

## Descartes' Perception Theory of Dissimilarity in *Optics* Mainly Centered from Discourse 1 to Discourse 6

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### Abstract

Descartes' *Optics*, in spite of its natural scientific appearance, can be situated in the history of the philosophy as an important text of the perception theory. Since the sense of sight is traditionally regarded to have the intimate relationship with the knowledge which begins in perception, optics implies commonly accepted attitude to the science in 17<sup>th</sup> century. The essential difference between the optics of ancient ages and that of Descartes consists in whether the fundamental explanation model is efficient-causal mechanism or not, and this change offers certain philosophical changes which is quite radical. Firstly, both the world as external object and human being as sensing body are *equally* subordinated to the objective law of nature. Secondly, in the course of the perception, everything exchanged is not any material which has various qualities, but just operation-movement which has only extensional quality. Then the corporeal image has double sense, that one is image as inner corporeal movement of the body and another is image as an effect of the movement. The world becomes a sign which is realized geometrically. However, behind the superficial necessity of the world, there is fundamental arbitrary nature between the law and its phenomenon, and this gap is a place for God. Lastly, the mind, the real place of perception, is not subordinated such objective law, but totally different substance than body. It causes a difficult problem which perception theory would have to solve in a different relation between the body and the mind.

### 1 Introduction:

#### ***Optics* as perception theory based on efficient-causal mechanism**

We can express those which every perception theory explains in its explicit aim or incidental effects, in minimum words as following: *Something perceives something, and the very perceived is something. And what are those somethings?* If we can say that Descartes' *Optics* is a remarkable perception theory text in the history of philosophy, it is because his work presents a special answer for that question directly and indirectly. Now, at the starting point of the whole argument, we can make Descartes' answer as a simple sentence as following : *the human being, who consists of body and soul, perceives external objects through the physical and physiological process, and the very perceived are ideas of the*

*soul*. Our reading will be focused on how the text gives a concrete form to that sentence.

First of all, we should note the term of “the physical and physiological process”, because this point contrasts with ancient optics sharply. What determines the rest of three *some things* will be an ontological problem, and they will be assigned their ontological status by an ontological implication of “the physical and physiological process”. Through this work, we can confirm the meaning and the value of the *Optics* in the history of philosophy.

However, we need to justify the particular characteristics of *Optics* first. To situate this text in the history of philosophy at a stroke, the text is too natural-scientific and it gives too much importance to the sense of sight exclusively, so it can evoke uncomfortable feeling to philosophical readers. Why should we find philosophical essence in the realm of Optics? Or inversely, why does the perception theory need such a natural-scientific explanation?

To answer those questions, we have to consider the traditional close correlation between seeing and knowledge in general. The sense of sight is not just one of the five senses which have equal importance, but a privileged sense, and this privilege concludes to the intimacy with the intellectual, the rational, and the truth. Descartes also was not the exception. He writes in the opening of *Optics*, “since that (sense) of sight is the most comprehensive and the noblest of these (senses)”<sup>1</sup> This is why Optics as inquiry about the vision and the light has a natural, direct connection with an inquiry about knowledge, which begins in the inquiry about the sensation and perception<sup>2</sup>.

Inquiry about optics in a geometrical way had already appeared in ancient ages, but that theoretical attempt came down to the similarity between the seeing and the seen, which is rather ambiguous and mystic. In the 17th century, however, under the influence of the development of natural science, the domain of optics also uses physical and physiological way, so that paradigm of optics is changed radically. Herefrom, the correspondence between the object and the idea is understood as the effect of completely measurable and intelligible process that is ruled by objective efficient-causal law. Optics, in the context of the mechanic revolution, shows new conceptual connections and new ontology.

Descartes’ *Optics* is the forerunner in this theoretical background. Three big parts composing *optics* are; first, the inquiry about the physical nature of the light in order to explain the process of the formation of the images in the back of eyes from the luminous body. Second, physiological and anatomic explanation of the process from the retinal image to brain. Third, inquiry about ideal images. For the convenience of our argument, we will indicate those processes as reception, transmission, and perception respectively. And we will not treat all the details, but the big figure of this text.

<sup>1</sup> *Optics*, R. Descartes, translated by Paul J. Olscamp, Hackett Publishing Company, p. 65, the original work of Descartes in French, *Œuvres philosophiques 1618–1637*, R. Descartes, édition de F. Alquié, Edition illustrée, p. 651

All the citations of *Optics* follow the translation of Olscamp.

<sup>2</sup> For Descartes, like most of the 17th century philosophers, sensation and perception does not have any conceptual differences.

## 2-1 Process of Reception (from ray of light to the eyes): World and ourselves

For Descartes, what the sense of sight receives from the external objects is not *similar material* which is called by scholastic philosophers as *intentional species*. He sets his object of investigation as following.

*Thus, not having here any other occasion to speak of light than to explain how its rays enter into the eye, and how they can be deflected by the different bodies that they encounter, I need not undertake to explain its true nature.*<sup>3</sup>

From this phrase, we can translate its meaning more positively, according to the whole text of *Optics*. He treats the light not as a material object which has various qualities, but only in the viewpoint of movement. It implies that every external object, as far as it is perceived by vision (and maybe other senses too), can be reduced into its operation. All visual objects, therefore, are various modes of the operation of ray of light, whose various qualities are abstracted. Differences and distinctions among particular visual objects come from different modes of operation and movement, not from their inner material qualities. From now on, first possibility of perception theory of dissimilarity is open; since object itself -as long as there is such a kind of something- is not *similar* to movement of the ray of light.

In fact, when perceiving objects we don't put the objects itself into our eyes. Then the state of sense organ and sense data in the course of reception can be an ontological problem. With this respect, it has great significance that Descartes' first metaphor is that of the blind person.

*I would have you consider light as nothing else, in bodies that we call luminous, than a certain movement or action, very rapid and very lively, which passes toward our eyes through the medium of the air and other transparent bodies, in the same manner that the movement or resistance of the bodies that this blind man encounters is transmitted to his hand through the medium of his stick. [...] In consequence of which, you will have occasion to judge that there is no need to assume that something material passes from the objects to our eyes to make us see colors and light, nor even that there is anything in these objects which is similar to the ideas or the sensations that we have of them.*<sup>4</sup>

Generally accepted similarity between the idea and object owes to the privilege of vision, and at the same time, the privilege of vision owes to that similarity. However, in perceiving something, what if we receive non-similar thing abstracted various qualities rather than similar something? Then we can compare all kinds of sense on the equal plan, even though each sensation is related to different sense organs and different qualities of sense objects. Moreover, if we are permitted to go further through this metaphor, we can see that our eyes and external objects are not something mystic and creative but something suited only to the mechanic operation. Then, the world itself and

<sup>3</sup> Olscamp, p. 66, Ferdinand Alquié, p. 653

<sup>4</sup> Olscamp, pp. 67-68, Alquié, p. 655

we ourselves will have different ontological meaning than before, as long as all the senses follow the process of operation and movement. Maybe it is Descartes' *Body* as substance having its *extension* attribute.

## 2-2 Process of Transmission (from retinal image to brain): The status of Image 1<sup>5</sup>

Retinal image in the back of the eyes, which is formed by receiving light coming from an object, is now transmitted through the nerve to the brain. Process of transmission also is explained by neurophysiologic mechanic process, replacing similarity model.

In this course of transmission, something transmits something *actually*, and retinal image must correspond to the ideas in the mind. Remind the famous experiment in the 5, 6 discourse which shows the geometrical process of the formation of retinal image<sup>6</sup>. Images imprinted in white body RST represent objects reduced into operation of ray of light faithfully. As following Descartes saying, "on the white body RST, you ought to see there the likeness of the objects V, X, Y. in the white body RST"<sup>7</sup>.

This experiment show only the reception process, but not the transmission process which retinal image is delivered to the pineal gland through nerves. Anyhow, this similar retinal image really does exist in this step, and we cannot deny its existence even though our purpose is the perception theory of dissimilarity. However, does not Descartes want to avoid this word of similarity himself? How can we refuse this similarity if we want to re-present something? Now we can pose two questions related to the status of image. First, how can we accept the similarity between retinal image or cerebral image and the external object, while Descartes denies to similarity model of perception theory? Second, what is that something transmitted?

To give an answer to the first question, we must clarify Descartes' intention when he refutes the traditional perception theory condemning for the explanation based on similarity. Through that refutation, Descartes want to say that there is no room for the similarity in the explanation of the corporeal process of perception. Everything in the process is simply operation-movement, and movement itself is not similar to the object itself or idea itself.

However we can find certain similarity between *the effect* of such a movement -retinal images, images in the brain- and external object *ex post facto*. It means that the active aspect of the image is operation-movement while its passive aspect is similar concomitant of the object. When some accident interrupts this process, perceiver would have distorted perceptions, but it is due to distorted movement process rather than due to distorted retinal images or brain images. It coincides with

5 For Descartes, image is primarily a corporeal thing. However, sometimes he confuses it with ideas of the mind, the reason why is idea corresponds directly with the image. In *Optics*, Descartes seems to think image in two manner. First, image as corporeal movement itself. Second, image abstracted from that movement which we can find in certain places in the body (like back of the eye, in the brain...) In other words, the former is image as a causal movement, the latter is image as an effect of that movement.

6 Refer to the appendix, picture 1

7 Olscamp, p.94, Alquié, p. 688

Descartes' phrase as following: "we must note that it is only a question of knowing how they can enable the mind to perceive all the diverse qualities of the objects to which they refer; not of knowing how the images themselves resemble their objects."<sup>8</sup>

Nevertheless there is no need to devaluate the status of image in *Optics* on account of priority of operation-movement, or on the ground that perception without images also exists such as situation perception or distance perception. In reality, Descartes tries to determine the nature of image with the considerable amount of pages in the discourse 4. We must not forget that "it is necessary to beware of assuming that in order to sense, the mind needs to perceive certain images transmitted by the objects to brain, as our philosophers commonly suppose", but at the same time "the nature of these images must be conceived quite otherwise than as they do"<sup>9</sup>. Images in their usage make no contribution to the explanation of the perception. This mere naive illustration or supposition only induced from the superficial experience, has no theoretical value. For Descartes, Image implies in itself operation-movement as its own ground and reason (in particular sense), and is unthinkable apart from that. Descartes' image is always under its way, and effect of corporeal things which keeps on *drawing*.

Now we can answer the second question, "what is that something transmitted?" Actually the transmitted thing is just operation-movement which can be distinguished, only by the distinction of reason, with the corporeal elements of body which deliver it. Since all the movements are movements of the bodies. Here is second proposition of the *dissimilarity*. There is no similarity between the retinal image and movement of the nerves and the brain. Moreover, the very movement is nothing but the movement which forms the similar image on the surface of the brain related directly to the soul, similar to the retinal image, consequently makes the same effect as if retinal image is transmitted directly to the brain. "not only do the images of objects form thus on the back of the eye, but they also pass beyond to the brain."<sup>10</sup>

It would be possible to say that operation-movement considered with corporeal elements -such as eyes, nerves, brain- as a whole, implies images in itself, while images indicate operation-movement in themselves, since no images can be produced without it.

Operation-movement is subordinated to the objective law of nature, so image also, which implies necessarily that movement is an objective being. For all that, it does not mean that image can re-present the external object perfectly. In the 5, 6 discourses, Descartes writes about the several cases that visual perception cannot represent external objects as they are. Sometimes we represent far situated objects as smaller than they really are, and in the perimeter of the focus, images become dimmer than the center. If it is accepted that we can approach to more perfectly composed objects by the aid of the instruments, relatively, it means that our visual perception contains some kind of lack. However, when we consider the objective conditions such as the structure of the formation of the eyes, distance from the object, quantity of the light such a lack is an objective effect, that all the corporeal elements being involved in the perception produce by following the objective law. In this respect, there is no error in the images even though there is some lack.

8 Olscamp, p. 90, Alquié, p. 685

9 all the citation in this paragraph, Olscamp, pp.89-90, Alquié, p. 685

10 Olscamp, p. 100, Alquié, p. 697

### 3-1 The Nature Composed of the Geometrical Signs: The status of image 2

From the preceding argument, two propositions of *dissimilarity* was affirmed, i.e. 1) dissimilarity between the object and the movement, 2) dissimilarity between the image as an effect and the movement as a cause. However, when we perceive something, we are not conscious of the process of operation-movement, but recognize only its effect, that is an image as an idea, and believe it is sufficient representation of the external object. New aspect of image poses a new problem. Can we really say there is any similarity between the object and the image, abstracting the operation-movement of that image? In the preceding part of this paper we compare the object with retinal image, but it was just under the relation with operation-movement. Now we compare the object with the image as effect directly.

*We must at least observe that there are no images that must resemble in every respect the objects they represent - for otherwise there would be no distinction between the object and its image.<sup>11</sup>*

As long as the perceiver cannot absorb the external object itself into his eyes, there must be certain difference between the object and the image. The issue is whether the formulating language is that of similarity or dissimilarity. Similarity implies the resemblance but at the same time it implies necessarily the non-resemblance too. If Descartes tried to explain it in the language of similarity, his theory would suffer from the lack of the objects. Instead of it, he approaches with the “sign”, which is the term of dissimilarity.

*We should consider that there are many other things besides pictures which can stimulate our thought, such as, for example, signs and words, which do not in any way resemble the things which they signify. [...] You can see that engravings, being made of nothing but a little ink places here and there on the paper, represent to us forests, towns, men, and even battles and storm, even though, among an infinity of diverse qualities which they make us conceive in these objects, only in figure is there actually any resemblance.<sup>12</sup>*

Image is a sign which indicates an object. Sign indicates only its dissimilitude, but it can indicate more perfectly than indication with similitude. When Descartes says in the first passage of the discourse 5 that sense image is not similar but fully perfect, it means the signifying character of the image. Then what does it mean fully perfect image exactly? For example, the smoke is the sign of the fire, but by itself we cannot acquire the sufficient knowledge of the fire itself. If we regard perception image like this, at once, we come to accept the profound abyss of the ignorance. For another example, the word ‘pencil’ indicates the object ‘pencil’, but their relation is not necessary but only arbitrary. Pencil can be named as other possible words like ‘sea’ or ‘tiger’ instead of ‘pencil’. If the perception image were such an arbitrary system, we could not know something real about

<sup>11</sup> Olscamp, pp. 89–90, Alquié, p. 685

<sup>12</sup> Olscamp, p. 89, Alquié, p. 685

the object, even though we can make a perfect correspondence system between the object and the image. Then, how can we give up the minimum similarity which assures the real knowledge? No, we cannot. But this similarity differs from the one that we have already denied.

*Even though, among an infinity of diverse qualities which they make us conceive in these objects, only in shape is there actually any resemblance.*<sup>13</sup>

We can verify from this passage that engraving, which compares with non similar perception image, do not reject all the similarity. The external object and the internal image can be met in their contents, quite really. Image is the sign of the object, but at least, not the mere arbitrary sign.

The important point of this passage is that the only mark of the similarity is the *figure*. We already know that in *Rules for the Direction of the Mind*, figure is implied in every sensual object as a common and simple one, that is, universal measure. From hence that universality is applied not only to external objects, but also to image as a certain corporeal thing. Existing commonly in the nature and the perceived image, figure guarantee that the perceived does not exist exclusively in the perceiver as a purely ideal being, but its attribution to the external object is quite legitimate.

### 3-2 The Establishment of the Nature

In this chapter we need to return to the efficient mechanism which forms and transmits the image. Our conclusion in the preceding chapters was the dissimilarity between the image and the operation-movement. Then we can ask how the operation-movement can make the very image which does not have any similarity or common character. Is there any necessity between them? There is certain correspondent relation among the object → retinal image → cerebral image → ideas of the mind. However the movements which make those terms, i.e. 1) movement of the ray of light from the object, 2) movement in the nerves and brain which forms images do not have to follow such a mechanism necessarily. Not in the physical sense but in the metaphysical sense. We, human beings, who are finite, cannot discover the necessity between them even we investigate the nature thoroughly. It poses an interesting metaphysical problem. Between the object and its movement, image as effect and its movement, there is fundamental arbitrary nature.

Here intervenes the concept of the *establishment of the Nature*. First of all, Nature establishes the form in which external object stimulate the body of the perceiver. Secondly, Nature establishes that certain particular movement makes certain particular effects of that movement, i.e. certain particular phenomenon. In other words, Nature establishes the form in which operation-movement of the bodies should be interpreted, interpreted to certain images or ideas. There is no reason for the Nature to exist (or to move) in that way.

Generally, the human being who perceives, accords their ideas to the external object directly, but such ignorance about the process does not interrupt his daily practice. If he decides to investigate the physical mechanism of the world, then he can approach to the laws behind the phenomenon.

<sup>13</sup> Olscamp, p. 90, Alquié, p. 685

However, even though he can know everything in the physical world, *en droit*, he would not grasp the very reason why this world exists as it is, and he would not discover the necessity of the signs in general, which means the nature realized geometrically. In the root of the superficial necessity of the Nature, arbitrary nature of the Reason exists.

#### 4 Corporeality of the mind, or transcendental subjectivity?

Third process of perception of the mind is essential stage of whole process, but at the same time, somewhat mystic. Descartes describes in several phrases that the only place of the perception is in the mind. For instance, in forth discourse, he says that “We already know sufficiently well that it is the mind which senses, not the body”<sup>14</sup>. In the experiment of the discourse 5, without the man, who plays a role of the perceiving mind, retinal image would be meaningless movement of the Nature, which has nothing to do with the perception. While the mind is not awake, the human being perceives nothing even though his sense organs function physically. This process is not considered profoundly due to the natural scientific characteristic of *Optics*, and very difficult point to think about, for the perception theory based on the substantial distinction between body and soul. Since, according to the common notion, the mind (or the soul) is not the part of the Nature which is realized geometrically, so that the mind cannot receive the corporeal movements, in peace of the objective law of nature.

One phrase in the *Sixth Meditation* seems to be the response.

*In similar fashion, when I feel a pain in my foot, physiology tells me that this happens by means of nerves distributed throughout the foot, and that these nerves are like cords which go from the foot, they in turn pull on inner parts of the brain to which they are attached, and produce a certain motion in them; and nature has laid it down that this motion should produce in the mind a sensation of pain, as occurring in the foot.*<sup>15</sup>

We can finish our argument by using the second arbitrary nature, between body and soul, but it seems to give up the investigatable problem too early. We find some phrases which make us to determine more positively the relation between them. “It (the mind) can see immediately only through the intervention of the brain”<sup>16</sup>, moreover, “[...] the mind in the brain”<sup>17</sup>. Even more, “The nature of our mind is such that the force of the movements in the areas of the brain where the small fibers of the optic nerves originate cause it to perceive light, and the character of these movements cause it to have the perception of color.” “If we understand the corporeal as being belonged to the body, the mind, even if it has different nature, as long as it is appropriate to be united with the body, can be told the corporeal.”<sup>18</sup> These phrases almost seem to insist the corporeality of the mind!

<sup>14</sup> Olscamp, p. 87, Alquié, p. 681

<sup>15</sup> *Meditations on First Philosophy*, translated by John Cottingham, p. 60

<sup>16</sup> Olscamp, p. 87, Alquié, p. 682

<sup>17</sup> Olscamp, p. 101, Alquié, p. 700

<sup>18</sup> Letter to Arnaud, july. 29. 1648, recitation from Fichant, p. 15



At this point, I dare to advance. Whenever Descartes excavates natural scientific investigation of the perception, he seems to reach, inexplicitly, to the unity of body and soul which can be separated hardly, to the immediacy between them, and to a certain kind of corporeality of the mind. Of course this is not coherent with his own thesis, which affirms their incommensurability. However, our modern readers who are not necessarily agreeing with the substantial duality of body-mind can have the desire for the misreading even though it is only valid in a few texts of Descartes. For instance in *Fifth Set of Objections with Replies*, Descartes says that what really matters is not the sense of sight or touch, but seeing thinking, or touching thinking. What about explaining it from an angle of the body thinking in itself, which has spiritual characteristic in itself? In other words, in some sense, our modern philosophers are somewhat forced to invent *thinking body*.

At the same time, for me, another interpretation seems to be possible too. This interpretation asserts that insufficiency of Descartes was in his lack of cognition about the transcendental nature of the mind. The picture of the discourse 5 poses an interesting question. A man in this picture plays a role of the mind which really perceives, i.e. has ideas. However, following the principle of that picture, does not the man need another small man in his head? If so, that small man also needs another smaller man in his head... and to infinity. We cannot help falling in the infinite regression. Then, to resolve this intricate problem of the mind perceiving the body, we may establish the transcendental subjectivity which is not exactly the soul. As a matter of course, it is not the perfect dissolution of the difficulties, but to solve this infinite regression, we can no more depart from the corporeal elements and receiving character of mind, but from the transcendental subjectivity.

Descartes' perception theory cannot avoid the swinging of the pendule between these two inclinations, as long as he puts the body and soul as two distinct substances.

## 5 Conclusion

Before finishing this paper, return to the first problem model, i.e. "*Something perceives something, and the very perceived is something. And what is those somethings?*" Now we can see Descartes' answer more precisely. The body's sense organs receive the mechanical operation of the objects in the nature, which is realized geometrically, and it is transmitted to the brain which is a part of the body subordinated to the objective law of nature, and it is perceived by the soul, and the finally, the soul get the ideas of the external objects.

After these six discourses, *Optics* treats instruments as an applied optics. These following parts of the optics owe its ontological justification to the assertions in six first discourses. As Descartes says in the beginning of *Optics*, "All the management of our lives depends on the senses, and since that of sight is the most comprehensive and the noblest of these, there is no doubt that the inventions which serve to augment its power are among the most useful that there can be."<sup>19</sup> Instrumental beings can be united directly with the human body, and help it increase its power, because in the object world and human body, ontological equality is guaranteed by the equal validity of the law of nature. To correlate each other without certain mediacy or detour, they must be equal beings. Since Descartes, eyes are not the mystic given, but the natural instrument, like other sense organs.

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19 Olscamp, p. 65, Alquié, p. 651

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## Appendice

picture 1

