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“COLOUR AS MATHEMATICS: AN APPROACH ON
WITTGENSTEIN’S “REMARKS ON COLOUR””

Remarks on Colour (Bemerkungen über die Farben),

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INTRODUCTION

Wittgenstein’s “Remarks on Colour”¹ (1950) is an unfinished work found on top of his desk, at Cambridge University (England), that he seemed to be working on, and re-writing, until the last days of his life. As we get all remarks together and read them we definitely get a confusing result. In “Tractatus Logico-Philosophicus” (1921) and in “Philosophical Investigations” (1950), though the style also indicated a predominance of short sentences, there seemed to exist an orientation, a goal. In “Remarks on Colour” (1950) what is clear is that Wittgenstein does not have a goal, he is thinking on colour, directly from his mind to his pen. We can experience his mind struggling with it and uncertainty is all over. But then again, “ (...) In any serious question uncertainty extends to the very roots of the problem”. (III, §44) And colour seems to be a serious enough question. Nevertheless, there is a serious scientific approach underneath.

1 Every reference with no further footnote will always refer to WITTGENSTEIN, Ludwig,

1. COLOUR:
A NON-PSYCHOLOGICAL
APPROACH

Several times, Wittgenstein vigorously states that his approach on colour is not psychological one. Before asking what approach is it then, let us try to understand how Wittgenstein comprehends this non-psychological feature of his approach.

A psychological approach speaks of appearance and connects it with reality. (III, §232) So sentences like “the appearance of white or grey comes under such and such conditions (causally)” (III, §229) is what psychology can and does offer. In short: “Psychology describes the phenomena of seeing.” (III, §168) But psychologists are not the ones that teach us the use of the word “seeing”. (III, §337)

At this point, several questions come up: why is there a necessity of such a science that *describes* seeing? And since we *do* see what are we trying to achieve by describing it? What kind of issue are we trying to address and to whom are they relevant? These are not up to psychology to answer for what is being questioned is the role of psychology itself when it comes to colour. Why is not possible to address these

questions within psychology and why do we have to step outside of it to answer to them? A few of Wittgenstein's remarks show us that. For instance: How do we *understand phenomena* of colour-blindness, and normal colour too, that psychologists *describe*? (III, §55) How are we able to learn those descriptions? (III, §283) What seems to be at stake here, more than mere *description* is understanding what enables us to do such descriptions. In order to find that out we must look carefully on what lies behind those.

2. THE PHENOMENON OF COLOUR

Goethe, in his "Theory of Colours" (1810) does precisely that: a very careful and detailed description of colour phenomena. So we could think, at first, that what he is trying to do is colour psychology. Still, we can not help thinking that for someone that is doing colour psychology his observations are not very polished, they are too raw. He does not seem to manipulate them in order to achieve a goal, or to make a point. What sense can we make of them then? What Goethe is trying to achieve is not an explanation of colour phenomena, nor is he trying to structure them in a specific way in order to make that description more evident (which would serve psychology gladly). Goethe tries to collect several colour phenomena, expressing them in the most simple way, describing them as if untouched by any kind of judgement/ rational thinking, ordering them in such a way that we firstly understand that all those simple sentences together uncover a mystery that lies within colour phenomena itself and secondly that by studying those observations carefully, those should be enough to exhibit

the magnitude of that mystery. In the end of all, Goethe's theory of colours shows us that something that is constantly at hand (colour) not only is unknown to us as it is a mystery hard to grasp. And "Theory of Colours" aims at showing us "why".

Wittgenstein's remarks are a valuable contribution to clarify this question formulated by Goethe: why is colour phenomena unknown to us? Though this question is never stated clearly, it is the question that underlies the whole work. In this sense Wittgenstein's remarks continue Goethe's work and he is the one clarifying that "Psychology connects what is experienced with something physical, but we connect what is experienced with what is experienced." (III, §234) So, it is really not about the physical aspect of colour that they both dwell on but on the experience we have of colour. In other words, *to know* colour is not to know its physical behaviour only; *to know* colour we have to understand how we interact with it, how we experience it. A psychological approach on colour is a monologue; an experience-based approach is a dialogue. The obscure meaning of Wittgenstein's sentence is more explicit if we add the following sentence: "(...) Well, the fact that we use certain words such as "saturated", "muddy", etc. is a psychological matter; but that we make a sharp distinction at all, indicates that it is a conceptual matter." (III, §211)

Therefore we seem to have two different views when it comes to our experience of colour: one which makes us not to question the fact that we see, and that we see in a specific way (*use/ experience*); and another view that makes us consider that the way we deal with colour, as apparently well grounded in logic, is logically unsustainable. (III, §4; III, §9)

Despite the topic of colour phenomena is not fully graspable logically the way we deal with it, works in daily life. So there seems to be something we *know* about it that is not demonstrated by logic only (or just to a certain extent). Not only what we *know* about colour works, as we are able to learn it, teach it and talk about it. And we are able to do that concerning a topic that seems to escape thought constantly, provoking a constant anarchy to any attempt to order it according rational thought. According to logic's own principles, logic is a *necessary* criterion to understand colour but not a *sufficient* one.

Wittgenstein's effort is to find out if it is possible to offer *sufficient* criteria to understand colour phenomena. How does he do that? Using a method², the phenomenological method.

3. COLOUR AS A PHENOMENOLOGICAL PROBLEM

Using the phenomenological method allows Wittgenstein not to state a hypothesis to start with, that he then tries to prove all the way his remarks (being this the classical scientific method). Like Goethe, Wittgenstein adopts the phenomenological method that embodies a collector's attitude. No premises are taken as a starting point and what leads us to a final result is the phenomena itself and not what we may think the phenomena is. It is this collector's attitude that sustains Wittgenstein's sentence "There is indeed no such thing as phenomenology, but there *are*

phenomenological problems." (III, §248) Phenomenology makes full sense when applied to phenomena precisely because it is a method and not a theory in itself.

When Wittgenstein states that Goethe's "Theory of Colours" "it is not a theory at all" because nothing can be predicted by means of it (III, §125) what he is saying is that we can not try to look for something in it that was never meant to be offered. (We can, but we will be disappointed.) We can read it and instead of looking for something, we have to carefully observe Goethe's sentences as carefully as he has collected them. Only then we will find something and, according to Wittgenstein, that is, the nature of colour: "(...) And here 'nature' does not mean a sum of experiences with respect to colours, but it is to be found in the concepts of colour". (III, §125)

We are now far from a psychological approach on colour and further from a physical one. Wittgenstein and Goethe's approach is about the concept of colour phenomena and to Wittgenstein that means to dwell on the logic of colour concepts. "We do not want to find a theory of colour (neither a physiological nor a psychological one), but rather the logic of colour concepts. And this accomplishes that which people have often unjustly expected from a theory." (III, §188) So to think on the logic of colour phenomena is to think about the concept of colour and that is what Wittgenstein offers us instead of a theory. Wittgenstein said about Goethe's "Theory of Colours" that it was not a theory and so are his remarks not one. Though that is not what we could expect from a traditional scientific approach on colour it is what both authors aimed at. Why have they took the option of a non-traditional scientific approach on colour phenomena?

² "In philosophy it is not enough to learn every case *what* is to be said about a subject, but also *how* one must speak about it. We are always having to begin by learning the method of tackling it." (III, §43)

Colour is a good topic to understand the limits of traditional scientific approach because: what can be a necessary and sufficient scientific approach to grasp such a rebellious, ever changing, seemingly-unscientific phenomenon? “(...) The logic of the concept of colour is just much more complicated than it might seem.” (III, §106)

The “ever changing” character of colour made Wittgenstein try to understand how we experience it using the concept of comparison (since we can only say something changes if we compare it with something else). The comparison concept allows us to determine that we can, and we do, compare surfaces and that it is an operation that is essential to our experience of colour, that enables us to say “that is the same colour” or “that is a different colour”.³ That is why “Among the colours: Kinship and Contrast. (And that is logic.)” (III, §46) But to what we compare it too? To other colours we perceive only? What are we using as reference when we compare? How does our colour concept is crafted? Wittgenstein attempts two possible answers: pure colours and context.

4. ESTABLISHING A COLOUR CONCEPT

It would be possible to think that we would compare colours using as a reference the concept of pure colours but it is not at all clear *a priori* “which are the simple colour concepts”. (III, §69) Wittgenstein goes even further saying: “There is no such thing as *the* pure colour concept”.

3 “(...) How do I now determine that a surface (for example) has this colour? Everything depends on the method of comparison.” (III, §259). “(...) it isn’t from the out set clear how shades of colour are to be compared, and therefore, what “sameness of colour” means here.” (III, §265)

(III, § 73) Then the interesting question becomes: “Where does the illusion come from then?” (III, §74) All colour concepts, and colour names, seem to be close to each other but all of them are different. (III, § 75) So maybe, talking about colour concepts is “a premature simplification of logic like any other”. (III, §74) Even if we consider the question of the number of Pure Colours, from a psychological point of view, what is the *importance* of that question to describe what we see? (III, §26) We see the way we see and not because in our minds we are consciously aware that we see the way we do because there are “x” pure colours. Moreover, even if different people have different colour concepts, from a *use* point of view, that hardly affects mutual understanding. (III, §32)

Though the concept of pure colours may not even exist it does play a part in our common language use when we speak about colour.⁴ It is part of the game. “I say: The person who cannot play *this* game does not have *this* concept.” (III, §115) This means that to understand Wittgenstein’s concept of concept, and to access colour logic, we have to identify what is colour’s language game. This means that not only what we see but also how we talk about what we see can help us unveil colour phenomena.⁵

What we are trying to grasp is “what is colour”, and in order to do that we have to understand its logic, and for that to happen we have to recognize that our

4 “Would it be correct to say our concepts reflect our life? §They stand in the middle of it.” (III, §302)

5 Not only color phenomena but also other phenomena: “I don’t know *how* irritated he was”. “I don’t know if he was *really* irritated”. – Does he know himself? Well, we ask him, and he says, “Yes, I was.” (III, §305)

perception of, let us say, grey, results of an impression of a certain context.⁶ Context is a very volatile option to try to establish a definition of a phenomena but concerning colour it seems definitely to be one since the difficulty is stated clearly by Wittgenstein himself: “(...) How do we compare physical objects – how do we compare experiences?” (III, §315) How to come up with a definition that makes compatibility between what we see with the way we talk about it, especially considering that we make others access what we see through the way we talk about it. That is why then that concerning context we have two relevant notions: gesture and language-games.

Colour concepts (logic) are affected by colour use. That is why “(...) The lives of the blind are different from those of the sighted”. (III, §319) Meaning: “(...) Practices give words their meaning”. (III, §317) And for sure a blind person does not use colour concepts in the same way as someone sighted. Therefore, inevitably, both have different colour concepts. Following Wittgenstein’s example: “A blind man could easily find out if I am blind too; by, for example, making a certain gesture with his hand, and asking me what he did.” (III, §344) Gesture is able to give us a context to better understand a person’s colour logic which will makes us have a different language-game to speak about it towards someone sighted or blind. That is why gesture is one more item to consider when reflecting on colour but it is still not enough.⁷ Because we do talk about colour,

6 “It is not the same thing to say: the impression of white or grey comes about under such and such conditions (causally), and to say that it is the impression of a certain context (definition). (The first is Gestalt psychology, the second logic.)” (III, §229)

7 “The ‘world of consciousness’ cannot be de-

not only with someone blind, but also with someone sighted, we have to communicate something we perceive. How do we make sure that that happens? How do we learn colour’s language game? And “(...) to what extent is it a matter of logic rather than psychology that someone can or cannot learn a game?” (III, §114) There are things we say, that are part of colour language game, that go beyond psychology, like the fact that it is hard for us to conceive something ‘grey-hot’ (III, §222).

Everything in colour seems to be an exception in that sense that it is an ever-changing phenomenon. When we look at one colour and try to show it to someone else, the colour is not the same anymore. “To observe is not the same thing as to look at or to view. § “Look at this colour and say what it reminds you of”. If the colour changes you are no longer looking at the one I meant. §One observes in order to see what one would not see if one did not observe”. (III, §326) Here Wittgenstein is making a distinction between to observe and to look, similar to his distinction between being and seeming. A colour may seem like “x” and that information is given by the surface where it appears to me but also along with the surface information (associated with to look and seeming) there is its identity, and my identification of its identity as “colour x” (associated with to observe and being). Is it possible to distinguish both operations? According to Wittgenstein, no, it is not possible: “Being and seeming may, of course, be independent of one another in exceptional cases, but that doesn’t make them logically independent; the language-game does not reside in the exception”.

scribed with a sweeping gesture.” (III, §316)

(III, §99) So colour language game logic implies an intertwined connection between being and seeming.

If there are no such thing as Pure Colours, if there are several colour concepts, if colour is ever-changing, if being and seeming are almost impossible to distinguish, if the identity and definition of colour is constantly escaping us, how is it then possible to make a diagram of colours, or establish a colour system? Wittgenstein approaches the topic of doing geometry, in order to create a colour system (III, §86; III, §154), and the question is that a system assigns a limited number of colours, though many colours in between can be perceived by us. That is why any system hardly can actually translate our full capacity to perceive colours. And also, let us not forget, because we are the ones building those systems it shows that those finite systems are actually sustained by our infinite ability to perceive different colours. That is why we should bare in mind that since we can build different systems to account colour we should strongly consider the existence of many other colours as possible, and also new colours. Because we can think about their existence we just do not see them yet still. In other words, the possibility of other colours though they are not visible, as a possibility, are part of our language-game. (III, §63, III, §127) When we refer the possibility of recognized a potentially infinite number of colours, and new colours, we are not talking only about the possibility of one day (perhaps) our visual system evolves and we are able to see new colours. What we are saying is that right now, infinite colours can be perceived by us in the sense that infinite contexts (were) are (and will be) presented to us and we are able to identify this or that colour, despite that infinite

variety of colours presented in very different contexts.⁸ “The difficulty is therefore, one of knowing what we are supposed to consider as the analogue of something that is familiar to us”. (III, §88) When do we know that a colour system works? When do we know that it is a good analogy to express our colour logic?

5. COLOUR AS SURFACE VS. COLOUR AS SUBSTANCE. TO BE AND TO SEEM

The question seems to be that we can do a distinction between “colours of substances” and “colours of surfaces”. (III, §254) A very good example to understand this is given by Wittgenstein himself: Though “*Golden* is a surface colour” (III, §100) and there is gold paint, “Rembrandt didn’t use it to paint a golden helmet”. (III, §79) Still, we recognize the object as a helmet as if the way he chooses to paint is analogous to gold. “The difficulties which we encounter when we reflect about the nature of colours (those difficulties which Goethe wanted to deal with through) are contained in the fact that we have not *one* but several related concepts of the sameness of colours”. (III, §251) To Wittgenstein, the indefiniteness of the concept of sameness of colours resides precisely in the method of comparing colours. (III, §78) What are we comparing it too, what are we using as reference?

Words, only “characterize the impression of a surface over which our glance wonders”. (III, §64) It is therefore the way we *use* colour that makes us realize

8 That is why colour concepts should be treated like the concepts of sensation (III, §71, III, §72) meaning they should try to attain the most possible range of sensations.

that words hide a specific colour language game. Wittgenstein makes an analogy in order to make clearer what kind of language game (logic) that is: mathematics.

Wittgenstein says about his colour remarks: “Here we have a sort of mathematics of colour”. (III, §3) Why does Wittgenstein do this analogy and to what extent is it relevant to understand his colour approach? Let us add another remark that can help us clarify that: “Can one describe higher mathematics to someone without thereby teaching it to him? Or again: *Is this instruction a description of the kind of calculation? To describe the game of tennis to someone is not to teach it to him (and vice versa). On the other hand, someone who didn’t know what tennis is, and learns how to play, then knows what it is. (“Knowledge by description and knowledge by acquaintance”.)*” (III, §291) The analogy between colour and mathematics gives us, in my view, the key to understand Wittgenstein’s approach as a non-psychological one, first of all, and secondly, as a phenomenological one. It is not a psychological one since psychology’s main aim is to *describe* and mathematics, as colour, is not defined in its essence by any effective description. It is a phenomenological one because its full grasp is only attained when experienced. This means that, like mathematics, the language game of colour is only fully exhibited in its full complexity when we consider its use. Moreover, it is in its use that its identity fully reveals since any attempt to *describe* it will always be insufficient. I can *describe* a language game to a blind person, or to a colour-blind person, but I cannot *demonstrate* it (III, §279, III, §284). If this is the case, then how is it possible that people learn the meaning of colour names? (III, §61) Again another analogy sentence on mathematics can provide and

answer “I could even exactly imitate someone who is doing a multiplication problem without being able to learn multiplication myself. §And I couldn’t then teach others to multiply, although it would be conceivable that I gave someone the impetus to learn it.” (III, §289) What Wittgenstein is saying he is that somehow we learn colour names though we are not sure that we are able to teach them (since its identity is so volatile). Still, we all seem to share a common colour logic spontaneously making out of colours words or colour concepts a secondary issue. It is the common way in which we *use* it that proves the existence of a colour identity. That identity is not possible to be translated successfully into a theory but that is not a bad thing.⁹ It is better to do that than to forge a theory that actually distorts a phenomenon instead of exposing effectively. What can it be an effective exposure of colour phenomena? It is possible to make a non-temporal exposure of it or will it always have a temporal, limited validity in time? Wittgenstein explores the relation between a “mathematics of colour” and a “natural theory of colours”. (III, §8, III, §9, III, §10, III, §11, III, §135)

6. A MATHEMATICS OF COLOUR

Is it possible to clearly distinguish a temporal (“natural theory of colours”) and a non-temporal (“mathematics of colour”) *use* of colour phenomena? Maybe it is

9 “Here I would like to make a general observation concerning the nature of philosophical problems. Lack of clarity in philosophy is tormenting. It is felt as shameful. We feel: we do not know our way about here we *should* know our way about. And nevertheless it *isn’t* so. We can get along very well without these distinctions *and* without knowing our way about here.” (III, §33)

again a confusing and hard to distinguish both when we consider colour *use*. But if we were aiming to do a natural theory of colours we would have to report on their occurrence in nature, not on their *essence*, and therefore its propositions would have to be temporal ones. (III, §135) This means that if we try to do more than to report colour occurrence in nature then we know that we are aiming at doing something that it is not a natural theory of colours (only). We are aiming to do a non-temporal demonstration of colour dwelling on its *use*, by trying to unravel its language game exhibited in context, gestures and words.

Ultimately, like mathematics, colour it is expressed through a language game that serves as an analogy in the sense that expresses something we do not know to which main reference relates with.¹⁰ Still we are able to experience, use it and demonstrate it, constantly (though the way we systematize it is insufficient and the way we teach it escapes our full control which reinforces the logic of colour only grasped an analogy).

CONCLUSION

It was our intent to provide an understanding of Wittgenstein's "Remarks on Colour" taking as main key the obscure sentence "Here we have a sort of mathematics of colour". (III, §3)

¹⁰ And the problem of knowing or not knowing does definitely not concern to psychology "If we introduce the concept of knowing into this investigation, it will be of no help; because knowing is not psychological state whose special characteristics explain all kinds of things. On the contrary, the special logical of the concept "knowing" is not that of a psychological state." (III, §350)

In order to do that that we first tried to show that though many times Wittgenstein's "Remarks" are hastily taken as psychological ones, they are not and the fact that he states that so often must be taken into account. Having said that, the question is that even if we do not consider the remarks as a non-psychological approach we are left with the question "they are not psychological but are they then?". Because, yes, they do seem confusing and yes they do seem to lack direction, maybe because it is an unfinished work but I believe not only because of that. Wittgenstein's approach aims to escape something that we spontaneously expect from him: a theory. And if we read the remarks constantly waiting him to deliver one we certainly end up facing his approach as unproductive and weak. Wittgenstein also tells us not to expect a theory from him – as Goethe, according to him, has also not provided one for him (and for us). But again we have the same problem "if it is not a theory what is it then?". I think it is an attempt to *demonstrate* our colour logic by exhibiting the many sides of a "too well known" language game to us. And by exposing that language game as a *demonstration* the remarks themselves become an analogy of our colour concept *use*. By doing that Wittgenstein is not failing on any expectation towards our ability "to know" what is colour. First of all, and more important than "to know" (more important than to obey classical scientific criteria) it is important to give a priority to the expression of the phenomena itself. And only then we can try to make some sense of it. Forging knowledge at the phenomena's distortion expense, that is what Wittgenstein tries to escape and he does so successfully. If that implies that at the end of it we know little about colour phe-

nomena that means that we have to find a more efficient and effective way to grasp it trying fiercely new approaches. "One must always be prepared to learn something *totally* new". (III, § 45)

Wittgenstein's "Remarks", like Goethe's remarks on "Theory of Colours", are not casual ones and they should not be taken lightly. Wittgenstein actually proposes a specific scientific approach on colour, a serious one, though the way he expresses it is not according to classical scientific patterns. Wittgenstein states: what is at stake is method (logic), demonstration (comparison) and context (definition/ identity) and not causality, description and explanation.

"Remarks on Colour" shows how can colour be taken as a philosophical topic, and not as a psychological and how can we distinguish both approaches. It is about *demonstrating* and not about *describing*. It is about colour identity, colour concept, colour logic and colour use. Wittgenstein provides a valuable example that totally escapes psychology: "(...) One person may react to the order to find a "yellowish" blue by producing a blue-green", another may not understand the order. What does this depend upon?" (III, §110)

Wittgenstein does use a phenomenological approach in the sense that method and phenomena are presented as one (at once, at the same time): *demonstration* is provided by method and vice-versa. This approach can surely be useful to psychology but it such be considered as prior to it since phenomenology questions the ground in which psychology sustains at.

Like mathematics, colour is only *demonstrated* when we *use/ do* it. That is why when using the language game of colour we are expressing an analogy. And when we try to unravel the way we use it we realize that do so having as reference some-

thing unknown to us. That is why Goethe says: "The colours are acts of light; its active and passive modifications: thus considered we may expect from them some explanation respecting light itself".¹¹ To grasp colour logic we must attain how it acts and only its active and passive modifications, following the dynamics of a heartbeat, will though some light over it.

11 GOETHE, Johann Wolfgang von, Theory Of Colours (1810), (Intro: D. B. Judd), MIT Press, 1978 (1970), Preface, p. xxxvii