THE LOGIC OF JUSTICE

IN

ARISTOTLE'S *NICOMACHEAN ETHICS*, BOOK V

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I

The Book V of the *Nicomachean Ethics* begins with the following impressive words: "Περὶ δὲ δικαιοσύνης καὶ ἀδικίας σκεπτέον περὶ ποίας τε τυγχάνουσιν οὖσαι πράξεις καὶ ποία μεσότης ἐστὶν ἡ δικαιοσύνη, καὶ τὸ δίκαιον τίνων μέσον."("In regard to Justice and Injustice, we have to enquire what sort of actions they are concerned with, in what sense Justice is a mean, and what extremes are between which that which is just is a mean." 1129a1-4)

In what sense is Justice a mean (μεσότης) and what extremes are between which that which is just is a mean (μέσον)? With these questions I probe into the geometrical structure which lurks behind Aristotle's argument of justice in distribution (τὸ διανεμητικὸν δίκαιον) and especially justice in reciprocity(τὸ ἀντιπεπονθὸς δίκαιον) in the Book V of *Nicomachean Ethics*. In the first place I take up the justice in distribution.

The subject matter of justice in distribution is, according to Aristotle, "the distribution of honor, wealth, and the divisible assets of community, which may be allotted among its members in equal or unequal shares."(1130b30-1131a1) It concerns not only the distribution of goods, but also political power and office. According to T. Irwin[1], Aristotle takes into consideration "not only such occasional windfalls as the revenues from the Athenian silver mines, but also the same distribution of political power and office, both intrinsic and instrumental goods. The same distributive principles will presumably also

1 T. Irwin, Aristotle's First Principles, Clarendon Press, Oxford, 1988, pp. 427 and 624.

cover taxation and questions about the distribution of land and the nature of laws about debt--two important issues for Greek radical democrats."

In order to manage these very important problems how does the principle of distribution work? To make this clear we must beforehand admit the following premises in general (V3, 3-4).

1) τὸ ἄδικον is an ἄνισον, hence τὸ δίκαιον is an ἴσον.
2) τὸ ἴσον is a μέσον, hence τὸ δίκαιον is a μέσον.
3) A μέσον is between certain extremes which are πλέον and ἔλαττον.
   3-1) τὸ ἴσον concerns two different things at least.
   3-2) τὸ δίκαιον is relative to two different persons at least.
4) Therefore τὸ δίκαιον implies four terms at least; one pair of persons and another pair of things.

Presupposing these conditions Aristotle says as follows (V3, 6):

"And if the persons are ἴσοι, the things will be ἴσα; since as the one person is to the other person, so is the one thing to the other thing, for if the persons are not ἴσοι, they will not have ἴσα; indeed all battles and complaints arise in consequence of ἴσοι having and possessing things which are not ἴσα, or persons who are not ἴσοι, things which are ἴσα."

Just distribution consists in the fact that each person takes a mean (μέσον) between two things in relative to the standard of each person's ἀξία; that is, justice in distribution is τὸ κατ' ἀξίαν.

"All admit in distribution τὸ δίκαιον should be determined κατ' ἀξίαν, but, τὸ κατ' ἀξίαν is ἀνάλογόν τι; hence so is τὸ δίκαιον too."

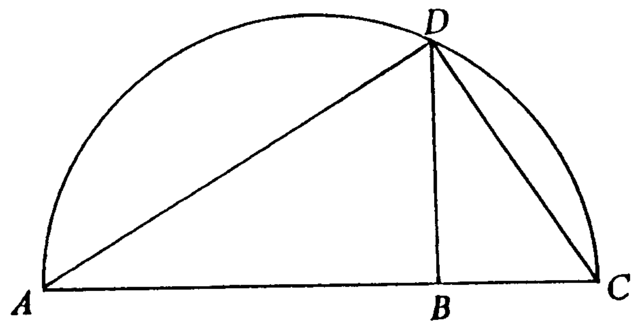
Thus Aristotle formulates his theory of justice in distribution as follows:

"Hence τὸ δίκαιον(justice) is ἀνάλογόν τι(a sort of proportion). For τὸ ἀνάλογον is not peculiar to numerical quantity, but belongs to quantity generally, since the ἀναλογία(proportion) is the equality of ratios and involve four terms at least. . . . And τὸ δίκαιον too has four terms (*A*, *B*, *Γ*, *Δ*) at least, and the ratio between the first pair of terms (*A*, *B*) is the same as that between the second pair (*Γ*, *Δ*). For the two lines (*A*+*B* and *Γ*+*Δ*) representing the persons and shares are similarly divided; then, as the first term (*A*) is to the second (*B*), so is the third (*Γ*) to the fourth (*Δ*); and hence, by alternation, as the first (*A*)is to the third(*Γ*), so is the second(*B*) to the fourth(*Δ*); and therefore also the whole to the whole. Now this is the combination which the distribution effects, and the combination is effected δικαίως if the ἀναλογία are so compounded. Hence the conjunction of the first term with the third, and that of the second term with the fourth is τὸ ἐν διανομῇ δίκαιον(justice in distribution): and this δίκαιον is a mean between two extremes that are disproportionate, since τὸ ἀνάλογον is a mean, and τὸ δίκαιον is ἀνάλογον. (1131a8-b7)

II

In the first place, I would like to emphasize a fact that the first half of Aristotle's above utterance points to something analogous to the proposition 13 of Book VI of the *Elements* which tells us that "*to two given straight lines to find a mean proportional*." [2] Aristotle

2 The proof of the proposition 13 runs as follows: "Let *AB*, *BC* be the two given straight lines; thus it is required to find a mean proportional to *AB*,*BC*. Let them be placed in a straight line, and let the semicircle *ADC* be described on *AC*; let *BD* be drawn from the point *B* at right angles to the straight line *AC*, and let *AD*, *DC* be joined. Since the angle *ADC* is an angle in a semicircle, it is right. And, since, in the right-angled triangle *ADC*, *DB* has been drawn from the right angle perpendicular to the base, therefore *DB* is a mean proportional between the segments of the base, *AB*, *BC*. therefore to the two given straight lines *AB*, *BC* a



furthers his thinking about justice in line with the *mos geometricus*.

My conjecture is neither fictitious nor anachronistic. Before Euclid Aristotle had well known a fact that the angle in a semicircle was a right angle. Two passages in *Metaph.* 1051a26 and in *Anal. Post.* 94a28 testify this. The former locus refers to the special case of the proposition 31 of Book III of the *Elements*; that is to say, in order to prove that the angle in the semicircle is right, it refers to the two isosceles right-angled triangles in a whole right-angled triangle; but the latter does not have such a restriction and runs as follows:

> "Why is the angle in a semicircle a right angle? Or what makes it a right angle? Suppose *A* to be a right angle, *B* half of two right angles, *Γ* the angle in a semicircle. Then *B* is the cause of *A*, the right angle, being an attribute of *Γ*, the angle in the semicircle. For *B* is equal to *A*, and *Γ* to *B*; for *Γ* is half of two right angles. Therefore it is in virtue of *B* being half of two right angles that *A* is an attribute of *Γ*, and the latter means the fact that the angle in a semicircle is right."

This utterance may be regarded as a match for the proposition 31 of Book III of *Elements*, which is a necessary presupposition of the proposition 13 of Book VI and which says as follows:

> "in a circle the angle in the semicircle is right, that in a greater segment less than a right angle, and that in a less segment greater than a right angle; and further the angle of the greater segment is greater than a right angle, and the angle of the less segment less than a right angle."[3]

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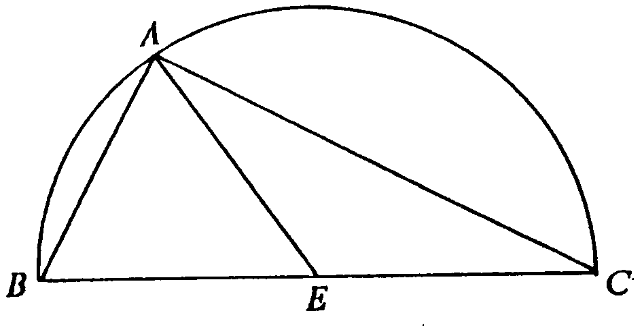
mean proportional *DB* has been found."

3 However, we should bear in our mind a fact that T. L. Heath conjectured that the proof known by Artistotle might be slightly different from that of III, 31(T. L. Heath, Mathematics in Aristotle, Oxford, 1949, pp. 37-39) and that this version of proof runs as follows (*The Thirteen Books of Euclid's Elements*, Cambridge, 1908, pp. 61-64):



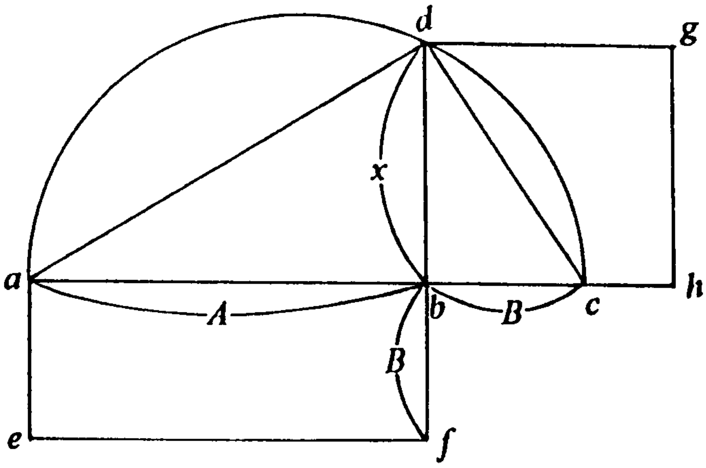
Now, we should take notice of a fact that when Aristotle refers to the finding of μεσότης or μέσον he seems above all to bear in his mind a geometrical construction called τετραγωνισμός (the transformation of a rectangle into a square equal in area). Thus , in *De Anima,* II, 2, 413a13-20 he says as follows:

"Definitions are usually like conclusions. For example, what is *tetragonismos*? The construction of a square equal in area to a rectangle. This kind of definition is a conclusion. But he who maintains that *tetragonismos* is the finding of a mean proportional (μέσης εὕρεσις), also specifies the rationale behind it."

The *tetragonismos* or *tetragonizein* (the procedure of *tetragonismos*) was for Aristotle's contemporaries meant above all the transformation of a rectangle into a square equal in area and it was substantially equivalent to finding a mean proportional between two sides of a rectangle.

Thus the proposition 13, Book VI of the Elements keeps in itself a *tetragonismos* as follows: [4]

1. In the first place, two sides of a rectangle *ab* · *bc* (=*AB*) or two unequal segments *ab*(=*A*) and *bc*(=*B*), to which a mean proportional (*x*) is being sought, are presupposed.
2. These two sides or segments are added together to form one straight



Since the angle *AEC* is double of the angle *BAE* (for it is equal to the two interior and opposite angles), while the angle *AEB* is also double of the angle *EAC*, the angles *AEB*, *AEC* are double of the angle *BAC*. But the angles *AEB*, *AEC* are equal to two right angles; therefore the angle *BAC* is right."

4 See Á. Szabó, *The Beginning of Greek Mathematics,* D. Reidel Publishing Company, Dordrecht: Holland, 1978, Appendix 4, 'How to find a square with the same area as a given rectangle.' pp. 347-349.

line *ac* ($A+B$).

3. The line *ac* ($=A+B$) is bisected.
4. A semicircle with radius $(A+B)/2$ is drawn around it.
5. A perpendicular x is raised from the point b at which A and B meet to the circumference of the semicircle.
6. Then, this perpendicular x is a mean proportional between A and B and at the same time it is the side of a square having the same area as AB, since the right-angled triangles $\triangle abd$ and $\triangle dbc$ are similar to one another so that $A : x :: x : B$; and therefore $x^2=AB$.

III

Now, returning to the context of Aristotle's theory of justice in distribution, let us suppose two sides of a rectangle or two line segments $ab(=A)$ and $bc(=B)$, each of which corresponds to the abilities of the carpenter and shoemaker respectively. These two sides or segments are added together to form one straight line *ac* ($A+B$).Then, we bisect the segment *ac* ($A+B$) at the middle point *m*.[5] A semicircle with radius $(A+B)/2$ is drawn. A perpendicular is raised from the point b at which A and B meet to the circumference of the semicircle. Let the point of intersection be d. And let the line *bd* be x. Then, x is a mean proportional between segments A and B. Then, the triangles $\triangle abd$ and $\triangle dbc$ are similar to each other and they are also similar to the whole right-angled triangle $\triangle adc$. Now, let the segment *ad* be Γ and *cd* be Δ. Then, the following proportion is effected: $A : x :: x : B :: \Gamma : \Delta$.

IV

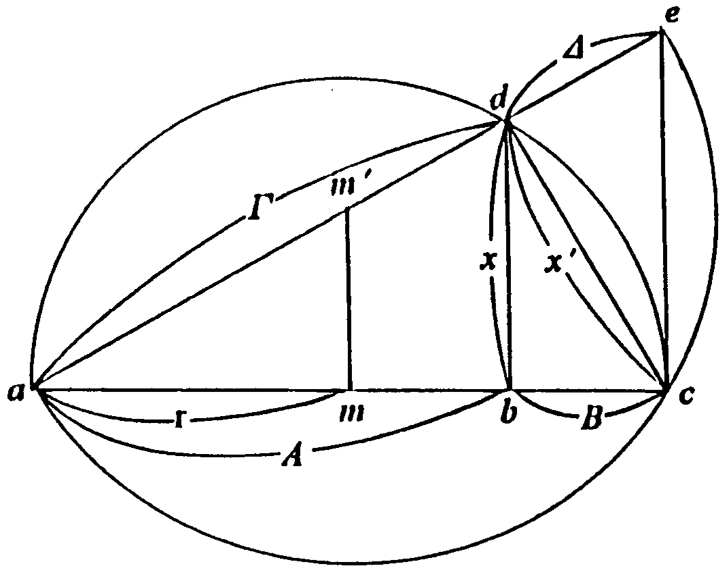
However, it is obvious that this formula is not the rationale which lurks behind the above cited Aristotle's utterace on the justice in distribution. The utterance suggests definitely the formula $A : B :: \Gamma : \Delta$, but not the former.

We must start afresh. Let A and B are abilities of carpenter and shoemaker and let Γ and

5 The operation of bisection should immediately remind us of Aristotle's utterance about the corrective justice (τὸ διορθωτικὸν δίκαιον); the bisection is the original point from which Aristotelian theory of justice starts.

Δ be the products of the carpenter and the shoemaker respectively. In that case, how can we establish a direct proportion $A : B :: \Gamma : \Delta$ between these four terms?

Now, in the right-angled triangle $\triangle adc$, the length *ac* is the base of it; the length *bd*(=*x*) is a mean proportional between segments *ab* (=*A*) and *bc* (=*B*) and determine the length of Γ at the point of intersection *d*. And *m* is the middle point of the length *ac*.



Let a perpendicular be raised from the middle point *m* to the segment Γ and let the point of intersection be *m′*. Then, the line *mm′* is parallel to the line *x*; hence *am* : *mb* : : *am′* : *m′d*. the line *am* is a radius of the circle *adc*.

Therefore the line *am′* can be also a radius of another circle. Draw a circle with radius *am′* around the point *m′*. Then, extend the length *ad* to the circumference and let the point of intersection be *e;* then the line *de* be Δ; furthermore, raise a perpendicular from the point *c* to *e* and let it be *ce.* The length *ce* is parallel to the length *x*; therefore, the ratio of *ab* to *bc* is directly proportional to the ratio of *ad* to *de*. Thus it obtains: $A : B : : \Gamma : \Delta$.

V

In the right-angled triangle $\triangle ace$, each of the triangles $\triangle abd$, $\triangle dbc$ and $\triangle cde$ is similar to one another and they are also similar to $\triangle ace$ itself. Therefore, the above cited Aristotle's utterance on the justice in distribution holds true for them as follows:

1. "The ratio between the first pair of terms (A, B) is the same as that between the second pair (Γ, Δ). For the two lines ($A+B$ and $\Gamma+\Delta$) representing the persons and shares are similarly divided; then, as the first term (A) is to the second (B), so is the third (Γ) to the

fourth (Δ)." That is to say, $A : B :: \Gamma : \Delta$.

2. "By alternation (ἐναλλάξ)[6], as the first (A) is to the third (Γ), so is the second(B) to the fourth(Δ)." [7] That is to say, $A : \Gamma :: B : \Delta$.

3. "And therefore also the whole to the whole (ὥστε καὶ τὸ ὅλον πρὸς τὸ ὅλον)." That is to say, $A : B :: A + \Gamma : B + \Delta$; and this is Justice in distribution.

What Aristotle conceived by 'the whole' (τὸ ὅλον) is not always obvious. However, many commentators took this context as the case $A + \Gamma : B + \Delta$.[8] Thus H. Rackham translated the locus as follows: "and therefore also, as the first is to the second, so is the sum of the first and third to the sum of the second and fourth."[9] Namely, $A : B :: A + \Gamma : B + \Delta$. It is clear that this interpretation is consistent with Aristotle's utterance "Hence the conjunction (σύζευξις=a synonym of Euclid's σύνθεσις; see *Elements*, V. def. 14; Prop. 17, 18)[10] of the first term with the third, and that of the second term with the fourth is the justice in distribution." (1131b8-10) And it is obviously right.

VI

Now, we should direct our attention to another aspect of the above construction. On the one hand, from the fact that $A : B :: \Gamma : \Delta$, it is the case that $A\Delta = B\Gamma$. On the other hand, in the above figure you can confirm a fact that the length dc is a mean proportional between Γ and Δ; thus, let dc be x'; then

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6 See Euclid, *Elements*, V. definition 13. Cf. also V. Proposition 16.

7 The expression is very similar to that of *Elements*, V. Proposition 16:"Let A, B, Γ, Δ be four proportional magnitudes, so that, as A is to B, so is Γ to Δ; I say that they will also be so alternately, that is, as A is to Γ, so is B to Δ." Aristotle refers to this proposition in *Meteorologica*, III 5, 376a22-24. See Heath, *E. E.*,Vol. 2, pp. 164-166.

8 See, for example, Henry Jackson, *The Fifth Book of the Nicomachean Ethics of Aristotle*, Arno Press, New York, 1973, Note to V.3, Section 12, p. 82; J. A. Stewart, *Notes on the Nicomachean Ethics of Aristotle*, Arno Press, New York, 1973, pp. 451-454.

9 H. Rackham, M.A., *The Nicomachean Ethics* with an English Translation, Loeb Classical Library, 1926, p. 271.

10 See Jackson, *op. cit.*, p. 82.

$A : x :: x' : \Delta$, hence $xx' = A\Delta$;

and also $\Gamma : x' :: x : B$, hence $xx' = \Gamma B$.

Therefore $xx' = A\Delta = B\Gamma$.

Now, let a mean proportional between the lengths x and x' be y, then $y = \sqrt{xx'}$; In other words, it is the case that $y^2 = A\Delta = B\Gamma$. What does the fact mean? I take this fact as a clue to the justice in reciprocity.

Concerning the requirements of justice in reciprocity, Aristotle said that the proportionate requital should be effected by the diagonal conjunction (ἡ κατὰ διάμετρον σύζευξις, 1133a7-8) and illustrated this as follows:

"For example, let A be a builder, B a shoemaker, Γ a house, and Δ a shoe. It is required that the builder shall receive from the shoemaker a portion of the product of his labour, and give him a portion of the product of his own. If then first there is proportionate equality (τὸ κατὰ τὴν ἀναλογίαν ἴσον) between the products, and then τὸ ἀντιπεπονθός (reciprocity) is effected, the result of which we speak will be attained."(1133a7-14).

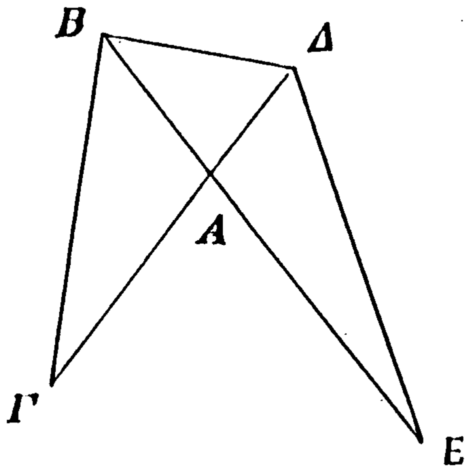
In order to establish the justice in reciprocity, we must first establish the proportionate equality between products. However, speaking more accurately in our context, what does "the proportionate equality between the products" mean? If we can detect a mean proportional by which the equation $A\Delta = B\Gamma$ is established, I think, we may take this as τὸ κατὰ τὴν ἀναλογίαν ἴσον in question; and this 'τὸ κατὰ τὴν ἀναλογίαν ἴσον' is, *ex hypothesi*, y. But how can we interpret Aristotle's above utterance?

VII

The kernel of our problem lies in the meaning of 'τὸ ἀντιπεπονθός.' In Euclid's *Elements* VI. 15 we read:

"Let $AB\Gamma$, $A\Delta E$ be equal triangles having one angle equal to one angle, namely the angle $BA\Gamma$ to the angle ΔAE;

I say that in the triangles $AB\Gamma$, $A\Delta E$ the sides about the equal angles are reciprocally proportional (ἀντιπεπόνθασιν), that is to say, that, as ΓA is to $A\Delta$, so is EA to AB."



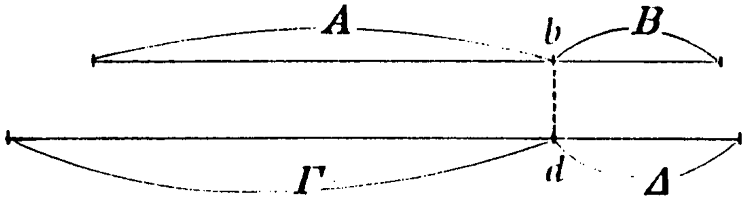
In general,

"Two magnitudes are said to be reciprocally proportional to two others when one of the first is to one of the other magnitudes as the remaining one of the last two is to the remaining one of the first."[11]

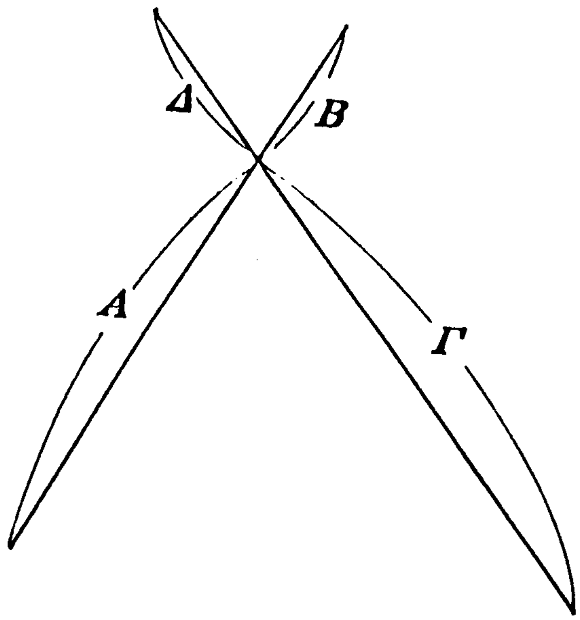
Now let us remind a fact that the proportion $ab(=A)$: $bc(=B)$: : $ad(=\Gamma)$: $de(=\Delta)$ was determined by a perpendicular *bd;* that is to say, a perpendicular raised from the point *b* to the circumference determined the point of intersecton *d,* so that the point *d* became an original point from which a new perpendicular *dc* was raised to the point of intersection *c*. The conjunction of the lengths $A+B$ and $\Gamma+\Delta$ was made possible by a combination of two points *b* and *d*, as if they were yoked together. We should firmly keep this fact in our mind, since the word σύζευξις in Greek (=combination) signified originally *a being yoked together*. By the way, according to Aristotle, both lengths $A+B$ and $\Gamma+\Delta$ should be *diagonally* combined one another (Ποιεῖ δὲ τὴν ἀντίδοσιν τὴν κατὰ ἀναλογίαν ἡ κατὰ διάμετρον σύζευξις: The diagonal conjunction effects a proportionate requital; 1133a6); but, not that cases of $A+\Delta$ and $B+\Gamma$; this is a crucial point to understand the matter correctly.

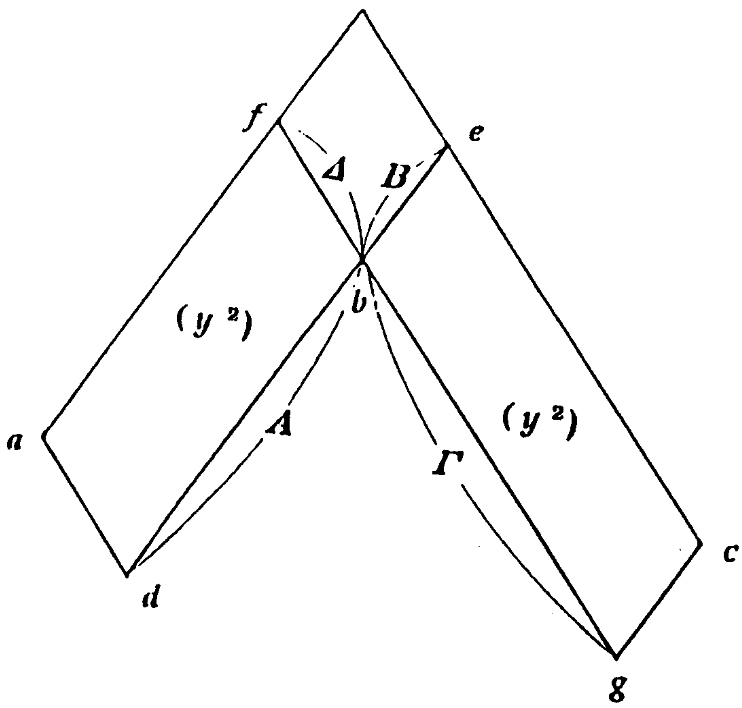
11 This is an alternative definition of the original definition 2 of *Elements* VI which was proposed by Simson and accepted by Heath. See Heath, *The Thirteen Books of Euclid's Elements,* Vol. II, p. 189; see also, Jackson, *ibid.* p. 93.

Then, how do you respond to this request? Beyond doubt, I surmise, you could accomplish the task as follows; namely, the two lengths are crossed on the point which is *b* and *d* at the same time.



I think, there is no other way which satisfies Aristotle's above wording διάμετρον σύζευξις(cross-junction). Now we should prove into the meaning of the word τὸ ἀντιπεπονθός. The solution of this problem hangs on our understanding of 'τὸ κατὰ τὴν ἀναλογίαν ἴσον' and of the equation $A\Delta = B\Gamma$ Here, let me draw a figure which reproduces an application case of the above cited Euclidean definition of the reciprocity (VI, Def. 2). We know immediately that (1) two magnitudes $A\Delta$ and $B\Gamma$ are equal in area to each other; so that (2) as A is to B, so is Γ to Δ. Therefore, the figure satisfies the requirements for the reciprocity. Namely, (3) $A\Delta(=y^2)$ and $B\Gamma\,(=y^2)$ are reciprocally equal to each other; and (4) therefore also the sides about the equal angles are *reciprocally proportional*.





The proof runs as follows: Let *ab* and *bc* be equal and equiangular parallelograms having the angles at *b* equal, and let the segments *A*, *B* be placed in a straight line; Thus the segments *Δ*, *Γ* are also in a straight line. Let the parallelogram *fe* be completed; then the parallelogram *ab* is equal to the parallelogram *bc*, and *fe* is another area; hence, as *ab* is to *fe*, so is *bc* to *fe*. Therefore, in parallelograms *ab*, *bc*, as *A* is to *B*, so is *Γ* to *Δ*. That is to say, the sides about the equal angles are *reciprocally proportional.*

Therefore, it is obvious that the justice in reciprocity does not clash with justice in distribution. However, speaking exactly, the justice in reciprocity is not the same as the distributive justice (v.2). In order to establish a justice in reciprocity among persons, in the first place, a mean proportional (=*y*) between two *diagonally* related magnitudes (*A* and *Δ*; or *B* and *Γ*; or *x* and *x'*) must be found out. This procedure is different from that of finding out a mean proportional between *A* and *B* or between *Γ* and *Δ*. They are quite distinctive from each other. Therefore, as Aristotle says explicitly, the justice in reciprocity is different from justice in distribution.

Now, returning to the historical background of justice in reciprocity, let us remind a fact that Aristotelian theory of τὸ ἀντιπεπονθός originated in his reflection on the Pythagorean justice: *lex talionis.* Although Aristotle accuses the Pythagoreans of confounding justice with 'simple reciprocation', it appears that his understanding of τὸ ἀντιπεπονθός still remains to be faithful to the traditional Greek idea of τὸ ἀντιπεπονθός. Thus the barter between carpenter (*A*) and shoemaker(*B*) is essentially reciprocal; the carpenter (*A*) must receive from the shoemaker (*B*) a portion of his work and must give him a portion of his own; thus they must be equalized ($AΔ=BΓ$; δεῖ ἰσασθῆναι, 1133a14), provided that this exchange is made according to *a proportionate equality* (τὸ κατὰ τὴν ἀναλογίαν ἴσον).

VIII

Thus, in regard to the difference between justice in distribution and justice in reciprocity, we may conclude as follows:

(1) The kernel of justice in distribution lies in its *direct* proportional structure. Initially the difference of labourers' abilities are presupposed ($A>$B). Then, to commensurate this

disproportionate difference a mean proportional (x) between them is interpolated; thus a proportional relation between abilities is effected ($A : x :: x : B$) and it becomes a principle of distribution. The distribution of wealth and honor, etc. is effected according to this *direct* proportion; that is to say, in the light of the ratio between persons' abilities, a mean proportional between goods (x') is looked for afresh. Speaking the matter geometrically, in that case, through the medium of these two proportional means, two *similar* but *unequal* plane figures ($\triangle\ adc$ and $\triangle\ ace$) are combined to each other in the framework of direct proportion: $A : B :: \Gamma : \Delta$; so that the proportion $A+\Gamma : B+\Delta :: A : B$ obtains.

(2) On the other hand, the kernel of justice in reciprocity lies in its *reciprocative* proportion. The initial problem is to square the values of products. Thus, in relative to the difference between labourers' abilities ($A > B$) a *reciprocative* proportion is effected between them (as $A\Delta$ *is to* ΔB, so is $B\Gamma$ to $B\Delta$; therefore also, as A is to B, so is Γ to Δ) and a proportionate equality is established ($y^2 = A\Delta = B\Gamma$, therefore $y = \sqrt{xx'}$). Speaking the matter geometrically, in that case, as a result of *tetragonizein* of the parallelograms $A\Delta$ and $B\Gamma$ respectively, two *equal* squares should be obtained; thus labourers themselves are to be squared and equalized with one another.

(3) However, the principle of reciprocity is also 'τὸ κατὰ τὴν ἀναλογίαν' in relative to the difference of labourers' abilities, so that the equality in question is under the regulation of the difference between labourers' abilities. Thus, though in an *occasional* barter A and B may get exactly equal things, nevertheless, in the long run, A takes more than B according to the superiority of his labour.[12] The difference between abilities,

12 A and B get exactly equal shares; and yet A takes more than B according to the superiority of his labour. In this respect it is worth to cite Stewart's notes; he says: "Let A be a workman of exceptional skill whose day's work is worth B's week's work. . . . if we consider A and B as contributing throughout a lifetime to the sum of the national well-being . . . A's entire receipts will be six times as large as B's; but that part of his entire receipts which A gets in the form of B's product, and that part of his entire receipts which B gets in the form of A's product, must be earned by exactly equivalent labour on the part of A and B respectively: . . . A and B are thus, *qua* exchanging equivalent products, i. e. A's quality being compensated for by the superiority of B's quantity; i. e. A's quantity and quality being reciprocally proportional to B's quantity and quality. A and B are thus, *qua* exchanging equivalent products, i. e. for the occasion, ἴσοι. Let the lines AA' and BB'

A--x--------------A'
B------------------------------x--------------B'

represent by their lengths the estimated total value of the labour performed in the working years of a man's life by these workmen A and B respectively: and let the equal parts A's x, taken from AA', and B's x, taken from BB', represent by their equal length the equal value of the products which A and B exchange. It is plain here that although A's x is equal finally, swallows the occasional equality of values between products. Thus, the reciprocative justice is after all under the supremacy of the inexorable principle of τὸ κατ' ἀξίαν.

(4) Therefore, as Aristotle explicitly says (V, 2. 1132b24), although the justice in reciprocity is not the same as justice in distribution, and yet it does not clash with the latter. The common denominator of them is after all each person's ability corresponding to the demand (χρεία).

(5) Both theories of justice make it a common presupposition that each person may take anything if it can be justified in relative to his ability of labour. Each person's ability is a final standard to measure each person's value (ἀξία), whereas in reality money (νόμισμα) as a substitute for person's demand (χρεία) makes its appearance into the site of our market and measures each person's ability substantially.[13] For "money is a middle term by which all things are measured, made commensurable and reduced into equality."[14] Therefore, we must in the first place establish the proportionate equality as a standard which is represented as *the value of money* and does measure the person's products, since "such a standard makes all things commensurable".[15] And, indeed, "all things are measured by money." (μετρεῖται γὰρ πάντα νομίσματι.)[16]

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to *B*'s *x*, it bears a smaller proportion to *AA'* than *B*'s *x* does to *BB'*.This means that the exchange of equivalent products 'takes more out of' *B* than 'out of' *A*. *A* and *B* are indeed *for the occasion* ἴσοι, else they could not be κοινωνοί: but, regarded *generally* as shareholders receiving dividends in virtue of labour contributed to the common fund of the national well-being, they are not ἴσοι: *A* is superior to *B*; and it may be a question for *B*, considering his economic inferiority to *A*, whether he can afford *to equal himself for the occasion* to *A*, i. e. whether he can afford to deal with *A* at all." See Stewart, *Op. cit.*, pp. 453-454.

13 Aristotle says in *Nic. Eth.* as follows: "It is therefore necessary that all commodities shall be measured by some one standard, . . .and this standard is in reality demand (χρεία). But demand has come to be conventionally represented by money (νόμισμα)."(V5, 11, 1133a26-30); "Money then serves as a measure which makes things commensurable and so reduces them equality."(V5, 14, 1133b16-18).

14 *Nic. Eth.,* V5, 15. 1133b16-17.

15 *Nic. Eth.,* V5, 14, 1133b7-14.

16 *Nic. Eth.,* V5, 15, 1133b23.

THE LOGIC OF JUSTICE
IN
ARISTOTLE'S *NICOMACHEAN ETHICS*, BOOK V

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In this paper I probe into the geometrical structure which lurks behind Aristotle's argument of justice in distribution (*τὸ διανεμητικὸν δίκαιον*) and especially justice in reciprocity (*τὸ ἀντιπεπονθὸς δίκαιον*) in the Book V of *Nicomachean Ethics*, and present a new solution for the interpretation of justice in reciprocity.

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