

## **RICHARD AVENARIUS' "KRITIK DER REINEN ERFAHRUNG" (CRITIQUE OF PURE EXPERIENCE): AN ENGLISH SUMMARY**

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We provide the first English translation of Richard Avenarius' masterpiece, the "Kritik der Reinen Erfahrung" (1888-1890), to give the possibility to the (almost) unaware English speakers to appreciate such a neglected and innovative philosopher and his still topical epistemology.

**KEYWORDS:** philosophy; epistemology; empirio-criticism; neuroscience; brain

### **INTRODUCTION**

The French-Swiss Professor in inductive philosophy Richard Avenarius (1843-1896), father of empirio-criticism together with Ernst Mach, is one of the most underrated and misunderstood philosophers ever. It mostly depends upon his terminology, which displays an insurmountable difficulty (Russo Krauss, 2015). However, influenced by the most innovative proposals of his times of transition between the Idealistic/Rationalist legacies and the new Materialistic/Scientific interpretation of reality – i.e. by cultural evolutionism, linguistics, biomechanics, entropy/energy and, above all, by the newborn experimental psychology -, Richard Avenarius produced a complete system of philosophy and innovative methods of investigation of the laws of knowledge (Tozzi and Peters, 2017). Chunks of his original ideas can be found not only in philosophers of mind after him - such as Gestalt, phenomenism, behaviourism, functionalism and cybernetics (Marr 1982), autopoiesis, dynamical systems theory (Churchland 2007; Richardson et al., 2014; Tognoli and Kelso, 2014), embedded/embodied mind (Gibson 1986; Friston 2008), topology of the brain function (Lewin 1936; Tozzi et al., 2017) – but also in countless neuroscientific theories and approaches – e.g., nervous transduction via electric spikes (Nieuwenhuys et al., 2008), neural code's cracking (Watanabe et al., 2014), consciousness (Tononi 2008); multisensory integration, Bayesian accounts (Friston 2010), symmetry breaks (Roldán et al., 2014; Tozzi and Peters, 2016; Sengupta et al., 2016) -. Our aim is to provide the first chronological English summary of his masterpiece, the "Kritik" (Avenarius 1908), to make English speakers aware of this ignored and pioneering thinker. The numbers in brackets provided below single out the original paragraphs of his book (Edition 1908).

## CRITIQUE OF PURE EXPERIENCE (1888-1890)

### PREFACE AND GENERAL INTRODUCTION [1-39]

Avenarius starts from **the two axioms of knowledge**. The first establishes that every human individual originally accepts over against him: a) a spatial environment composed of manifold parts which stand in relation of dependence to one another, and b) other human individuals making manifold describable statements; c) what-is-stated is in some way dependent upon the environment. **The second axiom** says that the scientific knowledge is just a development of the pure knowledge, i.e. the non-scientific, simple and natural possible knowledge.

It follows the **empiriocritic assumption**: when the human individual finds himself in the mist of the external environment, he states he's having an experience [1]. The concepts of matter, substance, soul, consciousness, causality, necessity, freedom, reality are not included in such assumption [38].

Follow then two (apparently) **interchangeable propositions**: if a statement comes from the environment, then the statement is an experience [2]; if a statement is an experience, then the statement comes from the environment [3]. **Three questions follow**: in what sense does the experience come from the environment [7]? In what sense is a statement an experience [8]? Do the two questions collimate or diverge [9]? The entire book will be devoted to the answers of these questions. Through analytic tools [14], a formal and **general theory** not only of the pure experience, but also of the human knowledge and action, can be displayed [11-13].

He includes no other **standpoint** than that where he stands. As the Greek philosopher, he stands in the turmoil of the market-place, not as buyer or seller, in order that he may just observe [16].

The next paragraphs explore the relationships among the three members: the environment, the self and the human statements. The ever-changing **environment** displays variations in quality and quantity, space and time, simplicity and intricacy [20-23]. The environment is not just involved in experience, but is also regarded as threat, as disturbing influence capable of breaking down the maintenance of the individual. The environment must nevertheless be regarded also as favorable to maintenance, nourishment and protection [37].

The **individuals** who make statements are organisms who live in a linguistic community, are born, grow preserve for a while and die [24]. The **statements** are not sounds or noises, but words (or gestures, such as the lacrimal secretions which point to cry, or mimic movements) [25]. The sensations are the describable content of statements. The latter are not stationary, because they may change [29]. They are simple or complex, primitive or evolved. We cannot perceive the thoughts and the sensations of other men, but just assign to them thoughts and sensations analogous to ours. The human statements can be divided in **elements** (such as green, cold, hard, sweet) and in **characters** (qualifications like pleasant, nice, beneficial, unpleasant) [30].

The link between the environment and the statements is very dynamical [31-36]. When the environment changes (as an example, during a chemical-physical experiment), it follows a variation in the statement [31]. Further, the statements may vary even if the environment does not, and vice versa: as an example, if a child looks at the same figure, he can see each time something different. The same names or sounds may refer to different people or facts. Other times, the sensation from a sensory modality may evoke sensations from another: i.e., I see a fruit and feel its taste. Furthermore, the statements may change due to the different cultural background of every individual.

## PART ONE: OUR ENVIRONMENT AND THE PARTIAL CENTRAL NERVOUS SYSTEM [40-435]

A **system** is formed of two variables connected in a way such that when one changes, the other changes [41]. The **initial state** occurs before the variation, the final state afterwards [44]. The changes can be either real or merely possible [46]. The **final state** depends on two settings: the initial state of the system and the external factors acting on the system [54].

The man is the only member of the empiriocritic assumption who stands as witness [58]. The environment of a single individual [59] is a system and can be divided into spatial and social environments [60]. The environment acts on the organisms in two ways: either gets into the organism causing a change in matter, or stimulates the nerves [62]. A peculiar kind of environment is the human being, in which a distinction can be done: the non-nervous and the nervous systems [66]. The **nervous system** can be divided in nerves and brain [67]. The statements made by human beings do not depend on the environment, nor by the nerves: when the nerves are damaged, is indeed possible to have sensations anyway (phantom limb syndrome, visual hallucinations during optic nerve atrophy) [68].

There is however a part of the more comprehensive system of nervous central organs in which are collected the afferences and the efferences [70], by which the statements depend on: we do not need to care about its precise anatomical and physiological structure, because it has not yet been sufficiently ascertained by the experimental trials to find a localization for brain functions; besides, we have no need of this information for our purposes [72]. (note of the translator: hereafter we will term, slight improperly, this unidentified subsystem with the broad **term of "brain"**), The only notable thing is that there is a division of functional subsystems in brain [73], irrespective of differences in coordination, morphological development, functional relationships [75-77].

When somebody accepts over against him that the statement depends on the environment, he accepts over against him that the statements depends on the brain [79], in particular on **changes in brain** [80]. The statements depend on the environment just in the sense that the environment is able to modify the brain [82]. The variations of the environment are studied by the special sciences [82-83], while the variations of the individual, and in particular of his brain, are noteworthy and deserve a better explanation [85]. The environment acts on the brain directly or indirectly, through physiological - awareness, sleep, fatigue, training - or pathological changes - hallucinations, illnesses - [102-117], or variations propagated by other parts of the organism, such as the movements of vocal organs. A very important variation is the **habituation**, which may exert on the brain a temporary functional action, or a permanent organic one [116.]

The statements do not directly depend on the environment, rather by brain variations, but the latter depend on the environment [127]. The whole psychical life is a function of the self-preservation of the organism within certain limits, or, in case it is becoming disorganized, is the function of the self-preservation of a partial system of the organism [130]. The brain tends **toward asserting itself**, either in the individual, or social, or global organisms. The ideal environment is the maternal womb, where the self-preservation is utmost [133].

The highest levels of conservation [139] are achieved when an energetic equilibrium occurs in the brain between two opposite forces: the stimulus (the excitation of a nerve) and the material exchange (the metabolism). In other words [155], our maintenance is conditioned by an highly dynamical equilibrium between two opposite customary processes: **work and nourishment**. The brain alternates between these states of equilibrium and breaks [160]: when changes take place, there are also at hand the conditions which annul the change; then the brain approximates again to its maximum-maintenance. It consists in **oscillations** [160] between two phases, in deviation from a preliminary value and in approximating to it again. A process of change is itself compounded from various oscillations, characterized by many features [163-176] treated extensively in part two, including the central habituation [173].

Psychical processes come along the physiological processes of the restoration of equilibrium in living organisms. When the equilibrium of a brain is disturbed, it is always on account of a

difference arising between the nutritive functions of the system and its work. It is unnecessary to deal further with the process of nourishment - we may even assume it to take place during the sleep [198, 200] -; then we have only to explain in what the work-process consists. The elementary physiological processes consist of a state of disturbance of the equilibrium of the brain and of a restoration of the difference. All the changes which lie between this beginning and end follow each other immediately; they form the **vital train** [181]. It is a complex process divided into three parts: the **introductory section**, where, starting from the quiet state, a disturbance (oscillation) is introduced which breaks the equilibrium [182]. Then follows the **intermediate** section, where compensation mechanisms are activated through mechanisms called variations counteracting the oscillations [223; 352 and following]. There are different types of **variations**: general and specific, significant and not significant, qualitative and quantitative [sleep and awakening: 190, then till 218], outside and inside the brain [241]. The **final state** is such that the oscillation is suppressed with return to the quiet and maximum preservation state [314]. Every vital train ends with phase three [189], but the vital trains are infinite, superimposed, cross-linked, hierarchical [184-185, 177]. The ideal equilibrium of the brain cannot be achieved, due to the continuous dynamics [186].

The following evolution is **towards more perfect series** [406]. The removal of the alteration toward the higher conservation occurs in two ways: either the return to the original stable state, or a different stable state. The environment is posed more times, leading to a final state, valid just for that individual in that moment.

There are also **systems of higher order**, in which the brain of different individuals joins together in higher social assemblies [328]. It is the tendency of the whole mass of human knowledge to become the highest degree adapted to the surrounding world. Humanity represents, in the whole, a kind of ultra-human organism, following the same basic rules of self-preservation of the individual [341].

An individual vital train is composed, e.g., of the following terms: (1) Habitual increase of nourishment; (2) Habitual increase of work, set for a short time; (3) Variation of work; (4) Compensating adjustments until the variation is completely annulled. The individual vital train is equipped with many processes [407-435] which progressively remove the useless terms, approximating to the final pure stages equipped with minimum energy and maximum stability, higher spatial and temporal unrestriction, indispensability [352, 389]. The role of habituation is once again crucial. The final state of the brain is a physiological configuration which does not vary when the environment changes [409]. It is unvaried towards every changing component of the environment. However, this final state is composed not only by the final pure state, but also by other variable, **accidental factors** [414], which need to be progressively abolished [432]. When the geographical and social environment widens to include the entire Earth surface and the entire mankind, the brain removes the accidental factors through a biomechanical process of progressive elimination.

**The answer to the first question** is thus the following: the environment is at the base of the experience only when he leads to variations in the individual brain, and only when a statement depends on environmental variations [435]. However, such values are valid just for a given individual, in a given moment: the individual final state changes from individual to individual, and also from place to place and from epoch to epoch.

## PART TWO: SPECIFIC VITAL TRAINS [436-963]

Avenarius illustrates the particular cases of the general principles exposed in Part one, looking for the countless psychological correlates of the physiological vital trains. The general scheme is the following: when an individual makes a statement, a change in oscillations occurs in brain [455]. The statements depend upon the characteristics of the physiological variations in brain and its oscillations.

The oscillations in the brain display different characteristics, each one leading to different statements [162-175; 458-552]. We will go through a few case in points. The **form** of the oscillations affects all statements dependent upon the senses (touch, pressure, temperature, hearing, smell, taste and sight) [459]. The **magnitude** of the oscillation gives rise to the values of intensity, as “strong” or “weak” [461]. The **relevance** of the oscillation depends upon the significance which the partial system just affected has for the whole central organ, related to natural disposition and training. Although the magnitude may be the same, the oscillation will assume a different value if it affects a partial system which is or is not highly developed by its disposition and training. The varying relevance of the oscillation affects the feeling, moods, and so on, [464], while the **direction** is related to “pleasure” and “pain” [469]. The mode in which an oscillation is affected by practice and training is the familiarity, including the “real,” “known,” and “certain,” and their variations. The **habituation** and its changes play once again a crucial role: they give rise to the “difference” [474] and the “identity” [476]: in other words, the more the same oscillation is repeated, the more the sensation is perceived as usual, the same [479]. Other values linked with changes in habituation are: the sure, the certain, the known, the familiar. The **opposition** of many oscillations gives rise to the sensation of prevalence and perception of finer details (discrimination), in which some sensations are highlighted by the attention, compared with the faded background sensations [505]. When the **connexions** of the oscillations vary, these latter become more active, more differentiated, more articulated. The concepts of thing, idea, arise from the mix of different oscillations [512; 535]. The things have a higher intensity than the ideas. When two oscillations are **similar** and the statement is perceived as the same, long chains of oscillations lead to: “all together”, “always”, “everywhere”, progressively reaching the **general concept of the total reality**, the world. When the identical becomes rule, the rules become laws and the truths become sure, existing, while the different becomes exception [552 sgg]. In summary, to make an example: a statement as to its strength depends only upon the amplitude of the oscillations, as to its pitch depends upon the number, and as to its timbre depends upon the form.

The mental life falls into series, called the **specific vital trains**, with prearranged general features, characterized by **three sections** [775]. In the first section, at the start there is the expected value, stated by the individual as sure, true, known. Then enters a variation, stated as different, diverging, doubtful, unexpected, together with the feeling of pain, opposition, or uncertainty, inquietude, dissatisfaction [797, 842]. The second section is an effort to suppress the anomaly: the brain strives to remove this unpleasant experience, through complex mental processes or simple habitual actions. At the end, value is found in the final section, leading to the feelings of rest, satisfaction, certainty, truth and quiet of the brain [850]. The variations can be **removed either through** peripheral action (practical behavior) or through brain action (theoretical behavior). Avenarius stresses that each statement is influenced by type and magnitude of the individual’s background [853], and that the final section **is independent** from the number or proceedings of the intermediate steps [857]. Furthermore, there are **three ways to suppress the variations**: (1) reduction of the unknown to the known; (2) gradual habituation to a change, so that the unknown becomes a known. (3) temporary substitution of one kind of change for another. However, due to the differences of the initial conditions among individuals, the ideas achieved in the third section could lead, after a while, once again from a known to an unknown. The ultimate suppression of variations occurs via the search for **universal laws** [888]. As times goes on, the individuals and the generations are in front of faster, simpler and unavoidable concepts [890]. The approximation will always be towards the identical highly generalized, unlimited concepts [891], independently from the initial steps. The universal concepts are characterized by simple, complete descriptions, by qualitative differences expressed in many ways and by formal equivalences expressed in different forms.

In a foremost paragraph, Avenarius examines **the experience regarded as character** [931], i.e. the variable form (emotions, sensations, perceptions and so on), in which we experience anything. The question is not what individuals mean for experience, but: what individuals state is an experience? [932]. Many examples are listed in which statements are referred as experience [933]: the appearance of the sun, the perceived temporal relationships among events, the difference between



sleep and arousal, the travel in far countries during dreams, the miracles, the presages of death, the causal connection, the footsteps of the animals, the things that man say each other, the logic, the calculations, the axioms, the mathematical laws. So, what is the experience? Is it always linked to the external environment [935]? Does it refer to entities, or simply to the cognition of their existence, or is it pure cognition without existence? [936]. The three solutions are not satisfactory [937], because the experience cannot be defined only in one way. The individual simply bumps into the components of the environment, and then describes what he met [938]. When a little girl states that she has seen angels, then the angels are an experience for her [938]. The individual who states: "it is an experience" is saying that he had a plurality of single perceptions [940]. Thus, the better, although incomplete, definition of experience could be: something perceived [940]. Also the ego, the I, is a statement, in which the perception is felt as the individual's own perception [943]. The more the thing and the perceiving individual are separated, the more the thing is perceived by the individual as active and as a factum of experience, while the individual perceives himself as a passive percipient [945, 946].

Then Avenarius evaluates **the experience regarded as content** [947], i.e. everything which is felt, sensed, perceived and so on. When individuals state they have an experience, what is the content of their experience [948]? The content depends on the modifications in the brain and on the current state and education of each individual [951]. It doesn't matter if the statements are related to existing or non-existing entities: all the values perceived by the individual in a given moment as experience are indeed a content of experience [952], and they may vary if the individual changes [953]. The difference between characters and contents is that the former are mutable and can be defined as forms, while the latter are permanent and can be defined as elements [955]. **The answer to the second question** is thus the following: the experience (in its narrower concept) is the perception by the brain of the things extracted from the environment [958-59]. A wider concept of experience does not involve the things, but the ideas. The ideas also look like existing, simply there, given, so that, even if a centaur is not an experience, its idea is an experience [961]. There is a passage from the perceived thing (the **narrower concept** of experience) to the represented idea (the **wider concept** of experience) [962-963].

### PART THREE: THE MOST GENERAL CONCEPTS [964-1040]

Part three investigates the highest concepts, i.e. the final states corresponding to all the possible environment manifold parts, equipped with the maximum possible frequency and embracing all the possible historical contents of the statements [971]. The highest concept, expressed by the statement: "the whole is this" is the **concept of the world**. However, they still embrace not only the more general concepts, but also superfluous ones: indeed, many different concepts of the world were expressed during the history of mankind, because they were also related to genetic constrains, social groups and historical background [977]. Thus the concepts of the world are incomplete, because **include also unnecessary** components [979] and their historical development is not ended at this time. The three possible series of the concept of the world -logical, historical, critical- [980] are correlated: when the historical series increases together with the critical series, it occurs a further generalization [981].

The concept of the world is preserved by the individuals and left to posterity via communication and conditioning [982]. If the concept is transmitted unchanged through the generations, its strength decreases with the time due to habituation, until it cannot be recognized anymore [984]. The transformation of the concepts of the world leads from certainty to doubts about them: thus arises **the enigma of the world**, in place of the concept of the world [986]. The most the perplexity increase, the most is strong the need to solve the problems as soon as possible [988] and several new different satisfying concepts of the world may arise [990-991]. The solutions are however transitory and changing with the time, both in the individual and in the community [992]. Every

concept of the world is characterized by residual unneeded concepts, depending on the education of the individuals [993]. The number of superfluous concepts may either remain the same, or decrease, or increase [994]. The provisional solutions to the enigma of the world are countless and the only way to find more general concept is to **expunge the surplus components** [996]: the more the concept of the world is spatially enlarged, including many communities and then the whole mankind, the more the solution is general and definitive, approximating a purified and exclusive experience [997, 1030]. When the concepts of the world are many, if the space and time is long enough, they always tend towards the highest concept [998] and the brain is satisfied [1000]. During the cultural evolution, the concepts of the world are at first regarded as a positive experience, a perceived thing, an empiric knowledge; however, in a following phase of removal, they weaken and are regarded as non-empirical knowledge, pseudo-problems, until they gradually vanish and disappear [1022-1023]. The last phase is their reappearance in a distilled form, just as pure descriptions [1002-21, 1024, 1028]. The final, pure concepts of the world allow the brain to be entirely conditioned by the environment and the statements to be regarded as complete experience [1031, 1040]. **The answer to the third question** is thus the following: a primitive experience (knowledge=naturally perceived) leads to addition of non-experience (either knowledge=perceived and knowledge=not perceived) until a definitive, just described, exclusive experience takes place (knowledge= purified perceived) [1034]. More advanced social groups may be closer than others to the pure concepts of the world, at least in some fields of knowledge [1035]: indeed, evolution does not proceed linearly nor uniformly and small groups of more civilized individuals have an important role in pushing forward the changes towards possible solutions of the problems [1036-37].

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