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The Philosophy of
ANAXAGORAS

The Philosophy of ANAXAGORAS

AN ATTEMPT AT RECONSTRUCTION

By FELIX M. CLEVE

"All Has Been Arranged by Mind"—ANAXAGORAS

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MANIBUS
ADOLFI STOEHR

FOREWORD

PHILOSOPHIA FIAT,
QUAE PHILOGIA FUIT!

IT IS A TRUE CALAMITY that we have so little left of those earlier philosophic masters and that we have been deprived of anything complete. Because of that loss we unintentionally measure them in wrong proportions and allow ourselves to be influenced against them by the mere accident that Plato and Aristotle have never been in want of praisers and copyists. . . . Probably the grandest part of Greek thought and of its expression in words has been lost to us.

Friedrich Nietzsche, who wrote these sentences in 1873,* is quite right (save that he takes for an accident what certainly was not one). Plato, our great Plato, is really but an imposing synthesis, the admirable architect of a grand building, practically none of the stones of which come from himself. And Aristotle, the polyhistor, as far as his philosophy is concerned, is apparently little else but a Plato deprived of his poetical make-up, notwithstanding those ostensible differences which Aristotle himself is given to emphasizing. The truly great ones, the giants, the really original thinkers, the pure philosopher types, these are to be found in the time before Plato. Again: Nietzsche is right.

But—his plaint is not quite justified. Those grand constructions are not hopelessly lost. We have been “deprived of anything complete,” but there have been left to us large numbers of fragments. It is doubtless true that works complete in a literary sense cannot be joined together from these remains. On the basis of the extant fragments, at any rate,

**Die Philosophie im tragischen Zeitalter der Griechen* (“Es ist ein wahres Unglück, dass wir so wenig von jenen älteren philosophischen Meistern übrighaben und dass uns alles Vollständige entzogen ist. Unwillkürlich messen wir sie, jenes Verlustes wegen, nach falschen Maassen und lassen uns durch die rein zufällige Tatsache, dass es Plato und Aristoteles nie an Schätzern und Abschreibern gefehlt hat, zuungunsten der Früheren einnehmen. . . . Wahrscheinlich ist uns der grossartigste Teil des griechischen Denkens und seines Ausdruckes in Worten verloren gegangen.”)

a philological reconstruction is not really feasible. However, we might attempt something rather different, reconstruction in a *philosophical* sense. This should not be a total impossibility.

I am well aware of the official dogma concerning the pre-Socratic philosophers: "Versuche, ihre Systeme auf abstrakt begrifflichem Wege zu rekonstruieren, sind aussichtslos."* And likewise: "The early Greek period is more a field for fancy than for fact."**

But we are hardly compelled to agree.

In principle a philosophic reconstruction is not impossible. It is impossible only to the old-fashioned nothing-but-philologist, just as it would be impossible to the mere philologist to reconstruct a whole from fragments of an ancient mathematician's work.

Cognition of the like by the like—it is here, if anywhere, that that old rule applies. *Command of the Greek language, though indispensable for this task, is not enough for grasping, let alone for judging, Greek philosophy.* In those olden times all people in Greece spoke Greek, after all. . .

What is to be accomplished by philosophic reconstruction is not to fit together, like pieces of a jig-saw puzzle, stray fragments into a literary whole; but *to construct a philosophic building in such a way that all the authentic material handed down can be fitted in.*

For some thirty years I have been attempting to reconstruct the genuine system, in all its foundations, branches, and ramifications, of one of the most gigantic of those pre-Platonic giants: *the system of Anaxagoras*.†

This fundamental condition, that all the authentic material must fit into the reconstruction, has been fulfilled. Thus, if I may venture the claim, I have finally accomplished my purpose, and this HYPOTHETICAL reconstruction, not of Anaxagoras' writing but of his philosophical system, seems to be fairly well substantiated.

The results achieved are unexpected enough, and this system claiming to be Anaxagorean appears indeed somewhat surprising. It certainly is opposed to nearly all the "established facts."

Sometimes, however, established facts turn out to be established, but not facts. That is to say, they do not stand the test. But then it does not matter, either, by whom they have been established; be it by Diels or by Zeller or even by Aristotle. "*magis amica veritas*," don't you know. . .

And sometimes several contrasting "facts" about one and the same

*Ueberweg-Praechter, *Geschichte der Philosophie*, I², p. 42.

**T. V. Smith, *Philosophers Speak for Themselves*, p. xi.

†The results of the first rudimentary attempt at such reconstruction were published under the title of *Die Philosophie des Anaxagoras. Versuch einer Rekonstruktion* (Vienna, 1917).

thing may claim to be "established;" just like those three or four "absolutely genuine" skulls of the famous Hungarian hero Kossuth that are shown in different places. Take, for instance, the mere dates of the main items in Anaxagoras' biography. Strange as it may seem, there are no less than three different versions:

Version Number One. Anaxagoras was born in Klazomenai in 500 B.C., lived and taught in Athens from 461 to 432, was accused and sentenced to death in 432, and having been rescued by his *friend* Pericles, left for Lampsakos, where he died in 428.

This is the current, "orthodox" version, based on Apollodorus' somewhat schematic statements and backed by authorities like Diels; which is to say that it is accepted by the majority.

Version Number Two. Lifetime: 500-428, as above; residence in Athens: 480-450; date of the trial: 450; then residence in Lampsakos, where he conducts a flourishing and influential school of philosophy for the last two decades of his life.

This version was "established" by A. E. Taylor in a clever essay, "On the Date of the Trial of Anaxagoras,"* supported by a number of quite impressive arguments.

Version Number Three. Anaxagoras was born in—533, came to Athens in 494 (after the fall of Miletus), and taught there for thirty years. His most famous pupils were Themistocles, Pericles, and Euripides. After the fall of the meteoric stone of Aigospotamoi in 467/6**, which confirmed his astrophysical theories, he finally made up his mind to put his doctrine down in writing, published his book in 466 and, thereupon, was indicted and sentenced to death "for impiety and Persian leanings" in 465. Rescued by his *pupil* Pericles, who was just successfully beginning his career at that time, he left for Lampsakos (then still under Persian rule†), where he died some years later, in 462 or 461.

This version was established in 1884 by Georg Friedrich Unger in a brilliant, detailed research on "Die Zeitverhältnisse des Anaxagoras und Empedokles,"†† in which he accounts for all his statements with really convincing reasons. I quote only one of these arguments: Aside from the fact that in none of the Platonic dialogues is Anaxagoras introduced as a living person, Socrates, who was born in 468, attended lectures by

**The Classical Quarterly*, II (1917), 81-87.

**According to more recent estimates, in 468/7.

†Magnaesia, Lampsakos, and Myus were those three cities which, just about that same time, Artaxerxes I (465-424) gave to Themistocles when the latter came as a refugee. (Themistocles died at Magnesia in 460.)

††*Philologus*, IV (1884) Suppl., 511-550. Prior to Unger, the great K. F. Hermann had maintained that Anaxagoras was born in 534 B.C. or Olymp. 61/3 (*De philos. Ionic. aetibus* [Göttingen, 1849], 13 ff.).

Archelaos, a disciple of Anaxagoras'; would he have done so if Anaxagoras himself had been available as a lecturer in Athens until 432?

(According to Unger, Empedocles was born in 520, published his philosophical poem before 472, was exiled from Akragas in 467/6, and disappeared for good in 461. And Democritus, who is reported in all the sources as younger than Anaxagoras by forty years, would have been born in 493, which would be in perfect keeping with Diodorus' statement that he died, at ninety years of age, in 404.)

There are, then, no less than three sets of "established facts," differing greatly from each other. You can make your own choice. It is no business of mine to arbitrate such a controversy. That would really be going beyond my "license." But I am entitled to state, just by way of a subjective, private opinion, that I for one prefer version number three. (Not merely because Diels, who later became *Geheimrat* in Berlin, had the power to silence Unger, who had dared to disagree, but, above all, for internal reasons.)

Therefore, reproachful pointing at contradictions of "established facts," while to be expected, will not be enough to cause me worry, so long as I can point instead at some of our philosopher's own words contrary to those "facts," or interpretations, "established" by later authorities—whatever their names may be.

There are those who like not only "facts," but also estimates to be "established" once and for all. And so I trustfully expect someone to produce the objection that I have "over-emphasized Anaxagoras' place in the philosophy of the era."

Such an objection would be tantamount to taking for granted and established what precisely is the question.

The place Anaxagoras has held so far had been given him on the basis of the old opinions and interpretations—those interpretations and opinions which now are being questioned and contested. It is not that I started by "over-emphasizing the place of Anaxagoras" and then, on this presupposition, undertook to reconstruct his philosophy. It is exactly the other way around: On the basis of the results of a thirty years research, I now suggest some change in the estimate of the place due to Anaxagoras in the philosophy, not "of the era," but of mankind.

The only presuppositions on which I venture to base my reconstruction are as follows:

1. that Anaxagoras was a real philosopher, and not a babbler;
 2. that, as after all a human being, Anaxagoras must not be expected to have foreseen what would happen even a single day after his death, let alone some decades or centuries later;
- and, consequently,
3. that Anaxagoras cannot justly be blamed for not having paid his

world-renowned successors enough reverence to harmonize his philosophy with their interpretations.

Time is not reversible. Therefore, if we want to arrive at an understanding of what the genuine Anaxagoras thought and taught, we may, in fact we must, presuppose all that he could have learned from his philosophic ancestors and brothers. But on the other hand, while attempting to reconstruct his philosophy, all of our knowledge and even of our notions which have arisen from later periods of human thought must be silenced and forgotten.

A difficult task, indeed, but as thrilling as an actor's! To impersonate Orestes in a tuxedo would hardly be proper, would it? And so, too, in the historic theatre of mental evolution, true style is pertinent.

However, it is not as wearers of their costumes that the heroes of Greek tragedy have become eternal human models, but only in so far as they are embodiments of eternal types of human character, engaged in eternal human conflicts.

Likewise, beyond its mental costume, so interesting historically, the philosophy of Anaxagoras—in its very essence, its primary and prime conception—has come to be an eternal question's eternal answer.

F. M. C.

New York City
September, 1948

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The late Dean Carl Ruediger, of George Washington University, Washington, D. C., in the summer of 1940 during the Quaker-sponsored "American Seminar" in Wolfeboro, New Hampshire, and during the subsequent winter, unceasingly encouraged me to carry on with my work and showed me how to prepare an American manuscript. Professor Richard P. McKeon, of the University of Chicago, after having examined an early copy of the manuscript, in a long correspondence imbued me with faith and confidence by the reiterated assurance of his hope that I would bring to completion the arduous task I had undertaken. Professor Horace L. Friess, of Columbia University, on my behalf submitted the manuscript to the Departments of Philosophy and of Latin and Greek. Professor Kurt von Fritz, of Columbia University, took the trouble to scrutinize the manuscript and judged that, from the philological angle, there was no flaw in it. Without Professor John H. Randall, Jr., of Columbia University, this book would never have been put between covers. His unforgettable, energetic "It must be printed!"—at the Smoker held at the Annual Meeting of the American Philosophical Association, Eastern Division, at Vassar College in 1941—started the whole matter of publication. Besides, his detailed advices in a memorable letter in October, 1944, proved tremendously fruitful for the final formulation. And last, but by no means least, I desire to mention Erwin O. Freund, of Chicago, my late, beloved cousin. He not only stretched his hand over the ocean to rescue me and my little family and in the first years of my stay in my new homeland enabled me to finish this book, but also eventually made financially possible the publication of the volume. By his sudden death, mankind has been deprived of a genuine, magnanimous American philanthropist.

CONTENTS

KEYNOTE.....	xxi
PROLOGUE.....	xxiii

THE CONSTITUENTS OF THE UNIVERSE

I. THE ELEMENTS AND THEIR MOIRAS.....	3
Aristotelian Reports, 3; An Old Question and a New Answer, 5; Essence of the Anaxagorean Elements, 6; The Ostensibly Infinite Number of the Elements, 7; The Distinctive Feature, 8; The Primary Relation and Its Dual Working, 9; Equally Infinite Particles of Each Element, 10; "The Great" and "the Small," 10; Infinite Geometrical Divisibility, 12; Infinity of Space Filled, 13; A Strange Juxtaposition and an Attempt at Solving the Riddle, 13; An Aggregation Terminology, 16	
II. NOUS, THE RULER ELEMENT AND CONSTRUCTION ENGINEER.....	19
Homogeneity, Relative and Absolute, and Why Snow Is Also Black and Warm, 19; Spatial Extensiveness of Nous, 21; Nous' Immiscibility as a Condition of Its Power, 21; Structure of the Anaxagorean Molecule, 22; Molecule: the "Grown-Together," 23; Impenetrability—Motion Resistance—Movability, 24; The Divine Mechanician, 24; Without Renunciation or Ideal . . . , 26	

COSMOGONY

III. THE PRIMORDIAL CONDITION.....	31
"Pantahomou," 31; An Endorsement by Aristotle, 34; "Keeping Itself at a Standstill . . .," 35; The Whereabouts of Nous, 36	
IV. FIRST MEANS OF COSMOPOEIA: DIFFERENTIATION.....	38
Disengagement of the Checked Qualities, 38; Beginning of Cosmopoeia and Its Very First Moments, 40; Why Cosmogony Had To Start from One Point, 43; Peri-échon—Proskri-thénta—Apokekriména, 43; Exegetic Paraphrase of Fragment Number One, 44	
V. SECOND MEANS OF COSMOPOEIA: ROTATION....	48
The Two Sorts of Motion and Their Allotment to Two Principles, 48; A Mental Experiment, 49; The Effects of Rotation upon the Earth and the Waters, and upon the Original Line of Fall, 50; Why the Rotation of the Earth Has Been Passed Over in Silence, 51; An Endorsement by Plutarch, 52; Internal Reasons for the Rotation of the Earth, 53; The Effects of Rotation upon Air and Ether, 53; Rotation and Stratification, 54; How the Earth Remains Suspended, 55	
VI. DIFFERENTIATION AND ROTATION ACTING TOGETHER.....	58
The Proskrihenta and Their Conglomerations, 58; Why Angular Velocity and Centrifugal Force Must Increase from Without Inwards, 59; Origin of the Stars, 60; How Anaxagoras Came to His Hypothesis, 61; The Stone of Aigospotamoi, 62; Will the Stars Crash Down to the Earth in Time to Come?, 63; Apparent and Real Magnitude of the Stars, 64; That Difficult Moon . . . , 65; Anaxagoras' Invisible Celestial Bodies, 67	

I. THIRD MEANS OF COSMOPOEIA: DISMEMBERMENT OF THE AXIS.....	69
--	----

Individual Rotation for Every Sphere, 69; Explanation of the Milky Way, 70; The Orbits and the Turnings of the Sun and of the Moon, 71; When Will Cosmogony Have Come to Its End?, 73

“THERE ARE SOME IN WHICH NOUS, TOO, IS CONTAINED”

II. THE BODIES.....	77
---------------------	----

Construction against Stratification, 77; If Nous Were Like the God of the Bible . . . , 77; *Creatio ex Nihilo*—Viewed Psychologically, 80; “Primordial Generation” and “Generation from One Another,” 81; First Measure against Decay: Breathing, 82; The Meaning of “Psyche,” 82; “Larger Psyche” and “Smaller Psyche,” and the Weakness of Human Perception, 83; Second Measure against Decay: Nutrition and Digestion, 85; An Ancient Interpretation, 86; The Genuine Anaxagorean Teaching, 87; And What about Fragment Number Ten?, 88; Third Measure against Decay: Perception, 89; What Is the Meaning of “Corresponding to the Deficiency . . . ”?, 91; Decay, 92; An Epitomist’s Report and Its Anaxagorean Sense, 93; Sleep and Death—Physiologically, 94

III. THE SOULS.....	96
---------------------	----

Nous Still the Only Person in the Universe, 96; An Enigmatic Fragment, 97; What the Riddle Consists in, 97; Attempts at Elucidation, 99; *Conditio Pluralitatis Personarum*, 100; Comparison with an Aristotelian Teaching, 101; The World-Nous and the Separate Nous-Individuals, 102; Sleep and Death—Psychologically, 103; The Site of the “Soul,” 104; The Conscious and the “Unconscious” Occurrences in the Organism, 104; Theory of Perception, 106; No Scepticism in Principle, 107; Physical Pain, 108; Attempt at Reconstruction, 109; Physical Delight, 111; No “Pain-and-Delight”-Element,

112; A Gross Misinterpretation, 112; Scanty Reports on Details, 114; Plants, Too, Have Individual Consciousness, 115; An Ungrateful Disciple, 116; The Actual Differences in Intelligence, 119; The Aristotle Mystery, 120

INFINITY IN SPACE AND TIME

X. ONE COSMOS OR MANY COSMOI?..... 125

"With Us" and "Elsewhere," 125; Is the Moon Inhabited?, 126; Infinity of Finite Cosmoi, 125; Duration of Cosmogony and the Destiny of the Stars, 128; "The Whole" and "the Wholes," 128; Witnesses—Contesting and Endorsing, 129

XI. THE OSTENSIBLE BEGINNING IN TIME..... 131

Eudemos' Reproach and Simplicios' Attempt at Refutation, 131; Rehabilitation, 132; Eternal Periodicity, 133; Does Pantahomou Imply a Sleep of Nous?, 134; The Three Hellenic Attitudes Regarding Commencement, 135; A Weighty Endorsement, 135; Remarkable Analogies, 136

ANAXAGORAS AND POSTERITY

XII. THE ELEMENTS—ARISTOTELIAN AND OTHERWISE..... 141

The Riddle of the Aristotelian Reports, 141; Confusion with Anaximander, 142; A Strange Criticism, 143; Friedrich Nietzsche, Paul Tannery, John Burnet, 145; Eduard Zeller, 147

XIII. NOUS—ARISTOTELIAN AND OTHERWISE..... 150

Is Nous "Pure Spirit"?, 150; Modern Interpretations, 150; New Answer by Counter-Question, 153; Anaxagoras, the Monist, the Dualist, the Pluralist, 155; Is Anaxagoras an

CONTENTS

xix

Inconsistent Teleologist?, 156; Is Nous Really But a Stop-Gap?, 156

EPILOGUE.....	160
INDEX OF PASSAGES.....	163
REGISTER OF NAMES..	166

KEYNOTE .

“When dealing with a thinker of Anaxagoras’ rank, we may assume, perhaps, ingenuous presuppositions and starting-points, but never any inconsistency or nonsense in the construction itself.”

(Page 53 of this book)

PROLOGUE

*That man is blessed who holds in his mind
Knowledge of science and neither for damage
Of his fellow-men nor wrongful deeds
Intends to strive,
But looks at immortal Nature's pile
Lasting for ever, Nature's arising,
Its where and how.
People like this man never are worried
With grief over shameful commissions.*

Ὀλβιος ὅστις τῆς ἱστορίας
ἔσχε μάθησιν, μήτε πολιτῶν
ἐπὶ πημοσύνην μήτ' εἰς ἀδίκους
πράξεις ὀρμῶν,
ἀλλ' ἀθανάτου καθορῶν φύσεως
κόσμον ἀγήρων, ἥ τε συνέστη
χῶπῃ χῶπως.
τοῖς δὲ τοιούτοις οὐδέποτε' αἰσχυρῶν
ἔργων μελέδημα προσίζει.
Euripides (fragm. 910 N.)

*Anaxagoras of Klazomenai,
Master of Euripides and Pericles of Athens,
was a beholder and an artist.*

*A beholder:
His eyes were groping for the jointlines
of this fragment of a world.*

*And he was an artist,
for this fragmentary world enticed him
to restoring it, according to its style,
in space and time.*

*Beholding
and, then, moulding what he had beheld
meant life itself to him.*

*He brooded on a building problem.
His work is dedicated to detail
How he,
The son of Hegesibulos,
Anaxagoras of Klazomenai,
Were he the world's construction engineer,
Would build this grand and beauteous cosmos
Out of a pile of particles
Minute and ultimate.*

*The Constituents of
the Universe*

I

THE ELEMENTS AND THEIR MOIRAS

WHAT ARE THOSE ultimate units which, by their variously changing aggregation and combination, are making the world's perceptible objects emerge and vanish, and, in the past, effected the formation of this whole?

ARISTOTELIAN REPORTS

In respect to the stones with which Anaxagoras built up his universe, there is present a wide and significant, but scarcely noticed (cf. p. 145) divergence between the expositions of Aristotle and the words of our philosopher himself as these are fragmentarily handed down by Simplicios.

Aristotle appears to designate the ultimate units of Anaxagoras by the term *homoiomereses*, and usually cites as examples flesh, bone, and other parts of organisms:

Anaxagoras . . . [holds] the *homoiomereses* to be the elements, I mean such as flesh and bone and every thing of that kind.

Ἀναξαγόρας . . . τὰ . . . ὁμοιομερῇ στοιχεῖα [φησὶν εἶναι], λέγω δ' οἷον σάρκα καὶ ὅστων καὶ τῶν τοιούτων ἕκαστον.

Arist. de caelo III, 3. 302 a 31.

He, namely, [sc., Anaxagoras] holds up as elements the *homoiomereses*, such as bone and flesh and marrow and all the others, the parts of which have the same names [sc., as the respective wholes].

Ὁ μὲν γὰρ τὰ ὁμοιομερῇ στοιχεῖα τίθησιν οἷον ὅστων καὶ σάρκα καὶ μυελὸν καὶ τῶν ἄλλων ὧν ἑκάστου συνώνυμον τὸ μέρος ἐστίν.

Arist. de gen. et corr. I, 1. 314 a 18.

In the extant fragments of Anaxagoras' work, however, the *seeds of things* are exemplified, instead, by *the bright* and *the dark*, *the rare* and *the dense*, *the dry* and *the moist*, *the warm* and *the cold*. The passages read as follows:

. . . the mixture of all things:
of the moist and the dry,
of the warm and the cold,
of the bright and the dark

(since also much earth was therein¹),
and, generally, of seeds infinite in quantity,
in no way like each other.

... ἡ σύμμιξις πάντων χρημάτων,
τοῦ τε διεροῦ καὶ τοῦ ξηροῦ
καὶ τοῦ θερμοῦ καὶ τοῦ ψυχροῦ
καὶ τοῦ λαμπροῦ καὶ τοῦ ζοφεροῦ
(καὶ γῆς πολλῆς ἐνεούσης¹)
καὶ σπερμάτων ἀπείρων πλῆθος
οὐδὲν ἑοικότεων ἀλλήλοις.

Simpl. phys. 156, 1 ff.

... the dense is severed from the rare,
the warm from the cold,
the bright from the dark,
and the dry from the moist.

... ἀποκρίνεται ἀπὸ τε τοῦ ἀραιοῦ τὸ πυκνόν
καὶ ἀπὸ τοῦ ψυχροῦ τὸ θερμόν
καὶ ἀπὸ τοῦ ζοφεροῦ τὸ λαμπρόν
καὶ ἀπὸ τοῦ διεροῦ τὸ ξηρόν.

Simpl. phys. 156, 13 ff.

How is it that a supposition of such strange elements is not mentioned by Aristotle in those passages, and that, instead, the aforesaid substances are referred to as kinds of *homoiomereses*? This is indeed an enigma.

But perchance the *homoiomereses* may not be identical at all with the *seeds* (σπέρματα) or *particles* (μοῖραι) of Anaxagoras?

In the lines following the first of the quoted passages, however, the term "σπέρμα" (seed) is used by Aristotle in exactly the same sense as the preceding "ὁμοιομέρες" (*homoiomeres*²). He continues the words quoted above by stating that in Anaxagoras' opinion

"air and ether³ are mixtures of these (sc., of flesh and bone) and all the other seeds."

"ἀέρα δὲ καὶ πῦρ³ μείγματα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων."

Arist. de caelo III, 3. 302 b 1.

1. The intercalated *genetivus absolutus* "καὶ γῆς πολλῆς ἐνεούσης" ("since also much earth was [potentially] therein") is understood as an illustration of the second, the fourth, and the sixth of the preceding genitives. As to this reconstruction of the system, it does not matter in the least whether we attribute these words of comment to Anaxagoras himself or consider them a marginal note by Simplicios, slipped into the context later on. I, for one, prefer the second opinion, even in spite of the Ionic form "ἐνεούσης" (cf. p. 32).

2. I am purposely not translating this term for the time being.

3. "πῦρ," usually "fire," is here the same as "αἰθήρ," "ether," for, as Aristotle reports after some lines, "he (sc., Anaxagoras) calls fire and ether the same" ("τὸ πῦρ καὶ τὸν αἰθέρα προσαγορεύει ταῦτό"). (Arist. de caelo III, 3. 302 b 4 [Cf. also: de caelo I, 3. 270 b 25 and Meteor. II, 9. 369 b 14]).

And, once more, I cannot but doubt the Aristotelian presentation. According to Aristotle, Anaxagoras considered air and ether "mixtures of these (i.e., flesh and bone) and all the other seeds." But in Anaxagoras' own opinion, ether essentially is a mixture of *the rare* and *the warm* and *the dry* and *the bright*:

... but the rare and the warm
and the dry [and the bright]
moved outward to the remoteness
of the ether.

... τὸ δὲ ἀραιὸν καὶ τὸ θερμὸν καὶ τὸ ξηρὸν
[we may safely complete: καὶ τὸ λαμπρὸν]
ἐξεχώρησεν εἰς τὸ πρόσω τοῦ αἰθέρος.

Simpl. phys. 179, 3.

It will be best, therefore, to use the reports of Aristotle and of the later authors he influenced with utmost care. In this hypothetical reconstruction of the foundations of the Anaxagorean system, I prefer to be guided rather *by the philosopher's own words and by reasons of inner consistency based on the technique of composition.*

AN OLD QUESTION AND A NEW ANSWER

How to develop the present state of the universe, in its differentiation and orderly movement, from a phase as undifferentiated as possible—the solution of this problem certainly had been attempted by the Natural Philosophers before Anaxagoras. Why was Anaxagoras induced to take up that problem once more and look for another solution?

The ancient Ionian philosophers had an ideal of construction: For them the whole variety of the universe was to originate from a single primary substance. And they believed they had really succeeded in finding a unique homogeneous substance, through the transformations of which the whole world must have emerged.

Thales considered water to be such a homogeneous principle. But how could it happen that he failed to notice that water was not at all a homogeneous substance? How could he fail to see that, on the contrary, the term "water" was a designation for a mixture, a mixture of a good many substances of quite different kinds, such as the moist, the cold, the dark, to mention only a few?

Heraclitus—I am speaking here as if I were Anaxagoras; that is why

4. We may do so on the basis of this passage in Hippolytus:

"... but the opposites to these, the warm *and the bright* and the dry and the light, to move out toward the remoteness of the ether."

"... τὰ δ' ἀντικείμενα τοῖς τοῖς θερμὸν καὶ τὸ λαμπρὸν καὶ τὸ ξηρὸν καὶ τὸ κοῦφον εἰς τὸ πρόσω τοῦ αἰθέρος ὁρμήσαι." (Hippol. refut. I, 8, 2.)

The same was done by Schorn as early as 1829.

I am taking Heraclitus, in this connection, as a natural philosopher only—Heraclitus erroneously thought he had discovered that ether ($\pi\upsilon\rho$) was the homogeneous primary substance and did not perceive that what men call ether is a mixture of the bright, the warm, the dry, the light, and some other elements.

Anaximander had avoided, it is true, the mistakes of the others. In his opinion, the primary substance, having been transformed into the numerous substances of the universe, on this very account no longer existed, and, therefore, was indeterminable ($\alpha\pi\epsilon\iota\rho\omicron\nu$, cf. p. 143). But to think that substances so very dissimilar as the warm, the moist, the bright, etc., have sprung from a single primary substance is certainly as impossible as to believe that they have originated from one another, for instance the light from the warm, the bright from the light, or the moist from the bright.

In other words, for Anaxagoras the elements of his predecessors were not elementary enough. He understood their "elements" as mixtures of still simpler things.

But when trying to make a choice between these things, to single out one of them for the rôle of the ultimate from which the others could be derived, he met with a difficulty: As a genuine Greek, as a naïve, ameta-physical monist without our distinction between an independent external world and internal individual worlds dependent on it, Anaxagoras was not yet able to say: Those numerous simplest things have not *originated* from one thing, but are *dependent* upon one thing *for their existence*; and that thing is present in the external world and imperceptible to us.

But neither did it enter his head to question, in the interest of one or two kinds of these "things," the reality of all others, as did Democritus after him.⁵

And so the problem of whether those various simplest things could be derived from any unique origin had to be answered by Anaxagoras in the negative, and he had to bear up with *an irreducible plurality of equally ultimate things*.

ESSENCE OF THE ANAXAGOREAN ELEMENTS

This seems to have been one (cf. p. 154, also p. 33, ann. 4) of Anaxagoras' leading motives for abandoning, in contradiction to the old Ionian tradition, the ideal of the oneness of a primary substance and for assuming *a plurality of ultimate elements of the world*.

These ultimate elements are exemplified by the *pairs of opposites*

5. Democritus himself thought he did that "in favor of the intellect," but actually his *atoms* are constructed of ingredients of the optic and haptic fields,—and he even knew it eventually (cf. fr. 125, Diels).

mentioned in the extant fragments. *Every pair* of these opposites corresponds to another field of sensation, or, to say it with an Aristotelian term, is "*specific as to the senses*" ("ἴδιον πρὸς τὰς αἰσθήσεις").⁶

Those pairs of opposites are usually called, "the qualities." This is not quite correct, as far as Anaxagoras is concerned. For his strict and consistent usage of "the warm," e.g., instead of "warmth,"—whilst, on the other hand, he speaks without ado of "quickness" (ταχυτής)⁷ and not of "the quick" (τὸ ταχὺ) instead—is not an awkward way of expression, but an intentional substitution for the common usage (cf. pp. 147, 148), in accordance with the cardinal meaning of his doctrine of elements.

Anaxagoras apparently realized those opposites not as "qualities," but as things (χρήματα)—as *things of spatial extensiveness*.

He thus realized all of the opposites indiscriminately, even those which, strictly speaking, have no space values in themselves, but can only be given space values mediately, by the association of ideas. That is to say, to Anaxagoras not only was a particle of "the bright" a part of space thoroughly filled with color, to put it in modern terms, but to him also a particle of "the warm", e.g., was a part of space thoroughly filled with warmth.

Therefore, whenever in the following the word "qualities" is used as a term signifying the Anaxagorean elements, the reader may keep in mind that this is being done in succumbency, so hard to avoid, to our habits of expression and from a view not properly Anaxagorean.

Nowhere, however, have I said that Anaxagoras regarded those spatialized, independent "qualities" as "subjective, secondary qualities."⁸

THE OSTENSIBLY INFINITE NUMBER OF THE ELEMENTS

Anaxagoras does not seem to have been entirely clear about the exact number of those elements. *He did not assign any definite number*, and was content to call the elements

numerous and diverse,
πολλὰ καὶ παντοῖα.

Simpl. phys. 34, 28, and 156, 1.

The same point is proved by another passage in which in an extensive quotation from Anaxagoras it is likewise only stated:

There are numerous particles of *numerous* [elements].
μοῖραι δὲ πολλὰι πολλῶν εἰσι.

Simpl. phys. 156, 13 ff.

Common opinion, accepted almost without opposition thus far, holds

6. Cf. Meteor. IV, 8. 385 a 1.

7. Simpl. phys. 35, 13.

8. Concerning the difference between my interpretation and P. Tannery's, cf. p. 146.

that Anaxagoras assumed an infinite number of elements. To my mind, this view is unfounded. At any rate, Anaxagoras cannot have assumed an infinite number of elements, if the new interpretation of his doctrine of elements is correct.

The usual opinion is based on the words, "seeds infinite in quantity" (σπέρματα ἀπειρα πλήθος), repeated several times within the preserved fragments, as, e.g., in *Simpl. phys.* 34, 21, and 156, 1. (Cf. also p. 42, annot. 3.)

But this argument does not stand the test. Even if one has the older view of the Anaxagorean elements, one ought to leave open the question whether the words, "seeds infinite in quantity," mean the number of the *kinds* of seeds or the quantity of the *particles* belonging to the various kinds.

This alternative disappears, if we accept the new interpretation of the Anaxagorean elements. For then that conception, according to which *the quantity of the moiras* of the different elements is meant by the cited words, remains as the only plausible one.

Thus, the number of the elements themselves, the number of the kinds of seeds, was left undetermined by Anaxagoras.

THE DISTINCTIVE FEATURE

Yet, for all the kinds of seeds, whatever their number, there is one indispensable characteristic, one condition, without which they cannot even pertain to that notion:

No likeness whatsoever, not even the slightest, must exist between them in anything, so that every single kind must be as incomparable to every other kind as a color is to any temperature.

In the conclusion of an enumeration Anaxagoras says:

... and, generally, of seeds
infinite in quantity,
in no way like each other.
For of the other ones, too,
[sc., of the other elements
not explicitly mentioned here]
none resembles any other in any respect.
... καὶ σπερμάτων ἀπείρων πλήθος
οὐδὲν ὁμοιότων ἀλλήλοις.
οὐδὲ γὰρ τῶν ἄλλων οὐδὲν
ἔοικε τὸ ἕτερον τῷ ἑτέρῳ.

Simpl. phys. 156, 1.

Incidentally, any construction with particles which differ from one

another only in shape, size, and velocity, like the *atoms* of Leucippus and Democritus, is rejected by this view from the outset.

THE PRIMARY RELATION AND ITS DUAL WORKING

Now, it is a matter of fact that there is, e.g., *no color, of which the "metaphysical carrier" (as we should call it today) would not be able to act equally upon the other senses as well.*

This is a fundamental discovery, and Anaxagoras understands it as *the basic and primary interrelation of the elements.* He declares:

*There is no isolated existence,
but all [things] have a portion
of every [element]. (Cf. p. 97 ff.)*

οὐδὲ χωρὶς ἔστιν εἶναι,
ἀλλὰ πάντα παντὸς μοῖραν
μετέχει.

Simpl. phys. 164, 25.

Likewise:

*The [elements] in this one cosmos
are not separated from one another.*

οὐ κεχώρισται ἀλλήλων
τὰ ἐν τῷ ἐνὶ κόσμῳ.

Simpl. phys. 175, 11, and 176, 28.

That is to say:

There is no thing containing
particles of the bright and the dark
(*color*)

which would not contain as well

particles of the warm and the cold,
(*temperature*)

particles of the rare and the dense,
or, what amounts to the same thing,
of the light and the heavy,
(*pressure*)

particles of the moist and the dry,
(other *haptic* qualities) etc.

I am intentionally saying that particles of the warm *and* the cold, etc., are in every thing, and not: particles of the warm *or* the cold, etc. For *that primary interrelation works in a dual operation.* It is valid not only between the qualities themselves, but also as to the two contrasting sorts of particles within every quality. There is, for instance, no warm that is not also combined with some cold, and vice versa. For Anaxagoras

10 THE CONSTITUENTS OF THE UNIVERSE

this is natural, because "the most warm" is always "the least cold" also, and vice versa:

The [elements] in this one cosmos
are not separated from one another
nor cut off with an axe [from one another],
neither the warm from the cold
nor the cold from the warm.

οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἐνὶ κόσμῳ
οὐδὲ ἀποκόπεται πελέκει
οὔτε τὸ θερμὸν ἀπὸ τοῦ ψυχροῦ
οὔτε τὸ ψυχρὸν ἀπὸ τοῦ θερμοῦ.

Simpl. phys. 175, 11, and 176, 28.

And so it is with everything.

EQUALLY INFINITE PARTICLES OF EACH ELEMENT

From this it follows that all the elements consist of *equally* infinite particles.

Therefore, if taken as numbers of the *moiras* of Anaxagorean *chremata* (elements), ∞ minus ∞ could not be considered a symbol for any finite number, as is usual elsewhere, but would have the value of zero. For otherwise the actual surplus would be "separated" (*χωρῖς*):

... one must understand
that none of all [the elements]
is less or more numerous
(for it is not feasible to be more than all),
but that *all [to each other] are equal*
[in quantity] for ever. (Cf. p. 34)

... γινώσκειν χρή, ὅτι πάντα
οὐδὲν ἐλάσσω ἐστὶν οὐδὲ πλείω
(οὐ γὰρ ἀνυστόν πάντων πλείω εἶναι),
ἀλλὰ πάντα ἴσα αἶε.

Simpl. phys. 156, 9.

"THE GREAT" AND "THE SMALL"

The fundamental statement that there is no isolated existence is true also in that field in which the opposites are named, "the great" and "the small." This could be the field of *spatial extensiveness as such*.

Anaxagoras seems to have been aware also of the fact that the optic sphere includes not the quality of color alone, since there is also colorless extensiveness.⁹

9. In this connection must be mentioned Anaxagoras' experimental proofs that the air, though colorless and, therefore, invisible, is not a "nothing," not a vacuum:

An isolated existence of particles of "the small" or of particles of "the great" can never occur. For the number of the great-particles which exist in the universe and the number of the small-particles which exist in the universe—like the numbers of the particles of all the other kinds of *moiras*, as explained above—are absolutely equal, namely, equally infinite. Thus an isolated surplus can never arise anywhere:

And since also the portions of the great and of the small are equal in number, also in this respect all [elements] would be in everything, and isolated existence is impossible. . . .

καὶ ὅτε δὲ ἴσαι μοῖραι εἰσι τοῦ τε μεγάλου
καὶ τοῦ μικροῦ πλῆθος, καὶ οὕτως ἂν εἴη
ἐν παντὶ πάντα· οὐδὲ χωρὶς ἔστιν εἶναι . . .

Simpl. phys. 164, 25.

Consequently, *there is no smallest nor greatest:*

For of the small there is no smallest, but always a smaller one. . . but also of the great there is always a greater one. And it [sc., the great] is equal to the small in number.

οὔτε γὰρ τοῦ μικροῦ ἔστι τό γε ἐλάχιστον,
ἀλλ' ἔλασσον αἰεῖ . . . ἀλλὰ καὶ τοῦ μεγάλου
αἰεῖ ἔστι μείζον. καὶ ἴσον ἔστι τῷ μικρῷ
πλῆθος.

Simpl. phys. 164, 16.

For an absolutely "smallest" would contain no great-particles at all, and an absolutely "greatest" would contain no small-particles at all. Such an "isolated existence," however, is out of the question: Even "the most great" is always "the least small" as well, and vice versa.

Hence

"*With reference to itself,*
each thing is both great and small,"
πρὸς ἑαυτὸ δὲ ἕκαστόν ἐστι
καὶ μέγα καὶ μικρόν,

(ibid.)

since it contains always both of these kinds of *moiras*, and only *with reference to something else* is it either great or small, being always great

Those trying to demonstrate that there is no vacuum . . . like Anaxagoras . . . prove *the air to be something* by bending leather bags and showing how strong the air is
οἱ μὲν οὖν δεικνύναι πειρώμενοι ὅτι οὐκ ἔστιν (τὸ κενόν) . . . ὥσπερ Ἀναξαγόρας
. . . ἐπιδεικνύουσι . . . ὅτι ἔστι τι ὃ ἀήρ, στρεβλοῦντες τοὺς ἀσκούς καὶ δεικνύντες
ὡς ἰσχυρὸς ὁ ἀήρ . . . (Arist. phys. IV, 6. 213 a 22.)

with reference to something smaller or small with reference to something greater.

INFINITE GEOMETRICAL DIVISIBILITY

That there is no smallest, implies an *infinite geometrical divisibility of all things*, because an absolutely smallest cannot be obtained by means of geometrical division. For otherwise the next step beyond the supposedly smallest would have to lead to nothing. This, however, is impossible. There is no literal *annihilation*, any more than there is a true *coming into existence* in its strict sense, that is, out of nothing. What is commonly so designated is *only a mixing and severing of elements which themselves are eternal*:

"To come into existence" and "to be annihilated" is wrongly used by the Hellenes; for no one thing comes into existence nor is annihilated, but of things that [eternally¹⁰] are [i.e., of the elements; "chremata" is used here ambiguously], it is mixed together and [then] severed [again]. And thus it might be correct [for the Hellenes] to say "to become mixed together" instead of "to come into existence," and "to become severed" instead of "to become annihilated."

τὸ δὲ γίνεσθαι καὶ ἀπόλλυσθαι
οὐκ ὁρθῶς νομίζουσιν οἱ Ἕλληνες·
οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται,
ἀλλ' ἀπὸ ἐόντων χρημάτων συμμίσγεται τε
καὶ διακρίνεται. καὶ οὕτως ἂν ὁρθῶς καλοῖεν
τὸ γε γίνεσθαι συμμίσγεσθαι
καὶ τὸ ἀπόλλυσθαι διακρίνεσθαι.

Simpl. phys. 163, 18.

Thus, since there is no true annihilation at all, that is to say, since whatever exists can never cease to exist, it cannot, consequently, cease to exist by being divided, either:

Of the small there is no smallest, but always a smaller one. For it cannot be that what is should cease to be by being cut.

10. That here "things that are" has the meaning of "things that are eternally," "everlasting," and not simply of "already existing previously," can be gathered also from a passage in Aristotle. Reporting on this Anaxagorean idea, he says:

"In another meaning (sc., than in the meaning of union and severance) they neither come to existence nor become annihilated, but *remain everlasting*."

"ἄλλως δ' οὕτε γίγνεσθαι οὐτ' ἀπόλλυσθαι, ἀλλὰ διαμένειν αἰδία." (Arist. *Meta-phys.* I, 3. 984 a 15.)

οὔτε γὰρ τοῦ μικροῦ ἐστι τό γε ἐλάχιστον,
 ἀλλ' ἔλασσον ἀέλ. τὸ γὰρ ἐὸν οὐκ ἔστι
 τομῇ¹¹ οὐκ εἶναι.

Simpl. phys. 164, 16.

INFINITY OF SPACE FILLED

The statement that there is no greatest implies the *infinity of space filled*, or, in other words, the *spatial infinity of the universe*.

A universe of finite magnitude would be a really "greatest." This means that here, also, a step beyond would have to lead to nothing.¹² This "thought," however, is not feasible (οὐκ ἀνυστόν).

But according to that primary relation, small-particles are always mixed with that supposedly greatest. This means, this "greatest" would not really be an absolutely greatest at all, since it is always smaller than something still greater.

That all this has been taught by Anaxagoras can be learned from his own words, as we have seen. Besides, it can be proved as well by a passage in Lucretius, who in his report on Anaxagoras says point-blank:

"And yet, he does neither admit
 to be there a vacuum in things anywhere
 nor a limit of solids to be cut."

"Nec tamen esse ulla idem parte in rebus inane
 Concedit neque corporibus finem esse secandis."¹³

Lucret. I, 843, 844.

A STRANGE JUXTAPOSITION AND AN ATTEMPT AT SOLVING THE RIDDLE

The interdependence of the elements implies that no particle can exist alone, and that each belongs to a *molecular union*, as we should call it today, *in which all the elements are represented*:

Since matters stand thus,
 one has to realize that there are
 in all the grown-togethers¹⁴
 many and manifold [sc., seeds],
 and seeds of *all* elements. . . .

11. I agree with Zeller, who reads "τομῇ" instead of the "τὸ μή" handed down. And so does Burnet (*Early Greek Philosophy* [4th ed.], p. 258).

12. Many a modern reader might be enticed to say instead: "to a void space." But to Anaxagoras this would have been as nonsensical as a quadrangular circle. To him such a "void space" would have been nothing but an absolute nothing.

13. This, by the way, is also a proof that the version "τομῇ" (instead of "τὸ μή") is correct.

14. A term for "molecule," cf. p. 23.

τούτων δὲ οὕτως ἔχόντων χρὴ δοκεῖν
 εἶναι πολλά τε καὶ παντοῖα (sc., σπέρματα)
 ἐν πᾶσι τοῖς συγκρινομένοις,
 καὶ σπέρματα πάντων χρημάτων . . .

Simpl. phys. 34, 28; 156, 1; 157, 9.

Before taking a further step in this attempt at philosophical reconstruction, we must continue for a while to deal with this sentence. For in the above it has not been quoted in its entirety. The words ending it, however, need a detailed interpretation because almost every one of them implies a problem.

To solve such problems, one thing is indispensable: *to read microscopically*. This is no more than due and proper when dealing with the words of a real philosopher.

The continuation of the sentence is:

“καὶ ἰδέας παντοίας ἔχοντα καὶ χροιάς καὶ ἡδονάς.”

Commonly, this is translated as:

“having all sorts of forms as well as of colors and tastes.” Some scholars even translate “smells” instead of “tastes,” as, for example, H. Diels (*Die Fragmente der Vorsokratiker*, 46 B 4):

“. . . die mannigfache Gestalten, Farben und Gerüche haben.”

But neither of these translations is quite correct, I regret to say.

Now, let us try in our way:

“Having” (ἔχοντα) relates to “seeds,” not to “elements,” for otherwise it would read “ἔχόντων,” the genitive. This is left ambiguous in the usual English and German translations.

From the connection “seeds of all elements” (σπέρματα πάντων χρημάτων) it follows that here “seeds” is not synonymous with “elements” but is used in its other meaning, that is, as a term for the particles of the elements, like *moiras* (cf. p. 18, annot. 17).

“Χροίη” (*chroiê*) is a word synonymous to “χρῶς, gen. χρωτός” and means, first of all, “surface of a body,” then also “the skin with the flesh under it,” hence also “flesh,” and “body,” “solid,” as well. Furthermore, it can also have the meaning of “color of the skin,” “complexion,” and thus, finally, can also be used in the sense of “color” in general, like “χρῶμα” (*chroma*).

I keep to the original and regular meaning, “surface.” Thus “manifold surfaces” means “manifold conditions of a surface,” such as evenness, crookedness, convexity, corrugation, etc.

“Ἰδέα” (*idéa*) means “form,” “shape,” “figure,” “configuration.” Here I prefer “shape,” as by this word the meaning “form of the outlines,” “form of the contour,” is best given. This is exactly what might be meant in that connection, in contradistinction to the “surfaces.”

And what finally could be the meaning of "ἡδονή" (*hedoné*)? It does not mean "smell," to begin with. Its regular and original meaning is "pleasant sensation," "pleasure," "enjoyment," "delight." Sometimes to be sure it means also "delicious taste," not emphasizing, however, taste, but delicious.

I cling to the ordinary meaning "pleasant sensation." The plural "ἡδοναί" (*hedonai*) could be understood either as comprising all the sensations of the various kinds insofar as they have assumed their form of pleasure: pleasant sight, melodious sound, pleasant odor, pleasant taste, delicious warmth, etc. (cf. p. 111). In this case "ἡδονάς," the last word of the sentence in question, would have to be tacitly completed by "καὶ λύπας," "and pains." Or: "ἡδοναί" could be considered also a representative designation comprising the total nuances of the sensations of every kind, from their being indifferent through their becoming pleasant to their becoming painful (cf. p. 111). To decide whether the one or the other has to be assumed is a philological matter. Philosophically, each of the two possibilities amounts to the same thing in the end: at any rate, whatever is said in that connection regarding pleasures is to be likewise applied to pains.

What, then, is the meaning of the entire closing part of that sentence?

One must not forget that the whole sentence is apparently a summary concluding an explicit presentation of certain teachings. This is evident from the words, "Since these matters stand thus," in the beginning. That explicit presentation, however, is lost. Only the comprehensive ending has been handed down. That is why every single word in this sentence is of outstanding weight, and one is bound to penetrate into and beyond each word.¹⁵ Once again, then, what could have been the sense of a strange juxtaposition like that of shapes, surfaces, and pleasures (and pains)?

The answer is implied in the word "ἔχοντα" ((having):

The Anaxagorean elements are the "qualities" of the various specific kinds. Seeds, or *moiras*, of these elements, of *all* the elements according to their primordial interrelation, are contained (*ἐνείναι*)-in every molecule. These seeds, these *moiras*, the constituents of the molecule, are not carriers of those qualities; they *do not have* those qualities; they themselves *are* those qualities.

In addition, however, there are:

15. Strictly speaking, each and every one of the Anaxagorean sentences handed down ought to be regarded in this way. When mentioning the work of Anaxagoras, Plato speaks of several "books" (apol. 26 D; Phaedo 98 B). Hence we must realize that these twenty-odd fragments kept from oblivion are merely certain particularly significant passages, such as introductions, résumés, and the like.

the various *shapes* of the *moiras*
 (and of the molecules, the shapes of which
 result from the commixture of the shapes
 of their *moiras*);

the various *surfaces* of the *moiras*
 (and of the molecules, the surfaces of which
 result from the commixture of the surfaces
 of their *moiras*); and finally,

the various *quantities* (absolute and relative) of the *moiras*,
 from the commixture of which within a molecule
 the various *intensities* of every quality result
 which correspond to the intensities of the respective
 sensation: *indifference, pleasure, pain*,
 and all the shades between. (Cf. pp. 110 ff. and 112.)

All these are not Anaxagorean elements; there are no seeds, no *moiras* of them. But *the seeds of the elements have them*. The *moiras*, the seeds, *have* all those variable inherencies and potentialities: they *have* various shapes; they *have* various surfaces; and their commixtures *have* various intensities.

This being carried by carriers *having* them—that is what *the common feature* of the links of that strange juxtaposition consists in.

Incidentally, hypostatizing of bare shapes, establishing of an independent “realm of mere forms”—this step was reserved for a subsequent period. Anaxagoras himself, in all probability, would have answered such a proposition by disapprovingly shaking his head.

AN AGGREGATION TERMINOLOGY

For the actual present world-state that relation of interdependence of the elements implies only that no particle exists alone, but that each belongs to a molecular union in which all the elements are represented.

However, it does *not* mean that in this actual world-state *equal* numbers of particles of each element are present in every molecular union. Today—it was not always so (cf. p. 31)—there are, on the contrary, all kinds of combining-ratios. For all substances known to us are different only because of inequality of the combining-ratios of the ultimate units, the *moiras*, within their penultimate units, that is, in modern terms, because of inequality of their molecular constitutions.

But is it not indeed anachronistic to expect of Anaxagoras the modern molecular conception?

This consideration, however, might disappear should we succeed in

removing, by this very "anachronism," one of the most painful obscurities in the tradition of the Anaxagorean doctrine.

In the reports on the system of Anaxagoras there are some terms, the meaning of which has not been plausibly stated thus far. It is not even at all certain whether they may be considered terms used by Anaxagoras himself or whether they are inventions of later reporters. For they are not contained in the extant fragments of Anaxagoras' work. They are the terms "ὁμοιομέρῆς" (*homoiomeres*) and "ὁμοιομέρεια," plur. "ὁμοιομέρειαι" (*homoiomereia*; plur., *homoiomereiai*), in Latin, "*homoeomeria*." The first of them is to be found mainly in the Aristotelian reports. The other terms are used only by some post-Aristotelian writers, e.g., by Lucretius, Plutarch, Sextus Empiricus, Diogenes Laertius, etc.

Schleiermacher, Breier, and Zeller, particularly, did not believe those terms to have come from Anaxagoras himself. In the extant fragments there are certainly enough other names for the ultimate elements and for the ultimate particles of the elements. Thus the terms in question might easily have seemed superfluous, and it was plausible to suppose they were invented by Aristotle and others, for reasons far removed from the Anaxagorean doctrine itself.

Now, one must not overlook the possibility that Aristotle might have attributed to Anaxagoras elements quite different from those he actually assumed. At any rate, however, Aristotle, as we have seen, has confounded with the term *homoiomeres* other terms which serve in Anaxagoras to signify the really ultimate elements (cf. p. 4). Hence one may presume that these terms were possibly used by Anaxagoras himself, but served to signify other conceptions than did the terms with which they were confounded by Aristotle later on.¹⁶

If we assume something like a molecular conception in Anaxagoras, we can eliminate the confusion caused by Aristotle, without being compelled to consider the terms *homoiomeres* and *homoiomereiai* inventions by Aristotle or later authors, and the following *aggregation terminology* would result for the Anaxagorean system of elements:

"μοῖραι" (*moirai*)

would be a designation for the ultimate particles, never existing actually isolated, of the

"χρήματα" (*chremata*),¹⁷

16. Those terms were considered by M. Heinze as probably going back to Anaxagoras himself. (*Über den Nous des Anaxagoras*. Berichte der königlich sächsischen Gesellschaft der Wissenschaften [1890].) But Heinze did not give any support to his conjecture, by a new interpretation, for example, of these terms.

17. "χρήματα" (*chremata*) is used by Anaxagoras also in its common meaning, "things," as, for instance, in the passage *Simpl. phys.* 35, 13, or even only "solid and liquid substances," as in 155, 23 (cf. p. 45). Such a shifting from the special use of a word as a *terminus philosophicus* back to its current, general meaning occurs in Anaxagoras now

the elements, which are also not isolable from one another.

A term directly corresponding to our "molecule" would be lacking (cf., however, p. 23). But we may possibly imagine that

"μέρεια" (*méreia*)¹⁸

could have been Anaxagoras' designation for a molecular aggregate of *moiras*.

At any rate, however,

"ὁμοιομέρειαί" (*homoioméreiai*)

might have been a name for molecules of equal constitution. That is why this term would correctly be used as a *plurale tantum*, being meaningless otherwise.

"ὁμοιομερές" (*homoiomérés*)

would be a designation for every mass which consists of *homoioméreiai*, i.e., of *mereiai* of only one species.

"ἀνομοιομερές" (*anhomoiomérés*)

could have been used for a mixture of unequal molecules.

And finally,

"ὅμοιον" (*hómoion*)

would then be a term to be applied only to a mass consisting, not of equal molecules, but of equal *moiras*.

Such a *hómoion* is an impossibility so far as the primary interrelation of the elements is valid. It would only be possible with an element not subjected to that relation of dependence, having, on the contrary, a full independence, "self upon itself."

Does Anaxagoras assume such an element?

As will be seen in the following chapter, he does.

and again. *Moiras*, e.g., is sometimes employed also in its usual meaning of "share" or "portion." (Cf. also p. 100, concerning "ἐνείναι.")

Finally, the term "σπέρμα" (*sperma*), "seed," is in need of explanation. At times it is synonymous with *moira*, at times with *chrema*. If one always asks "with regard to what?" then the dual use of this term is accounted for. The *moiras* are "seeds" with regard to the molecule because, compared with them, this is something new. For a molecule does not originate from a summing up of *moiras*, but from a special kind of aggregation (cf. p. 23) of *moiras* of all the elements. In the same sense, the single elements themselves may be called "seeds" with regard to all the things which exist really isolated. On the other hand, a molecule of a substance is no "seed" with regard to a mass of that substance.

18. It is conceded that in other Greek sources this term *mereia* is found only in the sense of "part of a town," "part of a district."

II

NOUS, THE RULER ELEMENT AND CONSTRUCTION ENGINEER

ANAXAGORAS has imposed over the other elements *a ruler element*. And this reigning element alone really is "self upon itself." It is the only one beyond that relation of interdependence. "*Nous*" (Intellect, Mind) is the only element thoroughly pure, not mixed with any of the others:

Nous, however, is not mixed with any element, but is the only one self upon itself.

νοῦς δὲ . . . μέμικται οὐδενὶ χρήματι, ἀλλὰ μόνος αὐτὸς ἐπ' ἑωτοῦ ἐστίν.

Simpl. phys. 156, 13.

For [Nous] is the thinnest of all the elements as well as the purest.

ἐστὶ γὰρ λεπτότατόν τε πάντων χρημάτων καὶ καθαρώτατον.

ibid.

HOMOGENEITY, RELATIVE AND ABSOLUTE, AND WHY SNOW IS ALSO BLACK AND WARM

Consequently, when speaking of Nous one may speak of a *real homogeneity*, indeed:

Every [piece of] Nous is homogeneous, a larger as well as a smaller one. Nothing else, however, is homogeneous in itself,¹ but every single thing is and was [only] most distinctly that of which the most is contained in it.

νοῦς δὲ πᾶς ὁμοίως ἐστὶ καὶ ὁ μείζων καὶ ὁ ἐλάττων. ἕτερον

1. "οὐδενὶ" is reflexive to "οὐδέν." Therefore: "Nothing else is homogeneous *in itself*." H. Diels translates: "Sonst aber ist nichts *dem anderen* gleichartig." Quite apart from the fact that, in this context, this is materially meaningless, it is incorrect philologically, too. For if Diels were right, it ought to read, instead: "οὐδὲν δὲ ἐστὶν ὁμοιον ἕτερον τῷ ἐτέρῳ," as can be learned from the sentence immediately preceding, in this fragment: "παντάσῃσι δὲ οὐδὲν ἀποκρίνεται . . . ἕτερον ἀπὸ τοῦ ἐτέρου πλὴν νοῦ."

δὲ οὐδὲν ἐστὶν ὁμοιον οὐδενί,¹ ἀλλ' ὅτων πλείστα ἐνι, ταῦτα
ἐνδηλότατα ἐν ἑκαστὸν ἐστὶ καὶ ἦν.²

Simpl. phys. 156, 13 ff.

It is not evident at first glance that these words are to be understood in this way. As a matter of fact, common opinion is far from giving the quoted passage this interpretation. However, relying on the context preceding and on the wording of the sentence in question, one could rather understand its idea as follows:

Nous is the only thing really homogeneous. It would be meaningless, therefore, to apply to it those distinctions concerning aggregation as to other substances, and to speak of *nous-moiras*, *nous-mereias*, etc., since *its homogeneity does not depend on the unit of measurement*.

Those other substances which are commonly taken for homogeneous, the *homoiomereses* (ὁμοιομερῆ)—i.e., substances consisting throughout of *homoiomereias*, or *mereias* of only one kind—may or may not be called homogeneous. If the *mereia* is taken as the ultimate unit, they are homogeneous just because they consist of equal *mereias*, of molecules of only *one* kind. Their homogeneity is lost if the *moira* is taken as a measure, because then a *plurality* is represented in every molecule, namely, the total number of all the kinds of *moiras*. The real individual diversity of the various substances has been brought about only by diversity of the actual combining-ratios of the contrasting species of *moiras* within every one of the various qualities:

. . every single thing is and was [only] most distinctly
that of which the most is contained in it.³

That is why, for example, snow is only white “most distinctly,” although it consists as well of particles of the black, and only cold “most distinctly,” although it consists as well of particles of the warm, etc. (Cf. Sext. Pyrrh. hypot. I 33, and Cic. Acad. II 31, 100.)

But as to *Nous*, those distinctions are devoid of meaning, because its *homogeneity is really absolute*. For

every [piece of] *Nous* is a *homoion*, a larger as well as
a smaller one,

even if one should have in view a piece as small as a molecule of a molecularized substance.

2. “ἐν ἑκαστον” is the subject, “ταῦτα” is the predicate, and “ἐνδηλότατα” is the *adverb* of the superlative. With regard to certain hazy and misleading translations still commonly accepted, it does not seem to me superfluous to state explicitly such obvious things.

3. It should be noted that it says: ἕτερον δὲ οὐδὲν ἐστὶν ὁμοιον οὐδενί, ἀλλ' ὅτων (plural!) πλείστα (plural!) ἐνι, ταῦτα (plural!) ἐνδηλότατα ἐν ἑκαστὸν (singular!) ἐστὶ καὶ ἦν. The plurals refer to the total number, represented in every molecule, of the kinds of *moiras*.

SPATIAL EXTENSIVENESS OF NOUS

Nous, then, is the reigning element.

However, Nous is an Anaxagorean element, and that means that *Nous* likewise, exactly as the other elements, *has spatial extensiveness*. Hence Nous can readily be called, in a quite literal sense, not only the purest, but even the "thinnest" of all the elements.

The fact that such "matter-like" attributes are given to Nous by Anaxagoras seems to imply a problem. That this is only a pseudo-problem will be shown in a subsequent chapter (cf. p. 154).

NOUS' IMMISCIBILITY AS A CONDITION OF ITS POWER

According to Anaxagoras' own words, the homogeneity of Nous, its being immixable with the other elements, is supposed to be *an absolutely indispensable condition for its power* over the world:

While the other [elements]
have a share of every element,
Nous is an infinite and autocratic being
and is not mixed with any element,
but is alone self upon itself.
For if it were not upon itself,
but mixed with any one other [element],
it would, merely by being mixed with any one [element],
partake of all the elements altogether,
since in every single [element]
a share of every [other element] is contained,
as I have demonstrated above.

*And the elements mixed with it would check it
so that it would not have power over any element
in the same way as [it has]
being alone upon itself.*

τὰ μὲν ἄλλα παντὸς μοῖραν μετέχει,
νοῦς δέ ἐστιν ἄπειρον καὶ αὐτοκρατὲς
καὶ μέμικται οὐδενὶ χρήματι,
ἀλλὰ μόνος αὐτὸς ἐπ' ἑωτοῦ ἐστιν.
εἰ μὴ γὰρ ἐφ' ἑαυτοῦ ᾗν, ἀλλὰ τεφ' ἐμέμικτο ἄλλω,
μετεύχεν ἂν ἀπάντων χρημάτων, εἰ ἐμέμικτό τεφ'·
ἐν παντὶ γὰρ παντὸς μοῖρα ἔνεστιν,
ὥσπερ ἐν τοῖς πρόσθεν μοι λέλεκται·
καὶ ἂν ἐκώλυνεν αὐτὸν τὰ συμμεμειγμένα,
ὥστε μηδενὸς χρήματος κρατεῖν
ὁμοίως ὥς καὶ μόνον ὄντα ἐφ' ἑαυτοῦ.

Simpl. phys. 156, 13 ff.

22 THE CONSTITUENTS OF THE UNIVERSE

The meaning of the last sentence of this passage has remained *de facto* *ununderstood to this very day*. There are attempts enough at interpretation, it is true, but I do not know of a real explanation.

Rule by *Nous* evidently consists in its having power to move the molecules at will, but in a downright *mechanical* manner, by pressing or pushing or pulling. For *Nous* does not operate by means of commands like the God of the Bible. How should *Nous* be kept from moving the other elements or their molecular aggregates by being mixed with them?

STRUCTURE OF THE ANAXAGOREAN MOLECULE

There is only one way, I dare say, to arrive at a solution: First of all, one must become clear about the structure of the Anaxagorean molecule. That is to say, one must answer the question of *how the union of moiras into a mereia might have been meant*.

The first thought is to take the *moiras* of a *mereia* in the sense of "severed atoms held together within a 'motion district' (*Bewegungsbezirk*)."

Apart from the fact that Anaxagoras could not have imagined it in this way, merely because he did not operate with a vacuum—why should *Nous* become unable to move the other constituents of a molecule by being a member of a molecular union such as this? (For in this case that would be the meaning of "being mixed.") Let us take a case quite obvious and simple: Supposing the other constituents of a *mereia* were enclosed by a *Nous*-tegument. In that case one cannot understand how a molecular structure of this kind should prevent *Nous* from moving the whole *mereia* quite arbitrarily, as long as *Nous*' ability to move itself is not taken away.

In order to avoid any operation with a vacuum, one might suppose, as well, that the *moiras* of a *mereia* could have been meant as "volume-units, stuffed with different qualities and amalgamated with each other."

Assume that one of these volume-units were filled with *Nous*. How could this *Nous*-particle be thus prevented from moving itself and, consequently, also the other parts of the *mereia* which are (immediately or mediately) welded together with it? That would be just as incomprehensible. One might say, perhaps, that motion would then be impossible because the whole infinite filling of space could form but one un-molecularized and therefore rigid mass. But that would be an objection only seemingly legitimate. For even without void spaces between, a molecularization would be possible: Whatever did not belong to the same molecule would likewise be side by side, but not amalgamated with each other. And also motions of the single molecules could take place within such a filling of space. For there could be not only motion systems forming circles, but even all kinds of motion of the single molecule, provided

only that corresponding motions of all the other molecules are combined with them in every instance, according to Nous' physical knowledge present in every single molecule.

Thus neither the "asunder" nor the "abreast" of the *moiras* of a *mereia* would clarify Anaxagoras' strange statement.

But beyond this: *Neither an asunder nor an abreast has any sense at all. For in both cases Anaxagoras would have been bound to imagine such a mereia to be black on the right, moist on the left, warm below, heavy above, fragrant before, and hard behind, or something like that—a monstrosity that I would not dare to impute to our philosopher.*

If Anaxagoras really taught that the ultimate elements were these spatialized qualities, then *union of their moiras within a mereia* could not have meant a relation of "asunder" nor a relation of "abreast." In consequence of his fundamental idea, as a real philosopher, he must have had in mind a relation of "into-one-another," of a *true mutual penetration* only.

MOLECULE: THE "GROWN-TOGETHER"

As a matter of fact, only by this interpretation do some terms, otherwise colorless and unnoticed, acquire color and plasticity.

Take, for example, the term "τὸ συγκρινόμενον" (*to synkrinómenon*), "the grown-together," in the sentence:

Since those matters stand thus, one has to realize that there are in all the grown-togethers many and manifold [seeds] . . . , τούτων δὲ οὕτως ἔχόντων χρη̑ δοκεῖν ἐνείναι πολλὰ τε καὶ παντοῖα ἐν πᾶσι τοῖς συγκρινομένοις . . . (cf. p. 13).

Now it becomes quite obvious that this term "*to synkrinómenon*," "the grown-together," "the fused," serves as an outright designation for "molecule," so that "ἐν πᾶσι τοῖς συγκρινομένοις" would have to be translated exactly as "in all the molecules," "in every molecule."

Also the assertion that the elements are "not cut off with an axe from one another" (cf. p. 10) is given an additional, particular meaning, since by that any relation of "asunder" or "abreast" is denied in a very plastic way.

Moreover, we can also now understand that the terms repeatedly used, "μίγνυσθαι" (*mignysthai*) or "μίσγεσθαι" (*misgesthai*), and "μεμειγμένον εἶναι" (*memeigménon einai*), that is, "to mix" and "to be mixed," mean, in their original sense, nothing but *just this true mutual penetration of qualities*. To think of the word "mixture," nevertheless, as of an "asunder" of the ultimate particles, is a quite modern automatism. And even nowadays this automatism is only to be found with men educated scientifically, while to simple-minded people "mixture" still means a real "into-one-another." It is not so difficult, after all, to return for a

moment to this way of thinking. It is quite evident that if you mix something fluid with something sweet, then the mixture is not sweet in one part and fluid in another, but sweet and fluid throughout and in all its parts. The same space is then filled with both qualities.

IMPENETRABILITY—MOTION RESISTANCE—MOVABILITY

But the question as to the structure of the Anaxagorean molecule was only preliminary. It was indispensable to answer this question first because otherwise it would have been impossible to solve that other problem.

Here we have the solution of the riddle. It is quite clear now why *Nous* must be immixable with the other elements in order to be able to rule over them:

*That the elements are penetrable to each other means that they do not resist each other. If *Nous* were mixable with the other elements, that is to say, if they were penetrable to *Nous*, it would not be able to rule over them, i.e., to move them. For if they do not resist *Nous*, it certainly can move itself as it likes; it can penetrate into their molecules and leave them again; but—its motion would not be able to cause their motion. It would not be able to pull or press or push them. It would no more be able to move them by its own motion than a moving shadow can move from the spot another shadow which it is going through.⁴*

How it is to be understood that the power of *Nous* is conditional upon its absolute immiscibility, and that the contrary would be equivalent to an impediment of its rule, now appears to be clarified:

*Molecules or elements penetrable to *Nous* would resemble *Nous* in power, in motive power, in so far as they would be able, by their very penetrability, to succeed in resisting *Nous*' motion impulses.*

THE DIVINE MECHANICIAN

Anaxagoras, however, maintains that *there is nothing equal to *Nous* in power*, saying:

[*Nous*] is the most powerful.

ἰσχυρὸν μέγιστον.

Simpl. phys. 156, 13 ff.

*But whence does *Nous* get its motive power, its own motivity?*

*This power is just an ingredient of *Nous*' sovereign nature, it belongs*

4. That despite penetration a determination and communication of movement could still be constructed as taking place, provided only that transmission of movement did not depend on penetration resistance, but on a primary law of pushing, is a possibility Anaxagoras did not become aware of. Regarding this possibility of construction, cf. Adolf Stöhr, *Philosophie der unbelebten Materie. Hypothetische Darstellung der Einheit des Stoffes und seines Bewegungsgesetzes* (Leipzig, 1907).

to Nous, never lost and from all eternity. For *Nous is a being that rules out of an original plenitude of power of its own, an autocratic being, αὐτοκρατής.*

Simpl. phys. 156, 13 ff.

Yet, *Nous is not omnipotent.* Nous is only "the most powerful."

Nous' power is not boundless, in that *Nous can by no means deal with the ruled elements by arbitrary will. For they have the cause of their existence in themselves, exactly as Nous has the cause of its existence in itself.* If they were not from all eternity, Nous would not be able to create them (*create*); since they exist already, Nous cannot annihilate them (*ad nihilum redigere*):

For no element comes into existence
nor is annihilated.

οὐδὲν γὰρ χρῆμα γίνεται
οὐδέ ἀπόλλυται.

Simpl. phys. 163, 18.

Consequently, Nous cannot make out of the elements whatever it may please. For *not even the possibilities of their development are created by Nous.* (There is no genuine creationism, in the biblical sense, in Greek thought.) *And whatever is discordant with these mechanical possibilities which lie in the elements is unaccomplishable.*

But Nous is *cognizant* of all these possibilities of development. Long before ordering the world, Nous knows all the different sequences of development to result from its interferences, *and thus can act accordingly.* For Nous has a knowledge not only of itself, but of all the other things as well:

[Nous] has all knowledge about all,
γνώμην γε περὶ παντὸς πᾶσαν ἴσχει,

Simpl. phys. 156, 13 ff.

and there is, in the whole world, no occurrence unbeknown to Nous, nothing that Nous has not known from all eternity:

Nous has known all (cf. p. 102).
πάντα ἔγνω νοῦς.

ibid.

Hence *Nous' power is a function of its knowledge* of the given possibilities.

But all the same, Nous' will is not hindered by that fact. For—and this is the most characteristic feature of this divine mechanician—he *can do whatever he wills, because he does not will anything except exactly what can be done, exactly what he knows he can do.*

WITHOUT RENUNCIATION OR IDEAL. . .

It is usual to take the *Nous* of Anaxagoras for a deity "setting purposes" and Anaxagoreanism for a teleological doctrine.

True, *Nous* is a being that works consciously. And so is the omnipotent God of the Bible, who creates the world out of nothingness to be subservient to His ends.

But there is a difference. *Nous*, not being a Creator, is only cognizant of what will result from his⁵ interferences. *Nous* knows all the mechanical possibilities lying in the elements and, out of those various possible courses of a world, chooses the most beautiful and most variegated (not, "the best," which is much too hazy). But that is all, and those possibilities are not dependent on *Nous*, as explained above.

A deity, however, able to accomplish only that which "can be done," a deity that has to take into account those independent possibilities, a deity that would have to renounce the realization of any wishes not accommodated to those possibilities—such a deity cannot be said to "set purposes," without emptying this term of its proper sense. The world of Anaxagoras to be sure is no blind mechanism; it is a seeing mechanism; but—a mechanism.

The Anaxagorean doctrine is usually labelled "teleological" in reference to these words: "*Und alles ordnete der Geist an, wie es in Zukunft werden soll und wie es vordem war (was jetzt nicht mehr vorhanden ist) und wie es gegenwärtig ist.*" (H. Diels, *Die Fragmente der Vorsokratiker*, 46 B 12.)

Anaxagoras himself, however—provided we may give credence to the texts handed down—wrote:

"καὶ ὅποια ἐμελλεν εἶσεσθαι
καὶ ὅποια ἦν, ἅσσα νῦν μὴ ἔστι, καὶ ὅποια ἔστι,
πάντα διεκόσμησε νοῦς."

Simpl. phys. 156, 13 ff.

And, unfortunately, this sentence made up of Greek words, and that other sentence made up of German words, are by no means to one another as Greek text to German translation. For "*ὅποια ἐμελλεν εἶσεσθαι*" no more means "*wie es in Zukunft werden soll*" ("how it shall come to be in the future") than "*διεκόσμησε*" means "*er ordnete an*" ("he gave orders, commands").

"*Διακοσμεῖν*" is a designation for the world-moulding, world-forming activity of *Nous*. *Διεκόσμησε* means "*er ordnete*" ("he put in order, he organized"), but not, "*er ordnete an*" ("he gave orders, he gave com-

5. Sometimes, owing to *Nous*' being a god as well as an element, one cannot help saying "he" in reference to *Nous*.

mands"). And μέλλειν has never had the meaning of "shall" as an imperative, to say nothing of the fact that "ἐμελλεν" is not the present tense.

Therefore, "ὅποῖα ἐμελλεν ἔσεσθαι" *does not mean the purport of a command*, but only denotes the totality of what had been impending, what had been future, sc., at the moment immediately preceding cosmopoeia. The preterit value in the word "διεκόσμησε" ("he arranged in order") is obviously meant from the view of the actual reader at any given time. Thus the meaning of the whole sentence might be:

Whatever had been future
[i.e., taken from the last moment before the beginning
of the formation of the world],
that is, the totality of all actually past
as well as the totality of all actually present,
has been the work
of Nous' organizing activity.

The "totality of all actually future" is not explicitly mentioned, first, because, in regard to matter, it is implicitly denoted in the two other determinations, and then for quite an obvious reason regarding style: It could not have been said of it, "διεκόσμησε" ("he *has* organized").

Thus, anyone who had not already gathered it from the whole character of the system, ought to have grasped, from this single sentence alone, the fact that the doctrine of Anaxagoras is not teleological, strictly speaking, since "ὅποῖα ἐμελλεν ἔσεσθαι" means merely the world process as it would result if and when and as long as Nous works in the correct way.

However, despite the aseity and autonomy of the moulded material, this universe is not a defective reproduction of a pattern enticing and elusive. Thoroughly unlike the cosmos of the Platonic Demiurge, this orderly running of the world of Anaxagoras was intended and is being operated by Nous just as it is, without renunciation or ideal.

Cosmogony

III

THE PRIMORDIAL CONDITION

How and from what kind of a primordial condition has Nous brought about the orderly variegation and motion that we see? Anaxagoras might have realized this as follows.

"PANTAHOMOU"

In the beginning, the universe or *sympän* (τὸ σύμπαν) (Simpl. phys. 34, 21) was—without regard to Nous—a *one homoiomeres* (cf. p. 18), boundless and immeasurable. For there was only one kind of *mereias*: *Every mereia had the combining-ratio 1:1 as to all the n elements*. Every single *mereia*—and likewise the *sympän*, the total of the *mereias*—was a "πάντα ὁμοῦ" (*panta homou*), an "all together."¹

That is to say:

In every <i>mereia</i> there were	<i>as many moiras of the bright as of the dark,</i>	
hence	<i>no color at all</i>	would have been visible
to a spectator;	<i>as many moiras of the warm as of the cold,</i>	
hence it had	<i>no temperature at all;</i>	
	<i>as many moiras of the moist as of the dry,</i>	
hence it was	<i>neither moist nor dry;</i>	
	<i>as many moiras of the rare as of the dense,</i>	
or, what amounts to the same thing,	<i>as many moiras of the light as of the heavy,</i>	
hence it was	<i>weightless throughout,</i>	
	<i>it balanced, was unmoved de facto,</i>	
	<i>not through an incapacity of motion,</i>	
	<i>but through its suppression;</i>	

1. "Pantahomou" has not the same meaning everywhere in Anaxagoras. In the fragment said to have been the beginning of Anaxagoras' work (Simpl. phys. 155, 23) it has, obviously and quite naturally (cf. p. 45), no particular sense at all but the usual one. Elsewhere, "pantahomou" is a short term for the primary interrelation of the elements. In this sense even every differentiated *mereia* is an "all together": "*As in the beginning also now all is together,*" ("ὅπως περ ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ") (Simpl. phys. 164, 25.) Besides, however, "pantahomou" has also the special meaning of "combining-ratio 1:1." *In the following presentation the term "pantahomou" will be used in this particular meaning only.*

and so on.

Now, these *pantahomou-mereias* contained also
as many moiras of the great as of the small.

What is the meaning of that? Obviously, it does not mean that from the *pantahomou-mereias*, invisible at any rate, extensiveness as such is taken. But it might mean that throughout they are

all of absolutely the same "normal" magnitude.

Therefore, as none of them is greater or smaller, consequently, than any other, it makes good sense to say that they are, by the combining-ratio 1:1,
neither great nor small (cf. p. 11).

In other words:

These *mereias* seemed to be without any quality at all,
*seemingly they did not exist at all,*²

only by compensation, as a result of their combining ratio 1:1, or, in Anaxagoras' own words, "because the combination was the hindrance":

But before these were severed when all still were together, *no surface quality whatsoever was perceptible: for the hindrance was the combination of all the elements, of the moist and the dry, and of the warm and the cold, and of the bright and the dark (since also much earth [potentially] was therein³), and, generally, of seeds infinite in quantity, in no way like each other. For of the*

2. Except that the finger of an imaginary observer would have felt resistance when trying to penetrate into them, for according to Anaxagoras, as reports Aristotle, "the *apeiron* (= the undifferentiated *mereias*) is tight for the touch" ("τῇ ἀφῇ συνεχές τὸ ἀπειρον εἶναι . .") (Arist. Phys. III, 4. 203 a 22).

3. As mentioned above (p. 4), the words "*καὶ γῆς πολλῆς ἐνεούσης*," "since also much earth was therein," are at any rate a remark of comment. The single genitive "*γῆς*" is not parallel with the preceding pairs of genitives. This passage is to explain why the primordial *migma* was imperceptible. If earth, and even "much earth," not mixed with anything contrasting that compensated its qualities, were *actually* contained, the *migma's* imperceptibility, conditional upon compensative mixture of all its components, would have been cancelled. Besides, the determination "in no way resembling each other" could not have been applied to the earth because of its resemblance to the dense, the cold, and the dark. But those words "*καὶ γῆς πολλῆς ἐνεούσης*" are, syntactically, not at all parallel with the preceding genitives. They are an intercalated *genetivus absolutus*, which is correctly expressed in Diels' translation, "zumal auch viel Erde sich darin befand." This *genetivus absolutus* is an illustration of the second, the fourth, and the sixth of the preceding genitives, and "*ἐνεῖναι*" obviously means, in this passage, "to be contained *potentially*." Whether one attributes this remark of comment to Anaxagoras himself or to Simplicios is of no consequence whatsoever concerning this reconstruction of the Anaxagorean system. The Ionic form "*ἐνεούσης*," however, cannot furnish a serviceable argument as there is something like a *petitio principii* involved. For the moment any one of the medieval copyists considered that remark traced to Anaxagoras himself, he had to change an original "*ἐνούσης*" into "*ἐνεούσης*" anyway. Incidentally, there could be some one who might take umbrage at *καὶ* being translated as a concluding "and generally" in *καὶ σπερμάτων ἀπειρῶν πλήθος* at the end of this enumeration, and deny that *καὶ* can have such a meaning. He would, however, be disabused by any school-dictionary of the Greek language.

other ones, too [sc., which here are not mentioned expressly], none resembles any other in any respect. Since these matters stand thus, one has to realize all the elements to be contained [already] in that *sympan*.

πρὶν δὲ ἀποκριθῆναι ταῦτα πάντων ὁμοῦ ἔοντων οὐδὲ χροὴ ἐνδηλος ἦν οὐδεμία· ἀπεκάλυε γὰρ ἡ σύμμιξις πάντων χρημάτων, τοῦ τε διεροῦ καὶ τοῦ ξηροῦ καὶ τοῦ θερμοῦ καὶ τοῦ ψυχροῦ καὶ τοῦ λαμπροῦ καὶ τοῦ ζοφεροῦ (καὶ γῆς πολλῆς ἐνεούσης³) καὶ σπερμάτων ἀπείρων πλήθος οὐδὲν ἐοικότων ἀλλήλοις. οὐδὲ γὰρ τῶν ἄλλων οὐδὲν ἔοικε τὸ ἕτερον τῷ ἑτέρῳ. τούτων δὲ οὕτως ἐχόντων ἐν τῷ σύμπαντι χρὴ δοκεῖν ἐνεῖναι πάντα χρήματα.

Simpl. phys. 34, 21, and 156, 1.

The translators of this passage render “χροὴ” (*chroíē*) as “color.” This is a mistake.

There is no reason for assuming that “χροὴ” should not be used here in its original, regular meaning “surface” (cf. p. 14). On the contrary, there are reasons against it:

If “χροὴ” meant “color,” the explanation given by this passage as to why no “color” was perceptible would be nonsensical. For in this case, nothing but the mixture, the combination, of the bright and the dark would have been a plausible cause. This pair of opposites, however, is not even mentioned in the first but only in the third place. On the other hand, what the moist and the dry, the warm and the cold are supposed to have to do with the visibility or invisibility of any color one fails to understand.

But all the pairs of opposites mentioned here, as well as the other ones, certainly are qualities which are perceptible *from the surface*. This also corresponds perfectly to the meaning of the whole idea. It is *only on the outside*, indeed, where those *pantahomou-mereias* are *not perceptible*, hence, seemingly, not existing at all, while *inside they actually contain all the qualities, or elements*.

Thus the total of these *mereias*, the *sympan*, is by no means a thing truly onefold that then would change into a multitude, like the “apeiron” of Anaximander. Anaxagoras did not accept the previous, naive conception of a changeable element. His elements are eternal and unchangeable.⁴ Therefore, as follows from the whole argumentation, all the elements are *actually* contained in that seemingly onefold *sympan* already. As cited above:

Since these matters stand thus, one has to realize *all the elements to be contained [already] in that sympan*.

4. Their plurality is consecutive to their unchangeableness.

τούτων δὲ οὕτως ἔχόντων ἐν τῷ σύμπαντι χρῆ δοκεῖν ἐνεῖναι
πάντα χρήματα.

Simpl. phys. 34, 21.

Why the detailed delineation of the primordial condition quoted just above is concluded by exactly this sentence now appears to be quite evident.

With regard to such a starting-stage of cosmogony, a statement, stressed by Anaxagoras again and again, becomes much clearer:

Anaxagoras maintains, as already mentioned, that *the numbers of the moiras of all the elements extant in the universe are equal*. In chapter I, we had to restrict ourselves to an incomplete quotation of the sentence containing that statement (cf. p. 10). Only now the whole sentence becomes comprehensible:

Since they were differentiated in such a way [i.e., out of a starting-stage like this], one must understand that none of all [the elements] is less or more numerous (for it is not feasible to be more than all), but that all [to each other] are equal [in quantity] *for ever*.

τούτων δὲ οὕτω διακεκριμένων γινώσκειν χρῆ, ὅτι πάντα οὐδὲν ἔλασσω ἐστὶν οὐδὲ πλείω (οὐ γὰρ ἀνυστόν πάντων πλείω εἶναι), ἀλλὰ πάντα ἴσα αἶ.

Simpl. phys. 156, 9.

Those words in the beginning, "Since they were differentiated in such a way," i.e., out of a starting-stage like this, with its combining-ratio 1:1, give the reason for the subsequent statement. That the numbers of the *moiras* of every single element not only must be equal in the beginning but also must remain equal for ever, then becomes a matter of course.

AN ENDORSEMENT BY ARISTOTLE

This condition of the *pantahomou*, of the primordial *migma*, that seemingly it does not exist at all, since seemingly it lacks any quality at all, exactly corresponds to the following description by Aristotle of the implicit condition of the Anaxagorean mixture:

As nothing was severed it is evident that it would not have been possible to predicate anything correct about that being [sc., the *migma*], that is to say, that it was neither white nor black nor grey nor of any other color, but *colorless*, of necessity. For [else] it ought to have been of any of these colors. But likewise it was *tasteless*, too, and, by that same reason, it was *lacking also of any other [quality] of the kind*. For it is not possible that that be of any quality or any quantity or anything at all. For certainly some of the specialties

specifically predicated ought to have been in it. This, however, is impossible *if all are mixed together*, for [else] they ought to have been severed already, whilst he [sc., Anaxagoras] maintains all to be mixed, except for Nous. . .

ὅτε . . . οὐδέν ἦν ἀποκεκριμένον, δῆλον ὡς οὐδέν ἦν ἀληθές εἰπεῖν κατὰ τῆς οὐσίας ἐκείνης, λέγω δ' οἶον ὅτι οὔτε λευκὸν οὔτε μέλαν ἢ φαιδὸν ἢ ἄλλο χρῶμα, ἀλλ' ἀχρώματον ἦν ἐξ ἀνάγκης· εἶχε γὰρ ἂν τι τούτων τῶν χρωμάτων· ὁμοίως δὲ καὶ ἄχρυμον, καὶ τῷ αὐτῷ λόγῳ τούτῳ οὐδὲ ἄλλο τι τῶν ὁμοίων οὐδέν· οὔτε γὰρ ποῖόν τι οἶον τε αὐτὸ εἶναι οὔτε ποσὸν οὔτε τί. τῶν γὰρ ἐν μέρει τι λεγομένων εἰδῶν ὑπῆρχεν ἂν αὐτῷ, τοῦτο δὲ ἀδύνατον μεμιγμένων γε πάντων· ἥδη γὰρ ἂν ἀπεκέκριτο, φησὶ δ' εἶναι μεμιγμένα πάντα πλὴν τοῦ νοῦ κτλ.

Arist. Metaphys. I, 8. 989 b 6 ff.

"KEEPING ITSELF AT A STANDSTILL. . ."

According to this interpretation, *the unmovedness of the pantahomoureias comes from a mutual compensation of two opposite motion tendencies of these mereias themselves*, as we have seen (p. 31).

There is a statement by Anaxagoras that appears to be in good harmony with this fact, although designated as nonsense by Aristotle:

Anaxagoras, however, nonsensically speaks about the *apeiron's* standstill: for he says that the *apeiron* "*keeps itself at a standstill.*"

'Αναξαγόρας δ' ἀτόπως λέγει περὶ τῆς τοῦ ἀπείρου μονῆς· στηρίζειν γὰρ αὐτὸ αὐτὸ φησι τὸ ἄπειρον.

Arist. Phys. III, 5. 205 b 1.

That the *apeiron*, or totality of the undifferentiated *mereias*, keeps *itself* at a standstill is by no means nonsensical, according to what has been explained above.

There is another passage in Aristotle attesting explicitly that before our intervention the *migma* of the elements was at rest:

He [sc., Anaxagoras]. . . says that, after all [things] having been [mixed] together and *resting the infinite time*, motion was brought in, and differentiation was caused, by Nous.

φησὶ . . . ἐκεῖνος, ὁμοῦ πάντων ὄντων καὶ ἡρεμούντων τὸν ἄπειρον χρόνον, κίνησιν ἐμποιῆσαι τὸν νοῦν καὶ διακρίναι.

Arist. Phys. VII, 1. 250 b 24.

Incidentally, has Aristotle not asserted that flesh, bone, marrow, etc., are one word: solid substances, were the ultimate elements to Anaxagoras? Then one cannot understand how it could escape his notice that those two conceptions were thoroughly incompatible. For of course a *migma* composed of elements like these would hardly be able to remain at a standstill even for one moment, let alone for "the infinite time." It

would have to start at once getting stratified according to the specific gravities of its different components. "The barley water becomes stratified if it is not stirred up" ("ὁ κυκῶν διίσταται μὴ κινούμενος") (Theophr. de vert. 9). Anaxagoras knew that as well as did Heraclitus, I am sure. A *pantahomou* like this would not be able to rest, and having arrived at rest again after stratification, it would not be a *pantahomou* any longer.

Thus Aristotle did not even become aware that he imputed quite a prodigious physical absurdity to Anaxagoras.

As long as the Aristotelian interpretation of Anaxagoras was admissible, there was the great difficulty of interpreting acceptably the explicit statement of the initial standstill. This difficulty exists no longer.

THE WHEREABOUTS OF NOUS

Thus the universe, in its primordial condition, was a *homoiomeres* of infinite dimension.

But *where was Nous at that time?* The molecules are "unlimited in quantity" (ἄπειρα πλήθος). Is there any space left for Nous?

Hippolytus, in his report, going back to Theophrast, on the Clazomenian's doctrine, uses the following words:

For first all [things] were [mixed] together, then *Nous came up* and arranged.

ὄντων γὰρ πάντων ὁμοῦ, νοῦς ἐπελθὼν διεκόσμησεν.

Hippol. refut. I, 8, 1 f.

But where is Nous supposed to have come from? Perhaps from "another world beyond"?

This might be quite out of the question. Anaxagoras no more reached beyond a naive, metaphysic-less monism than did the other early Greek philosophers (cf. p. 130). The idea of a plurality of worlds had not yet been conceived. Moreover, in spite of fervent efforts, this idea was found not even by those who, as, for instance, Democritus, would have become disentangled from their various constructing-troubles only through this idea.

Now, Archelaos, who was a disciple of Anaxagoras', is said to have taught that

the *migma*, in a way, so to speak, is in Nous,

τῷ νῷ ἐνπάρχειν τι εὐθέως μίγμα.

Hippol. refut. I, 9, 1.

One could try to use this sentence for solving the problem. Should we succeed in getting through to a satisfactory result in this way, then, relying on such an argument based on the technique of composition, we should be allowed to consider this sentence one of those positions on which Archelaos agreed with his master Anaxagoras.

A proper "being in one another" in the sense of a true penetration is not meant here, of course, because of the exceptional position of *Nous* in this respect; hence the restricting words "in a way, so to speak" ("τι εὐθέως").

Consequently, there are only two more meanings possible as to the *migma* being included in *Nous*:

Nous, like an envelope, encloses the whole *migma* of the other elements. This is one possibility. In this case, however, the elements would not be "unlimited" ("ἄπειρα") any longer, for the *Nous*-envelope would be their limit, their πέρας. And, moreover, this would contradict an explicit statement by Anaxagoras who says:

Nous, however, being always (sc., everywhere), quite certainly also now is *wherever all the other (elements)*

are. . .

ὁ δὲ νοῦς, ὃς ἀ(εῖ) ἐστι, τὸ κάρτα καὶ νῦν ἐστὶν ἵνα καὶ τὰ ἄλλα πάντα . . .

Simpl. phys. 157, 5.

It says, "also now." That means, "all the more so before," consequently.

Hence only the other possible meaning is left, and so Anaxagoras seems indeed to have realized it himself:

Every molecule is flowed around by Nous on all sides; *Nous*, as "the thinnest of all the elements" (cf. p. 19), fills up all the spaces between the molecules; *Nous is the non-molecularized medium in which the molecules are embedded*.

IV

FIRST MEANS OF COSMOPOEIA: DIFFERENTIATION

THE primordial condition of full homogeneousness and isomerism was to be changed by Nous into the world's thousandfold variegation.

Therefore, first of all, equality of the molecules had to be turned into a thorough inequality. *The combining-ratio 1:1 had to disappear.*

DISENGAGEMENT OF THE CHECKED QUALITIES

Nous could attain this effect and, in this way, *disengage the checked capacities and qualities by taking single moiras out of their molecular unions and incorporating them into other molecules.*¹

This implies that that *primary relation*, according to which there is no isolation of *moiras* of the various elements, *is not valid "in statu nascendi,"* to use this modern term of chemistry.

On the other hand, it follows from that primary relation that

either

the pantahomou-mereias must not have contained only one moira of every element, nor even of any single element;

or

that mereias with only one moira of a single element had to remain undifferentiated in the respective field,

and

that those mereias containing only one moira of each element could not be taken at all into the process of unequalizing.

Otherwise, these *pantahomou-mereias*, in this way of differentiation, *would have been liable to lose one or the other kind of moiras entirely.*

1. Nous would have obtained the same result by unequally dividing the individual molecules:

Suppose $a_n a_n b_n \beta_n \dots$ to be the formula of the *pantahomou*-molecules. Then, e.g., is

$$a_n a_n b_n \beta_n \dots = \frac{a_n}{2} \frac{a_n}{3} \frac{b_n}{4} \frac{\beta_n}{5} \dots + \frac{a_n}{2} \frac{a_{2n}}{3} \frac{b_{3n}}{4} \frac{\beta_{4n}}{5} \dots ;$$

or:

$$= \frac{a_n}{5} \frac{a_n}{4} \frac{b_n}{3} \frac{\beta_n}{2} \dots + \frac{a_{4n}}{5} \frac{a_{3n}}{4} \frac{b_{2n}}{3} \frac{\beta_n}{2} \dots ;$$

etc.

But Anaxagoras apparently did not think of this possibility.

This, however, must not be. The number of the *kinds* of *moiras*, that is, the number of the elements represented in a *mereia*, must always and for all *mereias* remain the same:

For this disengagement is not a thorough rent,

οὐ γὰρ παντελὴς διασπασμός ἐστιν ἡ διάκρισις,

Simpl. phys. 461, 20,

but *none* becomes severed or disengaged from any other *entirely*.

παντάσῃσι δὲ οὐδὲν ἀποκρίνεται οὐδὲ διακρίνεται ἕτερον ἀπὸ τοῦ ἑτέρου.

Simpl. phys. 156, 13 ff.

One need but bear in mind that a *mereia* with only one *moira* of each kind would also contain only one *moira* of the great and only one *moira* of the small. If this sole great-*moira* were taken away, that *mereia* would become a really, absolutely smallest (cf. p. 11). However,

As "the smallest" cannot be there at all, it might also not be capable of being separated and getting on itself, but, on the contrary, as in the beginning [i.e., before differentiation], also now [i.e., after differentiation] [only] all [the elements] might be capable of being together: also among the differentiated [mereias] [the] many [elements] are contained equal in number in all of them, in the greater ones and in the smaller ones as well.

ὅτε τοῦλάχιστον μὴ ἔστιν εἶναι, οὐκ ἂν δύναίτο χωρισθῆναι οὐδ' ἂν ἐφ' ἑαυτοῦ γενέσθαι, ἀλλ' ὅπως ἀρχὴν εἶναι καὶ νῦν πάντα ὁμοῦ. ἐν πᾶσι δὲ πολλὰ ἔνεστι καὶ τῶν ἀποκρινομένων ἴσα πλήθος, ἐν τοῖς μείζονσι τε καὶ ἐλάσσονσι.

Simpl. phys. 164, 25.

Unequalizing the combining-ratio relates to the two sorts of moiras which correspond to the opposites in every single of the specific qualities:

From the rare the dense becomes severed, and from the cold the warm, and from the dark the bright, and from the moist the dry. (But there are many *moiras* of many elements.) But none becomes severed or disengaged from any other entirely. . . .

ἀποκρίνεται ἀπὸ τε τοῦ ἀραιοῦ τὸ πυκνὸν καὶ ἀπὸ τοῦ ψυχροῦ τὸ θερμὸν καὶ ἀπὸ τοῦ ζοφεροῦ τὸ λαμπρὸν καὶ ἀπὸ τοῦ διεροῦ τὸ ξηρὸν. μοῖραι δὲ πολλαὶ πολλῶν εἰσι. παντάσῃσι δὲ οὐδὲν ἀποκρίνεται οὐδὲ διακρίνεται ἕτερον ἀπὸ τοῦ ἑτέρου . . .

Simpl. phys. 156, 13 ff.

Hence *differentiation* need not take place in all the fields in the same way, but *can be performed quite unequally* within the various pairs of opposites.

Consequently, it can easily happen that *mereias* are produced which, while unequal in everything else, are *equal* in their contents of the rare and the dense, that is to say, *in their specific gravities*.

Differentiation can even be omitted in one or the other field, as may be exemplified by the air-*mereias*, the *colorlessness* of which obviously is to be explained in this way, or by the *mereias* of *scentless* or *tasteless* substances, etc.

In short: *Coordination of the combining-ratios* within the individual *mereias* is apparently *left to the will of Nous*.

True, the coordination of some kinds of *mereias* is somehow stated in the extant fragments:

The dense [overbalancing the rare also present, hence compensating it, and itself effective only through the surplus] and moist [this and the following by analogy] and cold and dark moved inward to that place where now there is the *earth*, but the rare and warm and dry [and bright (cf. p. 5, annot. 4)] moved outward to the remoteness of the *ether*.

τὸ μὲν πυκνὸν καὶ διερὸν καὶ ψυχρὸν καὶ τὸ² ζοφερὸν ἐνθάδε συνεχώρησεν, ἔνθα νῦν (ἡ γῆ), τὸ δὲ ἀραιὸν καὶ τὸ² θερμὸν καὶ τὸ² ξηρὸν [καὶ τὸ² λαμπρὸν] ἐξεχώρησεν εἰς τὸ πρόσω τοῦ αἰθέρος.

Simpl. phys. 179, 3.

However, a rule of coordination, according to which, perhaps, with a decline of the rare-contents and increase of the dense-contents proportionate analogies in all the other fields would have to correspond, cannot be gathered from these statements.

Among all the differentiations, those effecting an unequal percentage of the rare and the dense (or *specific density*) and of the great and the small (or *specific magnitude*) in the individual *mereias* were of the greatest consequence as to *the mechanism of cosmogony*.

BEGINNING OF COSMOPOEIA AND ITS VERY FIRST MOMENTS

The world-building activity of *Nous*

started, first, from some small [district]. . . ,

πρῶτον ἀπὸ τοῦ μικροῦ ἤρξατο . . . ,

(Simpl. phys. 156, 13 ff.)

chosen quite to *Nous*' liking.

2. The articles might have come from the pen of a copyist who did not comprehend the meaning perfectly.

Proceeding from this district, Nous' activity gained more and more ground. Not that Nous wandered. Being the medium between the *mereias*, Nous is, of course, ever present everywhere. It took place in such a way that Nous *began* operating *successively* in the various spheres around this centre-kernel. For if intending a true cosmogony, Nous had to avoid a differentiation simultaneous in all points of the infinite universal space and had to be intent on obtaining *a differentiation gradually progressing in globular waves*.

The reason why Nous had to do so, in order to attain that purpose, will become clear presently.

Let us suppose that this tiny initial district consisted of

100 *pantahomou-mereias*.

Then the differentiation, with regard to the rare and the dense and to the great and the small, might have been accomplished in such a manner that Nous, by regrouping their *moiras*, transformed

50 *pantahomou-mereias*

into

2 very heavy and very small *mereias* of earth,

and

48 very light and very great *mereias* of ether;
and

50 *pantahomou-mereias*

into

10 heavy and small *mereias* of water,

and

40 light and great *mereias* of air.

Illustrated mathematically:

a_1 shall be the notation of a dense-*moira*; α_1 , of a rare-*moira*;

b_1 , the notation of a small-*moira*; β_1 , of a great-*moira*.

c and γ shall denote the two sorts of *moiras* of any other specific quality.

$a_3\alpha_3b_3\beta_3c_3\gamma_3 \dots$ is supposed to be the formula of *pantahomou*.

Thus,

$$\begin{aligned} 100 a_3\alpha_3b_3\beta_3c_3\gamma_3 \dots &= 2 a_{51}\alpha_3b_{51}\beta_3c_3\gamma_3 \dots + \\ &+ 48 a_1\alpha_3b_1\beta_3c_3\gamma_3 \dots + \\ &+ 10 a_7\alpha_3b_7\beta_3c_3\gamma_3 \dots + \\ &+ 40 a_2\alpha_3b_2\beta_3c_3\gamma_3 \dots \end{aligned}$$

(I do not pretend to assert that Anaxagoras himself calculated like this. But there is no reason why we should not thus illustrate his idea mathematically today.)

The two earth-*mereias* were made to rush towards each other by Nous. Therefore, by mutual compensation, they lost their motion and became the resting centre of the originating cosmos. (Needless to say, "resting" is meant as pertaining to locomotion only.) This earth-kernel was

covered by the 10 water-*mereias*; these were enveloped by the 40 air-*mereias*; and these, in turn, by the 48 ether-*mereias*. This differentiation was repeated all around, and the new products had to be *stratified* in every instance, according to their specific gravities so that

“all of the same kind came together,”

“... συνελθεῖν τε τὰ ὅμοια . . .”

(Hippol. refut. I, 8, 2)

oriented to the resting kernel of the first differentiation. And in every instance there resulted *more ether than air, more air than water, and more water than earth*:

For these [sc., air and ether] are contained in the totals as the largest [substances] by quantity and by magnitude as well.

ταῦτα γὰρ [sc., ἀήρ τε καὶ αἰθήρ] μέγιστα ἔνεστιν ἐν τοῖς σύμπασι καὶ πλήθει καὶ μεγέθει.

Simpl. phys. 155, 23.

The words, “by magnitude as well,” indicate that Anaxagoras thought *the ether and the air occupy such a large space* not only because there are more *mereias* of them than of the other substances, but *also because their mereias themselves are very voluminous*. For according to the above calculations,

an ether-*mereia* would be

not only twice as light,
but also twice as great

as an air-*mereia*;

an air-*mereia*,

not only four times as light,
but also four times as great

as a water-*mereia*;

and a water-*mereia*,

twelve times as light and also
twelve times as great

as an earth-*mereia*.

But on the other hand, within the embedding *Nous* the distances between ether-*mereias* and the distances between air-*mereias* need not at all be larger than the distances between earth-*mereias* or water-*mereias*.

Nous, of course, produces not only these four substances from the *pantahomou*, but the full number of the kinds of *mereias* possible.³ There-

3. This full number of the kinds of *mereias* possible, produced by *Nous* from the *pantahomou*, the full number of possible combining-ratios, is not infinite in the strict sense of the word, though, but certainly very great and, at any rate, practically undefinable. It might

fore, in this presentation, the terms *earth*, *water*, *air*, and *ether* are to be taken as representative designations for four sections of the line of the different densities, or specific gravities. Apparently, this line is graded continually, it is true. Those four sections, however, are intended to correspond to *the four physical conditions*. For according to the almost common ancient Greek conception, there is also a special etheric condition that precedes the gaseous condition in the same sense as the gaseous condition precedes the liquid condition.

WHY COSMOGONY HAD TO START FROM ONE POINT

Now it is evident why cosmogony had to start from one point:

If Nous had differentiated simultaneously in all points of space, an infinite multitude of stratified globules staying unmoved side by side would have been obtained or, at best, a chaos of motions, in the sense of the kinetic theory of gas, remaining without any result for a world structure.

Therefore, differentiation had to be done *successively* in the various spheres around the centre-kernel, while, on the other hand, in each instance it had to be performed *simultaneously* in the entire sphere included at a time:

And after Nous had begun to move [sc., by doing away with compensation of the two opposite motion tendencies], on the part [ἀπό] of the *whole* moved [district] severance took place, and [always] as much as Nous made to move, this was stratified *in its entirety*.

καὶ ἐπεὶ ἤρξατο ὁ νοῦς κινεῖν, ἀπὸ τοῦ κινουμένου παντὸς ἀπεκρίνετο, καὶ ὅσον ἐκίνησεν ὁ νοῦς, πᾶν τοῦτο διεκρίθη.

Simpl. phys. 300, 27.

Which means that differentiation was progressing in globular waves. *Otherwise, compensation of motion of the world-kernel would have been lost again.*

Needless to say, in all those movements of stratification Nous gives way accordingly.

PERI-ÉCHON—PROSKRITHÉNTA—APOKEKRIMÉNA

The *panтахomou*-masses surrounding the growing cosmos at a given time are:

“τὸ περιέχον” (*to peri-échon*), “the enclosing;” also: “the mass of the enclosing” (“τὸ πολὺ τοῦ περιέχοντος”) or “the enclosing mass” (“τὸ πολὺ περιέχον”).

be that this, too, induced later reporters to ascribe to Anaxagoras an assumption of an “infinite” number of such “elements” as could be paralleled with the four Empedoclean *stoicheia*.

The *mereias* in the process of being differentiated and stratified at a given time are:

"τὰ προσκριθέντα" (*ta proskritθένta*), literally: "the just being added ones thereto by severance."

The *mereias* already differentiated and stratified at a given time are: "τὰ ἀποκεκριμένα" (*ta apokekriména*), "the severed ones."

The passages containing these important terms are:

... For also air and ether are severed from *the mass of the enclosing*, and just *the enclosing* is infinite in quantity.

... καὶ γὰρ ἀήρ τε καὶ αἰθήρ ἀποκρίνονται ἀπὸ τοῦ πολλοῦ τοῦ περιέχοντος καὶ τό γε περιέχον ἄπειρόν ἐστι τὸ πλῆθος.

Simpl. phys. 155, 30.

Nous, however, ... also now is wherever all the other [elements] are: in *the enclosing mass* and in *the just being added ones by severance* and in *the severed ones*.

ὁ δὲ νοῦς ... καὶ νῦν ἐστὶν ἵνα καὶ τὰ ἄλλα πάντα, ἐν τῷ πολλῷ περιέχοντι καὶ ἐν τοῖς προσκριθείσι⁴ καὶ ἐν τοῖς ἀποκεκριμένοις.⁵

Simpl. phys. 157, 5.

EXEGETIC PARAPHRASE OF FRAGMENT NUMBER ONE

This stage of starting differentiation and gradual stratification must be distinguished from that very first world-stage, the stage of the undifferentiated *mereias*.

It is only this second world-stage that the following sentences, said to have been the beginning of the first book of the Anaxagorean work, can relate to. For here air and ether are mentioned: differentiation, consequently, has already begun. These sentences, commonly known as fragment number one in the usual collections, are:

All things were together, infinite both in quantity and smallness; for even the small was infinite. And though all were together, nothing was perceptible in consequence of smallness: for air and ether enveloped all [things], both together being infinite. For these [sc., air and ether] are contained in the totals as the largest [substances] by quantity and by magnitude as well.
ὁμοῦ πάντα χρήματα ἦν, ἄπειρα καὶ πλῆθος καὶ μικρότητα· καὶ γὰρ τὸ μικρόν ἄπειρον ἦν. καὶ πάντων ὁμοῦ ὄντων οὐδὲν ἐνδελον ἦν ὑπὸ μικρότητος· πάντα γὰρ ἀήρ τε καὶ αἰθήρ

4. Notice the *aoristus ingressivus*!

5. Notice the *perfectum praesentiale*!

κατείχεν, ἀμφοτέρα ἀπειρα ὄντα· ταῦτα γὰρ μέγιστα ἔνεστιν
ἐν τοῖς σύμπασι καὶ πλήθει καὶ μεγέθει.

Simpl. phys. 155, 23.

Among the Anaxagorean fragments, this is one of the most difficult to interpret. Mere translation does not suffice. Here a detailed exegetic paraphrase is required for an understanding.

In these ostensibly introductory statements, air and ether are mentioned in contradistinction to the "things." Hence *here* "things" means *only the solid and liquid substances*, and does not comprise also gaseous things like air and ether, in full accordance with common ancient daily life phraseology. And as a matter of course, terms are likely to be used in their common meaning at the outset of a book, as one cannot very well begin with special *termini technici*. (That is also why in this fragment "things" [*chremata*] has the meaning of "elements" all the less.) In this connection one should remember: Anaxagoras' experimental proofs that the air, though invisible and transparent, was not a "nothing" (cf. p. 10) were quite an achievement in those times.

Now, *in the very first moments* after the beginning from a tiny district of differentiation by Nous, this "together" of the "things"—

All things were together,

ὁμοῦ πάντα χρήματα ἦν

—this small

starting-district, was not simply "small." Those differentiated things gathering in and around the kernel still were even *infinitely small*, since consisting only of a few *mereias* initially; and nevertheless, they were *infinite in quantity as well*:

infinite in quantity as well as in smallness;

ἀπειρα καὶ πλήθος καὶ σμικρότητα·

For that "small something" ("σμικρόν τι," cf. p. 40) itself, that infinitely small starting-district, was, on the other hand, infinite in quantity, too,—

for the small, too, was infinite.

καὶ γὰρ τὸ σμικρόν ἀπειρον ἦν.

—since there was in the whole universe an infinite number of such small districts chosen by Nous as starting-points of cosmogonies (as will be shown later, cf. p. 127 ff.).

And though all solid and liquid things so far differentiated were together in such a tiny starting-district, still *nothing could be perceived initially, but only because of the initial smallness of their aggregation*. Apart from that initial smallness, however, there would have been *no other hindrance to visibility* for an imaginary human spectator. For all those differentiated solid and liquid things, already colored by differentiation,

within that tiny starting-district were enveloped by *transparent* air and ether only. These, consequently, would not have been a hindrance to visibility. Thus, only the initial smallness of aggregation, nothing else, constituted the hindrance:

And though all were together, nothing was perceptible
in consequence of smallness: for air and ether enveloped
all [things].

καὶ πάντων ὁμοῦ ἐόντων οὐδὲν ἔνδηλον ἦν ὑπὸ σμικρότητος·
πάντα γὰρ ἀήρ τε καὶ αἰθήρ κατεΐχεν.

To "air and ether" Anaxagoras adds the words:
both together being infinite;

ἀμρότερα ἀπειρα ἔοντα·

This is not exactly correct, of course. For within a world district growing by differentiation, the number of the air- and ether-*mereias* certainly is no more infinite, though constantly growing larger, than that of the other *mereias*. But if one considers that the still undifferentiated *mereias* of the *peri-echon* likewise are in a gaseous state, then air, ether, and the non-differentiated, together, really are infinitely large. And indeed, Anaxagoras corrected his statement himself by explaining:

Air and ether, namely, are also severed from the mass
of the *peri-echon*, and just this *peri-echon* is infinite
in quantity.

καὶ γὰρ ἀήρ τε καὶ αἰθήρ ἀποκρίνονται ἀπὸ τοῦ πολλοῦ τοῦ
περιέχοντος καὶ τό γε περιέχον ἀπειρόν ἐστι τὸ πλήθος.

Simpl. phys. 155, 30.

However, not only air and ether are strictly speaking not infinite in quantity; even *the whole resultant cosmos*, being formed from the differentiation products and comprising the "things" and air and ether, *is but finitely large at any given time*.

And yet, *it is quite impossible to determine how many mereias this finite quantity consists of*. For this quantity is not constant but variable, since it grows larger from instant to instant,

so that the quantity of the [*mereias*] being severed
cannot be figured out, neither by calculating [λόγῳ]
nor by counting off [ἔργῳ].

ὥστε τῶν ἀποκρινομένων μὴ εἰδέναι τὸ πλήθος μήτε λόγῳ μήτε
ἔργῳ.

Simpl. de caelo 608, 24.

But this, at least, can be stated: Every increase in small, heavy *mereias* is accompanied by an increase of correspondingly, still more ether- and air-*mereias* each time. That is to say that, at any rate, there is *always more ether and air than water and earth* (cf. p. 42),

for [among all the products of differentiation] these [sc., air and ether] are contained in the "totals" [i.e., in every single total complex of growing cosmos plus *proskrithenta* plus *peri-echon*=in the single world-systems, cf. p. 128] as the largest [substances] by quantity [of their molecules] and by [molecular] dimension as well [cf. p. 42].

ταῦτα γὰρ μέγιστα ἔνεστιν ἐν τοῖς σύμπασι καὶ πλήθει καὶ μεγέθει.

Between the *pantahomou*-stage proper, as it is described in *Simpl. phys.* 156, 1 (cf. p. 32), and this stage of beginning differentiation, this difference is the most significant: Here nothing was perceptible "because of *smallness*" ("ὑπὸ σμικρότητος"), whilst in the stage of non-differentiation nothing had been perceptible because "(compensating) *combination* of all elements was the hindrance" ("ἀπεκώλυε γὰρ ἡ σύμμιξις πάντων χρημάτων").

V

SECOND MEANS OF COSMOPOEIA: ROTATION

HAD the unequalizing of the *mereias* been the only activity of Nous, *a stratified globe with strata continually increasing* would have been the primitive result.

That was not the intention of Nous. If this had been the only evolution of the *pantahomou* possible, perhaps Nous would not have interfered at all. A lifeless, dreary ball in which no sunny day, no night, moonlit and glittering with stars, had been achievable would scarcely have presented an objective to entice Nous to building.

There were, however, other possibilities, finer ones and more artistic, and Nous, the omniscient physicist and engineer and architect, knew them and willed them and was cognizant of the methods to be used for realizing them.

This is *the chief means* Nous employed for moulding the cosmos such as it is shown to our eyes today:

Going round about,
περιχώρησις (perichoresis)

Simpl. phys. 156, 13 ff.

with its "force" (βλη):

It is namely the quickness [of going round about] that produces force.

βλην δὲ ἡ ταχυτῆς (sc., *τῆς περιχώρησιος*) *ποιεῖ*.

Simpl phys. 35. 13.

That is to say: *Rotation with its centrifugal force.*

The results achieved through co-operation of this component shall be examined in the following.

THE TWO SORTS OF MOTION AND THEIR ALLOTMENT TO TWO PRINCIPLES

The mereias would never have been able to take a crooked path by themselves. Spontaneously, they are capable of rectilinear motion only, or even, if the world centre is already taken into account, of motion recti-

linear up and down only. *Nous alone is capable of any non-rectilinear spontaneous motion.*

Hence *Nous effected a rotation of the mereias by means of rotating itself*—first in the primordial globule and then in every single sphere further included, around an axis chosen quite to *Nous'* liking but put through the centre of the world kernel—and thus dragging along the embedded mereias:

Nous effected by its might¹ the whole rotation, too, so that [Nous] went around from the very outset. And first [Nous] began going around from some small [district], but is going around farther. . . .²

καὶ τῆς περιχωρήσιος τῆς συμπάσης νοῦς ἐκράτησεν,¹ ὥστε περιχωρῆσαι τὴν ἀρχήν. καὶ πρῶτον ἀπὸ τοῦ μικροῦ ἤρξατο περιχωρεῖν, ἐπὶ δὲ πλέον περιχωρεῖ ²

Simpl. phys. 156, 13 ff.

Anaxagoras apparently allotted the sorts of motion to two principles. He was induced to do so by the obvious fact that "lifeless" bodies, by themselves, *only go up and fall*, while *any other kind of motion* is to be met *only with living beings or, with lifeless bodies, only when the will of a living being interferes.*

A MENTAL EXPERIMENT

Actually, then, this highly important means of rotation and centrifugal force had been combined with the disengagement of the automotion of the *mereias* from the very commencement, from the very first differentiation, or, at the latest, immediately after the first differentiation.

But for the purpose of a better didactic arrangement of presentation, in order to make more distinct the single components in their individual

1. Literally: "It ruled over" But here "κρατεῖν" obviously has the same meaning as in the preceding sentences of that fragment, i.e., "to rule by moving," "to move" (cf. p. 21).

2. One should not close one's eyes any longer to the clear wording of these sentences. "περιχωρεῖν" means exactly "to go around," and "ὥστε περιχωρῆσαι τὴν ἀρχήν" means plainly and literally: "So that it went around from the very outset." And just as in the sentence ending with these words (and as in the two preceding sentences), also in the sentence immediately following (as in the two subsequent sentences) "νοῦς" is the grammatical subject: "νοῦς" is the subject of "ἤρξατο περιχωρεῖν" ("it began going around"), as well as of "ἐπὶ πλέον περιχωρεῖ" ("it goes around farther"), and of "περιχωρήσει ἐπὶ πλέον" ("it will go around still farther"). This seems to me rather incontestable. Diels translates: "So hat er auch die Herrschaft über die gesamte Wirbelbewegung, so dass er dieser Bewegung den Anstoss gibt. Und zuerst fing dieser Wirbel (!) von einem gewissen kleinen Punkt an, er (sc., dieser Wirbel) greift aber weiter und wird noch weiter greifen." Aside from other, minor grammatical errors, this, to say the least, is a gross obscuring in the first sentence and a common blunder in the second. And if other people translate "ὥστε περιχωρῆσαι τὴν ἀρχήν" as "dergestalt, dass sie (sc., die Wirbelbewegung) anfang, herumzuwirbeln," it is not only nonsensical, but likewise simply wrong grammatically.

modes of acting, I am going to draw out their simultaneity into a succession—by way of a mental experiment, so to speak.

The function of the one component has been described in the foregoing.

Now differentiation shall be supposed to have already produced a stratified globe of some size. And not until this moment shall the other component start acting, and, from then on, the magnitude of the cosmos shall remain constant, influx of further material from the *peri-echon* shall be interrupted, until centrifugal force will have made up for what I am supposing it to have missed.

THE EFFECTS OF ROTATION UPON THE EARTH AND
THE WATERS, AND UPON THE ORIGINAL LINE OF FALL

Centrifugal force caused *the earth* in the middle of this cosmos *gradually to lose its spherical form and become increasingly oblate, until it assumed the shape of a flat disk,*

the earth, however, to be flat in shape,

τὴν δὲ γῆν τῷ σχήματι πλατείαν εἶναι,

(Hippol. refut. I, 8, 3 [from Theophr.], and elsewhere)

and, finally, even was transformed into a hollow, surrounded by big rolls of mountains ascending toward its circumference.

This reconstruction of the final shape of the earth as a hollow surrounded by mountains is based upon the doctrine of Archelaos, a follower of Anaxagoras.' Archelaos taught that

first it [sc., the earth] was a basin, being high on its circumference but concave in the middle.

λίμνην . . . εἶναι [sc., τὴν γῆν] τὸ πρῶτον, ἅτε κύκλῳ μὲν οὖσαν ὑψηλήν, μέσον δὲ κοίλην.

Hippol. refut. I, 9, 4.

In the middle of this hollow the waters flowed together, forming an enormous ocean. For the effect, in the sense of tossing outwards, of centrifugal force on the heavy, bulky stones is much stronger than on the less heavy water:

These [sc., the stones] get outwards [sc., in consequence of rotation] more than the water.

οὔτοι δὲ [sc., οἱ λίθοι] ἐκχωρέουσι μᾶλλον τοῦ ὕδατος.

Simpl. phys. 155, 21.

True, this strict separation is not in conformity with *the present distribution of water and land*. But Anaxagoras seems to have assumed that from this first condition of the earth surface the actual state *might have resulted later*, as a consequence of two causes:

In his opinion, one part of
the waters *evaporated* under the influence of the sun.
... διατμισθέντων ὑπὸ τοῦ ἡλίου τῶν ὑγρῶν . . .

Diog. Laert. II, 8, and elsewhere.

(One cannot do entirely without naïvetés, after all, even with "the greatest natural philosopher" [ὁ μὲν φυσικώτατος Ἀναξαγόρας . . .] [Sext. Emp. VII, 90] of the Greek.)

Another part of the waters *sank down into the many caves of the earth*, for it [sc., the earth] is cavernous and contains water in the hollow spaces.

εἶναι γὰρ αὐτὴν [sc., τὴν γῆν] κοίλην καὶ ἔχειν ὕδωρ ἐν τοῖς κοιλώμασιν.

Hippol. refut. I, 8, 5.

Anaxagoras might have imagined these subterranean hollow spaces to result from laxations of the solid structure of the earth, as an effect of centrifugal force.

The most conspicuous manifestation of centrifugal force is that as a result of it everywhere *the bodies fall in the direction rectangular to the horizontal plane*, instead of falling toward the geometrical centre of the earth.

This original falling direction toward the centre implies a tendency to obliqueness, to deviation from the perpendicular, and this trend increases in proportion to the distances from the axis. But centrifugal force, while being zero in the middle of the disk, likewise grows with the increasing radius and, consequently, is always strong enough at any point to surmount the trend to obliqueness of the fall's original direction.

It is presupposed, here, that the angular velocity of the rotating earth is the same everywhere. This may safely be assumed with regard to the solid physical condition.

WHY THE ROTATION OF THE EARTH HAS BEEN PASSED OVER IN SILENCE

As in the first stages of cosmogony, *the earth is still rotating around the world axis with a velocity far surpassing all known velocities*. Today, also, the earth is not excluded from

the rotation rotated now by the stars and the sun and
the moon and the air and the ether that are produced
through severance.

... τὴν περιχώρησιν ταύτην, ἣν νῦν περιχωρεῖ τὰ τε ἄστρα
καὶ ὁ ἥλιος καὶ ἡ σελήνη καὶ ὁ ἀήρ καὶ ὁ αἰθήρ οἱ ἀποκρινόμενοι.

Simpl. phys. 156, 13 ff.

Their [sc., of the rotating things] quickness, however, does not resemble the quickness of any thing [literally: "any thing in quickness"] among the things existing with men now, but, at any rate, is many times as quick. ἡ δὲ ταχυτῆς αὐτῶν [sc., τῶν περιχωρούντων] οὐδενὶ ἔοικε χρήματι τὴν ταχυτῆτα τῶν νῦν ἔδντων χρημάτων ἐν ἀνθρώποις, ἀλλὰ πάντως πολλαπλασίως ταχύ ἐστι.

Simpl. phys. 35, 13.

However, to all appearances *this sharing of the earth in the rotation was not taught expressly by Anaxagoras*. For otherwise he would probably have mentioned the earth, too, in the sentence quoted above in which those celestial bodies taking part in the *perichoresis* are enumerated. This is somewhat striking.

But it may be that Anaxagoras even avoided uttering it explicitly, in order not to give too much offence. One must not forget: Dealing with natural history of heaven and earth was quite a perilous amusement in those times, outside of Ionia. In proof of this, one need but point to the fact that Anaxagoras himself came very near being killed in Athens when it had got abroad that he regarded Helios and Selene as glowing clods of stone.

There is no knowing, after all, whether Anaxagoras did not intentionally abstain from saying many another thing as well. He might have understood that a martyrdom for the sake of enlightenment was neither due nor of use to mankind, since their narrowmindedness was too spiteful and too inherent.

AN ENDORSEMENT BY PLUTARCH

There is a confirmation by Plutarch of this view, an endorsement really thrilling:

Anaxagoras was the first to put down in writing the clearest as well as boldest of all explanations of the irradiations and shadow of the moon. But neither was Anaxagoras himself considered venerable on that account, nor was that explanation praised by all people. *On the contrary, it was still kept dark and spread step by step in a few words only and with precaution or in strict confidence. For in those days, natural philosophers and "star-gazing babblers" were not tolerated, they were persecuted [even] [literally: "maltreated"], as if levi-gating the Godhead into irrational causes, blind forces, and fated, necessary occurrences. That is why Protagoras fled, and the life of Anaxagoras, whom they had thrown into dungeon, could narrowly be saved by Pericles, for his own sake.*

ὁ γὰρ πρῶτος σαφέστατόν τε πάντων καὶ θαρραλέωτατον περὶ σελήνης καταναγασμῶν καὶ σκιᾶς λόγον εἰς γραφὴν καταθέμενος Ἀναξαγόρας οὐτ' αὐτὸς

ἦν παλαιὸς οὔτε ὁ λόγος ἔνδοξος, ἀλλ' ἀπόρρητος ἔτι καὶ δι' ὀλίγων καὶ μετ' εὐλαβείας τινὸς ἡπίστεως βαδίζων. οὐ γὰρ ἠνείχοντο τοὺς φυσικοὺς καὶ μετεωρολέσχας τότε κακούμενους, ὥς εἰς αἰτίας ἀλόγους καὶ δυνάμεις ἀπρονοήτους καὶ κατηναγκασμένα πάθη διατρίβοντας τὸ θεῖον, ἀλλὰ καὶ Πρωταγόρας ἔφυγε καὶ Ἀναξαγόραν εἰρχθέντα μόλις περιποιήσατο Περικλῆς.

Plutarch. Nic. 23.

INTERNAL REASONS FOR THE ROTATION OF THE EARTH

Therefore, if one intends to reconstruct, not in a philological sense, but *philosophically*, then *also reasons of inner consistency, based on the technique of composition, may, no, must co-operate*, and the question must be not only: "What has been written in the text?" but also: "What might the philosopher have thought to himself?". And *when dealing with a thinker of Anaxagoras' rank, we may assume, perhaps, ingenious presuppositions and starting-points, but never any inconsistency or non-sense in the construction itself.*

Thus, the fact that in the texts it is passed over in silence cannot prevent me from believing that Anaxagoras imagined *the earth to share in the "perichoresis,"* or rotation, not only at the beginning of cosmogony, but *for ever.* He had to construct in this way, since otherwise he could not have worked out the flatness of the earth. For *if the rotation of the earth had stopped, its oblateness, also, would have had to become lost again, and the spherical shape, to come back.*

Is the earth, then, supposed to rotate with this incomparable speed, although we do not feel it?

But this conception would hardly have presented any difficulty to Anaxagoras. He needed merely to remember this fact: When sailing in the open sea, one likewise would not be aware of the ship's movement, except by inferring it from the oarsmen's manipulations or from the whizzing of the sails and the roaring of the waves. And yet the ship moves faster than the strongest fellow can run. Only the movements aboard the ship are felt, not those of the ship itself. Certainly, it could be quite so with the earth.

On the other hand, however, *Anaxagoras explicitly says that the air partakes in the perichoresis. Consequently, for this reason alone, he was forced to keep the earth rotating as well.* Otherwise he would not have been in a position to explain the fact that there was no feeling this continual, furious rotation of the air.

THE EFFECTS OF ROTATION UPON AIR AND ETHER

What effects resulted from centrifugal force for the air stratum and the ether stratum?

I cannot but admit that any statement on this question turns out

to be extremely difficult, considering that in the air-*mereias* and in the ether-*mereias* the rare-percentage surmounts the dense-percentage. *Their lightness, consequently, should not mean, strictly speaking, a very low degree of heaviness, but a quality working against heaviness.* Thus the *mereias* in which the rare prevails would have no trend at all toward the centre of the cosmos, but a trend away from it. To the *mereias* in which the dense prevails a tendency of "moving inward" (συγχωρεῖν) would belong; to those with the rare prevailing, a tendency of "moving outward" (ἐκχωρεῖν) (cf. Simpl. phys. 179, 3). But as to this problem, one really cannot venture to say whether Anaxagoras did carry out this idea to its extreme consequences. And it would obviously be impossible, moreover, merely by means of reconstructing to determine how centrifugal force might act upon such "light" molecules.

However, in the reports on the doctrine of Anaxagoras there are some passages in which the effect of that action is simply stated, without any deduction, as, for instance, in Plutarch. Lys. 12, wherein a "(living) force (literally: tension) of rotation" (τόνος τῆς περιστροφῆς) is mentioned quite generally. From this one may gather that *it did not occur to Anaxagoras to think of any other difference but a gradual one in the respective effects upon heavy and light bodies of centrifugal force.*

It may be that the effects of this "force produced by quickness" were merely plagiarized, so to speak, from the world of obviousness by Anaxagoras, but *not further analysed.* Indeed, there is a significant indication, even, that he really took all of it *from mere observation* without having been able to resolve it into more elementary components: *his opinion that Nous alone is capable of that kind of spontaneous motion by which centrifugal force is produced.*

On the other hand, to become familiar with the fact as such of centrifugal force and with its behaviour—which gave rise to his statement that during cosmogony likewise

mere rotation effected severance

ἡ δὲ περιχώρησις αὐτῇ ἐποίησεν ἀποκρίνεσθαι

Simpl. phys. 156, 13 ff.

—, he needed only go for a stroll through the Kerameikos of Athens.

ROTATION AND STRATIFICATION

Separation of the substances in the sense of *stratification* to their specific gravities was not only not arrested, but even *strengthened* by centrifugal force.

Anaxagoras expressly says:

And after Nous had begun to move [sc., by doing away with compensation of the two opposite motion tend-

encies], on the part of the whole moved (district) severance took place, and (always) as much as Nous made to move, this was stratified in its entirety. However, while thus there was motion and stratification as well [anyway], *rotation but greatly intensified stratification*.

καὶ ἐπεὶ ἤρξατο ὁ νοῦς κινεῖν, ἀπὸ τοῦ κινουμένου παντὸς ἀπεκρίνετο, καὶ ὅσον ἐκίνησεν ὁ νοῦς, πᾶν τοῦτο διεκρίθη· κινουμένων δὲ καὶ διακρινομένων ἡ περιχώρησις πολλῶ μᾶλλον ἐποίει διακρίνεσθαι.

Simpl. phys. 300, 27.

HOW THE EARTH REMAINS SUSPENDED

At this point it would be proper to halt our stopping the influx of further material from the *peri-echon* and to demonstrate how the *proskrithenta* (cf. p. 44) are acted upon by gravity and centrifugal force jointly.

But first let us consider just one little remaining problem, a rather obscure passage in Hippolytus (taken from Theophrast³) concerning the mechanical relationship between the earth and the air:

Anaxagoras is said to have held

the earth . . . to remain suspended in consequence of its magnitude and in consequence of there not being any vacuum and because the air, being strong enough, carries the earth sitting on it.

τὴν γῆν . . . μένειν μετέωρον διὰ τὸ μέγεθος καὶ διὰ τὸ μηδὲν εἶναι κενὸν καὶ διὰ τὸ τὸν ἀέρα ἰσχυρότατον ὄντα φέρειν ἐποχουμένην τὴν γῆν.

Hippol. refut. I, 8, 3.

If it were admissible to impute to Anaxagoras a belief in an absolute "above" and "below," this sentence should be conceived as intending to explain how the earth does not fall "down" but persists in its state of suspension.

But there is one very awkward thing about it: *The factors quoted in that sentence would by no means be able to protect the earth from falling down.* For largeness of the mass could but enhance a fall within the aerial region, and the air, becoming displaced, would not be strong enough to check the fall.

Anaxagoras, however, was not so naïve as to believe in an absolute "above" and "below."⁴ In the same report, some lines previous to the passage cited above, it says:

3. Cf. Arist. de caelo II, 13. 294 b 13, and 295 a 16.

4. Cf., in contradistinction, Arist. Phys. IV, 1. 208 b 14, and de caelo IV, 1. 308 a 18.

All the heavy things to move together *to the middle*.

πάντα τὰ βαρέα συνελθεῖν ἐπὶ τὸ μέσον.

Thus, in Anaxagoras' opinion, *the heavy does not gravitate "downwards," but toward the centre of the axis of rotation.*

Perhaps, the meaning of that sentence is that, while the earth rotates on the spot in a definite manner, any change of this definite kind of rotation is prevented by atmospheric resistance which, because of the great magnitude of the earth, is sufficiently strong.

Three possibilities of a rotation of the earth disk are conceivable: Firstly, the axis of rotation can be rectangular to the disk in its centre; secondly, the axis of rotation can be oblique to the disk; and, thirdly, the axis of rotation can coincide with a diameter of the disk.

If the air did not rotate itself, a trifling frictional resistance would result in the first case. In the second and third instances, however, an air displacement resistance would arise, increasing in accordance with the largeness of the disk even unto insuperability.

But the air does rotate, in Anaxagoras' opinion. It rotates around an axis obviously coinciding with the axis of the earth rotation. (The other case, rotation around a different axis, though imaginable theoretically, can be disregarded. One would not understand whence such an irregularity should proceed.)

In the first of the possible instances mentioned of an earth rotation, i. e., rotation around a central axis rectangular to the plane of the earth, the rotation of the air, equal in direction and velocity, would imply even a cessation of the trifling frictional resistance of the air. Likewise in the third instance, that is, in the case of rotation around a diameter, this would imply a cessation of the air displacement resistance that would have arisen with air at rest. (The second of the mentioned possibilities, rotation around an axis oblique to the plane of the disk, is too unnatural for consideration.) Now, it must be remembered that the earth disk has resulted from a previous earth ball which has become oblate by its rotation. On that very account, no form of rotation other than one around an axis rectangular to the disk in its centre is possible at all. It could not be comprehended, however, how this manner of rotation should be capable of being changed into any of those other manners of rotation.

Thus it is seen that this consideration of the relationship between the earth and the air, and of the possibilities of the earth's rotation, still has not enabled us to interpret that obscure passage in Hippolytus.

Perhaps, however, the passage has this meaning:

It certainly is conceivable that the earth, while rotating around the world axis, could in addition oscillate along this axis to and fro (and every point of the earth describe a spiral line instead of a circle, conse-

quently). But *when the air from above the earth rushes about the earth disk into the air below the earth, this storm under the earth does not make the earth shift along the axis, but instead merely effects a shaking in the sense of an earth-quake:*

Earth-quakes take rise when the air from above rushes in the air under the earth: For when this [air below the earth] is moved, also the earth sitting on it is shaken by it.

σεισμούς δὲ γίνεσθαι τοῦ ἀνωθεν ἀέρος εἰς τὸν ὑπὸ γῆν ἐπίπτοντος· τούτου γὰρ κινουμένου καὶ τὴν ὀχουμένην γῆν ὑπ' αὐτοῦ σαλεύεσθαι.

Hippol. refut. I, 8, 12.⁵

In this the earth is *like a stretched drumskin:*

. . the earth being flat and drumskin-like. .

. . πλατεία οὖσα καὶ τυμπανοειδὴς ἡ γῆ . .

Simpl. de caelo 520, 28.

If you press a drumskin down with your finger at one spot, a corresponding convexity immediately rises at another spot, but the drumskin as a whole does not give way. The drumskin, however, is fastened at its circumference, while the earth disk is not: Where does the similar behaviour of the earth come from?

This "remaining suspended" in the middle of the world axis is vouched for "by its [enormous] size." *Since resistance of the air from both directions is insuperable owing to the earth disk's enormous size, neither a gust of air down to the earth (not perceptible to us) nor a gust of air from the opposite side is able to make the earth leave the middle of the world axis.* Both of the air masses, the one which

"carries the earth sitting upon,"

"ἐποχουμένην φέρει τὴν γῆν,"

and the other which

sitting upon is carried by the earth,

ἐποχούμενος φέρεται ὑπὸ τῆς γῆς,

are equal contributors to that mechanical effect.

5. Cf. Arist. Meteor. II, 7. 365 a 32.

VI

DIFFERENTIATION AND ROTATION ACTING TOGETHER

BUT now let us really abandon the fictitious constancy of size of the cosmos and continue the differentiation in the *peri-echon*, which had been interrupted for the purpose of greater lucidity in the presentation of the effects of centrifugal force.

We shall now consider the *proskrithenta* (cf. p. 44).

THE PROSKRITHENTA AND THEIR CONGLOMERATIONS

The proskrithenta are under the joint influence of gravity and centrifugal force everywhere, with the exception of the line of the axis itself.

In this very line of the axis, every *mereia* coming from the *peri-echon* must reach, and remain in, that stratum which corresponds to its specific gravity, *in a fall thoroughly rectilinear* toward the earth centre. For the centrifugal force's intensity, being zero there, cannot disturb the fall's rectilinearity in this line.

Due to this very cause, conglomerations of *mereias* are impossible in that line.

Everywhere else, however, opportunity is given for conglomerations of the proskrithenta.

The new *ether-mereias* find their place directly in the outermost strata of the cosmos.

The *air-particles*, the *water-particles*, and the *earth-particles* *trickle inwards* more and more across the ether-strata, and when they finally reach the true air-stratum, they can be *conglobated to complete clouds*. And these, in their turn, are dissociated so that the air-contents remain in the aerial sphere, while the water- and earth-contents stream down to the earth in form of *rain*, containing earth-particles:

For out of the clouds water is severed, but out of the water earth.

ἐκ μὲν γὰρ τῶν νεφελῶν ὕδωρ ἀποκρίνεται, ἐκ δὲ τοῦ ὕδατος γῆ.

Simpl. phys. 155, 21, and 179, 6.

From the *pantahomou-mereias* of the *peri-echon* also *stone-particles* are

produced that are nothing but earth-particles congealed, owing to a greater contents of the cold-element.

On their way into the cosmos, *these stone-particles are worked upon by centrifugal force with particular intensity*, much more than water:

Stones congeal out of earth, owing to the cold. These, however, get more outwards than the water.

ἐκ δὲ τῆς γῆς λίθοι συμπήγνυνται ὑπὸ τοῦ ψυχροῦ, οὗτοι δὲ ἐκχωρέουσι μᾶλλον τοῦ ὕδατος.

Simpl. phys. 155, 21.

As a consequence, the stone-particles conglomerate to full stone clods very quickly and already in strata far distant from the centre.

Then, under the joint action of gravity and centrifugal force, *such a stone clod will sink across the ether from stratum to stratum—but not, of course, in a radial path—until it reaches a stratum, the “force” (βίη) of which will be strong enough to prevent it from sinking farther, at least pro tempore.*

WHY ANGULAR VELOCITY AND CENTRIFUGAL FORCE MUST INCREASE FROM WITHOUT INWARDS

The intensity of centrifugal force is not equal everywhere.

It is a matter of course that within every sphere the intensity of centrifugal force is graded continually from a maximum at the equator to zero at the poles.

But there is another gradation, besides: *the gradation of the total values of the single spheres themselves.* And here, according to Anaxagoras' construction, the arrangement is that *angular velocity and, consequently, centrifugal force as well increase from without inwards.*

If, instead, angular velocity were equal in all the spheres, then the intensity of centrifugal force would have to increase from within outwards. Thus it would reach its actual maximum at the equator of the actually outermost sphere at any given time. Consequently, from a definite size of the growing cosmos, centrifugal force in the outermost stratum—apart from the poles and their nearest surroundings—would be strong enough for a long time to keep the *proskrihenta* from penetrating into the cosmos. The *proskrihenta*-masses would be jammed until they would have grown to such immensity that they would finally be able to force their entrance and passage and then would burst in upon the whole cosmos stratified by then, catastrophically destroying it forthwith.

However, this would only occur provided rotation did not set in simultaneously with differentiation, whereas in this case something quite different would happen. From a certain moment, centrifugal force would preponderate over gravity, and another system of strata, produced by the centrifugal force's stratifying activity, would originate around the

kernel stratified by then. And this additional system, the strata of which would be arranged in an order strictly reverse to the order of the kernel, would remain isolated from that kernel for ever, forming a shell that would incessantly grow thicker and thicker.

Hence an increase of centrifugal force from without inwards was the only possibility serviceable to Anaxagoras.

If looking for a plausible starting-point, he certainly could suppose that Nous spinned, at first, with the same *absolute* velocity in every sphere joining rotation. Then Anaxagoras was free to interpret as secondary results whatever was different today. The equality of angular velocity within the whole earth, e.g., could have resulted from intensive cohesion as an average angular velocity later. Generally, whenever it turned out to be necessary in the course of evolution, Nous could change the original relation between the velocities of the various spheres. In this way, Nous caused, e.g., the inmost air strata to rotate with the same angular velocity as the earth, and conferred on the future moon-heaven and the future sun-heaven velocities of rotation many times as great as the velocity conferred on the earth and the inmost air strata. Only the principle that angular velocity and, hence, centrifugal force had to increase inwards at least as far as to the future moon-sphere had to be heeded.

This arrangement of the velocities corresponds also to the fact that in the extant reports the whole rotation is sometimes designated by the terms

“whirlpool” and “whirl,”

“δίνη” and “δίνησις.”

Arist. de caelo II, 13. 295 a 9; and elsewhere.

It is characteristic of a whirl to be most torrential toward the middle.

ORIGIN OF THE STARS

Let us assume, then, that the clod of stone (or of metal) mentioned above has reached an ether-stratum, the centrifugal force of which is strong enough to prevent it from sinking farther for the present. It remains in this sphere and takes part in its *perichoresis*.

But the velocity of this clod is smaller than the velocity of the surrounding medium: The clod *swims* in the ether-sea.

Through this swimming in the warm ether *an enormous friction* takes place, as a result of which *the clod begins to glow and shine*. That is to say: *The stone, heavy and cold originally, has changed into a fiery, radiant, revolving star.*

Though stonelike and heavy, they [sc., the stars] shine in consequence of the [frictional] resistance and breaking [in the sense of “surf”] of the ether, and, being clasped by [centrifugal] force, are

dragged along through the whirl and strain of rotation. Presumably in this way they had been prevented from falling hither [to us] also in the beginning when the cold and heavy substances were severed out of the whole.

λιθώδη . . . ὄντα [sc., τὰ ἄστρα] καὶ βαρέα λάμπειν μὲν ἀντερείσει καὶ περικλάσει τοῦ αἰθέρος, ἔλκεσθαι δὲ ὑπὸ βίας σφινγόμενα δίνῃ καὶ τόνῳ τῆς περιφορᾶς, ὥς πού καὶ τὸ πρῶτον ἐκρατήθη μὴ πεσεῖν δεῦρο τῶν ψυχρῶν καὶ βαρέων ἀποκρινομένων τοῦ παντός.

Plutarch. Lys. 12.

The sun and the moon and all the stars to be burning stones dragged along round about by the ether's rotation.

ἥλιον δὲ καὶ σελήνην καὶ πάντα τὰ ἄστρα λίθους εἶναι ἐμπύρους συμπεριληφθέντας ὑπὸ τῆς αἰθέρος περιφορᾶς.

Hippol. refut. I, 8, 6.

This, then, is Anaxagoras' theory that the stars are glowing clods of stone or metal.¹

HOW ANAXAGORAS CAME TO HIS HYPOTHESIS

The way in which Anaxagoras came to arrive at this famous doctrine is extremely interesting.

It is stated he taught that the sun (sc., as well as the stars generally) was a glowing clod, a "*mydros*,"²

because of the burning's immensity,

διὰ τὸ ἄμετρον τῆς πυρώσεως.

Olympiod. in Meteor. p. 17, 19.

That is to say, he seems to have reasoned as follows:

True, also things not made of fireproof material can burn and gleam, but after a short time they come to an end of their burning, they burn

1. It may be mentioned that the epitomist Aetios oddly enough summarizes the Anaxagorean teaching about the origin of the stars in this way (literally!):

Anaxagoras [says] that the encircling ether is fiery by nature, but that through the strain of the whirl it has pulled up [!] rocks from the earth [!] and, by burning them up [!], has transformed them into stars.

Ἄναξαγόρας τὸν περικείμενον αἰθέρα πύρινον μὲν εἶναι κατὰ τὴν οὐσίαν, τῇ δὲ εὐτονίᾳ τῆς περιδινήσεως ἀναρπάσαντα πέτρους ἀπὸ τῆς γῆς καὶ καταφλέξαντα τούτους ἡσπερωκέναι.

Aetios II, 13, 3.

Among all the ancient reporters, Aetios alone has managed to turn Anaxagoras' ingenious hypothesis into such egregious nonsense.

2. The Greek terms used in the report s are: "*μύδρος*" (*mydros*), Olympiod. in Meteor p. 17, 19 Stüve; "*μύδρος διάπυρος*," Diog. Laert. II, 8 and 12, and Harpocr.; "*μύδρος πυρόεις*," Diog. Laert. II, 15; "*μύλος διάπυρος*," Joseph. c. Ap. II, 265; "*βῶλος*," Eurip. "Phaeton" FTG fr. 783; "*λίθος διάπυρος*," Xenoph. Memor. IV, 7, 7; "*λίθος ἔμπυρος*," Hippol. refut. I, 8, 6; "*πέτρος διάπυρος*," Aet. II, 20, 6.

away. Consequently, if there is to be not only a comparatively short flaring up in the sky each time but stars *continually* gleaming, the material employed must be fireproof.

This is still not enough to guarantee an "immensity of burning." For even if a thing consists of fireproof material but has the origin of its glow within itself, this glow must come to an end, finally, because of the continual loss of heat.

But Anaxagoras did not fail to consider this point, too. Indeed, his stars do not have the origin of their glow within themselves: They have it from the motion of the medium in which they are swimming and from the friction arising in this way. Thus *continual loss is compensated by continual restitution*.

Motion of the medium itself, however, cannot stop unless Nous itself stops "going around."

One may realize that a conquest like present-day "caloric death" theory would have been sneered at by Anaxagoras as a particularly "silly fancy" (*ἄτοπόν τι*). Or he would even have refused such a theory with indignation. To take the World-Nous for clumsy is an unprecedented impertinence (*ὑβρις*), he would have muttered.

THE STONE OF AIGOSPOTAMOI

The stone clod, then, changed into a star, shares in the *perichoresis* of that sphere, the centrifugal force of which has been able to compensate its heaviness. Thus the star discontinues to sink.

Yet—only for a time. For a long time, perhaps. But not for ever. For *the magnitude of a star is not constant*.

A star is not alone in the sphere in which it swims at a given time. In that sphere there are also other *mydroi* which have previously reached it. Besides, however, differentiation incessantly goes on outside in the outermost remoteness (*πρόσω*) of the cosmos. That is to say, continually new *proskrihenta* arise and consequently new *mydroi* as well. And all these *mydroi* penetrate into the cosmos along ways similar to the ones pursued by the *mydros* in question. Inevitably, therefore, *mydroi* of both groups, some of those having been in that sphere previously and likewise some of those having reached it later, will come into *collisions* with our clod, or, rather, star.

It is plausible that such occurrences do not pass off particularly smoothly. On the contrary, such a *mydros* rushing headlong can hit our star so vehemently that a piece will break off and crash down to the earth as an *aerolith*, like the famous stone of Aigospotamoi:

It is said Anaxagoras foretold that when a slipping or shaking occurs

among the bodies held fast in the sky, a flinging and a falling down of one [piece] broken off will take place.

λέγεται δὲ Ἀναξαγόραν προειπεῖν, ὡς τῶν κατὰ τὸν οὐρανὸν ἐνδεδεμένων σωμάτων γενομένου τινὸς ὀλισθήματος ἢ σάλου ῥίψις ἔσται καὶ πτώσις ἐνὸς ἀπορραγέντος.

Plutarch. Lys. 12.

As to these proceedings, the [known] stone-fall, also, became a proof, it is said. For a huge stone had darted down—from Heaven, in the opinion of the people at large—to Aigospotamoi. And even today it is still pointed out, because it is a subject of [superstitious] awe to the inhabitants of the Chersonese.

οἱ δὲ καὶ τὴν τοῦ λίθου πτώσιν ἐπὶ τῷ πάθει τοῦτω σημείον φασὶ γενέσθαι· κατηνέχθη γὰρ, ὡς ἡ δόξα τῶν πολλῶν ἐξ οὐρανοῦ,³ παμμεγέθης λίθος εἰς Αἰγὸς ποταμούς. καὶ δείκνυται μὲν ἔτι νῦν σεβομένων αὐτὸν τῶν Χερρονησιτῶν.

Plutarch. Lys. 12.

One can imagine that the fall of this meteorite (in 468/7 B.C.) was a welcome support of his hypothesis to Anaxagoras. And so did Plutarch understand it. The reports⁴, however, that the fall was predicted by Anaxagoras can only have this meaning, if any, that he “predicted,” not the fall of this particular meteoric stone, but such stone-falls generally and theoretically, just as it is stated in the first of the two passages of Plutarch cited above.

WILL THE STARS CRASH DOWN TO THE EARTH IN TIME TO COME?

Despite the pieces flung off, however, because of its union with the other *mydroi* the star in question grows larger and larger, heavier and heavier, and, finally, *too heavy*. It will be released, so to speak, by its sphere and *sink again* until it can remain in another sphere with a centrifugal force sufficiently stronger:

Anaxagoras has declared that the whole sky [sc., meaning “total of all the stars,” of course,] consists of stones; that they have united as a consequence of the vehement rotation; and that *they will be released in the future and sink down*.

τὸν δὲ Ἀναξαγόραν εἰπεῖν ὡς ὅλος ὁ οὐρανὸς ἐκ λίθων συγκέοιτο· τῇ σφοδρῇ δὲ περιδινήσει συνεστάναι⁵ καὶ ἀνεθέντα(ς)⁶ κατενεχθήσεσθαι.

Diog. Laert. II, 12.

3. I put the comma after “οὐρανοῦ.” The version with the comma after “πολλῶν” instead, accepted by Diels, does not make much sense nor would it be an explanation as to why that stone was “a subject of awe to the inhabitants of the Chersonese.”

4. Diog. Laert. II, 10; Plinius Nat. Hist. II, 149 f.; and elsewhere.

5. συνίσταμαι = “unite,” “join.”

6. ἀνίημι = “let go something held fast.” Instead of “ἀνεθέντα” which is meaningless in this context, I read the word as “ἀνεθέντας.”

Naturally, this is true not only as to the future. Even the present places of the various stars are not the same as were their places in the beginning. This obviously follows from the very manner of their origin:

None of the stars is in the place of its origin (today).

εἶναι δὲ καὶ τῶν ἄστρων ἕκαστον οὐκ ἐν ᾗ πέφυκε χώρῃ.

Plutarch. Lys. 12.

In days gone by, they sank into the spheres in which they are now revolving, and they will sink still deeper in days to come.

Hence these questions arise:

Is this supposed to continue irresistibly in this way? Did Anaxagoras go so far as to believe that these proceedings would end for every star by its crashing down to the earth some day when its time will have arrived?

This result would not have been quite satisfactory, to be sure.

Nous could have avoided such an effect by spinning itself, and thereby all else in the respective sphere, with a velocity correspondingly greater when a star was about to become too heavy.

But this conception of velocities increasing without end would not have been quite the thing either and, besides, was certainly not assumed by Anaxagoras, since otherwise he would not have let the stars sink at all.

However, there was another way of avoiding such a result, and Anaxagoras, to all appearances, did make use of it, although not only for solving this problem alone. But this point will be dealt with in a subsequent chapter.

APPARENT AND REAL MAGNITUDE OF THE STARS

Wherever in addition to gravity centrifugal force is at work, there are conglomerations of the *proskrithenta*, and consequently also *mydri*.

The hugest conglomerations arise where centrifugal force is strongest, that is, *in the equatorial zone*. For by this very cause more conglomerations, i.e., more material capable of uniting, originate there than elsewhere. But on the other hand, it is these places where, to become too heavy for the "forces" of the single spheres and to sink deeper, a star must grow to a much bigger mass than anywhere else. And, as a matter of fact, the greatest stars, namely, the planets, the sun, and the moon, are precisely in this zone that has to be realized as still lying in the equatorial plane of the earth.

Anaxagoras drew a strict distinction between *apparent* and *real* magnitude of the stars.

As is well-known, he maintained that *in reality the sun might be larger than the Peloponnesus*, and that *the moon contained complete mountains and valleys*:

It [sc., the sun] . . . to be larger than the Peloponnesus, but the moon to contain . . . ⁷ summits and gorges.

μείζω [sc., τὸν ἥλιον] τῆς Πελοποννήσου . . . τὴν δὲ σελήνην . . . ἔχειν . . . ⁷
καὶ λόφους καὶ φάραγγας.

Diog. Laert. II, 8; also in Hippol., and elsewhere.

Which is not particularly surprising, considering that, according to Theophrast, Anaxagoras has made the greatest number of original contributions, as far as the various senses are concerned, in the analysis of the sensations of sight; since this was to him the "great" sense (cf. p. 114, annot. 12), obviously because of its supreme degree of variegation and differentiation:

. . . he says original things of his own about all the senses and *particularly about sight* because it is the *great* sense . . .

. . . ἴδιον ἐπὶ πάσαις λέγει ταῖς αἰσθήσεσι καὶ μάλιστα ἐπὶ τῇ ὄψει, διότι τὸ μέγα αἰσθανόμενον ἐστίν . . .

Theophr. de sensu 37.

And he dealt even with optics to solve problems of scenography and perspective, if the report in Vitruv is reliable.⁸

Anaxagoras did not doubt that the moon was nearer to the earth than the sun:

The moon . . . to be still deeper than the sun, nearer to us.

εἶναι δὲ τὴν σελήνην κατωτέρω τοῦ ἡλίου πλησιώτερον ἡμῶν.

Hippol. refut. I, 8, 7.

Consequently, he might have assumed that in reality the moon was surpassed by the sun in magnitude much more even than it seemed to be, and that the other stars, being more distant from the earth than the sun, certainly are larger than a naïve observer would believe. But all the same, Anaxagoras might not have had any doubt that of all the stars the sun was still the largest.

THAT DIFFICULT MOON . . .

Like every other star the sun, too, is a glowing stone clod, a *mydros*,

7. The complete passage in Diog. Laert. reads: ". . . but the moon . . . to contain *homes*, but also summits and gorges," "τὴν δὲ σελήνην . . . οἰκήσεις ἔχειν, ἀλλὰ καὶ λόφους καὶ φάραγγας," as if Anaxagoras had asserted the moon to be inhabited. This is a misunderstanding easily refuted (cf. p. 127).

8. Vitruvius VII, pr. 11: "Primum Agatharchus Athenis Aeschylō docente tragoediam scaenam fecit et de ea commentarium reliquit. ex eo moniti Democritus et Anaxagoras de eadem re scripserunt, quemadmodum oporteat ad aciem oculorum radiorumque extinctionem certo loco centro constituto lineas ratione naturali respondere, uti de incerta re certae imagines aedificiorum in scaenarum picturis redderent speciem et quae in directis planisque frontibus sint figurata alia abscedentia alia prominentia esse videantur."

though of enormous magnitude. And so should be the moon, Anaxagoras had to deduce from his astrophysical views.

But here, apparently, he met with a difficulty. On the one hand, he certainly could not reason why the moon should be anything but a *mydros*. On the other hand, it was an established fact, since Thales, that *moonlight was nothing but reflected sunlight*. And, of course, Anaxagoras approved of this fact:

Thales was the first to say that it [sc., the moon] was lighted up by the sun. And so said Anaxagoras.

Θαλῆς πρῶτος ἔφη ὑπὸ ἡλίου φωτίζεσθαι . . . Ἀναξαγόρας ὁμοίως.

Aet. II, 28, 5.

The moon . . . to have its light not from itself, but from the sun.
τὸ δὲ φῶς τὴν σελήνην μὴ ἴδιον ἔχειν, ἀλλὰ ἀπὸ τοῦ ἡλίου.

Hippol. refut. I, 8, 8.

Or, in Anaxagoras' own words:

The sun confers upon the moon the bright.

ἥλιος ἐντίθησι τῇ σελήνῃ τὸ λαμπρόν.

Plut. de fac. in orb. lun. 16 p. 929 B.

(Cf. also Plato Cratyl. p. 409 A.)

Besides, however, Anaxagoras could not have overlooked the obvious fact that *the moon did not give any heat at all*.

Neither do we feel the glow of the stars, it is true. However, this is no analogon, for they are much too distant:

The heat, however, of the stars is not felt because of their great distance from the earth.

τῆς δὲ θερμότητος μὴ αἰσθάνεσθαι τῶν ἄστρον διὰ τὸ μακρὰν εἶναι τὴν ἀπόστασιν τῆς γῆς.

Hippol. refut. I, 8, 7.

But the moon is not even as distant from the earth as is the sun.

Anaxagoras tried to harmonize his theory with the facts in this manner: Essentially, he said, the moon, too, is a *mydros*. But there is *some irregularity as to the mixture of its mass: Also much of the cold and much of the dark is mixed with it. And because of this the heat produced by friction and the corresponding light are compensated*:

Anaxagoras [declared] the moon to be an annealed solid, containing flat grounds and mountains and gorges.

Ἀναξαγόρας . . . στερέωμα διάπυρον ἔχον ἐν ἑαυτῷ πεδία καὶ ὄρη καὶ φάραγγας (sc., τὴν σελήνην).

Aet. II, 25, 9.

[But,] according to Anaxagoras, there is an irregularity in the mixture of the solid, as it is not only earth-like (having high and flat and hollow parts), but is, besides, mixed with the cold. And with the shining fiery the dark is mixed. And these [sc., the cold and the dark] bring about the shadiness [sc., of the moon]. That is why this star is said to be falsely luminous.

Ἀναξαγόρας ἀνωμαλότητα συγκρίματος διὰ τὸ ψυχρομιγὲς ἅμα καὶ γεῶδες, τὰ μὲν ἐχούσης ὑψηλὰ τὰ δὲ ταπεινὰ τὰ δὲ κοῖλα. καὶ παραμεμῖχθαι τῷ πυροειδεῖ τὸ ζοφῶδες, ὧν τὸ πάθος ὑποφαίνει τὸ σκιερὸν· ὅθεν ψευδοφανῇ λέγεσθαι τὸν ἀστέρα.

Aet. II, 30, 2.

ANAXAGORAS' INVISIBLE CELESTIAL BODIES

The most distant spheres are spangled with stars all over. But *in the inferior strata there is always only one star in every sphere*: the moon in the moon-sphere, the sun in the sun-sphere, and only one planet in each of the various planet-spheres.

This, to all appearances, was felt as something like *a defect of beauty* by Anaxagoras. He assumed that, just as in the heaven of stars, *also in the strata below*, i.e., in the heavens of the planets and in the sun-heaven and the moon-heaven, *mydroi* were spread *all over*, but that they were *not visible* to us, presumably since they were too small and became outshined:

The sun, the moon, and all the stars are fiery stones dragged around by the ether's rotation. But [also] *below the stars* there are certain bodies, dragged around along with the sun and the moon [that is to say: in the same spheres], though invisible to us.⁹

ἥλιον δὲ καὶ σελήνην καὶ πάντα τὰ ἄστρα λίθους εἶναι ἐμπύρους συμπεριληφθέντας ὑπὸ τῆς αἰθέρος περιφορᾶς. εἶναι δ' ὑποκάτω τῶν ἄστρον ἡλίω καὶ σελήνῃ σώματά τινα συμπεριφερόμενα ἡμῖν ἀόρατα.⁹

Hippol. refut. I, 8, 6.

It seems to me that Anaxagoras made this assumption for no other reason but in order not to be compelled to accept such inartistic asymmetry. To be sure, he is said¹⁰ to have made use of those invisible celestial bodies also for explaining solar and lunar eclipses, in addition to the other, well-known causes of these phenomena—causes even said to have been

9. With those "earth-like formations *in the region of the stars*, moving around together with them" ("εἶναι δὲ καὶ γεώδεις φύσεις ἐν τῷ τόπῳ τῶν ἀστέρων συμπεριφερόμενας ἐκείνοις"), fathered upon Anaximenes by Hippolytus (I, 7, 5), these Anaxagorean invisible celestial bodies *beneath the heaven of stars*, rotating in the sun-sphere and in the moon-sphere, are not connected in any way, materially.

10. Aet. II, 29, 6 a. 7.

thoroughly analysed for the first time by Anaxagoras, according to Hippolytus.¹¹ But there was, perhaps, no need for him to think these bodies out for this purpose.

■ This is but a trifle, after all. But from just such a trifle it becomes particularly manifest once more that Anaxagoras' philosophizing essentially was a kind of indulgence in an artistic passion for moulding.

11. Refut. I, 8, 10.

VII

THIRD MEANS OF COSMOPOEIA: DISMEMBERMENT OF THE AXIS

YET, this condition of the cosmic system still was different from the world as it is today, since all of this *diakosmesis* still was unfit to bring about an alternation of day and night. For everywhere *the entire perichoresis was still taking place around the one axis* chosen in the beginning when Nous started cosmogony from that tiny district. Consequently, *the circles described around that axis by the sun and the moon could lie only in the plane of the earth disk itself*, and the orbits of the other stars were either in this very plane *or parallel with it*.

In other words: *There was neither rising nor setting for any star. All of them were visible continually and simultaneously.* The moon, the sun, and the planets were revolving around the earth in the heaven-equator which, of course, coincided with the earth-equator. And the starred sky was set upon the horizon like a well-fitting cupola.

If Nous intended to avoid such uniformity, if a condition resembling that of today was to be brought about, then *the identity of the axes of rotation* of all the rotating spheres *had to be abolished*.

INDIVIDUAL ROTATION FOR EVERY SPHERE

Thus, Nous had to divide the one common perichoresis into a very system of perichoreses. The one unique axis had to be cut into pieces, so to speak. Only in this way could every sphere, fully independent of the others, be enabled to execute its own *perichoresis*.

And as a matter of fact, Anaxagoras realized this in the way described. According to the report of Diogenes Laertius, Anaxagoras taught:

Originally, the stars moved *like a cupola*, so that on the top of the earth [i.e., from the surface of the earth] the celestial vault [i.e., the starry sky] was *continually* visible. Later on, however, they got their slanting position.

τὰ ἄστρα κατ' ἀρχὰς μὲν θολοειδῶς ἐνεχθῆναι, ὥστε κατὰ κορυφὴν τῆς γῆς τὸν αἰὲ φαινόμενον εἶναι πόλον, ὕστερον δὲ τὴν ἑγκλισιν λαβεῖν.

Diog. Laert. II, 9.

Only by this assumption of *Nous* breaking the axis of rotation was Anaxagoras enabled to perfectly harmonize his theory with the obvious physical world. For now it was very easy for him to bring about the actual condition from the one preceding it in his construction: *Nous was free* not only to change the velocities of the various spheres according to need (cf. p. 60), but also to *turn each single axis* of rotation correspondingly, while retaining their mutual intersecting point in the earth-centre, needless to say.

Anaxagoras even gained a further advantage in this way. As everybody knows, the direction of the rotation of the heaven of stars is opposite to the direction of the rotations of the other spheres. How is this to be explained? Should *Nous* have reversed the original direction of its own rotating? There was no need for Anaxagoras to resort to such a supposition. He was allowed to let *Nous* keep the original direction and only turn the axis by 180 degrees.

EXPLANATION OF THE MILKY WAY

During that cosmic condition characterized by the oneness, for all the spheres, of the axis of rotation, the whole sky had been bespangled with stars uniformly. By the transformation into the condition of today, the symmetrical distribution of the stars was not abolished, to be sure, but there arose *that continual alternation in the conditions of light to be observed now*.

Today, during the sun's way *above* the earth, all the other stars are outshined, which gives an impression as if the sun were alone in the sky. During the sun's way *below* the earth, the other stars become visible, but it looks as if their distribution were *unequally dense*. For those stars which come into the direct shadow of the earth can display their illuminating power most strongly, while the light of the others is weakened by reflected sunlight. That is the Anaxagorean explanation of the Milky Way:

The Anaxagoreans . . . assert the Milky Way to be the light of certain stars. For the sun when moving below the earth not to irradiate [literal translation: "see"] some of the stars. The light of all those stars enveloped in its rays not to become visible (because of being checked by the rays of the sun). The own light, on the other hand, of all those stars adumbrated by the earth, so that they cannot be irradiated by the sun, to be exactly what the Milky Way is.

οἱ δὲ περὶ Ἀναξαγόραν . . . φῶς εἶναι τὸ γάλα λέγουσιν ἄστρων τινῶν. τὸν γὰρ ἥλιον ὑπὸ τὴν γῆν φερόμενον οὐχ ὁρᾶν ἔνια τῶν ἄστρων. ὅσα μὲν οὖν περιορᾶται ὑπ' αὐτοῦ, τούτων μὲν οὐ φαίνεσθαι τὸ φῶς (κωλύεσθαι γὰρ ὑπὸ

τῶν τοῦ ἡλίου ἀκτίνων). ὅσοις δ' ἀντιφράττει ἡ γῆ, ὥστε μὴ ὁρᾶσθαι ὑπὸ τοῦ ἡλίου, τὸ τούτων οἰκεῖον φῶς φασιν εἶναι τὸ γάλα.

Arist. Meteor. I, 8. 345 a 25.

Hence this phenomenon, too, has been made possible only by breaking the axis of rotation.

THE ORBITS AND THE TURNINGS OF THE SUN AND OF THE MOON

Thus the difference, as to the orbit of the sun, between today's actual condition and the previous state is that now the solar heaven's equator does not belong any more to the same plane as does the equator of the earth, or, in other words, that now the sun is above the earth and below the earth, alternately.

But there is, besides, another difference: The daily circles described by the sun now are not in one and the same plane; or, strictly speaking, *now the sun does not describe any circles at all, but a helical line*, that is, to be specific, during six months a helical line ascending and during the other six months a helical line descending.

This, however, presents a problem. *How is it that the sun is not executing its orbit perpetually in the equinoctial?* Even this is easily accounted for by that division of the original axis:

Let us visualize the sun to have been in a certain sphere and in the equator of the sphere. Presently that operation of "breaking" the axis is performed. As a result, *the axis of rotation of one of the nearest lower spheres will form an angle with the axis of what had been the sun-heaven until then*. In this moment or later, the sun shall become too heavy for its sphere and rush into that lower sphere in question, the centrifugal force of which is supposed to be sufficiently stronger. Henceforth, the sun will execute its revolution in the direction of the rotation of its new sphere, without farther falling toward the world's centre.

The fall tendency, however, will last. And henceforth, since not parallel with any parallel of that sphere, this fall tendency will manifest itself as a component of the sun's motion through the effect that *the sun will never again return to the starting-points of its daily orbits*. That means: The sun will not describe daily circles any longer, but something like a spiral line.

The sun cannot have reached that sphere in the sphere's equator, i.e., in the plane of equinox. *Hence, upon arriving at this plane in the course of the helical line, the sun will not remain in it, but will continue its winding orbit.*

However, if the sun were as large as the earth or still larger, and the medium surrounding as dense as the air surrounding the earth, then all this would not be possible. In this case the sun would be forced, in spite

of that component, to remain in the parallel it had arrived at when rushing into the sphere. For the medium's resistance would be much too strong to allow the sun to leave that plane. The same mechanism would set in by which the earth is prevented from leaving its place in the middle of the world (cf. p. 57).

But the sun is much smaller than the earth. It is merely somewhat larger than the Peloponnesus, after all. Besides, the medium, although mingled with the *proskrithenta*-molecules streaming through from the *peri-echon*, is at any rate rarer than the air surrounding the earth. Therefore, the sun is able to overcome the medium's resistance and to execute a screw-shaped orbit.

Yet, this cannot be continued *in infinitum*. For resistance increases because *the medium is being condensed more and more by the sun's compressing it perpetually*. And in this way, the medium is given *power* by the sun itself *to push it back, finally*.

Then, driven by this repulsion, the sun will describe a helical line in the opposite direction, pass the sun-heaven's equator once more, and reiterate the play on the other side.

This goes on to and fro, again and again. Twice a year there is an *equinox*, and twice a year the sun is forced to turning back, to the *winter solstice* and to the *summer solstice*:

Anaxagoras [sc., realized solstice to take place] through repulsion by the air in the north [by the air in the south likewise, of course]. The sun itself, by compressing the air, renders it powerful through that very condensation.

'Αναξαγόρας [sc., τροπήν ἡλίου γίνεσθαι] ἀνταπώσει τοῦ πρὸς ταῖς ἄρκτοις ἄερος, ὃν αὐτὸς [sc., ὁ ἥλιος] συνωθῶν ἐκ τῆς πυκνώσεως ἰσχυροποιεῖ.

Aet. II, 21, 3.

This likewise applies to the moon's orbit.

Only as to the *turnings* of the moon a little difference can be stated, in Anaxagoras' opinion. The sun is pushed back by a dry and warm medium. But in the repulsion of the moon's orbits there co-operates frequently *the cold-element* contained in the watery vapor that is sometimes globulated to complete clouds already in the moon-heaven:

The sun and the moon as well are turned when repelled by the air. The moon, however, often is turned because it cannot overcome the cold.

τροπὰς δὲ ποιεῖσθαι καὶ ἥλιον καὶ σελήνην ἀπωθουμένους ὑπὸ τοῦ ἄερος. σελήνην δὲ πολλάκις τρέπεσθαι διὰ τὸ μὴ δύνασθαι κρατεῖν τοῦ ψυχροῦ.

Hippol. refut. I, 8, 9.

Thus Anaxagoras has succeeded in clarifying these phenomena, too, by that division of the original axis.

In this way, Anaxagoras has even avoided certain things which afterwards Plato did not know how to shun, and which appear somewhat forced in the latter's interpretation of those phenomena. According to Plato, the stars are fixed in their centres at definite points of their respective spheres. Consequently, for explanation of the orbits of the sun and the moon Plato was left no other way out than to assume the very axes of their spheres to pendulate.

The "(generative) power of rotation" (ἡ δύναμις ἐν τῇ περιχωρήσει), to apply a Pythagorean-like term, was herewith exhausted. Nothing more could be accomplished in this way.

WHEN WILL COSMOGONY HAVE COME TO ITS END?

The world-forming activity of Nous, as far as hitherto delineated, began in a tiny initial district, from there expanded more and more in spherical undulation, and *has not yet finished expanding* up to this day, in Anaxagoras' opinion:

First [Nous] started going around from some small [district], but [Nous] is going around farther [even now], and will expand its going around still farther [i.e., over spaces still wider] also in the future.

πρῶτον ἀπὸ τοῦ μικροῦ ἤρξατο περιχωρεῖν [sc., ὁ νοῦς], ἐπὶ δὲ πλεον περιχωρεῖ, καὶ περιχωρήσει ἐπὶ πλεον.

Simpl. phys. 156, 13 ff.

Was that supposed by Anaxagoras to go on in infinitum?

This question shall remain unanswered, for the present.

*“There are some in which Nous,
too, is contained”*

(Simpl. phys. 164, 22)

VIII

THE BODIES

NOT YET was the total of possibilities implied in the *pantahomou* materialized.

A good many other formations, fine and artistic, could be moulded from those substances produced by means of differentiation. A good many other forms, indeed, and among them particularly those things with *psyche*: all kinds of organisms breathing and living, the whole vast variety of plants, animals, human beings.

CONSTRUCTION AGAINST STRATIFICATION

Nous was fully cognizant of that. For when producing molecular constitutions different from the combining-ratio 1:1, Nous had made also blood-molecules and flesh-molecules and bone-molecules and the like.

However, by the means applied up to this point a formation of organisms was not accomplishable. In this way, *nothing but single lumps at best could have originated, in which the various constituents of organisms would have been deposited in layers according to their specific gravities.*

Hence, if Nous wanted to succeed in constructing the organisms of the various styles despite the general trend to stratification, *Nous had to interfere in a special way.*

IF NOUS WERE LIKE THE GOD OF THE BIBLE . . .

Yet, mere moulding, mere building up but once, would not have been enough for Nous to accomplish this intention.

It is true: If the Nous of Anaxagoras were like the God of the Bible, then, perhaps, even this would have sufficed. For then moulding would have implied an order given to matter, previously created and then moulded, to persevere in its forms until counter-order. Where a "Let there be!" is enough for creation, a "Let it keep on!" may be enough to preserve the formedness of things.

August Gladisch¹ has tried to make it plausible that Anaxagoras in his conception of Nous' cosmopoeia may have been influenced by the Bible.

1. "Anaxagoras und die alten Israeliten," Niedner's *Zeitschrift für historische Theologie* (1849), 4th issue, no. 14, and *Anaxagoras und die Israeliten* (Leipzig, 1864).

One of the most serious counter-arguments is that there is no *creatio ex nihilo* in Anaxagoras' doctrine. But Gladisch endeavored to refute this argument by *contesting that a true creatio ex nihilo was taught at all by the Bible*.

In one of his writings² he says:

In dem ersten Verse: "Im Anfange schuf Gott den Himmel und die Erde," soll der Ausdruck "schuf" bedeuten: schuf aus dem Nichts; und der Ausdruck "den Himmel und die Erde" soll bedeuten: eine chaotische Masse! Hier wird uns erstens zugemutet, wir sollen diese Bedeutung des Wortes **בָּרָא** sofort zugeben, ohne dass sie durch eine einzige Stelle der hebräischen Schriften erwiesen wird, in denen das Wort vielmehr nur in der Bedeutung "machen" überhaupt, ja auch geradezu in der Bedeutung "aus vorhandenem Stoffe bereiten" vorkommt³ . . . Wir könnten uns vielleicht entschliessen, das Unglaubliche zu glauben, dass gleichwohl der Verfasser der Schöpfungsurkunde, er allein unter den Hebräern, das Wort in der bestimmten Bedeutung "aus dem Nichts erschaffen" gedacht und gebraucht habe. Allein, sogar dieser Entschluss, wenn wir ihn fassen wollten, wird uns durch die Urkunde selbst unmöglich gemacht: denn . . . hier findet man dasselbe Wort nicht bloss von der ersten angeblichen Hervorrufung des Ganzen aus dem Nichts, sondern auch von der Bildung des Einzelnen aus dem vorhandenen Stoff, V. 21, und am deutlichsten V. 27 von dem aus einem Erdenkloss geformten Menschen. Trotzdem sollen wir im ersten Verse zu dem Worte nur dreist ergänzen: aus dem Nichts! Doch das ist noch nicht die ganze Zumutung, sondern zweitens auch dies, dass der Ausdruck "den Himmel und die Erde" im ersten Verse eine chaotische Masse bezeichne, sollen wir nur so geradhin glauben, ungeachtet selbst Diejenigen, welche uns den Glauben zumuten, noch niemals gewagt haben und wohl auch niemals wagen werden, diese Bedeutung des Ausdruckes in ein hebräisches Wörterbuch aufzunehmen. Der Verfasser der heiligen Urkunde soll bei dem ersten Verse die Anschauung eines finstern Chaos, welches Gott aus dem zu ergänzenden Nichts hervorrufe, um hernach, vom dritten Verse ab, daraus das gegenwärtig sichtbare Weltganze zu bilden, vor seiner Seele haben, und soll diese Anschauung eines finstern Chaos mit den Worten aussprechen, welche jedem Hebräer das bereits gebildete gegenwärtig sichtbare Weltganze, den Himmel und die Erde, vor die Seele stellten! Welch einer seltsamen Art zu schreiben muss er fähig erachtet werden! Einer, der für seine Vorstellung keinen nur verwandten

2. *Anaxagoras und die alten Israeliten* (Niedner's Zeitschrift, 1849), p. 535.

3. Gladisch seems to have overlooked the fact that in no other passages this word could have the meaning of *create e nihilo*.

Ausdruck fand, der Jenes dachte, aber Dieses hinschrieb, ein solcher soll der Verfasser der heiligen Urkunde sein! Wenn eine Worterklärung wie die, welche wir hier vor uns haben, bei andern Schriftwerken, z. B. griechischen oder lateinischen, vorgebracht werden sollte, so würde sie ohne Zweifel das höchste Erstaunen erregen; bei den heiligen Schriften der Israeliten aber ist diese Auslegung, die in Wahrheit eine Hineinlegung und augenfällige Unterschiebung genannt werden muss, aus den ältesten Zeiten her eingeführt und so geheiligt, dass auch jetzt noch selbst die gründlichsten Forscher sich von ihr nicht durchaus loszusagen vermögen.

It might be quite interesting to become acquainted with the altogether antagonistic view of a man who had, if anything, at least as good a command of the Hebrew language as had Gladisch, one may safely suppose.

Samson Raphael Hirsch, the famous rabbi of Frankfurt, in his Pentauch-Edition, published 1893 in Frankfurt-on-the-Main, comments upon the first word of the first chapter of Genesis as follows:

Die Lautverwandtschaft mit רעש und רחש, wovon das Eine eine Ortsbewegung und das Andere eine innere Bewegung bedeutet, lehrt, dass wir ראש als den Sitz der Bewegung, als dasjenige Organ zu begreifen haben, von welchem alle äussere und innere Bewegung den Ausgang nimmt. Daher heisst ראשית der Anfang einer Bewegung, der zeitliche Anfang, nie der räumliche. Der räumliche Anfang heisst wie das Ende קצה; es sind eben die beiden Endpunkte einer Ausdehnung, die, je nachdem man seinen Standpunkt nimmt, Anfang oder Ende sein können. בראשית ונ' heisst somit: im Anfang alles Werdens war es Gott, der schuf; oder mit den beiden nachfolgenden Objecten zusammengefasst: uranfänglich schuf Gott den Himmel und die Erde. Jedenfalls spricht בראשית das Faktum aus, dass dem Schaffen Gottes Nichts vorangegangen, dass der Himmel und die Erde nur aus dem Schaffen Gottes hervorgegangen. Es ist damit die Schöpfung aus Nichts, יש מאין, konstatiert, eine Wahrheit, die den Grundstein des Bewusstseins bildet, welches die Lehre Gottes uns aufbauen will, etc.

And *ad vocem* ברא:

Die verwandten Wurzeln: ברה, ברה, פרה, פרה, פרע, die sämtlich ein Hinausstreben und Hinaustreten aus einer Innerlichkeit oder einer Gebundenheit bedeuten, ergeben für ברא ebenfalls den Begriff des Hinaussetzens in die Aeusserlichkeit; heisst ja auch chaldäisch ברא ohne weiteres das Draussenseiende, draussen. ברא ist somit das Aeusserlichmachen eines bis dahin nur im Innern, im Geiste Vorhandengewesenen. Es ist jenes Schaffen, dem nichts anderes als der Gedanke und der Wille vorausgegangen. Es ist das

eigentliche *שׁוֹמֵר* [creatio ex nihilo] und wird daher nur von dem Schaffen Gottes gebraucht. Ehe die Welt ward, war sie nur als Gedanke in dem Geiste des Schöpfers—menschlich zu sprechen—vorhanden. Der Schöpfungsakt machte diesen Gedanken äusserlich, gab diesem Gedanken ein äusseres, konkretes Dasein. Die ganze Welt im ganzen und einzelnen ist somit nichts als verwirklichte Gottesgedanken.

Creatio ex Nihilo—VIEWED PSYCHOLOGICALLY

But—I am ready, nevertheless, to grant that on the basis of the biblical context one has, perhaps, no right to assume the author of that Genesis text already had the strict notion of a *creatio ex nihilo*. After all, as early as the days of the *Mishnah* and the *Talmud*, the rabbis were fully enlightened as to the fact that not seldom Scripture amazingly corresponded to popular view and phraseology. That is why they were induced to lay down, for logical justification, the principle: "*The Doctrine has spoken* [sc., intentionally] *like the tongue of the sons of Adam* [sc., in order to be understood by them]." ("דברת תורה כלשון בני אדם").⁴

In such cases, however, the question of whether or not an idea is precisely formulated is not of great importance. Here the mere fact that a *formulation* logically precise is lacking is far from being proof that the *idea itself* is lacking. For such ideas as *creation, emanation, effulguration*, etc. are rooted in a person's character or even in the psychic fundamentals of a whole race. It is quite evident to me that a man can be a true creationist, psychologically speaking, without arriving at a formulation of the idea of *creatio ex nihilo*, in this logical precision, ever in a lifetime.

The same might have occurred in the instance in question. The idea of creation is a genuinely Jewish idea. It got its express formulation rather late, it is true. But this only means that the characteristic and distinctive traits of the Jews' own nature were not thrown into particular relief and clearness by them until they had become acquainted with the natures of other peoples. Psychologically viewed, however, there is a complete identity of two things: of the idea of *creatio ex nihilo*, on the one hand, and of the conception, on the other hand, that the mere command "Let there be!" is sufficient to conjure up the universe, although this command is not oriented to any mechanical possibilities or impossibilities of matter. This is a relationship of exactly the same identity as that between the tree and the seed-grain, out of which it has sprung up.

4. *Talmud Babli's* tracts: *Babab Meziah* 31, 2; 94, 2; *Kiddushin* 17, 2; *Berachoth* 31, 1; *Arachin* 3; *Kerithoth* 11; *Yebamoth* 71; *Kethuboth* 67; *Gittin* 41; *Nedarim* 3; *Sanhedrin* 56; 64; 85; 90; *Makkoth* 12; *Abodah zarah* 27; *Sebachim* 28; *Niddoh* 32; 44.—For this list of passages I am indebted to the kindness of the late Rev. Dr. S. Rubin of the former Jewish Theological Seminary of Vienna.

One might perhaps suspect that the idea of a *creatio ex nihilo* was taken over into Judaism from the foreign, Greek philosophy. But this would be a mistake. For of the ancient Greek philosophy's numerous instances of a "not being" ("μη ὄν"), from which or in which the cosmos is formed (not created!), none is a true "nihil." It may be that the Greek positions were misinterpreted by the Jews in the sense of their own Jewish, creationistic constitution. But this would only lend support to my opinion.

The Anaxagorean Nous, however, is not the Jewish God, not a Creator absolutely omnipotent, who out of nothingness conjures up the world to be subservient to His ends, the ends of the Lord. The Nous of Anaxagoras is a Hellenic artist, the architect of the world, a mathematical and physical intelligence of the highest rank, but of a might only relatively highest. A skilful mechanician, knowing all that can be made of the world, but performing as well all the conditions indispensable for accomplishing the chosen possibilities.

For Nous, therefore, moulding but once the various organisms and then abandoning them to themselves would not have sufficed. *The artistic structures would have been destroyed again by the general stratification tendency in no time.*

A command of Nous to persevere would not have overcome destruction, either. Not even the will of Nous is a wizard. Otherwise there would have been no need for Nous to do the differentiation of the *pantahomoumereias* with Its own hand, so to speak, nor to effect the general rotation by rotating Itself. For these ends, too, a mere command would have sufficed.

Thus, if the formed organisms were not to decompose immediately, Nous had to make use of all those means enabling the prevention, in a mechanical way, of the components of the organisms from stratification to their specific gravities. And since Nous knows everything, it knows of course all these means, too, and also how to handle them. The godship of Nous consists, above all, in its omniscience, but not in an omnipotence of its liking.

"PRIMORDIAL GENERATION" AND "GENERATION FROM ONE ANOTHER"

Hence, not only in the case of the first specimens of the organisms, but whenever an organism is to originate, Nous itself must operate as the moulding and preserving principle.

According to Anaxagoras, there is the very first production of the organisms by Nous, the so-called *primordial generation*, immediately from their constituents, and there is, subsequently, the so-called *generation from one another* of the organisms by Nous:

The living beings . . . to originate [first] out of moist and warm and earth-like [substances], but later on from one another.

ἕφα γίνεσθαι ἐξ ὑγροῦ καὶ θερμοῦ καὶ γεώδους, ὕστερον δὲ ἐξ ἀλλήλων.

Diog. Laert. II, 9.

In comparison with the primordial generation, *the subsequent generation from one another means merely a simplification*, not a becoming autonomous and independent.

That in every single case the intervention of Nous was indispensable could be learned by Anaxagoras from the very fact that copulation often occurred without result for propagation. Whenever Nous has not decided on a living being to originate, copulation is for pleasure alone.

Once more one may point to a characteristic difference between the biblical God and the Nous of Anaxagoras. With the God of the Bible, mere blessing is sufficient for propagation of the first specimens of the organisms.

FIRST MEASURE AGAINST DECAY: BREATHING

Now, what are the measures, by the taking of which Nous succeeds in keeping the organisms alive, that is, in preserving them from their constituents being stratified to their "dense"- and "rare"-contents? What are the *working-functions* (the "Betriebsfunktionen," to apply the term of Wilhelm Roux), the somatic activities of Nous, *to counterbalance those losses continually inflicted on the organisms* by the stratification tendencies of inorganic nature?

Nous sees these losses compensated—that means: *preservation*—and supercompensated—that means: *growth*—by making them good, over and over again from the organisms' vicinity, in various ways.

The first and basic and simplest activity against decomposition is *breathing*.

THE MEANING OF "PSYCHE"

Aristotle, already, is at a loss to know what is *the meaning proper*, in Anaxagoras, of "*psyche*." He complains of Anaxagoras having expressed himself not clearly enough about it nor about *the difference between "psyche" and "nous"*:

Anaxagoras speaks about them less plainly.

Ἀναξαγόρας ἥττον διασαφεί περὶ αὐτῶν.

Arist. de anima I, 2. 404 b 1.

For now he seems, Aristotle says, to distinguish strictly between "*nous*" and "*psyche*," now he applies the two terms in a way as if they referred to the same being:

Anaxagoras seems to conceive *psyche* and *nous* as different . . . but he employs *both together like one reality*.

Ἄναξαγόρας δ' ἔοικε μὲν ἕτερον λέγειν ψυχὴν τε καὶ νοῦν . . . χρήται δ' ἀμφοῖν
ὥς μὴ φύσει.

Arist. de anima I, 2. 405 a 13.

It is usual to take "*psyche*" for the name of a *thing* and translate it as "soul." But the question is whether the word has been used in this sense by Anaxagoras. And this question must rather be answered in the negative. For originally, "*psyche*" is a designation for breath; not for the air exhaled and inhaled, but for the respiratory movement, for *breathing*. From the linguistical standpoint, also, "*psyche*" is not a designation for a thing, originally, but a *substantial designation for an occurrence*:

"Ψυχὴ" is to "ψύχειν" exactly as "βολή" is to "βάλλειν," "τροπή" to "τρέπειν," "στροφή" to "στρέφειν," "μονή" to "μένειν," etc., or as "passio" is to "pati," "lectio" to "legere," "(com)pressio" to "premere," etc., or as "motion" is to "move," "action" to "act," "failure" to "fail," "enjoyment" to "enjoy," "seizure" to "seize," "comprehension" to "comprehend," etc., or as "Fall" is to "fallen," "Gang" to "gehen," "Wurf" to "werfen," "Traum" to "träumen," "Genuss" to "geniessen," "Griff" to "greifen," "Begriff" to "begreifen," etc.

Therefore one may conjecture that to Anaxagoras "*psyche*" was not the name of a thing, *not a name for something that executes certain functions, but a name for those functions themselves, while that something executing the functions just is Nous*.

In this way, the terms "*psyche*" and "*nous*" would really designate different ideas and yet, concerning the subject, refer to one reality, and only "both together" (it reads: "ἀμφοῖν"!) would mean "one nature" ("μία φύσις"), since function can never subsist independently, apart from the functioning thing, any more than there can be motion without a moved being.

"LARGER PSYCHE" AND "SMALLER PSYCHE," AND THE WEAKNESS OF HUMAN PERCEPTION

In this way, even an Anaxagorean sentence becomes comprehensible that otherwise would be left void of sense.

Anaxagoras says:

All those having *psyche*, a larger one as well as a smaller one, are ruled over by *Nous*.

καὶ ὅσα γε ψυχὴν ἔχει καὶ μείζω καὶ ἐλάσσω, πάντων νοῦς
κρατεῖ.

Simpl. phys. 156, 13 ff.

If one translates "*psyche*" as "soul," what shall be the meaning of

"differences in size" of the souls?⁵ But if "ὅσα ψυχὴν ἔχει" means "whatever has breath, whatever is breathing, i.e., all the organisms," then it makes good sense to distinguish "larger psyche" and "smaller psyche":

In Anaxagoras' opinion, *whatever does not breathe is no organism.*

However, there are indeed *some* kinds of organisms which *do not seem to breathe*, as, for instance, the worms, the mussels, and, above all, the plants.

With regard to such cases, Anaxagoras points out that *the sharpness of the human organs of sense just happens to have its limits*.⁶

In consequence of their weakness we cannot discern the real fact.

ὕπ' ἀφανρότητος αὐτῶν [sc., τῶν αἰσθήσεων] οὐ δυνατοὶ ἔσμεν κρίνειν τάληθές.

Sext. Emp. VII, 90.

That is why we are not aware of, say, tiny changes of color:

For if we take two colors, black and white, and then pour, drop by drop, from the one into the other, the eye will not be able to distinguish the little by little changes, although they are actually taking place.

εἰ γὰρ δύο λάβοιμεν⁷ χρώματα, μέλαν καὶ λευκόν, εἶτα ἐκ θατέρου εἰς θάτερον κατὰ σταγόνα παρεκχέοιμεν,⁷ οὐ δυνήσεται ἡ ὄψις διακρίνειν τὰς παρὰ μικρὸν μεταβολάς, καίπερ πρὸς τὴν φύσιν ὑποκειμένης.

Sext. Emp. VII, 90.

Quite the same, however, occurs with the breath of those species of organisms: Their breathing happens to be much too slight, *their "psyche" is much too small*, to be perceptible to a human observer.

Therefore Anaxagoras, notwithstanding, expressly taught that even the plants breathe:

Anaxagoras maintained that they [sc., the plants] have breath as well.

Ἀναξαγόρας γὰρ εἶπε ταῦτα [sc., τὰ φυτὰ] ἔχειν καὶ πνοήν.

Nic. Damasc. [Arist.] de plantis I, 2. 816 b 26.

5. The most easy-going certainly is not to connect "καὶ μείζω καὶ ἐλάσσω" with "ψυχὴν," and, as did Diels, to translate: "Und über alles, was nur eine Seele hat, Grosses wie Kleines, hat der Geist die Herrschaft."

6. This is the meaning of that Anaxagorean "weakness" of human perception, and *not a scepticism in principle* as it has been interpreted by Sextus Empiricus according to his own scepticism (cf. p. 107).

7. This is indirect presentation. In my translation I have transformed it into direct speech.

But on the other hand, he also endeavored to demonstrate, as a proof of his assertion, the mechanism of breathing in such organisms:

Anaxagoras, however, (and Diogenes) say that all [the organisms] breathe, and [therefore] explain [also] about the fishes and the mussels, in which manner they breathe.

Ἀναξαγόρας δὲ (καὶ Διογένης) πάντα φάσκοντες ἀναπνεῖν περὶ τῶν ἰχθύων καὶ τῶν δοσπείων λέγουσι τίνα τρόπον ἀναπνέουσιν . . .

Arist. de respirat. 2. 470 b 30.

At any rate, then, "psyche" was not the name of a thing to Anaxagoras, but a designation for a function, that is to say, at least for the function of breathing.

It is not unlikely, however, that to Anaxagoras, in addition to this narrower sense, "psyche" served also as a representative name for the total of the "somatic activity" (σωματική ἐνέργεια⁸) of Nous, for the total of the "working-functions" preserving the organism from decay.

This would not be without analogy. The same thing was usual in Indian philosophy. In the Sâmkhya system every working-function in the organism is realized as a kind of breath; and already as far back as the earlier Upanishads, "prâna" ("breath") is likewise used in the very broadest sense.⁹

SECOND MEASURE AGAINST DECAY:

NUTRITION AND DIGESTION

Another function, meant to compensate and, if need be, supercompensate the continual losses, is *nutrition* from, and *digestion* of, the eatable and drinkable substances in the organism's neighborhood.

The nourishment of most kinds of organisms cannot be obtained from their immediate surroundings. Therefore, in these cases *the embedding Nous has to make use of its own free motivity*. For wherever Nous does not do so, motion happens but in the mounting and falling directions. And even this occurs only when bodies are taken from those positions which correspond to their specific gravities, while otherwise they remain in the relative rest of *perichoresis*.

Now, a part of an organism's *food* consists of substances *similar* to the substances to be supplied, such as flesh, but another part, of substances *dissimilar* to them, as bread and others. This implies a problem: *Something lost is replaceable only with something similar. How is it, then, that bread does nourish, nevertheless?*

8. Cf. Aet. V, 25, 2.

9. Cf. Richard Garbe, *Die Sâmkhya-Philosophie* (1894), pp. 255-257, and Paul Deussen, *System des Vedanta*, pp. 353-356 and 359-363.

AN ANCIENT INTERPRETATION

Anaxagoras is said to have answered this question in quite a strange way: Bread becomes flesh and blood and bones, etc. A true becoming, however, is not thinkable. Consequently, *bread just consists of flesh-particles and blood-particles and bone-particles, etc.!*

At least, that is how the respective tenets of Anaxagoras were interpreted by all the ancient reporters. A few examples may suffice:

He [sc., Aristotle] shows us the reason why Anaxagoras came to such a conjecture . . . Anaxagoras, however, came to this idea (sc., that every single *homoiomereia* contains all in itself in the same way as does the whole [of the world]) because of his conviction that *nothing originates from the not-being* and that *every* [sc., *organism*] *can nourish itself by similar things only*. Now, he saw everything originating from everything, though not immediately, but successively. (For from fire air originates, from air water, from water earth, from earth stone, and from stone fire again,¹⁰ and *out of one and the same food supplied, as, e.g., bread, many dissimilar things originate, such as muscles, bones, veins, sinews, hair, nails, and also, occasionally, wings and horns. But on the other hand, like can grow by like only.*) *That is why he assumed all those things to be contained already in the food, as well as wood and bast and fruit to be contained in the water, inasmuch as the trees live on it.* For this reason, he declared that all things are mixed in everything, and that origination originates by means of disseverance. . . . He saw that from every one of the things now differentiated all (kinds of things) were being severed, *such as from bread muscles and bones and the other [constituents of organisms], since all of them were jointly contained in it and mixed up together.* From that he concluded that all the existing [substances] had been mixed up also before severance [all the more].

τὴν αἰτίαν ἡμᾶς διδάσκει [sc., δ' Ἀριστοτέλης], δι' ἣν εἰς τοιαύτην ἦλθεν δ' Ἀναξαγόρας ὑπόνοιαν. . . ἄλλ' εἰς μὲν τὴν τοιαύτην ἔνοιαν (sc., ἐκάστην ὁμοιομέρειαν ὁμοίως τῷ ὅλῳ πάντα ἔχουσιν ἐνυπάρχοντα) δ' Ἀναξαγόρας ἦλθεν ἡγούμενος μηδὲν ἐκ τοῦ μὴ ὄντος γίνεσθαι καὶ πᾶν ὑπὸ ὁμοίου τρέφεσθαι. ὁρῶν οὖν πᾶν ἐκ παντός γινόμενον, εἰ καὶ μὴ ἀμέσως, ἀλλὰ κατὰ τάξιν (καὶ γὰρ ἐκ πυρὸς ἀήρ καὶ ἐξ ἀέρος ὕδωρ καὶ ἐξ ὕδατος γῆ καὶ ἐκ γῆς λίθος καὶ ἐκ λίθου πάλιν πῦρ¹⁰ καὶ τροφῆς δὲ τῆς αὐτῆς προσφερομένης οἶον ἄρτου πολλὰ καὶ

10. The use of "πῦρ" in the sense of "fire" ("from stone fire again") is a proof that this exemplification by Simplicios is not to be traced to Anaxagoras himself. For in Anaxagoras' phraseology, in accordance to older, previous usage (cf. Heraclitus), "πῦρ" is synonymous with "αἰθήρ." ("He [sc., Anaxagoras] calls 'fire' and 'ether' the same" ["τὸ πῦρ καὶ τὸν αἰθέρα προσαγορεύει ταυτό"]. Arist. de caelo III, 3, 302 b 4; cf. chapt. I, p. 4.) Aristotle, in the passage commented upon by Simplicios, says only:

"As he saw everything becoming from everything. . ." ("διὰ τὸ ὁρᾶν ὅτι οὐκ ἐξ ὅτου οὐν γινόμενον . . .").

ἀνόμοια γίνεται, σάρκες ὅσῃ φλέβες νεῦρα τρίχες ὀνυχες καὶ πτερὰ δὲ εἰ οὕτω τύχοι καὶ κέρατα, αὖξεται δὲ τὸ ὅμοιον τῷ ὁμοίῳ· διὸ ταῦτα ἐν τῇ τροφῇ ὑπέλαβεν εἶναι καὶ ἐν τῷ ὕδατι, εἰ τοῦτῳ τρέφοιτο τὰ δένδρα, ξύλον καὶ φλοιὸν καὶ καρπὸν. διὸ πάντα ἐν πᾶσιν ἔλεγε μεμῖχθαι καὶ τὴν γένεσιν κατὰ ἔκκρισιν γίνεσθαι. . . . ὁρῶν οὖν ἄφ' ἐκάστου τῶν νῦν διακεκριμένων πάντα ἐκκρινόμενα οἷον ἀπὸ ἄρτου σάρκα καὶ ὅστουν καὶ τὰ ἄλλα, ὥς πάντων ἅμα ἐνυπαρχόντων αὐτῷ καὶ μεμιγμένων ὁμοῦ, ἐκ τούτων ὑπενδύει καὶ πάντα ὁμοῦ τὰ ὄντα μεμῖχθαι πρότερον πρὶν διακριθῆναι.

Simpl. phys. 460, 4.

It seemed to him [sc., to Anaxagoras] to be a main difficulty [to understand] how anything should be able to originate from the not-being or to perish into the not-being. *Now, the food we take is simple and "one-like," bread and water, and from it hair, vein, artery, muscle, sinews, bones, and the other parts [of an organism] are nourished. Because of these facts, one must admit that in the food taken all the existing (substances) are contained.*

ἔδόκει γὰρ αὐτῷ [sc., τῷ Ἀναξαγόρῃ] ἀπορώτατον εἶναι, πῶς ἐκ τοῦ μὴ ὄντος δύναται τι γίνεσθαι ἢ φθείρεσθαι εἰς τὸ μὴ ὄν. τροφὴν γοῦν προσφερόμεθα ἀπλὴν καὶ μονοειδῆ, ἄρτον καὶ ὕδωρ, καὶ ἐκ ταύτης τρέφεται θρίξ φλέψ ἄρτηρία σὰρξ νεῦρα ὅσῃ καὶ τὰ λοιπὰ μόρια. τούτων οὖν γιγνομένων ὁμολογητέον ὅτι ἐν τῇ τροφῇ τῇ προσφερομένῃ πάντα ἐστὶ τὰ ὄντα.

Aetios I, 3, 5.

In later antiquity, then, this really was the common interpretation of the Anaxagorean tenets concerning the problem of food.

Evidently the blame has to be laid at Aristotle's door. For he had been the first to father upon Anaxagoras the queer teaching that such things as flesh, bone, marrow, in short, constituents of organisms, were the ultimate elements of the world and that, therefore, certain substances commonly considered homogeneous, such as air and ether, were mixtures of particles of flesh and bone and "all the other seeds" (cf. p. 4.). Of course the later reporters were influenced by the Stagirite in this respect.

THE GENUINE ANAXAGOREAN TEACHING

How could this mistake have arisen? After all, that assertion of Aristotle's cannot have been a mere fabrication.

Anybody who did not comprehend, or did not thoroughly comprehend, the cardinal idea of the Anaxagorean elements doctrine could easily have misunderstood the original formulation of the genuine teaching of Anaxagoras as to this problem.

From his presuppositions Anaxagoras must have concluded that in bread and the other victuals seemingly dissimilar the same had to be contained as

was contained in flesh, in blood, in bone, etc. This, however, did not mean that the ones consisted of the others, but that both consisted of the same thirds—namely, of those ultimate elements: rare- and dense-moiras, bright- and dark-moiras, warm- and cold-moiras, moist- and dry-moiras, etc., etc.

The differences between those substances consist but in an inequality of the combining-ratios of the *moiras* within the *mereias*, in an inequality of the "*homoiomereian* formulas." For "*flesh*" and "*bread*," etc., are nothing but dissimilar names for the same elements in dissimilar molecular constitutions.

Thus, of course, everything can become from everything, even from any single molecule every other molecule (cf. p. 38, annot. 1), but, at any rate, from an adequate number of *mereias* of one constitution, *mereias* of any other constitution, provided only that the *moiras* of the elements are regrouped in the right way each time.

This, too, can be done by Nous only. For none but Nous with numerical exactness knows the combining-ratios of the elements for the *mereias* of every stuff.

Hence, for preservation of the organism, Nous has to take upon itself also the *physiological function of digestion*: Nous has to regroup the seemingly dissimilar foodstuffs into the elementary combining-ratios of the various organic parts to be replaced or enlarged at a given time. This is done in the same way in which Nous had transformed and is transforming, respectively, the *mereias* seemingly quality-less of the *pantahomou* to render them different and distinguishable.

AND WHAT ABOUT FRAGMENT NUMBER TEN?

Before leaving this topic, we cannot help dealing somewhat with a sentence that would be apt to render questionable all of this hypothesis on the Anaxagorean elements doctrine—provided, of course, that it really proved authentic.

As one can learn from Migne's *Patrologia Graeca*, (XXXVI, 911), the codex Monacensis no. 216 contains a scholion by an Anonymus to one of the speeches of St. Gregory Nazianzene, the Christian bishop (329–389/90 A.D.). This scholion begins with a warning not to believe in those teaching all to be in all, and then gives a short and rather superficial statement of one of the principles of Empedocles and Anaxagoras, respectively. And the concluding sentences of the scholion are:

But all that is false. For how should contrasts be together?

ἀτινα πάντα ψευδῇ ἐστι. πῶς γὰρ τὰ ἐναντία τοῖς ἐναντίοις συνέσονται;

This presentation by the Anonymus is very likely to be conditional upon that passage in Simplicios (first half of the sixth century A.D.), quoted above, about the Anaxagorean problem of food, as also H. Diels appears to have become aware of. For in one part of that scholion the

respective sentences in Simplicios are obviously used. But there is one difference: The Anonymus speaks not of food, τροφή (*trophé*), but of "evolution of the embryo," γονή (*goné*). Which seems to me a significant token of some carelessness of that anonymous reporter, who, at any rate, was not interested in giving a particularly correct presentation of the pagan philosopher's doctrine, but in advancing what he took for its repudiation.

This scholion contains a sentence cited in a way as if it were an authentic quotation from Anaxagoras' writings:

"For how should, he [sc., Anaxagoras] says, from not-hair hair originate and flesh from not-flesh?"

"πῶς γὰρ ἂν, φησὶν, ἐκ μὴ τριχὸς γένοιτο θρίξ καὶ σὰρξ ἐκ μὴ σαρκός;"

And really, without paying heed to the somewhat suspicious surroundings, H. Diels has bestowed upon this sentence the rank of an ostensibly genuine Anaxagorean fragment by inserting it in his collection as number ten.

However, one need not agree: With regard to the very source, the pretended authenticity of the sentence stands on a weak foundation. Moreover, the whole style of this rhetoric question, with the cunning chiasmus in the arrangement of its words, by no means looks very Anaxagoras-like. But quite apart from all that—to take this sentence for an authentic dictum by Anaxagoras would imply, at any rate, a *petitio principii*, for only if Aristotle's interpretation of Anaxagoras' elements doctrine is correct, those words could pass for Anaxagorean. (Consequently, it is not permitted, either, to use those words as proof of the Aristotelian interpretation being correct.)

Besides, however: If that sentence is to be accepted as a genuinely Anaxagorean argumentation, then, by the same reason and in the same way, Anaxagoras ought to have refused such things as his own ingenious hypothesis on the origin of the stars by asking: "How should star originate from not-star?"

THIRD MEASURE AGAINST DECAY: PERCEPTION

There seems to be still another somatic activity of Nous that serves to protect the body from decay and to compensate the losses sustained.

The system of Anaxagoras contained also something like a "theory of perception," the main reports on which are to be found in a writing of Theophrast's fragmentarily handed down under the title, "Περὶ αἰσθήσεως καὶ αἰσθητῶν" ("De sensu").

It is extremely difficult and requires great cautiousness to worm out a true Anaxagorean meaning from these reports, and it is sometimes hard to decide whether the difficulty stems from the "obvious and vast

corruption" of the text¹¹ or from the way Theophrast deals with the subject.

What could have been to Anaxagoras the purport of a "theory of perception?"

Certainly not the question of how by action of a lifeless, unconscious "matter" upon an organism the various specific perceptions of that organism's "consciousness" originate. For this problem, as consecutive to the assumption of a "matter"—be it in its modern or even only in its Aristotelian sense—, would have been meaningless to Anaxagoras who did not have such notion as "matter without consciousness" (cf. p. 154).

Neither was there to Anaxagoras a fundamental difference between organisms and "lifeless" things, since both after all consisted of *mereias*, of "grown-togethers" (cf. p. 23) from *moiras* of the "things in no way resembling each other," the various specific "qualities," from *moiras* of those various pairs of opposites.

These themselves, being eternal elements of the world, do not originate at all, and since everywhere and at any time every *mereia* is being flowed around and touched and thereby known (cf. p. 102) by Nous as the infinite embedding medium, the *moiras* and their *mereias* are always an actual *Bewusstseinsinhalt* in the infinite divine "consciousness" of Nous.

This divine consciousness, however, is the sole "consciousness-unit" we have obtained so far in this hypothetical reconstruction of the Anaxagorean system (cf. p. 96 f.). Therefore, as this reconstruction has not yet yielded separate consciousness-units for the organisms, we are, strictly speaking, not yet in a position to reconstruct the proper meaning of an Anaxagorean theory of perception, and have still to postpone such an attempt.

But in the midst of Theophrast's presentation of what he claims is the Anaxagorean doctrine on perception, there is a striking statement that seems to be significant and essential in an unexpected sense:

For [Anaxagoras says] that whatever is equally warm and cold [sc., as the organism]—This obviously means: "Whatever contains 'warm' and 'cold' in the same combining-ratio as does the organism." It reads, "warm *and* cold," and not, warm *or* cold!—], when approaching [sc., to the organism], neither warms nor cools; and that also the sweet and the sharp [the sour] are not cognized through themselves, but through the warm the cold, through the briny the potable, through the sharp the sweet, *corresponding to the deficiency of each. For "all [the elements],"* he says, *"are contained in us."*

11. Cf. Gustav Kafka, emphasizing "die offenbare und weitgehende Verderbnis des theophrasteischen Fragmentes De sensu . . ." (*Philologus*, LXXII [1913], 65.)

τὸ γὰρ ὁμοίως θερμὸν καὶ ψυχρὸν οὔτε θερμαίνειν οὔτε ψύχειν πλησιάζον οὔδὲ δὴ τὸ γλυκὺ καὶ τὸ ὀξὺ δι' αὐτῶν γνωρίζειν,¹² ἀλλὰ τῷ μὲν θερμῷ τὸ ψυχρὸν, τῷ δ' ἀλμυρῷ τὸ πότιμον, τῷ δ' ὀξεί τὸ γλυκὺ κατὰ τὴν ἔλλειψιν τὴν ἐκάστου. πάντα γὰρ ἐνπάρχειν φησὶν ἐν ἡμῖν.

Theophr. de sensu 28.

WHAT IS THE MEANING OF "CORRESPONDING TO THE DEFICIENCY . . ."?

The *mereias* of an organism consist of the same ultimate elements as do all the other things.¹³ And since even in every *mereia* all the elements are represented, they are, consequently, represented also in the whole organism composed of those *mereias*: "*All [the elements] are contained in us.*" That is clear.

But Theophrast speaks also of a *deficiency of each*. What does this stand for?

The meaning cannot be that in the organism any element become lost or be lacking altogether. For this is impossible even with any single *mereia* (cf. p. 39, also p. 13). However, "deficiency" can mean not only that a thing is not present *at all*, but also that a thing is not available in its *appropriate* quantity. There can be a deficiency of a thing and a deficiency *in* a thing:

Anaxagoras could have assumed that *an organism*, or its single molecules, *must contain the elements in strictly definite combining-ratios*. To give the simplest example, let us suppose that in the various living beings warm-*moiras* and cold-*moiras* have to be combined in definite ratios *as a*

12. γνωρίζειν is the infinitive of the active voice. The seemingly lacking grammatical subject of this *accusativus cum infinitivo* is obviously the same as in the preceding *acc. c. inf.* opening the paragraph, namely: τὸν αὐτὸν δὲ τρόπον καὶ τὴν ἀφὴν καὶ τὴν γεῦσιν κρίνειν, just as also γνωρίζειν is parallel to κρίνειν. And so, in the respective parts of the sentence in question, τὴν ἀφὴν and τὴν γεῦσιν, respectively, have to be tacitly added as the grammatical subjects of γνωρίζειν. However, to make things simpler and to avoid, at the time being, a discussion on whether, from an Anaxagorean view, really "touch" and "taste" are the ones which "discern and cognize" their percepts or rather, maybe, something else, I have converted the phrase into the passive voice.

13. That the organisms consist of the same elements as all the other things could be the real meaning of this passage in *Irenaeus* (II, 14, 2): "Anaxagoras, however, who also was called 'the atheist,' taught the living beings to have grown from seeds fallen from heaven unto the earth." ("Anaxagoras autem, qui et atheus cognominatus est, dogmatizavit facta animalia decidentibus e caelo in terram seminibus.") "Decidere e caelo," "to fall from heaven," could relate to the coming from the *peri-echon*, and, above all, "semina" ("seeds") is obviously the translation of the Anaxagorean σπέρματα (cf. p. 18). In this way, the sentence would get a truly Anaxagorean meaning, although it might not have been so understood by Irenaeus. Otherwise, one ought either to refuse any credence to that report or to father upon Anaxagoras something like a "Migration Theory." But to impute a modern whim of that kind to Anaxagoras would mean a lack of reverence for a man whom his friends justly called "Nous" (Plutarch. Pericl. 4), paralleling him with the god he propagated.

standard. Nowadays, one would say: This organism has a definite specific heat or caloricity.

Now, if an organism were a thoroughly stable and stiff and unchangeable building, those combining-ratios would never be capable of being deranged. Hence, also a deficiency in anything, an ἔλλειψις, could not occur with it.

But an organism is a very unstable building. It is in continual danger of destruction through the stratification tendencies, preserved from it only by the continual restitutive activity of Nous, and, besides, is liable also to many other perturbations.

Therefore, as the "normal" combining-ratios in an organism are always being deranged, Nous must see the perturbations undone at any given time, by replacing from the neighborhood the deficit—

filling up again the deficient, ἐπαναπληροῦν τὸ ἐνδεές

(cf. Theophr. de sensu 8)

—and giving to the

neighborhood the surplus, respectively, that is to say, in any case restoring the *status quo ante*,

rendering it the same as before, ἐπανισοῦν (cf. *ibid.*).

In other words: *Nous* has to correct deranged combining-ratios in the fields of the various specific pairs of opposites through opposite combining-ratios, or, for short:

through the opposites [sc., of the 'opposites'],

τοῖς ἐναντίοις [sc., τῶν ἐναντίων].¹⁴

Theophr. de sensu 27.

Thus it seems to have been Anaxagoras' opinion that not only breathing, and nutrition through eating and drinking, but *somehow also perception* is a compensation-function, a working-function, one of the continual restitutive somatic activities of Nous.¹⁵

DECAY

An organism keeps on living only as long as Nous applies to it those means against decay.

The moment Nous ceases to operate in those special ways, the organism, unprotected, lies open again to stratification, and will decompose, will die.

14. Incidentally, Theophrast's distinction between those constructing—or, as he would say, "making"—perception "through the like" and those constructing it "through the opposite" fails as far as Anaxagoras is concerned. For while here perception comes from opposite combining-ratios of two contrasting "qualities," these themselves must always belong to *one and the same pair of opposites*. And so it is a "cognition by the opposite" and a "cognition of the like by the like" as well.

15. It might not be quite improper to see in the Anaxagorean idea the ancient form of the modern view that appropriate nervous irritation, as a passing through between over-excitement and underexcitement, is indispensable for life.

AN EPITOMIST'S REPORT AND ITS ANAXAGOREAN SENSE

In Aetios there is a passage that could serve as a proof that Anaxagoras realized it in the same way himself.

Aetios says that in Anaxagoras' opinion
there is also a death of *psyche*:¹⁶ the "*diachorismos*."
*εἶναι δὲ καὶ ψυχῆς θάνατον*¹⁶ τὸν διαχωρισμόν.

Aet. V, 25, 2.

In order to get through to an understanding of this statement, one must first try to make out what meaning is to be attributed to the words *psyche* and *diachorismos* in this sentence.

Diachorismos means "severance." But of what? And from what? This is not stated. In the immediate neighborhood of the quoted sentence, however, the same Aetios relates that according to the teachings of Empedocles,

death takes place by severance of the ethereal, the aerial, the liquid, and the solid [literally: the earth-like], of which the human body's mass is composed.

τὸν θάνατον γίνεσθαι διαχωρισμῷ τοῦ πυρώδους (καὶ ἀερώδους καὶ ὑδατώδους καὶ γεώδους), ἐξ ὧν ἡ σύγκρισις τῷ ἀνθρώπῳ συνεστάθη.

Aet. V, 25, 4.

Hence one may safely assume that in the passage on Anaxagoras likewise *diachorismos* means *severance from one another of the constituents of the organism*.

As to *psyche*, there is no doubt that Aetios will have understood this word as a thing's name in the sense of "soul." But the problem is just to find out the original meaning of that sentence. That is why we must try to penetrate to its Anaxagorean sense even beyond the phraseology of Aetios and independently of how it might have been understood or misunderstood by Aetios himself. Therefore, it seems proper to take *psyche* in its older meaning here (cf. p. 85) and to understand it as the name of a function, designating either *breathing* or, in its broader sense, *the total of the preserving working-functions altogether*.

The sentence in question is contained in a chapter superscribed: "To Which of the Two Belong Sleep and Death, Respectively: to Soul or to Body?" ("Ποτέρου ἐστὶν ὕπνος καὶ θάνατος, ψυχῆς ἢ σώματος.") That chapter in Aetios consists of summary and none too correct statements of the teachings of Aristotle, Anaxagoras, Leucippus, and Empedocles on this topic. Every one of these successive paragraphs contains also a conclusive remark concerning that topic, a topic, however, set by Aetios, the epitomist, not by those men, the philosophers.

16. I adopt Richard Meister's suggestion to put a stop before "*τὸν διαχωρισμόν*." (*Zeitschrift für die deutschösterreichischen Gymnasien* [1919], issues 1 and 2, p. 76.)

SLEEP AND DEATH—PHYSIOLOGICALLY

And now let us cite in its context the whole passage dealing with Anaxagoras:

Anaxagoras [says] that corresponding to a relaxation of the somatic activity [of whom?] sleep arises; (for this is a corporeal state, not a psychical one;) but that there is also a death of *psyche*: [the body's] decay.

Ἀναξαγόρας κατὰ κόπον τῆς σωματικῆς ἐνεργείας γίνεσθαι τὸν ὕπνον·
(σωματικὸν γὰρ εἶναι τὸ πάθος, οὐ ψυχικόν·) εἶναι δὲ καὶ ψυχῆς θάνατον· τὸν
διαχωρισμόν.

Aet. V, 25, 2.

Anaxagoras certainly was not in a position to foreknow what the views would be, from which, some centuries later, an epitomist would arrange a presentation of those ancient philosophers' teachings. For Anaxagoras the problem was to understand the mysterious fact of the body's decomposition: *How is it that, after having remained intact despite the general stratification tendency for such a long time, the organism decomposes nevertheless in the end?* This was Anaxagoras' problem, but not to answer such questions as whether sleep and death belong to "body" or to "soul."

That is why I have put in parenthesis, as apparently a conclusion by the epitomist, the second sentence in the paragraph. (The infinitive "εἶναι" cannot prevent me from accepting this obviousness). But the other two sentences may perhaps be traced to some genuine Anaxagorean text, read though not thoroughly understood by Aetios, the epitomist.

However, supposing this to have been the case; then *somatic activity* would mean *the somatic activity of Nous*, of course, and *psyche* would be *another designation for exactly the same*, namely, for the total of the somatic working-functions.

The two pairs of contrasts then are: *Sleep* and *decay*, on the one hand, and *relaxation* and "death," i.e., full cessation, on the other hand.

And those sentences would have to be read, consequently, with this accentuation: "By *relaxation* of the somatic activity [of Nous] *sleep* is caused. But there is also a *death* [a full cessation] of *psyche*: [and that is what the body's] *decay* [is]."

If one accentuates, instead, as is usual: "There is also a death of *psyche*," then the effect would be pure nonsense. For *then the contrasting statement would have to be that sleep is the death of the body!* Which is neither true, of course, nor the purport of that sentence.

Thus, the meaning would be: *Decay takes place by "psyche" definitively stopping*, that is, *by Nous ceasing to exercise "psyche,"* that is to say, to

exercise the working-functions, by which the organism had been protected from decay during its lifetime.

This interpretation is debatable, perhaps, but—possible.¹⁷

17. Whereas Erwin Rohde (*Psyche* [4th ed.], II, 196, annot. 1) renders that ending sentence (which he isolates, not even mentioning the precedent part of the paragraph) in this way (literally translated!): "But (sc., as the body's so) also the soul's death consists in its severance (sc., from the body)." (?)

IX

THE SOULS

THROUGH the activities of Nous described so far, formation and physiological working of the organisms could have been accounted for in the main.

In a psychological meaning, however, the organisms were still lifeless.

True, the *mereias* employed in forming an organism are just as all the other *mereias* nothing but complexes of grains of those ultimate "things," the qualities, or, to use an Aristotelian term, of the "unfinished percepts."¹ It is likewise true that by the activity of Nous those *mereias* are held together into the "morphological unity" of the organism, as a modern biologist would call it. But this union does not away with the pulverization of the "unfinished percepts," as it cannot give them a capacity to coalesce into a large unity of consciousness, since the "morphological" union does not produce a real, genuine unity, the single *mereias* of an organism still remaining ultimately asunder.

In their disjointedness, however, they are but an object of cognition to the only knower-individual then in existence, to Nous.

NOUS STILL THE ONLY PERSON IN THE UNIVERSE

But even supposing those complexes of grains of "unfinished percepts," held together to the morphological unit of an organism, were able to coalesce into a larger consciousness-unit, then thinking and volition, mirth and grief, in short: personality, would still be wanting in such consciousness. The personality-element, however,—that is Nous.

Now, every *mereia* of an organism is entirely surrounded by Nous, it is true. The organism, consequently, is thoroughly steeped, as it were, in the personality-element, and there is in the organism not a single *mereia* not cognized by Nous or not being the object of an intention to Nous, etc. But—neither is there in the whole universe any molecule to which this would not apply. Nous is the non-molecularized medium in which all the molecules in the world are embedded. Every molecule, or *mereia*, is flowed around by this "thinnest element" on all sides.

This implies that there are no isolated Nous-individuals; that the whole,

1. Concerning the term "unfinished percept" ("τὸ ἀτελὲς [αἰσθητόν]"), cf. Arist. de anima III, 7. 431 a 4-7.

boundless Nous is still a one and infinitely large being; that Nous is the only person in the whole universe.

But this does not conform with today's actual condition. *Today there is a plurality of persons.* No man knows what the other man is thinking or intending, and nobody knows how the cosmos has been put together, and even Anaxagoras himself has just conjectured it, but not remembered.

Should Anaxagoras not have realized these facts? Should he have made the same mistake in his construction as was made afterwards by Ibn Rushd (Averroës)?²

According to this Arabic philosopher's *monopsychism*, his theory that there is a oneness of *aql*³ in the world, everybody would have to know everything, yea, there could not even be at all a plurality of persons. (His distinction between *active aql* and *passive aql*, between *aql* and *nafs*³, designed to get over this difficulty, still does not do, after all.)

AN ENIGMATIC FRAGMENT

Among the Anaxagorean fragments there is one that has not even been mentioned in this book so far. This is indeed a strange and enigmatic fragment.

I am going to try to pierce its shell and bring out the kernel of meaning. In this way, I shall perhaps be enabled to demonstrate that *the problem implied in the plurality of consciousness-units has not escaped Anaxagoras' notice.*

That fragment reads as follows:

In every [what?] a share [but it could also mean: a *moira*—the word apparently is somewhat iridescent] of every [what?] is contained except for Nous, but there are some [what?] in which Nous, too, is contained.

ἐν παντὶ παντὸς μοῖρα ἔνεστι πλὴν νοῦ, ἔστιν οἷσι δὲ καὶ νοῦς
ἐνι.

Simpl. phys. 164, 22.

WHAT THE RIDDLE CONSISTS IN

The first part of this fragment is a sharply pointed, brachylogical formulation of the Anaxagorean teaching about the elements' interrelation.

The ancient reader had the whole context. For him it might not have been difficult to get the meaning by supplying the necessary complements. The words "in every" (ἐν παντί) and "of every" (παντός) offer no sense by themselves alone, of course. For the ancient reader it

2. 1126–1198 A.D.

3. "*Aql*" is "mind," "*nous*"; "*nafs*" is the same as "psyche."

certainly was easier to mentally add the terms wanting than it is for the modern reader to whom only a few more or less incoherent fragments are available.

There are two possible ways of completion. One would be to tacitly add "element" (χρῆμα) in both cases. This complement could be quite appropriate to the apparent meaning of the sentence, but would be more satisfactory if the wording were: "In every *every* is contained" (ἐν παντὶ πάν ἐνεστί), instead of: "In every *a share of every* is contained" (ἐν παντὶ παντὸς μοῖρα ἐνεστί). Therefore the other interpretation, likewise appropriate, is preferable:

In every [sc., molecule] a share of every [sc., element]
is contained except for Nous.

ἐν παντὶ (sc., συγκρινομένῳ) παντὸς (sc., χρήματος) μοῖρα
ἐνεστί πλὴν νοῦ.

I am referring to the respective explanations in the second chapter and particularly to the finding that by the "being in" (ἐνέειναι) of the *moiras* in the molecule is meant a true "in each other," a mutual penetration, of the spatialized qualities. I am referring also to the statement that the reason why Nous must be in a relationship of "abreast" with the molecules, and why they must not be penetrable to Nous, is that otherwise they would not constitute a motion resistance to Nous, and that Nous would not be able, consequently, to rule over them, that is, to move them (cf. p. 24).

And then, suddenly, comes that strange supplement:

But there are some [sc., molecules; this of course is the
appropriate completion also here] in which Nous, too,
is contained.

ἔστιν [sc., συγκρινόμενα] οἷσι δὲ καὶ νοῦς ἐνι.

At first glance, these additional words make quite an impression as if they were a mere inconsistency not at all philosophical, a humdrum restriction of what had been stated just before.

If it were not for that reasoning of why Nous does not penetrate, one would be free to take those two contradictory assertions for two statements applying to different fields. Then one would only need to give the one assertion a formulation as specific as that of the other one. But that reasoning renders it difficult, if not entirely unfeasible, to attempt a settlement in this way.

For the decisive question is: *Do those molecules related to in the one assertion remain unpenetrated by Nous because they are impenetrable to it or because it does not want to penetrate them?*

In the latter case, that reasoning makes no sense, and Nous will never be able to move even a single molecule. For if the molecules are not really

impenetrable to it, and it wants to maintain their *de facto* not being penetrated, then it must not will to push them in any direction. Therefore, if Nous does not press, then, of course, they will not move according to its will. But if Nous does press, it will just penetrate and be transmitted, and they will not move then, either.

If, however, those molecules remain unpenetrated by Nous because they are impenetrable to it, that is to say, because Nous would not be able to penetrate them, even if it wanted to—of course Nous would not want to, being a realist—then it certainly can move them as much as it likes. Now, a molecule—I mean: the Anaxagorean molecule, or *mereia*, as I prefer to call it—is nothing but a penetration district for elements *moiras*. And in every *mereia* all the elements are represented. Consequently, that general assertion, “In every *mereia* every element is represented except for Nous,” *would have to be valid without any exception*, for all the *mereias*. (The quantity of the various *moiras* penetrating each other in a *mereia* could hardly make any difference in this respect.)

Hence the restriction, “There are some *mereias* in which Nous, too, is contained,” still is left without sense. One could almost feel inclined to take these words for a later supplement by a Peripatetic who perhaps intended to perfect that (in his opinion) imperfect doctrine of Anaxagoras with the corresponding teaching of Aristotle. That is to say, one could feel like considering those concluding words a later polemic marginal note slipped into the context in the course of time. (Aristotle, as is known, did teach that there were things containing also Nous: the human organisms.)

ATTEMPTS AT ELUCIDATION

However, let us continue our attempts at finding a solution.

The main passage on the impenetrableness for Nous of the elements reads:

Nous . . . *is mixed* with no element,
 νοῦς . . . μέμικται οὐδενὶ χρήματι,

Simpl. phys. 156, 13 ff.

while here it says:

There are some [*mereias*] *in which* Nous, too, *is*.
 ἔστιν οἷσι δὲ καὶ νοῦς ἐνι.

Should, perhaps, any deeper sense be hidden behind this distinct phraseology?

One could guess as follows:

If a warm-*moira* and a moist-*moira* penetrate each other, then they are really *mixed* (μεμειγμένοι), for then the warm is moist and the moist is warm. But if a blood-*mereia*, for example, is penetrated by Nous—supposing this were possible—then thinking becomes neither warm nor

moist nor red, nor will blood begin to think; only Nous will be thinking within the blood as well as without. Such a relationship one could not then designate as "to be mixed" ("μεμειγμένον εἶναι"), but as "to be in" ("ἐνέειναι").

For three reasons, however, it is extremely difficult to make use of this distinction:

First of all, "to be in" (ἐνέειναι) is often used by Anaxagoras in the same meaning as "to be mixed" (μεμειγμένον εἶναι), as can be learned directly from the first part of the fragment in question. True, this would not be of much consequence. For "to be in" could be the broader term, so that everywhere instead of "to be mixed" one would be free to say "to be in" as well, but not inversely.

Secondly, for the reasons explained above one could not understand how Nous should have been enabled to penetrate the blood-*mereia* at all.

And finally, there is not the slightest difference, geometrically, between "to be mixed" and "to be in" in the meaning of "to be mutually in each other." For what is mixed with each other—in the ancient sense of the word (cf. p. 23)—as well as what is in each other fills one and the same space. From what should such a difference be deduced? Only reference to a divine will beyond possibility and impossibility would be left. This, however, would not be very Anaxagorean. The very fact that one cannot say, "Blood is thinking," or, "Thinking is red or warm," but only, "Nous is thinking," would have fortified Anaxagoras' belief in the absolute immiscibility of Nous.

Conditio Pluralitatis Personarum

Nevertheless, it does not appear to be without significance that in the one passage it reads "is in" (ἐν), and in the other "is mixed" (μέμικται):

"To be mixed" positively has but one meaning. With "to be in," however, this is not so. Indeed, why should not Anaxagoras, too, have occasionally played upon words? Could he not have used the same word ἐνέειναι ("to be in") as a special term with the meaning of μεμειγμένον εἶναι ("to be mixed") in the first part of that sharply pointed sentence, and in the usual, commonly accepted meaning in the second part? Archelaos is said⁴ to have declared, obviously in conformity with his master, that the molecules are "so to speak, in Nous" (cf. p. 36). Could not, on the other hand, a piece of Nous be in a molecule as well,—in the same sense as a fellow locked into a prison "is in"?

Anaxagoras is said to have asserted that "the mereias have all kinds of shape" ("τὰ ὁμοιομερῆ⁵ πολυσχήμονα"). (Aet. I, 14, 4.) Could he not have

4. Hippol. refut. I, 9, 1.

5. The later reporters are in the habit of confounding the terms "ὁμοιομερές" and "ὁμοιομέρεια." Hence it is certainly permissible to translate here "ὁμοιομερῆ" by

assumed Nous to have formed also mereias which, like shells, contain Nous kernels within themselves?

If the *mereias* have all kinds of shape they should also be of *unequal sizes*. Consequently, by moulding a *balloon mereia* sufficiently large, even a piece of Nous-medium together with the complex of the embedded *mereias* can be locked in. Indeed, Nous also can isolate from the proximity little spaces (together with their contents) quite perceptible even macroscopically, by forming a balloon not out of one single *mereia*, but by welding together a number of *mereias*, so that they become one balloon.

At the very instant, however, when such balloon mereia or such mereias balloon is shut on all sides, at the very instant when the kernel has been entirely wrapped up in the shell impenetrable to it—at this very instant, Nous has ceased to be a one, an undivided being.

And—*impenetrableness has even turned out to be principium individuationis, too.*

Thus, then, in every organism whatsoever there is also, severed from the World-Nous and isolated by means of an impenetrable tegument, a piece of Nous as the person, as the self, of the organism.

COMPARISON WITH AN ARISTOTELIAN TEACHING

It is noteworthy that nearly all the interpreters supposed those words, "There are some in which Nous, too, is contained," to relate to the organisms in some way or other. As one did not know the reason why Nous had to be unmixable with the other elements, one had no possibility nor desire to understand how any exception should be feasible. One accepted both assertions, reflecting upon them as little as possible.

What gave the interpreters the idea that one of those statements was aimed at the organisms it is not easy to determine. Perhaps it was an assimilation, more or less intentional, to that known Aristotelian teaching that, when human organisms originate, also Nous, "coming from outside" (*θύραθεν*), joins the "mixture of substances and psyches," to leave it again at death.

Incidentally, as early as antiquity itself, many a feature of the Aristotelian doctrine (that seems to me mediately conditional upon Anaxagoras much more than one has been aware of so far) was assigned in retrospect to Anaxagoras. This can be learned from an assertion of Aetios', for instance, who says that also Anaxagoras taught

Nous to join [sc., the human body] coming from outside,
θύραθεν εἰσκήρνεσθαι τὸν νοῦν,

Aet. IV, 5, 11,

"molecules" or "*mereias*," though Anaxagoras himself is likely to have meant something different by this term (cf. p. 18).

although this would have been quite unnecessary to Anaxagoras, since wherever all the other [elements] are,

ἵνα καὶ τὰ ἄλλα πάντα,

Simpl. phys. 157, 5; cf. p. 37

always Nous, too, is present.

On the basis of our attempt at elucidation of that fragment, the conjecture that the sentence in question aims at the organisms comes very close to being substantiated. At any rate, this interpretation relieves us of any compulsion to father upon Anaxagoras the fault of not having seen the problem implied in the plurality of consciousness-units. If he did see this problem, he could have become aware of it only when observing, and reflecting on, organisms. Consequently, one may safely suppose that also the passage offering a solution of the problem will relate to the organisms.

THE WORLD-NOUS AND THE SEPARATE NOUS-INDIVIDUALS

The inclosed piece of Nous is of the same nature, to be sure, as the World-Nous, having been a part of It before inclosure:

For the nous in every one of us is a god.

ὁ νοῦς γὰρ ἡμῶν ἐστὶν ἐν ἐκάστῳ θεός.

Euripides, fragm. 1018.

But compared with the World-Nous' infinite dimensions, this piece of Nous is so minute that of the World-Nous' omniscience no more than almost nothing has been left to the diminutive god of a diminutive world. Nearly all that it had known before, as World-Nous, has become hidden, unknown, in no direct way cognizable, ἀδηλον. The nous confined is dependent upon earning anew—in the hard way of experience, of learning successively little by little—a tiny portion only of its previous knowledge.

The World-Nous does not need experience. It knows whatever It is touching, and It is in touch with everything because It is the medium embedding.

Thus, touching (without penetrating) is a condition to Nous not only for moving the mereias, but also for knowing and cognizing. Aristotle's remark of comment, therefore, is correct:

Hence Nous necessarily is unmixable, in order to "rule," as says Anaxagoras, that is, in order to know.

ἀνάγκη ἄρα . . . ἀμικτὴ εἶναι (sc., τὸν νοῦν), ὥσπερ φησὶν Ἀναξαγόρας ἵνα 'κρατῇ,' τοῦτο δ' ἐστὶ ἵνα γνωρίζῃ.

Arist. de anima III, 4. 429 a 18.

It tells, however, but half the truth, since it neglects the other Anaxagorean sense of that "ruling," namely: "moving."⁶

6. Elsewhere Aristotle appears fully cognizant of it, as, e.g., when saying:

"But he (sc., Anaxagoras) attributes to the same principle both cognition and motion by declaring Nous to move the whole."

The nous confined of an individual living being is in touch with the walls of its prison only. Therefore, it knows but little. It has to experience and infer from the reports transmitted by the body's senses, from the percepts, now for it the only way to get knowledge of the things that have become unknown:

"For it is the percepts of the senses⁷ that give perception of the things unknown," as says Anaxagoras.

"ὅψις γὰρ τῶν ἀδήλων τὰ φαινόμενα,"⁷ ὥς φησιν Ἀναξαγόρας.

Sext. Emp. VII, 140.

Nous not only *moves* the things and not only *knows* the moved or touched, but also *perceives* and *discerns* all possibilities hidden therein, and *resolves* accordingly.

But only what the *World-Nous* decides upon is put into execution without hindrance. For the World-Nous perceives the total of all the possibilities contained in the total of all existing, and can thus conform.

A *separate nous*, however, perceives only those possibilities which are in all that it has already experienced at a given time. But it does not perceive the conflicting, hindering possibilities in all that is still unknown to it.

Conflicting resolutions of *two nous-individuals* are but two components of an immensely manifold bundle of components, the resultant of which means realization of the World-Nous' resolution.

SLEEP AND DEATH—PSYCHOLOGICALLY

The World-Nous is free to open again the prison It has locked, as in (dreamless) *sleep* and in *death*. Then, immediately, the *nous-individual*—although remaining in its place!—is reunited with the World-Nous, and the organism has lost its separate consciousness.

In this respect sleep and death are exactly alike.

As demonstrated above (p. 94), the only difference between death and sleep is that in death the embedding World-Nous entirely ceases to exercise *psyche*, the working-functions, thereby abandoning the organism to decay; while sleep is conditional only upon a temporary relaxation of those functions exercised by the embedding Nous.

But neither in sleep nor in death does the individual nous discontinue at

"ἀποδίδωσι δ' ἅμω τῇ αὐτῇ ἀρχῇ, τό τε γινώσκειν καὶ τὸ κινεῖν, λέγων νοῦν κινήσαι τὸ πᾶν."

Arist. de anima I, 2. 405 a 17.

7. In this apparently literal quotation by Sextus from Anaxagoras' work, I am taking τὰ φαινόμενα in the simple, common meaning "percepts of the senses," intentionally and for good reasons avoiding translation as "phenomena." (τὰ φαινόμενα is the subject, ὅψις τῶν ἀδήλων, the predicate of the sentence.)

all to think. It only discontinues to be separated and individual and single and tiny.

Aetios, the epitomist, concluding that to Anaxagoras sleep was "a corporeal state, not a psychical one" (cf. p. 94), was quite right in his remark—except that he ought to have applied it to death as well. Nous never ceases to think, neither in sleep nor in death, and to think *actually*, and not, perchance, "potentially" only,

for the [Anaxagorean] nous is [nous] *in actuality*.⁸

ὁ γὰρ νοῦς ἐνεργεῖα.

Arist. Metaph. XI, 6. 1072 a 5.

THE SITE OF THE "SOUL"

Where in the organism is the place of personality supposed to be, in Anaxagoras' opinion?

Censorinus reports that, according to the Clazomenian, "the brain from which all the organs of sense proceed" ("cerebrum, unde omnes sunt sensus") (Cens. 6, 1) originates first in the development of the embryo.

This apparently implies that Anaxagoras considers the brain the organism's central organ, and thus it is quite obvious that, like Alkmaion of Croton, he too connects the brain with thinking and volition in some way or other.

On the basis of our previous arguments, the nature of this connection is not difficult to surmise: Anaxagoras might have believed *the separate nous pertaining to the organism to be located, together with the possibly embedded air molecules, in the ventricles of the brain; and the brain, or one layer of it at least, encircling those hollow spaces, to be the shell which encases that precious kernel*.⁹

THE CONSCIOUS AND THE "UNCONSCIOUS" OCCURRENCES IN THE ORGANISM

How is it that so many occurrences in the organism are never felt?

From those words, "The brain from which all the organs of sense proceed," one may infer Anaxagoras to have put to himself this question, too. For that very sentence implies the answer:

All the organs of sense, being outgrowths of the brain, are connected with

8. A striking analogy obtrudes itself: the doctrine of René Descartes, likewise maintaining that "mens semper actu cogitat."

9. This curious opinion that the hollow spaces in the brain are the site of the "soul" has proved enduring for a very long time, indeed. Vestiges of it can even be found in the teaching of Descartes that the hollow spaces in the brain are the thoroughfare and switching-place for the so-called "spiritus animales," or "spiritus corporales," mediating the reactions upon the percepts.

the brain. The nous confined learns only what is transmitted by the senses. All the rest is imperceptible to it. And so, consequently, are all the occurrences taking place in those parts of the organism from where no nerve-conduction (as it would be called today) leads to the brain. These proceedings are activities of the World-Nous surrounding the molecules of the organism, and the World-Nous alone, therefore, knows them.

On the whole, most of the proceedings in the organism are operated by the World-Nous, and not by the separate nous, since it requires far too much wisdom for such a tiny morsel of nous to execute them correctly and with the necessary preciseness. The physiological processes of digestion, for instance, pertain to that big group of processes passing always off "unconsciously," that is, *unconsciously for the separate consciousness.*

This group, however, forms only one part of the operations exercised in the organism by the World-Nous. To the other part belongs the total of those occurrences which, although not enacted by the separate nous, yet become known to it, but only during, and not before, their passing off or after they have taken place, since they happen in parts of the organism which, by means of a sense-conduction, are connected with the brain, or, rather, with the separate nous inclosed in its hollow spaces.

From a modern point of view, one would say, perhaps, that these two groups comprise any occurrence that might take place in an organism. But Anaxagoras is unlikely to have thought so. He might have considered not only the instinctive reactions pertaining to the second group, to be sure; *but he might at least have reserved for the separate nous the deliberate movements exercised on the basis of a resolution.*

One might be tempted to say that that modern view would be just too modern after all to be expected of Old Anaxagoras. However, such an objection would not be tenable. One could very well imagine thousands of years passing before some master-minds may again meet with an idea that, once before, had arisen in the brains of a genius who was misunderstood by his age and by all later ages, likewise.

But it is for a reason more profound that Anaxagoras might not have assumed the individual consciousness to be effecting no movements at all. Is not the nature of the separate nous the same as that of the World-Nous? Consequently, the separate nous must likewise be able to produce movements. Or, rather, expressed the other way 'round: *If Anaxagoras had not believed himself to be experiencing that his will (or his resolution, to put it more intellectualistically) caused movement, then neither would he have imagined the World-Nous as a mechanical mover:*

Just as in the living beings, it is also in nature [generally].

καθάπερ ἐν τοῖς ζῴοις, καὶ ἐν τῇ φύσει . . .

Cf. Arist. Metaph. I, 3. 984 b 15.

THEORY OF PERCEPTION

Now we are finally in a position to attempt at reconstructing hypothetically what might have been Anaxagoras' teachings on perception.

The basic statement on this subject is implied in the report by Theophrast on quite another man. That statement is almost hidden, and so it is no wonder that it has remained nearly unnoticed.

At the end of a short presentation of some teachings of Clidemus', who apparently belongs to the "men around Anaxagoras" (οἱ περὶ Ἀναξαγόραν) (Theophr. de sensu 1) and seems to be the first, or even "the only one" (μόνος), to point at the relationship between the specialization of the *structures* of the various sense organs and the various, specifically different sensations, Theophrast says:

However, (Clidemus maintains) it is *only the ears* that by themselves discern nothing but transmit [all] to the nous, and does not make nous the principle of *all* [sc., sensations], *as does Anaxagoras*.
 μόνον δὲ τὰς ἀκοὰς (Κλειδήμος φησι) αὐτὰς μὲν οὐδὲν κρίνειν, εἰς δὲ τὸν νοῦν διαπέμπειν, οὐχ ὥσπερ Ἀναξαγόρας ἀρχὴν ποιῶν πάντων [sc., αἰσθήσεων] τὸν νοῦν.

Theophrast. de sensu 38.

This appears to be perfectly the same as if Theophrast had said:

Anaxagoras maintains that the senses by themselves discern nothing, but transmit (all) to the nous, as he makes nous the principle of all (sc., sensations). Which means that to Anaxagoras the senses are mere messengers, incompetent to "discern and cognize" (cf. p. 91, annot. 12) the messages they convey to the nous confined in the hollow spaces of the brain, and that these messages become sensations not until they are "discerned and cognized" by the little nous-individual.

The messages conveyed, the "percepts that give percipience of the things unknown" (cf. p. 103)—of the things that have become unknown and hidden to the little nous by its being inclosed and surrounded with an impenetrable shell—are the various specific qualities singly intercepted by the specific senses, the organs of interception and channels through which these messages are transmitted to the nous, to be combined and unified again.

These organs are weak and small, these channels, narrow.

True, there are differences. The organs of sense are not equally weak and small and narrow with the various organisms:

[Anaxagoras says] that the bigger the living beings are, the more sense perception they get, and that, generally, perception is proportionate to the size of the organs of sense.

αἰσθητικώτερα δὲ τὰ μείζω ζῶα καὶ ἀπλῶς εἶναι κατὰ τὸ μέγεθος (τῶν αἰσθητηρίων) τὴν αἰσθησιν.

Theophr. de sensu 29.

But weak and small and narrow they are, all the same.

NO SCEPTICISM IN PRINCIPLE

This statement must not be taken for scepticism. The fact that the senses are small and narrow brings about a tremendous reduction of the amount of messages to be transmitted, and that they are weak means that their sharpness has limits. But whatever they do perceive and transmit is allright and adequate.

It is worth while taking up again that quotation by Sextus from Anaxagoras' work we have dealt with when discussing psyche (p. 84):

In consequence of their weakness we cannot discern the real fact. For if we take two colors, black and white, and then pour, drop by drop, from the one into the other, the eye will not be able to distinguish the little by little changes, although they are actually taking place.

ὑπ' ἀφαιρότητος αὐτῶν [sc., τῶν αἰσθήσεων] οὐ δυνατοὶ ἐσμεν κρίνειν τὰ ληθές. εἰ γὰρ δύο λάβοιμεν χρώματα, μέλαν καὶ λευκόν, εἴτα ἐκ θατέρου εἰς θάτερον κατὰ σταγὸνα παρεκχέοιμεν, οὐ δυνήσεται ἡ ὄψις διακρίνειν τὰς παρὰ μικρὸν μεταβολάς, καίπερ πρὸς τὴν φύσιν ὑποκειμένας.

Sext. Emp. VII, 90.

It reads: "The eye will not be able to distinguish *the little by little changes*." But the human eye does have the ability to perceive the one *big change* from the two colors in the beginning to the color at the end of that process, while it is one of the functions of the nous to *infer* that those little by little changes must have taken place. (Which, besides, shows that the later slogan, *nil est in intellectu, quod non antea fuerit in sensibus*, would not have been accepted by Anaxagoras.)

It is not Anaxagoras, but Sextus Empiricus, the sceptic, who, in his interpretation of Anaxagoras' statement on the weakness of the senses, unawares replaces "weakness" by "treachery," saying (l.c.):

Anaxagoras, the greatest natural philosopher, vituperating the senses as being weak, says: "In consequence of their weakness we cannot discern the real fact," and adduces as a proof of their *treachery* the little by little change of the colors: "For if we take two colors, black and white," etc.

ὁ μὲν φυσικώτατος Ἀναξαγόρας ὡς ἀσθενεῖς διαβάλλων τὰς αἰσθήσεις ὑπ'

ἀφαιρότης αὐτῶν,' φησίν, 'οὐ δυνατοὶ ἔσμεν κρίνειν τὰ ληθές,' τίθησί τε πίστιν αὐτῶν τῆς ἀπιστίας τὴν παρὰ μικρὸν τῶν χρωμάτων ἐξαλλαγὴν. 'εἰ γὰρ δύο λάβοιμεν χρώματα, μέλαν καὶ λευκόν,' κτλ.

But—"weakness" is not tantamount to "treachery," not even to "untrustworthiness" (the other possible meaning of "ἀπιστία").

Anaxagoras' attitude toward the senses is faithful in principle, and so much so that he even has accepted their "messages," the qualities, as the ultimate "things" of the world, one must not forget.

Incidentally, with this faithful attitude toward the senses a report in Aristotle's *Metaphysics* on an utterance by Anaxagoras would seem to be well in keeping. The passage reads:

But there is also handed down a remark by Anaxagoras to some of his friends [to the effect] that things will be for them such as they would perceive them.

Ἀναξαγόρου δὲ καὶ ἀπόφθεγμα μνημονεύεται πρὸς τῶν ἐταίρων τινάς, ὅτι τοιαῦτ' αὐτοῖς ἔσται τὰ ὄντα ὅσα ἂν ὑπολάβωσιν.¹⁰

Arist. *Metaph.* IV, 5. 1009 b 25.

PHYSICAL PAIN

The Anaxagorean "weakness" ("ἀφαιρότης") of the senses has still another meaning: Not only the sharpness, but also the endurance and capacity of the senses are limited, due to their tenderness, narrowness, and smallness.

When the amount of a "message" is too great—because of one big amount storming in at once—or grows too great—by too many small amounts of the same, piling up through perseverance—the sense involved runs into the danger of being hurt, damaged, or even destroyed, and *the message transmitted to the little nous-individual assumes the form of pain:*

But [Anaxagoras says] that this manifests itself in the length of duration [of the percepts] as well as in the excessive intensity of the percepts. For [he says] that the bright [dazzling] colors as well as the excessive noises cause pain, and that one cannot hold out dwelling on the same [percepts] for a long time.

φανερὸν δὲ τοῦτο τῷ τε τοῦ χρόνου πλήθει καὶ τῇ τῶν αἰσθητῶν ὑπερβολῇ. τὰ

10. Burnet renders that passage as "Things are as we suppose them to be," and, taking it for a sentence of scepticism, rejects this report as having "no value at all as evidence" (*Early Greek Philosophy* [4th ed.], p. 274). However, ὑπολαμβάνειν does not necessarily mean "suppose," it can mean as well "take up," "receive," "perceive." Furthermore, the integrant modification "αὐτοῖς," "for them," implying "for every one of them," is omitted in Burnet's translation. And, besides, the mere fact that Burnet says "we" instead of the "they" of the passage indicates that his words are not meant at all as a translation, but just as a rough rendering of the approximate sense of the sentence as he understood it.

τε γὰρ λαμπρὰ χρώματα καὶ τοὺς ὑπερβάλλοντας ψόφους λύπην ἐμποιοῦν καὶ οὐ πολὺν χρόνον δύνασθαι τοῖς αὐτοῖς ἐπιμένειν.

Theophr. de sensu 29.

But this is true not only in the fields of sight and hearing. It applies to all the senses without exception:

But [Anaxagoras says] that any perception whatsoever [can be] with pain.

ἅπασαν δ' αἰσθησιν μετὰ λύπης.

Theophr. de sensu 29.

And, to be strict—for “with pain,” “μετὰ λύπης,” could be taken ambiguously—:

We experience pain in the manner of the perception itself.

. . . λυπούμεθα κατ' αὐτὴν τὴν αἰσθησιν.

Theophr. de sensu 17.

Which removes the possible misunderstanding as if to Anaxagoras pain were an independent perception *sui generis*, just combined with the others.

ATTEMPT AT RECONSTRUCTION

How do these factual statements in Theophrastus on Anaxagoras' teachings about pain fit into this hypothetical reconstruction?

The World-Nous must undo the continual perturbations of the “normal,” standard combining-ratios in the molecules of an organism by correcting deranged combining-ratios in the fields of the various specific pairs of opposites through opposite combining-ratios, or “through the opposites,” as we have seen (cf. p. 92). And since in any molecule, or *mereia*, the normal combining-ratios for the various fields can be different (cf. p. 40), the *mereia* being not just a commixture of *moiras*, but a commixture of commixtures of *moiras*, the undoing of the perturbations has to be performed separately for the contrasting *moiras* of every quality. For only in this way the previous combining-ratios can be restored.

We remember, furthermore, that in the field of any quality equal numbers of *moiras* of the two opposites are being mutually compensated, and that always only the actual surplus, if there is any, of the one of the two contrasts is effective (cf. pp. 20 and 40).

The intensity of every quality, therefore, is a function of the quantity of the effective surplus-moiras in every field (cf. p. 16).

All this applies to all the mereias of which an organism consists.

But here we have only to deal with the undoing of those perturbations which occur in the various organs of sense of an organism. For these perturbations alone, due to the connections of the senses with the brain

(cf. p. 104), come to the knowledge of that organism's individual little nous.

There is a relationship not only between the quantity of the effective *moiras* of a quality and the intensity of that quality, but also between the sizes of the organs of sense of an organism and the intensities of the sensations resulting at the end of the whole process. Or even more exactly: *The intensity of a sensation is conditional upon two factors: on the intensity of a quality to be perceived—which depends on the total amount of effective moiras of that quality—and on the size of the perceiving organ—which corresponds to the amount of the mereias that organ consists of.*

The amount of effective *moiras* can happen to be *too small* for the size of a sense organ of a certain living being, but just fitting to the size of the respective sense organ of another living being. That is to say, the total amount of effective *moiras* can be so small, in relation to the total amount of the *mereias* of a sense organ of a certain living being, that that amount does not suffice in the least for "filling up again" (ἐπαναπληροῦν), for undoing in the single *mereias* of the organ the continual, so to speak "physiological," perturbation of the normal combining-ratio in the field of the quality in question, while the same amount would be enough with the analogous sense organ of a correspondingly smaller living being. Thus, in the one case *the "message" passes unperceived, and there is no sensation at all*, whereas in the other case a normal sensation would result:

[Anaxagoras says] that, generally, perception is proportionate to the size of the organs of sense. For [he says] that those living beings which have large . . . eyes see large [objects] as well as from far, but those having small ones, contrariwise [i.e., small objects as well as from near]. But [he says] that also with hearing it is the same. For [he says] that the large [living beings] hear the big [sounds] and the [sounds] from far, while *the smaller [sounds] remain hidden* [i.e., unperceived], but the small [living beings], the small [sounds] and the [sounds] from near. And [he says] that it is the same also with smell. . . .

ἀπλῶς εἶναι κατὰ τὸ μέγεθος (τῶν αἰσθητήριων) τὴν αἴσθησιν. ὅσα μὲν γὰρ μεγάλους . . . ὀφθαλμοὺς ἔχει, μεγάλα τε καὶ πόρρωθεν ὁρᾶν, ὅσα δὲ μικροῦς, ἐναντίως. ὁμοίως δὲ καὶ ἐπὶ τῆς ἀκοῆς. τὰ μὲν γὰρ μεγάλα τῶν μεγάλων καὶ τῶν πόρρωθεν ἀκούειν, τὰ δ' ἐλάττω λανθάνειν, τὰ δὲ μικρὰ τῶν μικρῶν καὶ τῶν ἐγγύς. καὶ ἐπὶ τῆς ὁσφρήσεως ὁμοίως, κτλ.

Theophr. de sensu 29 and 30.

On the other hand, the total amount of effective *moiras* of a quality specific to a sense organ can be much *too great* for the size of that organ, that is to say, for the total amount of the *mereias* of the organ. The result will be that the amount of *moiras* spreading over the *mereias* of the organ

surpasses the undoing of the previous perturbation and effects for every *mereia* an excessive derangement of its normal combining-ratio in the field of the quality in question far toward the opposite direction.

This can be brought about in two ways: Such an excessive derangement of the combining-ratio can occur either at once, through an exceedingly intensive quality, that is, through an exceedingly great number of effective *moiras* storming in at once, or in the way of a perturbation not superintensive as such, but becoming excessive through summing up, in other words, by a perception lasting for an exceedingly long time (cf. p. 108).

In these two cases, the resulting sensation will assume its form of pain.

PHYSICAL DELIGHT

Pain is not a durable state. The excessive derangement ending in a combining-ratio exceedingly discrepant from the normal combining-ratio has to be ironed out. Which the little nous does in the same way as the World-Nous when correcting perturbations: through "the opposites." The little nous makes the organism flee from dazzling light to shadow, from torturing noise to stillness, from unbearable heat to coolness, and so on, until normalcy is reached again, which means, until a percept is in perfect harmony, as to the mixture of the *moiras*, with the normal combining-ratio of the *moiras* of that quality in the *mereias* of the perceiving organ.

This *perfect harmony*—this *ἐναρμόττειν* (cf. Theophr. de sensu 7 and 9)—obviously is *the condition for physical delight*.

For between "too little" (result: no sensation at all) and "too much" (result: painful sensation) there are many shades. Among these there is a minimum, the point of "just enough" to make for a weak, indifferent sensation, and an optimum, the point of perfect harmony as described above, making for a strong but not too strong sensation, which is to say that the perception assumes its form of pleasure (cf. p. 15).

Thus, the condition for a percept to *be* pleasant is that harmony; and the condition for a percept to *become* pleasant is the process in itself of approaching to that state of vigorousness, be it a coming from the point of indifference or a coming back from the point of aching.

While physical pain excites a tumult in the organism, physical delight allays and pacifies. But, nevertheless, it is not durable, either, due to that "physiological" instability of the perceiving organs themselves, that continual perturbation beyond the power and control of the little nous.

Apparently, we have no authentic statement about what, in Anaxagoras' opinion, is the condition for physical delight. However, there is a sentence in Theophrast that amazingly looks as if it could fill the gap:

[He says,] however, that *delight comes about through those being alike as to the moiras and the mixture*, but pain, through the opposites [sc., as to the mixture of the moiras].

ἡδεσθαι δὲ τοῖς ὁμοίοις κατὰ τε (τὰ) μόρια καὶ τὴν κρᾶσιν, λυπεῖσθαι δὲ τοῖς ἐναντίοις.

Theophr. de sensu 9.

True, this sentence is contained in Theophrast's report on—Empedocles. But with regard to the new findings about the relationship between Anaxagoras and Empedocles as presented p. 116 ff., one could be tempted to apply this sentence to, if not even to reclaim it for, the Anaxagorean doctrine, and so I am taking the "*μόρια*" (*moría*) of the passage, which means "particles," in the sense of the Anaxagorean term "*μοῖραι*" (*moirai*), which means exactly the same.

NO "PAIN-AND-DELIGHT"-ELEMENT

Anaxagoras, as we have seen, did not consider physical pain an independent perception *sui generis*, but a possible form of every perception. Nor did he take physical delight for a special kind of perception, we may safely assume. Pain and delight are not made of *moiras* of a specific pair of opposites. No "*λυπηρόν*"- and "*χαρίεν*"-*moiras* ("sore"- and "pleasant"-*moiras*) are mentioned anywhere in Anaxagoras' enumerations.¹¹

Pain and delight, to all appearances, are ultimately conditional upon quantity: upon the quantities of the *moiras* of the various specific qualities and, on the other hand, upon the quantities of the *mereias* forming the various specific organs of sense (cf. pp. 16 and 110). Quantity, however, is not an ultimate "thing" in Anaxagoras' view, not an element, no more than are shape or surface. But the *moiras*, the "seeds," of the elements *have* shapes and surfaces and quantities, or, as Anaxagoras says, anticipating the result, "pleasures" (cf. p. 14), in that sentence about the

seeds . . . having all kinds of shapes as well as of surfaces and pleasures,

σπέρματα . . . καὶ ἰδέας παντοίας ἔχοντα καὶ χροιάς καὶ ἡδονάς.

Simpl. phys. 34, 28, and 157, 9.

A GROSS MISINTERPRETATION

Anaxagoras' view that upon excessive intensity every perception be-

11. In the modern controversy about whether or not physical pain and delight are special "modalities," and whether or not there are separate pain-nerves or a specific pain-centre, Anaxagoras would certainly have sided with William James (*Psychology*, I 143 ff.), Adolf Stöhr (*Psychologie* [2nd ed.], 165 ff.), Theodor Ziehen (*Leitfaden der physiologischen Psychologie*, 10th ed., 200 ff.), against Blix, Funke, von Frey, etc.

comes painful was given a meaning by the ancient reporters as if he had taught

seeing and hearing . . . to be painful,

τὸ ὁρᾶν καὶ τὸ ἀκούειν . . . εἶναι λυπηρόν,

cf. Arist. Eth. Nic. VII, 15. 1154 b 7

or,

every perception to be with pain,

πᾶσαν αἰσθησιν μετὰ πόνου,

Aet. IV, 9, 16

or,

every perception whatsoever to be [actually connected] with pain,

ἅπασαν αἰσθησιν μετὰ λύπης,

Theophr. de sensu 29

which is the way Theophrast himself understood this sentence already quoted. And still more expressly:

However, frequently when having a perception we experience pain in the manner of the perception itself, [or even not frequently,] but, as says Anaxagoras, *always*: For [he says] every perception to be with pain.

καίτοι πολλάκις αἰσθανόμενοι λυπούμεθα κατ' αὐτὴν τὴν αἰσθησιν, ὥς <δ'> Ἀναξαγόρας φησὶν αἰεὶ· πᾶσαν γὰρ αἰσθησιν εἶναι μετὰ λύπης.

Theophr. de sensu 17.

Only Aspasios, in a remark of comment upon the passage in Aristotle cited above, says:

. . . yet it was not their [sc., the Natural Philosophers'] opinion that the living being is in a condition of pain *continually*.

. . . οὐκ ἔδοκει γὰρ αὐτοῖς [sc., τοῖς φυσιολόγοις] αἰεὶ ἐν πόνῳ εἶναι τὸ ζῶον.

Aspasios ad Arist. I. c., 156, 14.

That ostensibly Anaxagorean statement had to be considered nonsensical, of course. And as a matter of fact, Theophrast was looking for a reason why Anaxagoras might have made such an assertion, and he came to say that

this might seem to be conclusive from the presupposition [sc., that perception comes about through the opposites]. For every unlike when touched effects pain,

ὅπερ ἂν δόξειεν ἀκόλουθον εἶναι τῇ ὑποθέσει· πᾶν γὰρ τὸ ἀνόμοιον ἀπτόμενον πόνον παρέχει,

Theophr. de sensu 29

as if Anaxagoras had come to his findings by means of Aristotelian syllogisms.

Undoubtedly, this is a gross, a really bad misinterpretation of that

Anaxagorean teaching. Theophrast might have been influenced in this respect by Aristotle. But all the same, this palpable mistake may justify an attitude of reserve and cautiousness toward all of Theophrast's reports on the Anaxagorean theory of perception.

SCANTY REPORTS ON DETAILS

Beyond the basic ideas as delineated in the foregoing, we can say very little about details of Anaxagoras' research into the "psychophysiology" of the various senses.

From the scanty reports by Theophrast we learn only a few of these details, such as that Anaxagoras considered the image on the pupil of the eye the final condition for seeing; that he maintained that light, or as he himself would have put it: "the bright," must always be the concomitant cause if an image is to be formed on the pupil (so that, consequently, even a perception of black would not be possible without some light); that he knew some living beings see better by night, but most by day, and that he guessed this difference might be conditional upon the color of the eye; that he suspected hearing might have something to do with the fact that the bone surrounding the brain is hollow; and a few more.

And then there is also in addition that passage in Vitruv (cf. p. 65, annot. 8) alleging Anaxagoras to have dealt with optics to solve problems of scenography and perspective, following the example of Agatharchus, who himself Vitruv says had been led to doing so by Aeschylus. This report seems to be considered unreliable by philologists. They ought to have forcing reasons, and it may be they really have. For otherwise the master of Euripides should not seem unlikely to have written also on this topic, making use of results from his analysis of sight which is said to have been one of his favorite subjects.

When summing up, Theophrast calls, strangely enough, the teachings of Anaxagoras on perception a "common and hoary doctrine." But nevertheless he admits that Anaxagoras has made original contributions of his own about all the senses and most in the analysis of sight, since this—obviously because of its supreme degree of variegation and differentiation—was to him the "great" sense, though the functioning of what Theophrast calls the "more corporeal" senses was not made clear:

Anaxagoras, then . . . upholds this somewhat common and hoary doctrine. Except that he says original things of his own about all the senses and particularly about sight because it is the great¹² sense, but he does not clarify the more corporeal senses.

12. The replacement of the meaningless "*μέν*" of the text handed down by "*μέγα*" in the more recent editions seems well justified. In this way, the passage acquires a meaning similar to the idea of one of the first sentences in Aristotle's *Metaphysics* (980 a 26) where

'Αναξαγόρας μὲν οὖν . . . κοινήν τινα ταύτην καὶ παλαιὰν δόξαν ἀναφέρει. πλὴν ἴδιον ἐπὶ πάσαις λέγει ταῖς αἰσθήσεσι καὶ μάλιστα ἐπὶ τῇ ὄψει διότι τὸ μέγα¹² αἰσθανόμενον ἔστιν, οὐ δηλοῖ δὲ τὰς σωματικωτέρας αἰσθήσεις.

Theophr. de sensu 37.

PLANTS, TOO, HAVE INDIVIDUAL CONSCIOUSNESS

Nous, then, and not only World-Nous, but also separate nous, is present in every organism whatsoever:

For Nous is in all the living beings whatsoever, in large ones as well as in small ones, in honored as in less distinguished ones.¹³

ἐν ᾗσιν γὰρ ὑπάρχειν αὐτὸν τοῖς ζώοις καὶ μεγάλοις καὶ μικροῖς¹³ καὶ τιμίοις καὶ ἀτιμωτέροις.

Arist. de anima I, 2. 404 b 3.

This is true, even, of the plants, according to Anaxagoras:

For the Platonists, the Anaxagoreans, and the Democriteans believe *the plant to be an animal stuck in the earth.*

ζῶον γὰρ ἔγγειον τὸ φυτὸν εἶναι οἱ περὶ Πλάτωνα καὶ 'Αναξαγόραν καὶ Δημόκριτον οἴονται.

Plutarch. quaest. phys. I. 911 D.

Anaxagoras and Empedocles assert them [sc., the plants] *to be moved by desire*, and positively declare that *they have sensations and feel pain and pleasure.*

'Αναξαγόρας μὲν οὖν καὶ 'Εμπεδοκλῆς ἐπιθυμίᾳ ταῦτα κινεῖσθαι λέγουσιν, αἰσθάνεσθαι τε καὶ λυπεῖσθαι καὶ ἡδεσθαι διαβεβαιούνται.

Nic. Damasc. [Arist.] de plant. I, 1. 815 a 15.

Anaxagoras, however, and Democritus and Empedocles declared *the plants to have also mind and cognition.*

ὁ δὲ 'Αναξαγόρας καὶ ὁ Δημόκριτος καὶ ὁ 'Εμπεδοκλῆς καὶ νοῦν καὶ γνῶσιν εἶπον ἔχειν τὰ φυτά.

Nic. Damasc. [Arist.] de plant. I, 1. 815 b 16.

That also the plants have individual consciousness seems, then, to

it says that of all perceptions we like most those through the eyes, "because among the perceptions this one makes us know a thing best and *shows (so) many distinctions*" ("... ὅτι μάλιστα ποιεῖ γνωρίζειν τι ἡμᾶς αὐτῇ τῶν αἰσθήσεων, καὶ πολλὰς δηλοῖ διαφορὰς"). —G. M. Stratton, in his *Theophrastus and the Greek Physiological Psychology before Aristotle*, renders the words "διότι τὸ μέγα αἰσθανόμενον ἔστιν" as "*when he sets forth the part which size here plays in perception.*" One may doubt whether this can still be called a translation.

13. This very Anaxagoras-like sentence makes quite an impression (despite the form "μικροῖς," instead of "σμικροῖς") as if it were an outright quotation, though in indirect speech, from the work of Anaxagoras.

have been taught first by Anaxagoras who, in this respect, was followed by Empedocles and Democritus.

In the beginning of the modern era this opinion was again advanced by Thomas Campanella,¹⁴ and quite recently, by Gustav Theodor Fechner.¹⁵

AN UNGRATEFUL DISCIPLE

Many a reader might have taken umbrage at the statement that Anaxagoras was followed by Empedocles in this respect. For it is customary to take the system of Anaxagoras for a further step in a direction previously inaugurated by Empedocles who, although the younger of the two, is commonly supposed to have influenced Anaxagoras.

However, I take the liberty of disagreeing. For I have taken to heart a precious sentence, written by A. E. Taylor in a remarkable essay on "The Date of the Trial of Anaxagoras"¹⁶: "The history of scientific thought will never be rightly written, even in its main outlines, until we learn that a thing is none the more certain because it has been pronounced *allgemein bekannt* by a chorus of *Herren Professoren*."

It is not very difficult (though it would lead too far here) to demonstrate that one can understand, and account for, all of Empedocles' natural philosophy if one presupposes Anaxagoras, but not inversely.

True, there is that well-known statement by Aristotle that Anaxagoras was to Empedocles

anterior in age, but posterior as to works.

τῇ μὲν ἡλικίᾳ πρότερος . . . τοῖς δ' ἔργοις ὕστερος.

Arist. *Metaph.* I, 3. 984 a 11.

But this could mean that Anaxagoras began publishing later than did Empedocles who apparently was somewhat impatient in this respect and too eager to become famous.

Besides, however, there have been handed down some reports that are just cut out for placing the whole relationship between Anaxagoras and Empedocles in quite a new and unexpected light.

Alkidamas of Elaia, a contemporary of Plato's, was a disciple of Gorgias' who, in turn, had been a disciple of Empedocles himself. This Alkidamas has related that *Empedocles attended lectures by Anaxagoras and later imitated his philosophy*:

According to Alkidamas' report in the "Physics," at the same time Zenon and Empedocles attended lectures by Parmenides. Later they left, and then Zenon philosophized in his own way, but the other one [sc., *Empedocles*] attended the complete course [*διακουσαι*] of *Anax-*

14. 1568-1639.

15. 1801-1887.

16. *The Classical Quarterly*, II (1917), 81-87.

*agoras' lectures and of Pythagoras*¹⁷: *And of the one [sc., Pythagoras] he [then] imitated the haughty ceremoniousness in the habits of life as well as in outward appearance, but of the other [sc., Anaxagoras] the natural philosophy.*

Ἀλκιδάμας δ' ἐν τῷ Φυσικῷ (Orat. Att. II 156 b 6 Sauppe) φησι κατὰ τοὺς αὐτοὺς χρόνους Ζήνωνα καὶ Ἐμπεδοκλέα ἀκοῦσαι Παρμενίδου, εἶθ' ὕστερον ἀποχωρῆσαι, καὶ τὸν μὲν Ζήνωνα κατ' ἰδίαν φιλοσοφῆσαι, τὸν δὲ Ἀναξαγόρου διακοῦσαι καὶ Πυθαγόρου¹⁷ καὶ τοῦ μὲν τὴν σεμνότητα ζηλῶσαι τοῦ τε βίου καὶ τοῦ σχήματος, τοῦ δὲ τὴν φυσιολογίαν.

Diog. Laert. VIII, 56.

I cling to this report by Alkidamas. It is well in keeping with the questionable character of a man tremendously gifted, whose real motives were indulgence in his reckless vanity and a rage for affecting the multitude and for gaining political power. It is quite in harmony with the way of a man covetous of fame, greedy of glory, who by reflecting people among his contemporaries was called an "impostor and charlatan," a "γόης":

According to Satyros (as relates Diogenes Laertius), Empedocles' own disciple

Gorgias had reported that he himself witnessed Empedocles humbugging the public.

Γοργίαν λέγειν ὡς αὐτὸς παρέιη τῷ Ἐμπεδοκλῇ γοητεύοντι.

Diog. Laert. VIII, 58.

Which is readily understood when placed side by side with those of Empedocles' verses in which he boastfully promises to teach how to arouse or calm down a storm, how to make rain and sunshine, and how to revive the dead (fr. III).¹⁸

But in addition, that report by Alkidamas joins well with another testimony of no less outstanding interest and importance:

Timaeus, the historiographer, in the ninth section of his work¹⁹, speaking of Empedocles as of a former hearer of Pythagoras', point-blank relates

17. Burnet (*Early Greek Philosophy*, p. 202) remarks to this passage: "Alkidamas, who had good opportunities of knowing, made him [sc., Empedocles] a fellow-student of Zeno under Parmenides. Theophrastos too made him a follower and imitator of Parmenides. But the further statement that he had 'heard' Pythagoras cannot be right. No doubt Alkidamas said 'Pythagoreans.'" Incidentally, it is a perfect enigma why neither here nor anywhere else in his book Burnet mentions with a word the momentous fact that Alkidamas, "who had good opportunities of knowing," in that same sentence reports that Empedocles also "attended the complete course of Anaxagoras' lectures."

18. Cf. the very instructive essay by G. F. Unger, "Die Zeitverhältnisse des Anaxagoras und Empedokles," *Philologus*, Suppl. IV (1884), pp. 511-549.

19. Cf., also, Diog. Laert. VIII, 54.

that he [sc., *Empedocles*] was sentenced because of *logoklopia*²⁰ and, thereupon, was excommunicated from the [further] lectures, just as was Plato [later on].

ὅτι καταγλωσθεὶς ἐπὶ λογοκλοπία τότε (καθὰ καὶ Πλάτων) τῶν λόγων ἐκωλύθη μετέχειν.

Fr. Hist. Gr. I, 211, fr. 81.

This was the way the Pythagoreans were able to deal with people of that kind. Anaxagoras, however, did not have at his disposal an organization like the Pythagorean Union. Hence he was not in a position to punish a young, rich, vain Sicilian for exposing to the public in grandiloquent and bombastic verses²¹ some of the basic ideas, diluted and popularized, of his master's philosophy at a time before the master himself had made up his mind to publish his own doctrine.²² For Anaxagoras was by no means bent upon becoming famous. His way, concerning even the most brilliant of his teachings, was "to keep them dark and spread (them) step by step in a few words only and under precaution or in strict confidence" (cf. p. 52), since he taught in Athens and had to be on his guard . . . The only thing Anaxagoras could do was to protect himself from similar experiences by being subsequently still more cautious in admitting new listeners to his lectures. And it certainly was for reasons of this kind, one may conjecture, that later Anaxagoras refused to admit as a hearer the young Democritus.²³

One almost feels inclined—although it is altogether impossible, of course, to furnish any proof—to, also, interpret those lines of poetry by Euripides (set at the beginning of this book) in praise of our philosopher as an implicit repudiation of Empedocles. When reading of the man "who holds in his mind knowledge of science and *neither for damage of his fellow-men nor wrongful deeds intends to strive*," and that "people like this man

20. "Theft of the doctrine," that is, publication without permission or even against interdiction.

21. It is remarkable how disparagingly Aristotle speaks of Empedocles: "For if one . . . takes it according to reason, and not according to what babbles Empedocles, one will find" etc. ("εἰ γὰρ τις . . . λαμβάνοι πρὸς τὴν διάνοιαν καὶ μὴ πρὸς τὸ ψελλίζεσθαι λέγων Ἐμπεδοκλῆς, εὐρήσει" κτλ.). (Metaph. I, 4. 985 a 5)

22. It is understood, however, that Empedocles' philosophy does not consist of popularized Anaxagorean ideas alone.

23. For revenge, Democritus afterwards cast on Anaxagoras the slur of plagiarism: "Favorinus in his *Varia historia* relates that Democritus says about Anaxagoras that his tenets on the sun and the moon are not his own but old ones, and that he stole them; and that he mocks at his cosmology and his teachings about Nous, *having a grudge against him because, as everybody knows, he had not admitted him*."

"Φαβωρίνος δὲ φησιν ἐν Παντοδαπῇ ἱστορίᾳ [FHG III 582 fr. 33] λέγειν Δημόκριτον περὶ Ἀναξαγόρου, ὡς οὐκ εἶψαν αὐτοῦ αἱ δόξαι αἱ τε περὶ ἡλίου καὶ σελήνης, ἀλλ' ἀρχαῖαι, τὸν δὲ ὑφηρησθαι διασύρειν τε αὐτοῦ τὰ περὶ τῆς διακοσμῆσεως καὶ τοῦ νοῦ, ἐχθρῶς ἔχοντα πρὸς αὐτόν, ὅτι δὴ μὴ προσήκατο αὐτόν."

Diog. Laert. IX, 34 and 35.

never are worried with grief over shameful commissions," many a contemporary might perhaps have remembered Empedocles, of whom just the opposite was true. For in this man's life there were plenty of "wrongful deeds" and "shameful commissions." It might have been well known that in his native country he committed two downright judicial murders, not to mention other crimes, and that, at the urgent request of the sons and grandsons of those innocent victims, he alone was not allowed to come back to Akragas from exile (in 461 B.C.), although his fellow-exiles were permitted to return.²⁴

THE ACTUAL DIFFERENCES IN INTELLIGENCE

After this digression, which, perhaps, was not quite irrelevant, let us continue our reconstruction.

In every organism whatsoever, then, *Nous* is of the same nature, Anaxagoras maintained. But what about the differences in intelligence between man, animal, plant and between the various species and individuals in these three realms? How might Anaxagoras have accounted for these differences? It is certainly obvious that he has not overlooked this problem.

The difference in intelligence between any separate *nous* and the World-*Nous* was easily deduced *from the difference in their quantity*. The same explanation could also be applied to the differences between the single miniature *nous*-individuals, although one cannot determine whether or not Anaxagoras really took account of this point. But if he did, then at any rate with the series, not sufficient alone of course, of graded *nous* quantities, he has combined another one, namely, the series of *the different levels of organization*:

The World-*Nous* constructs organisms of the most variegated structures, simple organisms and complicated ones, coarse ones and fine. Now, it is self-evident that there is no accomplishing as much with a simple machine as with a highly complex one. Hence, *the more complex and the more subtle an organism's construction is, the more numerous and the more varied are the ways of acting available to Nous*.

Among the animals, therefore, always that one is more intelligent which has a relatively larger skull or which is constructed in a relatively more complex and subtle way.

In the World-*Nous*, maximum quantity is united with the highest level of the body's organization. For Its body is the sum total of the other elements.

This is not so strange as it might sound. True, *Nous* has spatial ex-

24. Cf. G. F. Unger, op. cit., p. 530.

tensiveness²⁵ and could therefore be called a kind of body itself.²⁶ But just as the separate nous, since it fills the ventricles of the brain extensively, *is* a (fine) body and, besides, *has* a (coarse) body—the organism—just so the World-Nous not only *is* a fine body, but also *has* a coarse body—the *sympan* of the other elements. If the World-Ghost is the world's ghost, then the world is that ghost's body, of course. If the organism is a micro-cosmos, then the universe is a macro-organism. And only world-body and world-ghost together are a full world-personality.²⁷ The only difference is that the world-body, with all the organisms, is (embedded) in the world-ghost, whilst the separate little ghosts are (inclosed) in their bodies, according to Anaxagoras . . .

That Anaxagoras, for the purpose of accounting for the differences in intelligence, did make use of the differences in the levels of organization is quite certain. Proof of it is furnished by his statement—a statement amazingly ingenious—that

it is because of his being armed with hands that man is the most intelligent animal.

διὰ τὸ χεῖρας ἔχειν φρονιμώτατον εἶναι τῶν ζώων ἀνθρώπων.

Arist. de partt. anim. I, 10. 687 a 7.

THE ARISTOTLE MYSTERY

It really strikes one as peculiar, alongside of so astonishingly modern-looking a statement, to read Aristotle's queer objection:

But according to reason, [Anaxagoras ought to have said that] because of [man's] being most intelligent he has got hands.

εὐλογον δὲ διὰ τὸ φρονιμώτατον εἶναι χεῖρας λαμβάνειν.

Arist. de partt. anim. I, 10. 687 a 9.

And no less queer is Aristotle's attitude in the face of the whole problem, Anaxagoras' solution of which he was not ready to appreciate. As previously mentioned, Anaxagoras' teaching is cited in Aristotle that there is Nous "*in all the living beings whatsoever, in large ones as well as in small ones, in honored as well as in less distinguished ones.*" This quotation is followed by Aristotle's polemic remark:

But nous, if meant as intelligence, does not seem to be equally present in all the living beings, nay, not even in all the human beings.

οὐ φαίνεται δ' ὅ γε κατὰ φρόνησιν λεγόμενος νοῦς πᾶσιν ὁμοίως ὑπάρχειν τοῖς ζώοις, ἀλλ' οὐδὲ τοῖς ἀνθρώποις πᾶσιν.

Arist. de anima I, 2. 404 b 5.

25. Cf. p. 21.

26. Cf., however, p. 153.

27. Cf. p. 154 concerning *panzoism*, etc.

On the whole, the Stagirite's way of regarding and presenting the doctrines of his predecessors—let it for once be expressly stated—does not seem to be quite appropriate. I cannot help having the impression that the constructions of most of his predecessors were frequently understood too subjectively by Aristotle and have been distorted in his reproductions.²⁸

This man was for centuries considered the unattainable model and pinnacle of human sagacity. What might have blinded his eyes to such a degree, just when regarding those ancient philosophies, that the great Ephesian's construction, bright and glary and almost palpable,²⁹ remained "obscure" (*σκοτεινός*) to him, and that, by his way of presenting the cardinal teachings of Anaxagoras, he made it possible that, beginning from a millennium and a half later, every once in two or three centuries some scrap or other of Anaxagoras' doctrine was invented quite anew, as, for instance, by Ibn Rushd (Averroës), Nicolaus of Autrecourt, Leibniz, Berkeley, or Ernst Mach? Is one to expect a thinker of Aristotle's historical importance and authority simply to have lacked a capacity of familiarizing himself with trains of thought different from his own, to have just had trouble in grasping those grand philosophies, and the doctrine of Heraclitus to have been obscure to him since he was dazzled by so much brightness?

28. Little by little, scholars cease to close their eyes to this fact. "Er (sc., Aristotle) berichtet vorzugsweise als Kritiker, aber eben deshalb sind auch seine Angaben nicht überall unbedingt zuverlässig, besonders da er an fremde Lehren den Masstab seiner eigenen Grundbegriffe legt und seine Uebersicht über die Lehren Früherer nicht von historischem, sondern von systematischem Zwecke beherrscht ist." (Ueberweg, *Grundriss der Geschichte der Philosophie*, I [12th ed., ed. by Praechter, 1926], p. 13.—"Denn so wenig skrupulös Aristoteles in historischen Dingen war, wo sein kritisch-polemische Interesse ins Spiel kam, . . ." (Heinrich Maier, *Sokrates* [Tübingen, 1913], p. 93).—"Möchten die Plato-Interpreten doch endlich anfangen, wenn sie über Platos Ideenlehre etwas beweisen wollen, es aus Plato zu beweisen und nicht aus Aristoteles. Es wird ja eben bestritten, dass des Aristoteles Auffassung der Ideenlehre unvoreingenommen, objektiv historisch sei. Sie ist vielmehr, wie übrigens seine ganze Darstellung und Beurteilung der älteren griechischen Philosophie, durchaus diktiert von seinen eigentümlichen philosophischen Voraussetzungen. Wie darf man da immer wieder argumentieren: die Auffassung des Aristoteles ist die richtige, denn—Aristoteles sagt doch so und so!" (Paul Natorp, *Ueber Platos Ideenlehre*, in: *Philosophische Vorträge*, publ. by The Kant Society [Berlin, 1914], no. 5. p. 20).—"Aristotle was capable of setting down something other than the objective truth when he had occasion to write about his predecessors . . . He was 'nearer' to them than we are, it may be objected; but nearer in time does not mean nearer in spirit, and it can be shown that Aristotle was so consumed with the ideology of Platonism and the new concepts he had himself discovered or developed that it was impossible for him to imagine a time when thinking men did not see the problems of philosophy in the same terms as did he. . . the false impression that Aristotle was interested in preserving the doctrines of the Presocratics for their own sake . . . Aristotle's belief that all previous theories were stammering attempts to express his own aids him in interpreting those theories out of all resemblance to their original form." (Harold Cherniss, *Aristotle's Criticism of Presocratic Philosophy*, [Baltimore, 1935], Foreword, pp. IX, X, XI, and XII.)

29. Cf. Adolf Stöhr, *Heraklit* (Wien, Prag, Leipzig, 1920).

Such an assumption would be considered almost blasphemy, I am sure, and the causes hinted at would hardly be accepted.

This strange peculiarity of Aristotle, consequently, has to remain a mystery beyond the reach of *luminis naturalis* cone of light, perhaps for ever . . .

Infinity
In Space and Time

X

ONE COSMOS OR MANY COSMOI?

I RETURN to the question left unanswered in Chapter Seven: Since Anaxagoras supposed cosmogony has not yet come to an end to this day, did he assume that this process would further spread without ending, in correspondence with the infinite extensiveness of the *pantahomou*?

"WITH US" AND "ELSEWHERE"

Possibly, the solution is offered by the following sentences of Anaxagoras, as quoted in Simplicios:

. . . and that [also there] human beings, as well as all the other living beings having breath, have been fit together [sc., out of the various *mereias*]; and that [also there] men have common dwelling-places and tilled corn-fields, *just as with us*, and that they have also a sun and a moon and the other [stars], *just as with us*, and that the soil lets sprout forth for them many [plants] of every kind, which they use for living,¹ gleaned the best ones. *By that I [wish to] have stated concerning differentiation that it might be taking place² not only with us, but elsewhere as well.*

καὶ ἀνθρώπους τε συμπαγῆναι καὶ τὰ ἄλλα ζῶα ὅσα ψυχὴν ἔχει.
καὶ τοῖς γε ἀνθρώποισιν εἶναι καὶ πόλεις συνωκημένας καὶ ἔργα
κατεσκευασμένα, ὥσπερ παρ' ἡμῖν, καὶ ἡλίον τε αὐτοῖσιν εἶναι

1. I prefer to take here "οἰκησις" in its first and basic meaning, namely, "dwelling," "living." H. Diels seems to consider "εἰς τὴν οἰκῆσιν" a local determination of "συνενεγκάμενοι" and takes "οἰκησις" in its secondary meaning "house." He translates: "wovon sie das beste in ihr Haus zusammenbringen und davon (!) leben." The entire rhythm of the sentence, however, does not seem to harmonize with this interpretation, as severance of "χρῶνται" from "εἰς τὴν οἰκῆσιν" apparently is somewhat violent. Also, one should then rather expect to read the plural "into their houses" ("εἰς τὰς οἰκῆσεις").

2. The optative with ἄν is the potential for the *present* tense, of course. Hence "ὅτι οὐκ ἄν παρ' ἡμῖν μόνον ἀποκριθεῖν" must be translated as "that differentiation *might take place* (or *might be taking place*) not only with us." Diels' translation as "*statigefunden hat*," the *past* tense, is a double mistake, since he neglects the meaning of an optative with ἄν (as a modest, conjecturing assertion) and, in addition, overlooks the fact that in the past the potential would have to be expressed by the indicative with ἄν of a historical tense, according to an elementary rule of Greek grammar.

καὶ σελήνην καὶ τὰ ἄλλα, ὥσπερ παρ' ἡμῖν, καὶ τὴν γῆν αὐτοῖσι
 φέειν πολλὰ τε καὶ παντοῖα, ὧν ἐκεῖνοι τὰ ὀνήιστα συνενεγκάμενοι
 εἰς τὴν οἰκησιν¹ χρῶνται. ταῦτα μὲν οὖν μοι λέλεκται περὶ τῆς
 ἀποκρίσιος, ὅτι οὐκ ἂν παρ' ἡμῖν μόνον ἀποκριθεῖη,² ἀλλὰ καὶ
 ἄλλῃ.

Simpl. phys. 34, 28 (also 157, 9).

What do these sentences relate to? What is the meaning of "with us" and of "elsewhere" in this context?

Is "elsewhere" perhaps supposed to mean any unknown regions of the earth? This is not probable. For otherwise it would have to read, "*the* sun and *the* moon" (τὸν ἥλιον καὶ τὴν σελήνην), instead of "a sun," etc. (ἥλιον κτλ.), as already Simplicios became aware of.³

Or should "ἄλλῃ" be having a temporal sense, somehow, and be relating to a past stage of the earth? This is also impossible. For in that case Anaxagoras would have had to say, "they *used*" (ἐχρῶντο), and not "they use" (χρῶνται), as Simplicios pointed out likewise, and "οὐκ ἂν ἀπεκρίθη (or ἀπεκρίνετο)," instead of "οὐκ ἂν ἀποκριθεῖη."

Furthermore, one might possibly suppose inhabitants of some star to be meant in those sentences. Yet, aside from the fact that in this case also "*the* sun" etc. would have been more appropriate—are not the stars glowing clods of stone? That living beings, however, can originate, and keep alive, on a glowing (or having been glowing) celestial body—this is believed only by modern natural philosophers, now and then.

IS THE MOON INHABITED?

But what about the moon? We have learned (p. 66) that its mass, according to Anaxagoras, is mixed with particularly great quantities of the dark and of the cold, so that, contrary to the other celestial bodies, it is shady and cool. (In this way, as we have seen, Anaxagoras tried to account for the fact that the moon had to have its light from the sun and did not give off the slightest heat, although, as a glowing stone clod like the other stars, it ought to have been shining by itself and fiery.)

However, the moon, though second in size among the bodies in the sky, still is quite a tiny thing as compared with the earth, being smaller by far than the Peloponnesus peninsula. Why, then, should Anaxagoras have come to realize the moon as inhabited? That the moon is "earth-like" means only that "it has high and flat and hollow parts" like the earth.⁴

True, Diogenes Laertius—alone, by the way, among all the ancient reporters—says⁵ that, according to Anaxagoras,

3. Phys. 157, 9.

4. Act. II, 30, 2.

5. II, 8; cf. p. 65.

the moon contains *homes* (οικήσεις), but also summits and gorges. And it might be proper to conjecture that this assertion has been based upon those sentences in question about "human and the other living beings . . . having dwelling-places . . . just as with us," all the more so, since in this passage the same word "οικήσεις" is contained which is used by Diogenes in his report. That Anaxagoras himself, in that passage, has probably employed this word in its basic meaning of "dwelling," "living," not in the secondary meaning of "house," "residence," is another story.

Yet, at first glance, this turns out to be a misinterpretation which arose from some superficiality. For to have said ostensible inhabitants of the moon have "also a sun *and a moon* and the other stars, just as with us," would have been somewhat nonsensical, to be sure.

INFINITY OF FINITE COSMOI

And so one must agree with Simplicios who declares that here Anaxagoras

hints at some other cosmogony besides the one with us,
ἐτέραν τιὰ διακόσμησιν παρὰ τὴν παρ' ἡμῶν αὐλίσσεται,

Simpl phys. 157, 9

and "elsewhere" can relate but to other worlds, other *cosmoi*, existing or originating simultaneously with our own world system:

Nous simultaneously started the differentiation of the pantahomou from numerous, to be precise, from infinitely numerous points, probably equidistant⁶ from each other.

As long as the process of cosmogony has not come to its end, between the single world systems there is present the *peri-echon*, consisting of *pantahomou*, which is invisible and impervious to light. That is why the inhabitants of the one world system cannot become aware of the fact that their system is not the only one in existence. This can be *but conjectured* by the most sagacious among them, and that is what Anaxagoras does, *in a most modest way*,⁷ saying:

. . . that differentiation *might be taking place* not only
 with us . . .

. . . ὅτι οὐκ ἂν παρ' ἡμῶν μόνον ἀποκριθῇ . . .

6. This seems to me more appropriate to the way of Nous. For unless those starting-points were equidistant from one another, not all of the *cosmoi* would be finished within the same time.

7. Theodor Gömperz (*Griechische Denker* [2nd ed.], I, 181 and 182) mocks at the "orakelhafte Sicherheit, mit der er (sc., Anaxagoras) seine gesamten und darunter auch manche dem Menschenverstand grell widersprechenden Theorien verkündete," and particularly at the ostensible fact that he "mit der Zuversicht eines Offenbarungsgläubigen von anderen Welten erzählte, in denen es genau so zugehe, wie auf Erden." To this very hour I have not been able to see a justification for this mockery.

DURATION OF COSMOGONY AND THE DESTINY OF THE STARS

The growth of the single systems will not end until the *pantahomou*-stock of the *peri-echon* will have been consumed, as far as this is possible at all with the globularly undulating progress of differentiation.

The problem of whether or not the process of cosmogony requires infinite time has herewith been solved: *If the process has begun, simultaneously, from infinitely numerous points (equidistant from each other) of the infinitely extensive pantahomou, then it must come to its end within a finite time. Its result will be: an infinite number of finite cosmoi.*

Hence the question, also, of whether it is really the destiny of every star finally to fall down to the earth (cf. p. 64) is easily answered: *The pantahomou once exhausted, there will be no more proskritheta nor, consequently, any further growing and becoming overweighty of the stars. And so they will remain henceforth in those spheres in which they will be at the end of evolution.*

"THE WHOLE" AND "THE WHOLE"

The *primordial* period previous to this evolution, to sum up, was the period of the invisible *pantahomou*, of the *mereias* seemingly quality-less in consequence of the combining-ratio 1:1. In that period there was nothing but one homogeneous, undifferentiated infinite multitude of molecules seemingly non-existing, embedded in the one infinite non-molecularized World-Nous.

The name for that is "the whole," "the universe," "the *sympan*" (τὸ σὺμπαν)—*in the singular*. As a matter of fact, in that fragment which describes the truly primordial condition, characterized by its imperceptibility in consequence of "the *mixture* of all the elements," the word is used in this way, that is to say, in the singular.

Subsequently, Nous chooses an infinite number of infinitely small starting-districts, of "small somethings," of "σμικρά τινα" (*smikra tina*), equidistant from each other, to be the centres of an infinite number of future worlds. By the progressions, globularly undulating, of the worlds forming activities of Nous, these worlds grow steadily into a *peri-echon*, steadily decreasing, of *pantahomou*. And this *peri-echon* is incessantly consumed by differentiation, "διάκρισις" (*diákrisis*), and by severance of the differentiated, "ἀπόκρισις" (*apókrisis*), in a constant stream of *proskritheta*, augmenting these growing worlds.

Henceforth, there is no more one whole, no one "*sympan*"—in the singular—, but an infinity of wholes, an infinity of "*sympanta*" (σὺμπαντα)—*in the plural*—each of them consisting of a growing cosmos and its *peri-echon*. And, indeed, in that fragment which presents the condition immediately following the start of cosmogony—that condition in which the initial invisibility of the "things" already brought forth by

differentiation is effected only by the initial *smallness* of their aggregations—in that other fragment Anaxagoras speaks, in a contradistinction distinct enough, of “the *sympanta*” (τὰ σύμπαντα) in the plural.

Today, the process of cosmogony obviously is still going on. For still out of the clouds water is severed and out of the water earth,

ἐκ μὲν γὰρ τῶν νεφελῶν ὕδωρ ἀποκρίνεται, ἐκ δὲ τοῦ ὕδατος γῆ,

Simpl. phys. 155, 21, and 179, 6

and still not an infinity of world systems is offered to the eyes of men, *still it seems as if the starry sky were the end of the universe.*

But when, *in some future time*, this evolution will have ended and, thereupon, the infinite embedding Nous' activity will but consist in preservation of the formedness, then *will lie revealed an infinity of finite cosmoi*, beaming in the radiance of their shining suns and glittering starry skies, a heavenly beauty, marred not even by a rainfall . . .

WITNESSES—CONTESTING AND ENDORSING

The opinion that Anaxagoras has assumed a plurality of *cosmoi* is opposed by a passage in Aetios (II, 1, 2). In this passage Anaxagoras is mentioned as among those who taught “the cosmos to be but one” (ἓνα τὸν κόσμον).

This report does not seem to be particularly reliable. The same Aetios relates that Archelaos, Anaxagoras' disciple, belongs to those who assumed

infinitely numerous cosmoi in the infinite space . . .

ἀπείρους κόσμους ἐν τῷ ἀπείρῳ . . .

Aet. II, 1, 3.

The disciple, however, is not likely to have differed from his master in so essential a point. Either both taught the cosmos to be but one or both believed in infinitely numerous *cosmoi*. And I prefer that possibility which seems to me more probable with regard to the technique of composition.

It is true that, among the extant Anaxagorean fragments, there is one which seems, at a hasty glance, to tell against me. It reads:

The [elements] *in this one cosmos* are not separated from one another nor cut off with an axe from one another, neither the warm from the cold nor the cold from the warm.

οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἐνὶ κόσμῳ, οὐδὲ ἀποκέκοπται πελέκει οὔτε τὸ θερμὸν ἀπὸ τοῦ ψυχροῦ οὔτε τὸ ψυχρὸν ἀπὸ τοῦ θερμοῦ.

Simpl. phys. 175, 11, and 176, 28.

But these words by no means imply an assertion that there *is* only one cosmos. On the contrary, the meaning of the sentence apparently is: In this one cosmos, namely, the one in which we ourselves are, in our cosmos, such and such a law is at work, that much I know; whilst I cannot know whether the same law is valid also in the other *cosmoi*; but there, too, it might well be "just as with us."

In addition, however,—what about the following passage in Simplicios?

Anaxagoras has placed Nous at the head as the cause of motion and origination, and the things, being differentiated by Nous [originating by this differentiation], have brought forth *the worlds* . . .

τῆς δὲ κινήσεως καὶ τῆς γενέσεως αἷτιον ἐπέστησε τὸν νοῦν ὁ Ἀναξαγόρας, ὑφ' οὗ διακρινόμενα τοὺς . . . κόσμους . . . ἐγέννησαν.

Simpl. phys. 27, 2.

This plurality of cosmoi, of "worlds," as it seems to have been taught by Anaxagoras, must be taken in the ancient sense and *means no more, to be exact, than a plurality of parts of space of the one and only world* of the naïve ametaphysical monism of the Greeks. For a true plurality of worlds—in the sense of the contrasts: "world appearing to me, or I-world," "thou-world, appearing to thee, metaphysical to me," and "external world, appearing to none of us"—had not yet been conceived of by Hellenic antiquity.⁸

8. Traditionally, it has been taken for granted that already Protagoras and Aristippus of Cyrene the Elder had the conception of these contrasts. I do not agree. But it would lead too far afield to account for my reasons here.

XI

THE OSTENSIBLE BEGINNING IN TIME

THUS Anaxagoras might have restored the world fragment before his eyes to a complete world picture comprising all infinity, in the spatial sense. That in this picture the fathomless presents itself in an arrangement artistically symmetrical and harmonious is a trait truly Hellenic.

Has he moulded his world with equal artistry in the temporal sense?

First, *pantahomou*-stage lasting an infinitely long time; then, suddenly, a cosmogony taking a finitely long time; and, thereupon, everlasting duration of the finished formedness: This is not particularly artistic, to be sure. This construction could be symbolized graphically by a straight line coming from the infinite; then, suddenly, being broken and mounting in an angle oblique to its previous direction; and after that, running parallel with the former direction to the other side, again towards infinity. Such a picture appears to be primitive rather than artistic and of harmonious beauty.

This presentation, however, fully responds to the interpretation accepted from times immemorial of the Anaxagorean doctrine:

Anaxagoras says the world to have originated from the mixture once for all, and ever since to keep on being arranged and differentiated by the ruling Nous.

τὸν Ἀναξαγόραν λέγειν ἅπαξ γενόμενον τὸν κόσμον ἐκ τοῦ μίγματος διαμένειν
λοιπὸν ὑπὸ τοῦ νοῦ ἐρεστώτος διοικούμενον τε καὶ διακρινόμενον.

Simpl. phys. 154, 29.

If Anaxagoras did construct in this way, then, in this respect, he was no artist, he alone, almost, among the philosophers of ancient Greece.

EUDEMOS' REPROACH AND SIMPLIKIOS' ATTEMPT AT REFUTATION

Already Eudemos, the Aristotelian, considered Anaxagoras deserving of blame for operating with a cosmogony's beginning in time.

Simplikios, by whom this is reported, has tried to refute that reproach by asserting *this whole origination of the world to be just a fiction, comprehensible from the requirements of didactic presentation*. Xenocrates had

declared Plato's cosmogony in the "Timaeus" to be meant as but virtual, that is to say, he had maintained one has to realize the Platonic cosmogony as placed back into eternity. Hence Simplicios believed himself to be justified, by the same right, in taking also Anaxagoras' doctrine in a way as if in his construction the world's simultaneous existence were drawn asunder into the succession of a genesis for reasons concerning style only:

That the world has originated at the beginning of a [definite] time seems to be asserted by Anaxagoras, Archelaos, and Metrodoros of Chios. They say, however, also motion to have begun [then]. For, whilst all had been resting in the previous time, motion came in, they say, only by Nous, and in consequence of that motion the world originated. *But they, too, seem to have assumed a beginning of cosmogony [just] for the purpose of a didactic arrangement of presentation.* ἀπ' ἀρχῆς δὲ χρόνου δοκοῦσι λέγειν γεγονέναι τὸν κόσμον Ἀναξαγόρας τε καὶ Ἀρχέλαος καὶ Μητροδόωρος ὁ Χίος. οὗτοι δὲ καὶ τὴν κίνησιν ἀρξασθαι φασιν. ἡρεμούντων γὰρ τὸν πρὸ τοῦ χρόνου τῶν ὄντων κίνησιν ἐγγενέσθαι φασὶν ὑπὸ τοῦ νοῦ, ὅφ' ἥς γεγονέναι τὸν κόσμον. φαίνονται δὲ καὶ οὗτοι τάξεως ἕνεκα διδασκαλικῆς ἀρχῆς τῆς κοσμοποιίας ὑποθέμενοι.

Simpl. phys. 1121, 21.

(Cf. also Simpl. de caelo 304, 5, and 305, 21.)

However, it is not feasible to accept Simplicios' opinion. For Anaxagoras expressly taught the process of cosmogony to have not yet come to its end. Consequently, the "beginning of cosmopoeia" (ἀρχὴ τῆς κοσμοποιίας) cannot have been meant, indeed, as anything but a true beginning in time.

Thus it looks as if Anaxagoras did deserve Eudemos' reproach.

REHABILITATION

But Eudemos has found, too, other items of Anaxagoras' philosophy to be deserving of blame. Let us examine these additional objections closely. It may be that they will offer a handle for a—rehabilitation of Anaxagoras.

According to Simplicios' report,

Eudemos has animadverted upon Anaxagoras not only because he maintains motion not having existed before to have arisen in a definite point of time, but also *because he has neglected uttering a statement as to whether it will last or will finish at some future time*, although it is not obvious [whether this will happen or that]. "For what is there to prevent," he says, "that at some future time Nous will deem it right to bring the universe to a standstill, just as Nous has put it in motion, according to that man's assertion?" But in addition, Eudemos makes also the following animadversion upon

Anaxagoras: "How is it possible that there should be a privation prior to the positive condition contrary to it? Consequently, if rest is privation of motion, it could not exist before motion."

ὁ δὲ Εὐδήμος μέμφεται τῷ Ἀναξαγόρᾳ οὐ μόνον, ὅτι μὴ πρότερον οὖσαν ἄρξασθαι ποτὲ λέγει τὴν κίνησιν, ἀλλ' ὅτι καὶ περὶ τοῦ διαμένειν ἢ λήξειν ποτὲ παρέλιπεν εἰπεῖν, καί περ οὐκ ὄντος φανεροῦ. "τί γὰρ κωλύει, φησί, δόξαι ποτὲ τῷ νῦν στήσαι πάντα χρήματα, καθάπερ ἐκείνος εἶπεν κινῆσαι." καὶ τοῦτο δὲ αἰτιᾶται τοῦ Ἀναξαγόρου ὁ Εὐδήμος· "πῶς ἐνδέχεται στέρησιν τινα προτέραν εἶναι τῆς ἀντικειμένης ἔξεως· εἰ οὖν ἡ ἡρεμία στέρησις κινήσεως ἐστίν, οὐκ ἂν εἴη πρὸ τῆς κινήσεως."

Simpl. phys. 1185, 9.

Well, then: what is there to prevent, says Eudemos, that Nous will think it right at some future time to bring the world to a standstill, to undo cosmogony, to decompose the cosmos into the *pantahomou* again? In that Eudemos is quite right. The one assertion implies the other, there is no doubt about that. If Nous is able to compose, Nous must also be able to decompose.

However, why does Eudemos pronounce that statement in so reproachful a tone? This is not quite clear. According to Simplicios, Eudemos aimed at blaming Anaxagoras for having failed to make an express utterance "as to whether it will last or will finish at some future time," although—but this is only Simplicios' opinion!—that be no matter of course. Eudemos himself, however, says, "What is there to prevent that . . . ?" and this means exactly the same as, "There is nothing to prevent, it is evident, it is obvious that" But if it really is obvious that Nous, being able to compose, can decompose again as well, then—then it certainly will have been obvious also to Anaxagoras. And that he did not explicitly pronounce an obviousness is deserving of praise rather than of blame.

One might, perhaps, suppose there to be some reason for another reproach. Even if Anaxagoras has considered it self-evident that Nous, building up the world, will destroy it again after a period of finishedness, he ought yet to have offered mechanics of that decomposition, just as he has constructed mechanics of composition.

However, before long one comprehends that explaining such mechanics of decomposition could not have consisted in anything more than in stating decomposition to be the strict inversion of composition. That is to say, not only the mere fact of decomposition but also its mechanism is an obviousness.

ETERNAL PERIODICITY

If, then, Anaxagoras has assumed that upon the *pantahomou*-stage follows the stage of the world's formation, that this is succeeded by a

period of finishedness, replaced, by turns, by a period of decomposition, until a return to the starting-condition, to the condition of *pantahomou*, finally takes place—then it is self-evident all the more that he has not believed in this succession of phases as happening only once, but in *a beginning-less and end-less periodicity of the cosmic occurrence*.

In this way also the third reproach by Eudemos becomes untenable. For now Eudemos is free to compose himself by realizing that prior to the *pantahomou*-stage, out of which this actual cosmos is being formed, nay, even prior to any *pantahomou*-stage, always a cosmos-stage can be placed.¹

DOES PANTAHOMOU IMPLY A SLEEP OF NOUS?

Adolf Stöhr has thought a controversy against the fundamentals of the Anaxagorean construction to have been carried on also from another angle.

Diogenes of Apollonia, a contemporary of Anaxagoras', is quoted in Simplicios as saying:

This, however, seems to me evident that [the divine element] is a great, powerful, eternal, immortal, and much knowing being.

ἀλλὰ τοῦτό μοι δῆλον δοκεῖ εἶναι, ὅτι καὶ μέγα καὶ ἰσχυρόν καὶ αἰδίων καὶ ἀθάνατον καὶ πολλὰ εἶδος ἐστί.

Simpl. phys. 153, 10.

This sentence has been taken by Stöhr for a statement antagonistic to Anaxagoras, as if it were its meaning that the *pantahomou*-stage was an assumption below the dignity of Nous as a godhead because the *pantahomou* implied the conception of a sleep of Nous.²

However, there is no necessity to attribute such a meaning to the sentence in question. And at any rate, such a reproach would be unjustified. For never did Anaxagoras assert Nous to sleep during the *pantahomou*:

Always Nous knows all. But not always is Nous active, too. In the *pantahomou*-stages Nous is just resting, quite similar therein to the Ephesian's Logos. The one time, it is the

Nous acting,

νοῦς ποιῶν.

Hippol. refut. I, 8, 1.

The other time, it is the

Nous resting,

νοῦς ἀναπαύμενος.

1. It is not at all on the basis of a thorough incapacity of spontaneous motion, by the way, that the *pantahomou* is unmoved. The *pantahomou* is without translatory motion merely due to the compensation of its own contrasting motion tendencies (cf. p. 31).

2. A. Stöhr, *Der Begriff des Lebens* (Heidelberg, 1909), p. 34.

*But any time, it is the
 Nous having all knowledge about all,
 νοὺς γνώμην γε περὶ παντὸς πᾶσαν ἴσχω.*

(cf. Simplicius, *phys.* 156, 13 ff.)

"Never He sleeps and never He slumbers."
Mens semper actu cogitat.

THE THREE HELLENIC ATTITUDES REGARDING COMMENCEMENT

The doctrine of an eternal periodicity of the cosmic occurrence could be considered all the more obvious by Anaxagoras, since it had already been propagated by the most distinguished among his predecessors, such as Anaximander and Heraclitus.

On the whole, there are but three types among the Greek philosophers as to the attitude regarding these problems: Those like Thales—provided one may give credence to the reports—or Aristotle simply offer a *description of the existent world* as it is and, in their opinion, has been from all eternity and will be forever. These are the inartistic ones. The truly constructive natures among them, however, let the world originate from some starting-condition, and of these there are two groups. With those like Plato, *the origination's point of time has to be placed back into eternity*, and the whole construction has to be understood as meant but merely virtual. The others do mean an outright origination, but in return insert it into a *beginning-less and end-less periodicity*.

None has assumed a proper, true start in time happening but once. Anaxagoras would thoroughly fall out of Greek ways had he done so.

The lack of an utterance, however, about this point should rather imply, with a Greek philosopher, that he agrees in this respect with the opinions of his predecessors. One should not admit a Hellene to have supposed a true, biblical beginning in time unless he affirms it expressly, unequivocally, and to the exclusion of the contrary.

A WEIGHTY ENDORSEMENT

Besides, however, it is by no means so absolutely certain that Anaxagoras has not spoken about this point as one might expect according to Eudemos or Simplicius.

Aetios mentions Anaxagoras among those philosophers who have taught that

the cosmos is destructible.
φθαρτὸν τὸν κόσμον.

Aet. II, 4, 6.

This would not have entered Aetios' head without some reason.

And in addition, there is another endorsement, a very satisfactory and extremely unequivocal one, indeed: According to Aetios' report, Archelaos, Anaxagoras' disciple, has taught that

infinitely numerous worlds originate and perish in the infinite space within every veering around.

ἀπείρους κόσμους ἐν τῷ ἀπείρῳ κατὰ πᾶσαν περιαγωγὴν sc., γίνεσθαι καὶ φθίβεσθαι.

Aet. II, 1, 3.

To prove that the disciple differed from his master on this very point should be somewhat difficult . . .

REMARKABLE ANALOGIES

An intrinsic compulsion to construct in this way is apparently implied in the whole conception, after all. For in philosophies positively unconnected with, and independent of, the Anaxagorean tenets there are quite astonishing analogies.

Exactly the same idea of an infinite number of world periods is to be found in the Sâmkhya doctrine, for example, whence it has passed into Jainism and Buddhism.³ And there, likewise, each world period consists of four phases: At first, there is the stage of "*sâmyâ-'vasthâ*," that is the condition of *equilibrium* of the three *gunas*, those constituents of the "material" world. (Incidentally, also the *gunas*—just like the Anaxagorean elements—essentially are absolute qualities, and the term "*sâmyâ-'vasthâ*" could even serve as an outright translation of "*pantahomou*.") Then follows a perturbation of the equilibrium of the three *gunas* and, as its consequence, the world's *evolution*.

When the evolution of the world total (*sarga*, *srshti*, *saṃcara*) has come to its end, a period of *continuance* (*sthiti*) follows. . . . When the time of continuance is over, the universe dissolves, in such a way that . . . in retrograde motion the products become reabsorbed into the respective material causes from which they have originated. Through this process of *reabsorption* (*laya*, *pralaya*, *pratisarga*, *saṃhâra*, *pratisaṃcara*), the three *gunas* arrive, finally, at the state of *equilibrium again*; primordial matter is then in the same condition again as in the time before evolution and perseveres in being so until the dawn of a new cosmogony.⁴

Not even Immanuel Kant in his "*Natural History of Heaven*" has been able to escape from that compulsion to construct a periodicity. Which

3. According to Richard Garbe, *Die Sâmkhya-Philosophie* (1894), p. 222.

4. R. Garbe, *op. cit.*, pp. 220 and 221.

is all the more significant as he was rather obliged not to offend Scriptural belief in a temporal beginning of the world.

Thus Anaxagoras, too, might have believed in a world built by Nous, upheld by Nous, destroyed by Nous, and built again, upheld again, destroyed again, in countless veerings of changes recurring again and again, from all eternity to all eternity.

Anaxagoras and Posterity

XII

THE ELEMENTS—ARISTOTELIAN AND OTHERWISE

THE PHILOSOPHY of Anaxagoras seems to have been misunderstood from the very start with respect to its most essential and characteristic features. In particular, his doctrine of elements was destined to remain unrealized.

THE RIDDLE OF THE ARISTOTELIAN REPORTS

How confusing the reports by Aristotle proved has been demonstrated. But the riddle still is how Aristotle came at all to father upon Anaxagoras the teaching that parts of organisms, "such as bone and flesh and marrow," were the elements, and that air and ether were mixtures of these and other elements of that kind.

According to Aristotle, Anaxagoras ostensibly taught that
the *homoiomereses* are the elements,

τὰ ὁμοιομερῆ στοιχεῖα,

while, according to this hypothetical reconstruction, he could have taught only that

the "elements" are *homoiomereses*,

ὁμοιομερῆ τὰ στοιχεῖα.

One could very well imagine Anaxagoras as having said somewhere: "Those four principles of a former pupil of mine, the so-called 'elements,'¹ are no principles at all. These 'elements' are *homoiomereses* only, as I call it, or masses of equal *mereias*. They are to my really ultimate 'things' as roots are to seeds. And that is also why this unfaithful disciple has very wisely called them *roots of all* (*πάντων ῥιζώματα*)² and has not dared to call them *seeds of all* (*πάντων σπέρματα*)."

Now, *homoiomeres* is also a term in Aristotle's own phraseology, but with a considerably different meaning. Aristotle, with his ever prevalent regard for verbal expression, was interested in when and when not one can use the same name for a part of a thing as for the whole thing,³ and

1. "Stoicheia" was indeed the usual term for the Empedoclean elements, earth, water, air, and ether.

2. Empedocles, fragm. 6 (Diels).

3. Cf. de gen. et corr. I, 1. 314 a 18.

accordingly called a thing *homoiomeres*, "of equal parts," or *anhomoiomeres*, "of unequal parts."

Though, consequently, also the metals are *homoiomereses* to him,⁴ he mainly applies this term to certain parts of organisms. Every bit of flesh can still be called flesh, and of marrow, marrow, etc., while a part of a face cannot be called a face any longer. Therefore, a face or a hand or a foot, etc., does not belong to the *homoiomereses*, but to the *anhomoiomereses*.

It could have been on the basis of the different meaning of *homoiomeres* in Anaxagoras and in his own terminology that Aristotle—who does not seem to have been too much interested "in preserving the doctrines of the Presocratics for their own sake"⁵—unintentionally converted an original "The elements are *homoiomereses*" ("ὁμοιομερῇ τὰ στοιχεῖα") into "The *homoiomereses* are the elements" ("τὰ ὁμοιομερῇ στοιχεῖα").

CONFUSION WITH ANAXIMANDER

There is another achievement of the Stagirite's that is quite amazing: Not only has he misrepresented the Anaxagorean teaching on the elements, he has even ascribed the true, genuine Anaxagorean doctrine about the ultimate elements of the world to quite another man, namely, to Anaximander.

Referring to Aristotle, Simplicios says of Anaximander:

This, however, constructs origination not by transformation of the element [namely: of a sole element], but *by differentiation of the opposites* in consequence of eternal motion. That is also why Aristotle has put him among the Anaxagoreans [sic!].

οὗτος δὲ οὐκ ἀλλοιούμενου τοῦ στοιχείου τὴν γένεσιν ποιεῖ, ἀλλ' ἀποκρινομένων τῶν ἐναντίων διὰ τῆς αἰδίου κινήσεως. διὸ καὶ τοῖς περὶ Ἀναξαγόραν τοῦτον ὁ Ἀριστοτέλης συνέταξεν.

Simpl. phys. 24, 13.

But contrasts are: warm, cold, dry, moist, and the others.

ἐναντιότητες δέ εἰσι θερμόν, ψυχρόν, ξηρόν, ὕγρόν, καὶ τὰ ἄλλα.

Simpl. phys. 150, 24.

And in Aristotle himself one reads:

... but the others [assert] that *from the one the contrasts contained in it are secreted, as says Anaximander* and all those who say there be one and many, like Empedocles and Anaxagoras; for these, also, have the other things be secreted from the *migma*.

... οἱ δ' ἐκ τοῦ ἐνὸς ἐνούσας τὰς ἐναντιότητας ἐκκρίνεσθαι, ὥσπερ Ἀναξίμαν-

4. Meteor. IV, 8. 384 b 32, and 10. 388 a 13.

5. Cf. H. Cherniss, *Aristotle's Criticism of Presocratic Philosophy* (Baltimore, 1935), p. XI.

δρός φησι καὶ ὅσοι δ' ἐν καὶ πολλὰ φασιν εἶναι, ὥσπερ Ἐμπεδοκλῆς καὶ Ἀναξαγόρας· ἐκ τοῦ μείγματος γὰρ καὶ οὗτοι ἐκκρίνουσι τὰλλα.

Arist. phys. I, 4. 187 a 20.

According to this interpretation, not Anaxagoras but Anaximander would have been the first among the Greek philosophers to operate with a plurality of elements instead of with one sole element, so that he would not have to be considered one of the transformists, but an "agenetist"⁶ or "migmatist."

To this interpretation is opposed the one according to which Anaximander assumed but a single element. He called it "apeiron" ("ἄπειρον"), not only because he realized it as an infinitely extensive filling of the infinite space, but also because this element, having changed into the many substances of the world, was no longer extant and therefore absolutely indefinable to men as to its qualities—a meaning that the term *apeiron* can also designate.

It is for a *psychological* reason that Aristotle's interpretation of the doctrine of Anaximander is unlikely to be the right one.

Anaximander, as reported, was a follower of Thales, whilst he himself is said to have had Anaximenes as a disciple who, in turn, was the master of Diogenes of Apollonia. Now, operating with unchangeable elements is far more elegant than operating with a sole, changeable element. Thales, on the one hand, however, and Anaximenes and Diogenes of Apollonia, on the other, were transformists. And Anaximander, standing between Thales and these two, is supposed to have been an agenetist? This is very unlikely, indeed. *If Anaximander had already found the elegant conception of a "non-originating, undestroyable, and unchangeable element" (of an "ἀγένητον καὶ ἄφθαρτον καὶ ἀμετάβλητον στοιχείον"), it would certainly not have occurred to his disciple and to his disciple's disciple to operate again with the old and rather naïve conception of a changeable element.*

Thus, if Anaximander has assumed no *migma* at all, neither has he assumed a *migma* of opposites.

True: A *migma* containing opposites is similar to a quasi-*migma*, namely, to something unique that *changes* into opposites. In this way a confusion of these two doctrines would be comprehensible.⁷

A STRANGE CRITICISM

The passages in Simplicios and Aristotle quoted in the foregoing are also remarkable in another respect.

That odd anachronism about Anaximander supposedly having been

6. From "ἀγένητον" (*ageneton*), "non-originating" (cf. Hesychios).

7. Abel Rey (*La Jeunesse de science grec*, [Paris, 1933] p. 59) thinks likewise that the interpretation of Anaximander's "infinite" as a mixture is a confusion with the theory of Anaxagoras.

put, by Aristotle, among the Anaxagoreans may be somehow excusable, considering that one cannot expect of Simplicios, who lived in the sixth century A.D., to have had a close knowledge of the chronology of the sixth and fifth centuries B.C.

Quite apart from this, however, the whole statement in Simplicios, and Aristotle's own words in the passage on the contrasts ostensibly contained in the "one" of Anaximander, undoubtedly show that Aristotle has attributed the opposites also to Anaxagoras and Empedocles. May we then suppose that Aristotle did have some occasional gleam of understanding that the *homoiomereses* were not the ultimate Anaxagorean elements?

The answer is implied in the sentence following the passage quoted. Having stated that "these also (sc., Empedocles and Anaxagoras) let the other things be secreted from the *migma*," Aristotle continues:

But the difference between them is that the one [sc., Empedocles] constructs a recurrence of them, the other [sc., Anaxagoras], a happening but once, and that the latter [sc., Anaxagoras] assumes as infinite the *homoiomereses* as well as the *opposites*, but the former [sc., Empedocles], the so-called elements alone.⁸

διαφέρουσι δ' ἀλλήλων τῷ τὸν μὲν περίοδον ποιεῖν τούτων, τὸν δ' ἅπαξ, καὶ τὸν μὲν ἄπειρα τὰ τε ὁμοιομερῇ καὶ τάναντία, τὸν δὲ τὰ καλούμενα στοιχεῖα μόνον.⁸

Arist. phys. I, 4. 187 a 23.

Here Aristotle has put the opposites and the *homoiomereses* side by side as if he were speaking of two co-ordinated things. (And accordingly, after some lines, Phys. I 4. 187 b 5, commenting on Anaxagoras, he produces a juxtaposition such as "white or black or sweet or flesh or bone"!)

This does not indicate that Aristotle grasped the proper meaning of Anaxagoras' idea.

Moreover, in another passage Aristotle criticises the Anaxagorean doctrine in a way manifesting beyond all doubt that he was far from penetrating to the cardinal Anaxagorean conception. In his *Metaphysics*, some lines before that description of the quality-less Anaxagorean primordial *migma* (cf. p. 34), Aristotle lays on Anaxagoras the following reprimand:

... For, although it is preposterous and wrong to maintain that all had been mixed in the beginning, firstly, because then it should be conclusive that still earlier [the constituents] would have had to be

8. The last word of this sentence, "alone" ("μόνον"), has been, quite surreptitiously and without further ado, suppressed by Diels in his quotation of this Aristotelian passage among the reports on Empedocles (21 A 46). This is an arbitrary proceeding, the purpose of which is altogether incomprehensible. At any rate, there is no textual justification whatsoever for doing so.

there unmixed, secondly, because by nature not everything is capable of being mixed with everything, and in addition to these reasons, *because the passions and the accidentals would be severed from the substances* (for of these themselves [only] is there a mixing and severing). . . .

. . . ἀτόπου γὰρ ὄντος καὶ ἄλλως τοῦ φάσκειν μεμῖχθαι τὴν ἀρχὴν πάντα, καὶ διὰ τὸ συμβαίνειν ἕμικτα δεῖν προὔπάρχειν, καὶ διὰ τὸ μὴ πεφυκέναι τῷ τυχόντι μίγνυσθαι τὸ τυχόν, πρὸς δὲ τοῖς ὅτι τὰ πάθη καὶ τὰ συμβεβηκότα χωρίζουτ' ἂν τῶν οὐσιῶν (τῶν γὰρ αὐτῶν μίξις ἐστὶ καὶ χωρισμός), κτλ.

Arist. Metaph. I, 8. 989 a 33-b 4.

That is to say: *Exactly that which forms the very point of the whole construction is interpreted as a defect.*

FRIEDRICH NIETZSCHE, PAUL TANNERY, JOHN BURNET

The Aristotelian interpretation of the elements doctrine of Anaxagoras was authoritative for the time that followed and is still dominant even today. It has been denied but three times: by Friedrich Nietzsche, Paul Tannery, and John Burnet.

Friedrich Nietzsche, in *Die Philosophie im tragischen Zeitalter der Griechen* (1873), describes the primordial state of Anaxagorean "matter" as follows:⁹

eine staubartige Masse von unendlich kleinen erfüllten Punkten, von denen jeder spezifisch einfach ist und nur *eine* Qualität besitzt, doch so, dass jede spezifische Qualität in unendlich vielen einzelnen Punkten repräsentiert wird.

The decisive words are, "von denen jeder spezifisch einfach ist und nur *eine* Qualität besitzt," implicitly abandoning the Aristotelian view.

Paul Tannery does not seem to have had any knowledge of that writing of Nietzsche's. His opinion on the elements doctrine of Anaxagoras, set forth in a chapter of his book, published in 1887, *Pour l'histoire de la science hellène*, likewise coincides to some degree with the interpretation this hypothetical reconstruction of the Anaxagorean system is based upon. He, too—like Nietzsche, apparently—had been struck by the palpable inconsistency of Aristotle's presentation with Anaxagoras' own words. On page 286 of that book he says:

. . . Si l'on examine les fragments, on n'y voit rien de semblable: Anaxagore ne parle que de qualités, l'humide, le sec, le chaud, le froid, le lumineux, l'obscur, le dense, le ténu, et il énonce formellement . . . que c'est par la concentration de ces qualités que se produit, d'une part, la terre, de l'autre, l'éther.

However, between the interpretations by Nietzsche and by Tannery

of Anaxagoras' words and this interpretation there is a veritable gulf, philosophically speaking.

As I conceive it, *Anaxagoras considers these "qualities" themselves the ultimate elements of the world. To him so-called matter is not a carrier of the qualities, but these are themselves that "matter."*

This was not so understood by Nietzsche nor by Tannery. Nietzsche's words, "von denen jeder . . . nur eine Qualität besitzt," imply that to him the filling of such a "filled point" was not a single quality itself, but a something that *carries* a quality. And Tannery says on page 286 of his book:

Le point capital est la question de savoir comment il [sc., Anaxagore] considèrait ses éléments, soit comme des parties d'un mélange, soit comme des *qualités inhérentes à la matière*, mais variables en degré d'un corps à l'autre.

In this way, however, all the ingenuity of the Anaxagorean idea is lost.

That Tannery does not get to the bottom of the proper sense of the Anaxagorean conception becomes particularly evident from the following passage (page 288):

. . . Anaxagore se représente les choses comme si les qualités ne pouvaient varier que par un déplacement mécanique des *particules de la matière auxquelles il les a attachées*. C'est dire qu'il ignore toute la physique et toute la chimie modernes, que même *il n'a pas encore la notion complète de la qualité et qu'il n'établit pas une distinction parfaitement nette entre la qualité et la substance*.

This is almost exactly the same animadversion upon Anaxagoras as that which Aristotle utters. Tannery, likewise, has interpreted as a defect what has been Anaxagoras' most ingenious and lasting idea.

John Burnet, the English philologist, seems to be the only one to prefer Tannery's interpretation to Aristotle's. (He, too, does not mention Nietzsche.) In his *Early Greek Philosophy*¹⁰ he says:

I still think that Tannery's interpretation is substantially right, though his statement of it requires some modification. It is, no doubt, difficult for us to think of the hot and cold, dry and wet as 'things' (*χρήματα*); but we must remember that, even when the notion of quality (*ποιότης*) had been defined, this way of thinking survived. Galen (*De nat. fac.* I, 2, 4) is still quite clear on the point that it is the *qualities* which are eternal. He says: *οἱ δὲ τινες εἶναι μὲν ἐν αὐτῇ (τῇ ὑποκειμένη οὐσίᾳ) βούλονται τὰς ποιότητας, ἀμεταβλήτους δὲ καὶ ἀτρέπτους ἐξ αἰῶνος, καὶ τὰς φαινόμενας ταύτας ἀλλοιούσεις τῇ διακρίσει τε καὶ συγκρίσει γίγνεσθαι φασιν ὡς Ἀναξαγόρας*. ("The others, however,

10. (4th ed.), p. 263, ¹annot. 1.

want the qualities to be in it [in the underlying substance], though, but to be unchangeable and unalterable from eternity, and they say that these appearing alterations come into being by severing and mixing, as [says] Anaxagoras.”)

But then Burnet does not specify that “some modification” which he justly says Tannery’s statement requires. Besides, the words, “Even when the notion of quality (*ποιότης*) had been defined” etc., seem to indicate that Burnet took the designation of the qualities as “things” for a “way of thinking” that remained as a residue “surviving” from a more primitive state of mind, and that he might not have realized this way of thinking as an intentional substitution by Anaxagoras for the common way of thinking. Burnet’s quotation of the passage shows that he no more than Galen came to think Anaxagoras could have meant a cancellation of that “underlying substance,” even though neither the notion of substance nor the notion of quality might have been already “defined” in Anaxagoras’ time. One has to distinguish between having a notion and having a definition of a notion.

At any rate, however, the views of Nietzsche, Tannery, and Burnet come incomparably closer than the commonly accepted Aristotelian interpretation to that which, in my opinion, was really meant by Anaxagoras.

EDUARD ZELLER

Zeller refused to accept Tannery’s opinion and retained Aristotle’s.¹¹ To Tannery’s interpretation he has dedicated the following annotation in his *Philosophie der Griechen*:¹²

Und an die Stelle dieser Stoffe mit Tannery, Science. Hell. 286 f., “Qualitäten” zu setzen, durch deren Verbindung die einzelnen Stoffe entstehen, widerstreitet nicht bloss allen unseren Zeugen ohne Ausnahme, sondern es findet auch in den eigenen Aeussierungen des Philosophen keine Stütze. Tannery verweist auf f. 3, 6, 8. Allein, τὸ διερόν, τὸ θερμόν usw. heisst nicht: “die Feuchtigkeit, die Wärme” usw., sondern: “das Feuchte” usf., d.h. die mit diesen Eigenschaften versehenen Stoffe, und Anaxagoras selbst nennt das διερόν usf. fr. 6 χρήματα. Davon nicht zu reden, dass die Annahme für sich bestehender Qualitäten in jener Zeit eines unbefangenen Materialismus ohne Analogie wäre.

That Tannery’s interpretation “is antagonistic to all of our witnesses without exception,”—does not matter too much.

11. Likewise Cl. Baeumker (*Das Problem der Materie in der griechischen Philosophie* [1890], pp. 73–79) has followed the traditional Aristotelian view, but without any mention of Tannery.

12. (5th ed.), I, 980.

But that "τὸ θερμόν" (the warm) should not be capable, especially in a philosopher, of having also the meaning of "θερμότης" (warmth), this is an opinion differing too much from lexical tradition for me to admit any foundation for it. There is nothing easier than to demonstrate that the use of "τὸ θερμόν" in the sense of "θερμότης" is not even sporadic. It might suffice to have a look into the *Thesaurus Graecus* by Henricus Stephanus. There one can read sub verbo θερμός, vol. IV, p. 331, column 2, sub lit. B:

Neutrum etiam pro θερμότης, calor (Plato Crat. p. 413 C: τὸ θερμόν τὸ ἐν τῷ πυρὶ ἐνόν). Theophr. C. Pl. (2, 6, 1), loquens de aquis frigidis: Πέψιν ποιεῖ μάλιστα διὰ τὴν ἀντιπερίστασιν τοῦ θερμοῦ καὶ κατάψυξιν, Propter cohibitum et coarctatum calorem a circumfuso frigore. 6 (7, 8): Πέττει γὰρ τὸ θερμόν ἀντιπεριϋστάμενον, Concoquit enim calor intra terram compressus, et cohibitus coactusque. . . Et ap. Alex. Aphr.: Τὸ ἐμφυτον θερμόν, Calor insitus (conf. I, 79); sicut Plut.: Τὸ οἰκεῖον καὶ τὸ σύμφυτον θερμόν ἡμῶν, ᾧ τρέφεσθαι πεφύκαμεν.

However, supposing there were no parallel passages in other ancient authors to attest this usage of the word—this still would not be a logical argument against the possibility of Anaxagoras' having used the term in this meaning. For from the very moment Anaxagoras carries out that spatialization of the "qualities," "τὸ θερμόν" not only can but *must* become to him equivalent to "θερμότης." And he would even have been compelled to enter into a conflict with his mother-tongue, had it not been yielding enough in itself to comply with his idea. *Anaxagoras equates "τὸ θερμόν," "the warm," and "θερμότης," "warmth," intentionally, just as Berkeley, for instance, equated "esse" and "percipi",* which can certainly not be justified lexicographically. But Berkeley is supported by the broader context, that renders superfluous an interpreter.

As to "absolute qualities," Tannery has by no means comprehended the Anaxagorean elements as absolute qualities, as I have demonstrated above. For he speaks of "particules de la matière auxquelles il (sc., Anax.) les (sc., qualités) a attachées." Hence it is my interpretation, properly speaking, that Zeller has anticipated, and when he alleges that "assuming absolute qualities would be without analogy in that period of unsophisticated materialism," it is incumbent upon me to apply this objection to myself and answer.

Let it be said, to begin with, that that period was neither the time of an unsophisticated nor of a sophisticated materialism, but of no materialism whatsoever.¹³ Besides, it is never entire ages that philosophize, but always only single, individual men. Moreover, it is the very essence

13. Cf. Chapter Thirteen, p. 154.

and token of a real philosopher that what he teaches is "without analogy," i.e.: original.

Finally, however, there is indeed (Zeller seems to have forgotten this) at least one very nice analogy—in Indian philosophy. In the Sâmkhya system that originated in the period previous to Buddha, those three constituents of "matter," the three *gunas*: *Sattva*, *Rajas*, and *Tamas*, are also nothing but independent "qualities," and they, too, just as the *chremata* of Anaxagoras, are not attached to a matter, but are that "matter" themselves.

XIII

NOUS—ARISTOTELIAN AND OTHERWISE

IS NOUS "PURE SPIRIT"?

IN LATE ANTIQUITY almost every author who reported on the philosophy of Anaxagoras took it for granted and self-evident that his Nous was opposed, in a dualistic sense, to the "material, unspiritual, unconscious" elements of the world, as a strange, "immaterial" power. As related by Simplicios,¹ Theophrast, who herein followed his master Aristotle,² considered Anaxagoras' Nous the strict contrast of the "material principles," the "ὀλικάι ἀρχαί."

This interpretation does not seem to have been contested prior to the eighteenth century. The modern interpreters appear to have been struck by the fact that, in the extant fragments, terms otherwise applied to the "material" elements are indiscriminately used also where Nous is characterized, particularly in that passage where Nous is called "the thinnest and purest of all the elements."

Thus, the question seemed to arise: *Was it still admissible to take Nous for "pure spirit," for an immaterial divine principle, or was not the "spirit" of Anaxagoras to be understood as something like a kind of matter, strictly speaking?*

MODERN INTERPRETATIONS

I shall cite some of the answers so far given to this question that was supposed to have been asked correctly.

Schaubach (*Anax. Clazom. fragm.* [1827], p. 103) writes: "Quaeritur, num haec epitheta (sc., the "thinnest" and "purest") tropice an proprie intelligenda sint. Praeferenda esse videtur prior ratio, quandoquidem alioquin aperte sibi repugnaret" etc. ("The question is whether these epithets are to be comprehended figuratively or literally. The first interpretation seems to be preferable, for otherwise he would apparently contradict himself, of course.") And referring to Carus, Tennemann, Hensen, and Ritter, he maintains this expression to be used as "de mentis acumine omnia penetrante" ("of the sharpness of Mind penetrating all things").

1. Phys. 27, 2.

2. Cf. Arist. Metaph. I, 8. 989 a 31, and elsewhere.

Similarly Breier (*Die Philosophie des Anaxagoras von Klazomenae nach Aristoteles*, [1840], p. 63 ff.) supposes Anaxagoras to have conceived Nous as certainly immaterial, but to have expressed this idea in a defective, popular way.

Heinze formerly maintained that the doctrine of Anaxagoras was to be comprehended as a dualism not yet perfect and conscious. Later, having altered his opinion, he tried to prove ("Über den Nus des Anaxagoras." *Berichte über die Verhandlungen der kgl. sächsischen Gesellschaft der Wissenschaften zu Leipzig, philologisch-historische Klasse*, [1890]) that Anaxagoras had meant, quite consciously, a regular dualism. And for this purpose, supposing to have removed thereby the philological difficulties, he translated, following Schaubach, "λεπτός" ("thin") with "scharfsinnig" ("sagacious") and gave the word "χρῆμα" the meaning of the indefinite "etwas" ("something").

No less decidedly does J. Freudenthal stand up for the immateriality of Nous. (*Über die Theologie des Xenophanes* [1886], p. 46.) In E. Rohde's opinion, also, Anaxagoras is "der erste entschiedene und bewusste Dualist unter den griechischen Denkern." For his "Geist" . . . wird mit solchen Beiwörtern beschrieben, dass man das Bestreben des Anaxagoras, ihn von allem Materiellen verschieden, selbst immateriell und unkörperlich zu denken, nicht verkennen kann." (*Psyche*, [4th. ed.], II, 192.)

On the other hand, already Brucker (*Historia critica philosophiae a mundi incunabulis ad nostram usque aetatem deducta* [1742-1744, 2nd ed. 1766-1767], I, 513³) considered Nous to be corporeal and attributed to him an aeriform nature. Similarly Tiedemann (*Geist der spekulativen Philosophie* [1791-1797], I, p. 329 ff³) comprehended the Nous of Anaxagoras as an ethereal or fiery being.

Fr. Kern (*Über Xenophanes von Kolophon* [1874], p. 24, annot. 69) declared it impossible to demonstrate, on the basis of the fragments and of the reports of reliable witnesses, that Anaxagoras taught anything immaterial, anything not extended in space. Windelband (*Lehrbuch der Geschichte der Philosophie* [5th ed., 1910], p. 35) says outright that Anaxagoras' Nous is a stuff, a material element, namely, the power element, the motion stuff, the thinking-stuff. Likewise Th. Gomperz (*Griechische Denker* [2nd ed.], I, 175) considers Nous a "vernunftbegabtes Fluidum" ("a fluid gifted with reason").

The same line is followed by Werner Jaeger (*The Theology of the Early Greek Philosophers* [Oxford, 1947] pp. 166 and 167), who maintains that Anaxagoras was "not yet aware of a real opposition between matter and

3. Quoted according to E. Arleth, "Die Lehre des Anax. vom Geist und der Seele" (*Archiv für Geschichte der Philosophie*, VIII [1894], nos. 1 and 2), who himself adheres to the immateriality of Nous.

mind," and that he "still conceived" of *Nous* "as something material, endowed with the power of thought."

Also for B. A. G. Fuller (*A History of Philosophy* [New York, 1936] pp. 34 and 35) the Anaxagorean *Nous* is not "an immaterial, divine intelligence, planning and directing the universe," but merely "the one self-moving stuff in a universe otherwise composed of inert elements," or (as he puts it in his *History of Greek Philosophy* [New York, 1923] p. 219) merely "the cosmic brain-matter."

A third group stands between those two antagonistic interpretations. Zeller (*Die Philosophie der Griechen* [5th ed.] I, 993) believes Anaxagoras to have really thought of an incorporeal being by which matter had been moved and put in order;

und mag es auch nicht bloss der Unbeholfenheit seines Ausdrucks zur Last fallen, wenn der Begriff des Unkörperlichen in seiner Beschreibung nicht rein heraustritt, mag er sich vielmehr den Geist wirklich wie einen feineren, auf räumliche Weise in die Dinge eingehenden Stoff vorgestellt haben, so tut dies doch jener Absicht keinen Eintrag.

According to Dilthey (*Einleitung in die Geisteswissenschaften* [1883], I, 207, annot. 2), *Nous* is a "verfeinertes Stoffliches" ("a refined material thing"), or, at least, "an der Grenze von Stofflichkeit [sic!] noch befindlich" ("still being at the border of materiality").

Salvatore Fimiani ("Alcune osservazioni su la relazione tra il *vous* e la *ψυχή* nella dottrina filosofica di Anassagora," *Rivista italiana di filosofia* [1889], p. 67) says:

Il noo di Anassagora, di fatti, sta in mezzo, tra il concetto d'una intelligenza pensante, umana, incorporea, distribuita tra gli esseri viventi, e quello d'una forza impersonale, motrice; tra il concetto d'una divinità radicalmente distinta da ogni elemento corporeo, e quello d'una forza della natura, i cui attributi non potrebbero riferirsi ad un essere schiettamente spirituale. (In fact, the *Nous* of Anaxagoras stands in the middle between the conception of an intelligence, thinking, human, uncorporeal, distributed among the living beings, and that of an impersonal, moving force; between the conception of a deity altogether different from any corporeal element and that of a natural force, the attributes of which could not relate to a being purely spiritual.)

v. Arnim, in his presentation of ancient European philosophy (*Kultur der Gegenwart*, I/5 [1909]), takes the "spirit" of Anaxagoras for "eine vom Stoff verschiedene Bewegungsursache" ("a motive cause different from matter").

In *Friedrich Ueberwegs Grundriss der Geschichte der Philosophie*, I, ed. by Praechter (12 ed., 1926), there is this statement (page 100):

Diese letztere Stelle [sc., that the Nous is "the thinnest and purest of all the elements"] zeigt zugleich, dass es Anaxagoras nicht gelungen ist, in seiner Auffassung des Geistigen den prinzipiellen Gegensatz zwischen Geistigem und Körperlichem voll zur Geltung zu bringen: Es genügt ihm, den Geist als feinsten und reinsten Stoff den gröberen, zusammengesetzten Stoffen entgegenzusetzen.

Similarly J. Burnet (*Greek Philosophy*, I, 79): "He (sc., Anaxagoras) did not, however, succeed in forming the conception of an incorporeal force . . ."

The most philosophical attitude is that adopted by W. T. Stace (*A Critical History of Greek Philosophy* [1920], pp. 99 and 100). He says:

But even if Anaxagoras did conceive the Nous as spatial, it does not follow that he regarded it as material. The doctrine of the non-spatiality of mind is a modern doctrine, never fully developed till the time of Descartes. And to say that Anaxagoras did not realize that mind is non-spatial is merely to say that he lived before the time of Descartes. No doubt it would follow from this that the incorporeality of mind is vaguely and indistinctly conceived by Anaxagoras, that the antithesis between matter and mind is not so sharply drawn by him as it is by us. But still the antithesis *is* conceived, and therefore it is correct to say that the Nous of Anaxagoras is an incorporeal principle.

An overwhelming majority of authors, then, maintains the immateriality of Nous. They differ only in this one point that some of them suppose Anaxagoras to have conceived the idea of dualism with perfect clarity and consciousness, while the others consider him to have had but a vague notion of it and to have been unable to put it in distinct relief. And only a few scholars hold Anaxagoras to have taught a materialistic monism, to have conceived Nous as a sort of matter.

NEW ANSWER BY COUNTER-QUESTION

Are these really the only possible interpretations?

Quite obviously these troubles result, largely, from that opinion about the Anaxagorean elements doctrine which, since Aristotle, has been commonly accepted and still rules to this day. On the basis of that Aristotelian interpretation there would be, indeed, a fundamental contrast, in a truly dualistic sense, between the "material" elements and Nous, and any matter-like attribute given to Nous would justly be considered an inconsistency, stemming from an incapacity of Anaxagoras to carry the idea of dualism to its extreme consequences.

That Aristotelian conception, however, does not correspond to the genuine teaching of our philosopher who—unless we refuse to give

credence to his own words—has assumed elements like those described in the first chapter. Now, if one bears in mind this new interpretation, then *the obvious answer to the question: Is Anaxagoras' Nous "pure spirit"?*, is a counter-question: *Are his moiras "pure matter"?*

It has been overlooked that Anaxagoras, too, must be considered a *panzoist*, i.e., one to whom *body and consciousness are still a unity not yet analysed*. In this respect he does not differ from his predecessors, the Ionian transformists, who had believed in a divine person, one and boundless, in a living divine primary substance, one and homogeneous. This "principle," this "*ἀρχή*," was the unseparate "together" of a body-component and a consciousness-component, but it probably did not even enter the heads of those thinkers not to take an identity of body and consciousness for self-evident. The notions of a *matter without consciousness* and of a *consciousness without body* do not yet exist for these men.⁴

Anaxagoras, however, makes two unprecedented discoveries.

The one: *Within a principle homogeneous throughout*, that is to say, within a body uniform throughout and a consciousness uniform throughout, *nothing distinguishable can happen*, in an outright physical and mechanical sense, *and no cosmos could arise from it. If a world is to result there must be dissimilarities*. (Which in itself would have been another reason for assuming a plurality of different, unequal elements⁵ [cf. p. 33, ann. 4].)

The other discovery: *The principles of the predecessors are not uniform, anyway. For the deity's body, be it water or air or whatever else, is but seemingly homogeneous. Strictly speaking, it is a complex: a complex of an irreducible plurality of "things" really simplest and specific, the proper "seeds in no way resembling each other."*

Only these would be homogeneous—if they could be isolated. Each of them, if such isolation were feasible, would then be as homogeneous in itself as is that one purest and thinnest of all "things," the medium in which the others are embedded: the deity's spirit.

But *neither is this a "pure spirit," nor are the constituents of the deity's body "pure matter."*

There is no such gap between the purest and thinnest thing and the other things as between "spirit" and "matter." Or rather, the gap of

4. That is why I am avoiding the usual term "hylozoism," which seems to me misleading and inadequate.

5. One may leave open the question as to whether or not Anaxagoras' assumption of a plurality of unchangeable elements was also dependent, historically, on the doctrine of Parmenides, and whether or not that assumption was also conditioned by any regard for ostensible immanent contradictions in the notion of becoming. At any rate, *for an understanding of the inner development of the system it would not be necessary to presuppose such relationship.*

dissimilarity is not greater than between the other things themselves, between a color and a temperature, for instance, or between any of the "seeds in no way resembling each other." But all the "things" alike are of spatial extensiveness, all of them have aseity, all of them are equally eternal, and also in power there is only a difference of quantity, just as between a ruler and his subjects. And while Nous is extensive like "matter," the "material" elements are never outside "consciousness," because at any time they are embedded in Nous and touched by Nous and thereby known by Nous who is always present "*wherever all the others are.*"⁶

It is highly significant that as a designation for all the ultimate constituents of the world, for all the "elements," for Nous as well as the others, Anaxagoras employs the term "thing" (*chrema*), which undoubtedly is one of the most general and most neutral expressions one can imagine, an expression as neutral as, or even more neutral than, the term "neutral stuff" of certain great epistemologists of our day.⁷

All this is built up consistently throughout. It is along the same clue that Anaxagoras has arrived both at the assumption of a Nous and at the assumption of the other constituents of the universe. He could not construct a full world-personality without a Nous. For him the other elements alone would not have constituted, in a monistic sense, a complete set, but a truncation.

ANAXAGORAS, THE MONIST, THE DUALIST, THE PLURALIST

And here we are again. "In a monistic sense," I have said. We have returned, then, to that topic usually given such outstanding importance: to the question of attaching a number-label. Is Anaxagoras to be called a "dualist"? Or a "monist"? Or what?

As already mentioned, Anaxagoras, from times immemorial, has been labelled "the first dualist." Only a small minority of scholars prefers to consider him a monist, and even a materialistic one.

If, indeed, there is any sense to this custom of labelling, one must first explain the question: What is it that is supposed to be counted? Then, however, it becomes obvious that one and the same thing would have to be given various labels, according to the different classifications possible:

6. *Simpl. phys.* 157, 5. (Cf. pp. 37 and 102).

7. There are striking similarities between Anaxagoras' pre-dualistic theory and the post-dualistic views of William James (*Essays in Radical Empiricism*) and E. B. Holt (*Concept of Consciousness*). The term *neutral stuff* is indeed less neutral than Anaxagoras' plain "thing," the word *stuff* still implying something like matter, after all, and, on the other hand, *neutral* admittedly (cf. Holt, p. 124, annot., and p. 136) being a substitution for "conceptual."

For if one classifies according to the assumed number of constituents not reducible to one another, then Anaxagoras becomes even a *pluralist*.

But if one considers the oneness of the clue and the deeper meaning of the whole construction, then Anaxagoras is a *monist*, though certainly not a materialistic, but at any rate an immaterialistic monist.

If, however, one is absolutely bent on sticking to the old label—very well, then this is likewise feasible, though not in the traditional sense. For Anaxagoras is indeed a *dualist*, too, in so far as he accepts the disunion into sense and intellect, into *αἴσθησις* and *νόησις*.

IS ANAXAGORAS AN INCONSISTENT TELEOLOGIST?

Anaxagoras is misunderstood in other points, too, today as in antiquity.

Nous is still considered a deity setting purposes, Anaxagoras is still taken for the first teleologist, and one still thinks it justified to accuse him, as did Plato, of inconsistency therein.

When Socrates—as he relates in that well-known passage in Plato's "Phaedo"—had learned of Anaxagoras introducing Nous as the world's "arranging principle" ("διακοσμῶν") and as "originator of all things" ("πάντων αἴτιος"), he read the writings of the Clazomenian with great zeal and, as he says,

in order to gain *knowledge of the best and the lesser* the speediest possible.

ἵν' ὡς τάχιστα εἰδέην τὸ βέλτιστον καὶ τὸ χεῖρον.

And with gross mockery he complains:

However, I have dropped, dear friend, most rapidly this wonderful hope. For when going on reading, I see a man not making use of 'intelligence' at all *nor assigning any reasons for arranging affairs*, but adducing as 'reasons' airs and ethers and waters and a lot of other preposterous rubbish.

ἀπὸ δὴ θαυμαστῆς ἐλπίδος, ὦ ἑταῖρε, ψόχῳ μὲν φερόμενος, ἐπειδὴ προῦν καὶ ἀναγιγνώσκων ὁρῶ ἄνδρα τῷ μὲν νῷ οὐδὲν χρώμενον οὐδὲ τινὰς αἰτίας ἐπαιτιώμενον εἰς τὸ διακοσμεῖν τὰ πράγματα, ἀέρας δὲ καὶ αἰθέρας καὶ ὕδατα αἰτιώμενον καὶ ἄλλα πολλὰ καὶ ἄτοπα.

Plato, Phaedon 98 B.

However, teleology in its exact meaning is out of question regarding Anaxagoras, as has been demonstrated (cf. p. 26). Hence it seems not quite justified to blame him for not having availed himself sufficiently of the (supposedly) teleological principle of a Nous.

IS NOUS REALLY BUT A STOP-GAP?

With this reproach by Plato another brought by Aristotle is commonly confused, though it does not coincide with the Platonic objection, nor would be affected by its confutation.

Aristotle, in his *Metaphysics*, accuses Anaxagoras that he *makes use of Nous for cosmogony in the way of a theatre-machine and drags it in only when in a dilemma as to the cause by which anything happens necessarily*, whilst otherwise he alleges, as causes of the occurrences, all things rather than Nous.

μηχανῇ χρῆται τῷ νῷ πρὸς τὴν κοσμοποιίαν καὶ ὅταν ἀπορήσῃ διὰ τιν' αἰτίαν ἐξ ἀνάγκης ἐστὶ, τότε παρέλκει αὐτόν, ἐν δὲ τοῖς ἄλλοις πάντα μᾶλλον αἰτιᾶται τῶν γιγνομένων ἢ νοῦν.

Arist. *Metaph.* I, 4. 985 a 18.

That is to say, Aristotle maintains Anaxagoras employed Nous but as a stop-gap, as a make-shift, having Nous intervene in those cases only in which he had not managed to uncover the natural, necessary mechanics.

Should this reproach turn out to be justified, then Aristotle would have really pointed at a badly amateurish insufficiency in Anaxagoras' construction. (Today, of course, one would not blame Anaxagoras, as did Aristotle, because supposedly he used such reference to the working of Nous as an explanation in those few cases only. Today he would be blamed, on the contrary, because he would not have left everything to the same natural lawfulness everywhere.) For by so doing he would have had the limit of natural lawfulness coincide with the limit of his knowledge of it, instead of singly admitting his inability to uncover the mechanics. Thus Anaxagoras, in this respect, would be modern in a way not very favorable to him. He would acquire a resemblance to certain biologists of the present day, who likewise let the actual shore of their knowledge of the mechanics of things be bound by an ocean of new, different, unmechanical lawfulness, without heeding the fact that year after year fresh soil emerges from the supposedly bottomless.

Was Anaxagoras really so "modern" as to think out a new agent, only to stop the gaps of his insight with it? Is it true that only when being unable to indicate "by what cause a thing occurs necessarily" does he have Nous intervene? Are the "δῖνοι" (whirls) Anaxagoras speaks of really "ἀνόητοι" ("irrational"; the word means also: "nous-less"), and do they really occur "without action and cognition by Nous" (σὺν τῇ τοῦ νοῦ ἀπραξία τε καὶ ἀνοία), as Clement of Alexandria says,⁸ following Plato and Aristotle?

All these critics have apparently not understood that *to Anaxagoras the very mechanics, seemingly blind, of the world occurrence was so full of genius, so fraught with meaning, so beauteous and grand, that he could comprehend it but from the conscious working of an intellect, an intellect ingenious like a god's.*

8. Strom. II, 14 p. 435 P.

His critics have not paid enough attention to the fact

that Anaxagoras had been *the first to put on the head of the world systems as principle of arrangement not hazard nor [blind] necessity, but Nous,*

ὅτι τοῖς ὅλοις πρῶτος οὐ τύχην οὐδ' ἀνάγκην διακοσμήσεως ἀρχήν, ἀλλὰ νοῦν ἐπέστησε,

Plutarch. Pericl. 4

and that

he says that

"none of all occurrences occurs by [a blind] fate, but this very word is void of sense."

λέγει γὰρ οὗτος γε (sc., 'Αναξαγόρας)

μηδὲν τῶν γινομένων γίνεσθαι καθ' εἰμαρμένην, ἀλλ' εἶναι κενὸν τοῦτο τοῦνομα.

Alex. de fato 2 (II, 165, 22 Bruns).

And neither Plato nor Aristotle has noticed that *precisely all those ostensibly preposterous and senseless things, those ἄτοπα καὶ ἀνόητα, are original and own performances of Nous, that all this perichoresis continues only as long as Nous Itself keeps on rotating, and that no organism can keep alive unless Nous keeps it going.*

It certainly is due to some superficiality on the part of the critics that they have reproached Anaxagoras for his supposed application of Nous as a stop-gap:

Anaxagoras taught that *the whole world course was operated by Nous, all has been arranged by Nous,*
πάντα διεκόσμησε νοῦς,

and

all is ruled (i.e., moved as well as known) by Nous.
πάντων νοῦς κρατεῖ.

But, besides, he felt tempted to *uncover the mechanics* applied to it by Nous, to find out

in what way God brings about every single occurrence in the sky.
τῶν οὐρανίων ἥ ἕκαστα θεὸς μηχανᾶται.

Xenoph. Mem. IV, 7, 6.

That is to say, consequently: In all those cases in which, in his opinion, he had succeeded in solving the riddle, he obviously has not repeated again and again *what he had stated once and for all*—that it was Nous who was performing all that in the way described. Only when Anaxagoras had not been able to find out the mechanism of an occurrence, he will have marked it *expressly* as a work of Nous. By so doing, however, he evidently meant to indicate: *In this occurrence the same lawfulness is at*

work as in all the other occurrences; this, too, is done by Nous; but I am not yet able to determine how it is done.

And so Aristotle does not seem to have done justice to Anaxagoras in this point, either.

Plato, however—even if in every single instance Anaxagoras had expressly mentioned Nous as the principle at work in the mechanics—Plato, from his standpoint, could still have said: “Well, this certainly is a deification of the world mechanics. But—what, in all that, is supposed to be considered ‘the best’ and what, ‘the lesser’ (τὸ βέλτιστον καὶ τὸ χείρον) is known to me no better now than heretofore.”

EPILOGUE

*To comprehend the structure of the world
and reproduce it in a philosophic mould,
that was the task
Anaxagoras had undertaken.
His philosophizing's deepest root had been
a bent for moulding like an artist's.
His speculation's way
was worked upon
neither by hidden wishing
nor by hankering for comfort
nor desire for hope.*

*He might not have at all put to himself
the question
how pain and how defectiveness could come
into a world ruled by a Nous.
He never might have felt an impetus
to interpreting the world,
that is,
to looking out
for a meaning of the sufferings of life.
The mere theorist
just is not very sensitive
to life's essential tragedy.*

*This Nous,
Lord of the World,
is neither a kind-hearted father
nor a spiteful demon,
but
an ingenious mathematician and physicist
entirely devoid of sentiment.*

*Nous is
"Originator of All Things,"
"πάντων αἷτιος,"
(Plato, Phaedo 97 B)
and he is
"The Cause of 'Beautifully' and 'Correctly'. "
"τὸ αἷτιον τοῦ καλῶς καὶ ὀρθῶς."
(Arist. de anima I, 2. 404 b 2)*

That means together:

In this universe
there is no one occurrence whatsoever
not passing off
in beauteous, divine exactness.
It is in beauty and correctness
that the world is running on,
phase by phase,
and veering after veering,
beginning-less and end-less,
as a magic pastime to the World-Nous
for the sake of Beauty.

INDEX OF PASSAGES

(The numbers in italics refer to pages in this book)

Aetios

- I, 3, 5: 87
- I, 14, 4: 100
- II, 1, 2: 129
- II, 1, 3: 129, 136
- II, 4, 6: 135
- II, 13, 3: 61
- II, 20, 6: 61
- II, 21, 3: 72
- II, 25, 9: 66
- II, 28, 5: 66
- II, 29, 6: 67
- II, 29, 7: 67
- II, 30, 2: 67, 126
- IV, 5, 11: 101
- IV, 9, 16: 113
- V, 25, 2: 85, 93, 94
- V, 25, 4: 93

Alexander of Aphrodisias

de fato

- 2: 158

Alkidamas

in: Or. Att. (Sauppe)

- II, 156 b 6

(also Diog. Laert. VIII, 56): 117

Anonymus

Schol. in Gregor. Naz.

(in: Patr. Gr. Migne XXXVI, 911): 88

Aristotle

Phys.

- I, 4, 187 a 20: 143
- I, 4, 187 a 23: 144
- I, 4, 187 b 5: 144
- III, 4, 203 a 22: 32
- III, 5, 205 b 1: 35
- IV, 1, 208 b 14: 55
- IV, 6, 213 a 22: 11
- VII, 1, 250 b 24: 35

de caelo

- I, 3, 270 b 25: 4
- II, 13, 294 b 13: 55
- II, 13, 295 a 9: 60
- II, 13, 295 a 16: 55

III, 3, 302 a 31: 3

III, 3, 302 b 1: 4

III, 3, 302 b 4: 4, 86

IV, 1, 308 a 18: 55

de gen. et corr.

I, 1, 314 a 18: 3, 141

Meteor.

I, 8, 345 a 25: 71

II, 7, 365 a 32: 57

II, 9, 369 b 14: 4

IV, 8, 384 b 32: 142

IV, 8, 385 a 1: 7

IV, 10, 388 a 13: 142

de anima

I, 2, 404 b 1: 82

I, 2, 404 b 2: 161

I, 2, 404 b 3: 115

I, 2, 404 b 5: 120

I, 2, 405 a 13: 83

I, 2, 405 a 17: 103

III, 4, 429 a 18: 102

III, 7, 431 a 4-7: 96

de respirat.

2, 470 b 30: 85

de partt. anim.

I, 10, 687 a 7: 120

I, 10, 687 a 9: 120

de plantis / Nic. Damasc./

I, 1, 815 a 15: 115

I, 1, 815 b 16: 115

I, 1, 816 b 26: 84

Metaphys.

I, 1, 980 a 26: 115

I, 3, 984 a 11: 116

I, 3, 984 a 15: 12

I, 3, 984 b 15: 105

I, 4, 985 a 5: 118

I, 4, 985 a 18: 157

I, 8, 989 a 31: 150

I, 8, 989 a 33-b 4: 145

I, 8, 989 b 6: 35

IV, 5, 1009 b 25: 108

XI, 6, 1072 a 5: 104

- Eth. Nic.
VII, 15, 1154 b 7: 113
- Aspasios
In Eth. Nic. (Heylbut)
156, 14: 113
- Censorinus
6, 1 (D. 190): 104
- Cicero
Acad.
II, 31, 100: 20
- Clement of Alexandria
Stromateis
II, 14: 157
- Codex Monacensis no. 216: 88
- Democritus
fr. 125 (Diels): 6
- Diogenes Laertius
de vitis, etc.
II, 8: 51, 61, 65, 127
II, 9: 69, 82
II, 10: 63
II, 12: 61, 63
II, 15: 61
VIII, 54: 117
VIII, 56: 117
VIII, 58: 117
IX, 34: 118
IX, 35: 118
- Empedocles
fr. 6 (Diels): 141
fr. 111: 117
- Euripides
Phaethon, FTG, fr. 783: 61
fr. 910 N.: xxii
fr. 1018: 102
- Favorinus
in: Fr. Hist. Gr.
III, 582 fr. 33: 118
- Galenos
de nat. fac.
I, 2, 4: 146
- Harpocrates: 61
- Hippolytus
refut. omn. haeres.
I, 7, 5: 67
I, 8, 1: 36, 134
I, 8, 2: 5, 42
I, 8, 3: 50, 55
I, 8, 5: 51
I, 8, 6: 61, 67
I, 8, 7: 65, 66
I, 8, 8: 66
I, 8, 9: 72
I, 8, 10: 68
I, 8, 12: 57
I, 9, 1: 36, 100
I, 9, 4: 50
- Irenaeus
adv. haereses
II, 14, 2: 91
- Josephus
c. Ap.
II, 265: 61
- Lucretius
de rerum natura
I, 843/844: 13
- Olympiodorus
In Meteor.
17, 19: 61
- Plato
apol. 26 D: 15
Cratylus 409 A: 66
Phaedo 97 B: 161
Phaedo 98 B: 15, 156
- Plinius
nat. hist.
II, 149 f.: 63
- Plutarchus
Pericl. 4: 9, 158
Nic. 23: 53
Lys. 12: 54, 61, 63, 64
de fac. in orb. lun.
16, 929 B: 66
quaest. phys.
1, 911 D: 115
- Satyrus
in: Diog. Laert.
VIII, 58: 117
- Sextus Empiricus
adv. math.
VII, 90: 51, 84, 107
VII, 140: 103
- Pyrrh. hypot.
I, 33: 20
- Simplikios
comm. in Arist.
Phys.
24, 13: 142
27, 2: 130, 150
34, 21: 8, 31, 33, 34
34, 28: 7, 14, 112, 126
35, 13: 7, 17, 48, 52
150, 24: 142
153, 10: 134
154, 29: 131
155, 21: 50, 58, 59, 129
155, 23: 17, 31, 42, 45
155, 30: 44, 46
156, 1: 4, 7, 8, 14, 33, 47
156, 9: 10, 34
156, 13 ff.: 4, 7, 19, 20, 21, 24, 25, 26,
39, 40, 48, 49, 51, 54, 73, 83, 99, 135

Simplikios

Phys.

- 157, 5: 37, 44, 102, 155
 157, 9: 14, 112, 126, 127
 163, 18: 12, 25
 164, 16: 11, 13
 164, 22: 75, 97
 164, 25: 9, 11, 31, 39
 175, 11: 9, 10, 129
 176, 28: 9, 10, 129
 179, 3: 5, 40, 54
 179, 6: 58, 129
 300, 27: 43, 55
 460, 4: 87
 461, 20: 39
 1121, 21: 132
 1185, 9: 133

de caelo

- 304, 5: 132
 305, 21: 132
 520, 28: 57
 608, 24: 46

Talmud Babli: 80

Theophrastus

de vert.

9: 36

de sensu

1: 106

7: 111

8: 92

9: 111, 112

17: 109, 113

27: 92

28: 91

29: 107, 109, 110, 113

30: 110

37: 65, 115

38: 106

Timaeus

in: Fr. Hist. Gr.

I, 211, fr. 81: 118

Vitruvius

VII, pr. 11: 65, 114

Xenophon

Mem.

IV, 7, 6: 158

IV, 7, 7: 61

REGISTER OF NAMES

- Aeschylus, 114
 Agatharchus, 114
 Alkidamas, 116, 117
 Alkmaion of Croton, 104
 Anaximander, 6, 33, 135, 142 f.
 Anaximenes, 143
 Anonymus, 88 f.
 Apollodorus, ix
 Archelaos, 36, 50, 100, 129, 136
 Aristippus the Elder, 130
 Aristotle, vii, viii, 3ff, 135, 141 ff., 156 ff.
 Arleth, E. 151
 Arnim, H. von, 152
 (Arrhenius, S.), 91
 Artaxerxes I, ix
 Averroës, *see* Ibn Rushd
- Baumker, Cl., 147
 Berkeley, G. 121, 148
 Blix, 112
 Breier, 17, 151
 Brucker, 151
 Buddha, 149
 Burnet, J., 13, 108, 117, 145 f., 153
- Campanella, Th., 116
 Carus, 150
 Cherniss, H., 121, 142
 Clement of Alexandria, 157
 Clidemus, 106
- Democritus, x, 6, 9, 36, 116, 118
 Descartes, R., 104
 Deussen, P., 85
 Diels, H., viii, ix, x, 14, 19, 26, 32, 49, 63,
 84, 88, 89, 125, 144
 Dilthey, W., 152
 Diodorus, x
 Diogenes of Apollonia, 134, 143
- Empedocles, ix, x, 112, 116 ff.
 Eudemos, 131 ff.
 Euripides, ix, xxii, xxiii, 118
- Fechner, G. Th., 116
- Fimiani, S., 152
 Freudenthal, J., 151
 Frey, von, 112
 Fuller, B. A. G., 152
 Funke, 112
- Galenus, 146 f.
 Garbe, R., 85, 136
 Gladisch, A., 77 f.
 Gomperz, Th., 127, 151
 Gorgias, 116, 117
 Gregory Nazianzene, 88
- Hegesibulos, xxiii
 Heinze, M., 17, 151
 Hensen, 150
 Heraclitus, 5, 36, 86, 121, 135
 Hermann, K. F., ix
 Hesychios, 143
 Hirsch, S. R., 79
 Holt, E. B., 155
- Ibn Rushd, 97, 121
 Irenaeus, 91
- Jaeger, W. W., 151
 James, W., 112, 155
- Kafka, G., 90
 Kant, I., 136
 Kern, Fr., 151
- Leibniz, G. W., 121
 Leucippus, 9
- Mach, E., 121
 Maier, H., 121
 Meister, R., 93
- Natorp, P., 121
 Nicolaus of Autrecourt, 121
 Nietzsche, F. W., vii, 145 f.
- Parmenides, 154
 Pericles, ix, xxiii, 52

Plato, vii, 118, 132, 135, 156, 159
Praechter, K., viii, 121, 152
Protagoras, 52, 130
Pythagoras, 117

Rey, A., 143
Ritter, 150
Rohde, E., 95, 151
Rubin, S., 80

Satyros, 117
Schaubach, 150, 151
Schleiermacher, F. D. E., 17
Schorn, 5
Simplikios, 3 ff., 126 f., 131 f.
Smith, T. V., viii
Socrates, ix
Stace, W. T., 153
Stephanus, H., 148

Stöhr, A., 24, 112, 121, 134
Stratton, G. M., 115

Tannery, P., 7, 145 f.
Taylor, A. E., ix, 116
Tennemann, 150
Thales, 5, 135, 143
Themistocles, ix
Tiedemann, 151
Timaeus, 117

Unger, G. F., ix, 117, 119

Windelband, W., 151

Xenocrates, 131

Zeller, E., viii, 13, 17, 147 ff., 152
Ziehen, Th., 112

