at Z; this line will indicate the directions south and morth.

Next take one sixteenth part of the whole circumference. Place the point of the compasses on the south-line, which meets the circumference at E, and mark the points H. and T on thelieft and right. In the same way on the northern side place the compasses on the north-line at Z and on the right and left mark the points I and K. Join HK and TI through the centre. The space between H and T will then be the district of the south and of the wind Notus, and that between I and K that of the horth. The remaining part on the right must be divided into three equal parts and that on the left into the same number, by the points L and M to the east and the points N and O to the west. Join MO and LN by in-

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κατά μεν ούν τούτον τον τρόπον όκτω έσται ίσα των άνέμων τε και πνευμάτων κατά περίοδον διαστήματα. Τρείς γούν

- 40 ἀνατολικοὶ ἄνεμοί εἰσιν ὡς εὖρος, ὅτι ἀπὸ τῆς ἔω μέει, δεύτερος δὲ ἀπὸ τῶν ἀνατολῶν κατὰ τὸν Θερινόν καὶ τροκικόν
 ὅρον, βορρεής, ὄν "Ομηρος αἰθρηγενέτην καλεῖ. Τρίτος
 δὲ ἀπὸ τῆς χειμερινῆς ἀνατολῆς κλείων, ὅτι ἐν τῷ μεταξὸ
 κεῖται τοῦ τε νότου καὶ τοῦ εὖρου εὐρόνοτος καλούμενος.
- 45 τρεῖς δέ εἰσι τούτοις ἐναντίοι ἀκὸ τῶν ὁυσμῶν, εἰς μὲν ἀργέστης ὂν καὶ καθρόν τινες ὁνομάζουσιν, ὅσκερ ἀντικνεῖ τῷ βορρῷ, ἔτερος δὲ ζέφυρος, ὅς ἀντικνεῖ τῷ εὖρψ, τρίτος δὲ λίψ, ὅς ἀντὶ τοῦ εὐρονότου κνεῖν φαίνεται. ἡ δὲ μεσημβρία ἔνα μόνον ἄνεμον ἔχειν λέγεται τὸν νότον,
- 50 τουνομα άπο της φύσεως αὐτου έχοντα, άχλυώσης γάρ έστι καὶ νοτίδας έπιφέρει ή δὲ άρκτος καὶ αὐτή ἔνα κατέχει τὴν ἀπαρκτίαν. τοῦτο δὲ γίνεται ὅτι ἀνατολή καὶ δύσις μεταβάλλονται, ἡ μεσημβρία δὲ καὶ ἄρκτος μόνικοι.

177: Strabo C. 62 f.:

"Εξής δὲ τὸ πλάτος τῆς οἰκουμένης ἀφορίζων φησὶν ἀπὸ μὲν Μερόης ἐπὶ τοῦ δι'αὐτῆς μεσημβριοῦ μέχρι 'Αλεξανδρεάς εἰναι μυρίους, ἐνθένδε εἰς τὸν 'Ελλήσποντον περὶ ὁντακισχιλίους ἐκατόν, εἴτ'εἰς Βορυσθένη πεντακισ" χιλίους, εἶτ'ἐπὶ τὸν κύκλον τὸν διὰ Θούλης (ἤν φησι Πυθέας ἀπὸ μὲν τῆς Βρεττανικῆς ἔξ ἡμερῶν πλοῦν ἀπέχειν πρὸς ἄρκτον, ἐγγὸς δ'εἶναι τῆς πεπηγυίας Θαλάττης) ἄλλους

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de poptoue xillow sevennoutoue. tav obv Er: speckings In this way there will be eight equal spaces round the circle for the cardinal and subsidiary winds. There are three easterly winds: first, Eurus, so called because it comes from the Dawn (Eos); second, from the summer tropic sunrise, Boreas, which Homer calls Etherborn; the third, blowing from the winter sunrise, because it lies in between Notus and Eurus is called Euronotus. Opposite to these are the three westerlies: first, Argestes, which some call Caurus, and which blows opposite to Boreas; second, Zephyrus, which blows opposite to Eurus; and the third, Lips, which appears to blow on the opposite side to Euronotus. The south is said to possess only one wind, Notus, so called from its nature, for it is misty and brings the damp. The north likewise has one wind, Aparetias. The reason for this is that sunrise and sunset change, while south and north are constant, because . selve and . selve and . selve and .

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Next, defining the breadth of the inhabited world, he says that the distance from Merce
along the meridian drawn through it to Alexandria is
ten thousand stades, from there to the Hellespont
about eight thousand one hundred, on to the Borysthenes five thousand, and then to the latitude of
Thule (which Pytheas says is six days' sail to the

mest of Lithing and manifest decis.

ώς μυρίους χιλίους πενταποσίους. ἐὰν οὖν ἔτι προσθώμεν ὑπὲρ τὴν Μερόην ἄλλους πρισχιλίους τετραποσίους, ἴνα Ιο τὴν τῶν Αἰγυπτίων νῆσον ἔχωμεν καὶ τὴν Κινναμωμοφόρον καὶ τὴν Ταπροβάνην, ἔσεσθαι σταδίους τρισμυρίους ὁκτακισχιλίους.

178: Strabo C. 125. 126:

βορές τετρακισχιλίων που σταδίων, δ δὲ περίπλους διπλάσιος. δ δ' Ερατοσθένης ταύτην μὲν τῶν ναυτικῶν
είναι φησι τὴν ὑπολήψιν περὶ τοῦ διάρματος τοῦ πέλάγους, τῶν μὲν οὕτω λεγόντων, τῶν δὲ καὶ ππντακισχιλίους οὑκ ὁκνούντων εἰπεῖν, αὐτὸς δὲ διὰ τῶν σκιοθηρικῶν γνωμόνων ἀνευρεῖν τρισχιλίους ἐπτακοσίους
πεντήκοντα.

179: Strabo. C. 134:

διήμει 8'δ παράλληλος ούτος ματ' Ερατοσθένη διά Καρίας, Λυμαονίας, Καταονίας, Μηδίας, Κασπίων πυλων, 'Ινδών των ματά Καύμασον.

180: Strabo. C. 134:

Μ Αυσιμαχείας, δυ φησιν Ερατοσθένης διά Μυσίας είναι καὶ Παφλαγονίας καὶ των περί Σινώπην καὶ Υρκανίαν καὶ Βάκρα.

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Lysimachia, wi Mysia, Paphla and Bactra. τι προσθώμεν ους, ζνα πμωμοφόρον ρίους όντα-

ξάνδρειαν πλους διναυτικών τοῦ πέτωντακιστῶν σκιοκοσίους

*Ερατοσθένη Κασπίων πυ-

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foriv & bid riac etvai Ypnaviav north of Britain, and near the frozen sea) some eleven thousand five hundred more. If then we add another three thousand four hundred beyond Meroe, to include the Island of Egypt, the Cinnamon country and Taprobane, the total will come to thirty-eight thousand stades.

178.

ound you you bear

The straight passage from Rhodes to Alexandria, with a north wind, is about four thousand stades, while the coasting voyage is double. Eratosthenes says that this is the supposition of sea-farers about the open sea passage, some giving this as the distance, while others do not scruple to say five thousand. He himself, using the shadow-catching gnomon, discovered it to be three thousand, seven hundred and fifty.

Spon tro vands 179. of deroys sales froi vindo

According to Eratosthenes this parallel passes
through Caria, Lycaonia, Cataonia, Media, the Caspian
Gates, and the parts of India next to the Caucasus.

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A little further north is the parallel through Lysimachia, which according to Eratosthenes passes through Mysia, Paphlagonia, the district round Sinope, Hyroania, and Bactra.

181: Strabo, C. 135:

φησί δ' Ερατοσθένης τούτους της Μερόης διέχειν μικρώ κλείους ή δισμυρίους τρισχιλίους, διά γάρ Ελλη-σκόντου είναι μυρίους διτακισχιλίους, είτα κεντακισχιλίους είς Βορυσθένης.

182: Straba, 9, 114:

δ μεν οδν Μασσαλιώτης Πυθέας τὰ περὶ

θούλην την βορειοτάτην των Βρεττανίδων ϋστατα λέγει, παρ'οίς δ αὐτός ἔστι τῷ ἀρντικῷ ὁ Θερινός τροπικός κύκλος παρὰ δὲ των ἄλλων οὐδὲν ἱστορῷ, οῦθ'

δτι Θούλη νησος ἄστι τις, οὕτ'εἰ τὰ μέχρι δεῦρο
οἰκήσιμά ἔστιν, ὅπου ὁ Θερινός τροπικός ἀρκτικός γίνεται.

183: Strabe C. 64, 65:

παραμυθούμενος δ'έπὶ πλέον, ὅτι κατὰ
φύσιν ἐστὶ τὸ ἀπὸ ἀνατωλῆς ἐπὶ ὅύσιν διάστημα
μεῖζον λέγειν, κατὰ φύσιν φησὶν εἶναι ἀπὸ τῆς
ἔω πρὸς τὴν ἐσπέραν μακροτέραν εἶναι τὴν οἰκουμένην,
5 καὶ, καθάπερ εἰρῆκαμεν, ὡς οἰ μαθηματικοί, κύκλον
συνάπτειν, συμβάλλουσαν αὐτὴν ἐαυτῆ΄ ὤστ'ς εἰ
μὴ τὸ μέγεθος τοῦ ᾿Ατλαντικοῦ πλλάγους ἐκώλυε,
κὰν κλεῖν ἡμᾶς ἐκ τῆς Ἰβηρίας εἰς τὴν Ἰνδικὴν διὰ
τοῦ αὐτοῦ παραλλήλου τὸ λοικὸν μέρος ὅν τοῦ ὅλου

10 κύκλου εἴπερ ὁ δι ᾿Λθηνῶν ἐλάττων ἐστὶν εἴκοσι

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tab vigor dero versign gla 181 radaghronan wonder, valbeque Eratosthenes says that this district is a little more than twenty-three thousand stades from Merce, for the parallel through the Hellespont is eighteen thousand, and from there on to the Borysthenes is five thousand. - who we dered the fire the shiele of the state of the st

total name code to and chair 182. I want for the confidence of

Pytheas of Massilia, at least, says that the region of Thule, the most northern of the British Isles, is the furthest limit, and that there the summer tropic is the same as the arctic circle. From other authorities I cannot learn at all, either that there is an island called Thule, or whether the land is habitable as far as where the summer tropic becomes the arctic circle.

The state of the s

He urges further that it is according to nature to say that the distance from east to west is greater, and says that it is according to nature for the inhabited world to be greater from east to west. "As I have already stated," he says, "in the mathematical manner, it joins itself and completes a circle. Thus, if the expanse of the Atlantic did not prevent it, we could actually sail the remaining part of the circle from Iberia to India along the same parallel; if, that is, the parallel through Athens, where I have computed the previously-mentioned measurement

μυριάδων, δπου πεποιήμεθα τον είρημένον σταδιασμόν άπο της 'Ινδικής είς την 'Ιβηρίαν.

184: Strabo C. 64:

Διαμαρτών δέ του πλάτους ήνάγκασται καὶ του

μήνους άστοχεϊν. ὅτι μὲν γὰρ κλέον ἢ δικλάσιον τὸ γνώριμον μῆνος ἐστι τοῦ γνωρίμου κλάτους, ὁμολογοῦσι καὶ
οἱ ὕστερον καὶ τῶν καλαιῶν οἱ χαριἔστατοι· λέγω δὲ τὸ
δ ἀκὸ τῶν ἄκρων τῆς 'Ινδικῆς ἐκὶ τὰ ἄκρα τῆς 'Ιβηρίας
τοῦ ἀκ' Αἰθιόκων ἔως τοῦ κατὰ 'Ιέρνην κύκλου, ὁρίσας
δὲ τὸ λεχθὲν κλάτος, τὸ ἀκὸ τῶν ἐσχάτων Αἰθιόκων μέχρι
τοῦ διὰ Θούλης ἐκτείνει κλέον ἢ δεῖ τὸ μῆκος, ἴνα
ποιήση κλέον ἢ δικλάσιον τοῦ λεχθέντος κλάτους.

- ΙΟ φησί γουν το μέν της 'Ινδικής μέχρι του 'Ινδου κοταμου το στενότατον σταδίων μυρίων Εξακισχιλίων.
 το γάρ έπὶ το άκρωτήρια τεΐνον τρισχιλίοις εἶναι μετζον:
 το δὲ ἔνθεν έπὶ Κασπίους πύλας μυρίων τετρακισχιλίων,
 εἴτ ἐπὶ τὸν Εὐφράτην μυρίων, ἐπὶ δὲ τὸν Νεῖλον ἀκὸ
- Τριαποσίους μέχρι Κανωβιπού, στόματος, εἶτα μέχρι τῆς Καρχηδόνος μυρίους τρισχιλίους πενταποσίους, εἶτα μέχτ τῆς ρι Στηλών ὁπταπισχιλίους τοὐλάχιστον, ὑπεραίρειν δὴ τῶν ἐπτὰ μυριάδων ὁπταποσίοις. δεῖν δὲ ἔτι προσθεῖναι τὸ
- 20 έπτος "Ηραπλείων στηλών πύρτωμα της Εθρώπης, άντιπεί" μενον μέν τοϊς "Ιβηροι, προπεπτωπός δέ πρός την έσπέραν,

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obs sharrow orables recentlies, and ad happeriple at from India to Iberia, is in fact less than two hundred thousand stades in circumference." Tope vegoto verostos ver vis escuela order pron ser

no vanta'a arunr .voc.184.or r volemb vrented onton as Since he fails to estimate the breadth correctly he is bound to miss the length also. Both the later writers and the most able of the ancients agree that the known length is more than double the known breadth: I mean that from the extremities of India to the extremities of Iberia is double the distance from Ethiopia to the Latitude of Jerne. Eratosthenes, having defined the said breadth from the limits of Ethiopia to the latitude of Thule, stretches out the length more than is proper in order to make it more than double the said breadth. At least he says that the narrowest part of India, as far as the river Indus, measures sixteen thousand stades: the part stretching to the capes is three thousand greater. From there to the Caspian Gates is fourteen thousand, from there to the Euphrates ten thousand, from the Euphrates to the Nile five thousand. To the mouth at Canopus is another thirteen hundred, from there to Carthage thirteen thousand five hundred, and to the Pillars at least eight thousand. The total, then, he says, is eight hundred in excess of seventy thousand. There is still to be added the bulge of Europe outside the Pillars of Heracles, lying in front of Iberia and projecting westwards: this is not less than

ούν έλαττον σταδίων τρισχιλίων, καὶ τὰ ἀνρωτήρια τὰ τε ἄλλα καὶ τὸ τῶν 'Ωστιμίων, ὁ καλεῖται Κάβαιον, καὶ τὰς κατὰ τοῦτο νήσους, ὧν τὴν ἐσχάτην Οὐξισάμην φησὶ τὰς κατὰ τοῦτο νήσους, ὧν τὴν ἐσχάτην Οὐξισάμην φησὶ τὰς κατὰ ἀκέχειν ἡμερῶν τριῶν πλοῦν. ταῦτα δ'εἰκῶν τὰ τελευταῖα οὐδὲν πρὸς τὸ μῆκος συντείνοντα προσέθηκε τὰ περὶ τῶν ἀνρωτηρίων καὶ τῶν 'Ωστιμίων καὶ τῆς Οὐξισάμης καὶ ὧν φησι νήσων. (ταῦτα γὰρ κάντα προσέθητιά ἐστι καὶ Κελτικά, οὐκ 'Ιβηρικά, μᾶλλον δὲ Πυθέου άρκτιά ἐστι καὶ Κελτικά, οὐκ 'Ιβηρικά, μᾶλλον δὲ Πυθέου διαστήμασιν ἄλλους σταδίους δισχιλίους μὲν πρὸς τῷ δύσει, δισχιλίους δὲ πρὸς τῷ ἀνατολῷ, ἴνα σώση τὸ μὴ πλέον ἡ ῆμισυ τοῦ μήκους τὸ κλάτος.

185: Strado G. 65:

'Εξης δὲ περὶ τῶν ἡπείρων εἰπῶν γεγονέναι ποτῶν λόγον, καὶ τοὺς μὲν τοῖς ποταμοῖς διαιρεῖν αὐτάς,

τῷ τε Νείλφ καὶ τῷ Ταναίδι, νήσους ἀποφαίνοντας, τοὺς

δὲ τοῖς ἰσθμοῖς, τῷ μεταξὺ τῆς Κασπίας καὶ τῆς Ποντικῆς

5 θαλάσσης καὶ τῷ μεταξὺ τῆς 'Ερυθρᾶς καὶ τοῦ 'Εκρήγματος,

τούτους δὲ χερρονήσους αὐτὸς λέγειν, οὐχ ὁρᾶν φησι, πῶς

ἀν εἰς πρᾶγμά τι καταστρέφοι ἡ ζήτησις αὕτη, ἀλλὰ μότον

νον ἔριν διαιτώντων μᾶλλον κατὰ Δημόκριτον εἶναι. μἡ

ὄντων γὰρ ἀκ, ιβῶν ὅρων καθάπερ Κολυττοῦ καὶ Μελίτης,

10 οἰον στηλῶν ἡ περιβόλων, τοῦτο μὲν ἔχειν φάναι ἡμᾶς,

ὅτι τουτὶ μέν ἐστι Κολυττός, τουτὶ δὲ Μελίτη, τοὺς

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three thousand stades. There are also the capes, especially that of the Ostimii, named Cabaeum, and the islands
in this neighborhood, of which Pytheas says the furthest,
Uxisame, is three days' sail away. After mentioning
these last places, though they all together do not affect
the length, he adds the parts about the capes, the Ostimii,
Uxisame, and the islands he mentions; all of which lie to
the north, and are rather Celtic than Spanish, or more
likely still inventions of Pytheas. Further, he adds to
the said distances of the length another two thousand
stades to the west and two thousand to the east, to save
the breadth from being more than half the length.

m přempadě, a i vomě, javá vom 185. romě poměna abitá bylá páce

Next he says that there has been much argument about the continents: some have divided them by the rivers Nile and Tanais, explaining that they are islands, others by the isthmuses between the Caspian and Pontic Seas, and between the Erythraean Sea and the Outbreak (of Lake Sirbonis), claiming that they are peninsulas. He does not see how this research can effect anything practical; it is just a matter for those who, like Democritus, live on disputation. When there are no exact boundaries, such as stone pillars or fences as with Colyttus and Melite, all we can say is: "This is Colyttus, and this is Melite", but

ορους δὲ μὴ ἔχειν εἰπεῖν. διὸ καὶ συμβαίνειν κρίσεις πολλάκις περὶ χωρίων τινών, καπάπερ 'Αργείοις μὲν καὶ Λακεδαιμονίοις περὶ Θυρέας, 'Αθηναίοις δὲ καὶ Βοιωτοῖς 15 περὶ 'Πρωποῦ. ἄλλως τε τοὺς "Ελληνας τὰς τρεῖς ἡπείρους ὁνομάσαι, οὐκ εἰς τὴν οἰκουμένην ἀποβλέψαντας, ἀλλ'εἰς τε τὴν σφετέραν καὶ τὴν καταντικρὸ τὴν Καρικήν, ἐφ' ἡ νῦν "Ιωνες καὶ ρὶ ἐξῆς. χρόνω δὲ ἐπὶ πλέον προιόντας ἀεὶ καὶ πλειόνων γνωριζομένων χωρῶν εἰς τοῦτο τος ἀεὶ καὶ πλειόνων γνωριζομένων χωρῶν εἰς τοῦτο τος ἀεὶ καὶ πλειόνων γνωριζομένων χωρῶν εἰς τοῦτος το καταστρέψαι τὴν διαίρεσιν.

186: Strabo C. 66:

and die keitens at the length amplied bee them

*Επὶ τέλει δὲ τοῦ ὑπομνήματος οὐκ ἐπαινέσας τοὺς δίχα διαιροῦντας ἄπαν τὸ τῶν ἀνθρώπων πλήθος εἰς τε "Ελληνας καὶ βαρβάρους, καὶ τοὺς 'Αλεξάνδρφ παραι" νοῦντας τοῖς μὲν 'Ελλησιν ὡς φίλοις χρήσθαι, τοῖς δὲ βαρβάροις ὡς πολεμίοις, βέλτιον εἶναί φησιν ἀρετῆ καὶ κακία, διαιρεῖν ταῦτα. πολλοὺς γὰρ καὶ τῶν 'Ελλήνων εἶναι κακοὺς καὶ τῶν βαρβάρων ἀστείους, καθάπερ 'Ινδοὺς καὶ 'Αριανούς, ἔτι δὲ 'Γωμαίους καὶ Καρχηδονίους, οὖτω θαυμαστῶς πολιτευομένους. διόπερ 10 τὸν 'Αλέξανδρον, ἀμελήσαντα τῶν παμαινούντων, ὅσους οἶον τ'ῆν ἀποδέχεσθαι τῶν εὐδοκίμων ἀνδρῶν καὶ εὐτ εργετεῖν.

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we cannot define the boundaries. In this way occur frequent disputes about some places, like those about Thyreae between the Argives and the Spartans, or about Oropus between the Athenians and the Bosotians. Further the Greeks named the three continents irrationally, not with regard to the whole inhabited world, but only with regard to their own country and that facing them, Caria, where the Ionians live now and their neighbours. As in time they advanced further and new countries became known they brought their division to its present position.

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. Towards the end of the Essay he censures people who divide the whole mass of mankind into two categories, Greeks and foreigners, and also those who advised Alexander to treat Greeks as friends and foreigners as enemies. It would be better, he says, to make this division according to goodness and badness; for many of the Greeks are bad, and many foreigners civilized, such as the Indians and Arianians, and still more the Romans and Carthaginians, whose states are so admirably organized. Thus Alexander paid no attention to his advisers, but received and honoured as many men of good reputation as he could. To de could with the -per out with the majorance recent at warpen expense to

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Book III: 187-285:

187: Strabo C. 67, 68:

Της οἰπουμένης πίνακα γραμμή τινι διαιρεί δίχα ἀπό δύσεως ἐπ'ἀνατολὴν παραλλήλω τῷ ἰσημερινῷ γραμμῷ. πέρατα δ'αὐτης τίθησι πρὸς δύσει μὲν τὰς 'Ηρακλείους στήδας, ἐπ'ἀνατολῆς δὲ τὰ ἄκρα καὶ ἔσχατα ὅρη τῶν ἀφοριζόντων ὑρῶν τὴν πρὸς ἄρκτον τῆς 'Ινδικῆς πλευράν. γράφει δὲ τὰν γραμμὴν ἀπὸ Στηλῶν διὰ τε τοῦ Σικελικοῦ πο, θμοῦ καὶ τῶν μεσημβρινῶν ἄκρων τῆς τε Πελοποννήσου καὶ τῆς 'Αιτικῆς, καὶ μέχρι τῆς 'Γοδίας καὶ τοῦ 'Ισσικοῦ κόλπου. 10 μέχρι μὲν δὴ δεῦρο διὰ τῆς θαλάττης φησίν είναι τὴν λεχ-

θείσαν γραμμήν και των παρακειμένων βπείρων (και γάρ αὐπέχρι τῆς Κιλικίας) εἶτα ἐπ'εὐθείας πως ἐκβάλλεσθαι καρ'
κέχρι τῆς Κιλικίας) εἶτα ἐπ'εὐθείας πως ἐκβάλλεσθαι καρ'
δλην τὴν ὀξεινὴν τοῦ Ταύρου μέχρι τῆς 'Ινδικής. τὸν γάρ

15 Τασρον έπ' εὐθείας τῷ ἀπὸ Στηλών θαλάττῃ τεταμένον δίχα τὴν 'Ασίαν διαιρείν ὅλην ἐπὶ μῆνος, τὸ μὲν αὐτῆς μέρος βόρειον ποιοϋντα, τὸ δὲ νότιον: Ϣσθ' ὁμοίως καὶ αὐτὸν ἐπὶ τοῦ δι' 'Αθηνών ἱδρῦσθαι καραλλήλου καὶ τὴν ἀπὸ Στη-λών μέχρι δεῦρο θάλατταν.

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Book III: 187-285: versta variation

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In the third book of his "Geography" he establishes the map of the inhabited world by dividing it in half with a line drawn from west to east parallel to the equator. For the ends of this line he takes the Pillars of Heracles in the west, and in the east the capes and furthest parts of the mountains which bound the northern side of India. He draws it from the Pillars through the Sicilian Strait and the southern capes of the Peloponnese and Attica, as far as Rhodes and the Gulf of Issus. Up to here, he says, the said line lies through the sea and the adjacent continents; and indeed our sea itself stretches in this way lengthwise as far as Cilicia. Thence it continues more or less straight along the whole range of the Taurus as far as India; for the Taurus, extending in a straight line with the sea from the Pillars, divides all Asia in half lengthwise, making of it a northern and a southern part. Thus the range and the sea from the Pillars to here are situated in the same way on the parallel through Athens . . . deapy d's aren and Ar er

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20 Ταθτα δ'είκων δίεται δείν διορθώσαι τον άρχαίον γεωγραφικόν πίνακα. πολύ γάρ ἐπὶ τὰς ἄρκτους
παραλλάττειν τὰ ἐωθινὰ μέρη των ὁρων κατ'αὐτόν, συνεπισπάσθαι δὲ καὶ τὴν 'Ινδικὴν ἄρκτικωτέραν ἢ δεί γινομένην. πίστιν δὲ τούτου φέρει μίαν μὲν τοιαύτην,
25 ὅτι τὰ τῆς 'Ινδικῆς ἄκρα τὰ μεσημβρινώτατα δμολογούσι

25 ότι τὰ τῆς 'Ινδικῆς ἀκρα τὰ μεσημβρινωτάτα ομολογουσι κολλοὶ τοῖς κατὰ Μερόην ἀνταίρειν τόποις, ἀκό τε τῶν ἀέρων καὶ τῶν οὐρανίων τεκμαιρόμενοι, ἐντεῦθεν δ'ἐπὶ τὰ βορειότατα τῆς 'Ινδικῆς τὰ πρὸς τοῖς Καυκασίοις ὅρεσι Πατροκλῆς, ὁ μάλιστα πιστεύεσθαι δίκαιος διά

30 τε τὸ ἀξίωμα καὶ διὰ τὸ μὴ ἱδιώτης εἶναι τῶν γεωγραφικῶν, φησὶ σταδίους μυρίους καὶ πεντακισχιλίους.
ἀλλὰ μὴν καὶ τὸ ἀκὸ Μερόης ἐκὶ τὸν δι' Αθηνῶν καράλληλον τοσοῦτόν κώς ἐστιν, ἄστε τῆς Ἰνοικῆς τὰ προσάρκτια μέρη συνάκτοντα τοῖς Καυκασίοις ὅρεσιν εἰς τοῦτον
35 τελευτᾶν τὸν κύκλον.

"Αλλην δὲ πίστιν φέρει τοιαύτην, ὅτι τὸ ἀπὸ τοῦ 'Ισσικοῦ κόλπου διάστημα ἔπὶ τὴν θάλατταν τὴν Ποντικὴν τρισχιλίων πώς ἔστι σταδίων πρὸς ἄρκτον ἰόντι καὶ τοὺς περὶ 'Αμισόν ἢ Σινώπην τόπους, ὅσον καὶ τὸ πλάτος 40 τῶν ὁρῶν λέγεται· ἔκ δὲ 'Αμισοῦ πρὸς τὴν ἰσημερινὴν ἀνατολὴν φερομένω πρῶτον μὲν ἢ Κολχίς ἔστιν, ἔπειτα ἡ ἔπὶ τὴν 'Υρκανίαν θάλατταν ὁπέρθεσις καὶ ἢ ἔφεξῆς ἡ ἔπὶ Βάκτρα καὶ τοὺς ἔπέκεινα Σκύθας ὁδὸς δεξιὰ ἔχοντι τὰ ὅρη· αὕτη δ'ἡ γραμμὴ διὰ 'Αμισοῦ πρὸς δύσιν

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After saying this he thinks fit to readjust the old map. According to it, he says, the eastern parts of the mountains deviate far to the north, and India is pulled with them, thus becoming more northerly than it should. One proof he adduces of this is to the effect that many agree that the southernmost capes of India rise opposite to the district round Merce, judging by the climate and the celestial phenomena, and that from there to the northern extremities of India, by the Caucasus mountains, Patrocles, who is most worthy of belief owing to his good reputation and his being no layman in geography, says the distance is fifteen thousand stades. Well, then, the distance from Merce to the parallel through Athens is about sufficient to make the northern parts of India, touching as they do the Caucasus mountains, end at this parallel. whilened wolquipris id pusybise countries

Another proof he adduces is to the effect that
the distance from the Gulf of Issus to the Pontic Sea is
about three thousand stades if you go northwards towards
the district round Amisus or Sinope, which is equal to
the reputed breadth of the mountains. If you proceed
towards the equinoctial sunrise, the first place is Colchis, next the pass to the Hyroanian sea, and after that
the road to Bactra and the Soythians beyond, with the
mountains on the right. This line, produced through

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45 ἐκβαλλομένη διὰ τῆς Προποντίδος ἐστι καὶ τοῦ 'Ελλησποντου, ἀπὸ δὲ Μερόης ἐπὶ τὸν 'Ελλήσποντον οἱ
πλείους εἰσι τῶν μυρίων καὶ ὁκτακισχιλίων σταδίων, ὅσοι καὶ ἀπὸ τοῦ μεσημβρινοῦ πλευροῦ τῆς
'Ινδικῆς πρὸς τὰ περὶ τοὺς Βακτρίους μέρη, προστε50 Θέντων τρισχιλίων τοῖς μυρίοις καὶ πεντακισχιλίοις,
ὧν οἱ μὲν τοῦ πλάτους ἦσαν τῶν ὁρῶν, οἱ δὲ τῆς 'Ινδικῆς.

188: Strabo. C. 87:

καίτοι έκετνόν γε και καρά τετρακοσίους σταδίους αίσθητά άποφαίνεσθαι τὰ παραλλάγματα, ώς έπὶ τοῦ δι' Αθηνών παραλλήλου καὶ τοῦ 'Ρόδου. . . . δ μέν οδν δι Αθηνών παράλληλος γνωμονικώς ληφθείς 5 και δ διά 'Ρόδου και Καρίας, είκότως έν σταδίοις τοσούτοις αίσθητήν έποίησε την διαφοράν. δ δ'έν nhátes nev tosoxilíwy otabíwy, pánes be nat tetpaπισμυρίων δρους, πελάγους δέ τρισμυρίων λαμβάνων την άπο δύσεως έπ' ίσημερινάς άνατολάς γραμμήν, καὶ τά ΙΟ έφ' έκατέρον το μέρος τα μέν νότια ονομάζων, τα δέ βόρεια, καὶ ταῦτα κλινθία καλῶν καὶ σφραγτδας, νοείσθω πώς και ταθτα λέγει και πλευρά τά μεν άρκτικά, τὰ δὲ νότια, καὶ κῶς τὰ μὲν ἐσκέρια, τὰ δὲ ἐωθινά. καὶ τὸ μὲν παρά πολὸ διαμαρτανόμενον παρορών δπεχέτω Ι5 λόγον (δίπαιον γάρ), τὸ δὲ παρά μιπρόν οὐδὲ παριδών έλεγητέος έστίν.

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Amisus westwards, lies through the Propontus and the Hel- t lespont. From Merce to the Hellespont the distance is not more than eighteen thousand stades, namely the distance from the southern side of India to the parts about Bactria with the addition of three thousand to the fifteen thousand, partly for the breadth of the mountains, partly for that of India. The Der for So palous . Wald

ally low of ryon on doll not sale to be ye yold Yet (says Hipparchus) even he indicates that differences in latitude are noticeable over four hundred stades, as in the cases of the parallel through Athens and Rhodes. . . . At least the taking by instruments of the parallel through (i. e. latitude of) Athens and that of Rhodes and Caria naturally, considering the number of stades, showed a noticeable difference. When he, in a case of three thousand stades' breadth and forty thousand stades' length of mountain, and thirty thousand stades of sea, takes his line from west to equinoctial east and names the parts on one side "South- small's ern" and those on the other "northern", calling them "tiles" and "seals", we must realize what he means by these terms "northern sides" and "southern sides", "western wides" and "eastern sides". When he overlooks a large error, let him undergo examination, as is just, but for a small error, even if he has overlooked it, he is not to be refuted.

189: Strabo C. 89, 90:

Οὐ τοῦτο οὖν λεπτέον πρὸς τὸν Ἐρατοσθένη, ἀλλ'
ὅτι τῶν ἐν πλάτει λεγομένων καὶ μεγεθῶν καὶ σχημάτων εἰναί τι δεῖ μέτρον, καὶ ὅπου μὲν μᾶλλον, ὅπου δὲ ἐλάττον
συγχωρητέον. ληφθέντος γὰι τοῦ τῶν ὁμῶν πλάτους τῶν
5 ἐπὶ τὰς ἱσημερινὰς ἀνατολὰς ἐπτεινομένων Τρισχιλίων σταδίων, ὁμοίως δὲ καὶ τοῦ τῆς θαλάττης τῆς μέχρι Στηλῶν,

οίον έν τῷ κλάτει τοῦ Ταύρου καντός καὶ τῆς μέχρι Στηλῶν θαλάττης, ὑκοκειμένων τρισχιλίων σταδίων, ΤΟ νοεῖται ἔν τι καραλληλόγραμμον χωρίον, το κεριγράφον τό τε ὅρος ἄκαν καὶ τὴν λεχθεῖσαν θάλατταν

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ούτω μὲν τοίνυν προσάρκτια ἄν εἴη τὰ ἔθνη ταῦτα, ἐπειδὴ καὶ ἐντὸς τοῦ Ταύρου, Ἐρατοσθένης δέ, πεποιημένος τὴν διαίρεσιν εἰς τὰ νότια μέρη καὶ τὰ προσάρκτια καὶ τὰ ὑπ' αὐτοῦ λεγομένας σφραγτδας, τὰς μὲν βορείους καλῶν, τὰς δὲ νοτίους, ὅρια ἀποφαίνει τῶν κλιμάτων ἀμφοῖν τὰς Κασπίους πύλας εἰκότως οὖν τὰ νοτιώτερα πρὸς ἔω τείνοντα τῶν Κασπίων πυλῶν νότια ἄν ἀποφάινοι, ὧν ἐστι καὶ ἡ Μηδία καὶ ἡ ᾿Αρμενία, τὰ δὲ βορειότερα πρόσβορα, κατ' ἄλλην καὶ ἄλλην διά-

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η τὰ έθνη σθένης δέ. n nai rà τδας, τάς romaives two oc ov tà ολών νότια pevía, λην διά-

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This, then, is no argument against Eratosthenes, but rather that his broad statements both of sizes and of shapes need some standard, and that in some cases more adjustment has to be made, in others less. If, for instance, the breadth of the mountains stretching towards the equinoctial east, and likewise that of the sea as far as the Pillars, are taken as three thousand stades In the case of the breadth of the whole Taurus and of the sea as far as the Pillars, if three thousand stades is assumed, a single parallelogram is visualized bounding the whole range and the said sea. The work of the said sea. sayops paking the sat hayoward be sarehaps, aports

. yorra for volken solutes at or cond vires'd sorvae These tribes, then, may well be taken as northern, as they are inside the Taurus. Eratosthenes, when he makes his division into southern and northern parts, and what he calls "Seals", some of which he names as northern and others as southern, takes as the boundaries of the two "climata" the Casplan Gates. He could quite naturally make the parts to the south-east of the Caspian lates, including Media and Armenia, "southern" and those to the north "northern", as this would follow whatever distribution backure two of its sides are vashed by the southern

ΙΟ ταξιν τούτου συμβαίνοντος. τάχα δὲ οὐκ ἐκέβαλε τούτω, διότι ἔξω τοῦ Ταύρου πρὸς νότον οὐδἔν ἐστιν οὕτε τῆς Αρμενίας μέρος οὕτε τῆς Μηδίας.

191: Strabo C. 69:

ταύτα γάρ δ "Ερατοσθένης λαμβάνει κάντα ώς και έκμαρτυρούμενα ύπό των έν τοίς τόποις γενομέτων, έντετυχηκώς ύπομνήμασι πολλοίς, ών εύπόρει βιβλιοθήκης έχων τηλικαύτην ήλίκην αύτός "Ιππαρχός φησι.

192: Strabo C. 93, 94:

του γάρ 'Ερατοσθένους έπὶ τῶν πόρρω διεστηνότων τὰ παραδεδομένα φάσκοντος έρειν διαστήματα, μὴ διισχυριζομένου δέ, καὶ λέγοντος ὡς παρέλαβε, προστιθέντος δ'ἔστιν δπου τὰ ἐπ'εὐθείας μᾶλλον καὶ ἤττον.

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καὶ δὴ τοῦ νοτίου μέρους πρώτην εἰπών σφραγτδα τὴν 'Ινδικήν, δευτέραν δὲ τὴν 'Αριανήν, ἐχούσας
τι εὐπερίγραφον, ἴσχυσεν ἀμφοτέρων ἀποδοῦναι καὶ
μῆκος καὶ πλάτος, τρόπον δὲ τινα καὶ σχῆμα ὡς ἄν
5 γεωμετρικός. τὴν μὲν γὰρ 'Ινδικὴν βομβοειδῆ φησι
διὰ τὸ τῶν πλευρῶν τὰς μὲν θαλάττη κλύζεσθαι τῷ τε

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is otherwise made. Perhaps, however, he did not pay attention to the fact that no part either of Armenia or of Media lies to the south outside the Taurus.

191.

Eratosthenes takes all these points as established by the evidence of people who have been in the actual places. He came in contact with many records, of which he had plenty if he had a library as large as Hipparchus says himself.

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Eratosthenes says that, where distances in far-off places are concerned, he will give the measurements assigned by tradition but without guaranteeing them, and stating further that they are traditional and adding in some places "in a more or less straight line".

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Thus after naming India as the first Seal of the southern half, and Ariana as the second, since they possessed an outline easy to draw, he was able to represent the length and breadth of each and to some extent their shapes as well, as a geometer naturally would. India he describes as rhomboid in shape, because two of its sides are washed by the southern

νοτίφ καὶ τῆ ἐψς, μὴ κάνυ κολκώδεις ἡόνας κοιούση, τὰς δὲ λοικάς, τὴν μὲν τῷ ὅρει, τὴν δὲ
τῷ κοταμῷ, κἀνταῦθα τοῦ εὐθυγράμμου σχήματος
10 ὑκο τι σωζομένου

194: Strabo C. 76:

Πάλιν δ'έκείνου τον Δηίμαχον ίδιώτην ένοείξασθαι βουλομένου καὶ ἄπειρον τῶν τοιούτων οἰεσθαι
γὰρ τὴν 'Ινοικὴν μεταξό κεῖσθαι τῆς τε φθινοπωρινῆς
ἐσημερίας καὶ τῶν τροπῶν τῶν χειμερινῶν, Μεγασθένει
τε ἀντιλέγειν φήσαντι ἐν τοῖς νοτίοις μέρεσι τῆς

- 'Ινδικής τάς τε άρκτους άποκρύπτεσθαι καὶ τὰς σκιὰς άντιπίπτειν· μηδέτερον γὰρ τούτων μηδαμού τῆς 'Ινδικής συμβαίνειν· ταῦτα δὲ Φάσκοντος ἀμαθῶς λέγεσθαι.

 τοιτε γὰρ τὴν φθινοπωρινὴν τῆς ἐαρινῆς διαφέρειν οἰ-
- 10 εσθαι κατά την διέστασιν την πρός τάς τροπάς άμαθές, του τε κύκλου του αυτου όνιος και της άνατολης. του τε διαστήματος του έπι της γης τροπικού άπο του ίση- μερινου, ών μεταξύ τίθησι την 'Ινδικήν έκετνος, δειχ- θέντος έν τη άναμετρήσει πολύ έλάττονος των δισμυρίων
- 15 σταδίων, συμβήναι αν καὶ κατ' αύτον έκετνον, ὅπερ αὐτὸς νομίζει, ούχ ὁ ἐκετνος ΄ δυετν μὲν γὰρ ἡ καὶ τριῶν
 μυριάδων οὖσαν τὴν 'Ινδικὴν οὐδὲ πεσετν μεταξὸ τοσού-

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and eastern seas, forming shores not much interrupted by gulfs, while the others (are bounded) respectively by the mountain range and the river and here too the rectilinear form is kept within a little.

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The same happens again when Eratosthenes wishes to show up Deimachus as a layman and without experience in such matters. He says that he (D.) thinks that India lies between the autumnal equinox and the winter tropic, and contradicts Magasthenes when he says that in the southern parts of India the sears are hidden and the shadows fall in reverse, on the ground that neither of these phenomena happens anywhere in India, and that when he speaks like that he speaks in ignorance. To think, he says, that the autumn equinox differs from the spring equinox in distance from the tropics is ignorant, for both its path and its rising are the same. Further, as the distance of the terrestrial tropic from the equator, between which Deimachus places India, has been shown in the section on the measurement (of the earth) to be much less than twenty thousand stades, even according to Deimachus himself, not his view but that of Eratosthens would be true; for India could not fall inside such a space if it measured twenty or

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τῆς δ'αὐτῆς ἀγνοίας εἶναι καὶ τὸ μηδαμοῦ τῆς 'Ιν20 δικῆς ἀποκρύπτεσθαι φάσκειν τὰς ἄρκτους μηδὲ τὰς
σκιὰς ἀντιπίπτειν, ὅτε γε πεντακισχιλίους προελθόντι ἀπ' Αλεξανδρείας εὐθὸς συμβαίνειν ἄρχεται.
ταῦτα δὴ εἰπόντα, εὐθύνει πάλιν οὐκ εὖ ὁ "Ιππαρχος,

195: Strabo C. 688:

μάλιστα δ'έκ τῆς διαίτης ἐδόκει τῆς τότε κιστότατα είναι τὰ ὑκὸ τοῦ Ἐρατοσθένους ἐν τῷ τρίτῳ τῶν γεωγραφικῶν ἐκτεθέντα κεφαλαιωδῶς κερὶ τῆς τότε νομιζομένης 'Ινδικῆς, ἡνίκα 'Αλέτουνδρος ἐκῆλθε'.... ἔστι δὲ τοιαῦτα, ἀ λέγει ἑ 'Ερατοσθένης.

Τὴν 'Ινδικήν περιώρικεν ἀπό μὲν τῶν ἄρκι
των τοῦ Ταύρου τὰ ἔσχατα ἀπό τῆς 'Αριανῆς μέχρι
τῆς ἐώας Θαλάττης, ἄπερ οἱ ἐπιχώριοι κατὰ μέρος
10 Παροπάρισόν τε καὶ 'Ηρωδόν καὶ "Ιμαον καὶ ἄλλα
ὁνομάζουσι, Μακεδόνες δὲ Καύκασον' ἀπό δὲ τῆς
ἐσπέρας ὁ 'Ινδὸς ποταμός' τὸ δὲ νότιον καὶ τὸ
προσεφον πλευρόν, πολύ μείζω τῶν ἐτέρων ὅντα,
προπέπτωπεν εἰς τὸ 'Ατλαντικόν πέλαγος, καὶ γί15 νεται βομβοειδὲς τὸ τῆς χώρας σχῆμα, τῶν μειζόνων

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thirty thousand stades, though it could if it is the size which Eratosthenes himself gives. It is, he says, part of the same ignorance to say that nowhere in India do the Bears set or the shadows fall in reverse, when the phenomena begin to happen if you travel even five thousand stades from Alexandria. When he says this, Hipparchus is again not right in correcting him. A volrvovano rod . Gordo vologna vor saxan

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195 sore valkexpends for va ds It was especially apparent from my survey at that point that the summary set out by Eratosthenes in the third book of his "Geography" about what was considered as India at the time when Alexander visited it is the most trustworthy account The account of Eratosthenes is as follows. The war worked whe had

India is bounded on the north by the end of the Taurus, from Ariana to the Eastern Sea. These mountains are called by the inhabitants Paropamisus, Emodus, Imaus and other names, but by the Macedonians Caucasus. The western boundary is the River Indus. The southern and eastern sides, which are much longer than the others, project into the Atlantic making the shape of the country rhombold, as each of the longer sides is quite three thousand stades longer than the side opposite, and the cape formed by the eastern abrile repubion. olnovor 8 haraved of Kovience naladuspers.

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πλευρών έπατέρου πλεονεπτούντος παρά το άπεναντίον πλευρόν και τισχιλίοις σταδίοις, δοων έστι το κοινόν απρον της εωθινής παραλίας και της μεσημβρινής, έξω προπεπτωπός έξ' τσης έφ' ένάτε, ον παρά την άλλην 20 ήιδνα. την μέν ούν έσκερίου κλευράς άκδ των Καυκασίων δρών έπι την νότιον θάλατταν στάδιοι μάλιστα λέγονται μύριοι τρισχίλιοι παρά τον 'Ινδον ποταμόν μέχρι των έκβολων αὐτου. ωστ'άκεναντίον ή έωθινή προσλαβούσα τούς της απρας τρισχιλίους έσται μυρί-25 ων καὶ έξακισχιλίων σταδίων. τοῦτο μέν οδν κλάτος της χώρας το τ'έλάχιστον καὶ τὸ μέγιστον μηκος δε το άπο της επέρας έπι την εω. τούτου δε το μεν μέχρι Παλιβόθρων έχοι τις αν βεβαιοτέρως είπετν, ματαμεμέτ, ηται γά, σχοινίοις, καὶ ἔστιν ὁδὸς βασιλι-30 κή σταδίων μυρίων. τὰ δ'ἐκέκεινα στοχασμῷ λαμβάνεται διά των άνάπλων των έκ θαλάττης διά του Γάγγου κοταμού μέχρι Παλιβόθρων είη δ'άντι σταδίων δισχιλίων. Εσται δέ το καν, ή βραχύτατος, μυρίων έξανισχιλίων, ώς έκ τε της άναγραφής των στάθμων της κεκι-35 στευμένης μάλιστα λαβείν Ερατοσθένης φησί και δ Μεγασθένης οδτω συναποφαίνεται, Πατιοπλής δέ χιλίοις έλαττόν φησι. τούτω δή κάλιν τω διαστήματι προστεθέν τὸ τῆς ἄκρας διάστημα τὸ προπίπτον ἐπὶ πλέον πρὸς τὰς ἀνατολάς, οί τη ισχίλιοι στάδιοι ποιήσουσι το μέγιστον μήκος -Εστι δε τουτο το άπο των επβολών του 'Ινδου ποταμου παρά τήν

έξης ήιδνα, μέχρι της λεχθείσης απρας και των άνατολικών

αθτής τερμόνων ο εκούσι δ'ένταύθα οι Κωνιακοί καλούμενοι.

and southern o directions bey surement of th to the Bouther stades along t site side the for the cape, measurements a country. Lens sible to give for it is mea thousand stad guesswork fro sea to Palibo The total, at is what Erato record of sta Patrocles giv the length of thousand stad from the mout

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κοί καλούμενοι.

196: Strabo 0. 690: and southern coasts projects an equal distance in both directions beyond the rest of the shore. Now the measurement of the western side from the Jaucasus mountains to the southern sea is estimated at thirteen thousand stades along the Indus to its mouther thus on the opposite side the cast coast, including the three thousand for the cape, will measure sixteen thousand stades. These measurements are the least and greatest breadths of the country. Length is taken from west to east. It is possible to give that to Palibothra with some reliability, for it is measured in schoeni: it is a royal road ten thousand stades long. Beyond, estimates are made by guesswork from the voyages up the River Canges from the sea to Palibothra: it may come to about two thousand stades. The total, at the shortest place, is sixteen thousand; this is that Eratosthenes says he makes it from the most trusted record of stages. Megasthenes agrees with this, while Patrocles gives it as a thousand less. If to this is added the length of the cape projecting further east, the three thousand stades will give the greatest length-that is, from the mouths of the River Indus along the coast ad-Joining, up to the cape already mentioned and the eastern limits of India. There the people called Contact live. coronion, rd fills of our agi of "lygingi. 'Ovgoinging

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196: Strabo C. 690: άπασα δ'έστι κατάρρυτος ποταμοίς, ή 'Ινδική, τοτς μέν είς δύο τούς μεγίστους συρρηγνυμένοις, τόν τε 'Ινδόν και τον Γάγγην, τοτς δέ κατ' ίδια στόματα έκδιδούσιν είς την θάλατταν. ἄπαντες δ'ἀπό τοῦ Καυμάσου 5 την άρχην έχουσι και φέρονται μέν έπι την μεσημβρίαν το πρώτον, είθ'οι μεν μένουσιν έπι της αύτης φοράς, και μάλιστα οί είς τον 'Ινδον συμβάλλοντες, οί δ'έπιστρέφονται πρός εω, παθάπερ παὶ ὁ Γάγγης ποταμός. οδτος μὲν οδν nαταβάς έπ της δρεινής έπειδάν άψηται των πεδίων, έπὶ-ΙΟ στρέψας πρός εω και βυείς παρά τὰ Παλίβοθρα, μεγίστην πόλιν, πρόεισιν έπὶ τὴν ταύτη θάλατταν καὶ μιὰν ἐκβόλην ποιετται, μέγιστος ων των κατά την 'Ινδικήν ποταμών. δ δὲ 'Ινδός δυσί στόμασιν είς την μεσημβρινήν έκπίκτει θάλατταν, έμπεριλαμβάνων την Παταληνήν καλουμένην χώραν, 15 παραπλησίαν τῷ κατ Αίγυπτον Δέλτα. ἐκ δὲ τῆς ἀναθυριάσεως των τοσούτων ποταμών και έκ των έτησίων, ώς 'Ερατοσθένης φησί, βρέχεται τοτς θερινοτς δηβροις ή 'Ινδική, κάι λιμνάζει τὰ πέδια· ἐν μὲν οὖν τούτοις τοῖς ὅμβροις λίνον σπείρεται καὶ κεγχρος· πρός τούτοις σήσαμον, δρυζα, βόσ-20 μογον. τοῖς δὲ χειμερινοῖς καιροῖς πυροί, κριθαί, όσπρια καὶ άλλοι καρποὶ ἐδώδιμοι, ὧν ήμετς ἄπειροι. δέ τι τοτς έν Αίθιοπία και κατ' Αίγυπτον τὰ αὐτὰ φύεται καὶ ἐν τῷ Ἰνδικῷ, καὶ τῶν ἐν τοῖς ποταμοῖς, πλήν Ίππου ποταμίου, τὰ ἄλλα φέρουσι καὶ οὶ 'Ινδικοί. 'Ονησίκριτος

25 δὲ καὶ τοὺς ἴκκους γίνεσθαί φησι. τῶν δ'ἀνθρώπων οἱ

(5m) DIO Rive the two larges into the sea h sources in the terwards some those which me like the Gange cends from the plains, turns Palibothra. forms a singl sea by two mo which resembl mists rising winds, accord summer rains, rains flax ar sesame, rice, barley, pulse sown. Indeed as in Ethlop: the same ores sicritus say

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Rivers flow all over India. Some join up with the two largest, the Indus and the Ganges, others flow into the sea by their own mouths. All of them have their sources in the Caucasus and travel southwards first: afterwards some continue in the same course, especially those which meet the Indus, while others turn to the east, like the Ganges. This, the greatest river in India, descends from the mountain regions and, on reaching the plains, turns eastward and flows by the great city of Palibothra. It then advances to the sea on that side and forms a single mouth. The Indus empties into the southern sea by two mouths, enclosing the land named Patalene, which resembles the Delta in Egypt. As a result of the mists rising from so many rivers and also of the annual winds, according to Eratosthenes, India is watered by summer rains, and the plains are flooded. During these rains flax and millet are sown, and in addition to these, sesame, rice, and bosmoron. In the winter season wheat, barley, pulses, and other edible crops unknown to us are sown. Indeed, practically the same things grow in India as in Ethiopia and Egypt: the Indian rivers, too, contain the same creatures except the hippopotamus, though Onesicritus says this is also found. Of the people, those of the north resemble the Ethiopians in colouring, gongsv soppert apol to deprehéent so, olday of per apper

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μέν μεσημβρινοί τοτς Αίθιοψίν είσιν όμοιοι κατά την χροιάν, κατά δὲ την όψιν καὶ την τρίχωσιν τοτς άλλοις (οὐδὲ γὰρ οὐλοτριχοῦσι διὰ την ψγρότητα τοῦ ἀέρος), οἱ δὲ βόρερι τοτς Αίγυπτίοις.

30 Ψήν δὲ Ταπροβάνην πελαγίαν εἶναί φασι νῆσον, ἀπέχουσαν τῶν νοτιωτάτον τῆς Ἰνδικῆς τῶν κατὰ τοὺς Κωνιακοὺς πρὸς μεσημβρίαν ἡμερῶν ἐπτὰ πλοῦν, μῆκος μὲν ὡς πεντακισχιλίων σταδίων ἐπὶ τὴν Αἰθιοπίαν. ἔχειν δὲ καὶ ἐλέφαντας. τοιαῦται μὲν αὶ τοῦ Ἐρατοσθένους 35 ἀποφάσεις.

197: Strabo, G. 510:

Ερατοσθένης δέ φησι καὶ ἔν τῷ 'Ινδικῷ φύεσθαι ἐλάτην καὶ ἔντεῦθεν καθπηγήσασθαι τὸν στόλον 'Αλεξάνδρον' πολλά δὲ καὶ ἄλλα τοιαῦτα συγκροψειν 'Ερατοσθένης πειρᾶται, ἡμῖν δ'ἀποχρώντως εἰρήσθω 5 κερὶ αὐτῶν.

198: Plin. VI # 81:

insulae) longitudinis VII M stad., latitudinis V M, nec urbis esse sed vicos DCC.

199: Strabo C. 78:

την δ' Αριανήν διών τάς γε τρεῖς κλευ, άς εχουσιν εὐφυεῖς πρός τὸ ἀποτελέσαι παιαλληλόγραμμον dians: their
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though in features and hair they resemble the other Indians: their hair does not curl, either, because of the dampness of the air. Those of the north are like the Egyptians and an vondor vistant vir adea providence

Taprobane is said to be an island out at sea, a voyage of seven days south of the southern extremities of India, where the Coniaci live, about eight thousand stades long in the direction of Ethiopia. There are elephants there too. -pathide of variation has vounded many the reminera upy to

These are the remarks of Eratosthenes. dat ing data what with the and the real way the total take the take

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Eratosthenes, however, says that the pine fine does grow in India too, and that Alexander built the ships for his expedition from it. Eratosthenes tries to reconcile many other similar contradictions, but I have said quite enough about them. See dr porga constitution

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work but it parties to have through the state of the control of Eratosthenes also gave the measurements (of the island of Taprobane) as 7000 stades in length and 5000 in breadth. According to him there are no cities, to confuse hay no judy upoli opper, on a feet to have the 18 End the Bundy torne land offer house and the second of but 700 villages.

For what read are the robal 199 received where the durant r He sees that Ariana has three of its sides very suitably placed to complete the shape of a paralσχήμα, τὴν δ'ἐσκέριον οὐκ, σημείοις ἀφορίσαι διὰ τὸ ἐκαλλάττειν ἀλλήλοις τὰ ἔθνη, γραμμῷ τινι ὅμως δηλοῖ τῷ ἀ
πὸ Κασκίων κυλῶν ἐκὶ τὰ ἄκρα τῆς Καρμανίας τελευτώση τὰ
συνάκτοντα πρὸς τὸν Περσικόν κόλκον. ἐσκεριον μὲν
οὄν καλεῖ τοῦτο τὸ κλευρόν, ἔφον δὲ τὸ καρὰ τὸν 'Ινδόν.

200: Strabo C. 723:

· · · περί ων *Ερατοσθένης οδτως είρημεν (ού γὰρ ἔχομέν τι Χέγειν βέλτιον περί αὐτῶν). δρίζεσθαι μέν γάρ φησι την 'Αριανήν έκ μέν των πρός εω τώ 'Ινδφ, πρός νότον δὲ τῷ μεγάλη θαλάττη, πρός ἄρπτον δὲ 5 τῷ Παροκαμίος καὶ τοτς ἔξῆς ὅρεσι μέχρι Κασκίων κυλών, τά δὲ πρός ἐσπέραν τοῖς αὐτοῖς ὅροις, οἶς ἡ μὲν Παρθυηνή πρός Μηδίαν, ή δε Καρμανία πρός την Παραιτανηνήν ναὶ Περσίδα διώρισται πλάτος δὲ τῆς χώρας τὸ τοῦ 'Ινδου μήμος το άπο του Παροκαμισου μέχρι των έμβο-ΙΟ λών, μύριοι καὶ δισχίλιοι στάδιοι (οἱ δὲ τρισχιλίους φασί). μήνος δε άπό Κασκίων πυλών, ώς έν τοῖς 'Ασιατικοίς σταθμοίς άναγέγραπται, διττόν. μέχρι μεν 'Α-Lekardpeias the er 'Apiois and Kasniwr nulwe bid the Παρθυαίας μια και ή αυτή δδός είθ'ή μεν έπ'ευθείας Ιδ διά της Βαμτριανής και της υπερβάσεως του δρους είς 'Ορrómava ênt thy ên Bantpur triobor, htic êmtir êr toic

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helogram, but he cannot define the western side mathematically, because the different races overlap. All the same, he shows it by a dotted line from the Caspian Gates ending at the capes of Carmania, adjacent to the Persian Gulf. This side, then, he calls the western, and that along the Indus the eastern.

-minegaliting series works you district an oblingation-

Of these districts Eratosthenes gives the following account; I cannot give any better.

Ariana is bounded on the east by the Indus, Comments carried to a service of the contract to the south by the great sea, to the north by the Paropamisus, and the adjoining mountains as far as the Caspian Gates, to the west by the same boundaries as divide Parthyene from Media and Carmania from Paraetacene and Persia. The breadth of the country is the length of the Indus from the Paropamisus to its mouths, namely twelve thousand stades, though some say thirteen thousand. Its length from the Caspian Gates, as it is recorded in the "Stages of Asia", is measured in two ways. To Alexandria in Ariana from the Caspian Gates through Parthyaea is one and the same road: then one goes straight on through Bactria and the mountains pass to Ortospana at the road-junction from Bactra among the Paropamisadae; while the other turns slightly southwards away from Ariana to Prophthasia in Drangiana, af-

på pinpov.

πρός νότον είς Προφθασίαν τῆς Δραγγιανῆς εἶτα πάλιν ἡλοιπὴ μέχρι τῶν ὅμων τῆς 'Ινδικῆς καὶ τοῦ 'Ινδοῦ'.

20 ἄστε μακροτέρα ἐστὶν αὕτη ἡ διὰ τῶν Δραγγῶν καὶ 'κραχωτῶν, σταδίων μυρίων πεντακισχιλίων τριακοσίων ἡ πᾶσα.

εἰ ἡἡ τις ἀφέλοι τοὺς χιλίους τριακοσίους, ἔχοι ἄν τὸ λοιπὸν τὸ ἀπ'εὐθείας μῆκος τῆς χώρας, μυρίων καὶ τετρακισχιλίων οὐ πολὸ γὰρ ἔλαττον τὸ τῆς παραλίας, κῶν παρ25 αὕξωσί τινες αὐτό, πρὸς τοῖς μυρίοις τὴν Καρμανίαν ἑξακισχιλίων τιθέντες 'ἦ γὰρ σὸν τοῖς κόλποις φανοῦνται
τιθέντες ἢ σὸν τῷ ἔντὸς τοῦ Περσικοῦ κόλπου παραλία τῷ Καρμανικῷ. ἐπεκτείνεται δὲ τοῦνομα τῆς 'Αριανῆς μέχρι μέρους τινὸς καὶ Περσῶν καὶ Μηδῶν καὶ ἔτι τῶν πρὸς ἄρκιν
30 Βακρτίων καὶ Σογδιανῶν εἰσὶ γάρ πως καὶ ὁμόγλωττοι κα-

The strate C. 514: A contract of 201: Strate C. 514: A contract of

λέγει δὲ ('Ερατοσθένης) καὶ οῦτω τὰ διαστήματα.

ἀπὸ Κασπίων πυλών εἰς 'Ινδούς εἰς μὲν 'Εκατόμπυλον χιλίους ἐννακοσίους ἐξήκοντά φασιν, εἰς δ' Αλεξάνδρείαν τὴν ἐν 'Αρίοις τετρακισχιλίους πεντακοσίους τριάκοντα, εἶτ'εἰς Προφθασίαν τὴν ἐν Δραγγῆ χιλίους ἐξακοσίους, δὶ δὲ πεντακοσίους, εἶτ'εἰς 'Αραχωτούς τὴν πόλιν τετρακισχιλίους ἐκατὸν εἴκοσιν, εἶτ'εἰς 'Ορτόσπανα, ἐπὶ τὴν ἐκ Βάκτρων τρίοδον, δισχιλίους, εἶτ'εἰς τὰ ὅρια τῆς 'Ινδικῆς χιλίους ὁμοῦ μύριοι πεντακισχίλιοι τριακόσιοι.

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Ινδικής χιλίους.

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India, and the Indus. Thus this road, through Drangiana and Arachosia, is longer, totalling fifteen thousand three hundred stades. If thirteen hundred are deducted, the remainder will be the length of the country in a straight line, namely fourteen thousand. The length of the coast is not much less, even though some writers increase it, adding to the ten thousand six hundred for Carmania; for they obviously take it including either the gulfs or the Carmanian coast inside the Persian Gulf. The name of Ariana is extended over some part of the Persians and Medians, and even of the Bactrians and Sogdianians in the north, for these do speak very nearly the same language.

druc, who bispagarol on the visus, altispetiful plan south

too, from the Gaspian Gates to India: to Hecatompylus is estimated as nineteen hundred and sixty stades; to Alexandria in Ariana four thousand five hundred and thirty; next, to Prophthasia in Drangiana sixteen hundred, or, according to some estimates, fifteen hundred; next, to the city of Arachoti four thousand one hundred and twenty; next, to Ortospana at the Bactrian crossroads two thousand; next, to the boundaries of India a thousand. This makes a total of fifteen thousand three hundred.

Tours to the second and the 202: Strabo C. 720: Strabo C. 720:

οἰνοῦσι δὲ "Αρριες πρῶτον, ὁ μώνυμοι
τῷ ποταμῷ "Αρβει τῷ ὁρίζοντι αὐτοὺς ἀπὸ τῶν ἐξῆς
'Πρειτῶν ὅσον χιλίων σταδίων ἔχοντες παραλίαν,
ῶς φησι Νέαρχος: 'Ινδῶν δ'ἐστὶ μερὶς καὶ αὕτη.
5 εἶτ' Πρεῖται ἔθνος αὐτόνομον: τούτων δ'ὸ παράπκλους, χιλίων ὁπτακοσίων, ὁ δὲ τῶν ἔξῆς 'Ιχθυοπφάγων ἔπτακισχίλιοι ἐπτακόσιοι, οἱ δὲ τῶν Καρπμανίων τρισχίλιοι ἔπτακόσιοι μέχρι Περσίδος:
ῶσθ'οὶ σύμπαντες μύριοι δισχίλιοι ἐννακοσίοι.

ad been sunda sout 203: Strabo C. 724: 500 alle makendeste

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ή δὲ τάξις τῶν ἐθνῶν τοιαύτη· καρὰ μὲν τὸν

'Ινδὸν οἱ Παροκαρισάδαι, ὧν ὑκέμκειται ὁ Παροκαρισὸς

δρος, εἰτ' Αραχωτοὶ κρὸς νότον, εἶτ' ἐφεξῆς κρὸς νό
τον Γεδρωσηνοὶ σὸν τοῖς ἄλλοις τοῖς τὴν καρὰλίαν ἔχου
δ σικ' ἄκασι δὲ καρὰ τὰ κλάτη τῶν χωρίων καράκειται ὁ

'Ινδός. τούτων δ' (ἐκ μέρους) τῶν καρὰ τὸν 'Ινδὸν

ἔχουσί τινα 'Ινδοί, κρότερον ὅντα Περσῶν· ὰ ἀφείλετο

μὲν ὁ 'Αλέξανδρος τῶν 'Αριανῶν καὶ κατοικίας ἱδίας συνε
στήσατο, ἔδωκε δὲ Σέλευκος ὁ Νικάτωρ Σανδροκόττφ, συν
10 θέμενος ἔκιγαμίαν καὶ ἀντιλαβῶν ἐλέφαντας κεντακοσίους.

τοῖς Παροκαμισάδαις δὲ καράκεινται κρὸς τὴν ἐσκέραν

"Αριοι, τοῖς δὲ 'Αραχωτοῖς Δράγγαι καὶ τοῖς Γεδρωσίοις'

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the ships vorse, be at the 202 thyyber plop rulinite the The first inhabitants (west of the Indus) are the Arbies, who bear the same name as the River Arbis, which divides them from their neighbours, the Orcitae. According to Nearchus their seaboard measures about a thousand stades: this too is part of India. Next are the Orcitae, an independent tribe, past whom the coasting voyage is eighteen hundred stades. That past their neighbows the Fish-Eaters is seven thousand four hundred, and past the Carmanians to Persia three thousand seven hundred. The total distance is thus twelve thousand nine Finding troofs by transportation and theor hundred. Troop day of a party to a series to a series of the series

drafdenbood for . vorch The tribes are arranged as follows. Along the Indus are the Paropamisadae, above whom lies the Paropamisus range. Then to the south are the Arachoti, and next the Gedroseni and the other occupants of the coast. Alongside the breadths of all these territories lies the Indus. Some of these territories along the Indus are held by Indians, though formerly they belonged to the Persians. Alexander took them away from the Arii and set up separate settlements, and Seleucus Nicator gave them to Sandracottus, making an agreement for intermarriage and receiving in exchange five hundred elephants. Alongside the Paropamisadae to the west lie the Arii, and alongside the Arachoti the Drangae and the Gedrosii.

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οί δ' Αριοι τοτς Δράγγαις άμα και πρός άρκτον παράπεινται και πρός έσπέραν, έγκυκλούμενοι μικράπως. ή

Ιδδὲ Βακτριανή τῷ τε 'Αρία πρός ἄρκτον παράκειται και τοτς
Παροπαμισάδαις, δι 'ὧνπερ 'Αλέξανδρος ὁπερέβαλε τὸν
Καύκασον, ἐλαύνων τὴν ἐπὶ Βάκτρων· πρὸς ἐσπέραν δὲ
ἐφεξῆς εἰσι τοτς 'Αρίοις Παρθυατοι και περὶ τὰς Κασπίους
πύλας' πρὸς νότον δὲ τούτοις ἡ ἔρημος τῆς Καρμανίας,
20 εἴθ'ἡ λοική Καρμανία και Γεδρωσία.

204: Strabo, C. 726:

Περσικόν κόλπον, εως αν συνάψη τῷ Περσίδι.

'Η δὲ Καρμανία τελευταία μὲν ἐστι τῆς ἀπό τοῦ 'Ινδοῦ ἐκβολῆς' τὸ μέντοι πρῶτον αὐτῆς ἄκρον ἔκκειται πρὸς νότον εῖς τὴν μεγάλην θάλατταν, ποιήσασα δὲ τὸ 'Υνοῦ ἐκβολῆς' τὸ μέντοι πρῶτον αὐτῆς ἄκρον ἔκκειται 'Αραβίας ἄκραν, ἐν ἀπόψει οὖσαν, κάμπτεται πρὸς τὸν 'Αραβίας ἄκραν, ἐν ἀπόψει οὖσαν, κάμπτεται πρὸς τὸν 'Ηερσικόν κόλπον, ἔως ἀν συνάψη τῷ Περσίδι'

205: Strabo C. 78, 79:

ούτω δ' όλοσχερεί τινι τύπω την δευτέραν άπο διδούς σφραγίδα, πολύ ταύτης όλοσχερέστερον άποδίδωσι την τρίτην σφραγίδα κατά πλείους αίτίας. πρώτην μέν την λεχθείσαν, ότι ούν εύκρινως άφωρισται η άπο Κασπίων 5 πυλών ἐπίκαρμανίαν, ητις κυινή ἐστι τῷ τριτῷ πρὸς την δευτέραν σφραγίδα πλευρά ἔπει θ' ὅτι εἰς την νότιον πλευράν ὁ Περσικός ἐμπώτει κόλπος, ὅπερ καὶ αὐτός φησιν,

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The Arii adjointhe west, more territory. Bathe Paropamisa the Caucasus with Arii are to Caspian Gates.

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The Arii adjoin the Drangae to the north as well as to the west, more or less enclosing a small part of their territory. Bactria lies to the north alongside Aria and the Paropamisadae, by way of whose land Alexander crossed the Caucasus when marching to Bactra. Westwards, next to the Arii are the Parthians and the district around the Caspian Gates. South of these is the desert of Carmania, and then the rest of Carmania and Gedrosia.

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Carmania is the last of the seaboard beginning from the Indus, but it is much further north than the mouth of the Indus. Its first cape, however, projects southwards into the great sea. After forming the entrance to the Persian Gulf with the cape of Arabia Felix, which is in sight in the distance, Carmania bends towards the Persian Gulf until it adjoins Persis.

ion by low . add an west 205.

Thus he represents the second Seal in rough outline, but the third he represents much more roughly than the second, for a number of reasons. First is that already mentioned, that the side from the Caspian Gates to Carmania, which is common to the second and third Seals, is not exactly defined; second, that the Persian Gulf interrupts the southern side, as he himself says, so that he is compelled

ώστ ήνάγκασται την έκ Βαβυλώνος λαβείν γραμμήν, ώς αν εύθείαν τινα διά Σούσων και Περσεπόλεως μέχρι των δρων

- 10 της Καρμανίας καὶ της Περσίδος, ή δυνατός ήν εύρεῖν μεμετρημένην δδόν, σταδίων οδσαν την δλην μικρῷ κλειόνων η έννακισχιλίων. ην νότιον μέν καλεῖ κλευράν, καράλληλον δ'οὐ λέγει τῆ βορείω. δηλον δ'ετι οὐδ'ό Εὐφράτης, φ τὸ ἐσκέριον ἀφορίζει κλευρόν, σύνεγγύς ἐστιν εὐθεία γραμ-
- 15 μῦ, ἀλλ'ἀπὸ τῶν ὁρῶν ἐπὶ τὴν μεσημβρίαν 'ροείς, εἶτ'ἐπιστρέψει πρὸς ἔω καὶ πάλιν πρὸς νότον μέχρι τῆς εἰς θάλαταν ἐκβολῆς. δηλοῖ δὲ τὸ μὰ εὐθύπορον τοῦ ποταμοῦ, φράζων τὸ σχῆμα τῆς Μεσοποταμίας, ὁ ποιοῦσι συμπίπτοντες εἰς ἐν ὁ τε Τίγρις καὶ ὁ Εὐφράτης, ὑπηρεσίω παραπλήσιον,
- 20 δς φησι. καὶ μὴν το ἀπό Θαψάκου μέχρι τῆς 'Αρμενίας οὐθὲ κᾶν μεμετρημένον ἔχει το ἐσκέριον κλευρόν το ἀφο-ριζόμενον ὑπό τοῦ Εὐφράτου, ἀλλά φησι το πρός τῷ 'Αρμενία μέρος καὶ τοῖς ἀρκτικοῖς ὅρεσι μὴ ἔχειν εἰκεῖν κόσον ἐστὶ διὰ τὸ ἀμέτρητον εἶναι. Τὰ δὴ ταῦτα κάντα
- 25 τυπωδώς φησιν άποδιδόναι την τρίτην μερίδα· καὶ γάρ καὶ τὰ διαστήματά φησιν έκ πολλών συναγαγείν των τούς σταθ-

"Ο μεν δή οδτως φησί την τρίτην μερίδα τυπω" 30 δως ἀποδίδεσθαι μυρίων σταδίων ἀπό Κασπίων πυλών ἐπὶ τὸν Εὐφράτην, κατὰ μέρος δὲ διαιρών, ὡς ἀναγεγραμμένην

εδρε την μέτρησιν, ούτω τίθησιν, εμπαλιν την άρχην άπο

to take the 11 line through 8 mania and Pers road a little gether. This say it is pare Euphrates, by nothing like a wards from the the south unt that the rive the shape of of the Tigris own words. F to Armenia, W full measurem of the part a because it ha then, he says rough outline put together

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phy, ac av er tay spay v edpetv neneπλειόνων ή , παράλληλον θοράτης, ώ y eddeia yeareic, elt'est" της είς θά-TOU ROTAHOU, συμπίπτοντες napandástov, * Appeviac pòv Tò ápopoc to Apper v einerv noταύτα πάντα · nai yap nai ών τούς σταθγράφους καλεί.

αερίδα τυπω πυλών έπὶ αγεγραμμένην ην άρχην άπὸ

to take the line from Babylon as a more or less straight line through Susa and Persepelis to the boundaries of Carmania and Persis, where he was able to find a measured road a little more than nine thousand stades long altogether. This he calls the southern side, but he does not may it is parallel to the northern. Obviously, too, the Suphrates, by which he marks off the western side, is nothing like a straight line, but after flowing southwards from the mountains it turns eastwards and again to the south until it flows into the sea. He points out that the river does not flow straight when he describes the shape of Mesopotamia as it is formed by the junction of the Tigris and Euphrates -- "like a galley", to use his own words. Further, of the western side from Thapsacus to Armenia, which is marked by the Suphrates, he has not full measurements, but says that he cannot give the length of the part adjoining Armenia and the northern mountains, because it has not been measured. For all these reasons, then, he says that he represents the third section in rough outline only. The distances, too, he says that he put together from many writers who worked on itineraries. Some of these works he even mentions as having no titles.

He says, then, that he represents the third section thus in outline, as measuring ten thousand stades from the Caspian Gates to the Euphrates. Splitting it up into its parts, he puts down the measurements just as he

του Εύφράτου ποιησάμενος καὶ τῆς κατά Θάψακον διαβάσεως αύτου. μέχρι μεν δή του Τίγριδος, ὅπου Αλέξανδρος δι-

- 35 έβη, σταδίους δισχιλίους καὶ τετρακοσίους γράφει ἐντεβθεν δ'ἐπὶ τοὺς ἐξῆς τόπους διὰ Γαυγαμήλων καὶ τοῦ Λύκου καὶ 'Αρβήλων καὶ 'Εκβατάνων, Ἡ Λαρετος ἐκ τῶν Γαυγαμήλων ἔφυγε μέχρι Κασπίων πυλῶν, τοὺς μυρίους ἐκπληροῖ, τριακοσίοις μόνον πλεονάσας. τὸ μὲν δὴ βόρειον πλευρὸν
- 40 οὐτω καταμετρεί, οὐ παράλληλον τοῖς ὄρεσι θείς, οὐθὲ τῷ διὰ Στηλῶν καὶ 'Αθηνῶν καὶ 'Ρόδου γραμμῷ' ἡ γὰρ θάψακος πολύ τῶν ὁρῶν ἀφέστηκε, συμπίπτει δὲ καὶ τὸ ὅρος καὶ ἡ ἀπὸ Θαψάκου ὁδὸς ἐπὶ τὰς Κασπίους πύλας. καὶ τὰ γε προσάρκτια μέρη τοῦ ὅρου ταῦτ ἐστίν.
- 45 Αποδούς δὲ τὸ βόρειον οὕτω πλευ, όν, τὸ δὲ νότιον, φησί, παρὰ μὲν τὴν θάλατταν οὐπ ἔστι λαβεῖν διὰ τὸ τὸν Περσιπὸν ἐμπίπτειν πόλπον, ἀπὸ Βαβυλώνος δὲ διὰ Σούσων παὶ Περσεπόλεως ἔως τῶν ὁρίων τῆς τε Περσίδος καὶ τῆς Καρμανίας σταδίους εἶναι ἐννακισχιλίους καὶ διακοσί-
- 50 ους, νότιον μεν λέγων, παράλληλον δ'ού λέγων τῷ βορείφ τὸ νότιον. τὴν δὲ διαφωνίαν τοῦ μήπους φησὶ συμβαίνειν τοῦ τε βορείου τεθέντος πλευροῦ καὶ τοῦ νοτίου, διὰ τὸ τὸν Εὐφράτην μέχρι τινὸς πρὸς μεσημβρίαν ἐυέντα πρὸς τὴν ἔω πολὸ ἐγκλίνειν.
- 55 Των δε πλαγίων πλευρών την έσπερίαν λέγει πρώτον. ην δποία τίς έστιν, είτε μία είτε δύο, έν μέσφ πάρεστι σκοπείν. ἀπό γάρ της κατά Θάψακόν φησι διαβάσεως παρά τον Εύφράτην είς μεν Βαβυλώνα σταδίους είναι τετρατ

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found them recorded, starting back again from the Suphrates and its crossing at Thapsacus. As far as the Tigris, where Alexander crossed, he makes it two thousand four hundred stades. From there to the various places in order, by way of Gaugamela, the Lycus, Arbela, Ecbatana, the way by which Darius fled from Gaugamela to the Caspian Gates, he makes up the total of ten thousand stades, exaggerating by three hundred only. This is the way in which he measures the northern side, not setting it parallel to the mountains or to the line through the Pillars, Athens, and Rhodes; for Thapsacus is a long way from the mountains, while the mountains and the road from Thapsacus converge at the Caspian Gates. So much for the northern parts of the boundary.

way, he says that it is not possible to take the southern side as following the sea because of the interruption of the Persian Gulf. From Babylon, however, through Susa and Persepolis up to the boundaries of Persia and Carmania the distance is nine thousand two hundred stades, and he calls this the southern side, without stating that the southern side is parallel to the northern. The disagreement in length between the northern and southern sides is due, he says, to the fact that the Euphrates, after flowing for some distance southward, bends considerably to the east.

πισχιλίους δυταποσίους, έντευθεν δ'έπὶ τὰς ἐμβολάς 60 του Εύφράτου και πόλιν Τερηδόνα τρισχιλίους. τά δ' άπο Θαψάνου πρός τάς άρντους μέχρι μέν των 'Αρμενίων πυλών καταμεμετρήσθαι καί είναι ώς χιλίους ένατόν, τούς δὲ διὰ Γορδυαίων καὶ Αρμενίων μηκέτι. διδ δή παραλείπειν αὐτούς. τοῦ δὲ πρὸς ἔω πλευροῦ

- 65 το μέν διά της Περσικής κατά μήκος άπο της Ερυθράς de est Mybiar nat rae apurous oun Exartor elvas bone? των δηταπισχιλίων, από δέ τινων απιωτηρίων και δπέρ τούς έννακισχιλίους, το δέ λοιπον διά της Παραιτακηνής καὶ Μηδίας έπὶ Κασπίους πύλας ώς τρισχιλίων. τὸν δὲ
- 70 Τίγριν ποταμόν και τον Εύφράτην βέοντας έκ της 'Αρμενίας πρός μεσημβρίαν έπειδάν παραμείψωνται τά των Γορδυαίων δρη, κύκλον μέγαν περιβαλομένους καί έμπεριλαβόντας χώραν πολλήν την Μεσοποταμίαν έπιστρέφειν πρός χειμερινήν άνατολήν και την μεσημβρίαν,
- 75 πλέον δὲ τὸν Εὐφράτην γενόμενον δὲ τοῦτον ἔγγιον άεὶ τοῦ Τίγριδος κατά τὸ Σεμιράμιδος διατείχισμα καὶ κώμην καλουμένην *Ωπιν, διασχόντα ταύτης δσον διαποσίους σταδίους, και βυέντα διά Βαβυλώνος έκπίπτειν είς τον Περσιμόν μόλπον. γίνεται δή, φησί, το σχήμα
- 80 της Μεσοποταμίας και Βαβυλωνίας ύπηρεσίω παραπλήσιον, δ μέν δή Ερατοσθένης τοιαύτ'εί ημε.

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Of the transverse sides he describes the western first. Its nature, and whether it is one line or two, is an open question. From the crossing at Thapsacus along the Euphrates to Babylon is, he says, four thousand eight hundred stades, and from there to the south of the Euphrates and the city of Teredon three thousand. The distance from Thapsacus northwards to the Armenian Gates has been measured, and is eleven hundred stades; but the distance in stades through Gordyene and Armenia has not yet been measured. Therefore he omits it from his account. The length of the eastern side, through Persia lengthwise from the Erythraean Sea on OI towards Media and the north appears to be not less than eight thousand stades, or measured from some capes even more than nine thousand. The remainder, through Paraetacene and Media to the Caspian Gates, is about three thousand. The rivers Tigris and Euphrates, flowing southwards from Armenia, when they pass the mountains of Gordyene describe a great circle and enclose much territory, called Mesopotamia: then they turn towards the winter sunrise and the south, especially the Euphrates. It, drawing nearer and nearer to the Tigris by the fortification of Semiramis and a village called Opis, from which it is a more two hundred stades distant, flows through Babylon and empties into the Fersian Gulf. The shape of Mesopotamia and Babylon, he says, is thus similar to that of a galley. Such, then, are the remarks of Eratosthenes.

206: Strabe C. 86:

φησὶ γὰρ ("Ιππαρχος) αὐτὸν λέγειν τὸ ἐκ

Βαβυλῶνος εἰς μὲν Κασπίους πύλας διάστημα σταδίων

ἐξανισχιλίων ἐπτανοσίων, εἰς δὲ τοὺς ὅρους τῆς Καρ
μανίας ναὶ Περσίδος πλειόνων ἢ ἐνανισχιλίων, ὅπερ

ἔπὶ γραμμῆς κεῖται πρὸς ἱσημερινὰς ἀνατολὰς εὐθείας

άγομένης"....

207: Strabo. C. 727:

μῆνος μεν οδν έστι κατ "Ερατοσθένη το έπὶ
τὰς ἄρκτους καὶ τὰς Κασκίους κύλας κερὶ ὁκτακισχιλίων,
κατά τινας κροκικτούσας ἄκρας, λοική δ'ἐστὶν ἐκὶ Κασκίους κύλας οὐ κλεῖον ἢ τῶν δισχιλίων · κλάτος δὲ τὸ
δ ἐν μεσογαία τὸ ἀκὸ Σούσων εἰς Περσέκολιν στάδιοι τετρακισχίλιοι διακόσιοι, κάντευθεν ἐκὶ τοὺς τῆς Καρμανίας ὅρους
ἄλλοι χίλιοι ἔξακόσιοι.

208: Steph Byzant, v. Aggupfa :

Λέγονται καὶ 'Ασσυρικοὶ (codd. Pal. 'Ασσύριοι)
καὶ "Ασσυρες καρὰ 'Ερατοσθένει' Τοως ώς ἀκὸ τοῦ 'Ιλλυριοὶ "Ιλλυρες.

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"Assyres"; "Illyr11" 206.

(Hipparchus) says that he (Eratosthenes) calls the distance from Babylon to the Caspian Gates six thousand seven hundred stades, and that to the boundaries of Carmania and Persis more than nine thousand, on a line drawn straight to the equinoctial sunrise.

He (Eratosthenes) gives the above distance from the Caspian Gates to Babylon, and says that to Susa it is four thousand nine hundred stades, while from Babylon (to Susa) it is three thousand four hundred.

207.

Its (Poreis) length, then, towards the north and the Caspian Gates, is, according to Eratosthenes, about eight thousand stades in the neighbourhood of some projecting capes, and the rest to the Caspian Gates is not more than two thousand. Its breadth in the interior from Susa to Persepolis is four thousand two hundred, and from there to the borders of Carmania is another Sixteen hundred.

208.

In Eratosthenes the Assyrici are also called "Assyres"; perhaps on the analogy of "Illyres" for "Illyrii"

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Pal. 'Acoú, 101)

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209: Strabo C. 743:

Γίνεται δ'έν τῷ Βαβυλωνίς καὶ ἄσφαλτος πολλή, περὶ ἡς 'Ερατοσθένης μέν οῦτως εἴρημεν. ὅτι ἡ μὲν ὑγρά, ἤν καλοῦσι νάφθαν, γίνεται ἐν τῷ Σουσίδι, ἡ δὲ ξηρά, δυναμένη πήττεσθαι, ἐν τῷ Βαβυλωνία ταὐτης δ'ἔστὶν ἡ πηγὴ τοῦ Εὐφράτου πλησίον πλημμύροντος δὲ τούτου κατα τὰς τῶν χιόνων τήξεις καὶ αὐτὴ πληροῦται καὶ ὑπέρ χυσιν εἰς τὸν ποταμὸν λαμβάνει ἐνταῦθα δὲ συνίστανται βώλοι μεγάλαι πρὸς τὰς οἰκοδομὰς ἐπιτήδειαι τὰς διὰ τῆς ὁπτῆς κλίνθου.

210: Strabo C. 746:

διαρρεϊ δ'δ Τίγρις την Θωπίτιν καλουμένην λίμνην, κατά πλάτος μέσην: περαιωθείς δ'ἐπὶ θάτερον χεῖλος κατά γῆς δύεται μετά πολλοῦ φόφου καὶ ἀναφυσημάτων: ἐπὶ πολὸ δ'ἐνεχθείς ἀφανής, ἀνίσχει πάλιν οδ πολὸ ἄπωθεν τῆς Γορδυαίας: οὖτω δὲ σφοδρῶς διεκφάλλει τὴν λίμνην, ὡς φησιν Ἐρατοσθένης, ὥστε ἀλμυράν αὐτην οδσαν καὶ ἄνιχθυν γλυκεῖαν κατά τοῦτ'εἶναι τὸ μέρος καὶ ροώδη καὶ ἔχθύων πλήρη.

211: Strabo C. 765 f:

'Ο μέν οδν Περσικός κόλκος λέγεται καὶ ἡ κατὰ Πέρσας θάλαττα, φησὶ θὲ κερὶ αὐτῆς 'Ερατοσθένης εξ' 'Αρρόζων, τοῦ τῆς Καρρανίας ἀκρωτηρίου τῆς 'Αραβίας ἐξ' 'Αρρόζων, τοῦ τῆς 'Αραβίας ἀκρωτηρίου τῆς 'Αραβίας ὰκρωτηρίου τὰκροτηρίου του 'Αραβίας ὰκρωτηρίου του 'Αραβίας ὰκρωτηρίου τ

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Eratosthenes gives the following account of it. The liquid, called naphtha, is formed in Susis, the dry, which can be made solid, in Babylon: the source of the latter is near the Euphrates, When the river is in flood at the time when the snows melt, the source is also filled, and overflows into the river. There great lumps coagulate, suitable for buildings made of baked brick.

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The Tigris flows through the middle of the lake called Thopitis, breadthwise. When it has crossed to the other bank it sinks underground with a loud noise and spouting. After travelling unseen for a great distance, it reappears not far from Gordyaea. It crosses the lake in such strength, according to Eratosthenes, that although the lake itself is salt and without fish, in this part it is fresh, flowing, and full of fish.

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sian Sea. Eratosthenes says of it that its entrance is ao narrow that from Harmozi, the cape in Carmania, the cape at Macae in Arabia is visible. From the entrance the right-hand coast, curving round, bends at first away

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ι καὶ ἡ Ερατοσθένης οδτως, ἄστ' τῆς 'Αραβίας 5 ἀφοράται το ἐν Μάκαις· ἀκό δὲ τοῦ στόματος ἡ ἐν δεξίς και αλίς κεριφερής οδσα κατ' ἀρχάς μὲν ἀκό τῆς Καρμανίας κρός τὴν ἐσκέραν μέχρι Τερηδόνος καὶ τῆς ἐκβολῆς τοῦ Εὐφράτου· κεριέχει δὲ τῆν πε Καμμανίων καραλίαν καὶ Εὐφράτου· κεριέχει δὲ τῆν πε Καμμανίων καραλίαν καὶ

10 την Περσών και Σουσίων και Βαβυλωνίων από μέρους, όσον μυρίων οδσα σταδίων. περί ών και Άρετς είρήκαμεν το δ'έντευθεν έξης έπι το στόμα πάλιν άλλοι τοσούτοι, καθάπερ και 'Ανδροσθένη λέγειν φησί τον Θάσιον, τον και Νεάρχω συμπλεύσαντα και καθ'αὐτόν. ώστε δήλον έκ τούτου

15 είναι, διότι μικρόν ἀπολείπεται τῷ μεγέθει τῆς κατά τὸν
Εὔξεινον θαλάττης αὐτη ἡ θάλαττα. λέγειν ὅξ φησιν ἐκεῖνον περιπεπλευκότα στόλφ τὸν κόλπον, ὅτι ἀπὸ Τερηδόνος ἐξῆς ἐν δεξίφ ἔχοντι τὴν ἤπειρον ὁ παράπλους ἔχει
προκειμένην νῆσον "Ικαρον, καὶ ἱερὸν 'Απόλλωνος ἄγιον
20 ἐν αὐτῆ καὶ μαντεῖον Ταυροπόλου.

Παραπλεύσαντι δέ τῆς 'Αραβίας εἰς δισχιλίους καὶ τετρακοσίους σταδίους έν βαθετ κόλπφ πετται πόλις

Γέρ, α, Χαλδαίων φυγάδων έπ Βαβυλώνος οἰπούντων γῆν άλμυριδα παὶ ἐχόντων ἀλίνας τὰς οἰπίας, ἄς, ἐπειδή λε-

25 πίδες των άλων άφιστάμεναι κατά την έπίκαυσιν την έκ των ήλίων συνεχείς άποπίπτουσι, καταρραίνοντες όδασι πυκνά τούς τοίχους συνέχουσι. διέχει δὲ τῆς θαλάττης διακοσίους σταδίους ή πόλις. πεξέμποροι δ'είσιν οι Γερρατοι τὸ πλέον των 'Αραβίων φορτίων και άρωμάτων. 'Αρι30 στόβουλος δὲ τούναντίον φησι τούς Γεργαίους τὰ πολλά σχε-

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from the capes of Carmania slightly eastwards, then northwards, and later westwards to Teredon and the mouth of the Euphrates. It includes the coast of Carmania and partly those of Persis, Susis, and Babylonia, totalling about ten thousand stades: about these districts I have spoken already. From there on to the entrance again is a similar number of stades, as he says is stated by Androsthenes of Thasos, who sailed both with Nearchus and on his own. Thus it is clear from these measurements that this sea falls little short of the Euxine in size. He says that Androsthenes, having sailed round the gulf with an expedition, states that the coasting voyage with the mainland on the right shows next in order from Teredon the island learus lying in front, and on it a temple sacred to Apollo and an oracle of (Artemis) Tauropolus.

two thousand four hundred stades, in a deep gulf lies the city of Gerrha. Chaldean fugitives from Babylon live there on salt soil in houses of salt: these, since flakes continually fall off. dropping away because of the burning action of the sun, they frequently sprinkle with water and consolidate their walls. The city is two hundred stades from the sea. The people of Gerrha are for the most part land-traders in Arabian products and spices. Aristobulus on the other hand says that they mostly trade with Babylonia on rafts; that from there they sail their products

δίαις εἰς τὴν Βαβυλωνίαν ἐμπορεύεσθαι, ἐπεῖθεν δὲ τῷ Εὐφράτη τὰ φορτία ἀναπλεῖν εἰς Θάψαπον, εἶτα πεζή πορίζεσθαι πάντη.

Πλεύσαντι δ'έπὶ πλέον ἄλλαι νῆσοι, Τύρος καὶ 35 "Αραδος, εἰσίν, ἰερὰ ἔχουσαι τοῖς Φοινικικοῖς ὅμοια. καὶ φασί γε οὶ ἐν αὐταῖς οἰκοῦντες τὰς ὁμωνύμους τῶν Φοινίκων νήσους καὶ πόλεις ἀποίκους ἐαυτῶν. διέχουσι δὲ αὶ νῆσοι αὖταὶ Τερηδόνος μὲν δεχήμερον πλοῦν, τῆς δὲ κατὰ τὸ στόμα ἄκρας τῆς ἐν Μάκαις ἡμερήσιον.

*Από δὲ τῆς Καιμανίας εἰρήκασι καὶ Νέαρχος καὶ "Ορθαγόρας νῆσον "Ωγυι ν κεἴσθαι πρὸς νότον πελαγίαν ἐν δισχιλίοις σταδίοις, ἐν ἡ τάφος "Ερύθια δείκνυται, χῶμα μέγα ἀγρίοις φοίνιξι κατάφυτον" τοῦτον δὲ βασιλεῦσαι τῶν τόπωννκαὶ ἀκ'αὐτοῦ τὴν θάλατταν ἐκώνυμον καταλιπεῖν"

45 δηλῶσαι δὲ ταῦτά φησιν αὐτοῖς Μιθρωπάστην τὸν 'Αρσίτου τοῦ Φρυγίας σατράπου, φυγόντα μὲν Δαρεῖον, διατρίψαντα δ'ἐν τῷ νήσω, συμμίξαντα δὲ αὐτοῖς καταχθεῖσιν εἰς τὸν Περσικὸν κόλπον καὶ ζητοῦντα κάθοδον δι'αὐτῶν εἰς τὴν οἰκείαν.

50 Καθ' ὅλην δὲ τὴν τῆς Ἐρυθρᾶς παραλίαν κατὰ βυθοῦ φύεται δένδρα ὅμοια δάφνη καὶ ἐλαία, ταῖς μὲν ἀμπώτισιν ὅλα διαφανῆ γιγνόμενα, ταῖς δὲ πλημμυρίσιν ἔσθ' ὅτε καλυπτόμενα, καὶ ταῦτα τῆς ὑπεικεικένης γῆς ἀδένδρου οὕσης, ὤστε ἐπιτείνεσθαι τὸ παράδοξον. περὶ 55 μὲν οὖν τῆς κατὰ Πέρσας θαλάττης, ἢν ἐώαν πλευρὰν ἔφα-

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up the Euphrates to Thapsacus, and then convey them in all directions by land.

Further along on the voyage are more islands.

Tyrus and Aradus, which possess temples like those of
the Phoenicians. Indeed, the people who live in them
say that the Phoenician islands and cities of the same
names are their colonies. These islands are ten days'
sail from Teredon, and one day's from the cape at Macae
by the entrance.

land of Ogyris lies out at sea some two thousand stades to the south of Carmania. There the tomb of Erythras is pointed out, a great mound covered with palms: he was king of the district, and left behind the sea named after him. (Nearchus) says that these things were shown them by Mithropastes, the son of Arsites, the satrap of Phrygia; he, sent into exile by Darius and living on the island. Joined them when they arrived in the Persian Gulf and tried to return to his own country by their means.

All along the coast of the Erythraean Sea trees
like laurels and olives grow deep down. At low tide they
become entirely visible, but at high tide they are sometimes entirely covered; yet the land which is situated
above is treeless, so that the contradiction is emphasized.
Such, then, are the statements of Eratoathenes about the

μεν είναι της ευδαίμονος 'Αραβίας, τοιαύτα είρημεν 'Ερατοσθένης.

212: Strabo C. 85:

'Ερατοσθένης δὲ τὸ μὲν τῆς οἰπουμένης λαμβάνει μῆκος τὸ δὲ τῆς τετάμτης ἐπὶ τῆς διὰ Θαψάπου καὶ 'Ηρώων πόλεως μέχρι τῆς μεταξὰ τῶν στομάτων
τοῦ Νείλου, ἥν ἀνάγκην, καταστρέφειν εἰς τοὺς περὶ Κά5 νωβον καὶ 'Αλεξανδρείαν τόπους.

213: Strebe G. 88:

τό δὲ θαυμάζειν, πῶς ἐθάρρησεν εἰπεῖν ἐξακισχιλίων σταδίων τὸ ἀπὸ Πηλουσίου εἰς Θάψακον, πλειόνων ὅντων ἡ ὁπιακισχιλίων, οὐκ ὁρθῶς.

214: Strabo C. 741:

Έραιοσθένης δέ, των λεμνών μνησθείς των πρός τη 'Αραβία, φησί το ύδωρ απορούμενοι διεξόδων ανοτξαι πόρους ύπο γης και δι έκείνων ύποφέρεσθαι μέχρι Κοιλοσόρων αναθλίβεσθαι δὲ εἰς τοὺς περὶ 'Εινοκόλουρα καὶ τὸ Κάσιον ὅρος τόπους καὶ ποιεῖν τὰς ἐκεῖ λύμνας καὶ τὰ βάραθρα.

215: Strabo C. 767 f:
 Επάνειμι δὲ ἐπὶ τὰς Ἐρατοσθένους ἀποφάσεις,
ἄς ἔξῆς περὶ τῆς ᾿Αραβίας ἐντίθεται. φησὶ δὲ περὶ τῆς

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הניטותנאדונים אתו בנותחת, הדוב בפדו מבדתנט דהב דב בסבתו-Persian Sea, which, I said, constitutes the eastern side of Arabia Felix. roli , worker welle A der degug der i &

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s de nev tev Hasarafav ale Begondyn nevganery the Eratosthenes takes the length of the inhabited So had yabya ab world that of the fourth (Seal) on the line stretching through Thapsacus and Heroopolis to the land A MOTO TASSE between the mouths of the Nile. This line must terminate in the districts round Canopus and Alexandria. TOW HEXEL TON "ATAGERED WENGHOUGHT SENDOLOGICANTAL

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His (Hipparchus') surprise, however, over his daring to say that the distance from Pelusium to Thapsacus was six thousand stades, when it was more than eight thousand, is wrong. prose for radona wisco vrouces

When Eratosthenes mentions the lakes near Arabia, he says that the water, deprived of ways out, opens up passages under ground and drains away through them to Coele Syria. It is thrust up into the districts about Rhinocolura and Mount Casius, and makes the lakes and pits there. We why on wir probangorate overy again to catenta three there we led at absorbe approach approached

0.7678463 v5r867 33 Fov 1 215 . . svsvqba h ov 1680probyaq f I now return to the remarks which aratosthenes next puts forward about Arabia. Of the northern, desert part, which lies between Arabia Felix, Coele Syria, and

προσαριτίου καὶ έρήμης, ήτις έστὶ μεταξύ τῆς τε εὐδαίμονος 'Αραβίας καὶ τῆς Κοιλοσύρων καὶ τῶν 'Ιουδαίων, μέχ-

- 5 ρι του μυχού του 'Αραβίου πόλπου, δίοτι ἀπὸ 'Ηρώων πόλεως, ἥτις ἐστὶ πρὸς τῷ Νείλφ μυχὸς τοῦ 'Αραβίου πόλπου,
 πρὸς μὲν τὴν Ναβαταίων Πέτραν εἰς Βαβυλώνα πενταπισχίλιοι ἐξαπόσιοι, πᾶσα μὲν πρὸς ἀνατολὰς θερινάς, διὰ δὲ
 τῶν παραπειμένων 'Αραβίων ἐθνών Ναβαταίων τε παὶ Χαυ-
- 10 λοταίων καὶ 'Αγραίων· ὑπὲρ δὲ τούτων ἡ Κύδαίμων ἐστίν, ἐπὶ μυρίους καὶ δισχιλίους ἐκκειμένη σταδίους πρὸς νότον μέχρι τοῦ 'Ατλαντικοῦ πελάγους. ἔχουσι δ'αὐτὴν οἱ μὲν πρῶτοι μετὰ τοὺς Σύρους καὶ τοὺς 'Ιουδαίους ἄνθρωποι γεωργοί' μετὰ δὲ τούτους δίαμμός ἐστι γῆ καὶ
- 15 λυπρά, φοίντικας έχουσα όλίγους καὶ ἄκανθαν καὶ μυρίκην καὶ όρυκτὰ ὕοατα, καθάπερ καὶ ἡ Γεδρωσία: σκηνίται δ' ἔχουσιν αὐτὴν "Αμαβες καὶ καμηλοβοσκοί. τὰ δ'ἔσχατα πρὸς νότον καὶ ἀνταίροντα τῷ Λίθιοπίς βρέχεταί τε θερινοῖς ὅμβροις καὶ δισπορεῖται παραπλησίως τῷ 'Ινδικῷ,
- 20 ποταμούς ο' έχει καταναλισκομένους είς πεδία καὶ λίμνας. εὐκαρπία δ' ἐστὶν ἢ τε ἄλλη καὶ μελιτουργεῖα δαψιλῆ, βοσκημάτων τε ἀφθονία πλὴν ἴππων καὶ ἡμιόνων καὶ ὑῶν, ὅρνεά τε παντοῖα πλὴν χηνῶν καὶ ἀλεκτορίδων. κατοικεῖ
 δὲ τὰ μέγιστα τέτταρα ἔθνη τὴν ἐσχάτην λεχθεῖσαν χώραν:
- 25 Μινατοι μέν έν τω πρός την 'Ερυθράν μέρει, πόλις δ'αὐτψν η μεγίστη Κάρνα ή Κάρνανα· έχόμενοι δὲ τούτων Σαβατοι, μητρόπολις δ'αὐτῶν Μαρίάβα· τρίτον δὲ Κατταβανετς, κα θήκοντες πρός τὰ στενὰ καὶ την διάβασιν τοῦ 'Αραβίου

lies between Archia Felia, doels Syria, and

Judaea, and he says that Arabian Gulf as far as Ba all towards Arabian trit Beyond these twelve thous first inhab farming peo tile: it be water is su cupied by A farthest so summer rain vers there and supply1 in the prod beasts exce kinds excep inhabit thi part by the gest city

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AC TE EVOCI-'Ιουραίων, μέχà "Howwy noραβίου πόλπου. BEVTONIOX (A)ác. bid bè TE nai Xavbalner forly. ouc apple voσι δ'αύτην ovoafous avres yn nai nat popingy ounvitas 6' d 6' Egyata ταί τε θε-To Ivoina. nai lipvac. δαψιλή, βοσai var, opnatoinel e Toay xwpay: πόλις δ'αύτων twv Zabatos, abavetc, na-ApaBiou

Judaea, and extends to the recess of the Arabian Gulf. he says that from Heroppolis, which is a recess of the Arabian Gulf near the Nile. towards Nabataean Petra and as far as Babylon is five thousand six hundred stades, all towards the summer sunrise through the neighbouring Arabian tribes of Nabataeans, Chaulotaeans, and Agraeans. Beyond these is Arabia Felix, stretching southwards twelve thousand stades as far as the Atlantic. Its first inhabitants after the Syrians and Judaeans are farming people. Past them the land is sandy and infertile: it bears a few palms, thorn, and tamarisk, and water is supplied by wells, as in Gedrosia. It is occupied by Arabs who live in tents and breed camels. The parts farthest south, opposite to Ethiopia, are watered by summer rain and are sown twice a year, like India. Rivers there are completely used up in watering the plains and supplying lakes. The land is fruitful, especially in the production of honey, and there is abundance of beasts except horses, mules, and pigs, and birds of all kinds except geese and chickens. The four largest tribes inhabit this furthest country we have mentioned; in the part by the Erythreean Sea are the Minaeans, whose largest city is Carna or Carnana; next to them are the Sabseans, whose capital is Mariaba; third are the Cattabanians, who come right to the straits and the crossing

κόλκου, το δε βασίλειον αύτων Τάμνα καλείται * πρός εω 30 δε μάλιστα Χατραμωτίται, πόλιν δ'έχουσι Σάβαταν.

Μοναρχούνται δὲ πᾶσαι καί είσιν εὐδαίμονες, κατασκευασμέναι καλῶς Ιεροῖς τε καὶ βασιλείοις αί τε οἰκίαι ταῖς Αἰγυπτίαις ἐοίκασι κατὰ τὴν τῶν ξύλων ἔνδεσιν. χώραν δ'ἀπέχουσιν οὶ τέτταρες νομοὶ μείζω

- 35 του κατ' Αίγυπτον Δέλτα' διαδέχεται δὲ τὴν βασίλειαν οὐ παῖς παρὰ πατρός, ἀλλ'ος ἄν πρῶτος γεννηθῆ τινι τῶν ἐπιφανῶν παῖς μετὰ τὴν κατάστασιν τοῦ βασιλέως. ἄμα γὰρ τῷ κατασταβίναι τινα εἰς τὴν ἀρχὴν ἀναγράφονται τὰς ἐγκύους γυναϊκας τῶν ἐπιφανῶν, καὶ ἐφι-
- 40 στασι φύλακας. ήτις δ'αν κρώτη τέκη, τὸν ταύτης εστιν ἀναληφθέντα τρέφεσθαι βασιλικώς, ἀς διαδεξόμενον.

φέρει δὲ λιβανωτὸν μὲν ἡ Κατταβανία, σμύρναν δὲ ἡ Χατραμωτῖτις καὶ ταῦτα δὲ καὶ τὰ ἄλλα ἀρώ45 ματα μεταβάλλονται τοῖς ἐμπόροις. ἔρχονται δὲ πρὸς
αὐτοὺς ἐξ Αἰλάνων μὲν εἰς Μιναίαν ἐν ἐβδομήκοντα ἡμέραις ἔστι δ'ἡ Αἴλανα πόλις ἐν θατέρφ τοῦ 'Αραβίου
κόλπου, τῷ κατὰ Γάζαν τῷ Αἰλανίτη καλουμένφ, καθάπερ
εἰρήκαμεν Γεββαῖοι δ'εἰς τὴν Χατραμωτῶτιν ἐν τετ50 ταράκοντα ἡμέραις ἀφικνοῦνται. τοῦ δ' Αραβίου κόλπου
τὸ μὲν παρὰ τὴν 'Αραβίαν πλευρὸν ἀρχομένοις ἀπὸ τοῦ
Αἰλανίτου μυχοῦ, καθάπερ οὶ περὶ 'Αλέξανδρον ἀνέγραψαν
καὶ 'Αναξικράτη, μυρίων καὶ τετρακισχιλίων σταδίων

of the Arabi Furthest to

TIN IDHAL

palaces. The ting of the greater that hereditary, the nobles has succeed men's wives them. Which

with trade within sever other rece Gaza, as he ramotitis Gulf along is, accord panions and this, howe

taken away

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εὐδαίμονες,
ίοις αί
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μοὶ μείζω
βασίλειαν
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ἀναγράκαὶ ἐφι-

ία, σμύρἄλλα ἀρώδὲ πρός
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, παθάπερ
ἐν τετίου πόλπου
ἀπό τοῦ
ν ἀνέγραψαν
σταδίων

ilinac.

of the Arabian Gulf, and whose royal city is called Tamma.
Furthest to the east are the Chatramotitae, whose city is

are prosperous. They are embellished with temples and palaces. The houses resemble the Egyptian in the jointing of their timbers. The four districts cover an area greater than the Egyptian Delta. The kingship is not hereditary, but passes to the first son born to one of the nobles after the king's accession; as soon as anyone has succeeded to the throne, a list is made of the noblemen's wives who are pregnant, and guards are placed over them. Whichever gives birth first, her son is by law taken away and brought up royally as heir apparent.

titis myrrh. These and the other spices are exchanged with traders, who travel there, from Aelana to Minaea, within seventy days. The city of Aelana stands on the other recess of the Arabian Gulf, called Aelanites, by Gaza, as has been said. The Gerrhaeans arrive at Chatramotitis within forty days. The side of the Arabian Gulf along Arabia, beginning at the recessof Aelanites, is, according to the records of Alexander and his companions and of Anaxierates, fourteen thousand stades: this, however, is an exaggeration. The coast by Trogethis, however, is an exaggeration. The coast by Trogethis,

έστίν' εξρηται δε έπὶ κλέον. το δε κατά την Τρωγλο55 δυτικήν, όπερ έστιν εν δεξί αποκλέουσιν από Ηρώων
πόλεως, μέχρι μεν Ητολεμαίδος και της των έλεφάντων
θήρας, εννακισχίλιοι πρός μεσημβρίαν στάδιοι και μιπρόν έπὶ την εω· εντεύθεν δε μέχρι των στενών, ως
τετρακισχίλιοι και πεντακόσιοι πρός την εω μάλλον.

δυποιετ δὲ ἄνρα τὰ στενὰ πρὸς τὴν Αἰθιοπίαν, Δειρὴ ναλουμένη, ναὶ πολίχνιον δμώνυμον αὐτῷ νατοικοῦσι δὲ
'Ιχθυοφάγοι. ναί φασιν ἐνταῦθα στήλην εἶναι Σεσώστριος τοῦ Αἰγυπτίου, μηνύουσαν ἱεροῖς γράμμασι τὴν
διάβασιν αὐτοῦ. φαίνεται γὰρ τὴν Αἰθιοπίδα καὶ τὴν

- 65 Τρωγλοδυτικήν πρώτος καταστρεψάμενος ούτος, είτα διαβάς είς την Αραβίαν, κάντευθεν την Ασίαν έπελθών την συμπάσαν. διό δη πολλαχού Σεσώστριος χάρακες προσαγορεύονται, και άφιδρύματά έστιν Αίγυπτίων θεών ίερων. τὰ δὲ κατά Δειρήν στενά συνάγεται είς στα-
- 70 δίους εξήμοντα· ού μην ταύτα γε μαλείται νυνὶ στενά, ἀλλὰ προσπλεύσασιν ἀπωτέρω, μαθά τὸ μεν δίαμμά εστι τὸ μεταξὸ τῶν ἡπείρων διαμοσίων που σταδίων, εξ δε νῆσοι συνεχεῖς ἀλλήλαις τὸ ἀάρμα ἐμπληρούσαι στενούς τελέως διάπλους ἀπολείπουσι, δι'ἔν σχεδίαις τὰ φορτία
- 75 κομίζουσι δεθρο κάκετσε, καὶ λέγουσι ταθτα στενά. μετά δὲ τὰς νήσους ὁ ἔξῆς πλοθς ἔστιν ἔγκολπίζουσι παρά τὴν σμυγνοφόρον ἔπὶ τὴν μεσημβρίαν ἄμα καὶ τὴν ἔω μέχρι πρὸς τὴν τὸ κιννάμωμον φέρουσαν, ὅσον πεντακισχιλίων

lodytica, which opolis, as far try, measures From there to dred. in a mo in the direct town of the s that there is describing hi have been the then to have overrun all places are w of temples o to a width o fact, these voyage in, " some two hur together, f passages: th directions After these coastal inl south and e

about five

hy Towykord Alpawy έλεφάντων or nat prevav. ac nakkov. beigh na-100001 be ιι Σεσώago thy nal thy είτα διέπελθών Panec TIWY DEWY lc oravi στενά, ρμά έστι , êξ δε s overode ed popula stevá, petd re nach thy w next

ισχιλίων

rope loby Ted avadus parter as of lodytica, which is on the right to voyagers from Heroopolis, as far as Ptolemais and the elephant-hunting country, measures nine thousand stades slightly east of south. From there to the straits is about four thousand five hundred, in a more easterly direction. The straits are formed in the direction of Ethlopia by a cape called Deire and a town of the same name inhabited by Fish-Saters. It is said that there is there a pillar of Sesostris the Egyptian, describing his passage in hisroglyphics. He appears to have been the first conqueror of Ethiopia and Troglodytica, then to have prossed into Arabia, and from there to have overrun all Asia. For this reason, naturally, in many places are what are called "camps" of Sesestris, and copies of temples of Egyptian gods. The straits at Deire narrow to a width of sixty stades; though now, as a matter of fact, these are not called the straits, but farther on the voyage in, where the crossing between the continents is some two hundred stades, and there are six islands close together, filling up the crossing and leaving very narrow passages: through those cargoes are carried in different directions on rafts, and these are called the straits. After these islands the voyage onwards, following the coastal inlets along the myrrh-boaring country towards the south and east right to the cinnamon-bearing country, is about five thousand stades. Beyond this point it is said

σταδίων· κέρα δὲ ταύτης οὐδενα ἀφῖχθαί φασι μέχρι νόν.

80 κόλεις δ'ἐν μὲν τὰ καραλία μὰ κολλὰς εἶναι, κατὰ δὲ

τὰν μεσόγαιαν κολλὰς οἰκουμένας καλῶς. τὰ μὲν δὰ τοῦ

'Ερατοσθένους κερὶ τῆς 'Αραβίας τοιαῦτα.

216: Strabo 0. 785 f:

φησί δή του 'Αραβίου κόλκου κρός την ἐσκέραν ἐννακοσίους ή χιλίους σταδίους διέχειν τὸν Νετλον, καρακλήσιον ὅντα κατὰ τὸ σχήμα τῷ γράμματι τῷ Ν κειμένῷ ἀνάκαλιν' ῥυεὶς γάρ, φησίν, ἀκὸ Με, ὅης ἐκὶ τὰς ἄρκτους

- δ ώς δισχιλίους καὶ ἐκτακοσίους σταδίους, κάλιν ἀναστρέφει πρός μεσημβρίαν καὶ τὴν χειμερυνὴν δύσιν ὡς τρισχιλίους καὶ ἐκτακοσίους σταδίους, καὶ σχεδόν ἀντάρας τοῖς κατά Μερόην τόποις καὶ εἰς τὴν Λιβύην πολύ προπεσών καὶ τὴν ἐτέραν ἐπιστροφὴν κοιησάμενος πρός τὰς ἄρκτους φέρεται
- 10 πενταιισχιλίους μέν καὶ τριακοσίους σταδίους έπὶ τὸν μέγαν καταράκτην μικρόν παρεπιστρέφων πρὸς τὴν εω, χι-λίους δὲ καὶ διακοσίους τοὺς ἐπὶ τὸν ἐλάττωντὸν κατά Συήνην, πεντακισχιλίους δὲ ἄλλους καὶ τριακοσίους ἐπὶ τὴν θάλατταν. ἐμβάλλουσι δ'εἰς αὐτὸν δύο ποταμοί, φερ-
- ξη τινων λιμνών ἀπό μεσημβρίας, καὶ σχεδον τὸ κατ'εὐ
 Ται κατά τὸ πρὸς ἔω πλευρόν, ἄτερος δ' Αστάπους οἱ δ'
 Αστασόβαν καλούσι, τὸν δ' Αστάπουν ἄλλον εἶναι, ῥεοντα

 κατασόβαν καλούσι, τὸν δ' Αστάπουν ἄλλον εἶναι, ῥεοντα

 κατασόβαν καλούσι, τὸν δ' Αστάπουν ἄλλον εἶναι, ῥεοντα

 κατινων λιμνών ἀπό μεσημβρίας, καὶ σχεδον τὸ κατ'εὐ-

not many cities many well est about Arabia.

-la lo veo

sand stades and that it way round.

sand seven he south and the seven hundred the distriction it makes it ried along cataract, it

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Syene, and

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n pězpi vov. , nará šž , pěv šá rov

thy Eonepay NeThov, sapa-N nespévo THE SENTOUS νιν άναστρέσει TPIOXILIOUS ic role nard ody nat thy ους φέρεται c ent rov THY EW. XIvtov nata orfouc ent oranoi, verλαμβάνοντες abopac nahersouce of b'

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that no one has yet gone. It is also said that there are not many cities on the coast, but that inland there are many well established. Such are the remarks of Eratosthenes about Arabia.

-IA to wrosey wit sand 216. The owner works to while

sand stades away from the Arabian Gulf towards the west, and that it is similar in shape to a letter N the wrong way round. Flowing northwards from Merce about two theusand seven hundred stades, it then turns back toward the south and the winter sunset for about three thousand seven hundred stades. After almost coming opposite to the district of Merce and after advancing far into Libya it makes its second turn, towards the north, and is carried along five thousand three hundred stades to the great cataract, turning aside a little towards the east. It then flows twelve hundred to the smaller cataract, at Syene, and five thousand three hundred more to the sea.

the east, enclosing Merce, an island of considerable size. One of the rivers, which flows on the eastern side, is called Astaboras, and the other Astapus. Some call the latter Astasobas, and say that the Astapus is another river, flowing from certain lakes to the south, which forms wer, flowing from certain lakes to the south, which forms wer, flowing from certain lakes to the south, which forms

20 θεταν σώμα τοῦ Νείλου. τοῦτον ποιεῖν τὴν δὲ πλήρωσιν αὐτοῦ τοὺς Θερινοὺς ὅμβρους παρασπευάξειν. ὑπερ δὲ τὰς συμβολὰς τοῦ 'Ασταβόρα καὶ τοῦ Νείλου σταδίοις ἐπτακοσίοις Μερόην εἶναι πόλιν ὁμώνυμον τῆ νήσφ. ἄλλην δ'εἶναι νῆσον ὑπὲρ τῆς Μερόης, ἢν ἔχουσιν οἱ Αἰ-

- 25 γυπτίων φυγάδες οἱ ἀποστάντες ἐπὶ Υαμμιτίχου, καλοῦνται δὲ Σεμβρῖται, ὡς ἃν ἐπήλυδες βασιλεύονται δὲ
 ὑπὸ γυναικός, ὑπακούουσι δὲ τῶν ἐν Μερόμ. τὰ κατωτέρω
 ἐκατέρωθεν Μερόης, παρὰ μὲν τὸν Νείλον πρὸς τὴν 'Ερυθρὰν Μεγάβαροι καὶ Βλέμρυες, Αἰθιόπων ὑπακούοντες, Αἰ-
- 30 γυπτίοις δ' δμοροι παρά θάλατταν δὲ Τρωγλοδύται διεστάσι δὲ εἰς δέκα ἡ δώδεκα ἡμερῶν δόδν οἱ κατά τὴν Μερόην Τρωγλωδύται τοῦ Νείλου. ἔξ ἀριστερῶν δὲ τῆς ἡὐσεως τοῦ Νείλου Νοῦβαι κατοικοῦσιν ἐν τῷ Λιβύῃ, μέγα ἔθνος, ἀκὸ τῆς Μερόης ἀρξάμενοι μέχρι τῶν ἀγκώνων, οὸχ
- 35 δποταττόμενοι τοῖς Αἰθίοψι, αλλ' ἰδίς κατά πλείους βασιλείας εἰλημμένοι. τῆς δ'Αἰγύπτου τὸ παρά τῆν Θάλαττάν ἐστιν ἀπὸ τοῦ Πηλουσιακοῦ στόματος πρὸς τὸ Κανωβικὸν στάδιοι χίλιοι τριακόσιοι. Ερατοσθένης μὲν οὖν οὕτως.

217: Strabo C. 824 f:

"Εστι δε δρθογωνίου τριγώνου το σχήμα, ώς "αν τις εν επιπέδφ νοήσειε, βάσιν μεν έχον την καθ' ήμας παραλίαν την άπο της Αίγύπτου και Νείλου μέχρι Μαυρου-

while as far a while the hyp thiopia and M figure I have or less under surmise owing not even give however, said that from Ale about ten the a straight linhabited wor tance, amount should be set its length in

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δέ πλήρωσιν ónen 8è σταδίοις Ayom. gyouv of Al-00. na-LEGOVIAL SE τά ματωτέρω thy Epu-SOVTEC, AIorai. 918lasd thy v 88 THC Λιβύα, μέγα YHOVOV, OUX λείους d thy महर्वेद परे τοσθένης

ήμα, ώς v nao huão is MaupouNile as far as Ethiopia and produced by me to the Ocean; while the hypotenuse is the whole ocean-coast between Ethiopia and Maurusia. Now the part at the vertex of the figure I have described, falling as it does already more or less under the torrid zone, I have to describe from surmise owing to its inaccessibility, Consequently I cannot even give the maximum breadth of the country. I have, however, said thus much in what I have already written: that from Alexandria to Merce, the Ethiopian capital, is about ten thousand stades to the south, and from there in a straight line to the boundary of the torrid zone and the inhabited world is another three thousand. The same distance, amounting to thirteen or fourteen thousand stades, should be set down as the maximum breadth of Libya, and its length is a little less than double the breadth. ac ag fanépia dvitilogyéc. Colvininge of ablese nove-

ORCHPÉVAC ROBRÉSACE TIVÉC, DE SOCE VESTE ÉCTEV LAVOR Eratosthenes estimates the distance from Cyrene to Alexandria by land at 525 miles.

Eratosthenes says the circuit of the Great Syrtia is five thousand stades and its width eighteen hundred, from the Hesperides to Automala and the boundary between Cyrenaica and the rest of Libya hereabouts. none probably rose buscound anal permentigues and reader

220: Plin. V # 41: 220 ca and an all

Clarissima est Meninx, longitudine XXV M passuum, latitudine XXII, ab Eratosthene Lotophagitis appellata,

221: Strabo, C. 170:

Ένιοι δὲ Στήλας ὁπέλαβον τὴν Κάλπην καὶ τὴν 'Αβίλυκα, τὸ ἀντικειμένον ὅρος ἐκ τῆς Λιβύης, ὅ φησιν 'Ερατοσθένης, ἐν τῷ Μεταγωνίῳ, Νομαδικῷ ἔθνει, ἱδρῦσθαι·
... καὶ Δικαίαρχος δὲ καὶ 'Ερατοσθένης καὶ Πολύβι5 ος καὶ οἱ πλεῖστοι τῶν Ἑλλήνων περὶ τὸν πορθμὸν ἀποφαίνούσι τὰς Στήλας.

melbedth beneators of 222: Strabo. S. 829:

a straight line to the be where of his torbid wood out to

-alb mass of . . Linksond seems wedsoon of himey bestfored

"Αρτεμίδωρος δ' Ερατοσθένει μεν άντιλέγει, διότι Λίξον τινά φησι κόλιν κερί τὰ ἄκρα τῆς Μαυρουσίας τὰ ἐσκέρια ἀντὶ Λυγγός "Φοινικικὰς δὲ κόλεις κατεσκαμμένας καμκόλλας τινάς, ὧν οὐδὲν ἰδεῖν ἐστιν ἔχνος ἐν δὲ τοῖς ἐσκερίοις Αἰθίοψι, τοὺς ἀξρας κλατεῖς φήσας, ταῖς τε ὁρθριναῖς ὥραις καὶ ταῖς Βειλιναῖς καχεῖς καὶ ἀχλυώδεις εἶναι τοὺς ἀξρας "

monomia della 223: Strabo G. 47: mere sure at allows

Search and to thurste and syes wanted to the

πεπίστευμε δε και περί των έξω στηλών 'Ηρακλείων πολλοϊς μυθώδεσι, Κέρνην τε νήσον και άλλους τόπους δνομάζων τούς μηδαμού νυνι δεικνυμένους, thenes "Lotop

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Не

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:1 E13 220 dante :455

-poops for The best known is Meninx, called by Eratosthenes "Lotophagitis". It is 25 miles long and 22 broad.

τοξον, και Σάκας μεν και Σογέζανους τοις όλοις έράφεσιν

by or Some have supposed that the Pillars are Calpe and Abilyx, the mountain which lies opposite in Libya. Eratosthenes says that it is situated in Metagonium,, the -home of a nomadicotribe . . . Dicaearchus, Eratosthenes, and most of the Greeks place the Pillars in the neighborhood of the straits nabique in an accompant accomman

ΙΟ Θάιτίους, τάχα δε καὶ έτε ους μέχηι Σκυθών, έπι θάτερα δε φέρη των Υρμανών πέρβικας, 222 ο δε Καδουσίους συμφώσιν

Artemidorus contradicts Eratosthenes when he mentions as "Lixus", instead of "Lynx", a certain city dro MEV TOU KAGabout the western boundaries of Maurusia, and when he describes as Phoenician a large number of cities now del' del Pla Lis 'Saciono' stroyed, of which it is impossible to see any trace: also because, after calling the atmosphere "flat", he says that among the western Ethiopians the air Ps thick and misty both in the early hours and vin the evening. 2υ δισχίλιοι δισμύριοι έξανόσιοι έβδορήμοντα.

He believes also in many mythical stories about व किस वेंहे किए कि the parts outside the Pillars of Heracles: he names the θένης παρά Πατροκλέου island of Cerne and other places which can nowhere be pointed out nowadays.

ne XXV M pasphagitis appellata.

s tiel on elle

any nat thy ge, 8 oggiv ει, Ιδρύσθαι. gs nat Holobjaopenov anogai-

ιντιλέγει, is Maupovoicoherc nates OTEV TXVOC. areic offoac, naxets nat

In at aldres nday Hoanάλλους τό-

224: Strabo C. 513 f:

φησὶ δ΄ Ερατοσθένης τοὺς 'Αραχωτοὺς καὶ Μασσαγέτας τοῖς Βακτρίοις καρακεῖσθαι κρὸς δύσιν καρὰ τὸν

Τῆξον, καὶ Σάκας μὲν καὶ Σογδιανοὺς τοῖς ὅλοις ἐδάφεσιν
ἀντικεῖσθαι τῷ 'Ινδικῷ, Βακτρίους δ'ἐκ'ὁλίγου· τὸ γὰρ

πλέον τῷ Παροκαμιζῷ καρακεῖσθαι' διείργειν δὲ Σάκας
μὲν καὶ Σογδιανοὺς τὸς 'Ιαξάρτην, καὶ Σογδιανοὺς δὲ καὶ
Βακτριανοὺς τὸν 'ῆξον, μεταξὸ δὲ 'Υρκανῶν καὶ 'Αρίων Τακύρους οἰκεῖν· κύκλῳ δὲ κερὶ τὴν θάλατταν μετὰ τοὺς
Υρκανοὺς 'Αμάρδους τε καὶ 'Αναριάκας καὶ Καδουσίους καὶ
Ο Οὐιτίους, τάχα δὲ καὶ ἐτέρους μέχρι Σκυθῶν, ἐκὶ θάτερα δὲ
μέρη τῶν 'Υρκανῶν Δέρβικας, τοὺς δὲ Καδουσίους συμψαύειν
Μίδων καὶ Ματιανῶν ὑκὸ τὸν Παραχοάθραν.

225: Strabo C. 509: Welled all

Φησὶ δὲ καὶ εὖπλουν εἶναι (καὶ οὖτος καὶ 'Ερατοσθένης παρὰ Πατροκλέους λαβῶν) καὶ πολλὰ τῶν 'Ινδικῶν Acc sagetae are not the Sacae and whole ground, for the most Sacae and Social and Bac Cani and Aristorder, after the Cadusii, haps others the Hyrcani

Caspius to to dred stades, sand six hum sand four humand four humand to the River five thousand dred and set

tact with the

is navigable

INV MINETORNY

THO "BETTY - WEST TO CHE WAS VOTE OF WEST OF WAS THE W According to Eratosthenes the Arachoti and Massagetae are next to the Bactrii along the Oxus to the west, the Sacae and Sogdiani lie opposite to India with their whole ground, but the Bactriani to only a small extent: for the most part they lie along the Paropamisus. The Sacae and Sogdiani are divided by the Jaxartes, the Sogdiani and Bactriani by the Oxus, while between the Hyr-Cani and Arii dwell the Tapyri. Round the seaboard in order, after the Hyrcani, are the Amardi, the Anariaces, the Cadusii, the Albani, the Caspii, the Vitii, and perhaps others as far as the Scythae. On the other side of the Hyrcani are the Derbices, and the Cadusii are in contact with the Medi and the Matiani below the Parachoathras.

The distances he gives as follows: from Mt. Caspius to the (mouth of the) Cyrus about eighteen hundred stades, from there to the Caspian Gates five thousand six hundred, then to Alexandria of the Arii six thousand four hundred, to the city of Bactra, also called Zariaspa, three thousand eight hundred and seventy, and to the River Jaxartes, to which Alexander marched, about five thousand. The total is twenty-two thousand six hundred and seventy. redotsken verquerra ver da 225. vaecreque to forq

-vaccounter (Aristobulus) says also that it (the Oxus) is navigable, a point which both he and Eratosthenes take

rous nai Maggaν παρά τὸν λοις έδάφεσιν ίγου τὸ γὰρ δὲ Σάνας ιανούς δέ καὶ nai 'Apiwy Taμετά τούς

Καδουσίους μαὶ , έπὶ θάτερα δὲ ίους συμψαύειν

μέν τοῦ Κασταδίους, ένθεν ους, είτ'είς τετραμοσίους, αλείται, τρισν 'Ιαξάρτην ποιλίους δροῦ

oc nai Epaov Ivoinav

φορτίων κατάγειν είς την 'Υρκανίαν θάλατταν, έντευθεν δ'είς την 'Αλβανίαν πεμαιούσθαι, και διά του Κύρου και των έξης τόπων είς τον Εύξεινον καταφέρευθαι.

226: Strabo, C. 507:

(ξοτι δ'δ κόλπος) ἀνέχων ἔκ τοῦ ἀκεανοῦ πρὸς μεσημβρίαν κατ ἀρχὰς μὲν ἱκανῶς στενός, ἐνδοτέρω δὲ κλατύνεται προιών, καὶ μάλιστα κατὰ τὸν μυχὸν ἐκὶ σταδίους που καὶ πεντακισχιλίους. ὁ δ'εἰσκλους μέχρι τοῦ μυχοῦ μικρῷ κλειόνων ἄν εἰη, συνάπτων πως ἤοη τὰ ἀοικήτφ. φησὶ δ'Ερατοσθένης, τὸν ὑκὸ τῶν Ἑλλήνων γνώριμον περίκλουν τῆς θαλάττης ταύτης, τὸν μὲν καρὰ τοὺς Αλβάνους καὶ τοὺς Καδουσίους εἶναι πεντακισχιλίων καὶ τετρακοσίων, τὸν δὲ καρὰ τὸν ᾿Αναριακῶν καὶ Μάρδων καὶ Ὑρκατιο νῶν μέχρι τοῦ στόματος τοῦ "Πξου κοταμοῦ τετρακισχιλίων καὶ ὁκιακοσίων. ἔνθεν δ'ἐκὶ τοῦ Ἰαξάρτου δισχιλίων τετρακοσίων.

227: Schol. Ap. Rhod. II. 1247:
τὰ δὲ καλούμενα Καυκάσια 'Ε, ατοσθένης φησί
πλησίον είναι τῆς Κασπιανῆς θαλάσσης.

Ballist of the latter of the calter and the first are the called

228: Strabo. C. 497:

φησὶ δ' * ματοσθένης ὁπὸ τῶν ἐπιχωρίων παλετσθαι Κάσπιον τὸν Καύπασον, τοως ἀπὸ τῶν Κασπίων παρονομασθέντα: from Patrocle to the Hyrcan over into Alb the Cyrus and

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from Patrocles, and that it takes much Indian merchandise to the Hyrcanian sea. From there the merchandise is taken over into Albania, and taken down to the Euxine by way of the Cyrus and the adjoining districts.

- Trans our Jeannardone, oracione, too of Kunving Swotze

(The Caspian is a gulf) projecting southwards from the Ocean. At the entrance it is rather narrow, but further in it broadens out as it proceeds: this is especially so at its inmost part, where it measures about five thousand stades. The voyage in to the inmost part may be a little more, verging as it does on the uninhabited zone. According to Eratosthenes, the voyage round this sea so far as it is known to the Greeks is five thousand four hundred stades along the Albanian and Cadusian coasts and four thousand eight hundred past the territory of the Anariaces, the Mardi, and the Hyrcani to the mouth of the River Oxus. From there to the Jaxartes is two thousand four hundred.

227.

Eratosthenes states that what is called the Caucasian range is near the Caspian Sea. Se ouder, photocongrides, who then all age soon toda, and

Eratosthenes says that the Caucasus is called Casplus by the natives. Probably it takes this name from the Caspii.

229: Strabo C. 91:

φησίν είναι και κατ' Έρατοσθένη τον αυτόν μεσημβ, ινόν τόν τε διά τοῦ Κανωβικοῦ στόματος καὶ τὸν διά Κανέων, διέχειν δὲ τοῦτον τοῦ διὰ Θαψάνου έξανισχιλίους τριαποσίους σταδίους, τάς δέ Κυανέας του Κασκί-5 ου δρους έξαπισχιλίους έξαποσίους, 8 κετται κατά την υπέρθεσιν την έπὶ το Κάσπιον πέλαγος έπ Κολχίδος, ώστε παρά τριακοσίους σταδίους το ίσον είναι διάστημα άπο του διά Κυανέων μεσημβρινού έπι τε Θάψακον και έπι τὸ Κάσπιον· τρόπον δή τινα έπὶ τοῦ αὐτοῦ μεσημβρινοῦ κεζο-ΙΟ θαι τήν τε Θάψανον καὶ τὸ Κάσπιον. τούτω δ'ἀκολουθεῖν τὸ ἀφεστάναι ἴσον τὰς Κασπίους πύλας Θαψάμου τε μαὶ τοῦ Κασπίου του δέ Κασπίου πολύ έλάττους άφεστάναι των μυρίων, Βσους φησίν άφεστάναι Ερατοσθένης της Θαγάκου. της Θαψάπου άρα πολύ έλάττους ή μυρίους άφεστάναι τούς Ιδ έπ'εδθείας. ηθηλοπορίαν άρα είναι τούς μυρίους, ούς λογίζεται έκετνος έπ'εύθείας άπο Κασπίων πυλών είς θά-Vanov

230: Schol. Ap. Rhod. II. 399:

sine by the natives, from bly it takes this mass from the

δ δὲ Φᾶσις φέιεται μὲν ἀπὸ τῶν ᾿Αρμενίας ὁμῶν, ῶς φησιν Ἐρατοσθένης: ἐπδίδωσι δὲ εἰς Κόλχους κατὰ Θάλασσαν.

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231: Sohol. Ap. . 229. IV. 131:

Hipparchus says that even according to Eratosthenes the meridian through the mouth of Canopus and that through the Cyanean Rocks are the same. This meridian is six thousand three hundred stades from that through Thapsacus, while the Cyanean Rocks are six thousand six hundred from Mount Caspius, which lies by the pass from Colchis to the Caspian Sea: thus the distance from the meridian through the Cyanean Rocks to Thapsacus is within three hundred stades of that to Mount Caspius, and both Thapsacus and Mount Caspius are practically on the same meridian. It follows from this that the Caspian Gates are the same distance from both Thapsacus and Mount Caspius. In fact, however, they are much less from Mount Caspius than ten thousand, which is the distance Eratosthenes gives from Thapsacus, and therefore they are much less from Thapsacus in a straight line. Thus the measurement of ten thousand must be a winding route, though Eratosthenes gives it as the straight line from the Caspian Gates to Thapsacus.

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The Phasis, according to Eratosthenes, comes down from the mountains of Armenia. It runs into the sea at Colchis.

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231: Schol. Ap. Rhod. IV. 131:

Τιτηνίδος αΐης. Τοῦ Τιτῆνος ποταμοῦ, ἀφ'
οδ καὶ ἡ χώρα Τιτῆνὶς κέκληται, μνημονεύει 'Ερατοσθένης ἐν Γεωγραφία.

232: Strabo, C. 529:

Ποταμοὶ δὲ πλείους μέν εἰσιν ἐν τῷ χώρφ,
γνωριμώτατοι δὲ Φᾶσις μὲν καὶ Λύκος εἰς τὴν Ποντικὴν
ἐκπίπτοντες θάλατταν (Ερατοσθένης δ'ἀντὶ τοῦ Λύκου
τίθησι Θερμώδοντα οὐκ εὖ),

233: Plin. VI # 3:

Mensuram Ponti a Bosporo ad Maeotium lacum quidam fecere XIV XXXVIII MD passuum, Eratosthenes

234: Strabo C. 74:

δ δ'Ερατοσθένης καὶ τουπίγραμμα προφέρεται τὸ ἐν τῷ 'Ασκληπιείῳ' τῷ Παντικαπαιέων ἐπὶ τῷ βαγείση χαλπιῦ. ὑδρία διὰ τὸν πάγον.

εἴ τις ἄρ'ἀνθρώπων μὴ πείθεται οἶα παρ'ἡμῖν γίγνεται, εἰς τἦνδε γνώτω ἰδὼν δδρίαν· ἤν οὐχ ὡς ἀνάθημαθεοῦς καλόν, ἀλλ'ἐπιδεῖγμα Χειμῶνος μεγάλου θῆχ'ἰερεὸς Στρατίος.

235: Strabo C. 91:

διόπερ πρώτον μεν έπείνου τὸ ἀπὸ τοῦ στόματος ἐπὶ Φᾶσιν εἰπόντος σταδίων ὁπταπισχιλίων, παὶ προσθέντος "Geography"
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Land of Titenis: Eratosthenes mentions in his "Geography" the river Titen, from which the country Titenis also takes its name. " row venerate vir smell , valo

There is a number of rivers in the country. The best known are the Phasis and the Lycus, which flow into the Pontic Sea. Eratosthenes substitutes, wrongly, the Thermodon for the Lycus.

According to some authorities the length of the Pontus from the Bosphorus to Lake Macotis is 1,4382 miles. Eratosthenes makes 100 less.

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Eratosthenes also refers to the epigram in the temple of Asclepius at Panticapaeum, inscribed on the bronze water-jar burst by the frost:

"If any man does not believe what kinds of things happen among us, let him look at this water-jar and learn. The priest Stratius offered it, not as a fair offering to a god, but as an example of a great winter."

. logo sqyyb'l for sugara 235. is spirite or soga" -Thus, Eratosthenes first stated that the distance from the mouth (of the Euxine) to Phasis was eight τούς είς Διοσπουριάδα ένθένδε έξαποσίους, την δ'άπό Διοσκουριάδος είς το Κάσκιον υπέρθεσιν ήμερων πέντε, ήτις κατ'αύτον "Ιππαρχον είπάζεται λέγεσθαι δσον χιλίων σταθίων, ωστε την σύμπασαν πατ' Ερατοσθένη πεφαλαιούσθαι έναπισχιλίων έξαποσίων.

236: Amm. Marc. XXII 8: 10:

Omnis autem eius (Ponti Euxini) velut insularis circuitus littorea navigatio viginti tribus dimensa milibus stadiorum, ut Eratosthenes adfirmat et Hecataeus et Ptolomaeus, aliique huiusmodi cognitionum 5 minutissimi scrutatores, in speciem Scythici arcus nervo coagmentati geographiae totius adsensione formatur.

237: Schol. Eurip. Med., 2:

τάς δε Συμπληγάδας δ Σιμωνίδης συνοιμάδας φησίν. 'Ερατοσθένης δε εν γεωγραφουμένοις φησί τον πλούν στενόν είναι και σκολιόν, δι'οδ φαντάζωθαι τους πλέοντας την ἀπόκλεισιν των πετιών.

238: Plin. V # 127:

Ex Asia interilsse gentis tradit Eratosthenes
Solymorum, Lelegum, Bebryoum, Colycantiorum, Tripsedorum.

239: Steph Byz. v. Páγγρα:

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- 'Ερατοσθένης δὲ οὐδετέρως τὰ Γάγγρα φησί.

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velut insutribus didfirmat et cognitionum loi arcus nervo formatur.

υνομμάδας φησίν. v mhour aterdy Léortas thr

Eratosthenes um, Tripsedorum.

άγγρα φησί.

thousand stades, and added to this the six hundred from there to Dioscurias, and five days' journey for the pass from Dioscurias to Mount Caspius, which is estimated according to Hipparchus at about a thousand stades, so that according to Eratosthenes the sum total is nine thousand.

named apply pro the transpose to a propose and a post on a particular

for troubours are actioned and week to verify a drodeness The coasting voyage round the whole (Euxine Sea), like the circumference of an island, measures twenty-three thousand stades. This is definitely stated by Eratosthenes, Hecataeus, Ptolemy, andother careful inquirers into this kind of statistics. All geographers agree that it is shaped like a strung Scythian bow. slanding property of ou ob work of

and more call papers, taking raft applied him rand bake to end de-

Simonides calls the Symplegades "Synormades". Eratosthenes in his geographical work says that the passage is narrow and crooked, and that for this reason voyagers imagined that the rocks closed in. there are due very different tennesses of Armilyagal, of American and The Control of the Control

Eratosthenes says that the following races have died out in Asia: the Solymi, Leleges, Bebryces, Colycantil, and Tripsedi. to out the district class the transfer the design of the des

-buoke yerokon ar ourland out of land accessor mys office. Eratosthenes uses the name "Gangra" in the neuter.

Lefterhov and Knore.

240: Steph. Byz. ν. "Αμαξα:
"Αμαξα χωρίον Βιθυνίας ὡς 'Ερατοσθένης.

241: Steph. Byz. v. Tapoóc:

- Έρατοσθένης δε Ταρσόν διά το πρότερον των καρπών φθειρομένων έν τῷ παρακμάζειν, τούτους πρώτους συναγαγόντας τερσάναι, καὶ εἰς τὸν χειμώνα ἀποθέσθαι τὴν τροφήν. ὁ πολίτης Ταρσεύς, ὡς 'Αλικαρ- ὁ νασσεύς. 'Ερατοσθένης δὲ καὶ Ταρσηνόν φησι.

242: Steph. Byz. Allóxtov:

243: Schol. Lycophr. 440:

Μάγαρσος δὲ πόλις Κιλινήθε μέμνηται δὲ αὐτοῦ καὶ 'Ε, ατοσθένης · πέντε δέ φησιν εἰς
Κύπρον ἀπενεχθῆναι, Τεῦκρον, 'Αγαπήνορα, 'Ακαμαντα,
Πράξανδρον καὶ Κηφέα.

244: Strabo, C. 684: 10 May 201

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240. My aroli .vol'dat vir vorviov recent a waste met an year-Amaxa, according to Eratosthenes, is a place resolut, proja per Esugenety sio, red o va peraha, sevin Bithynia. Jan homeny our vision was some varyhouses a

no services on any any first of the services and an in-- Eratoathenes says that Tarsus received its name from the fact that, in former times, when fruits used to be lost through overripeness, these were the first people to dry them (tersainein) and store them for winter food. An inhabitant is called "Tarseus" on the analogy of "Halicarnasseus", but Eratosthenes also uses the form "Tarsenus". vasovoo fon 'punva 3

và parvadda) virmà i dec 242, på inn pravage racque pror

Aethopion: A place in Lydia, beside Hyllus and near Euripus, from which is named Aethopian Artemis. . . . Some say that she is the same as Hecate, who always holds torches: this is the explanation of Eratosthenes.

coolean proget opel on 243. It polymeranous

Magareus is a city of Cilicia. . . . Eratostheres also mentions it. He says that five men went away to Cyprus: Teucer, Agapenor, Acamas, Praxander, and Cepheus. -laval for fast good sens markaged for fast and dot of 's

Eratosthenes is not right, either. When he rebukes Damastes, he says Hierocepia is not in the north (of Cyprus); but in the south. . . . Eratosthenes says that

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ς γάρ τούτον. day and voton gyonaνούντων των πεδίων, ωστε κατέχεσθαι δρυμοζς καὶ μή γεωρδ γεζοθαι, μικρά μεν έπωφελεζν πρός τοῦιο τὰ μεταλλα, δενδροτομούντων πρός την καῦσιν ποῦ χαλκοῦ καὶ τοῦ ἀργόρου, προσγενέσθαι δὲ καὶ τὴν ναυπηγίαν τῶν στολῶν,
ἤοη πλεομένης ἀδεῶς τῆς θαλάττης καὶ μετὰ δυνάμεων ὡς δ'οὐκ ἐξενίκων, ἐπιτρέψαι τοῖς βουλομένοις
ΤΟ καὶ δυναμένοις ἐκκόπτειν καὶ ἔχειν ἱδιόκτητον καὶ
ἀτελῆ τὴν διακαθαρθεζσαν γῆν.

245: Aelian. hist. anim. VII. 48:

ACCUPATION AND DESCRIPTION OF A STATE AND A PARTY OF

ϊδιον δή τῶν ζώων καὶ ἡ μνήμη· καὶ συνώδον τοῖς προειρημένοις, καὶ ἐς τὸ αὐτὸ δ'ἐστὶν (εὕδοντος ἐν τῷ Σάμψ ἐπὶ τοῦ κεχηνότος Διονύσου νομίζοιτο ἄν καὶ τὸ φωλιὸν εἰδέναι). καὶ τοῦτο ἀκουέτω 'Ερατοσθένους τε δ καὶ Εὐφορίωνος καὶ ἄλλων περιηγουμένων αὐτό.

246: Strabe C. 108:

Προπεπτωπυίας δὲ τῆς Εὐιώπης ἄκραις πλείοσι,

... ἐκεῖνος μὲν γὰρ τιεῖς ἔφη, τὴν ἐπὶ τὰς Στήλας
καθήκουσαν, ἐφ'ἡς ἡ 'Ιβηρία, καὶ τὴν ἐπὶ τὸν Πορθμόν, ἐφ'
ἡς ἡ 'Ιταλία, καὶ τρίτην τὴν κατὰ Μαλέας, ἐφ'ἡς τὰ μετα5 ξὸ τοῦ 'Αδρίου καὶ τοῦ Εὐξείνου πάντ'ἔθνη καὶ τοῦ Μαναίδος.

247: Plin., III # 75:

Eratosthenes autem inter ostium oceani et Sar-

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ις πλείοσι, i τὰς Στήλας v Πορθρόν, ἐφ' φ'ῆς τὰ μετααὶ τοῦ Μαναί-

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formerly the plains were full of forests, so that they were covered with woods and not cultivated. The mines helped a little in this respect, as they cut down trees to smelt copper and silver, and ship-building for fleets was also practised when the sea was fearlessly navigated and in force. When they did not succeed in conquering (forests), permission was given to any who could and would to cut them down and have as private property, free of taxes, the land which was cleared.

or interior of view 245. A standed to a

Agreeing with what has just been said (the story of Androcles) and leading to the same conclusion is (the story of the "Gaping Dionysus" at Samos. . .) This may be found in Eratosthenes and Euphorion, as well as others who describe it.

sutcorpin via dad's particular in the succession of the

Europe projects with a number of promontories.

Eratosthenes gave them as three: that which comes down to the Pillars, containing Iberia, that at the (Sicilian) Strait, containing Italy, and third, that at Malea, containing all the peoples between the Adriatic, the Euxine, and the Tanais.

247

Eratosthenes gives the name "Sardinian" to the

diniam quidquid est Sardoum, inde ad Siciliam Tyrrenum, ab hac Cretam usque Siculum, ab ea Creticum.

248: Strabo C. 47: at elydel a bester

τοιγάιτοι τον μέν 'Ισσικόν κόλπον ἐπίστευσεν ἐωθινώτατον τῆς καθ' ἡμᾶς θαλάττης σημεῖον, τοῦ κατὰ Διοσκουριάδα τὴν ἐν τῷ τοῦ Πόντου μυχῷ σχεδόν τι καὶ τρισχιλίοις σταδίοις ἐωθινωτέρου ὅντος καὶ κατ' τοῦ αὐτὸν ἐκ τοῦ σταδιασμοῦ οὖ φησι.

249: Strabo C. 475:

'Ερατοσθένης δ'άπο μεν της Κυ, ηναίας έπι το Κριου μέτωπον δυείν ήμειων παι νοπτων πλούς, άπο δε Κιμάρου (ἐπὶ Ταίναρον) εἰσὶ στάδιοι ἐπταπόσιοι (μεταξό δὲ Κύθηρα), ἀπο δὲ τοῦ Σαμωνίου πρός Αίγυπτον τετο τάρων ήμερων παι νυπτων πλούς, οὶ δὲ τριῶν φασι· σταδίων δ'είναι τοῦτον τινές πενταπισχιλίων εἰρήπασιν, οὶ δὲ ἔτι ἐλαττόνων. 'Ερατοσθένης δ'ἀπο μὲν της Κυρηναίας μέχρι Κρίου μετώπου δισχιλίους φησίν, ἔνθεν δ'εἰς Πελοπόννησον ἐλάττους.

250: Schol. Ap. Rhod. IV 284:

τὸν "Ιστ. ον. . . . Ε, ατοσθένης δὲ ἐν τ. ίτω Γεωγιαφικών ἐξ ἐι ήμων τόπων βεῖν, περιβάλλειν δὲ
νῆσον Πεύκην.

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stretch from the entrance to the Ocean (Gibraltar) as far as Sardinia: from there to Sicily he calls "Tyrrhenian"; thence to Crete, "Sicilian", and from there onwards "Cretan". oon evoque as totto 'Epotocosevic, bas voice b'opic.

abelvestro vov se vico 248 so viv enterpass vov sorio

Thus he believed that the Gulf of Issus was the most easterly point of our sea, whereas the point by Dioscurias in the corner of the Pontus is some three thousand stades further east even according to Eratosthenes himself, by the itinerary he gives.

:403 . o.ii (nessaw .agii .jegev) .lodo8 :832

According to Eratosthenes, the voyage from Cyrenaica to Ram's Forehead takes two days and nights, while from Cimarus (to Taenarum) it is seven hundred stades, with Cythera lying between. From Samonium to Egypt the voyage takes four days and nights, or, according to other authorities, three. Some say that this is five thousand stades, others even less. Eratosthenes says that from Cyrenaica to Ram's Forehead is two thousand, and from there to the Peloponnese less. descue to Thorselonies as him hentred, he care to the

250.

The Ister. . . . Eratosthenes in the third book of his "Geography" says that it flows from desert parts, and that it washes round the island of peuce. Releases by Andresselle, from whos priginates the line of

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251: Strabo C. 28: έπιστροφήν γάρ λαμβάνει πρός νότον άμρωτηριάζουσα ή Θράνη, ναθ'ά συνάπτει τῆ Μακεδονία.... ούν ένόησε δὲ τοῦτο 'Ερατοσθένης, ὑπερνόησε δ' ὁμῶς. αύτὸς γοῦν ἐξηγεῖται τὴν ἐπιστροφήν, ἢν λέγω, τῆς e χώρας, suesi to true ent fant bevelled en sunt with

nost easterly point or our sea, whereas the noint of Dio-252: Steph Byz., v. "Ixvai:

*Ιχναι, πόλις Μαμεδονίας Ερατοσθένης δὲ "Αχνας αὐτήν φησι.

253: Schol. (Venet. Lips. Wassen) Il. a., 594:

Ερατοσθένης δὲ (φησὶ Σίντιας προσαγορευθηναι), έπει γόητες όντες εδρον δηλητήρια φάρμαμα.

1, eebste benbaud 254: Strabo, C. 106: 1 of) emanic mont

Έξης δὲ τὰ τοῦ Ἐρατοσθένους ἐπανορθοί, τὰ μὲν εὖ, τὰ δὲ χεῖρον λέγων ἡ ἐμεῖνος. έξ 'Ιθάνης μεν γάρ είς Κορνύραν τριακοσίους είπόντος, πλείους φησίν είναι των ένναμοσίων. έξ Επίδάρνου δὲ εἰς Θεσσαλονίκειαν έννακοσίους άποδόντος, πλείους των δισχιλίων φησί· ταῦτα uèv ev.

255: Schol. Od. Mediolan. Y' 188:

Νεοπτόλεμος πορθήσας την Μολοσσίαν, έξ 'Ανδρομάχης ίσχει Μόλοσσον, ἀφ'οῦ καὶ τὸ γένος ἐστὶ

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Eratosthene views are i where the 1 Ithaca to C dred; and w

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Molossus by

sas hippysecorngs lagors 251: vasiross piccocon va vin Thrace, near where it joins Macedonia, takes a turn to the south and juts out into a promontory. Eratosthenes did not know this for sertain, but he nevertheless suspected it. At least, he describes the turn of wat "Monorousevac. the land I mean.

SAY AN AND AND 252. MATERIAL AND STATE

Ichnae: a city in Macedonia. . . Eratosthenes calls it Achnae.

253.

Eratosthenes (says that they are called "Sinties") because they are sorcerers and discovered harmful drugs. rest of the state of the state

(Polybius) goes on to correct the statements of Eratosthenes. Sometimes he does so well, but sometimes his views are inferior to those of Eratosthenes. For example, where the latter says that it is three hundred stades from Ithaca to Corcyra, Polybius says it is more than nine hundred; and where Eratosthenes gives the distance from Epidamnus to Thessalonica as nine hundred, he says it is more than two thousand. These corrections are right.

construction and value of the contract vools, while

After sacking Molossia, Neoptolemus had a son Molossus by Andromache, from whom originates the line of

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των έν Μολοσσία βασιλέων, ως ίστορες Ερατοσθένης.

256: Steph. Byz.: Advok and of any

Αύταριαται, εθνος Θεσηρωτικόν. Χάραξ εβδόμη χρονικών, και Φαβωρίνος εν καντοδακαίς, και Ερατοσθένης.

257: Isidorus Etymolog. IX. 2. 76:

Eratosthenes autem dicit, dictos Myrmidones

a Myrmidono duce, Iovis et Eurymedusae filio.

258: Steph. Byz.. ν. 'Αγρατοι:
Εστι καὶ ἔτερον ἔθνος πλησίον 'Ακαρνάνων.
. . . λέγονται δὲ καὶ 'Αγραετς, ὡς 'Ερατοσθένης.

259: Vit. Arat. Petav. Uran. δ. 269 A:
 άλλ' ἀπὸ τῶν ἐν τῷ 'Αττικῷ ('Αθηνῶν) ωὶ
πολῖται 'Αθηναῖοι, ἀπὸ δὲ τῶν ἐν Εὐβοίᾳ 'Αθηνῆται
λέγονται, ἄσπερ 'Εματοσθένης φησὶν ἐν τῷ πρώτφ
Υεωγραφουμένων.

260: Eustath. ad II. β. 612. p. 302. 29:

καὶ ὅτι Ἐρατοσθένης καρὰ ᾿Αρκάσι φησὶ
φελλόν, μέσον τι κρίνου καὶ δρυός, δ ἐνίους
θηλύπρινον καλεῖν.

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261: Strates C. 389: the kings of Molossia. This is related by Eratosthenes.

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Eporocoevanc be more sent develo nev Tov "A-

Autariatae: A tribe of Thesprotia: Charax in the seventh book of "Chronology", Favorinus in "Miscellany", and Eratosthenes, or of a vicin , plan or of a

visalidat vērseka" vēr tam avidāa vēr als vērsamā vidi an

Eratosthenes, however, says that the Myrmidons were called after their leader Myrmidonus, son of Jupiter or one present presses wedered light to and Eurymedusa. "Bredwigt, ton be ose . . realthouse Arype by ad, bi of

. prveylagan vänga 258. vonagdas vär arvägnjarkon

There is also another tribe of Acarmanians, close by. . . . They are also, according to Eratosthenes, called "Agraeis".

true discounts in

cont places . . Tot 259. more some The citizens of Athens in Attica are called "Athenians", but those of Athens in Euboea are called "Athenetans", as Eratosthenes says in the first book of his geographical work. Shave , VISWIEDER SUBLEY by esons too very los 260; by poplant vor

Also Eratosthenes says that in Arcadia is found the cork-tree, halfway between the holm-oak and the oak, called by some the "female holm-oak".

261: Strabo. C. 389:

'Ερατοσθένης δέ φησι περὶ Φενεδν μὲν τὸν 'Ανίαν καλούμενος ποταμὸν λιμνάζειν τὰ πρὸ τῆς πόλεως,
καταδύεσθα: δ'εῖς τινας ἡθμούς, οὅς καλεῖσθαι ζέρεθρα·
τούτων δ'ἔμφραχθέντων, ἔσθ'ὅτε ὁπερχεῖσθαι τὸ ὕδωρ
δ εἰς τὰ πεδία, πάλιν δ'ἀναστομουμένων ἄθρουν ἔκ τῶν
πεδίων ἔκπεσὸν εἰς τὸν Λάδωνα καὶ τὸν 'Αλφειὸν ἔμβάλλειν,
ὤστε καὶ τῆς 'Ολυμπίας κλυσθῆναί ποτε τὴν περὶ τὸ
ἱερὸν γῆν, τὴν δὲ λίμνην συσταλῆναι· τὸν 'Ερασῖνον
δὲ περὶ Στύμφαλον βέοντα, ὑποδύντα ὑπὸ τὸ ὅρος, ἐν
10 τῷ 'Αργείς πάλιν ἀναφανῆναι· οιὸ δὴ καὶ 'Ιφικράτη,
πολιορκοῦντα τὸν Στύμφαλον καὶ μηδὲν περαίνοντα,
ἔπιχειρῆσαι τὴν κατάδυσιν ἀποφράξαι, σπόγγους
πορισάμενον πολλούς, παύσασθαι δὲ διοσηκίας
γενομένης.

262: "Soymn.", 405, f:

έξῆς δὲ μεγάλη χερρόνησος 'Υλλική πρός τὴν Πελοπόννησόν τι ἐξισουμένη· πόλεις δ' ἐν αὐτῷ φασι πέντε καὶ δέκα "Υλλους κατοικεῖν, ὅντας "Ελληνας γένει· τὸν 'Ηρακλέους γὰρ 'Ϋλλον οἰκιστὴν λαβεῖν, ἑκβαιβαρωθῆναι δὲ τούτους τῷ χρόνῳ τοῖς ἔθεσιν ἱστοροῦσι τοῖς τῶν πλησίον, ὡς φασι Τίμαιός τε κάρατοσθένης.

of Pheneus the of the city as "zerethra". Soverflows in the water from Ladon and the round the tereduced. Like phalus, sink trict of Arg when he was obtained a little descent:

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in size to the Yllians dwell by race; for as their found civilization

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ire son or sight thee the According to Eratosthenes, in the neighbourhood of Pheneus the river called Anias forms a lake in front of the city and then sinks into some openings called "zerethra". Sometimes when these are blocked up, the water overflows into the plains, and when they open again, all the water from the plains descends and flows into the Ladon and the Alpheus. In this way once even the ground round the temple at Olympia was flooded, and the lake was reduced. Likewise the Erasinus, which flows near Stymphalus, sinks under the mountain and reappears in the district of Argolis. It was because of this that Iphicrates, when he was besieging Stymphalus and making no headway, obtained a large number of sponges and tried to block up the descent: he desisted, however, when a thunder-storm took place.

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A For voryood vis bovied Next is the great Yllian peninsula, similar in size to the Peloponnese. Men say that there the Yllians dwell in fifteen cities, and that they are Greeks by race; for they had Hyllus, the companion of Heracles, as their founder, but are related to have lost their civilization through the customs of their neighbors. That is what Timaeus and Eratosthenes say.

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263: Steph. Byz. v. Auppaxiov:

Έρατοσθένης γ'Γεωγραφουμένων· Έχδμενοι οἰνοῦσι Ταυλάντιοι. κόλις δὲ Έλληνὶς Ἐκίδαμνος ἐκὶ Χερρονήσου τῆς καλουμένης Δυρραχίου. κοταμοὶ δὲ ερίλων καὶ "Αωος, κερὶ οὕς οἱ Κάδμου καὶ 'Αρμο5 νίας τάφοι δείκνυνται.

264: Schol. Ap. Rhod. IV 1215:

Τοὺς δὲ Νεσταίους Σπύλαξ ἔθνος 'Ιλλυριπον φησιν. 'Ερατοσθένης δὲ ἐν γ' Γεωγραφουμένων,
Μετὰ 'Ιλλυριπούς, φησί, Νεσταΐοι, παθ' οὕς Φάρος
νῆσος, Φαρίων ἀποιπία.

265: Strabe C. 47:

τοῦ τε 'Αδρίου καὶ τὰ άρκτικὰ καὶ τὰ ἔσχατα διεξιών οὐδενὸς ἀπέχεται μυθώδους.

266: Strabo 0. 93:

δ δε και την 'Ρώμην τιθείς έπι ταύτου μεσημβρινού την τοσούτον και Καρχηδόνος, δυσμικωτέραν, ύπερβολήν ούν άπολείπει της των τόπων άπειρίας και τούτων και των έφεξης πρός δύσιν μέχρι Στηλών.

. Titadi dend ever 267: Strabe C. 23: Telemon estade de

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263.

Eratosthenes, "Geography" 3: Next live the Taulantians. There is a Greek city called Epidamnus on the peninsula called Dyrrhachium. There are rivers called Drilo and Aotis, near which the tombs of Cadmus and Harmonia are pointed out.

Scylax calls the Nestaeans an Illyrian tribe. Eratosthenes, however, in "Geography" 3, says: "After the Illyrians come the Nestaeans, and alongside them the island of Pharos, a colony of the Pharians".

265.

illi Cooyniam adpoliant.

In discussing the furthest northern parts of the Adriatic there is nothing fabulous which he rejects.

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He, however, when he places Rome, which is so much further west than Carthage, on the same meridian, leaves no room for greater ignorance both of these localities and of those in succession westwards as far as the Pillars.

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In this gulf, called that of Cumae by Eratosthenes and formed by the Sirenussae.

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268: Strabo. C. 224:

οῦτ' οδν 'Ερατοσθένης δρθώς δ φήσας μη καθοράσθαι μήτε την Κύρνον έκ της ήπείρου μήτε την Σαρδόνα,

269: Steph. Byz. v. Tavolonos

270: Gaes. Bell. Gall. VI. 24:

--circa Hercyniam silvam, quam Eratostheni et quibusdam Graecis fama notam fuisse video, quam 1111 Orcyniam adpellant.

allegine of stille 271; Strabo, C. 104; and shall be

τον δ' Ερατοσθένη διακορήσαντα, εί χρή κιστεύειν τούτοις, όμως κερί τε της Βρεττανικής κεκιστευκέναι και των κατά Γάδειρα και την 'Ιβηρίαν.

272: Strabo, C. 106:

ἀπὸ δὲ Μασσαλίας ἔπὶ Στήλας λέγοντος ἐπτα
πισχιλίους, ἀπὸ δὲ Πυρήνης ἐξαπισχιλίους, αὐτὸς

λέγει χεῖρον πλείους ἢ ἐνναπισχιλίους τοὺς ἀπὸ

Μασσαλίας, ἀπὸ δὲ Πυρήνης μιπρὸν ἐλάττους ἢ ὁπτα
5 πισχιλίους· ἐγγυτέμω γὰρ τῆς ἀληθείας ἐπεῖνος

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268.

Eratosthenes, then, is not right when he says that neither Cyrnus nor Sardo can be seen from the mainland.

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Tauriscans: a tribe in the vicinity of the Alps. . . . Eratosthenes calls them "Teriscans" with an epsilon.

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. . . . round about the Hercynian forest, which I notice was known by repute to Eratosthenes and to some (other) Greeks: they call it "Orcynian".

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Though Eratosthenes was at a loss whether these stories should be believed, yet he did believe in those (of Pytheas) about Britain and the parts about Gadiz and Spain.

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veraviopone and 272. Where (Eratosthenes) says that it is seven thousand stades from Massilia to the Pillars, and six thousand from Pyrene, (Polybius) himself says, more wrongly, that the distance from Massilia is over nine thousand and that from Pyrene a little less than eight thousand. The estimates of Eratosthenes are nearer to the truth.

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273: Strabo. C. 159:

Ερατοσθένης δὲ καὶ ναύσταθμον ἔχειν φησίν αὐτὴν (Ταρρακώνα).

274: Steph. Byz. ν. Γάδειρα:
- Ερατοσθένης δὲ ἡ Γάδειρά φησι θηλυμώς.

275: Strabo. C. 148:

καὶ 'Ερατοσθένης δὲ τὴν συνεχῆ τῷ Μάλπρ
Ταρτησσίδα καλετσθαί φησι, καὶ 'Ερύθειαν νῆσον εὐδαίμονα.
πρὸς ὂν 'Αρτεμίδωρος ἀντιλέγων καὶ ταῦτα ψευδῶς λέγεσθαί
φησι ὑπ'αὐτοῦ, καθάπερ καὶ τὸ ἀπὸ Γαδείρων ἐπὶ τὸ 'Ιε5 ρὸν ἀκρωτήριον διάστημα ἀπέχειν ἡμερῶν πέντε πλοῦν,
οὐ πλειόνων ὅντων ἡ χιλίων καὶ ἐπτακοσίων σταδίων,
καὶ τὸ τὰς ἀμπώτεις μέχρι δεῦρο περατοῦσθαι ἀντὶ
τοῦ κύκλω περὶ πᾶσαν τὴν οἰκουμένην συμβαίνειν, καὶ
τὸ τὰ προσαρκτικὰ μέρη τῆς 'Ιβηρίας εὐπαροδώτερα
10 εἶναι πρὸς τὴν Κελτικὴν ἡ κατὰ τὸν ἀκέανον πλέουσι,
καὶ ὅσα δὴ ἄλλα εἴρηκε Πυθές πιστεύσας, δι'ἀλαζονείαν.

276: Strabo. C. 107:

with add of person one assentanted to best truth.

πάλιν δε τούτο μεν δρθώς άποφαίνεται,

δτι άγνοες τὰ 'Ιβηρικά ὁ 'Ερατοσθένης, καὶ διότι

περὶ αὐτῆς ἔσθ' ὅπου τὰ μαχόμενα ἀποφαίνεται· ὅσ

γε μέχρι Γαδείρων ὑπὰ Γαλατών περιοικες σθαι φήσας.

5 τὰ ἔξωθεν αὐτῆς, εξ γε τὰ πρὸς ὑσιν τῆς Εὐρώπης

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Tal. diéti · 8g φήσας. WHAC

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Eratosthenes says that Tarrasco has also a del road for ships. a design of the second

Eratosthenes uses "Gadeira" in the feminine.

deserver eluctives, obs int the constant of be been burner-

Rossey, tel verse appearanting they'de day ac sic toy

Eratosthenes also says that the land adjoining Calpe is called Tartessis, and that Erythea is called Happy Island. Artemidorus contradicts him and says that what he says is untrue, like his statements that the distance from Gadeira to the Sacred Cape is five days' voyage, whereas it is not more than seventeen hundred stades; that the limit of the tides is here, whereas they join up all round the inhabited world; that the coasting voyage to Jeltica provides an easier passage than the ocean voyage; and, indeed, because of the imposture of Pytheas, he discredits all the other statements Tratosthenes makes on his authority. . The reperson of r vig very bur aways vonfiv oforse har nowharman and the season of the property of

As arothed prov goads

vor flamed inusting On the other hand he shows correctly that Eratosthenes is ignorant about Iberia, if only because in some places he makes inconsistent statements about it. At least, after saying that its outer parts round to Gadeira are inhabited by Gauls, (if in fact they occupy the μέχει Γαδείρων έχουσιν έπεῖνοι, τούτων έπλαθόμενος πατά την τῆς 'Ιβηρίας περίοδον τῶν Γαλατῶν οὐδαμοῦ μέμνηται.

277; Strabo, C. 195;

'Οσίσμιοι δ'είσίν, ους 'Ωστιμίους δνομάζει Πυθέας, ἐπί τινος προπεπτωπνίας ίπανως ἄπρας είς τὸν ώπεανὸν οίπουντες, ουπ ἐπὶ τοσουτον δέ, ἐφ' ὅσον ἐπετνός φησι καὶ οί πιστεύσαντες ἐπείνω.

THE YER HETTAVINAG NATA TO ENJUTIFIED

το καλούμενον Βελέριον οἱ κατοικούντες φιλόξενοι τε διαφερόντως εἰσὶ καὶ διὰ τὴν τῶν ξένων ἐμπόρων ἐπιμιξίαν ἐξημερωμένοι τὰς ἀγωγάς, οὖτοι τὸν καττίτερον κατασκευσός φιλοτέχνως ἐργαζόμενοι τὴν φέρουσαν αὐτὸν γῆν. αὔτη δὲ πετρώδης οὖσα διαφυὰς ἔχει γεώδεις, ἐν αἶς τὸν πόρον κατεργαζόμενοι καὶ τήξαντες καθαιρούσιν. ἀπότυς ποῦντες δ'εἰς ἀστραγάλων βυθμούς κομίζουσιν εῖς τινα

νήσον προκειμένην μέν της Πρεττανικής, δνομαζομένην δέ

ΙΘ "Ιπτιν, κατά γάρ τὰς ἀμκάτεις ἀναξηραινομένου τοῦ μετεξύ τόπου ταῖς ἀμάξαις εἰς ταύτην κομίζουσι δαψιλῆ τὸν καττίτερον. ἔδιον δέ τι συμβαίνει περὶ τὰς πλησοίον νήσους τὰς μεταξύ κεψμένας τῆς τε Εὐρώπης καὶ τῆς Πρεττανικῆς κατά μὲν γὰρ τὰς πλημμυρίδας τοῦ μεταξύ
 15 πόρου πληρουμένου νῆσοι φαίνονται, κατά δὲ τὰς ἄμσου

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westward parts of Europe as far as Gadeira) he forgets
all about this and mentions Gauls nowhere in his survey
of Iberia.

Int vincoybrox neverbe 277. anthe hervious salvatos

Ostimii, live on a cape which projects a considerable distance into the ocean, but not so far as he and those who rely on him say.

varnixà (à xin 6x . 203 an x 278); xix hint of the in opposition

called Belerium are not only remarkably friendly to strangers but, through their intercourse with foreign merchants, civilized in their manners. They produce tin, skilfully working the earth which bears it. This earth is rock-like, but contains earthy channels along which they cut their way. They smelt the ore, refine it, and cast the tin into the shape of knuckle-bones. They then convey it on to an island lying in front of Britain, named Ictis: the intervening channel becomes dry at low tide, and they convey the tin in large quantities in carts. (It is a peculiar thing that happens with the inlying islands between Europe and Britain: when the intervening channel fills up at high tide they become islands, but when the sea flows away at low tide and leaves

πώτεις άπορρεούσης της θαλάττης και πολύν φόπον άναξηραινούσης, θεωρούνται χερρονήσοι. ἐντεύθεν δ'οί ἔμποροι παρά των ἐγχωρίων ἀνούνται και διακομίζουσιν είς την Γαλατίαν. τὸ δὲ τελευταῖον πέζη διά της Γα-20 λατίας πορευθέντες ἡμέρας ὡς τριάκοντα κατάγουσιν ἐπὶ των ἰππων τάφορτία πρός την ἐκβολήν τοῦ 'Ροδανοῦ ποταμού.

279: Diod. Sic. V. 21:

αύτη γάρ τῷ σχήματι τρίγωνος ούσα παραπλησίως τῷ Σιπελία τὰς πλευράς ούν ἱσοκώλους ἔχει. παρεπτεινούσης δὲ αὐτῆς παρά τὴν Εὐρώπην λοξῆς, τὸ μὲν ἐλάχιστον άπό της ήπείρου διεστημός άμιώτηριον, δ μαλούσι Κάντιον, 5 φασίν ἀπέχειν ἀπό τῆς γῆς σταδίους ὡς ἐκατόν, καθ'δν τόπον ή θάλασσα ποιετται τον έκρουν, το δ'ετερον ακρωτήριον το καλούμενον Βελέριον απέχειν λέγεται της ήπείρου πλούν ήμερων τεττάρων, το δ' δπολειπόμενον ανήμειν μέν Ιστοροσσιν είς το πέλαγος, δνομάζεσθαι, δ'"Ορκαν. των δὲ κλευρών 10 την μεν έλαχίστην είναι σταδίων έπταπισχιλίων πενταποσίων, παρήπουσαν παρά την Εύρωπην, την δε δευτέραν την άπο του πορθμού πρός την πορυφήν ανήπουσαν σταδίων μυρίων πενταπισχιλίων, την δέ λοικήν σταδίων δισμυρίων, ώστε την έδσαν είναι της νήσου περίφοραν σταδίων τετραπισμυρίων δισχιλίων 15 πεντακοσίων, κατοικείν δέ φασι την Πρεττανικήν αφτόχθονο γένη καὶ τὸν παλαιὸν βίον ταῖς άγωγαῖς διατηρούντα. άρμασι μέν γάρ κατά τούς πολέμους χρώνται, καθάπερ οί παλαιοί των Ελλήνων ήρωες έν τω Τιωικώ πολέμω κεχρησθαι παραδέδονται,

a wide channe merchants buy it from here through Gaul on horses to

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α παραπλησίως SOPERTE! nev elaxiotov ούσι Κάντιον. v, на6° бу тоpor answeaptor ήπείρου πλούν μέν Ιστορούσιν v dè ndeupäv av sevtanosluv. v thy and tov wolwy reviousoe thy kaoay elwww. Stoxthiwv κήν αὐτόχθονο ρούντα. άρμασι of salatof tav majadédoviai,

a wide channel dry, they are seen to be peninsulas.) The merchants buy the tin from the inhabitants and transport it from here to Gaul. Finally, after travelling by land through Gaul about thirty days, they bring their cargoes on horses to the mouth of the river Rhodanus.

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This island, like Sicily, is in shape triangular with unequal sides. It stretches sideways alongside the coast of Europe, the least distant point from the continent being the promontory known as Cantium, which is said to be about one hundred stades from the mainland: this is where the sea flows (into the Ocean). The second corner, named Belerium, is said to be four days' sail from the continent, while the other, according to the authorities, projects out to sea and is named Orca. The shortest side, alongside Europe, is seven thousand five hundred stades long; the second, from the Straits to the cape which projects, is fifteen thousand; and the last is twenty thousand. Thus the total perimeter of the island is forty-two thousand five hundred stades. Britain is said to be inhabited by indigenous tribes, who practise an old-fashioned manner of life in their pursuits. For example, they employ charlots in warfare, as tradition has it that the Greek heroes of old did in the Projan War. They occupy cheap -maker building at shor inchesons -634 Massey for roverboir wine vi vialouros pervoulr

καὶ τὰς οἰκήσεις εὐτελεῖς ἔχουσιν, ἐκ τῶν κολάμων ἢ

20 ξύλων κατὰ τὸ κλεῖστον συγκειμένας· τῆν τε συναγωγὴν

τῶν σιτικῶν καρκῶν κοιοῦνται τοὺς στάχυς αὐτοὺς ἀποτέμνοντες καὶ θησαυρίζοντες εἰς τὰς καταστέγους οἰκήσεις·
ἐκ δὲ τούτων τοὺς καλαιοὺς στάχυς καθ ἡμέραν τίλλειν,

καὶ κατεργαζόμένους ἔχειν τὴν τροφήν· τοῖς δ'ἦθεσιν

25 ἀκλοῦς εἶναι καὶ κολὸ κεχωρισμένους τῆς τῶν νῦν ἀνθρώκων ἀγχινοίας καὶ κονηρίας. τὰς τε διαίτας εὐτελεῖς
ἔχειν καὶ τῆς ἐκ τοῦ κλοῦτου γεννωμένης τροφῆς πολὸ
διαλλάττοντας. εἶναι δὲ καὶ πολυάνθρωκον τὴν νῆσον,

καὶ τὴν τοῦ ἀξρος ἔχειν διάθεσιν καντελῶς κατεψυγμένην,

30 ὡς ἄν ὑκ'αὐτὴν τὴν ἄρκτον κειμένην. Βασιλεῖς δὲ καὶ
δυνάστας κόλλους ἔχειν, καὶ κρὸς ἀλλήλους κατὰ τὸ κλεῖστον εἰρήνικῶς διακεῖσθαι.

280: Plin. H. N. II. 99:

Octogenis cubitis supra Britanniam intumescere aestus Pytheas Massiliensis auctor est.

281: Strabo, C. 201:

είσὶ δὲ καὶ ἄλλαι περὶ τὴν Βρεττανικήν νῆσοι μικραῖ. μεγάλη δ'ἡ 'Ιέρνη πρὸς ἄρκτον αὐτῆ παραβεβλημένη, πρόμηκες μᾶλλον πλάτος ἔχουσα. περὶ ἡς οὐδὲν ἔχομεν λέγειν σαφές, πλὴν ὅτι ἀγριώτεροι τῶν τῶν Βρεττανῶν ὑπάρχουσιν οἱ κατοικοῦντες αὐτῆν, ἀνθρωποφάγοι τε ὅντες καὶ πολυφάγοι, τούς τε πατέρας τελευτήσαντες κατεσθίειν ἐν καλῷ τιθέμενοι καὶ φανερῶς μίσdwellings, for ber. They have many known as required in a have many known as required in a peacefully of the control of the co

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Britain, who to the north can give no inhabitants are not only to eat their

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dwellings, for the most part constructed of reeds or timber. They harvest their grain by cutting off just the
ears alone, storing them in covered buildings. From
these they select the old ears day by day, and, preparing
them as required, use them for food. They are simple in
their habits, and far removed from the small-minded wickedness of today. Their ways of living are cheap, and
they have nothing to do with the luxury resulting from
wealth. The island too is thickly populated, though the
disposition of the climate is very cold, as might be expected in a land situated right under the Bear. They
have many kings and princes, who for the most part are
peacefully disposed towards each other.

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On the authority of Pytheas of Massilia the

281.

Britain, while Ierne is a large island lying alongside it to the north, whose breadth is greater than its length. I can give no certain information about it except that its inhabitants are more uncivilized than the Britons. They are not only gluttons, but cannibals, and consider it right to eat their fathers when they die and openly to have inter-

γεσθαι τατς τε άλλαις γυναιξί καὶ μητράσι καὶ άδελφατς· καὶ ταῦτα δ'οὖτω λέγομεν, ὡς οὖκ ἔχοντες
ΙΟ ἀξιοπίστους μάρτυρας.

282: Strabo. 0. 201:

πρός μέντοι τὰ οὐράνια καὶ τὴν μαθηματικὴν θεωρίαν ἄν ἱκανῶς δόξεις κεχρῆσθαι τοῖς
πράγμασι, τοῖς τῷ κατεψυγμένη ζώνη πλησιάζουσι
τὸ τῶν καρκῶν εἶναι τῶν ἡμέρων καὶ ζώων τῶν μὲν

δ ἀφορίαν παντελῆ, τῶν δὲ σπάνιν, κέγχρω δὲ καὶ
ἄλλοις λαχάνοις καὶ καρποῖς καὶ βίξαις τρέφεσθαι·
καρ'οἰς δὲ σῖτος καὶ μέλι γίγνεται, καὶ τὸ πόμα ἐντεῦθεν ἔχειν' τὸν δὲ σῖτον, ἐπειδὴ τοὺς ἡλίους οὐχ ἔχουσι καθαρούς, ἐν οἴκοις μεγάλοις

10 κόπτουσι, συγκομισθέντων δεῦρο τῶν σταχύων· αἰ
γὰρ ἄλως ἄχρηστοι γένονται διὰ τὸ ἀνήλιον καὶ
τοὺς ὅμβρους.

283: Gemin. Rhod. . El. Astr. . VI:

τόδος ή μεγίστη ήμέρα γίνεται ώρων ξσημερινών ις, καὶ τοῖς ἔτι βορειοτέροις ιζ καὶ τη ἀρών ή μεγίστη ήμερα γίνεται. ἐπὶ δὲ τοῆς τόπους τούτους δομεῖ καὶ Πυθέας δ Μασσιλιώτης παρεῖναι. φησὶ γοῦν ἐν τοῖς περὶ τοῦ ἀμεανοῦ πεπραγματευμένοις αὐτῷ, ὅτι Ἐδείμνυον ήμτν οἱ βάρβαροι ὁποῦ ὁ ἤλως μοιμάται. συνέβαινε γὰρ περὶ τούτους τοὺς

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phenomena and seem to have the people we scarcity of others a complants, on for and honey many have no clear buildings whing-floors as

Propontis ha those furthe hours. It s districts in the Ocean: "to rest." For

and rain.

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women. I give this information for what it is worth: I have no trustworthy witness for it.

282.

All the same, if we have regard to the heavenly phenomena and mathematical principles he (Pytheas) would seem to have made good yse of the facts. He says that the people who live close to the frigid zone have a noblev liebnovi Balantia Eornoc scarcity of some cultivated crops and of animals, and of for rado Regardy diagestora, no. others a complete lack: they live on millet and other var rovis végoső vá sá vordor plants, on fruits and roots. Those people who have grain and honey make their drink from them as well. As they have no clear sunshine, they thrash their grain in large buildings where they first collect the ears, for threshing-floors are useless because of the lack of sunshine and rain. III , II VANA . W

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The people who live even further north than the Propontis have a longest day consisting of 16 hours, and those further north still have longest days of 17 and 18 hours. It seems that Pytheas of Massalia visited these districts in person. At least, he says in his work on the Ocean: "The natives kept showing us where the sun goes to rest." For it happened that the night became extremely

10 τόπους την μεν νύντα παντελώς μικράν γενέσθαι, ώρων οίς μεν δύο, οίς δε τριών ώστε μετά την δύσιν μικρού δια- λείμματος γινομένου έπανατέλλειν εὐθέως τὸν ηλιον.

284: Strabo, C. 104:

προσιστορήσαντος δὲ καὶ τὰ περὶ τῆς Θούλης καὶ τῶν τόπων ἐκείνων, ἐν οἶς οὔτε γῆ κατ αὐτὴν ὑπῆρχεν ἔτι, οὔτε θάλαττα, οὔτ ἄηρ, ἀλλὰ σύγκριμά τι ἑκ
τούτων πλεύμονι θαλαττίψ ἐοικός, ἐν ῷ φησι τὴν γῆν

5 καὶ τὴν θάλατταν αἰωρεῖσθαι καὶ τὰ σύμπαντα, καὶ
τοῦτον ὡς ᾶν δεσμὸν εἶναι τῶν ὅλων, μήτε πορευτον
μήτε πλώτον ὑπάρχοντα. τὸ μὲν οὖν τῷ πλεύμονι ἐοικὸς
αὐτος ἑωρακέναι, τἆλλα δὲ λέγειν ἐξ ἄκοῆς. ταῦτα μὲν
τὰ Πυθέου.

285: Plin. H. N. XXXVII, 11:

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Pytheas Gretonibus Germanicae genti accoli
aestuarium Oceani, Metuonidis nomine, spatio stadiorum
sex milium; ab hoc diei navigatione abesse insulam
Abalum: illo per ver fluctibus advehi, et esse con5 creti maris purgamentum. incolas pro ligno ad ignem
uti eo, proximisque Teutonis vendere. Huic et Timaeus
credidit sed insulam Basiliam vocavit.

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For it happened that the night becaus extradely

hort about these hours, in others had elapsed after

those districts or sea, or air fish; in this suspended, it possible to we fish he says the is relating Pytheas.

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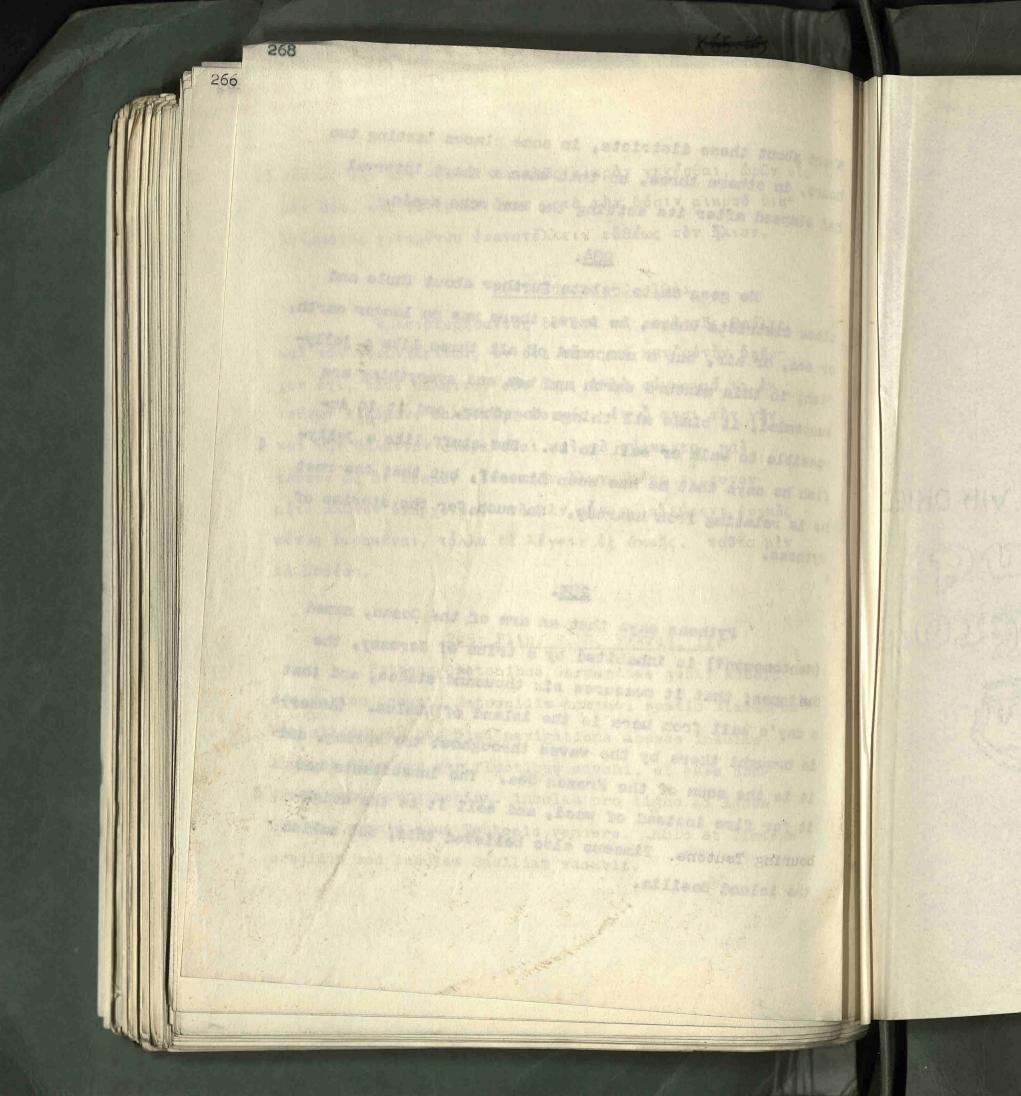
mort about these districts, in some places lasting two hours, in others three, so that when a short interval had elapsed after its estting the sun rose again.

284.

He goes on to relate further about Thule and those districts where, he says, there was no longer earth, or sea, or air, but a compound of all three like a jellyfish; in this mixture earth and sea and everything are suspended, it binds all things together, and it is impossible to walk or sail in it. The stuff like a jellyfish he says that he has seen himself, but that the rest he is relating from hearsay. So much for the stories of Pytheas.

285.

Pytheas says that an arm of the Ocean, named (Mentonomon?) is inhabited by a tribe of Germany, the Ometones; that it measures six thousand stades, and that a day's sail from here is the island of Abalus. (Amber) is brought there by the waves throughout the spring, and it is the soum of the Frozen Sea. The inhabitants use it for fire instead of wood, and sell it to the neighbouring Teutons. Timaeus also believed this, but called the island Basilia.



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