

Alexander of Aphrodisias and Peripatetic meteorology.
Explaining optical phenomena: the case of halo.

(1) Aristotle, *Meteor.* 3.2, 372a16-21

<p>(1) τὰ μὲν οὖν περὶ ἕκαστον αὐτῶν συμβαίοντα ταῦτ' ἐστίν· τὸ δ' αἴτιον τούτων ἀπάντων ταυτό· πάντα γὰρ ἀνάκλασις ταῦτ' ἐστί. (2) διαφέρουσι δὲ τοῖς τρόποις καὶ ἀφ' ὧν, καὶ ὡς συμβαίνει γίνεσθαι τὴν ἀνάκλασιν πρὸς τὸν ἥλιον ἢ πρὸς ἄλλο τι τῶν λαμπρῶν.</p>	<p>(1) Now, the characteristics of each of them are these. The cause of them all is the same: for all of them are reflection. (2) But they differ by the modes [of reflection], and from what things and how the reflection towards the sun or towards any other of the shining things happens to come about.</p>
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(2) Aristotle, *Meteor.* 3.2, 372a29-b

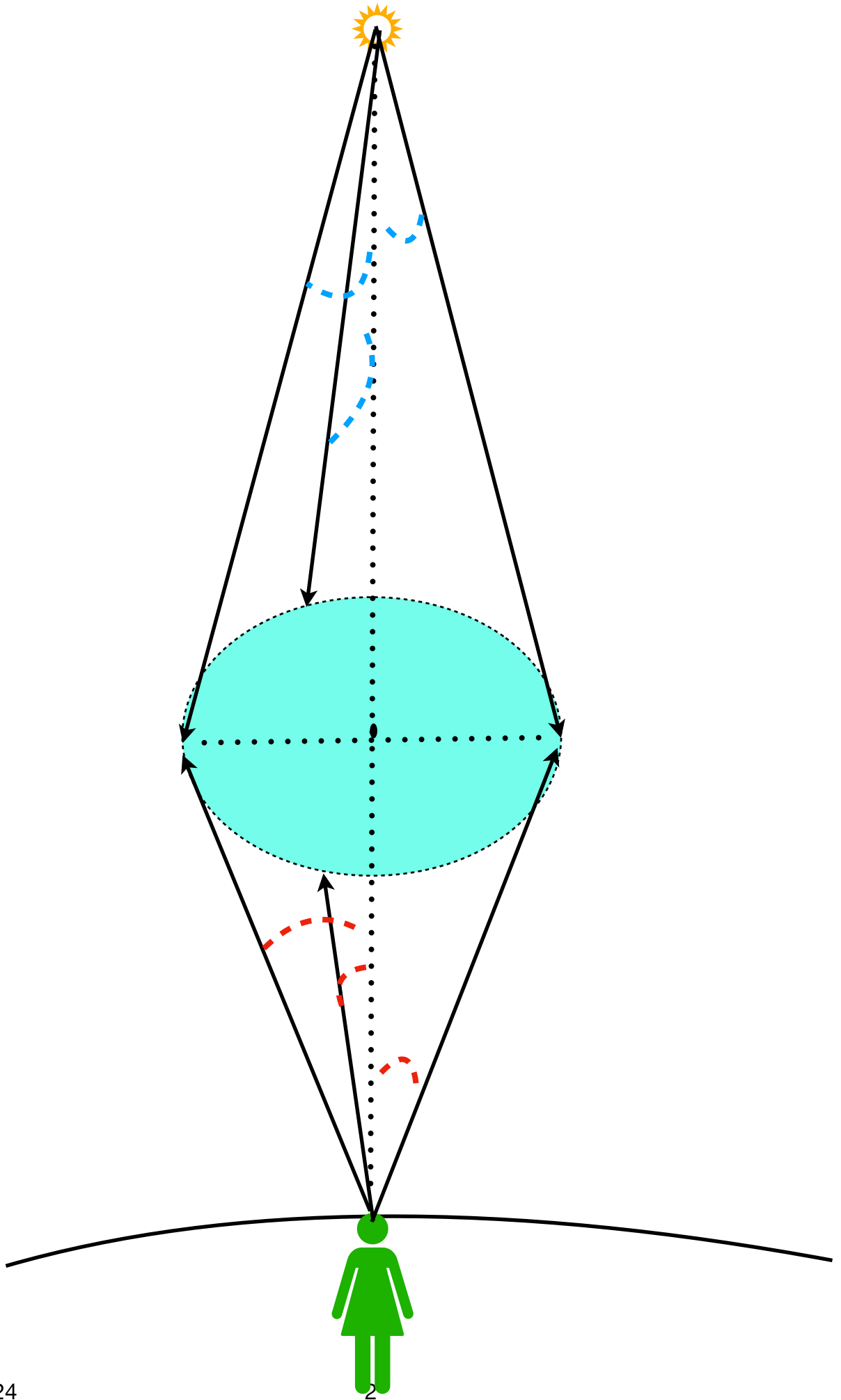
<p>(1) ὅτι μὲν οὖν ἡ ὄψις ἀνακλάται, ὡσπερ καὶ ἀφ' ὕδατος, οὕτω καὶ ἀπὸ ἀέρος καὶ πάντων τῶν ἐχόντων τὴν ἐπιφάνειαν λείαν, ἐκ τῶν περὶ τὴν ὄψιν δεικνυμένων δεῖ λαμβάνειν τὴν πίστιν, (2) καὶ διότι τῶν ἐνόπτρων ἐν ἐνίοις μὲν καὶ τὰ σχήματα ἐμφαίνεται, ἐν ἐνίοις δὲ τὰ χρώματα μόνον· τοιαῦτα δ' ἐστὶν ὅσα μικρὰ τῶν ἐνόπτρων, καὶ μηδεμίαν αἰσθητὴν ἔχει διαίρεσιν· ἐν γὰρ τούτοις τὸ μὲν σχῆμα ἀδύνατον ἐμφαίνεσθαι (δόξει γὰρ εἶναι διαιρετόν· πᾶν γὰρ σχῆμα ἅμα δοκεῖ σχημά τ' εἶναι καὶ διαίρεσιν ἔχειν), ἐπεὶ δ' ἐμφαίνεσθαι τι ἀναγκαῖον, τοῦτο δὲ ἀδύνατον, λείπεται τὸ χρῶμα μόνον ἐμφαίνεσθαι. (3) τὸ δὲ χρῶμα ὅτε μὲν λαμπρὸν φαίνεται τῶν λαμπρῶν, ὅτε δέ, ἢ τῷ μείγνυσθαι τῷ τοῦ ἐνόπτρου ἢ διὰ τὴν ἀσθένειαν τῆς ὄψεως, ἄλλου χρώματος ἐμποιεῖ φαντασίαν. ἔστω δὲ περὶ τούτων ἡμῖν τεθεωρημένον ἐν τοῖς περὶ τὰς αἰσθήσεις δεικνυμένοις· διὸ τὰ μὲν λέγωμεν, τοῖς δ' ὡς ὑπάρχουσι χρῆσώμεθα αὐτῶν.</p>	<p>(1) Now, we must take the demonstration from the science of optics as a ground for believing that the sight-stream is reflected from air as well as from water and all [bodies] that have smooth surface. (2) and that in some of the mirrors shapes too are reflected, while in some only colours. These latter are all the mirrors that are small and have no perceptible division. In these shape cannot be reflected (for it will seem to be divisible: for every shape seems at the same time to be shape and to allow of division). But since something must be reflected, and this is impossible, it remains that colour alone is reflected. (3) The colour of bright objects sometimes appear bright [in reflection], and sometimes either because of the admixture of the colour of the mirror, or because of the weakness of sight, it produces an impression of a different colour. Let us take these matters as studied in what has been proved about sense perceptions. therefore let us explain some of these and take the rest for granted.</p>
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(3) Aristotle, *Meteor.* 3.3, 372b15-18

<p>(1) πρῶτον δὲ περὶ τῆς ἄλλω τοῦ σχήματος εἶπωμεν, διότι τε κύκλος γίνεσθαι, καὶ διότι περὶ τὸν ἥλιον ἢ τὴν σελήνην, ὁμοίως δὲ καὶ περὶ τι τῶν ἄλλων ἄστρον· ὁ γὰρ αὐτὸς ἐπὶ πάντων ἀρμόσει λόγος. (2) γίνεσθαι μὲν οὖν ἡ ἀνάκλασις τῆς ὄψεως συνισταμένου τοῦ ἀέρος καὶ τῆς ἀτμίδος εἰς νέφος, ἐὰν ὁμαλῆς καὶ μικρομερῆς συνισταμένη τύχη.</p>	<p>(1) Let us first speak about halo, why it is a circle and why it is around the sun or the moon, and in the same way around some of the other stars. For the same reasoning will be suitable for all of them. (2) Now, the reflection of the sight-stream is formed when air and vapour are condensed into a cloud, if it happens to be condensed as smooth and made of small parts.</p>
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(4) Aristotle, *Meteor.* 3.3, 373a19 - 27

<p>(1) δεῖ δὲ νοεῖν συνεχῆ τὰ ἐνόπτρα· ἀλλὰ διὰ μικρότητα ἕκαστον μὲν ἀόρατον, τὸ δ' ἐξ ἀπάντων ἐν εἶναι δοκεῖ διὰ τὸ ἐφεξῆς. (2) φαίνεται δὲ τὸ μὲν λευκόν, ὁ ἥλιος, κύκλῳ συνεχῶς ἐν ἐκάστῳ φαινόμενος τῶν ἐνόπτρων, καὶ μηδεμίαν ἔχων αἰσθητὴν διαίρεσιν, (3) πρὸς δὲ τῇ γῆ μάλλον διὰ τὸ νηνεμώτερον εἶναι· πνεύματος γὰρ ὄντος οὐκ εἶναι στάσιν φανερόν. (4) παρὰ δὲ τοῦτο μέλαινα ἢ ἐχομένη περιφέρεια, διὰ τὴν ἐκείνης λευκότητα δοκοῦσα εἶναι μελαντέρα.</p>	<p>(1) The mirrors must be thought of as continuous. But because of smallness each is invisible, whereas the aggregate of all seems to be one because of the succession. (2) The bright light, i.e. the sun, is manifest as appearing continuously in a circle in each of the mirrors and having no perceptible division, (3) closer to the earth because it is calmer there. For if there is an air current, a clear structure does not obtain. (4) Next to it, there is a dark circumference which seems to be darker because of the brightness of the halo.</p>
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(5) Theophrastus *Meteorology* 14 (part), Arabic version by Ibn Suwâr ibn al-Khammâr, Daiber 1992.

<p>ذكر اسباب الدائرة الكائنة حول القمر</p> <p>(١) وأما الدائرة حول القمر متكون إذا غلظ الهواء و امتلأ بخارا حتى تحدث فيه من ضوء القمر حركة موجية كما انا نحن إذا القينا في الماء حجرا حدثت حول الحخر حركة مستديرة، (٢) و اما لأن شعاع القمر إذا صادف الهواء غليظا لطف الموضع المحاذي للقمر، و كلما لطف هذا الجزء من الهو غلظت الأجزاء التي حوله أكثر، و من أجل ذلك يكون الهواء الغليظ الذي حول هذا الجزء الذي قد لطف دائرة، (٣) و نظير ذلك أنه إذا نفخ انسان بأنبوب في موضع فيه تراب نقي الموضع الذي ينفخ فيه و اجتمع الغبار المنكس منه في الموضع المحيط بالموضع النقي و عمل دايرة، (٤) و الدايرة حول القمر تتحل <أما> إذا هبت ريح صعبة و بددت الغليظ و أما إذا كان مطر، (٥) فمن هذه الاسباب يكون كل واحد من هذه الاشياء</p>	<p>Report of the causes of halo formed around the moon</p> <p>(1) As for the halo around the moon, it is formed when air becomes thick and full of vapour so that in it from the moonlight an undulating movement is produced such as when we throw a stone into the water a ring-shaped motion is produced. (2) And indeed since the moon rays meet the thick air, the place opposite the moon becomes thin, and the thinner this part of the air, the thicker the parts which are around it. (2) And in this respect the thick air which is around this part that has been thickened is halo. (3) And similar to this is when someone blows through a pipe onto a place where there is dust, the place onto which he is blowing becomes clean and the dust that has been swept from it is collected in the place that surrounds the clean place and makes a ring. (4) And the halo around the moon grows thin either if a strong wind blows and scatters the thick or if there is a rain. (5) And these are the causes of each of these things.</p>
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(6) Arius Didymus, fr. 14 Diels (Stob. *Ecl.* 1.30.1, 240.13 - 241.3)

<p>Ἀριστοτέλους. (1) ἄλλω δὲ καὶ ἴριδας καὶ παρήλιον καὶ ῥάβδους καὶ τᾶλλα τὰ κατὰ τὰς ἐμφάσεις ὑπὸ μὲν τῆς αὐτῆς αἰτίας γίνεσθαι (πάντα γὰρ εἶναι ταῦτα τῆς ὄψεως ἀνάκλασιν), διαφέρειν δὲ τοῖς τόποις καὶ ἀφ' ὧν καὶ ὡς ἔχει συμβαίνειν τὴν ἀνάκλασιν. (2) ἄλλω μὲν οὖν καὶ περὶ ἥλιον φαίνεσθαι καὶ περὶ σελήνην καὶ καθόλου περὶ τὰ λαμπρὰ τῶν ἀστρῶν καὶ οὐθὲν ἥττον ἡμέρας ἢ νυκτός καὶ περὶ μεσημβρίαν ἢ δείλην· ἔωθεν δ' ἐλαττονάκις καὶ περὶ δύσιν. (3) συμβαίνειν δ' ὅταν διὰ τοῦ πέριξ ἀέρος ἀχλωδούς ὄντος ἐπιλάμπηται τὸ φῶς αὐτῶν, ὥσθ' ὄλον ὀραῖσθαι τὸν κύκλον· περιφανῆ γὰρ εἶναι καὶ σφαιρικὴν κατὰ τὴν ἔμφασιν τὴν ἄλλω.</p>	<p>Aristotle. (1) Halos and rainbows and mock-sun and rods, and the rest formed in accordance with impressions are produced by the same cause (for all these are the reflection of sight stream), but differ in locations and those from which and how disposed the reflection happens. (2) Now, halo appears around the sun and around the moon and generally around the bright stars, no less in daytime than at night and at midday than in the afternoon, but less frequently in the morning and at sunset. (3) And it happens when through the air around since it is misty their light shines forth so that the whole circle is seen. For halo according to the impression is seen from all sides and spherical.</p>
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(7) Aëtius 3.5a Mansfeld/Runia (was 3.18 Diels)

<p>Περὶ ἄλλω. ἢ δ' ἄλλως οὕτως ἀποτελεῖται· μεταξὺ τῆς σελήνης ἢ τινος ἄλλου ἀστρου καὶ τῆς ὄψεως ἀήρ παχὺς καὶ ὀμιχλώδης ἴσταται· εἴτ' ἐν τούτῳ τῆς ὄψεως κατακλωμένης καὶ εὐρυνομένης καθ' οὕτω τῷ κύκλῳ τοῦ ἀστρου προσπιπτούσης κατὰ τὴν ἔξω περιφέρειαν, κύκλος δοκεῖ περὶ τὸ ἄστρον φαίνεσθαι (ὅς κύκλος φαινόμενος ἄλλως καλεῖται, ὅτι ἐστὶν ἄλφ προσοικῶς), ἐκεῖ δοκοῦντος τοῦ φάσματος γίνεσθαι, ἔνθα συνέπεσε τὸ πάθος τῆς ὄψεως.</p>	<p>On Halo. Halo is formed as follows: between the moon or some other star and the sight-stream thick and misty air is set, next <u>because the sight-stream is bent and widened in it and then in this way it falls upon the circle of the star at its external circumference</u>, a circle seems to appear around the star (which circle is called 'halo' because it looks like a [round] threshing floor), the appearance seems to be in the place where the affection of the sight happens.</p>
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(8) Arabic compendium of Aristotelian meteorology, trans. by Ḥunain ibn Ishâq (Daiber 1975)

<p>القول فى الدائرة التى حول الشمس والقمر و حول الكواكب نوات الشعاع</p> <p>و هذه الدائرة ترى بالليل اكثر ما ترى بالنهار و قد ترى بالنهار احيانا و اكثر ذلك نصف النهار و بالعشاء . فاما عند طلوع الشمس و عند غروبها فقلما ترى. و علة هذه الدائرة كلها واحدة و ذلك لان البخار الرطب اذا كثر فى الجو فاشرقت الشمس و القمر و الكواكب النيرة فيه سطع نورها فى الهواء ثم عطف ذلك النور راجعا من الهواء على ذلك البخار الرطب فترى تلك الدائرة كذلك. و رؤية هذه الدائرة دالة. على كون المطر و كذلك اضمحلالها و تحللها دال على الصحو و هبوب الرياح. فاما دلالتها على هبوب الرياح فلان المحل لتلك الرطوبة انما هو البخار الحار اليابس الذى هو مادة الرياح.</p>	<p>The account of the ring around the sun, the moon and the stars that have rays.</p> <p>(1) This ring is seen more at night than during the day. It is seen sometimes during the day, more in the afternoon or in the evening. It is rarely seen at the sunrise and at the sunset. (2) The cause of all these rings is one, namely that when a lot of moist vapour builds up in the air and the sun, and the moon and the shining stars light upon it, their light is spread in the air, then <u>this light is bent back from the air to this moist vapour and this ring is seen in this way.</u> (3) And the appearance of this ring is a sign of the occurrence of rain and in the same way its disappearance and dissolution is a sign of clear weather and the blowing of winds: it indicates the arrival of clear weather because it is a sign of dry air, and it indicates the blowing of wind because what is released by this moisture is the hot and dry air which is the matter of the wind.</p>
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(9) Alexander, in *Meteor.* 141, 3 - 20: Aristotle does not favour the physical theory of sight streams

<p>(1) Οὐκ ἀρέσκειται μὲν τῆ δόξη τῆ δι' ἀκτίνων ἐκχύσεως ὁρᾶν ἡμᾶς λεγούσῃ, καθά φασι οἱ ἀπὸ τῶν μαθημάτων, ἣ δόξη ἀκόλουθός ἐστι καὶ ἡ δι' ἀνακλάσεως τῶν αὐτῶν τούτων ἀκτίνων ὁρᾶν ἡμᾶς πάντα τὰ δι' ἐμφάσεως ὁρώμενα λέγουσα. (2) (a) οὔτε γὰρ ἀπὸ τῆς ὄψεως ἀκτίνάς τινας ἐκχεομένας καὶ προσπιπούσας τῷ ὁρατῷ τοῦ ὁρᾶν αἰτίας ἡμῖν οἷόν τε γίνεσθαι (b) οὔτε τὰς αὐτὰς ταύτας ἀνακλωμένας ἀπὸ τῶν κατόπτρων καὶ πάντων τῶν διὰ τοιούτων ὁρωμένων ἐπὶ τὸ ὁρώμενον τὴν αἰτίαν πάλιν ἡμῖν παρέχειν τοῦ ταῦτα ὁρᾶν, τῆς τῶν ἀκτίνων ἀνακλάσεως πρὸς ἴσας γινομένης γωνίας. (3) ὅτι γὰρ ἀδύνατα ταῦτα, ἐδείχθη ἐν τοῖς Περὶ τοῦ πῶς ὁρώμεν, ὧν καὶ αὐτὸς ἐν τοῖς Περὶ ψυχῆς ἐμνημόνευσε. (4) δοκεῖ γὰρ αὐτῷ τὰ μὲν ἐπ' εὐθείας ὁρώμενα ὁρᾶσθαι οὐ δι' ἀκτίνων, ἀλλὰ τῷ τὸ μεταξὺ τοῦ τε ὁρωμένου καὶ τῆς ὄψεως διαφανὲς ὑπὸ τοῦ ὁρωμένου χρώματος πάσχειν καὶ μεταδιδόναι τούτου τοῦ πάθους τῆ ὄψει, οὔσῃ καὶ αὐτῇ διαφανεῖ· τοῦτο γὰρ εἶναι τὸ εἶναι διαφανεῖ· (5) τὰ δὲ κατὰ ἀνάκλασιν ὁρᾶσθαι δοκοῦντα ὁρᾶσθαι τῷ πρῶτον ἐν τοῖς ἐνόπτροις τε καὶ ἐνοπτρικοῖς πᾶσι τὴν τοῦ ὁρωμένου ἔμφασιν γινομένην διὰ τοῦ μεταξὺ διαφανοῦς εἶτα ἀπὸ τούτου πάλιν ἤκειν ἐπὶ τὴν ὄψιν διὰ τοῦ διαφανοῦς πάλιν τοῦ μεταξὺ τοῦ τε ἐνόπτρου καὶ τῆς ὄψεως.</p>	<p>(1) He does not favour the view according to which we see by the outflow of the rays, the way the mathematicians teach, the view which the teaching follows which claims that it is by the reflection of these very rays that we see all things seen as reflected images . (2)(a) For neither certain rays flowing out from our organ of sight and falling upon the object of sight can be the causes of our sight, (b) nor yet can these same rays reflected towards the object of sight from the mirrors and all things seen through them provide a cause for us to see these things insofar as the reflection of the rays is at the equal angles. (3) For he proved that to be impossible in the <i>On how we see</i> which he himself also mentioned in <i>On the Soul</i>. (4) (on 2a) For he thinks that things seen along the straight line are seen not by means of the rays, but because the medium between the object seen and the sight being transparent is affected by the colour and transmits this affection to the sight, which itself is also transparent. For this is what it is to be transparent.(5) (on 2b) Those things that are believed to be seen by reflection are seen because (a) first in the mirrors and all the reflecting surfaces the reflection of the object seen comes about by the transparent medium, (b) and then from this it travels back to the sight again through the transparent medium between the mirror and the sight.</p>
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(10) *Alexander in Meteor.* 141, 20 - 30

<p>ἐπεὶ δὲ οὐδὲν ὅσον ἐπὶ τῷ λόγῳ διαφέρει ἢ (α) τὴν ὄψιν λέγειν ἀπὸ τοῦ κατόπτρου ἀνακλωμένην πρὸς ἴσας γωνίας, ὅταν ὑπὸ τὴν τοιαύτην ἀνάκλασιν τύχη τὸ ὄρατὸν ὄν, προσπίπτουσιν αὐτῷ ὄραν αὐτό, ἢ (β) αὐτὸ τὸ ὄρατὸν διὰ τὴν ποιὰν σχέσιν πρὸς τὸ κάτοπτρον διὰ τοῦ μεταξὺ διαφανοῦς πάσχοντος ἐμφαινόμενον ἐν ἐκείνῳ, ὄντι τοιούτῳ [διαφανεῖ], ὡς μὴ μόνον πάσχειν ὑπὸ τοῦ χρώματος δύνασθαι οὕτως, ὡς διαδιδόναι τὴν ἀπ' αὐτοῦ ποιότητα ἄλλῳ διαφανεῖ, ἀλλὰ καὶ φυλάσσειν δυναμένῳ τὴν ἔμφασιν διὰ λειότητά τε καὶ στιλπνότητα, ὡς ἀπ' αὐτοῦ πάλιν τὸ μεταξὺ αὐτοῦ τε καὶ τῆς ὄψεως διαφανὲς πάσχειν ὡς ἀπὸ κεχρωσμένου, τῇ δόξῃ τῇ τῶν ἀκτίνων καθωμιλημένη τε οὕση καὶ τοῖς μαθηματικοῖς ἀρεσκούση προσχρήται.</p>	<p>But as far as the argument is concerned, it makes no difference whether to say (a) that sight-stream reflected from mirror at equal angles, when the visible object happens under such reflection, sees it by falling upon it, or (b) that the visible object itself because of a certain position relatively to the mirror is reflected in it through the affected transparent medium, and this mirror is such that it can not only be affected by the colour so as to transmit a quality from it to another transparent, but is capable of preserving the reflection in virtue of its smoothness and brightness, so that the transparent medium between it and the sight is affected by it again as by a coloured object.</p> <p>So Aristotle uses the view of the rays as it has won a common currency and is favoured by the mathematicians.</p>
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(11) *Alexander in Meteor.* 142, 21-143, 7

<p>(1) Καὶ πρῶτόν γε περὶ τῆς ἄλλω ποιεῖται λόγον καὶ ζητεῖ περὶ τε τοῦ σχήματος αὐτῆς διότι κύκλος, καὶ διὰ τί περὶ αὐτὸν τὸν ἥλιον ἢ τὴν σελήνην ἢ τι ἄλλο τῶν ἄστρον περὶ ὃ ὄραται γίνεται, ἀλλ' οὐχὶ καταντικρῶ φέρε εἰπεῖν ἢ ἐκ πλαγίων. (2) φαίνεσθαι δὴ φησὶ τὴν ἀνάκλασιν τῆς ὄψεως ἐν τούτοις ἀπὸ τῆς συνισταμένης ἀτμίδος εἰς νέφος μετὰ τὸ ἀνενεχθῆναι, ἂν ἡ σύστασις αὐτῆς ὀμαλῆς τε καὶ μικρομερῆς συνισταμένη τύχη. (3) τοιαύτης γὰρ οὕσης αὐτῆς, ἂν ὑπερφερόμενον αὐτῆς ἄστρον τι τῶν λαμπρῶν ἢ ὁ ἥλιος ἢ ἡ σελήνη τύχη, τὸ μὲν κατὰ τὴν κάθετον τοῦ ὑπερφερομένου σώματος ἀνάγκη διακρινόμενον μανότερόν τε καὶ λεπτότερον γίνεσθαι, μέχρι τινὸς τῆς τοιαύτης προοιούσης ἐν αὐτῇ κινήσεως, τὸ δ' ἐντεῦθεν οὐδὲν τοιοῦτον πάσχει, μένει δὲ οἷόν περ ἐστί. (4) ἐξ ἴσου δὲ πάντῃ περὶ τὴν κάθετον τοῦ τοιοῦτου συμβαίνοντος διὰ τὴν ὀμαλότητα τοῦ νέφους, κύκλον ἀναγκαῖον γίνεσθαι τὸ πέρασ τῆς ἐπιεικῶς διακεκριμένης ἀτμίδος. (5) ἀφ' οὗ τὸ ἐπέκεινα πάλιν μᾶλλον μὲν συνέστηκεν, ὀμαλὲς δ' ὄν καὶ μικρομερῆς συνεχῆ καὶ μικρὰ κάτοπτρα κατὰ τὴν τοῦ κύκλου περιφέρειαν ἴσχει, πρὸς ἃ (α) κατὰ μὲν τοὺς τὴν τῆς ὄψεως ἀνάκλασιν αἰτιωμένους ἢ ὄψιν προσπεσοῦσα ἀνακλασθεῖσα πρὸς τὸ ἄστρον τὴν τῆς ἄλλω φαντασίαν ποιεῖ, (β) κατὰ δὲ τὸ ἀληθὲς τὸ φῶς τὸ τοῦ ἄστρου προσπίπτον τοῖς προειρημένοις κατόπτροις, ἔπειτα ἐπὶ τὴν ὄψιν τὴν ὀρώσαν ἀνακλασθέν τε καὶ διαδοθὲν ποιεῖ τὴν φαντασίαν τῆς ἄλλω. ἐν γὰρ τοῖς εἰρημένοις κατόπτροις διὰ μικρότητα, τοῦ χρώματος ἔμφασιν γίνεται μόνου.</p>	<p>(1) And first he makes an argument about the halo and inquires about its shape, why it is a circle, and why it is comes about around the sun itself, or the moon, or some other of the starts at which it is seen and not opposite, say, or sideways. (2) And he says that the reflection of the sight-stream appears in them from the vapour that is condensed into cloud after being raised up, if the structure happens to be settled as smooth and consisting of small parts. (3) For since [this vapour] is such, if some of the bright stars happens to be carried above it, or the sun, or the moon, that which is perpendicular to the body moving above must be dissolved and become looser and finer in texture, such a motion proceeding in it up to a point, and thereupon it is not affected by anything of the kind, but remains as it is. (4) And since such a process takes place evenly on every side at the perpendicular because of the smoothness of the cloud, the limit of the properly dissolved vapour must be a circle. (5) The part beyond it is more condensed, but being smooth and made of small parts has continuous small mirrors along the circumference of the circle: (a) according to those who use the explanation by the reflection of the sight stream, the sight-stream falls upon these [small mirrors] and being reflected towards the star makes an impression of a halo, (b) while in truth the the light of the star falls upon the mirrors mentioned above and then being reflected upon and transmitted to the sight that is seeing produces the impression of a halo. For in these mentioned mirrors because of their smallness only colour is reflected.</p>
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(12) Alexander in Meteor. 143, 8-14

καὶ ἡ μὲν Ἀριστοτέλους δόξα περὶ τῆς ἅλω ὡς ἐπὶ κεφαλαίων τοιαύτη. ἐπηκολούθησε δὲ αὐτῷ καὶ Ποσειδώνιος, πάντων σχεδὸν τῶν ἄλλων οὐ κατὰ ἀνάκλασιν, ἀλλὰ κατὰ κλάσεις ὄψεων αἰτιωμένων, ὡς ἐπὶ τῶν δι' ὕδατος ὀρωμένων γίνεται· ὑποτίθενται γὰρ σφαιροειδὲς καὶ κοῖλον τὸ νέφος, ἔπειτα τὸ ὑπερκείμενον ἄστρον αὐτοῦ κατὰ κύκλον φασὶ διεσπασμένον ἐν αὐτῷ ὀρᾶσθαι. ἀλλ' ὅτι μὲν αἱ τοιαῦται δόξαι περὶ τῆς ἅλω ψευδεῖς, ἰκανῶς ὁ διδάσκαλος ἡμῶν Σωσιγένης ἐν τῷ ὀγδόῳ Περὶ ὄψεως ἔδειξεν.	And such is Aristotle's view of the halo summarised. Posidonius too followed him, while practically all the rest explained it not with reflection, but with the bendings of the sight-streams, as happens with the things seen through the water. For they assume that the cloud is spherical and hollow, then they say that the star lying above is seen in it as broken up along the circle. But that such views about the halo are false, our teacher Sosigenes has sufficiently shown in Book 8 of his <i>On sight</i> .
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3 οὐ κατὰ] οὐκ a fort. recte

4κατὰκλάσεις B_{Wa} κατὰ κλάσεις Hayduck

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