

# KANT AND THE CONSTRUCTION OF PURE REASON: AN ANALOGY WITH A CHEMICAL EXPERIMENT<sup>1</sup>

---

JOEL THIAGO KLEIN

<https://orcid.org/0000-0003-2665-9113>

UFPR

*Department of Philosophy*

*Curitiba, Paraná*

*Brazil*

[jthklein@yahoo.com.br](mailto:jthklein@yahoo.com.br)

## Article info

CDD: 142.3

*Received: 27.11.2021; Revised: 26.05.2022; Accepted: 26.07.2022*

<https://doi.org/10.1590/0100-6045.2023.V46N1.JK>

## Keywords

Constructivism

Chemical Experiment

Kant

Pure Reason

**Abstract:** This paper defends a constructive interpretation of the *Critique of Pure Reason*, which is built in analogy with an experimental construction that Kant believes to be characteristic of chemistry. I also argue for a way to reconcile the methodological perspective of the constructivist method with that of transcendental reflection. I therefore provide a constructive explanation for what Kant describes as being

---

<sup>1</sup> Research supported by CNPq (bolsa produtividade em pesquisa) and PROEX/CAPES, Auxílio N°. 0320/2021, Processo N°. 23038.006752/2021-95, PPGFil-UFSC.

pure reason and the argument of the transcendental deduction. I propose to frame the different perspectives in such a way that the experimental construction is the *ratio cognoscendi* of pure reason, while pure reason is the *ratio essendi* of the experimental construction.

O'Neill (1989, 2015) is one of the most important scholars that have argued for a constructivist reading of the *Critique of pure reason* (CPR). In this paper I develop and explore new aspects of this line of interpretation. One of the main criticisms raised against constructivist readings of Kant's philosophy is an alleged commitment to subjectivism or voluntarism (cf. Kleingeld & Willaschek 2019). This concern led some scholars to rename their position as constitutivist instead (Korsgaard 2009; Sensen 2013, 2017; Formosa 2011). Constitutivism, is intended to be a sort of constructivism capable of avoiding voluntarism. However, it becomes difficult, sometimes, to differentiate between the constitutivist and foundationalist positions, which are based on transcendental reflection and imply a sort of realist perspective on reason. The same preoccupation applies to the constructivist interpretation of the CPR. In order to deal with this issue, the following questions must be addressed: how can constructivism justify the necessity and universality of transcendental principles of pure reason without compromising the normative and procedural aspects of the construction? How to reconcile arguments based on the analysis of representations and faculties with a constructivist procedure? Or even, how may transcendental reflection, as a view of the possibility of *a priori* cognition, be rendered compatible with a constructive procedure?

This paper is divided into three sections, followed by brief final remarks. The first section outlines the main characteristics of constructivism and relates them to Kant's positions about the nature of philosophy and its method. The second part argues for a type of experimental

constructivism that might serve as a guiding analogy to understand the method underlying the CPR. Thirdly, I will show how the transcendental subject and pure reason are derived from this experimental construction. The conclusion briefly points out some advantages of this position.

## 1. Main aspects of constructivism

Rawls's influent position contrasts constructivism and intuitionism. The latter implies a kind of moral realism that assumes an intellectual receptivity to a pre-existing order that grounds the first principles and laws. This order may be 'seen' and 'grasped' by reason but cannot be produced by reason alone. In this sense, for intuitionism, the 'first principles (...) are regarded as true or false in virtue of a moral order of value that is prior to and independent of our conceptions of person and society, and of the public social role of moral doctrines.' (Rawls 1989, 95) On the other hand, Rawls argues that Kantian constructivism justifies principles and substantive laws based on a practical understanding of philosophical argumentation, namely, it considers them as a result of a process of construction. The procedures of construction themselves, in turn, cannot be constructed, otherwise it would lead to infinite regress. However, *the grounds for this construction must mirror the structure underlying rationality itself.* 'This basis is the conception of free and equal persons as reasonable and rational, a conception that is mirrored in the process' (Rawls 1989, 99). This, along with 'the conception of a society of such persons (...) constitutes the basis of Kant's constructivism' (Rawls 1989, 99). So, the philosophical argumentation justifies the substantive principles, insofar as it is grounded in a practical conception of rationality arising from the conception and actions of free and equal rational agents. This groundwork is regarded as a

practical shift in argumentation and justification (cf. Korsgaard 1996a, 66f.; O'Neill 2015, 2, 70f.).

Defending a constructivist position in theoretical philosophy ultimately means that theoretical knowledge is also grounded in an agency, which, in turn, must follow the constitutive rules of argumentation among free and equal agents. Theoretical knowledge is grounded, then, neither on self-evident propositions nor on intellectual intuitions. These constitutive rules are *normative*, establishing how agents must behave during the argumentation process, rather than serving as a description of their actual claims. In this sense, constructivism is essentially procedural and anti-intuitive. Therefore, according to Rawls, while intuitionism is incapable of adjudicating conflicts between distinct intuitions, constructivism is a procedural method for solving controversies (cf. Rawls 1999a, 30f.; O'Neill 1989, 207). Kant's constructivism is grounded in more abstract and austere notions of agency and rationality than the Utilitarian version and thereby enables more robust notions of objectivity.

Constructivism also aims to serve as an alternative to skepticism and realism. It vindicates objectivity (in contrast to skepticism) without appealing to alleged facts that are independent of any sets of determining rules (in contrast to realism). '[F]or realist, practical reason is governed by a prior order of values, whereas for the constructivist, the directions of explanation is reversed, and the order of values is constituted out of the constraints on practical reason.' (Stern 2013, 23) The realist position defends that objectivity is grounded in 'the fabric of the world, as a mind-independent property that rational agents possess' (Stern 2013, 23). Realism need not be equated with dogmatism, since a sort of realism potentially exists that does not back theoretical claims before critically evaluating our cognitive faculties, yet it still defends the existence of *a priori* structures that are

independent of rules justified by a specific argumentative procedure. A *realist interpretation* of the CPR, after a careful *description* of our faculties and representations, reaches the conclusion that we have certain faculties and *a priori* representations that are the noumenal reality of our reason, which, in turn, structures the phenomenal reality<sup>2</sup>. The *constructivist interpretation* of the CPR, on the other hand, posits that even the theory of faculties and *a priori* representations have to be grounded in a procedural argumentation with practical rules that assume *equal freedom* as the fundamental principle of rationality.

Constructivism represents an alternative to foundationalist and rationalist theories (cf. O'Neill 1989, 3-14; 2015, 13-37), because its method is different from an

---

<sup>2</sup> An anonymous referee raised the important issue that all representations are by definition phenomena rather than noumena. According to a realist reading, this statement is subject to dispute, since we have to distinguish the empirical and *a priori* representations from the transcendental ones, which are the conditions of the former. Thus, they structure the form of the phenomena but are not themselves phenomena. This is why Kant calls them conditions of possibility and why they cannot be conditions of themselves. This means that reason itself is not in time and is not therefore subject to causal laws but works on the presumption of a transcendental freedom. Of course, when we use the category of causality, for example, in order to deal with a phenomenon, this happens at the level of phenomena. However, the structure of causality itself which allows us to make that use, is not at the level of phenomena. Nor Kant does locate it at the level of noumena but at a level he calls transcendental. However, the realist reading transforms this transcendental level and deals with it as if it were a real thing, in a fashion to that of a noumenal reality. I would like to thank the two anonymous referees for their insightful questions and challenges, which I shall try to answer to the furthest extent possible within the scope of this paper.

argumentative proof made *more geometrico* combined with introspection, as paradigmatically carried out by Descartes. According to constructivism, philosophy cannot present its results as proof grounded in clear and evident premises that are supposed to grant objective knowledge independently of the practical perspective of the participants in the argumentative process.<sup>3</sup> Therefore, the most fundamental criterion for constructing a philosophical theory is not the positive definitions, rather the following negative practical rule: ‘any principle of thinking and acting that can have authority cannot enjoin principles on which some members of a plurality cannot (not ‘would not!’) act’ (O’Neill 1989, 20). This practical constitutive rule of the argumentative process serves as a practical criterion of rationality that counts as ‘reason-giving’ in a legitimate process of argumentation (see O’Neill 2004: 191; Korsgaard 2008, 55f.). The ‘cannot’ rather than ‘would not’ means that even theoretical philosophy is grounded in the realm of normative agency, which excludes *descriptive foundationalism*. In a nutshell, constructivism sees philosophical practice, even in the field of theoretical philosophy, as an enterprise grounding substantive claims in an argumentative procedure that can ideally be accepted by free and equal agents (i.e., agents considering themselves to be free and equal)<sup>4</sup>.

A detailed exploration follows of how this construction is laid out in CPR. For now, I will reconstruct different

---

<sup>3</sup> ‘No master plan is inscribed in each one of us; rather we must devise a plan that assembles the various elements. This plan must not presuppose unavailable capacities to coordinate, such as preestablished harmony between reasoners or between each reasoner and a transcendent reality.’ (O’Neill 1989, 19)

<sup>4</sup> It is worth calling attention here to the distinction between idealization and masquerading abstractions (O’Neill 1989, 210).

aspects of Kant's understanding of the general framework and how it leads to constructivism. This framework cannot be constructed, but it will frame what may count as the normative principles chosen in investigations and philosophical argumentation. *The constitutive principles that frame the construction are equality, freedom and independence, and they reflect, on the one hand, Kant's rejection of intuitionism and, on the other, the need for a shared self-legislation as formulated in the categorical imperative.*

*The principle of equality* is strictly grounded in Kant's critical-transcendental method and his rejection of intuitionism. He contends that mysticism is the true antipode of philosophy (cf. KpV, AA 05: 163<sup>5</sup>), as exemplified in the oppositions: inspiration *versus* investigation; secret doctrine *versus* public use of reason; alchemy *versus* chemistry; inspiration *versus* work; death of reason *versus* enlightenment; and grace *versus* nature (see Henrich 1966), which run through both the practical and the theoretical uses of reason, ranging from the foundation of knowledge, to morality, to the philosophy of religion and history. The common essence of mysticism is the attempt to ground objective knowledge using an alleged supra-sensible or intellectual intuition. Kant, refutes this strategy, alleging that in all its variations it always functions like *Deus ex machina* (cf. Br. AA 10:131). Mysticism comes in different degrees. The highest degree is attributed to philosophers that defended the existence of a sole single being, while everything else is only a modification of it (cf. KpV, AA 05: 102; KU, AA 05: 393, 421 and 439), a position that 'leads directly to enthusiasm' (cf. WDO, AA 08: 143n.; Refl. 6050, AA 18: 435; Refl. 6055, AA 18: 439).

---

<sup>5</sup> All translations follow The Cambridge Edition of the Works of Immanuel Kant (Kant 1992ff), with pagination in standard format according to the Akademie Ausgabe (Kant (1900-)).

Mysticism in practical reason ‘makes what served only as a *symbol* into a *schema*, that is, puts under the application of moral concepts real but not sensible intuitions (of an invisible kingdom of God) and strays into the transcendent.’ (Cf. KpV, AA 05: 70-71). In religion, mysticism is portrayed as a belief in a heavenly magical influence that can improve ‘the whole human being radically (of making a new man out of him)’, while ‘such a faith would have to be regarded as itself imparted and inspired directly by heaven’. It is a ‘*salto mortale* of human reason.’ (Rel, AA 06:120f.) In the philosophy of history, mysticism assumes ‘a supernatural communication and widening of one’s view of future time’, which could be called ‘premonitory (prophetic)’ history (SF, AA 07: 80; cf. Anth. AA 07:187f.).

Mysticism is the attempt to ‘ris[e] above humanity’ (Refl 5063, AA 18: 438) and it ‘can lead to no true knowledge of the object, [and] must necessarily promise a surrogate thereof, supernatural information (mystical illumination): which is then the death of all philosophy.’ (cf. VI, AA 08: 398) While true philosophy means *work according to the rules of the public use of reason*, mysticism implies secret doctrines. A philosopher of intuition speaks from their own authority and is not held accountable. After all, how could one conceptually argue against intuitions or feelings that one allegedly has? So, genius rejects the laws that reason gives to itself and assumes the maxim of a ‘lawless use of reason’, which ‘is that reason’s superior lawgiving is invalid — we common human beings call this enthusiasm, while those favored by beneficent nature call its illumination.’ The result of this process is ‘the complete subjection of reason to facts, i.e., superstition,’ and freedom is replaced by libertinism (cf. WDO, AA 08: 145f.).

One of the central positions defended throughout the CPR is that human understanding is discursive rather than intuitive; it can think and relate different representations, but



it lacks any intuition. Our only intuitions arise from sensibility. ‘Thus we are not allowed to think up any sort of new original forces, e.g., an understanding that is capable of intuiting its object without sense’ (KrV, B798). We can conceive of the idea of an intuitive understanding, but only as a negative concept, as an intellect that would work differently from ours, even if we know nothing about its existence or even about how it actually works.

The criterion of equality is then translated into the *communicability* of concepts and judgments. Distinct from intuition, concepts are the product of reason; moreover, thoughts have a logical isomorphic structure with language, which allows them to be shared (cf. Kaulbach 1978, 131ff.). Therefore, thinking correctly implies that we are ‘in community with others to whom we communicate our thoughts, and who communicate theirs with us! Thus one can very well say that this external power which wrenches away people's freedom publicly to communicate their thoughts also takes from them the freedom to think’ (cf. WDO, AA 08:144). For the same reason, thoughts that do not compromise with communicability fall into self-contradiction. This is the case of the logical egoist, who ‘considers it unnecessary also to test his judgment by the understanding of others; as if he had no need at all for this touchstone’ (Anth, 07:128). In this sense, the so-called philosophers by inspiration have a mystery in themselves, ‘but are unfortunately incapable of uttering and disseminating it generally, by means of language’ (VAVT, AA 08:389). So, ‘Critique stands to the ordinary school metaphysics precisely as chemistry stands to alchemy, or astronomy to the fortune-teller’s astrology’ (Prol, AA 04:366), and those who reject its procedure ‘can have nothing else in mind except to throw off the fetters of *science* altogether, and to transform work into play, certainty into opinion, philosophy into philodoxy.’ (KrV, B XXXVII)

*Freedom is the second constituent principle of Kantian constructivism.* It is a practical one in the sense that reason is conceived as autonomous and subject only to self-imposed rules. So, ‘that would-be philosophers behave in a superior fashion can by no means be indulged in them, since they elevate themselves above their guild-brothers, and violate the inalienable right of the latter to freedom and equality in matters of mere reason’ (VAVT, AA 08:394). They ‘are not at all inclined to align themselves with those who – like school-men – consider themselves obliged to proceed slowly and circumspectly from the critique of their cognitive powers to dogmatic knowledge’, but instead, ‘like men of genius’ they are able ‘to accomplish by a single piercing glance within them everything that industry can ever hope to achieve, and a good deal more besides’. They essentially act as they were dismissed of ‘the Herculean labor of self-knowledge’ (VAVT, AA 08:390).

The autonomous self-giving law of reason in both fields (theoretical and practical) is ‘not an arbitrary form-giving undertaken by design, or even machine-made (on behalf of the state), but above all a piece of handwork, dealing with the given object, and indeed with no thought of taking up and evaluating the preceding industrious and careful work of the subject, his own faculty (of reason)’. The genius, on the other hand, who ‘opens up an oracle for the vision of the super-sensible will be unable to deny having contrived it by a mechanical manipulation of men’s brains, and attached the name of philosophy to it for honorific purposes alone.’ (VAVT, AA 08:404). The true method of philosophy is to bring ‘the moral law within us to clear concepts by logical instruction’. In other words, in order to respect freedom, the philosopher has to discern the law ‘into clear insight by logical treatment’, otherwise ‘that [supposedly] pronouncement of reason would be the voice of an oracle, exposed to every kind of interpretation’ (VAVT, AA 08:405).

Philosophy must be undertaken with freedom as autonomy, which is also a freedom to think for oneself.

‘Thinking for oneself means seeking the supreme touchstone of truth in oneself (i.e. in one’s own reason); and the maxim of always thinking for oneself is *enlightenment*.’ Furthermore, making ‘use of one’s own reason means no more than to ask oneself, whenever one is supposed to assume something, whether one could find it feasible to make the ground or the rule on which one assumes it into a universal principle for the use of reason.’ Through this test, which anyone can apply to themselves, one ‘will see superstition and enthusiasm disappear’ (WDO, AA 08: 146f.n.). We can safely conclude that *universalization*, as the quintessence of the categorical imperative, works as the ‘checks and balances’ that prevent freedom from degenerating into solipsism and libertinism.

The position that freedom is the keystone of philosophy relates to the fact that it is under the moral commandment of veracity. ‘It may be that not everything is true which a man takes to be so (for he may err); but in everything he says he must be truthful (he must not deceive), whether his profession be merely internal (before God), or also an external one. The violation of this duty of truthfulness is called a lie’. A Lie ‘whether internal or external, is of two kinds: 1. when someone gives out as true, what he nevertheless knows to be untrue; and 2. when he gives out as certain, what he nevertheless knows himself to be subjectively uncertain of.’ Therefore, the commandment ‘Thou shalt not lie (were it even with the most pious intentions), if most sincerely adopted into philosophy, as a doctrine of wisdom, would alone be able, not only to procure eternal peace therein, but also to assure it for all time to come.’ (VNAEF, AA8:421f.)

Kant contends that there is ‘a certain dishonesty in human nature’ (KrV, B775), that does not affect ‘the *matter*

but the *tone*' (KrV, B772). The 'same dishonesty, misrepresentation, and hypocrisy [reaches] even in the utterances of the speculative way of thinking' (KrV, B 776). It may be caused by 'private vanity' (KrV, B 777), by recklessness (cf. KrV, B 800), or even by a 'spiteful and malicious cast of mind' (KrV, B784). Therefore, the pure reason and philosophy have to be subject to strict discipline, which means that 'transcendental reflection is a duty from which no one can escape if he would judge anything about things *a priori*' (KrV, B 319). Since practical is everything 'that is possible through freedom' (KrV, B 828), and since philosophy originates from freedom, it follows that philosophy is eminently practical. In other words, because the maxims of philosophy can be corrupted, they must be subject to self-discipline. Only then can reason follow the principles of its own freedom.

*Independence, the third principle*, can be understood as a procedural view of that which enables each of us to follow the regressive and the progressive steps of an argument. This reconstructive feature allows everyone to replicate the process, to find gaps and mistakes. Independence results from proceduralism, which, in the case of Kant's theoretical philosophy, is thought in *analogy with mathematics and chemistry*. 'What chemists do in analyzing materials, what mathematicians do in their pure theory of magnitude, the philosopher is even more obliged to do', namely, 'securely determine proper value and influence of the advantage that a special kind of cognition has over the aimless use of the understanding' (KrV, B 870).

In order to avoid any missteps, the *differences* between philosophy, on the one hand, and mathematics and chemistry, on the other, have to be stressed. Philosophy cannot follow the mathematical method defined as the 'construction of concepts' namely, 'to exhibit *a priori* the intuition corresponding to it' (KrV, B 741). Because

philosophy cannot present its concepts immediately by pure intuition, it lacks in a *strict sense definitions, axioms and proofs* (cf. KrV, B 755-764). Therefore, Kant's philosophical constructivism must not be confused with that which he attributes to mathematics. On the other hand, philosophy, unlike chemistry, cannot deal directly with empirical objects. Nevertheless, philosophy resembles mathematics in that both work with *a priori* concepts and principles. The similarity with chemistry lies in the fact that, for both, the object must be given. Therefore, they must proceed either by decomposing the given (for chemistry the given are the elements of experience, while for philosophy they are the *a priori* concepts), or by composing the found elements, thus either by analysis or synthesis<sup>6</sup>.

The nature of our discursive understanding implies that we 'must employ much labor on resolving and again compounding its concepts according to principles, and toil up many steps to make advances in knowledge.' (VAVT, AA 08:389) So, considering that we have made synthetic *a priori* judgments, 'we can analyze them into their elementary

---

<sup>6</sup> An anonymous referee raised the issue about the likelihood of decomposing an *a priori* concept. Take for example the concept of causality. In science and in normal human life, we come across a great deal of judgments that apply the category of causality in a universal and necessary way. This is what is given, namely, a judgment that establishes a causal relation. So, the concept of causality is given to the philosopher by way of a great number of different uses in judgments and his work is not to construct the concept of causality, as the mathematician does with geometrical forms, but to analyze it, which, I am suggesting, is a way of determining its constitutive parts and correct uses. This analysis does not follow a strictly logical procedure (which would only reach analytical judgments) but takes place instead in analogy with a chemical experiment. See below the third premise of the experiment.

concepts and, in default of *mathematics*, adopt a procedure similar to that of *chemistry* – the *separation*, by repeated experiments on common human understanding, of the empirical from the rational that may be found in them’. Thus, we can prevent ‘the leaps of *genius* by which, as happens with the adepts of the philosopher’s stone, without any methodical study or knowledge of nature visionary treasures are promised and true ones are thrown away.’ (KpV, AA 05: 163) The philosopher ‘must proceed as precisely and, so to speak, as scrupulously as any geometer in his work’. However, philosophy differs from geometry to the extent that it is merely a ‘rational cognition through mere concepts without construction of them’. Thus, the only method left is that of a chemist, that ‘can at any time set up an experiment with every human practical reason in order to distinguish the moral (pure) determining ground from the empirical’ (KpV, AA 05:92)

Therefore, *freedom*, *equality* and *independence* frame the concept of the Kantian republic (cf. MS, AA 6:314; cf. TP, AA 08:290) and of that which counts as rationality<sup>7</sup>. ‘Reason must subject itself to critique in all its undertakings, and cannot restrict the freedom of critique through any prohibition without damaging itself and drawing upon itself a disadvantageous suspicion.’ Therefore, ‘the very existence of reason depends upon this freedom, which has no dictatorial authority, but whose is never anything more than the agreement of free citizens, each of whom must be able to express his reservations, indeed even his *veto*, without holding back.’ (KrV, B766)

---

<sup>7</sup> These three republican principles are also mirrored in the three maxims of common sense (*sensus communis*) namely: ‘1. To think for oneself; 2. To think in the position of everyone else; 3. Always to think in accord with oneself.’ (KU, 5:294). This discussion, however, is beyond the scope of this paper.

In the next section I will delve more deeply into the analogy between philosophy and chemistry to point out how these three principles are embodied in the experiment of pure reason.

## 2. Chemical experimental constructivism

Henrich (1969; 1975; 1984; 1989; 2001) set down the guidelines for interpreting the transcendental deduction in CPR in analogy with a juridical procedure. Since then, a wealth of literature has deepened and further developed this approach<sup>8</sup>. It is unquestionable that Kant uses a large number of juridical metaphors and concepts throughout his major work. The most famous one appears already in the first pages: ‘Reason should take on anew the most difficult of all its tasks, namely, that of self-knowledge, and to institute a court of justice, by which reason may secure its rightful claims while dismissing all its groundless pretensions, and this not by mere decree but according to its own eternal and unchangeable laws’ (KrV, A xi). However, I intend to argue here that the use of political and juridical analogies should not mask *a more fundamental perspective*, at least in the field of theoretical philosophy, namely, that of the *experimental method of empirical sciences*<sup>9</sup>, in particular that of chemistry.

---

<sup>8</sup> Other scholars that interpret the CPR in totality or only the transcendental deduction from a juridical paradigm are: Höffe (2003), Pievatolo (1999), Proops (2003), Seeberg (2007), Trevisan (2018), Möller (2020).

<sup>9</sup> To my knowledge, only Kaulbach (1978, 122ff.) and Gloy (1996) compare the transcendental method to the idea of

The metaphor of the Copernican-turn ‘will provide a splendid touchstone that we assume as the altered method of our way of thinking, namely that we can cognize of things *a priori* only what we ourselves have put into them.’ (KrV, Bxviii) This altered method has already been put to use by mathematics and physics, wherein they replaced contemplation with work and construction (cf. KrV, Bxii). Natural scientists ‘comprehended that reason has insight only into what itself produces according to its own design; that it must take the lead with principles for its judgments according to constant laws and compel nature to answer its questions’. However, these questions should not be asked at random, ‘according to no previously designed plan’. Reason ‘must approach nature with its principles in one hand, according to which alone the agreement among appearances can count as laws, and, in the other hand, the experiments thought out in accordance with these principles’. Essential to my argument is the aspect which states that the experiment is so designed that the philosopher has ‘to be instructed by nature not like a pupil, who has recited to him whatever the teacher wants to say, but like an appointed judge who compels witnesses to answer the questions he puts to them.’ (KrV, Bxiii) The analogy to a judge is not used in order to stress some relation with a juridical argumentation *per se*, but in order to enlighten the procedural and constructive method of natural sciences. ‘This method, imitated from the method of those who study nature, thus consists in this: to seek the elements of pure reason in that *which admits of being confirmed or refuted through an experiment.*’ (KrV, Bxviii, n.)

It is noteworthy that it was Bacon who used the language of juridical practice to shed light on the experimental process

---

experimentation, but only in a highly preliminary and sketchy manner and without relating it with chemistry.



(cf. Gloy 1996, 68). In fact, Kant begins the CPR with a quote from Bacon who defined experiment as the search for a result according to a previously designed plan conducted as a trial<sup>10</sup>. He criticized the Aristotelian view of cognition as contemplation in favor of science as organized and careful

---

<sup>10</sup> Cf. “for we reject (in an inquiry into nature) all that hasty human reasoning, based on preconceptions, which abstracts from things carelessly and more quickly than it should, as a vague, unstable procedure, badly devised. And I cannot be arraigned to stand trial under a procedure which is itself on trial.” (Bacon 2000, 13); “As for the first notions of the intellect: not one of the things which the intellect has accumulated by itself escapes our suspicion, and we do not confirm them without submitting them to a new trial and a verdict given in accordance with it.” (Bacon 2000, 17); “In forming axioms by this kind of induction we need also to conduct an examination and trial as to whether the axiom being formed is only fitted and made to the measure of the particulars from which it is drawn, or whether it has a larger or wider scope. If it is larger and wider in scope, we must see whether, like a kind of surety, it gives confirmation of its scope and breadth by pointing to new particulars; so that we do not just stick to things that are known, nor on the other hand extend our reach too far and grasp at abstract forms and shadows, not at solid things clearly defined in the material.” (Bacon 2000, 84) “There remains mere experience: which is chance, if it comes by itself; experiment, if sought. (...) The true order of experience, on the other hand, first lights the lamp, then shows the way by its light, beginning with experience digested and ordered, not backwards or random, and from that it infers axioms, and then new experiments on the basis of the axioms so formed.” (Bacon 2000, 67); “And yet every interpretation of nature which has a chance to be true is achieved by instances, and suitable and relevant experiments, in which sense only gives a judgement on the experiment, while the experiment gives a judgement on nature and the thing itself.” (Bacon 2000, 45) I explore in detail other relations between Kant and Bacon in Klein (2019).

work<sup>11</sup>. Now, on these grounds, I suggest that the general method working along the CPR, even with the references to juridical expressions like deduction, court and process, is better understood as fundamentally structured from the viewpoint of the empirical sciences, in particular chemistry, instead of the jurisprudential paradigm supported at that time by Hufeland, Achenwall, and Wolf.

This experiment must have a hypothesis, which is to be tested according to publicly acceptable criteria in the same way as those planned in chemistry. ‘This experiment of pure reason has a great similarity to that of the chemists, which they term the experiment of reduction, or, more usually, the synthetic process.’ In the first moment, the ‘analysis of the metaphysician separates pure cognition *a priori* into two heterogeneous elements, viz., the cognition of things as phenomena, and of things in themselves’, while in the second, ‘the Dialectic combines these again into harmony with the necessary rational idea of the unconditioned, and finds that this harmony never results except through the above distinction, which is, therefore, concluded to be just.’ (KrV, Bxxii, n.) In this sense, I suggest reading the CPR as a complex experiment that assumes ‘the transformation in our way of thinking presented in criticism merely as a hypothesis’, which ‘will be proved not hypothetically but rather apodictically from the constitution of our representations of space and time and from the elementary concepts of the understanding.’ (KrV, Bxxii, n.)

---

<sup>11</sup> Cf. “For the end we propose for our science is the discovery of arts, not of arguments, of principles and not of inferences from principles, of signs and indications of works and not probable reasonings. Different results follow from our different design. They defeat and conquer their adversary by disputation; we conquer nature by work.” (Bacon 2000, 15s.)

This complex experiment must articulate a great number of premises and must be designed to answer a fundamental question, namely: ‘*How are synthetic judgments a priori possible?*’ (KrV, B19/ cf. Prol, AA 04:377) A complex mental experiment has to be put together to address this issue, and it must function as a *constructive procedure* designed to decide between opposite statements. As far as I can see, the experiment has to consider and articulate *at least 10 premises* or variables, which serve the same function as the variables that Copernicus had to work with in his hypothesis about the heliocentric motion of the celestial bodies. I present them below.

1) *The first premise is the strict observance of the logical rules, without attempting to derive substantive claims merely from them.* According to Kant, ‘the general and formal laws of understanding and reason, is therefore certainly the *conditio sine qua non* thus the negative condition of all truth; further, however, logic cannot go, and the error that concerns not form but content cannot be discovered by any touchstone of logic.’ (KrV, B84) In other words, the rules of general logic are necessary but not sufficient conditions for knowledge. Moreover, general logic should always work as a *canon*, but never as an *organon*. One of the great mistakes of the dogmatic metaphysicians was confusing the logical principle of contradiction, which is always strictly followed by mathematicians, with a sufficient condition of truth, and then trying to derive only from it synthetic *a priori* judgments (cf. KrV, B14; Prol, AA 04:268).

2) *The second premise is the rejection of any appeal to an alleged intellectual intuition or to a self-evident truth.* The claim that Kant would have substituted one absolute (God) for another (reason) is false, since the critical position has abandoned any such claims of absolute objectivity. So, the necessity and universality of synthetic *a priori* judgments are placed under

the limitation of a discursive intellect, which demands proofs and arguments in order to sustain any claim of objectivity. Therefore, the CPR ‘establishes a mode of thinking’ (Prol, AA 04:383), that requires that principles should be publicly justified for the philosophical community. In this sense, Kant challenges his opponents ‘to prove in his own way any single truly metaphysical (i.e., synthetic, and cognized *a priori* from concepts) proposition he holds, and at best one of the most indispensable, such as the principle of the persistence of substance or of the necessary determination of the events in the world through their cause – but, as is fitting, to prove it on *a priori* grounds.’ Otherwise, if ‘he can’t do this (and silence is confession), then he must admit’ it (Prol, AA 04:378). Therefore, the standard constructive augmentation requires that the ‘*Critique* must either be accepted or a better one put in its place’ (Prol, AA 04:379), but it does not permit an alleged refutation of the *Critique* without replacing it with a better or a more complete experiment.

3) *The experiment should be able to explain the existence of synthetic a priori judgments in mathematics and in the pure science of nature.* The question ‘*How are a priori synthetic judgments possible?*’ already presupposes the existence of those judgments. In Kant’s words, ‘it is easy to show that in human cognition there actually are such necessary in the strictest sense universal, thus pure *a priori* judgments.’ (KrV, B4) This certainty is displayed ‘as a fact’ (KrV, B5) about pure mathematics and pure natural sciences, ‘since they are actually given, it can actually be asked *how* they are possible; for that they must be is proved through their actuality.’ (KrV, B20) ‘We have therefore some at least uncontested synthetic cognition *a priori*, and we do not need to ask whether it is possible (for it is actual), but only: *how it is possible*, in order to be able to derive, from the principle of the possibility of the given cognition, the possibility of all other synthetic cognition *a*

*priori*.' (Prol, AA 04:275) So, the hypotheses requiring testing must entail an *explanation* about the validity of those judgments, such as in the case 'of geometry with respect to all objects of the sensible world' (Prol, AA 04:292).

This position does not deny that '*as far as time is concerned*, no cognition in us precedes experience, and with experience every cognition begins. But although all our cognition commences *with* experience, yet it does not on that account all arise *from* experience.' (KrV, B1) Therefore, one should not confuse the historical or psychological order with the epistemological one. This distinction is based on the *kind of certainty* present in the *a priori* judgments, since 'experience teaches us, to be sure, that something is constituted thus and so, but not that it could not be otherwise.' (KrV, B3) 'Empirical universality is therefore only an arbitrary increase in validity from that which holds in most cases to that which holds in all' (KrV, B4). However, even in the latter case, the judgment can always be restricted by a counterfactual. This highlights the difference between *a posteriori* and *a priori* judgments and the limits of induction. It is due to this difference in validity that the '*empirical* derivation, however, to which both of them [Locke and Hume] resorted, cannot be reconciled with the reality of the scientific cognition *a priori* that we possess, that namely of *pure mathematics* and *general natural science*, and is therefore refuted by the fact.' (KrV, B127f.) Therefore, for the philosopher, the existence of *a priori* judgments is the given that has to be explained.

4) *In the experiment, we can appeal neither to a 'plaything of probability and conjecture', nor to 'the divining rod of so-called sound common sense'* (Prol, AA 04:369). Regarding *a priori* cognition, there is no space for opinions (cf. KrV, Axxv). 'Only in empirical natural science can conjectures (by means of induction and analogy) be tolerated, and even then, the possibility at least of what I am assuming must be fully

certain.’ (Prol, AA 04:369) *Sound common sense*, on the other hand, ‘has a use no further than the extent to which it can see its rules confirmed in experience’ but has no competence ‘to have insight into these rules *a priori* and independently of experience’ (Prol, AA 04:370). Moreover, *ordinary understanding* is easily subject to mistakes when the objective rules have uncommon consequences, such is the case with the heliocentric revolution. Thus, ‘sound common sense and speculative understanding are both useful, but each in its own way; the one, when it is a matter of judgments that find their immediate application in experience, the other, however, when judgments are to be made in a universal mode, out of mere concepts, as in metaphysics’ (Prol, AA 04:259f.).

5) *In order for the experiment be successful, it must be able to explain the origins and also to dissolve the antinomies of reason that binder metaphysics as well as sciences.* Distinct from empirical experiments in chemistry, the metaphysical ‘experiment will be feasible only with concepts and principles that we assume *a priori* by arranging the latter so that the same objects can be considered from two different sides’. Moreover, ‘if we now find that there is agreement with the principle of pure reason when things are considered from this twofold standpoint, but that an unavoidable conflict of reason with itself arises with a single standpoint, *then the experiment decides for the correctness of that distinction.*’ (KrV, Bxviii-xix, n. emphasis added)<sup>12</sup> Besides dissolving the antinomies of reason (cf.

---

<sup>12</sup> In this quote Kant evaluates the metaphysical experiment by way of its capacity to solve the antinomies of reason at the same time that it satisfies a wide range of interests on either side of the conflict.

Prol, AA 04:292), the experiment should explain the epistemological grounds for their origin (cf. KrV, Axiif.), since they neither arise from a simple but recurrent mistake throughout the history of philosophy, nor can they be grounded in a simple psychological or anthropological feature of some individuals and people (KrV, B490ff.).

6) *The experiment must satisfy to some extent the demands of metaphysics as a natural predisposition.* As Kant says, ‘metaphysics is actual, if not as a science yet as a natural predisposition’, which means that ‘human reason, without being moved by the mere vanity of knowing it all, inexorably pushes on, driven by its own need to such questions that cannot be answered by any experiential use of reason and of principles borrowed from such a use’ (KrV, B21; cf. B6f.). The experiment must find a way ‘to relieve this pressing need, which is something more than a mere thirst for knowledge’, since the fact that ‘the human mind would someday entirely give up metaphysical investigations is just as little to be expected, as that we would someday gladly stop all breathing so as never to take in impure air.’ (Prol, AA 04: 367) Rooted in this natural predisposition to metaphysics is the practical moral interest of reason grounded in freedom (cf. Prol, AA 04: 363s; KrV, B xxvii-xxxv; B490-504).

7) *The experiment should be capable of explaining the transition from subjective to objective cognition, namely the passage from judgments of perception (which are only subjectively valid) to those of experience (which are objectively valid).* ‘All of our judgments are at first mere judgments of perception; they hold only for us, i.e., for our subject, and only afterwards do we give them a new relation, namely to an object, and intend that the judgment should also be valid at all times for us and for everyone else’ (Prol, AA 04:298). Therefore, in judgments of perception, I relate two representations according to my particular state,

but if I want them to be a judgment of experience, then I ‘require that this connection be subject to a condition that makes it universally valid. I want therefore that I, at every time, and also everyone else, would necessarily have to connect the same perceptions under the same circumstances.’ (Prol, AA 04:299) The objectivity required by judgments of experience arises from the legitimacy of the rules for relating the representations. Objectivity requires the claim to be shared by all, because all can freely agree to follow the same rules; therefore, the metaphysical experiment should be able to explain how objectivity is produced.

8) *The experiment has to explain not only how synthetic a priori judgments are possible in mathematics and in the pure science of nature, but also how synthetic a priori judgments are possible in general.* From this wide-ranging perspective, the objective of critical philosophy is not only to explain how actual experience is possible, but how *experience in general* is possible. ‘We will therefore have to analyze experience in general, in order to see what is contained in this product of the senses and the understanding, and how the judgment of experience is itself possible.’ (Prol, AA 04:300) since, ‘without this original relation to possible experience, in which all objects of cognition are found, their relation to any object could not be comprehended at all.’ (KrV, B127) Only in this broader framework would the metaphysical experiment be comprehensive and capable of drawing the limits of the whole of possible cognition.

Two strategies are used to delineate the concept of possible experience. *On the one hand*, there must be a principle capable of ensuring a thorough search for all the fundamental concepts of understanding to serve as the logical fundamental structure of nature (cf. Prol, AA 04:260). It is precisely for this lack of strategy that Kant



criticizes Aristotle when he presents his table of categories (cf. KrV, B107). Kant finds this principle in general logic, more precisely in the forms of judgments, in the case of the categories (cf. B95f.), and in the forms of inference, in the case of ideas (cf. KrV, B390f.). *On the other hand*, like chemistry, philosophy must apply regulative ideas in the search for completeness. Chemistry uses ideas like ‘pure water’ and ‘pure earth’ (cf. KrV, B674), while philosophy must make use of the idea of a self-organized whole. So, reason is represented as ‘a unity entirely separate and subsisting for itself, in which, as in an organized body, every part exists for the sake of all the others as all the others exist for its sake’ (KrV, B XXIII; cf. B673f.; Prol, AA 04:263). Another important maxim is that ‘everything that nature itself arranges is good for some aim’, therefore, ‘[t]he objections against the suasions and the self-conceit of our purely speculative reason are themselves put forth by the nature of this reason, and must therefore have their good vocation and aim, which one must not cast to the wind.’ (KrV, B771)

9) *The function, characteristics and limits of the analytical procedure of experiment.* Firstly, the analytical procedure should be distinguished from the set of analytical propositions. In the former ‘one proceeds from that which is sought as if it were given, and ascends to the conditions under which alone it is possible’, therefore ‘it might better be called the regressive method to distinguish it from the synthetic or progressive method.’ (Prol, AA 04:276n.). Along this line, starting from the actuality of the synthetic *a priori* proposition, the analytical path searches for ‘the ground of its possibility’ (Prol, AA 04:279; cf. GMS, AA 04:392). However, this method has an obvious limitation, namely ‘the mere analysis of the concepts that inhabit our reason *a priori*, is not the end at all, but only a preparation for metaphysics proper’,

because ‘it merely shows what is contained in these concepts, but not how we attain such concepts *a priori* in order thereafter to be able to determine their valid use in regard to the objects of all cognition in general’ (KrV, B23f.). In a nutshell, the analytical method enables us to identify the possibility conditions of *actual cognition* but does not allow us to go further and explain how *a priori synthetic cognition in general* is possible. It is incapable of explaining the concept of *possible experience*.

In *Anthropology*, Kant returns to the analogy with chemistry regarding the analytical and synthetical procedure. The analytical movement decomposes the elements of cognitions to arrive at understanding and sensibility, i.e., the two ‘heterogeneous substances. The synthetic movement, on the other hand, shows *how* both elements may be united, ‘where this *union* brings about a third entity that has properties which can only be produced by the union of two heterogeneous elements’ (Anth, AA 07:177). By way of this union, ‘whereby an entirely new thing emerges (somewhat like the neutral salt in chemistry)’, ‘we arrived at cognition of the play of forces through experience of its effects’ (Anth, AA 07:177n.). In this sense we can shed new light on the famous formulation that ‘[T]houghts without content are empty, intuitions without concepts are blind. It is thus just as necessary to make mind’s concepts sensible (i.e., to add an object to them in intuition) as it is to make its intuitions understandable (i.e., to bring them under concepts).’ (KrV, B75) The union of two heterogeneous elements produces synthetic *a priori* propositions that cannot be reduced to a single element.

The reductive experiment aims to identify heterogeneous elements, without entering in elucidations regarding how these might arise from a simple, homogeneous element. Therefore, ‘we can not reach the ultimate cause and the simple components into which its material can be analyzed’,

otherwise ‘in what darkness does human reason lose itself when it tries to fathom of the origin, or even merely undertakes to make a guess at it!’ (Anth, AA 07:177n) So, we can merely say ‘that there are two stems of human cognition, which may perhaps arise from a common to us unknown root, namely sensibility and understanding’ (KrV, B29). This limitation is a feature of our discursive and relational intellect, which may recognize the heterogeneous and understand how it can be combined but is incapable of truly understanding how the heterogeneous results from the homogeneous. In the end, trying to surpass this limitation implies hopelessly seeking an intuitive understanding and the cognition of the unconditional. For us, this attempt would only mean falling back into the antinomies of reason.

10) *The function, characteristics and limits of the synthetic procedure of the experiment.* ‘By synthesis in the most general sense, however, I understand the action of putting different representations together with each other and comprehending their manifoldness in one cognition.’ (KrV, B103) The progressive or compositional process is the most fundamental act of our discursive intellect, because, if we have some propositional content in our mind, then it has either been given to us in some way (as in the case of the innate ideas, a hypothesis rejected by Kant), or we must have produced it (which is the critical and constructive alternative). As Kant puts it, ‘prior to all analysis of our representations these must first be given, and no concepts can arise analytically as far as the *content is concerned*.’ This means that ‘the synthesis alone is that which properly collects the elements for cognitions and unifies them into a certain content; it is therefore the first thing to which we have to attend if we wish to judge about the first origin of our cognition.’ (KrV, B 103)

The progressive and synthetical movement should explain how we achieve the cognitive content of a synthetical *a priori* judgment from the two elements resulting from the analytical procedure. The syntheses should not target only the actual but also the *possible* experience. Now, what Kant named as the transcendental deduction follows exactly this synthetic method, as ‘the explanation of the way in which concepts can relate to objects *a priori*’ (KrV, B117)<sup>13</sup>. In opposition to the physiological derivation (proposed by Locke), which is empirical and achieves only ‘the explanation of *possession* of a pure cognition’ (KrV, B119), the transcendental deduction has to show ‘how *subjective conditions of thinking* should have *objective validity*, i.e., yield conditions of the possibility of all cognition of objects’ (KrV, B122). Without this deduction, the relationship between pure mathematics and appearances, for example, ‘could indeed be granted, but into which we could have no insight at all’ (Prol, AA 04:285)

---

<sup>13</sup> An anonymous referee raised the issue about the limits of the transcendental deduction and the function of the schematism chapter, which is supposed to be the appropriate place where Kant deals with the question “How?”. This is a challenging question that far transcends the scope of this paper. I can only remark that it is debatable whether transcendental deduction ends with the Analytic of Concepts, because until it is shown how the categories become principles, the task of transcendental deduction remains incomplete. In further papers I will tackle the issue of how the transcendental deduction might be read in detail as a constructive argument and address some points of the schematism chapter. This paper is limited to extending the constructivist reading further into the theoretical realm and defending its plausibility by establishing an analogy with the complexity of chemistry, something that Kant suggested more than once throughout his work.

Transcendental deduction is a synthetic move that explains *how* objective composition from heterogeneous (sensible and logical) representations is possible. This is a far more complex move than the analytical one, since each step of the composition must be explained until we reach the concept of possible experience and synthetic *a priori* judgments in general. It cannot rely on any other premise or presupposition that was not enunciated in the nine aspects above. Finally, this process is in conformity with the general point of view established by the Copernican turn, namely that only when we ‘put into’ something, when we carry it out, can we fully understand it. Only by way of the synthetic method may we understand how something heterogeneous is formed. It stands for what Kant called ostensive proof, which combined ‘the conviction of truth and simultaneously with insight into its sources; the apagogic proof, on the contrary, can produce certainty, to be sure, but never comprehensibility of the truth in regard to its connection with the grounds of its possibility.’ (KrV, B 817) Therefore, Kant claims that *CPR* ‘had to be composed according to the *synthetic method*, so that the science might present all of its articulations, as the structural organization of a quite peculiar faculty of cognition, in their natural connection.’ (Prol, AA 04:263)

These ten elements, which are the premises and conditions of the chemical experiment of reason, are brought together in the following formulation:

the *criterion of a hypothesis* is also the intelligibility of the assumed *ground of explanation* or its *unity* (without auxiliary hypotheses), the *truth* (agreement with itself and with experience) of the consequences that are derived from it, and finally the *completeness* of the ground of explanation of these consequences, which do

not refer us back to anything more or less than was already assumed in the hypothesis, and which merely analytically give back *a posteriori* and agree with that which was thought synthetically *a priori*. (KrV, B115)

I suggest that this lesser studied passage may serve as a structural hint for the CPR and it relates to the above elements as follows:

- a) the *intelligibility of the assumed ground of explanation* meet conditions 1, 2 and 4;
- b) the criterion of *unity* implies conditions 8 and 4;
- c) *truth* is related to conditions 3, 5, 6, and 7;
- d) the *completeness* of the ground of explanation is satisfied with conditions 9 and 10;
- e) the *truthfulness* of the hypothesis is concluded when *all the conditions* are met in the experiment.

These conditions of the philosophical experiment may be seen in analogy with Rawls's original position, the veil of ignorance and the conditions of justice. Relevant differences also exist, however. Rawls's procedure is intended to decide about the principles of justice and follows the paradigm of *choosing*, even if ideally, those principles, while Kant's constructive procedure does not. For Kant, the experiment itself will decide upon the truthfulness of the hypothesis. Rawls's constructive procedure works in analogy with an assembly and by a choosing procedure, while Kant's CPR works in analogy with a chemical experiment. Kant's goal is to establish objective principles of *theoretical cognition*, while Rawls seeks to set up the objective principles for the *practical cognition* of the basic structure of a liberal and democratic society. The differences are profound, yet they do not

diminish the similarities of the constructivist nature of the argument.

What remains to be explained is how to reconcile this constructive experimental procedure with several realist and foundationalist formulations inherent to the point of view of transcendental reflection and the nature of our faculties of the mind. This will be taken up in the following.

### **3. Pure reason and the transcendental I as theoretical constructs**

I suggest interpreting the transition from an experimental constructive formulation to the perspective of the transcendental reflection about our faculties in the same manner that Kant explains his own philosophical position in the history of Philosophy. Since he claims that ‘considered objectively, there can be only one human reason, [then] there cannot be many philosophies; in other words, there can be only one true system of philosophy from principles in however many different and even conflicting ways one has philosophized about one and the same proposition.’ Thus, as the chemist rightly says, ‘there is only one chemistry’, the philosopher claims that only one philosophy can exist. ‘So anyone who announces a system of philosophy as his own work says in effect that before this philosophy there was none at all. For if he were willing to admit that there had been another (and a true) one, there would then be two different and true philosophies on the same subject, which is self-contradictory.’ To this extent, *regulatively* conceived, when ‘critical philosophy calls itself a philosophy before which there had as yet been no philosophy at all, it does no more than has been done, will be done, and indeed must be done by anyone who draws up a philosophy on his own plan.’ (MS, AA 06:206f.) It is also in the same vein that Kant claims in *The history of pure reason*: ‘the *critical* path alone is still open’ (KrV, B883). Two perspectives are at work there: first,

the historical view, where Kant's philosophy is one among others; and second, the viewpoint of the object itself, in which he assumes that there is only one true philosophy and he argues in favor of this.

Acknowledging this *change of perspective* is necessary in order to understand how Kant combines his experimental constructivism with what he calls transcendental reflection<sup>14</sup>. From the constructive angle, methodological principles confer legitimacy on the experiment, while from the object's perspective, i.e., the description of how pure reason works, we encounter a *description* of how heterogeneous substances (in this case, the faculties and representations) interact in the experiment<sup>15</sup>. In the first section of this paper, I showed the *constitutive* criteria of the *meta-discourse in philosophy*, while in the

---

<sup>14</sup> The procedure of changing perspectives is much broader in the CRP. I explore, for example, how it defines the different meanings of the concept of noumena throughout the CPR in Klein (2020).

<sup>15</sup> An anonymous referee made a relevant comment that the transmission of terminology from the chemical context into philosophical is questionable, since, for Kant, faculties are certainly not substances. I do not think that faculties are substances, but this does not hinder the transmission of the terminology, because it is Kant himself who suggests it in the Anthropology and in several other quotations that I have brought up in this paper. The analogy with a chemical experiment gives not only a terminology but also a wider framework with which to understand Kant's argumentative steps. For example, if we use a model based in the field of logic and semantics, we can think in a similar way as Allison does and describe the argument in the transcendental deduction A as an argument from below, and the transcendental deduction B as an argument from above. However, if we frame the transcendental deduction as a synthetic experiment, then there is neither above nor below, but a process that has to bring together several premises at once by way of a progressive procedure. This topic is most certainly worthy of a future paper.



second, I have identified the specific premises of the *meta-discourse of the transcendental philosophy*, which *design a plan* for elucidating ‘how synthetic *a priori* judgments are possible’. Now, I will deal with how our faculties interact to produce synthetic *a priori* judgments. In this sense, from the perspective of the transcendental reflection, it describes what takes place inside the experimental investigation.

Thus, on the one hand, while the language of the experiment seeks the perspective of the researcher that formulates a plan for questioning a witness, on the other, the language of transcendental reflection aims at the perspective of the thing that is being described or of the narrative of the witness itself. We may call the former the *methodological point* of view and the latter the *substantial point* of view. From the *methodological point* of view, we talk of the experimental rules and premises, while the *substantial point* of view describes the object, the faculty of pure reason. The former view ensures that the philosophical argumentation follows from a construction subject to public justification, to testing and replication. The latter perspective describes what happens in the object itself,<sup>16</sup> and this constructed object (pure reason) must be able to explain how synthetic *a priori* propositions are possible. The internal perspective has to take an objective form in the discourse, since it would be self-contradictory that two different yet true realities coexist, which would mean the same as asserting that two different philosophies are true. Therefore, the discourse at the level of the object assumes the *foundationalist tone* that is characteristic of the transcendental reflection. Both perspectives do not

---

<sup>16</sup> I believe that this internal perspective of what takes place in reason or better, the sort of reason’s agency (*die Handlung der Vernunft*), is the point of view of that Kaulbach (1978, ch.1-3) used for interpreting the CPR. So, as I see it, Kaulbach presents an internal constructive description of reason.

contradict but complement each other and form a single complex unit.

In order to assure that both points of view are coherent in a single complex unity, the features at work in the conditions of the experiment must be transferred and incorporated in the description of the transcendental subjectivity. According to Rawls, the features of the construction must be mirrored in what is constructed. Thus, since pure reason is the result of the philosophical experiment, it must mirror the features that were considered in the formulation of the publicly justified experiment called transcendental deduction. Methodologically speaking, though, *the methodological perspective or the constructive experimental perspective has logical and epistemological precedence*, since it establishes the parameters of legitimacy for what will be considered transcendental reflection and pure reason<sup>17</sup>. The criteria of the experiment are the general guidelines for justification.

Another way to frame this change of perspective between the methodological/constructivist and the substantialist/realist points of view is by way of Kant's famous distinction between *ratio essendi* and *ratio cognoscendi*. In *Critique of practical reason*, Kant states that in order to avoid the accusation of inconsistency when, in a moment he claims that freedom is the condition of the moral law, and in another he states that the moral law is the condition of freedom, he remarked that 'whereas freedom is indeed the *ratio essendi* of the moral law, the moral law is the *ratio cognoscendi* of freedom. For, had not the moral law already been distinctly thought in our reason, we should never

---

<sup>17</sup> In this sense, my position is contrary to that of Schafer (2019), who argues for an epistemological primacy of the self-conscious rational capacities.

consider ourselves justified in assuming such a thing as freedom (even though it is not self-contradictory). But were there no freedom, the moral law would not be encountered at all in ourselves.’ (KpV, 05:04) *Mutatis mutandis*, we can say that the metaphysical experiment as a methodological construction is the *ratio cognoscendi* of pure reason, while pure reason is the *ratio essendi* of the construction.

Acknowledging that transcendental reflection has a substantialist and realist tone does not mean the same thing as a realist reading of the CPR. First of all, the realist perspective is subject to the methodological one, which has *logical and epistemological priority*. Secondly, this “realist tone” is better understood in the sense of what Korsgaard calls a *procedural* realist. In ethics, for example, ‘the procedural moral realist thinks that there are answers to moral questions *because* there are correct procedures for arriving at them. But the substantive moral realist thinks that there are correct procedures for answering moral questions *because* there are moral truths or facts which exist independently of those procedures, and which those procedures track.’ (Korsgaard 1996b, 35s.) In the same fashion, a procedural realist acknowledges pure reason as a result, as a construct, in other words, *because* of the construction procedure, rather than the argument that pure reason is a fact that only manifests itself in our *a priori* judgments.

A detailed description of how pure reason and the transcendental I are constructed from this experiment is beyond the scope of this paper. However, I will briefly outline two decisive moments: one is analytical/regressive, and the other is synthetic/progressive.

In the *metaphysical exposition* of the concepts of space and time, as well as in the *metaphysical deduction* of the categories, a regressive and analytical argumentation is used. Upon analyzing the representation of space and time, the following features are detected: a) they cannot be derived from

experience (*a priori* arguments); and b) they lack the same features as the conceptual representations (*singularity* arguments). So, decomposition uncovers that representations of space and time cannot be derived from experience, but are actually presupposed by experience. Moreover, in tracking how these representations work while combining and reacting with other elements, it becomes evident that space and time do not work in a similar fashion to that typical of conceptual representations. In the same way as a different class of chemical substances, their properties can be understood by the way of their behavior with other substances and conditions. This fundamental difference requires them to be separated into different species. Following this regressive procedure, Kant argues that space and time make up a special class of representation, and are, as such, the only two *a priori* forms of sensibility.

The so-called metaphysical deduction of categories also makes use of a regressive argument. The search for a complete table of categories is carried out using the notion of 'logical function', the common element that connects categories with the table of judgments. If the fundamental feature of the concept, as a distinct sort of representation, is its function, namely 'the unity of the action of ordering different representations under a common one' (KrV, B93), then, by finding the fundamental and irreducible functions of understanding (using 'the clue' [*Leitfaden*]) of the table of judgments), we can arrive at the table of categories of understanding. This is similar to the procedure used by chemists when they distinguish metals from non-metals, organizing them internally according to some principle. So, in order to add or remove any category from Kant's proposed table, one must prove either that some specific logical function does not result from the composition of other functions in the former recognized categories, or that it has a function that none of the other categories

independently or conjugated can fulfill. It is in this sense, for example, that Kant argues for the specific logical function present in infinite judgments and for the category of limitation (cf. KrV, B97).

On the other hand, a synthetic and progressive argumentation is used in the *transcendental exposition* of space and time as well as in the *transcendental deduction*. At this point of the philosophical experiment, those elements found through the regressive procedure have to be combined not only to explain *actual* synthetic *a priori* judgments present in pure sciences of nature and mathematics (a task for the transcendental exposition of space and time), but *how synthetic a priori judgments in general are possible* (a task for the transcendental deduction of categories). In the case of the transcendental exposition of space and time, Kant believes that it was enough to *show that*, without the pure forms of space and time, it would be impossible to have any insight of the necessity and universality of the judgments of mathematics and the pure natural sciences. In the case of the transcendental deduction of the categories, however, it must be demonstrated not only *that* but also *how* categories are always present in any synthesis, otherwise the concept of *possible experience* could not be explained according to a progressive and gradual procedure.

Within the confines of this paper, I can only offer an *exemplary* reconstruction in order to explain the role of transcendental apperception in this progressive movement constructed in analogy with a chemical experiment. I suggest that the chemical experimental hypothesis may help us to understand Kant's famous claims in paragraph 16, namely that the original unity of apperception is synthetic, but as a proposition it is analytical. This thesis may be explained as follows:

a) Upon the regressive process of decomposing the synthetic *a priori* judgments of pure physics and mathematics, Kant did not find the ‘transcendental I’ as a fundamental element. Therefore, the ‘I’ cannot count as an element in the same sense as the pure forms of intuitions and the categories. The ‘I’ cannot work as a function of synthesis.

b) By denying any appeal to intellectual intuition, it follows that all analyses should be preceded by a synthesis (when we are dealing with judgments and concepts). According to Kant: ‘no concepts can arise analytically as far as *the content is concerned*.’ This means that ‘the synthesis alone is that which properly collects the elements for cognitions and unifies them into a certain content; it is therefore the first thing to which we have to attend if we wish to judge about the first origin of our cognition.’ (KrV, B103; cf. B 133n.) Otherwise, we would be implicitly assuming the existence of innate ideas, as analytical unities already present and given to our mind and from which we could derive knowledge according to logical principles (cf. KrV, B135; B 139).

c) Since our mind can only use the categories as ‘rules of synthesis’ (KrV, B185) rather than analytical unities, and since the manifold has to be given by the faculty of sensibility, then categories can only contain analytical content after being used as rules of synthesis for the sensible manifold.

d) The relation between categories and the forms of sensibility can only be possible if both kinds of representations might be combined in a certain way. Similarly, when two heterogenous elements have to

interact in order to form a third and distinct one, the categories and intuitions must have access to a medium that enables them to interact.<sup>18</sup> The ‘original-synthetic unity of apperception’ is supposed to fulfill this role, since it is the ‘I think’ that ‘must be able to accompany all my representations’ (KrV, B131). In other words, the apperception is the fundamental condition that enables concepts and intuitions to interact.

e) In order to relate sensible and conceptual representations, the apperception must be in a position that is not only superior to both types but even to the categories, since it must enable the categories to come together in a single judgment. Therefore, the only position that the apperception can possibly occupy is ‘the highest to which one must affix all use of the understanding’ (KrV, B133n.). Only then it can explain how heterogeneous elements could be combined into an analytical unity.

f) Although the transcendental apperception is what makes the synthesis possible, the proposition that ‘the I think must be able to accompany all my representations’ is ‘itself analytic’ (KrV, B138). In a chemical experiment, in order to meld two heterogeneous elements into a third one, at least three

---

<sup>18</sup> An anonymous referee posed the relevant question of the function of schemas and their mediating role between concepts and intuitions. I shall have to leave this topic for another paper. However, I would suggest that the transcendental I is the medium that allows the relation between the categories and the sensible manifold, while the schemas are the rules through which they are connected.

things must be presupposed, namely, the two elements and the medium that allows them to interact. The apperception is *this medium and the way* that enables categories to work as rules of synthesis for the manifold given through sensibility. In other words, in order to explain how a discursive intellect can formulate the concept of object in general as an analytical unity, then at least three premises must be in place: i) the manifold has to be given in the sensibility; ii) there must be specific ways of connecting this manifold (the task for the categories); and, iii) a medium and a way through which the manifold and the categories might interact (the task of the apperception). In this sense, the claim that ‘the apperception is a synthetic unity’, is the result of a regressive and analytical movement explaining what is already assumed for a discursive intellect capable of combining different kinds of representations.

g) From another point of view, however, when we try now to explain how the ‘I think’ becomes a concept, or an analytical unity, then, the *synthetic* unity becomes the necessary condition, to the extent that it is only by performing combinations that a discursive intellect may create the concept of the ‘transcendental I’<sup>19</sup>. Nevertheless, considered as an analytical unity, it means nothing more than a logical-transcendental presupposition of a synthesis in general. It is in this sense that Kant claims that ‘it is only because I can combine a manifold of given representations *in one*

---

<sup>19</sup> The ‘I think’ has to be an ‘identical self in regard to the manifold of the representations that are given to me in an intuition because I call them all together my representations, which constitute one.’ (KrV, B135)



*consciousness* that it is possible for me to represent the *identity of the consciousness in these representations* itself, i.e., the *analytical* unity of apperception is only possible under the presupposition of some *synthetic* one.’ (KrV, B133) The ‘transcendental I’ must not be confused with the psychological I, which can be the object of internal experience and empirical knowledge.

Therefore, in using the analogy with a chemical experiment, we can better understand in which sense the transcendental apperception: i) is a synthetic unity (in the sense that it is the fundamental condition for any composition or synthesis); ii) is accessed by way of analytical construction, in the sense that we identify it through a regressive argument regarding the combination of heterogeneous elements in a judgment; and yet iii) as a concept, namely the analytical unity of the transcendental I, is dependent on the synthetical unity, i.e., is only possible through the act of composing representations. In other words, the transcendental deduction is a progressive argument designed to show *how* conceptual and sensible representation interact in order to compose synthetic *a priori* judgments *in general*. However, inside this progressive argument there is a new regressive moment, as a sort of argumentative sub-movement, since the *progressive* experiment itself has analytical premises, namely that at least three things are needed in order to form any composition: two heterogeneous elements and a medium for combining them. For the purposes of this paper, this brief reconstruction of the paragraph 16 is sufficient.

#### 4. Final remarks

The meta-philosophical and transcendental premises presented in the first two sections of this paper *constitute* the premises for the construction of the pure reason. In this case, pure reason, as the result of that experimental construction, should be capable of explaining the possibility of its own self-cognition through that experiment. This is not a vicious circle, rather a way of organizing different perspectives of the same thing in a coherent unity capable of internal self-regulation. From a Copernican point of view, we could say that it is because we can find neither in heaven nor on earth an absolute and stable point, so we have to build an Archimedean critical perspective that might function as a stable point internal to an experiment with a complex set of variables. This Archimedean point with a Copernican character is achieved through the articulation of several premises. Borrowing Bacon's metaphor, it is not the building of a castle, but that of a ship that can cross the seas without any absolute stable ground<sup>20</sup>. If the balance between the premises (each of which might depend as well on other constructions from different fields of investigation) is lost, the ship may very well sink.

The justification of the hypothesis depends, then, on the coherence and balance among the premises and their explanatory capacity, i.e., due to their capacity to recognize illusions and dissolve antinomies, as well as the ability to explain the possibility of synthetic *a priori* judgments in general. However, it is beyond human capacity to look for a final explanation of why pure reason is the way it is. According to critical philosophy, from a theoretical point of view, the absolute can only be thought of regulatively and therefore, there is no absolute explanation.

---

<sup>20</sup> Frontispiece of Bacon's *Instauratio Magna* was a ship sailing.

Let us turn, now, to the criticism that a constructivist position would be incapable of avoiding the voluntarism and contingency of its results. It actually depends on what sort of construction we are dealing with. On the one hand, the construction has to be grounded in the free choice of the starting points implicit in the premises, in the formulation of the hypothesis and the questions formulated by the ‘judge that questions his witnesses’. On the other, some constructions may be considerably more adequate than others, as determined by: a) the extent to which they respect the principles of freedom, equality and independence (proceduralism) intrinsic to philosophical argumentation (cf. section 1); b) the way that they do justice to the set of variables considered in formulating the hypothesis, such as the rules of general logic, completeness, coherence, articulation with the results well established in other fields (mathematics, physics, etc.) and, finally, their capacity to be regressively and progressively constructed (cf. section 2); c) the coherence and explanatory capacity of the regressive and progressive process of argumentation keeping in mind the actual set of cognitions as well as its explanatory capacity regarding future cognitions, whether by avoiding antinomies, or by enhancing and enlightening the research in other fields of knowledge (either in sciences, or in morality (cf. section 3)). Therefore, if space exists for voluntarism and contingency, they are, though, purified and circumscribed by a method made up of a complex and articulated set of criteria. It is in this sense that we can understand Kant’s claim that the legislation both in theoretical and in the practical fields is ‘not an arbitrary form-giving undertaken by design, or even machine-made (on behalf of the state), but above all a piece of handwork, dealing with the given object’ (VAVT, AA 08: 404).

Finally, this constructivist interpretation has an important philosophical advantage. Not only does it present the

concept and the plan of construction of pure reason in its theoretical use, but it also displays the process used to elaborate said plan. Thereby, it opens avenues for adapting itself and taking new variables into account. Said variables must be introduced in case they are important theoretical elements constructed in other relevant investigatory fields, such as mathematics, physics, chemistry, and biology, for example. Thus, pure reason is a construction with two perspectives. On the one hand, it is a concept that strengthens and limits the construction of cognition in theoretical (in mathematics and empirical sciences) and practical fields (apply practical philosophy), but, on the other, it must be also permeable to them<sup>21</sup>. Thus, pure reason, is a construction that carries in itself the meaning of the ‘critical path’ that must be subject to the evaluation of our faculties according to the procedures of a republican process.

## References

All translations are quoted from *The Cambridge Edition of the Works of Immanuel Kant* (1992ff.) and the quotation rules followed are those established by the *Akademie Ausgabe*. Kant, Immanuel (1900ff): *Gesammelte Schriften*. Hrsg.: Bd. 1–22 Preussische Akademie der Wissenschaften, Bd. 23 Deutsche Akademie der Wissenschaften zu Berlin, ab Bd. 24 Akademie der Wissenschaften zu Göttingen. Berlin.

---

<sup>21</sup> A similarly complex relation between science and technique was presented by Wind (2001), who also carried it as far as the relation between metaphysics and sciences. Despite several disagreements with Wind, there are some key similarities between our proposals, which are beyond the scope of this paper.

- Bacon, Francis (2000): *The New Organon*. Cambridge texts in the history of philosophy. Cambridge.
- Formosa, Paul (2011): Is Kant a Moral Constructivist or a Moral Realist?, in: *European Journal of Philosophy* 19(3), pp.1–27.
- Förster, Eckart (ed.) (1989): *Kant's Transcendental Deductions*, Stanford.
- Gloy, Karen (1996): *Kants Philosophie und das Experiment*, in: Schönrich, Gerhard; and Kato, Yasushi (Hrsg.) *Kant in der Diskussion der Moderne*, Frakfurt am Main.
- Henrich, Dieter (1966): *Zu Kants Begriff der Philosophie*, In: Kaulbach, Friedrich; ritter, Joachim (Eds.). *Kritik und Metaphysik* (Festschrift für Heinz Heimsoeth), Berlin, pp. 40-59.
- \_\_\_\_\_. (1969): *The Proof-Structure of Kant's Transcendental Deduction*, in: *The Review of Metaphysics*, 22(4), pp. 640-659.
- \_\_\_\_\_. (1975): *Die Deduktion des Sittengesetztes*, in: Schwan, A (Org.). *Denken im Schatten des Nihilismus*. Festschrift für Wilhelm Weischedel zum 70. Geburtstag. Darmstadt.
- \_\_\_\_\_. (1984): *Die Beweisstruktur der transzendentalen Deduktion der reinen Verstandesbegriffe*, in: Tuschling, B. (Org.). *Probleme der 'Kritik der reinen Vernunft'*. Kant-Tagung Marburg 1981, Berlin.
- \_\_\_\_\_. (1989): *Kant's Notion of a deduction and the Methodological Background of the First Critique*, in: Förster, Eckart (ed.). *Kant's Transcendental Deductions*. Stanford.

- \_\_\_\_\_. (2001): Systemform und Abschlussgedanke. Methode und Metaphysik als Problem in Kants Denken, in: Gerhardt, V. (Orgs.). Kant und die Berliner Aufklärung, Berlin.
- Höffe, Otfried (2003): Kants Kritik der reinen Vernunft. Die Grundlegung der Moderne Philosophie. München.
- Kaulbach, Friedrich (1978): Das Prinzip Handlung in der Philosophie Kants. Berlin.
- Klein, T. Joel (2020): Systematic perspectives on the distinction between appearances and things in themselves in the Critique of Pure Reason, in: *Studia Kantiana*, v. 18, p. 139-175.
- \_\_\_\_\_. (2019): Ciência e Método em Bacon e Kant, in: *Revista Dissertatio de Filosofia*, v. 49, p. 287-311.
- Kleingeld, Pauline & Willascheck, Marcus (2019): Autonomy without Paradox: Kant, Self-Legislation and the Moral Law, in: *Philosophers's Imprint* v.19, n.6, pp.1-18.
- Korsgaard, Christine M. (1996): *Creating the Kingdom of Ends*, Cambridge.
- \_\_\_\_\_. (1996b): *The Sources of Normativity*, Cambridge.
- \_\_\_\_\_. (2009): *Self-Constitution: Agency, Identity, and Integrity*, Oxford.
- Møller, S. (2020). *Kant's Tribunal of Reason: Legal Metaphor and Normativity in the Critique of Pure Reason*. Cambridge University Press.
- O'Neill, Onora, (1989): *Constructions of Reason*, Cambridge University Press.
- \_\_\_\_\_. (2015): *Constructing Authorities*, Cambridge University Press.

- Pievatolo, Maria Chiara (1999): 'The Tribunal of Reason: Kant and the Juridical Nature of Pure Reason', in: *Ratio Juris*, 12, pp. 311-327.
- Proops, Ian (2003): 'Kant's Legal Metaphor and the Nature of a Deduction', in: *Journal of the History of Philosophy*, 41 (2), pp. 209-229.
- Rawls, John (1980): 'Kantian Constructivism in Moral Theory', in: *Journal of Philosophy* 77, pp. 515–72. Reprinted in Rawls 1999b, pp.303–58.
- Rawls, John (1989): 'Themes in Kant's Moral Philosophy', in: Förster (ed.): 81–113. Reprinted in Rawls 1999, pp. 497–528.
- \_\_\_\_\_. (1996): *Political Liberalism*, rev. ed., New York.
- \_\_\_\_\_. (1999a): *A Theory of Justice*, rev. 2nd., Oxford.
- \_\_\_\_\_. (1999b): *Collected Papers*, ed. S. Freeman, Cambridge, MA: Harvard.
- Reath, Andrews (2006): *Agency and Autonomy in Kant's Moral Theory: Selected Essays*. Oxford.
- Schafer, Karl (2019): 'Kant: Constitutivism as capacities-first philosophy', in: *Philosophical explorations*. DOI: 10.1080/13869795.2019.1599049
- Seeberg, Ulrich (2007): 'Kants Vernunftkritik als Gerichtsprozeß'. In: Bowman, B. (Org.). *Darstellung und Erkenntnis*. Paderborn.
- Sensen, Oliver (2013): 'Kant's Constructivism', in: Bagnoli, Carla (ed.): *Constructivism in Ethics*, Cambridge University Press, pp. 63-81.

- \_\_\_\_\_. (2017): Kant's Constitutivism, in: E. Schmidt and R. dos Santos (eds.), *Realism and Antirealism in Kant's Moral Philosophy (New Essays)*, Berlin, pp. 197-220.
- \_\_\_\_\_. (2013): Moral Skepticism, Constructivism, and the Value of Humanity, in: Carla Bagnoli (ed.), *Constructivism in Ethics* (Cambridge: Cambridge University Press), pp. 22–41.
- Trevisan, Diego. K. (2018): *Der Gerichtshof der Vernunft: Eine historische und systematische Untersuchung über die juristischen Metaphern der Kritik der reinen Vernunft*. Würzburg.
- Wind, Edgar (2001): *Das experiment und die Metaphysik*, Frankfurt am Main.

