

CHILDREN'S KNOWLEDGE AT THE AGE OF 3 YEARS.

"TERMINATIONS". FREUD'S "PSYCHOLOGY PROJECT". "BAHNUNGEN".
SOLUTION TO THE SYNAPSES MYSTERY.

Carles UDINA i COBO

2020-05-21

cucobo@gmail.com

Dedicated to my older brother, Javier, who died today, but from whom I have not been able to say goodbye, due to the absurds confinements.

Keywords

Knowledge representation. Knowledge acquisition. Symbolic systems of the psyche. Versatility. Language hatching. Linguistic "Terminations" (Endings). Global model of the psyche. Structure of thought. "Complexation" processes. Perception. Unconsciousness. Information transfer. Synapses. FREUD. RAMON y CAJAL. LLINÁS. LEIBNIZ. Caracteristica Universalis. Algebraic duality. Star operator.

NOTE: This article is the third in a series that begins with "Heuristics of numerical and conceptual systems" and continues with "Children's knowledge at 2 years of age", which are the ones that precede it. It will be followed by two others (6 years and 10 years), all of which are a more understandable restatement of the initial 1996 writings.

* On 18 June 2020, it was registered with the **Intellectual Property Registry of Barcelona** (Spain) under number **B-809-20**.

ABSTRACT

It is common to speak of the surprising "hatching" of language in children because it is not understood how this faculty, which has not been an evolutionary necessity in Homo, can appear so early (2 and 3 years). The last widely discussed hypothesis, influenced by the genetic discoveries of the last century, has not been satisfactory either.

In the preceding document "Knowledge of children at 2 years of age", the appearance of the first cognitive processes is explained: the simplest-sensitive concepts (cat, "bug", ...), which are made possible by a "recycling" of the child's psychomotor faculties which are transferred to language (so little to do with genetics). And at the age of three, in his attempt to copy the language of adults, the previous conceptualisation together with the identifiers of his environment (his relatives, his cat "Mischa", ...) allow the faculty of intuitively managing the "Terminations" (Endings) of words to appear, by recognising without error their complex phenomenological correspondence.

The explanation of this surprising faculty was advanced by FREUD in a document of 1895 but which was not discovered until 1950 (the so-called "Psychology Project"), in which he also advanced the concept of synapses (synapses discovered by LÖWI in 1921), and even FREUD described them more correctly than in the later neurological conception, which is confirmed by the most recent contribution of LLINÁS, since LLINÁS he also revealed the error of the prevailing hypotheses until then about their functioning, which is not to be found in the chemistry of their neurotransmitters.

The "Knowledge of children at 3 years of age" completes this unfinished "Project...", showing the total correctness of his intuitions, as well as the human impossibility that 125 years ago he could have progressed beyond what he had already contributed. Thus, he adds how synapses work, which is explained by the informational unconsciousness dynamics of the psyche, through the nervous system (the simile of the "Tele-tac" of the toll highways), already intuited by FREUD.

In turn, the emergence of the child's neuronal interconnections and their minority genetic and physiological causes, highlight the informational importance of the stimulus, and consequently the need for an "aRb" relational model of the human psyche, as well as the unfeasibility of the perspectives and hypotheses currently in force. It also implies a linking of neurology and psychology, as well as the future line for the progression of both, in parallel and without interference as hitherto. In the expression of a well-known chemist, it is the third strand to be added to FREUD and RAMON y CAJAL in order to achieve a "scientific psychology".

This series of papers (which will continue with knowledge at 6 and 10 years) is an adaptation of the 1996 writings on the "Representation of knowledge", i.e. what are the processes that make human knowledge possible, a representation validated by its correct computer simulation and which in turn solved the challenge of LEIBNIZ's "Characteristica universalis". Since, in spite of this validation, it was not possible to make it understood due to its many innovations, -it represents a radical change of scientific paradigm, with its usual initial rejection-, this series has been rewritten in a way closer to current knowledge in order to make it more comprehensible, which in turn has made it possible to explain various pending problems of language and psychology, in addition to the neurological ones already mentioned.

It is therefore inevitably long, with many collateral explanations and several annexes, since it has had to clarify the many misunderstandings of current science, which is still restricted to its exclusively material perspectives, without having yet incorporated information into its most basic paradigms.

Annex 3 of 13 March 2021 cites an article by other researchers (DEISSEROTH, ...) that confirms the certainty of this document. And Annex 4 of 17 July 2024 cites another (YANG, BUZSÁKI, ...) with new further confirmation.

INDEX

1 FIRST PROBLEM: SUBJECT MATTER OR INFORMATION

1.1. Information in life science (genetics), and even in physics.

1.2. "Pseudo-science"? Or perhaps better yet, full science, including a virtual-informational science, given that even in our current information age, information has not yet been incorporated into the old, traditional, material science.

The virtuality of information. Information is not material, but it exists, doesn't it?

1.4. The informational virtuality of the stimulus. Comprehension.

1.5. Stimulus and its action in genetics (metadata)

2 SECOND PROBLEM: STRUCTURING BY COMPLEXATION

2.1. System, evolutionary interactions and "complexation" (or "complexification").

2.2. The unlimited virtual "complexations".

2.3. The need for the "a**R**b" model

2.4. Versatility versus Plasticity

3 THIRD PROBLEM: UPDATING AN ALREADY CENTURY-OLD CONTRIBUTION.

4 SEMANTIC REMARKS: ERINNERUNGSSPUR, CONTACTSCHRANKE, WAHRNEHMUNG, BAHNUNG, NACHTRÄGLICHKEIT.

4. 1. Erinnerungsspur

4. 2. Contact barriers/ Synapses (= "Contactschranke", abbreviated "Cschr")

4. 3. Wahrnehmung (= "Perception")

4. 4. Bahnung

4. 5. Nachträglichkeit ("-keit")

5. SIMULTANEITY

6. THE PLEASURE OF MOTOR REPETITION

7. THE PLEASURE OF SOUND REPETITION. SIMIL-CADENCE.

8. MUSICAL RHYTHM. THE PLEASURE OF DANCE. COMBINED BAHNUNG

9. GRAMMATICAL MORPHOLOGY

10. CONCLUSIONS

11. OUTLINE OF THE GLOBAL MODEL OF THE PSYCHE

ANNEX 1: CLASSIFICATION OF EXISTENTIAL SYSTEMS

ANNEX 2: ALGEBRAIC DUALITY AND STAR OPERATOR

ANNEX 3: EXPERIMENTAL CONFIRMATION WITH OPTOGENETICS, OF THE FUNCTIONING OF THE SYNAPSES PRESENTED HERE (2021-03-13).

ANNEX 4: NEW EXPERIMENTAL CONFIRMATION ... (2024-07-17)

REFERENCES

TWO OTHER CONSIDERATIONS: HEURISTIC

1 FIRST PROBLEM: MATTER OR INFORMATION

FREUD (1856 - 1939) was practically a contemporary of RAMON y CAJAL (1852 - 1934). Although he destroyed his first private writings, it is known from a publication that his first intuition was that with the same cellular units (e.g. of an invertebrate) more complex nervous systems (e.g. of a vertebrate)* can be constituted, something totally correct and innovative, but at that time opposed to the rest of neurologists. For this purpose he studied the anatomy of the archaic agnathid *Petromyzon* (Lamprey), and some of his drawings are preserved in an extensive publication of 1878.

* This explains, for example, the high level of intelligence that some cephalopods, belonging to a phylum as primitive as the Molluscs, have been able to reach.

In his lecture "The Structure of the Elements of the Nervous System" (1884), FREUD anticipated the "Theory of Dynamic Polarisation" of 1892 by RAMÓN y CAJAL, who also, in his "Remembrance of my Life", cites the contribution of the staining of nervous tissue with gold chloride, although without knowing that it is due to FREUD.

Far beyond FREUD's "youthful" contributions to neurology, dyes included, FREUD's intuitions were always remarkably accurate. With his "*psy-system*". Or with his "Contact Barriers" which even anticipated SHERRINGTON's "Synapses" in 1900, and which could not be observed until much later (LÖWI, 1921). Or advancing by more than 40 years to some proposals such as that of Donald HEBB, who more recently have tried to apply the "Neural Networks". Or memory hypotheses such as the "Bahnung". Note also his apt names: "system", "complex" (to be discussed repeatedly).

Perhaps aware of this intuition, FREUD soon found investigating the biochemical material perspective an uninspiring and unhelpful challenge [17]:

"In front of me,, something boils and gas bubbles form, and I have to deal with it. Two-thirds [of my time]... consists in waiting..." (Letter to Martha BERNAYS, 1882-06-27)

FREUD should have received four or more Nobel Prizes, for having anticipated what was subsequently the reason for the Nobel Prize (or nominations) to other people: S. RAMON y CAJAL (in 1906); O. LÖWI (1936); B. KATZ (1970); R. LLINÁS (only nominated for the Nobel Prize in 2011);; ... [1]. And this for discoveries that he considered secondary and therefore abandoned...

The "Project of Psychology" ("Entwurf einer Psychologie") was a long letter of 1895 to his then friend FLIESS, which for the same reason he could not destroy, and which fortunately saw the light of day in 1950, after FREUD's death, and was thus "baptised" by the publishers. Independently of the contributions that this letter has made and which we shall see, with it FREUD tried to find the neurological, that is to say, anatomical-material, justifications for human behaviour, but it only led him to the opposite conclusion of what he intended*, for he later commented that:

"...all attempts to conceive of ideas as stored in nerve cells, and excitations as following the course of nerve fibres, have completely failed "**.

"psychic reality is a special form of existence, distinct from material reality".

"The relationship between the somatic and the psychic is, in animals as in man, a reciprocal interaction, but the action of the psychic on the body was in the early days unwelcome to physicians. They seemed reluctant to grant a certain autonomy to the psychic life, as if they were in danger of abandoning the firm ground of the scientific".

* There is no direct relationship, no doubt, but the relationship must necessarily exist in some other way, which as will be seen is through informational phenomena such as "methodological transfers" or processes represented by the "Star operator" (see Annexes), all of which were still totally unknown in those years.
** This is what is made clear in this paper. Note also the importance of using the term "ideas".

So FREUD devoted himself to what RAMON y CAJAL considered to be "theorising" attitudes, in a disparaging interpretation of the term, and which he dedicated to FREUD more than once.

* NOTE: there is a serious and historical error in confusing "theory" with "hypothesis". A hypothesis is prior to a theory, which becomes such if it can subsequently be shown to be correct and that now, at this time, and as far as is known, no absurdity has been detected. Worse, even theories as accepted as Einsteinian Relativity are not strictly so because of their numerous contradictions (between "special" and "general", or both with Quantum) and paradoxes (an elegant way to hide an absurdity). Current physics is prolific in "theories" that are either hypotheses, or useless, or unprovable, or outright false.

RAMON y CAJAL had discovered the neuron in 1888, which marked the beginning of histological pathological anatomy (for his reference to this discovery and for many other things in this paper, we suggest watching the video "How to improve our learning..." in the link [2]), and also the well-deserved Nobel Prize for Medicine in 1906. But without detracting from his merit, with the progressive technological advances in microscopy and staining, if it had not been him, someone else would have done it soon after. As an example, his unfortunate confrontation with his disciple Pío del RIO HORTEGA. Just look at FREUD himself, who, despite being younger than him (4 years younger than him with a little more than 30 years difference, it is important), was twice ahead of him.

For this, much more important than his discoveries themselves, was that with RAMON y CAJAL postulated a new neurological model in which the neuron was specialised to "transmit signals".

This introduction of informational elements into neurobehavioural behaviour was in accordance with FREUD's conclusions. But at the same time, with the very limited knowledge then available, it must be said that it was also a "theorising" attitude, just like the ones he reproached FREUD with.

It should be remembered that in those years, apart from the problems of staining the tissues observed, the resolution achieved by microscopes was limited, but even worse, there was not even an adequate photographic support, so that the observations had to be drawn by the researcher himself! An additional skill in which RAMON y CAJAL also excelled and was recognised.

1.1. Information in life science (genetics), and even in physics.

Rosalind FRANKLIN's discovery of the structure of DNA was an important contribution chemically, but insufficient to understand the dynamics of life, which is presumably why Rosalind, a humble and responsible working woman, was not quick to disclose it. WATSON and CRICK took advantage of this, for as they even acknowledged, they stole her information (and subsidiarily the merit), taking advantage of the prevailing machismo (which has been changing, among other reasons, due to FREUD's contributions). Therefore, genetics did not begin until GAMOV (a physicist and not a biochemist) intuited that the DNA sequence should be interpreted as an information code. He possibly postulated this because of his knowledge of differential geometry, where the "Star operator"* describes precisely this "jump" from matter to information. A concept that has only recently been introduced by mathematics, but which has been

used by life since its emergence 3.5 billion years ago. It was in his 1952 article in "Nature" that opened the way to the "Codon" (the basic element of genetic information), a simple element which, through successive "complexations", gives rise to all the structures of life (* see Annex 2 "Algebraic duality...").

It is a "leap" from the material (DNA) to a management function (Codon, virtual information) that makes it possible to chemically manage other material components of the cellular environment to produce the amino acids and proteins required for life. If anyone is to be given credit for the emergence of genetics, it should be only FRANKLIN and GAMOV (and perhaps CHARGAFF as well), but certainly not WATSON, CRICK nor WILKINS.

The automation of information (informatics) by means of computers makes it possible to represent any dynamic and thus even automate it. This is what has allowed the current technological revolution and change that we enjoy. But despite this power and usefulness, science has serious problems in incorporating information into its own paradigms, when taking it into account is the only way to progress and deepen scientific knowledge.

Even genetics still maintains an exclusive biochemical material perspective which is limiting, as it continues to resist extending to the necessary informational perspective. Thus, it was not until 2007 that the insufficiency of the sequential perspective (which, as expected, only explains the structural, the anatomical), and the need to open up to a complementary "geometric" strategy to explain the dynamic (instincts, growth, pregnancy, childbirth, ...) was raised.

But the very name "geometric" indicates the researchers' lack of success, because it is strictly a "relational" strategy. If for the static, for the structure, a tree-sequential representation is sufficient, the dynamic requires relationality. The anticipation of this change of paradigm can be seen in "L'exactitud a les ciències" [3]), proposing a relationality which, furthermore, may possibly make us understand the usefulness of what has unfortunately been disparagingly called "junk DNA", where this necessary relationality should be sought. "There is no worse audacity than that of ignorance", even among the research elite.

It should not be forgotten that the hypothesis of chromosomes as a support for the transmission of life was already made by SUTTON on 1902, but he was ridiculed because such repetitive/boring structures could not support something as lofty as life. 50 years lost from SUTTON to GAMOV.

Even worse, physics, which was not a new science since "MAXWELL's Demon" (1867), took 100 years to introduce information for the first time with SZILÁRD's explanation (1959) associating entropy and information. And even today physics has made little progress in integrating information, when with phenomena such as Entanglement or Quantum Computation it is incomprehensible not to consider that information must exist, inexcusably, at the base of material dynamics. Even more so when the phenomena of life and the behaviour of higher animals can no longer be explained without the corresponding underlying information (genetic, psychic). Two points define a straight line, which also points to physics. But this is not the subject of this paper (see [19]).

It is therefore necessary to distinguish traditional material systems from those based on information, in the case of genetics, which I denote by (+M, +S) systems, as opposed to material systems, which I denote by (+M, -S).

1.2. "Pseudo-science".

Or perhaps better yet, full science, including a virtual-informational science, given that even in our current information age, information has not yet been incorporated into the old, traditional, material science. The virtuality of information. Information is not material, but it exists, doesn't it?

Despite this basic and characteristic function of transmitting information, so clearly described from the beginning, RAMON y CAJAL did not make any progress in it, but only in the physiology. On the other hand, and fortunately, FREUD progressed in it, not worrying about the physiological (in which RAMON y CAJAL continued to progress). But FREUD had to do it necessarily by "theorising", given the minimal resources and knowledge then available. But rather than "theorising", it should be said that he was manifesting a brilliant intuition, of exceptional merit. Genius for two reasons:

- One because FREUD's "theories" have contributed, directly or indirectly, to many of the recent cultural changes in our human civilisation. And only in one century. And the positive changes of the last century have been in the direction of his contributions.
- And secondly, because it was a scientific breakthrough that extended the domain of science with the underlying information systems. It brought the "Symbolic information systems to symbolic support", henceforth (-M, +S)*, which were more than half a century ahead of the "Symbolic information systems to material support", as in the case of genetics, the said (+M, +S), which are much less sophisticated and therefore help to understand FREUD's earlier ones. So it was a giant step, but surprisingly ignored by science itself to this day. The reason is that it is so innovative that even many find it difficult to understand. It is as simple as that, as we shall see (* see Appendix 1 "Classification of systems...").

Since, as has been said, information was not accepted by science until the middle of the last century, it should be even more appreciated that FREUD introduced half a century earlier, in his "Interpretation of Dreams" (1899), some information systems (-M, +S) which are not even based on material, but on signs/symbols, such as the experiential elements of which a dream is composed, so that, apparently, the dream is not understood until it is possible to understand what these experiences represent/hide for each person (which are therefore totally personal, they cannot be generalised). And, it must be stressed, this was more than half a century before the systems (+M, +S) of genetics.

It must also be said that FREUD's explanation was an interpretation totally opposed to the hypothesis of dreams formulated by RAMON y CAJAL, who, moreover, reiterated it in a futile attempt to combat FREUD's hypothesis. Today there is not the slightest doubt as to the oblivion and error of RAMON and CAJAL's, and the genius of FREUD's.

Despite all the above, FREUD remains a "cursed" character for most of the scientific community (it is interesting to analyse in more detail the reasons for this, but it is not appropriate to pursue this here).

It is therefore all the more surprising that despite the passage of more than a century, there is a current within "Neuroscience" which obstinately denies information, i.e. the psyche, reducing everything to the brain and its so-called "plasticity", which cannot explain the power and versatility of the human mind (senses, psychomotricity, consciousness, ..., thought, ..., art, ...)*. To do so is to go back to archaic neurological

conceptions prior to 1884, when the innovative contributions of FREUD and RAMON y CAJAL appeared, to which can be added in recent decades the discovery of the formation of neuronal interconnections by stimulation, which will be seen later, has made it even clearer.

* "Mind" was already used by DESCARTES long before, 4 centuries ago, intuiting the necessary dissociation of information (the "mind", to distinguish it from the "soul" in his Aristotelian interpretation), from the corporeal and mechanical (today understood as "brain").

The above negative stubbornness is even more surprising today, given the existence of computer technology in which nobody would think (least of all a "hacker") of copying or spying by placing voltmeters in any wiring. What is significant is the decoding of the signals (and before that, if necessary, their decryption). Thus, the brain and nerves are only the material support structures (like "hardware") for the transmission of psychic information through them (like "software").

1.3. The virtuality of information. Information is not material, but it exists, doesn't it?

Classical optics, which FREUD undoubtedly knew but today seems to have been forgotten despite the fact that most of us wear glasses or contact lenses, has made the difference between the real (the material) and the virtual image very clear for many years. Has anyone questioned the scientificity of optical images as a virtual and not a tangible phenomenon?

The real cannot be virtual and reciprocally. They are disjunct concepts, which together make up the existential. But something so obvious and basic is easy to see that not even a large part of the scientific community is clear about it. The expression "Virtual Reality" proves it, for it is an absurd construction that should simply be replaced by "Virtuality". Does "Southern Siberia" exist, no, Siberia has no territory in the southern hemisphere, it is all in the northern hemisphere. It only exists as a graphic term, with no possible interpretation.

Thus, FREUD says in his "Interpretation of Dreams":

*"Everything that can become the object of our inner perception is **virtual**, like the image produced by the entry of light rays into the eyeglass".*

But in spite of what the optic makes clear, it is not surprising that in his time Freud himself came up with expressions that were not very correct, as in the statement already seen when he spoke of "psychic reality", for although it is understood, he should have said "psychic virtuality" or "psychic existence". And if these expressions initially sound strange, it is simply because it is not yet said in this way, even though it is correct.

This usual confusion is by no means trivial, firstly because of the very power of the unconscious as opposed to the conscious, for as the physicist Heinrich Rudolf HERTZ (1857 - 1894) said:

"When conceptual contradictions are eliminated in science, our mind, free from bewilderment, will stop asking spurious/false questions".

When this is not done, it leads to the serious errors that occur in confusing brain and psyche. Or as, it must be insisted, DESCARTES distinguished long before when he spoke of (real) body and (virtual) mind.

Moreover, this confusion between neurological and psychic is to contradict even RAMON y CAJAL himself, since it has already been mentioned that he was also clear from the beginning of his research that "his" neurons transmitted signals, and in no case were they used for some kind of transport of matter. And it has always been said of him that his greatest virtue was not his discoveries but his criteria. He knew what he wanted to see, that "Know what you are looking for and understand what you find".

So, by the legacy of the two most eminent neurologists, FREUD and RAMON y CAJAL, by ignoring the information of the psyche, or what is the same, by attributing to the brain something that is exclusive of informational processes, there is no other justification than the ignorance and stubbornness of the one who does it.

Science has traditionally studied a-informational material systems (+M, -S), i.e. systems without explicit or manifest presence of informational processes (which does not preclude that there may be underlying ones). But today it is inexcusable to add "underlying information systems":

- be the (+M, +S) of genetics, immunology (hormones [=molecular sign], proteins, prions [a disturbing "polysemous" element in genetic language], ...);
- and certainly the (-M, +S) of the psyche and languages;
- and one day it will have to do so with those of physics which are not supported by matter in any case, not even indirectly (as the psyche finally has to do, which in the second instance uses the nervous system to transmit the signals), since the underlying information of physics is prior to matter (this is why the photon has no mass, since the information associated with the photon and its energy is what could generate the materialisation of the Universe, see [19]).

Insisting that, in addition, within the psyche must be included the human unconscious which is an unimaginably complex and large structure of such information systems with symbolic support, which by such magnitude would be totally denied to any material structure.

1.4. The informational virtuality of the stimulus. Comprehension.

To what FREUD and RAMON y CAJAL already knew more than a century ago, the most important physiological discovery, and much later, only a few decades ago, has been the phenomenon of neuronal interconnections and their "functionality", that is, their enormous growth due to stimulation in the last months of pregnancy and first years of the newborn, and NOT due to direct physiological or genetic causes. This corresponds to the important discovery of the "optimal periods" by HUBEL and WISSEL (Nobel laureates 1981). So nothing at all "pseudo-scientific" even if genetics or physiology cannot explain such dynamics. The concept of "optimal periods" refers to the fact that in biology certain processes must be carried out in certain periods, outside of which they are difficult to carry out.

This explains the irrecoverability of isolated or abused young children, which, despite centuries-old cases such as those of the wolf-children, have nowadays been surprising in terms of the cognitive and behavioural problems that appear in adopted children, especially from "eastern" countries.

A few months before birth, the neurological system has already formed, but the newborn is practically invalid, unable to walk, or even to see properly. It is also known that all children are born with a relatively similar number of neurons and interconnections, just as their height or weight is in a not excessively differentiated range.

However, at the age of three, not only does it have its full senses, full bipedal balance and psycho-motor coordination (it can run), but it has even hatched language (see [2]), something for which Homo has certainly not evolved.

So what changes could have enabled him to exercise all these faculties? Even if he doubled the size of his brain, or the number of neurons, or several times the muscle volume, these are limited increases that cannot justify the enormous change of faculties already described.

But on the contrary, in this period, neuronal interconnections can multiply up to 10,000 times in a "normal" child, but much less in other children who are not correctly raised/stimulated (isolated, abused, ...). Consequently, it can only be justified by the enormous increase of neuronal interconnections, generated by the virtual and/or intangible stimuli received.

Is a "Stimulus" pseudo-scientific? The question is a stupid, ignorant approach: how can the major cause of the appearance of the number of neuronal interconnections (repeatedly discussed here) be considered pseudo-scientific, since, I insist, it is known that very little is due to genetic or physiological causes? What exists, whether real or virtual, is not scientific or unscientific. It can only be scientific or unscientific, the way it is treated when contemplating/studying it. A stimulus can be, for example, a caress, a simple gesture, a word, a whole advice, ... And furthermore, its effects do not necessarily have to be the same on one occasion or another, for one person or another (it is appropriate to insist on the subjectivity of the experiences that make up dreams, which has already been explained). A stimulus is conjunctural and subjective: depending on the person, the moment and/or this conjuncture, it can be just the opposite, a repression.

We can measure, or assess, the effects of a stimulus (e.g. such interconnections), because they can be real and manifest. There is no doubt about it. But can we measure a cause as the stimulus? It is clear that we cannot "measure" it (with a meter, with a voltmeter, or similar). That is to say, the stimulus itself is unmeasurable, since it IS INFORMATION, something VIRTUAL (but which undoubtedly exists). It would not even be correct to try to associate to the stimulus some measure of entropy already seen. Can a stimulus be treated with mathematical integrals or differentials (something that, if it is not incorporated in a physics article, is not considered a serious article), even less so.

That traditional science does not know how to deal with it is only a limitation of traditional science, but in no case will a stimulus cease to exist despite the fact that it is often not even real. Not even for opposing the beliefs of millions of people. So, pseudo-science is denying the existence of something, just because you don't understand it.

Faced with situations like this, the only scientific and appropriate thing to do is to think that science still lacks something new. As Benoît MANDELROT jokingly put it :

"...car nous ne considérons comme scientifiques que les phénomènes qu'elles permettent d'expliquer!" ("...given that, "we" do not consider scientific only the phenomena that we are able to explain!)

That is to say, what we are not yet able to explain, science, strictly its proud "Scientific Community", gets out of the way -one problem less-, saying that it is not scientific. It is the same attitude of dogmatism and/or lack of humility and criticism that is popularly expressed with:

"He who cannot catch them, says they are green", by J. de la FONTAINE ("*Le renard et les raisins*").

Another example could be "Comprehension". Can it be measured with apparatus of any kind, with electrodes on the head, or detected in an encephalogram? In the cited video [2], and in [14], its definition and even how it can be **measured** (something I do not know has been achieved before) is discussed, but not as something "material". It can only be understood and treated from an informational and relational perspective (-M, +S).

It is customary to present psychoanalysis as pseudo-scientific, especially since POPPER's well-known argument of falsifiability, and to contrast it with Einsteinian theory (which, moreover, as has already been said, is not even a theory, since it is not consistent, I insist, see [19]). It turns out then that it is just the opposite, the strictly pseudo-scientific thing to do is to deny the scientificity of psychoanalysis (which, by the way, has nothing to do with the competence, or not, of those who perform or explain it). Regardless of POPPER's possible contributions, his argumentation against FREUD's contributions is inconsistent. See, for example, "The Falsifiability of Psychoanalysis. FREUD, POPPER and common sense" (BLASCO, 2019) [4].

As for BUNGE's obsessive arguments against psychoanalysis (even age did not help him to improve), they deserve no more space than the following reference which reveals his totalitarian tendencies: "Filosofia de la tecnologia" [6].

The absurdity is to deny the existence of sciences and their treated systems ($\pm M$, +S) of any kind, be they genetic (+M, +S) or psychic (-M, +S). But this so untenable in the 21st century, it is still the norm. It is urgent to change this outdated conception of science, and to vindicate above all the marginalised "sciences" (-M, +S) and their abysmal differences with the (+M -S). It must be insisted that to deny them is not only pseudo-scientific but even anti-scientific because of the serious errors it entails*.

* Among so much absurdity, it is comforting to find scientists of the matter (+M, -S) such as José ELGUERO [17] who states: "The future is to weave a golden structure of three strands with the contributions of FREUD, RAMON y CAJAL and a third genius who will achieve FREUD's dream: a scientific psychology". He also clearly understands the difference between body and mind: "Recognising that he could not successfully study the brain, FREUD decided to study the mind". Is pseudoscientific the development of software, a language, which occupies mathematicians and engineers? Or again, not exist the Knowledge sciences?

An image of a real object reaches the retina and it cannot even be said that a visual-virtual image is formed there, as in a mirror. An image is certainly formed, but it is no longer visual, but produces a series of stimuli that cause modifications in the proteins of the retina. Modifications that result in the contribution of signals to the optic nerve (I insist, with a coding that is still totally unknown), which, as FREUD and RAMON y CAJAL knew, are transmitted to the brain. In no case is there a transport of something material, only a virtual communication of information. So even less can there be anything material in the reconstruction of the image in the brain, in its memorisation, perception or any other more complex management. And we know that the child, when it is born and begins to see, takes weeks to correctly reconstruct the received image, it looks but does not see. There are only information systems, yes, supported by a material structure, the nervous system, just as software is supported by hardware. Has anyone ever wondered if vision is pseudo-scientific because we still don't know in detail how it works, how a mental image is formed by reconstructing the impulses received from the retina?

Physiology and ophthalmology end in the retina. But also neurology, because unless neurological lesions hinder the transmission of signals through the optic nerve, a non-material process has begun in the optic nerve, an informational process: the psychic.

A valid analogy would be a "*.jpg" from the computer. The camera receives the image. Initially it was replicated on the photographic film with a chemical image that was "developed", but nowadays nor this, then is replicated in a set of information (pixels) with a binary structure (colour, intensity, ...), structured and positionally located. The file "*.jpg" does not contain an image, only signals (bits), which the software has encoded (and even compressed) appropriately. And which are de-coded to be displayed again on a screen (or on a printer).

It is necessary to expose all the above because with the current misunderstandings of science already mentioned, if they are not taken into account and corrected, nothing can be understood about human behaviour, including human language (languages, ...) and, no doubt, those of any other higher animal. Nor any other language such as those of computer science, but which nobody hesitates to study in polytechnic universities.

For this reason, on several occasions I have read articles in neurology whose problems, which they did not know how to solve, could be easily explained from the informational perspective (-M, +S), such as [5] and [7].

1.5. Stimulus and its action in genetics (the metadata)

Ten years ago, in relation to some previous articles and a conference, an exemplary mother who read them came to tell me about the case of her son Pau [newborn in 1995], who at the time the doctors considered a miracle because he was born prematurely at only 23 weeks of pregnancy without any sequelae. The explanation of the "miracle" was to be found in these articles and conferences, so I made a document about it ([18]). From the perspective of information and with the stimulations made, the "miracle" was no longer a miracle and everything was perfectly understood, but despite the effort to translate it into English, I immediately saw the impossibility of trying to publish it in a neonatology journal, since no editorial board would have understood anything, due to ignorance of this informational perspective. In addition there was the easy identification of the medical protagonists and their mistakes, so they did not come off well.

Because of the exclusively biochemical perspective that still dominates genetics, after all these years I am not aware that genetics still considers this important informational concept in the genome. This is why I have just made a review of this document, which is more adapted to the restrictive publication protocols, to see if, in addition, with the progressive evolution of scientific paradigms towards more informational perspectives, it is possible to publish [18] because of its interest. In the same way that I yet had already advanced to the "relational" needs of genetic information in 2007 ([3]), in that mentioned document [18] I also raised the need to locate the metadata that this genetic information must necessarily incorporate. However, biologists and geneticists do not even dare to consider this...

But there are still two other important issues that need to be clarified before we can go on with something as simple as the intuitions of 2 and 3 year olds.

2 SECOND PROBLEM: STRUCTURING BY COMPLEXATION

Today, with resources such as the electron microscope, we know with precision the molecular structure of the sarcomeres and therefore their contractile dynamics, since a muscle is structured in myofilaments, these are grouped in sarcomeres, these myofibres, these in fibres (the muscle cell), etc., etc., etc., etc., etc. This is why I call it structure by "complexation". The structure of the bones in which they are inserted is analogous, ... That of the nerves, ... Or the whole anatomical structure. It is unthinkable to discuss what we already know precisely about our body structure.

But there is a dramatic contrast with the informational replica (the psyche) that precisely enables the functioning of this extraordinary and precise bodily structure.

"Sense", "mind", "memory", "feeling", "perception", "emotion", "abstraction", "drive", "idea", "concept", "knowledge", "thought", "reasoning", "intuition", "intelligence", "unconscious", "consciousness", ...are some of the innumerable concepts relating to psychic functions and faculties, which are always defined literally (blah, blah, blah), in isolation (without unequivocal relations between them), and much worse still with notable semantic differences according to the experts and the "Schools" that deal with them. And that no one, except from very extreme positions, will deny their existence...

There is not even the awareness that, in coherence with the bodily structure, all of them can be integrated into an unequivocal structure, but obviously a virtual-informational structure. How can one pretend to do psychology or pedagogy with this chaos? As BALMES said: "Define and you will not argue". Or the aforementioned HERTZ.

Can we imagine a computer programme, for example of a sophisticated aircraft, written line by line in a single file (of perhaps a million sentences)? Impossible, unmanageable. Your program is strictly a structured integration of many progressively simpler programs, and at the same time with a design that assumes the different implicit programming levels (machine language, assembler, ...). Despite this and the fact that it can be considered a ridiculous program compared to the size of the psyche (in the order of billions), some planes even crash because of its computer failures...

Scientists repeatedly set themselves challenges, and assess their importance and/or potential significance. For example:

"What is the Biological Basis of Consciousness?"

But if their basis is unknown, how can it be claimed that they are biological? This, apart from the fact that the noun "Consciousness" (a grammatical noun: "-ness") can only be the final effect, that which is conscious, something that can be memorised, which does not pose a different problem to any other element contained in the memory. What is complex and unexplained is the process by which consciousness occurs, so that "Consciousness-raising" may even be more appropriate. Not distinguishing between a process and its effect is one more sign of the superficiality with which science approaches the study of psychic faculties (and today few dare to deny that consciousness and the unconscious and their interrelation exist, a dynamic especially deepened by FREUD).

FREUD's first challenge was his "Psychology Project", trying to find an explanation of how psychic behaviour could occur on the basis of the neurology he knew and/or could intuit. It has already been said that despite his genius, in his time he lacked too much

information to achieve it (it would be interesting to know if he got to know BOOLE's work with his "Laws of thought"). It was too difficult to solve everything the first time, impossible. His determination recalls the intuition of LEIBNIZ when he set the challenge of his "Characteristica universalis" two centuries earlier (now already three), trying to find a language as powerful and intuitive, that is to say, as natural, as the positional systems of numeration that he had already analysed in depth:

"It will be very difficult to form or invent this language or this Characteristica universalis. But very easy to learn with it without any dictionary."

Psychoanalysis deals with the unconscious, and its possible "consciousness-raising". The need to find an explanation of consciousness was raised by Freud from the beginning (in 1895, in the same "Project..."). But after LACAN's proposal (although without proposing anything concrete), has anyone asked how the unconscious is structured? Or what the aforementioned process of consciousness is like? Or, since it is considered to be an elevated faculty, which is even denied by many to other higher animals, what relation does it have with other equally "exalted" and "exclusive" faculties of *Homo sapiens*, such as thought or language? There are no satisfactory answers, on the contrary, only rather endless books and articles..

To know how it is possible to construct such a prolific unconscious (like a whole Galaxy of the Universe but within a single individual). To know how the act of "consciousness-raising" can be realised, what it consists of, what are its most elementary component faculties, etc., all this independently of the behavioural dynamics of each patient and his therapy. Whoever is interested can find the correct explanation in "What is Consciousness(-Raising)?" [8], which, as expected, does not result from biology. Recently (2025) it has been translated into English: <https://vixra.org/abs/2507.0023>

If we focus on knowledge, possibly the biggest contradiction in science is the one shown in the video [2], which I move:

"Today, even without moving (via the Internet, ...), we can find out and inform ourselves about anything, or find the expert to ask (mobile phone, ...), on any subject, EXCEPT FOR ONE THING: "HOW DO WE KNOW?"
What is the psychic process that enables any person to acquire his knowledge, whatever it may be?"

Curiously, and except for the "consciousness-raising" but as ill-considered as it has been, scientists are not even aware (it is worth the redundancy) of these two other "black holes" (the "+S" and "How do we know?" sciences), bigger than the sum of the 125 outstanding problems compiled by "Science". So now it is even clearer that the problem of "scientificity or not", so lightly raised by POPPER, is not about "what" is studied, but "how" it is studied.

Has anyone seen a single proposal for a definitional structure which unequivocally incorporates all the psychic faculties, relating and differentiating them? Moreover, with the advantage that such a structure is even, by the same token, easily assessable as to its correctness. For example, with intelligence, the only thing that could be argued against its exact definition (see in [7]), is:

"For me, intelligence is not "this", but for me it is "that"..."

but even leaving aside that "this" is exactly defined, structured and related to all the other faculties, and "that" may not even be properly defined (just blah, blah, blah), the

problem starts to be solved: we are talking about two different things, "my" definition and "yours", so we simply have two issues (but defined without confusion). The two definitions - avoiding the dangerous polysemy - can then be dealt with efficiently), one dealing with "mine" and the other with "yours" (and start by seeing which of the two definitions is not even coherent in itself). The problem of the simple convention of what we call something should never be the problem, but it has always been the main barrier. Any mathematical theorem, any computer program must start by defining its treated/managed "variables". This is what it is all about.

What is the "use of reason" and at what age is it considered to appear? It is an ambiguously defined faculty, but of general scope as it is used in various cultures. In the best of cases, its age is considered to be from 7 years of age, but it must be borne in mind that in this case it is not an autonomous exercise, but rather a memorised one, conditioned by the reasoning imposed by the environment. Yet another sign of the need for a "Representation of knowledge" and a "Global model of the psyche" that allows these faculties to be treated unequivocally, with exact definitions and within a progressive structure of complexation. Without this it is chaos, blah, blah, blah, pseudo-science (because of its deficient treatment, and I insist, not because of what it is about).

As a further example, we even have the limitations of mathematical logic, as it handles words and not elements of the aforementioned "Characteristica universalis", defined exactly and algebraically. Words are ambiguous and can indistinctly represent identifiers, sensitive concepts, virtual concepts, knowledge or methods, which in turn each have different sub-levels of complexity, so they must be treated differently. As explained in the video [2], and as we will see in this series of articles, to improve logic it is necessary to contemplate the "Knowledge Representation" (see [14] or the "RUSSELL's Paradox (in the didactic version of the "barber)" in [11]).

In trying to describe the 1996 Representation of cognitive processes that I had deduced from my research in previous years, all the shortcomings outlined above forced me to write down some prior criteria to be able to follow, by way of contextualisation, even for myself. And at the same time, to frame this representation in what I call the "Global Model of the psyche", with which concepts such as all the previous ones are structured and defined. Moreover, with the advantage of having an exact definitional method, as LEIBNIZ proposed 3 centuries ago with his "Characteritica universalis".

To help to minimally fill the "black holes" already discussed (consciousness-raising, "+S" sciences, and "How do we know?") and others to come, the two "Annexes" are attached:

- the necessary classification ($\pm M, \pm S, \pm N$) of the systems studied by science;
- Algebraic Duality - "Star Operator".

But the concept of "System" and its progressive "complexifications" through "evolutionary" relationships must also be understood. It is seen below.

2.1. System, evolutionary interactions and complexation (or complexification).

A system "A" is a set of related elements. That is, if we modify one element of the system, the remaining elements can be modified because they are related. It is a basic and universal representer since everything around us are systems. Incidentally, it is a representer that is the complete opposite of the simplistic "good - bad", "innocent - guilty" moral model.

Within the Relationship Makers, which allows relationships to be established,

- there are those that can be considered normal, with no further significance outside the "A" system,
- and those that I call "evolutionary" (nothing to do with the "Evolution of the species") since with the elements of the system "A" that it relates, be they two or even more, new more complex elements are formed, composed as has been said of these elements of "A", which in turn and if naturally their new structure is minimally stable (+N), these composite elements can form a new system, but, I insist, if and only if new relations exist between them.

For example, the system of atoms, through the chemical bond (who would have thought it, since it is the outermost, weakest and most unstable layer of the atom) forms more complex elements, the molecules, which is a new system by establishing its own relationships with other molecules. And these elements, the molecules, and this new system, moreover, its chemical behaviour does not necessarily have to show any similarity with the elements of the previous system that generates it, not even with its component elements (at room temperature, hydrogen and oxygen are gases, but water is liquid).

In biology they are called "emergent" (because of the appearance of a new system, different from the base system), to characterise the surprising emergence of new and different properties, but the name is not sufficiently adequate to the importance of the phenomenon and its generality. Beyond how surprising it may seem to us, what is important is the process of generation that makes possible new and more complex systems, which is omnipresent:

Physical particle → Nucleus → Atom → Molecule → Substance → Object ...→
Myofilament-Sarcomere → Myofibre → Fibre→ ...
Letter → Syllable (Phoneme) → Word → Sentence → ... → Library
Brick → Wall → ... → ... → City

These processes, moreover, allow us to move from a perception of apparent chaos (which has been maliciously exploited by many scientists in recent decades) to an admirable and exquisite order. But complexations are not welcome in science, such as the important symbiogenesis discovered by Lyn MARGULIS, initially rejected. Or more recently the awkward "ménage à trois" lichens discovered by Toby SPRIBILLE's team (Universität Graz), which after a century and a half of study, a yeast still has to be added to the fungus and the algae (or cyanobacteria).

2.2. The limitless virtual "complexations"

With material realities, this repetitive process of progressive complexation has the limitations imposed by the stability of the material, so that complexation processes of more than half a dozen levels are hardly possible (for example, the muscle). But with

virtual elements, i.e. virtualities, it is an unlimited process, as repeated as desired. Computer programming can be a good example, with the many levels that have been consolidated in just a few years.

Thus, thought is constructed —and above all matures— with repetitive "loops" of the same process, the "Loop of Thought", that of "ruminating" as thinking is also called. With each "loop" the relatability (comprehension) matures, stabilises/consolidates progressively the system reached (see video [2]), and at some point allows the complexation to a new level. This repetitive process allows e.g. abstraction and conceptualisation, with which knowledge is initiated.

Thus, with this structured complexity it is possible to explain both the immense complexity of the human unconscious, or of any other psychic level, and above all, to be able to describe what is the resulting structure of the psyche, what are its "evolutionary" relations and consequently to be able to define all this and obtain that "global model of the psyche", which Freud intuitively with his aforementioned "*psy-system*". Adding also its necessary coherence with the structures of genetic information which precede it. It can be seen in [8], [9], [10] and [11].

And finally, a "relational" model can be established that allows for easy validation, simulation and finally useful application.

Nowadays it is common to speak of "brain back-up". It presupposes a ridiculous simplification of the information that our mind can contain (I use this less precise term here, instead of psyche, so that no one tries to avoid some part of its content). The number of neurons is of the order of almost 10 to the order of 11 ($\approx 100\,000\,000\,000$). And neurons, which with almost 10 000 interconnections each, can generate a total of more than 10 to the power of 14 interconnections. For comparison, 100 hard disks of 1 TeraByte have the same number of bytes, close to the PetaByte).

Could we express these quantities with the Roman numeral system? Obviously not, totally **impossible**.

So why do we express them with powers of the decimal positional system? (in base 2 would be respectively 40 and 50 orders of magnitude). Because it is a complexation structure in which in each new hierarchy, in each advanced position, the quantity represented in it is multiplied by a factor of ten. In these processes, each new hierarchy multiplies the elements resulting from the lower hierarchy by a certain number, depending on each case, these are the elements that can be grouped together. Thus a single long muscle, with only five "hierarchical" levels:

muscle, fascicle, fibre (the muscle cell), myofibril, sarcomere (or even six levels if we consider the myofilaments that make up the sarcomeres),

as the groupings of the muscular elements can go from 6 by 6, to thousands by thousands (instead of regularly 10 by 10 as in a base 10 number system), we have perfectly structured billions of sarcomeres that receive the psychomotor impulses/signals and work in unison (I insist, by means of synchronised signals characterised by their duration, intensity, speed, ...).

To manage the motility of the billions of motor components of a single muscle in unison, a similarly structured signal replication is needed. And it must also send the coordinated signals/information to the hundreds of muscles. Plus the information for the balance functions. And to exercise the sensory-sensory faculties of the environment. And manage other systems and organs (enteric system, ...). and sentimental-emotional management. And the cultural management added in the last

millennia (thought, art, ...), ... It is impossible to think about all this without a perfect structuring by complexation, in this case virtual, of information elements. This indispensable structuring is the "global model of the psyche".

Moreover, "coordinated", i.e. "related", because only with sequential structures that generate tree structures, such as the genetic ones already known up to now, it would be absolutely unthinkable for anything to work, the dynamics of life would be impossible. All dynamics require a necessarily relational representation (which is ignored). Tree structures only allow us to define the static.

At school, the chemistry teacher gave us the exercise of calculating how long it would take all the students in the class to count, at a rate of one per second, all the atoms in a mole of gas, the "AVOGADRO number". It is larger than the number of interconnections, but the gas has no structure, not even a shape. These same calculations should be made by any of those who prophesy such a possibility of Back-up, because the problem is of origin: who knows how to describe, represent or specify all this amount of information to be copied, what kind of information it is and how it is encoded in each case? Even more so, when, as has already been said, if we do not even know "how do we know? It is suggested to the reader to make such calculations, in order to sensitise them.

120 years ago, both FREUD and RAMON y CAJAL had to be "theorists" (although the latter was not conscious of doing so), i.e. they had to intuit with the then innovative model of the transmission of signals by the nerves, and not of some transport of matter. This is now abundantly clear (although some are still stubbornly ignoring it). As it is also clear, I insist, that the impulses transmitted by the nerves, i.e. the informational signals of the psyche, must be structured and encoded, but we do not know how (we only know how to stimulate them, but not how to generate them by "synthesis" from their most basic elements/signals).

We are therefore faced with the need to "theorise" in order to make progress, just as the aforementioned researchers did in their day. And the most important question is to know, not only where this information is processed (which from the measurements of brain activity can be assumed to be in which parts of the cortex), but above all the "how". And in turn, where this information may reside while it is not being processed.

It should also be noted that the site of processing is of little relevance. The place is simply "conjunctural", which is clearly shown in children with cerebral palsy who have a hemispherectomy (removal of the injured/short-circuited hemisphere), and, re-educated, end up leading a completely normal life with only half a healthy brain and its interconnections. And finally that even the colourful brain maps of the much-vaunted, multi-million dollar "Brain project", are erroneous due to deficiencies found in the software used...

To continue "theorising" let us take the well-known example of the muscle. Its cell, the muscle fibre, structures millions of sarcomeres (the unit of action, since each one receives one and only one impulse/information from the psyche). But in turn, the contractile unit is much smaller, many more millions of myofibrils made up of proteins.

Similarly we must ask, into what structure of complexation can any part of the neuron, any of its components, be broken down to ultimately support such encoded information signals? If a muscle cell is still able to break down structurally into millions of functional components, the same should be expected of the nerve cell to ultimately support the minimal units of psychic information. Thus we would go from 10^{11}

neurons and 10^{14} interconnections, to perhaps 10^{17} or even more, basic information units.

As mentioned above, genetics is a symbolic system of information (+M, +S), since there are no signals, as the information is encoded directly in matter: they are the sequences that make up the DNA, i.e. the codons that structure the genetic information (codon → first grouping of codons → second group... → third... → ... → ... → gene → ... genome). In contrast, the (-M, +S) of the psyche (like all languages including software) is not directly supported by matter but by signals/symbols, but which ultimately and indirectly must have some stable material support in order to be preserved. In a computer, the "memory" is finally supported, either in the CPU itself (its nodes), or in the different technological supports, such as the little holes of the CD/DVD, the miniaturised magnetisations of the hard disks or of the current SSD, etc. But we still have to find out what this elementary material medium of psychic information is like. And then the different encodings in which this information is structured (the software).

Undoubtedly other important questions that science should be asking itself, but which are hard to find formulated. Yet another black hole...

The advantage is that the means of supporting information units is much simpler than, for example, structuring a mechanical traction unit, since it requires a notable protein structure (the polymers of myosin and actin). In other words, since we are dealing with information, we only need capacities such as magnetisation or ionisation in something that can be structured in neurons in order to be able to retrieve these units of information in a structured way.

On learning of MONTAGNIER's discovery (Nobel Prize in medicine 2008) of the emission of electromagnetic radiation by bacterial DNA and his request for someone to explain this surprising behaviour, I wrote to him (on 2010-03-18 [12]) not only explaining it to him but also explaining the process of the appearance of life (I insist, the "process", because the "place" where it appeared, or from where it came to us, is anecdotal)*. Although without quoting me, as is his custom, as a result, MONTAGNIER was able to carry out the revolutionary experiment of 2014, which is explained in an hour-long video [13], broadcast on French television channel 2 (as it would be difficult to fit it into the archaic formats of scientific journals). The experiment confirms the capacity of water to support and transmit information (the so-called "memory of water", another question raised by Science in July 2005, but also in very unfortunate terms).

* "The electromagnetic emission of DNA is the **support for the information transfer** between the information supported by the molecular dielectric superstructures of water (the wrongly named, and at the same time argued "Memory of Water") and the genetic information of the codons supported by the DNA, which, at the same time, transitively communicates with the "Pre-material Information" of the "NullPunktEnergie", or "The Vacuum Energy", through the dynamic CASIMIR effect (manifested in nanodielectrics)."

Yes, as I explained in the letter:

- the information of life came through the information-carrying capacity of water (which also explains the inseparable link between water and life, when chemically water and the genetic sequences of DNA are virtually unrelated),
- water is an essential and omnipresent component of our body,

it is quite plausible to think that one day the "mechanisms" for supporting such information will be found in the water of neurons (or perhaps glial cells*), involving a capacity of basic units of 10^{17} or even much more**. For example, in the "Exclusion Zone" (EZ) of G. POLLACK's water interfaces.

* As explained above, GAMOV had the merit of initiating genetics by proposing that the sequential biochemical structure of DNA should be interpreted as an information code. Logically, in his 1952 paper he made a first and immediate structural hypothesis, but it was not the correct one. Subsequently, researchers found the correct one, the Codon. This served WATSON, CRICK and WILKINS to discredit GAMOV's contribution and to give themselves all the protagonism (protagonism added to the one previously usurped from FRANKLIN). The usual "spelling fallacy" of belittling the substance because of insignificant formal errors such as spelling mistakes. This is why I prefer to err by excess, including glial cells, than by defect, excluding them.

** These units would be equivalent to the Byte, so in a space as small as the brain, we are approaching as many units of psychic information as the number of AVOGADRO!

In turn, the complexation structure would place these basic units of hierarchy 17 only 3 steps/hierarchies away from some "aRb" process of the 10^{14} neuronal interconnections ($17 - 14 = 3$), immediately retrievable by the network structure*.

* To use the computer simile, a centralised structure, such as a "Host" (a large, single central computer serving multiple users/terminals with access to it but with no computing autonomy) implies information in queues and sharing the same resource. This is why it evolved towards the "Client - server" design and the "Network", to which multiple information can arrive simultaneously and instantly. Transferred to the neuron and its interconnections, this means being able to autonomously process up to 10,000 pieces of information received at the same time (or simply discard them at the same time).

So FREUD's "failure" at the beginning is no longer such. Just to add, for the sake of clarification, that if it is the neurons and not the glial cells, the neuron would have dual functionality:

- by memory, and
- processing (through their interconnections/synapses, such as CPU nodes).

I finish this part of the presentation. For more than 100 years we have known that in neurology the basic aim is the transmission of information, but Freud has also contributed that the basis of psychoanalytical processes is "association". And what is an association? Simply a relationship between two thoughts/experiences. So we come back to the triad "aRb", and of course to the fact that its functioning is clearly made possible by neural interconnections (with their intuited "Contactschranke"/ "Contact barriers", which we will see in a moment).

But this indispensable relational perspective and its structuring by complexation is not central to psychoanalytic studies. Regrettably, it is not raised. It is an absence analogous to that of genetic studies, which, as has been mentioned, have until recently only contemplated the limited sequentiality, not the relationality.

And again to insist that only the simultaneous processes of information made possible by such a network of interconnections can explain the complexity and versatility of psychic functioning. And without falling into the usual error of such material science that the interconnections themselves (the misnamed "Synapses", as we shall see) can enable any of this enormous development of faculties. Without the information (like software) that makes this neural structure (like its hardware) possible, no explanation is possible.

What about "neural networks"? They are like that remote Polynesian tribe, ignorant of technology, who, on seeing the first aircraft of the Second World War fly for the first time, built an analogous structure with logs and branches, pretending that it would fly (without the most basic knowledge of fluid theory and aeronautical technology).

What is important and basic in a "Network" is the "aRb" relationality it makes possible, which is consistent with the development of the children's neuronal interconnections according to their stimulation. The "Network", or rather its extension, serves as a

support for the accumulation of information (memory). And, as we have just said, for the agile transmission and availability of the information required on each occasion. The dynamic, the processes, are made possible by the availability of interconnections that allow relational processes, not by the "Network" itself. As if they were the crossings that characterise CPUs. And so, by means of the available relational devices as required by the versatility of the psyche, the information supported by the "Network" can be "completed" as unlimitedly as necessary.

Moreover, and without being fully aware of it, the only useful thing that researchers and programmers of Networks end up executing is relational management. Put very crudely, the "Network" would be the static, or the quantitative; the interconnections would be what enables the dynamic, the processes, the qualitative.

2.3. Need for the "aRb" model

What is the function of a neuronal interconnection? It is to link the information content of two neurons. And if this function must multiply enormously in the newborn to enable all the functional changes that occur in this period (from the end of pregnancy to a few years and then it stops), it must mean that all these functions must necessarily be based on an "aRb" model.

So far from all the complex and absurd models that have been proposed in almost a century, everything must be based on the relationality "aRb", where "a" and "b" must necessarily be located in two interconnected neurons. And the "R"? We will see it in "4. 4. Bahnung".

This leads to the conclusion that the simple relational model "aRb" and its structural complexation is the basis of all psychic functioning, and that it cannot be in any other way if we take into account that the "hardware" available for this informational management is something as simple as neuronal interconnections, since, as has been said, they are generated precisely at the request of the child's needs. Starting from this simple "aRb" structure, the only strategy that allows us to reach the complexity that the psyche manifests is that of progressive "complexations", and as many as necessary, as virtuality allows. Bearing in mind, moreover, that psychomotricity is already a structure of this type, so everything "fits".

So far, despite repeated attempts to validate human behavioural functioning with neurologically or biologically based models, they have always failed. Even less with complex and far-fetched models that have been proposed (statistical, "pattern" models for knowledge/language (see "Pattern theory" in "Annex 3", ...)). So one can understand this failure and be sure that failure is guaranteed. And again to insist that only the simultaneous information processes made possible by such a network of interconnections can explain the power of psychic information management. And as will be seen (4.2. "Contact barriers") without falling into the usual error of such material science that the interconnections themselves (I insist, the wrongly called "Synapses") can manage by themselves the enormous psychic faculties. Without the information (like software) that makes this neural structure (like its hardware) possible, no explanation is possible.

2.4. Versatility versus Plasticity

All systems ($\pm M$, $+S$) are characterised by the faculty of copying (genetics, informatics, ...), something impossible in material systems ($+M$, $-S$). Is there any similar intrinsic difference between systems ($+M$, $+S$) and ($-M$, $+S$)? Undoubtedly, the former (hormones, proteins, ...) can only be specific, for one or a few functions, while the latter can be versatile, i.e. they can take on totally diversified and unexpected functions.

This facility given by the virtual-informational domain to build structures of complexation is also what allows Versatility, a much more powerful and useful faculty than material Plasticity. The versatility of the symbolic Systems to symbolic support is the only thing that can explain what was exposed at the beginning about the Lamprey or the Cephalopods.

What does the study of the *Petromyzon* (Lamprea) in 1878! and the observation that "with the same cellular units (e.g. of an invertebrate) more complex nervous systems (e.g. of a vertebrate) can be constituted" imply? Well, questioning properties of material "plasticity" and requiring informational versatility. For example, a "floppy disk" from the 80's had capacity and speed limitations compared to a current hard disk or an SSD, but it can contain the same information (sound, video, editors, ...).

Why then do we talk about plasticity? Because neurology does not want to talk about information, about the virtual, and plasticity is a term used to try to justify what is strictly speaking versatility. For example, the versatility of a CPU that can handle word processing, graphics, audiovisuals, calculations, ... only respecting compatibility conventions.

Different brains are not known for different functions. The versatility of the psyche surpasses all imagination: sense, psychomotricity, balance, feelings, language, thought, art, science, ...

Plasticity is a material property that in no case allows such versatility. Even a spanner can be considered "plastic" because it can be used with different nut sizes, but nothing more (except as a throwing weapon if it is big enough...). Plasticity allows changes of shape, size, ..., but not an unlimited diversification of its intrinsic function.

Talking about plasticity is just an obsessive ploy to avoid incorporating information systems and their versatility. Nor should versatility be confused with polyvalence (which, moreover, is always limited and fixed).

3 THIRD PROBLEM: UPDATING AN ALREADY CENTURY-OLD CONTRIBUTION.

The third problem lies in the lack of updating of Freud's contribution. Can we imagine ourselves today continuing research with the microscopes of the end of the 19th century? Or still studying in the Faculties with RAMON y CAJAL's drawings? It would hardly have been possible to make progress, and there would certainly not have been contributions such as those of HUBEL and WIESEL.

There has been no significant updating, taking advantage of the many new insights that have emerged. A good example is precisely the phenomenon of "Terminations" (Endings or read for linguists: "desinences" or roughly speaking "grammatical morphology"), an unexplained phenomenon of children which I am not aware of having been related so far to FREUD's contributions, when it is this relationship which makes it possible to explain the unexplained emergence of language in children. An explanation that does not exist in all the pseudo-theories of language (simple erroneous hypotheses) that have been appearing for more than a century.

FREUD's contribution is brilliant precisely because of the very limited knowledge and resources of more than a century ago. And on top of that, because he always had to row against the tide. With all these years and new discoveries, can we not update and improve, at least a little, the Freudian contribution? Why has this not been done? The absence of incorporating a structure of the psyche and/or of going deeper into relationality and its "evolutionary" relationality has already been mentioned. Such knowledge could also help the therapist in therapy and/or psychoanalytic processes.

This lack of updating and complementation, however annoying it may be, is a reality. FREUD's first disciples, in trying to "extend", have dispersed more than anything else, perhaps because they did not measure up to their "master". The case of LACAN is even more significant, for with his numerous "boutades" he has done much more damage to FREUD's contribution than the few useful contributions that can be found. And nowadays, the dispersion of psychoanalytic (and also psychological) "Schools" is regrettable, possibly a consequence of the previous inertias. Moreover, all this leads to an enormous production of documents, most of them repetitive and useless, which makes it even more difficult to separate the wheat from the chaff.

Heuristics (= description of the process leading to the establishment of correct knowledge, that of "Eureka, I found it") is an efficient pedagogical resource, unfortunately underused. B. PASCAL already rightly said that a child could not be expected to learn in hours or days, knowledge that has taken centuries to mature.

Knowledge in science is acquired very slowly. If it seems much less so today, it is because behind a single piece of research there may be thousands of researchers stumbling around in the dark, so that one day someone will have the simple good fortune to find something useful.

But when someone comes along, a true genius, who is able in his own lifetime to do what thousands or millions of others cannot do in decades or centuries, a major personal problem arises. First, to mention that the most prominent case, perhaps even more than FREUD, is that of LEIBNIZ, not only for his transcendent contributions in mathematics and physics, as FREUD's may have been in the psyche, but also for having anticipated by up to three centuries with his "Characteristica universalis", or with his premonitions of present-day computer science.

The problem arises when this heuristic process is concentrated in a single person, whose reaction, entirely human, may be to be ashamed of the simplicity of his first contributions in relation to the final ones, which is rather a reflection of personal self-demand, because there is no other way to progress. Is the "Loop" of thought that is required to mature, that is to say, in each loop to incorporate new or better relationships on which understanding is based.

It is understandable, then, that Freud wanted to make his early writings disappear, which fortunately was not possible with his "Entwurf ..."/"Project...", because today it serves us to see this extraordinary process of maturation that took place in the short period of his life. The important thing, then, is not to see his limitations, but rather his successful intuitions and the pitfalls he had to overcome in order to try to present and develop these intuitions.

And also a sign of the immaturity of part of the scientific community, which has not even been able to understand, not even in a hundred years, a process already discovered and explained by someone else...

4 SEMANTIC REMARKS: ERINNERUNGSSPUR, CONTACTSCHRANKE, WAHRNEHMUNG, BAHNUNG, NACHTRÄGLICHKEIT.

4. 1. Erinnerungsspur

If FREUD already uses a Germanic term "Erinnerungsspur", it is a useless, unfortunate and snobbish cultism to translate it back to its Greek equivalent (Mneme, mnemonic) of 2500 years ago and which has not even been inherited by German (with only a very brief "entry" in the SLABY* GROSSMANN dictionary, as opposed to a whole column for "erinner").

erinner: remember

Erinnerung: "Remembrance" (better than "Memory"), see "-ung" below.

spur: keep track of

Erinnerungsspur: "to keep track of the remembrance, of what has been memorised".

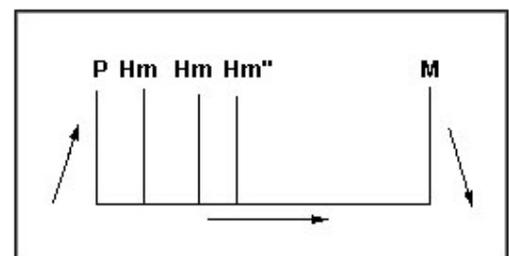
"Mnemonic" (from the Greek Mneme, Memory): was the retentive basis or basic principle in a mind or organism, which has the faculty of memory. But "Huella mnemica" (=Mnemonic footprint), apart from what has been said, is not accurate because it does not translate the dynamic, the rich process that FREUD tries to describe, only the final "memory", something static. We return to the error of confusing an entire process, with just the final effect.

* It is interesting to know the biography of Rudolf Jan SLABY (1885 - 1957). Not only because of his links with Barcelona and Catalan, but also because of his extraordinary abilities as a translator (Czech, German, Spanish, Catalan, Russian, English, Swedish, Danish, Norwegian, Dutch, ...). He even collaborated with the ESPASA CALPE encyclopaedia, which was my usual source of reference as a child, and which was the reason that years later led me to change this rudimentary support of knowledges for the "Characteristica universalis" or "Conceptual system (intrinsic and exact)". It would also have been interesting to know his opinion on this whole article, and not only on these translations, in which I have already tried to follow his criteria.

4. 2. Contact barriers/ Synapses (= "Contactschranke", abbreviated to "Cschr")

Even today we do not know what the images formed by the psyche of the senses, but FREUD already understood what they were not like: they are not at all a faithful reproduction of the real image. They are not "Enneagrams" as is still often proposed in neurology (impression with similarity to the real, like a hieroglyphic). Today we only know that it is something informational/virtual (-M, +S). Nothing to do with any information on a material support (+M, +S) or even less as something material (+M, -S).

Drawings such as the frequent "Hm", are certainly obsolete to be still in use today, as mentioned before, as if today we continue to use the drawings of RAMON y CAJAL. Instead of schemes like this one, it is necessary to consider the already mentioned "Global model of the psyche".



The term has no problem in translation: "contact barriers". It is also fully sensitive and incorporates the perspective of informational control. But it should also be added that "Synapses" (from the Greek "synapsis" = point of contact, but without "barrier"), which SHERRINGTON later gave and is the one in current use, is less adequate, purely material, not informational.

It should also be noted that it cannot be dissociated from the phenomenon of "Bahnung". FREUD proposes a strict system (i.e. of related elements) and also intuitively, right from the start, their multiple interrelationships through the ramifications of the dendrites. The latter is historically important because it is equivalent to the phenomenon of neuronal interconnections (generated by stimulation), but which has not received its full importance until relatively few years ago.

And in this system of interconnections it proposes filters to the establishment of relations, filters that execute the "Barriers":

- allowing and/or favouring some, and
- hindering/preventing others.

That is, establishing preferences/ priorities/ advantages.

Perhaps the mistake would be to think that the barriers have any importance in themselves, when it is a simple automatism of passage. The action of favouring or hindering the passage of information through these barriers occurs precisely in function of the information that reaches them. I therefore insist on the inadequate denomination of "Synapse". Like the trams of the 1960s, which could change the direction of the detour at the driver's will when they reached a turn-off, although sometimes the mechanism failed... (which is a matter for neurology). Or the "Tele-tac" to raise the barrier at motorway tolls and not have to stop. **In other words, these are remote-controlled switches ('tele')**.

An information/instructions incorporated by the unconscious, as to whether the barrier is to be such a barrier, hindering or even impeding. Or vice versa, favouring the establishment of the relationship. This addition of instructions it is nothing other than the contribution of perception ("Wahrnehmung"), the subjective that feelings add to the neutral sensory images that come to us, by selectively relating them, or not, to previous images already available in memory ("Erinnerungsspur"). We see this in the following.

To put it crudely, the only thing we can do with a barrier is to grease it, that is to say, to maintain its complex mechanism so that it works properly. This is what neurology tries to do, and it is certainly very good, but it is understood that it is something limited, the important thing is the instructions for its opening, or on the contrary, the limitations to the passage of information.

The confirmation of LLINÁS

Once the initial drafting of the document was completed, in order to make it better understood, I looked for other known related documents to facilitate it. In this way I became aware of LLINÁS' important contributions to neurology, such as his "Law" (1988) on neuronal functioning. In brief:

"...CANNOT be functionally replaced...", "...the function of a neuron CANNOT be determined by the connections and neurotransmitters released by neurons alone...", "...".

As the current "Wikipedia" summarises more than 30 years later:

"The dogma of neuroscience dictated that only the connections and neurotransmitters released by neurons determined the function of a neuron. The research carried out by LLINÁS ... showed that the 'neurological dogma' held until then was erroneous" (Wikipedia).

"Dogma" is verbatim from the contributors to the article. And the fact that "traditional" neurology was surprised that neurons cannot be exchanged, only indicates how wrong their conceptions of psychic functioning are for all that has already been explained and which makes it obvious: the existence of psychic information supported by the physiological. Half a physiologically malformed brain can be removed, but information cannot be exchanged once it has been established on the healthy physiological support.

Thus, synaptic function does NOT depend primarily on the biochemical aspects present at the synapse itself, including neurotransmitters, so it must therefore be due to other factors not yet considered by neurology. And if the causes of synaptic functioning are largely unrelated to their environment, then it can only be due to something coming to them from somewhere else. And it can only be signals (I insist, virtual information), since it has been known since RAMON y CAJAL that nerves transmit signals. And it must be insisted that in 120 years NOBODY has been able to observe material transport by them to deny it (as on the contrary happens in the case of blood). If SERVET was a victim of those who denied the circulation of blood, today there are those who insist that nerves do not circulate/transport signals (although fortunately they can no longer burn their opponents).

Consequently, LLINÁS' contribution validates the "Contactschranke" intuited by FREUD, but also insists that the double concept of "contact barriers" is more appropriate than the simple denomination of "Synapse" (=contact), which was introduced later by SHERRINGTON and is the one currently in use. So for the sake of appropriateness and for the sake of its anteriority, for the sake of seriousness and in fairness, medicine should change "Synapses" to "Contactschranke".

On the other hand, the hypothesis added in the document, that the management of these "Contactschranke" and neurotransmitters is not autonomous, but is determined by the psychic information that circulates and reaches them (the simile of the tram or the "Tele-tac"), is also validated.

It should also be noted that there is a common aspect between LLINÁS and FREUD, their negations:

- "...all attempts to conceive of ideas as stored in nerve cells, and excitations as following the course of nerve fibres, HAVE utterly FAILED". (Insisting on taking into account the limited knowledge of the time).
- "...THEY CAN'T..."

FREUD intuited it at the end of the 19th century from a generic perspective and LLINÁS* confirmed it specifically at the end of the 20th century.

* On the other hand, I saw that Rodolfo LLINÁS was born in 1934. At the age of 85 I was able to contact him to thank him for his contribution, and there were fortuitous coincidences. His family had emigrated to Colombia two generations ago from Llinás (now Llinars), a village near Barcelona that he had visited on several occasions. It is a neighbouring village to Sant Vicenç de Mont-alt, where I was born, and they are separated by gentle hills and Mediterranean forests (El Corredor) where I used to run and train when I was young.

It cannot be understood, then, that today certain totally discredited paradigms continue to be defended, in a similar way to how alchemy might be claimed in chemistry. But in addition to a century lost for the advancement of science, some nostalgics still insist on extending it. They do not want to understand that neurotransmitters are simply automatism of the overall psychic process.

Addendum 2022-01-26

It should be added that in the case of interconnections that go from one neuron to another, it should also be considered that the information that governs the "Barrier" may come not only from the sending neuron but also from the receiving neuron. In other words, it is the destination neuron that can decide and filter what it accepts or does not accept depending on what is sent. It is exactly the same: remote (tele-) management depending on what is sent.

Alzheimer.

The above, would also help to better understand diseases such as Alzheimer's, in which, in addition to neurological causes, possible previous environmental causes are not yet taken into account, **hygienic**, given that the consequences of repeated repressive behaviors should also be associated with this pathology (our or imposed) and/or undesirable experiences that one tries to forget, should also be associated with this pathology, and which through such repetition ends in a permanent and uncontrolled blockage of the passage of any information: that is, loss of memory.

Epigenetics is not yet known! As will be seen in part 6. on "Exercise", exercising forgetting can lead to uncontrolled forgetting, a blocking of the "Contactschranke".

The difficulty of finding a cure for the disease is understandable if it is understood that its deepest causes may be behavioural and that the physiological-neurological dysfunctioning is largely a consequence of the above, as we must insist on what FREUD said (psychosomatisation):

"The relationship between the somatic and the psychic is, in animals as in man, a reciprocal interaction, but the action of the psychic on the body was in the early days unwelcome to physicians. They seemed reluctant to grant a certain autonomy to the psychic life, as if they were in danger of abandoning the firm ground of the scientific".

I have known too many cases of Alzheimer's in close proximity to family or friends well know (politicians, "intellectuals", ...), of whom I also knew "intimate" aspects of all kinds of these people because of my age, aspects that are usually hidden and unknown. I cite just one. A 76 year old person with a very advanced disease, diagnosed 6 years ago. At the age of 11 he lost his father, a very loving person, and at the age of 55 his mother with whom he had a normal relationship at the time. Only 2 years ago her spouse with whom she lived for 53 years, in a very unhappy, submissive and repressive relationship, died. Although with little coherence, she sometimes recalls and quotes her daughter (without acknowledging her), her mother and her father (dead for 65 years!), but never her spouse who died so recently. As has been said, neurological it is possible to "grease" the barriers (medication), but if the information is "tired" of being passed on and brings "conflicts", it is of little use...

I can give you a dozen analogous cases, but they could be recognised. Twelve equally unequivocal cases, isn't that enough to start a scientific study?

It is not up to me to carry out a study of others cases to highlight this "action of the mind on the body", but it would be very easy to do so guaranteeing confidentiality, with patients whose relatives have a minimum knowledge of psychology to collaborate in adequately transferring these intimacies and who agree to provide them, with as much anonymity as is necessary.

4. 3. Wahrnehmung (= "Perception")

A visual image, in order to be computer processed, has some structure, its "format" (*.jpg, *.bmp, *.gif, ...), which are interchangeable between them. A chaotic/arbitrary content such as a volume of gas would be unthinkable as unmanageable, the image could not be reconstructed. The same as images of any kind, visual, sonorous, experiences, ... (which would correspond to the *.jpg or *.mp3 or *.mp4,), which the individual receives and activates perception.

What is perception? Well, it is a different psychic structuring in which each new sensory image (or virtual image in a conversation) is selectively related/associated with all the existing ones in the memory. And from where this selection of associations results.

For example, during the day on a walk in the forest, we selectively associate with the images received from the many, many memorised memories some that are always pleasant, pleasurable. But in the same place at night, we associate totally different and intimidating memories with the shadows we receive, even though objectively they have nothing to do with the environment. Or if the image we receive is associated with the memory of an unpleasant experience, which makes us uncomfortable and unnerved. Or the other way round, to a possible stimulus related to other images in memory that are being retrieved. So the same sensory image can be perceived very differently at one time or another, at one juncture or another, by one person or another.

It is therefore a management of information structures, in which the incoming image is also the simplest (an image, a sentence, ...), while the resulting image is a combination/structure of images of a higher level of complexity, as it integrates what is received by the senses with the images with which it is related, selected from among those already in the memory. But the latter are much more complex than the sensory ones, since they also involve the feelings of the unconscious.

And this resulting image returns to the memory, partly to the conscious and partly to the unconscious, as a more and more complex image, for a new future perception (this static effect is of the "Consciousness" type). Perception is thus an operation that is applied to what is received (sensory and/or virtual), resulting in a much more complex image, because it composes this image with a selection of more complex images already existing in the memory. As it is memorised and available for new perceptions, this means that it is stable in time and therefore corresponds to a new level of complexation. And so on for each perception.

So memory is infinitely more complex, not only because it stores such disparate sensitivities (which would be static), but also because of its dynamic of bringing them into play, i.e. of continually relating them to the new images received from the sensitive or factual level. Or even exclusively internal processes (thought, ...).

Since LÚRIYA (1902-1977), the explanations that have been given to date about memory are tiny in relation to what we still have to know. And furthermore, with confrontational explanations, that is to say, without fully knowing the few that are true. All of this is due to a failure to prioritise relationality and complexity.

With the aforementioned "mechanisms" supporting the basic units of psychic information and the computer similes explained, it is clear where future research on memory should be focused.

Perception is something intrinsically subjective, unconsciously managed (the selection of images already existing in memory that are associated with a perception are not voluntary). And it is undoubtedly something dynamic, whose static effects, what is perceived, is sent to the memory as a new element to be conserved and made available.

So a perception is not "debatable", once it has been made the individual cannot change it, it is what it has been. The subsequent conscious action that results from it is another thing. You cannot try to convince someone that such a perception has been another, different from what it has been.

Its relationship to empathy is clear: **empathy** is the ability to guess another person's perceptions and relate to them in a way that generates pleasant perceptions as far as possible, rather than unpleasant ones. It is certainly an art. And yet another definition to add to the list of faculties of the psyche.

At least we have already differentiated, and in turn related, memory and perception. Perception is thus a structural level superior to sensibility and even to feelings, since it involves them all, and which refers back to memory (but, I insist, with more complex elements).

And what interests us here is that this relational dynamic of images results from the "contact barriers" as a selective element and the "Bahnung" as an active element, but also only in a few specific and fortunately simple cases, which allow for certain linguistic phenomena, such as the "Terminations".

4. 4. Bahnung

Bahn is the German equivalent of "Via" (which encompasses more specific concepts such as road, track, path, ...), and not necessarily a railway track, although BahnHof (=house of the track) is commonly used for railway stations.

The "Termination" "-ung" -which complements "Bahn"- is the equivalent of "-ing" ("-ant", "-ent", "-int" in Catalan, "-ando", "-endo" in Spanish,), which is "the realisation of the phenomenological action associated" with the root concept which it complements from behind. We have seen two other "Terminations" (Endings) used by Freud: **Wahrnehmung** and **Erinnerung**.

Now a problem arises, for it is said that German has no gerunds. And the repetition of this statement is surprising. A sign of the lack of depth with which linguists analyse the language, trying to make a literal translation instead of the correct conceptual translation. It is precisely this that is solved by these "Terminations" (Endings) that children manage from the age of three, as they result directly from the phenomenological perception that a child begins to exercise at this age, and which, as will be seen below, anticipate the grammatical rules.

What is the gerund? It is simply a name that grammar (Spanish grammar, Catalan grammar, ... but in this case not German grammar) has given to what is strictly speaking the realisation of the phenomenological action associated with the concept it complements.

camino → camin-ar → camin-ando (Spanish-Castilian)

path, way → to walk → walk-ing (English)

"to walk" is the action (called "verb" by grammar), "walking" is the realisation of that action (called "gerund"). Moreover, by using this totally arbitrary name of gerund, this strict interpretation is concealed, which as I say, even children perceive precisely because their intuition has not yet been inhibited by arbitrary grammatical names and rules, because fortunately they do not know them at this age.

So, even if German does not have this arbitrary gerund desinence (I use now "Desinence" and not "Termination" precisely to differentiate between them, as a cultural convention the former and phenomenological perception the latter), does the German language have any "Termination" which represents/interprets the same perceived phenomenological action?

Undoubtedly, and unsurprisingly, because perception is a human faculty (independent of the language spoken), not an arbitrated cultural convention. It is "-ung", which stands for the same thing but constructed by German as the ending of the expression given to the associated action, i.e. the associated verb.

erholen (=to recover) → Erholung (=the process of recovery, ="recovering")

Wander (=traveller) → wandern (=travelling, formerly on foot; today "hiking") → Wanderung (=to make the excursion, ="hiking").

The other difference is that German gives it a substantival form (hence the capital letters) and feminine gender: Die Erholung, Die Wanderung. In Spanish and Catalan the gerund is neuter because it is an adjective.

If we also take into account that we are dealing with a phenomenological question formalised by the German language, it is difficult to think that Freud would take license from a personal and capricious slang. So "Bahnung" must be translated by:

"the performance of the action associated with the track" (or the route, or the track, or the path, or the road, or...).

and in our context, which is not territorial, but psychic:

"the realisation/exercise of the psychic process of selectively retrieving elements of memory".

only that in our Latin languages it is not commonly used "viar" (the action associated with the "via"), nor "viando" (the performance of the action, the gerund). Nor "excursionando", but we do use "recuperando" regularly.

So the proper and correct thing to do in this case is something as simple as accepting the foreignism and keeping it, bearing in mind its previous definition given. It is what one would do in any mathematical theorem or computer program, which represents its elements (the "variables") by "x", "Y", or any other abbreviation (besides, FREUD uses this resource continuously).

The usual translation, "Facilitation", is inadequate:

- its "Termination" (Ending) "-tion" refers generically/globally to a phenomenon/process, while

- "-ung" is more specific: only to the realisation of this process;

- The usual thing is not exactly to "facilitate", but on the contrary, they serve above all to "impede", making a brutal selection (for example the case of Alzheimer's already seen);

- the only relation of the concept "Facilitation" to "Bahnung" is the specific (and least usual) case when there is permissiveness, preference, priority, advantage, ... or in other words, facilitation;
- is not sensitive, i.e. the name does not help much to understand how it should be interpreted. And it has already been said about the action of the unconscious as a function of the name (semiological optimisation) and the need for an optimal conceptualisation.

That said, the specific case of '**Terminations**' is one in which the association between the child's intuitive but unconscious phenomenological perception and the terminations they hear from adults is 'facilitated.' In turn, even if unconsciously, the child begins to construct the first **compound concepts**, since they combine the main concept (e.g. 'Form-') with the possible "terminations" (e.g. '-ated', '-ality', '-ation', '-er', etc.). These are **trivial** compositions, since virtual-compound concepts do not appear, fully and consciously, until the age of 6. "Concepts compound-virtual" which make up 'Level 2' of thinking (see [10]).

Bahnung, versatility, relatability and knowledge.

And the "R"? which was mentioned in "2.4. Need for the "aRb" model". The "R" is precisely the "Relator", which being also necessarily information (what substance or material structure could relate such different things?, the already explained versatility), is the information associated to the two "a" and "b", which opens the barriers making possible the interconnection of the information and stably establishing the triad "aRb".

And from this point on, the structure of complexation "aRb" is established ("established" derives from stable, the condition of a new, higher complexation already seen), a memorisable element is already constituted which guards the psyche and leaves the interconnection free for new relations. So we can define and differentiate "Relators" which are nothing else than privileged and preferential "Bahnung" in the circulation of information through the psyche, and which in this case it would be correct to call "Facilitations" (but which I insist, is an exceptional case, not a generic one).

It is because of this, because of this versatility, relationality and progressive complexity, that Homo has been able to take advantage of this informational structure for other purposes for which it had not evolved: knowledge. And as explained in the video [2], cognitive Relators are the basic faculties that structure it.

What does the "Eureka!" entail? The establishment of a new "aRb" interconnection which in turn simultaneously interconnects (a repetition) many other previous "aRb" triads, creating a "harmony"/coherence that is perceived as a "flash of light", as a "final bang". It is the pleasure associated with the exercise of the psychic process of retrieving and ordering a large number of memory elements in a chain. It is also understood that when a great discovery is made, the person has the so-called "inner strength" to be able to defend it against the stupidity of the environment, even to the point of death. It is a pleasure, a "superior" strength. On the other hand, as we shall see, the inconvenience of not celebrating, or worse, scolding a child who spontaneously says "El gato se ha morido" (unlike Catalan or Spanish, in English the intuitive termination is accepted), instead of the other usual but **irregular** form "El gato se ha muerto". And the irrecoverability of "wild"/abandoned children, or children kept in rooms or hospices, without stimulation, and their serious and unavoidable adult problems, is also understood.

4. 5. Nachträglichkeit ("-keit")

Although the term is of little relevance here in itself, it is interesting because of the coincidence of being another "Termination" and at the same time the reiteration that FREUD makes of them in his writing, precisely in order to express himself with the greatest precision.

Nachträglich: ulterior, posterior, ... (in Spanish-Castilian; subsequent, later in English)

-keit: has associated with it as a property of the way of proceeding to ... (-ness, in English)

Nachträglichkeit: ulterior-idad, posterior-idad; ..., ("après-coup", in French; ... posterior-ity in English).

Plasticity, luminosity, competitiveness, topicality, permeability, totality, mortality, mobility, seasonality, legality, vitality, ...

Note how the literal definition required by the language "has associated as a property of the way of proceeding to ..." is long and difficult, but surprisingly intuitively managed by a young child, given that it is a phenomenological manifestation.

5. SIMULTANEITY

FREUD's "Project ..." intuits and generalises, but obviously without specifying. It must be stressed that it was a letter written by hand and in one go (computer text editors were still almost a century away...).

But the "Interpretation of Dreams" of 1899 already provides some specifics. The most obvious, that of simultaneity, by which sensory or sentimental images (i.e. relating to feelings) received simultaneously are related. Who does not get excited, or enjoy, with certain music (even vulgar in itself), for the reason that it was the one they listened to in a certain emotionally pleasant and important circumstance? Or in any case it immediately brings to mind the experiences with which that music was associated in the past. There is no objective relation between music and emotion, but the psyche of the subject associates the same musical sensory images, retrieving them together with that previously associated emotion ("Nachträglichkeit").

It is the aforementioned process of perception, which brings together different structures of complexation such as the recognition of sensory images, memory ("Nachträglichkeit"), associated feelings, etc.

How should "Bahnung" and "Barriers ... Cschr" (I insist, both together, as they are inseparable) be interpreted here?

- To begin with, the representation model ("Vorstellung", yet another "Termination") is, as has been said, the relational model "a**R**b", which is the established and retrieved associations, which create a structure of relations, a small network of relations, which should replace the little drawing of the "Hm".

- And within the relational, its structuring in levels of complexation, since there are several levels that have been managed by relationality.

And how have the barriers acted? Well, out of the almost infinite possible processes of recovery/association "Hm ", the many "Bahnung", selecting only a few who are allowed to pass through and with a certain level of "prominence" (as the resulting "quantity", of "Q_η ", although this contribution is possibly not very relevant).

6. THE PLEASURE OF MOTOR REPETITION

The satisfaction of a child who is able to take his first three steps, albeit falling, to go to his parents is unmistakable. His clear satisfaction is not in going to his parents, but in finally being able to do so autonomously, of his own free will, not depending on their begging and crying. He can go when he wants to, not when they let him.

Exercise is one of the first pleasures for newborns. An infant struggles for a whole year just to be able to maintain bipedal balance and minimally coordinate a few dozen muscles to be able to walk. Hence the satisfaction/pleasure of exercising this faculty.

Each step is a success that culminates a long and long-suffering psychomotor evolution of a whole year. And when the steps have become normal and the challenges are greater, the pleasure appears in the repetition of difficult steps, "strange" steps, not at all efficient because they end up tiring, but which produce the pleasure of being able to do them, of exercising a skill, a faculty. They are the syncopated movements of all children, and which as adults we still find amusing, both to watch and even to perform.

The result is the desire to walk with skilful rhythmic/repetitive movements, movements that are totally unnecessary but bring pleasure. In this case, the action of the Bahnung and its barriers is totally favourable, preferential, advantageous, permissive, ...

A footballer, young or old, wants "the ball", so they all indulge in the repeated pleasure of the skill of kicking or heading it as many times as they can keep it moving, before it hits the ground and inevitably stops.

Something that seems to be ignored about the exercise should be taken into account: its transcendence. Exercise is the actualisation/realisation of a faculty. And if it is not exercised, the tendency is for it to disappear. Thus, a biological organ, if it does not perform its function, atrophies. Or vice versa, exercise develops it ("The function makes the organ").

The economy of nature exists from the very beginning: the "Principle of least action" which governs all physics, for example with the well-known optical path that light chooses "wisely" (a "preference" also clearly intuited in the "Project..."). It is not to be understood as the "Law of least effort" (for then the light would just stay put...), but the law of maximum efficiency, of maximum performance.

Thus, the exercise of a faculty is intrinsically associated with any faculty, which translates into the pleasure of the higher living organisms in exercising their faculties. And without doubt, perhaps the best example is sexuality, which, being the condition for the maintenance of life, is so potent, so omnipresent. And of course, in order to favour its exercise, this exercise is linked to pleasure. The supposed "obsession" with sexuality that is usually attributed to FREUD as a criticism, is understood here as an argument of the most basic common sense: the Bahnung of sexuality must be a priority, the most favoured/facilitated (of biological root, transferred to the psyche), because the maintenance of the species depends on them. More so with billions of years of sexuality.

And at the individual level? Running is the most characteristic faculty of the human species compared to other related species. For several million years, in what other faculty has man evolved more than balancing and running with only two feet, running

after other species to hunt and eat them, or running in front of others to avoid being eaten?

But it should be noted that despite the above, in many people today it is repressed, unconscious, due to an inadequate culturisation, when it is a renunciation of the most economical pleasure and with minimal limitations for its realisation. To understand it better, one only has to think of the trauma of its absence, be it mutilation, reduction, paraplexia, tetraplexia, ... Moreover, the absence of this exercise is at the basis of the deterioration of health with age. Even walking is the most commonly prescribed "medicine" in old age.

Marketing" and consumerism-"snobbery", or sports tourism, are not enough to explain the emergence of something as "tired" as marathons (including Nordic skiing), or in general "running" (or before that "jogging", note the "snobbery" of the two terms, when "running" or "jogging" have always existed). It also explains why there must be something deeper than the above, more "intrinsic", which is none other than the aforementioned pleasure of the psychomotor exercise of running, also favoured by the current increase in healthy social behaviour.

7. THE PLEASURE OF SOUND REPETITION. SIMILE-CADENZE.

A newborn baby recognises its mother's phonemes from a few weeks before birth, even if it understands nothing of the semantic interpretation of their combinations (the words). But it certainly perceives the emotionality of the intonations perfectly. The mother's lungs are an intense sounding board which in the last months of pregnancy, with its perfectly formed auditory apparatus, are a continuous exercise for the child. It is millions of years before the recent language, initially gestural and later spoken. Written language is even more recent, only about 6000 years ago ("Tartarian clay tablets", from 3 800 to 5 300 BC). So it is a serious mistake to speak of "mother tongue".

This is "maternal semiology", the recognition of basic sound signs, with which the spoken language is constructed, semantic, which is a higher level of "complexation" than the semiological, so that if there is no automatic/immediate recognition of the elements of the immediately lower system (the aforementioned phonemes), the semantic interpretation of the linguistic system is particularly difficult and time-consuming. This is what happens to anyone with semiologically distant languages, the more so the more distant they are (...<> Arabic <> Chinese <> ...). This is why it is a serious mistake, I insist, to speak of "mother tongue".

For this reason, a child at birth already has an important maturing of what will become spoken language, and precisely because he does not yet know it (he is incapable of interpreting a single word) he is specialised in the recognition of what is repeated: the different phonemes used by his mother's language. "What is repeated" is a particularly important fact, as we shall see, because it is possibly the child's first abstraction, not yet conceptual but sensorial: the identification of verbal signs, i.e. the different phonemes. Thus, the child can manifest the pleasurable associative ability to string together, not movements but sounds, verbally, aurally:

"..., fruit, ..., whore...", "Blasco que asco",

where rhythm, rhyme, ... are preferential, advantageous, favourable, facilitated.

I think it is appropriate to quote a few paragraphs from "Si la pregunta es por qué los niños repiten lo mismo una y otra vez. La respuesta es: su cerebro está aprendiendo" ("If the question is why children repeat the same thing over and over again, the answer is: their brain is learning") by Laura RUIZ MITJANA, in 'Bebés y más'

(<https://www.bebesymas.com/infancia/pregunta-que-ninos-repiten-otra-vez-respuesta-su-cerebro-esta-aprendiendo>).

A study by Bjork and Bjork (2011), tells us that repetition activates processes that are essential for memory consolidation.

When a child repeats a word, an action or a question, they are not just saying the same thing; they are reinforcing neural connections that 'record' that information in their brain. It is as if they were drawing an increasingly detailed map in the hippocampus region, which is key to learning and remembering.

Another study, by D. TSE et al. ('Repetition and learning' 2011), published in *Science*, highlights that repetition and prior experience facilitate the consolidation of new memories in the hippocampus and neocortex, reinforcing connections and facilitating rapid and lasting learning. **Each repetition strengthens these neural connections.** So, even though it may sometimes tire us or seem like they are just 'messing around', the truth is that they are building something enormous inside themselves: a tool for relating to the world.

And in turn, I refer you to another previous article, [10] from 2007, to [.2120], which explains the '**Thought loop**', which would be like 'ruminating', an analogous repetition but at higher levels of thought, more elaborate, in order to mature conceptual relationality, that is, to mature knowledge.

It is also doubly appropriate, in relation to what was said in 1.4 and 1.5, if the reader who has reached this far still thinks that the "Stimulus" can be pseudo-scientific because of its virtual nature, and because **it is not material or physiological**.

The "Transfer of methodological elements between different existential systems".

Here we should be aware of another "black hole" in science, to be added to the previous ones: it is the usual, but usually ignored, phenomenon of the "Transfer of methodological elements between different existential systems". Methods, surprising as it may seem, can be transferred. And I say "existential" because it is still much more frequent between virtual systems than between real ones. And it also occurs **between material (+M, +S) and virtual (\pm M, -S) systems**, as with psychomotricity, or in these previous cases. There is no limit.

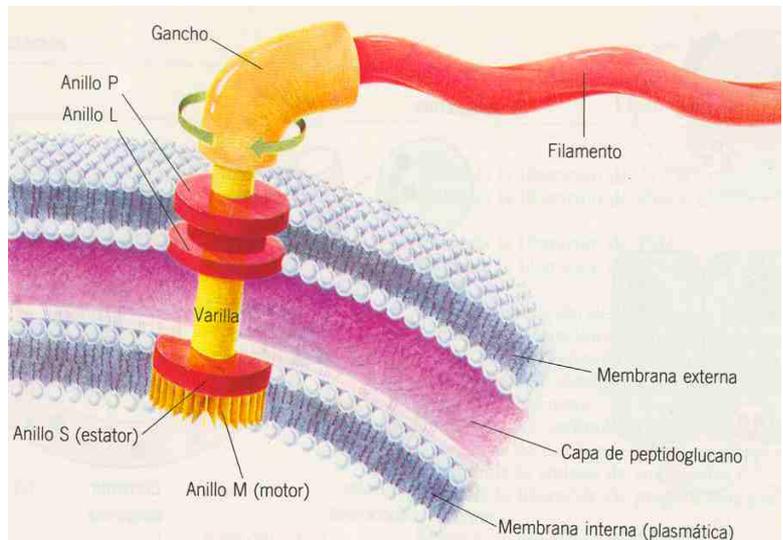
Thus, although it is a ubiquitous phenomenon, its recognition is confined almost exclusively to learning and sport: the recognised transfers of learning, the transfers of skills between certain sports, ...

An example outside these already known previous fields is the here mentioned "replication" that the structure of the signals of the psyche must imply to the muscular structure that it manages (two very different systems, the virtual one, the real/material one) so that psychomotor activity can function correctly. Much more than a similarity, and even more than an analogy, it requires a homology of structures.

The most extraordinary example I know of such methodological transfers is between:

- bacterial flagella (which have existed for more than 3 billion years),
- with the recent "invention" (during the 19th century) of electric motors with rotor and stator.

Simple fortuitous coincidence, certainly not. The existence of mathematics also results from this phenomenon (see [8]), or the aforementioned "Star operator" of differential geometry, which children use intuitively from the age of 6 when they begin "Level 3" of thought, that of strict "Knowledge" (see [10] and [11], or Annex 2 below).



It helps to understand these transfers at the level of "Method", which is the "Level 4" and the last level in which human thought is structured, as such transfers are of frequent occurrence at this level. It is explained in detail in [10] and in:

- "Diccionari intrínsec i llenguatge natural", and
- "El mètode com sistema estructurat a partir del coneixement. Mathematical representation and psychological consequences",

but they are documents from 1996, in WordStar, which have yet to be migrated to pdf.

The case of similitude involves a transfer of repetition from psychomotor to verbal language, yet another proof that the language faculty is a recycling of already existing innate/evolutionary faculties (evolutionary in Darwinian interpretation, not in that of system relationalists). At the same time, it invalidates erroneous hypotheses such as CHOMSKY's "generative grammars" (based on genetic-biological arguments), so fashionable with the appearance of genetics.

To make it clearer what we want to explain, with some exceptions, in cultural language we do not repeat words, once is enough. At most, in an act of congratulation, we can repeat ourselves two or three times (precisely because it is an emotional rather than a communicational manifestation). So why don't we clap once (like the isolated "bravos" that are also made), as intensely as one might think, and instead clap repeatedly, even for minutes at a time? Because each applause produces the pleasure of consciousness-raising, of remembering, the pleasure that what we applaud has given us. It is important to see the disinhibition of the basic psychic processes and their interrelation: the satisfactory emotion experienced is transferred to an elementary psychomotor repetition (clapping) that allows us to prolong the emotion, the satisfaction.

With similitude, poetry follows this same pattern of repetition of pleasure, without which there would be no such literary manifestation. And as in the music we shall see, it evolves so that the sensitive sound repetition of the rhymes of the first poems (of the "Golden Century", for example), can become sophisticated to the conceptual associations of today's more "abstract" poems.

8. MUSICAL RHYTHM. THE PLEASURE OF DANCE. COMBINED BAHNUNG

Repetition is the easy and cheap possibility of economically multiplying an associated pleasure. For this very reason, rhythm is a basic component of music, and all of them have started with it. Subsequently, melody appeared and then other more sophisticated elaborations such as polyphony, harmony and counterpoint, fugues, ..., which are much later. At the same time, they are a new example of the processes of complexation.

And in turn, the rhythm of the music induces the dance. A feedback transfer that combines two different Bahnung, the psychomotor rhythm according to the sound rhythm.

In so-called "classical" music, the highest level of musical complexity, recitatives were a device to avoid composing melody to the very long scripts that had to be set to music. Even in the geniuses the inspiration to generate melodies had a limit. Classical music is also called "cultured" music, a classy and unfortunate expression but intended to indicate the complexity and even the discipline of aural learning involved in reaching this high level of perception and its corresponding extraordinary gratification.

The "Rap"

This explains the emergence of "Rap" at the end of the 20th century, and precisely in cultural environments that have not had access to elaborate/complex classical music, because "Rap" is nothing more than rhythmic recitatives, accompanied by non-melodic music.

Hip-hop

Finally, the case of "Hip-hop" is an example of psychomotor transfer. The simple "strange" and "difficult" repetitive walks of the children become complex and elaborate movements but still maintain the aforementioned feedback between a psychomotor rhythm and the sound rhythm.

And it is clear that without an associated pleasure, none of it would exist.

Little could FREUD have imagined that a hundred years later, universal phenomena such as "Rap" or "Hip-hop" could be justified by his extraordinary and brilliant intuitions, namely his pleasurable/facilitating Bahnung. Despite being correct and a century ahead of the appearance of a phenomenon, are intuitions also "pseudo-scientific"? Why was DIRAC's contribution extraordinary, brilliant, simply because he intuited and was a few years ahead of the discovery of the phenomenon of so-called "antimatter", which had already existed for 14 billion years. To anticipate or predict a discovery has always been considered a scientific contribution superior to any other. To FREUD's many "anticipations", such as the discovery of the "Contactschranke" (= "Synapses"), widely commented on, we still have to add "Rap" and "Hip-hop", two cultural phenomena that did not even exist in his time...

9. GRAMMATICAL MORPHOLOGY

The reader can see for himself that grammatical morphology is a direct consequence of FREUD's Bahnung, which will surprise more than one linguist.

The problem has been that since languages have historically been established in total ignorance of this intuitiveness ("Children are idiots, they can't contribute anything to adult scholars"...), this intuitive "inheritance" has been "manipulated" by the arbitrary conventions and rules of linguistics, creating an anti-intuitive and obscure discipline which, instead of taking advantage of this intuition, habitually represses it.

What with Grammar is unattractive because of its arbitrariness, and also difficult to remember, becomes transparent (intuitive) and unambiguous with the phenomenological perspective. Grammar must give way to intrinsic Semiology and Semantics.

It is clear that in the 21st century and with the knowledge available, all languages should be revised and a "scientific" standardisation should be made, in order to make them more efficient for their communicative purpose. This means introducing an intrinsic Semiology and an intrinsic Semantics, which is not the place here. But at present it is difficult for any linguist to be in favour of this...

10. CONCLUSIONS

Two previews:

- FREUD cannot be asked to do more than he already did, for a theory of information was non-existent in his time, and even today even science does not yet know how to differentiate explicitly between non-symbolic (+M, +S) and symbolic (\pm M, -S) systems. And the latter being subdivided into symbolic (+M, -S) with material support, and symbolic (-M, -S) on signs. FREUD was not able to mature the symbolic information systems (-M, +S) as the genetics, neither the relationality "aRb" and nor the complexations.

- It should be noted how the very intuitiveness of "Terminations" is what has enabled us to clarify the correct translations of "Bahn-ung", "Wahrnehm-ung", "Vorstell-ung", "Nachträglich-keit", "Erinner-ung", and "...-spur", And above all its importance in the understanding of the constructive process of human language initiated by children. And, I insist, its use by FREUD. But which, precisely, some erudite adults have altered with arbitrary conventions, confusing and making it difficult to see the importance of the Freudian contribution in itself. Moreover, in all these years, they have made possible supposed theories of language which are simply erroneous hypotheses.

Now we have enough examples to understand what all this has to do with the emergence of language in children. If at the age of two the child's conceptual constructions are explained by the "Laws of thought" discovered by BOOLE, the beginning of a fluent language months later, between three and four years of age, is explained, among others, by these first "intuitive" contributions of FREUD (see "The knowledge of the child at two years of age" [14], in translate process).

First, identification appears, the child recognises its mother, even during pregnancy, an identification which, if not lost at birth, is further consolidated by the bond of birth, but this is another matter ([15],). Once born, it recognises other people (father, siblings, ..., dog, cat, ...) which does not mean, by any means, that it has reached the concept of father, sibling, dog or cat.

Conceptualisation, which is exclusively sensitive at the beginning and does not add the fully virtual/compound until the age of six or more, is initiated by the abstraction involved in associating, i.e. relating to certain realities a same and repeated combined sound of phonemes (phonemes already mastered before birth): bed, table, Thus, at the age of two, he is even capable of constructing a tree-structured system of concepts such as Misha, Cat and Bug, with the characteristics of algebraic accuracy (see [11] and [14]). Incidentally, another transfer of chained methods, from physiology to psychomotor skills, and from psychomotor skills to mathematics.

And a year later he repeats the abstracting process with phonemes that, independently of the words he is conceptualising, appear at the end of these, associated/ related to some phenomenological aspects that he also begins to perceive. These are the "Terminations" with which a word already associated with a concept can be complemented. For example, "-ando", which unconsciously, without explanation, in Spanish-Castilian is associated with an action (the child understands the laws on his own, without even being explained). Or "-ido" to a state (in Spanish-Castilian), ...).

Composing at the age of three years both skills allows such genial expressions as "El gato se ha morido", but that justly represses culturisation by absurd grammatical conventions (grammatical morphology), when these conventions have justly resulted from the previous skills, but have suffered unnatural modifications (the irregularities)

by linguistics. See that this incoherence corresponds to the concept of "Stupidity", defined in [9].

The repression which the unnatural conventions of grammatical rules may entail is a repression of the intuition which the child has manifested, but also a repression of the pleasure to which he has begun to become accustomed through the skill of the use of sound repetitions, of the preferential "Bahnung". That is why I do not think it is appropriate to renounce the term "Termination" because of its sensitivity. It is self-explanatory.

It is also frequent in the various languages and usually behind (in the ending of the word, rarely in a pre-position), since another important intuition is also involved (a concept that in [8] and [9], as well as being correctly defined, unlike the mystical "immediate knowledge" of some dictionaries, also explains the functioning of this "miraculous" faculty). It is the intuitive use of tree structures, present in all of nature, certainly in our own anatomical structures already seen, and which end up being transferred to our own organisation such as social, political or administrative (neighbourhood → municipality → county → ...).

Linguistics ignores something that is already perceived unconsciously by a 3-year-old child,

- what is the core concept, what is intrinsic to it and what is
- a set of extrinsically derived complementarities that often manifest themselves with "Terminations".

For example from a single main concept "Form" (=external appearance, visual or tactile abstraction of contour, limits, ...) results: formal, formable, formator, formation, formalisation, formality, formability, to form, format, formalism, ... A dozen conceptual complements (the "secondary" concepts, not the strict "main" concepts) that are self-defined and related (comprehension) through the Terminations, when the dictionary does just the opposite: presenting them disjointedly, defined literally (which makes errors possible) and uselessly occupying more than one page of a dictionary (see video [2]).

The first "Terminations" managed by children are the phenomenological ones, but with a gradation. Thus we see how three-year-olds perceive

- those of the "gerund" already mentioned (**-ing**): walking, building, running, ... etc.
- those of the resulting final state (adjectival verb participle, **-ed**): cooked, hidden, manipulated, ... etc.

but others, such as Future Feasibility Property (**-feasibility**), which is not infrequent in the language, is very sophisticated/elaborated, so it may not start to be managed until well after 10 years: activability, actionability, updatability, formability, It is in these cases that their knowledge can be advanced by making it explicit/learning it. In the earliest cases, it would be appropriate to make the child aware of them.

Others, although not phenomenological but agreed, such as science/associated study (**-logy**), can be managed to the extent that the child has sensitised, i.e. knows a few areas of sciences in which they are used (see video [2]).

'Terminations,' which are an intuitive representation of phenomenology, allow children to **quickly move** from initial sensory and static concepts, to dynamic phrases. There is an hatching, but not a 'miracle'.

For this reason, it seems appropriate to transfer some texts from this video:

The intuitive management of terminations by children is explained by FREUD's studies more than 120 years ago, without linguistics and pedagogy having incorporated it. It was in his the "Psychology project" (1895) and the "Interpretation of Dreams" (1899) with concepts such as: "Erinnerungsspur", "Bahnung", "Contactschranke", ...

This is why a child of **only** 3 years old says something **so great** like "El gato se ha morido" (but is scolded!!!, **inhibiting** his intuition).

It's the funny **sincopious** movements of children (psychomotricity), which **transfers** them to their **poetic rhymes** ("Blasco, !qué asco!"; "... fruta, ... puta"; ...).

And they can progressively manage various of phenomenological relations "a**R**b" (many of them expressed with "Terminations") which are intuitive by the above **transfer**, which in turn makes the existence of grammatical morphology possible. The **inexplicable** "Hatching of language in children"!

We manage all our knowledge with a little more than a hundred Relators like the ones we have seen, of which the majority, 50, have an inverse, are "double" ("hemisymmetric"), and 14 are "simple" ("symmetric"), so, strictly speaking, there are 64, and most of them are intuitive, of immediate comprehension and use. On the other hand: How many years does it take a child to memorise arithmetic tables?

So, like Ludo-teca (=ludic room, play room, toy library), all the concepts formed with Terminations (-ing, -ed, ...), could be introduced in primary school from the age of 4, with this efficient system, only limiting itself to the sensitive concepts that the child perceives by himself and little by little from the environment that surrounds him, through his work, through his daily practice.

The "a**R**b" Relators, to which the "Terminations" belong, are the basic faculties that allow the structuring of human knowledge. The set of such language Relators can be seen in an initial compilation "Les relacions del llenguatge", from 1996! [16].

NOTE (2020-06-02): Insisting that "scientificity" is given by the "how" and not by the "what", and just as, at present, semantics and even more so semiology are not very serious disciplines because of their superficial treatment, the same is true for etymology, until today restricted only to noting, but without going deeper into the reasons for the changes. On the other hand, the following table of endings and their structuring according to phenomenology allows us to understand the evolutions between "Action", "Act" and "Actuality" and not only to note their etymological derivation.

TRANSLATE NOTE (2025-07-17)

The table is attached in Spanish-Castilian, similar to Catalan, because the morphology is different for each language, and my very limited English could lead to an inaccurate translation. I am only making a partial proposal. Perhaps it would be better to find another examples that is more suitable for English. I haven't found a dictionary with a simple table that translates all the 'Terminations' which, as has been said, would greatly facilitate any language learning, or translation process.

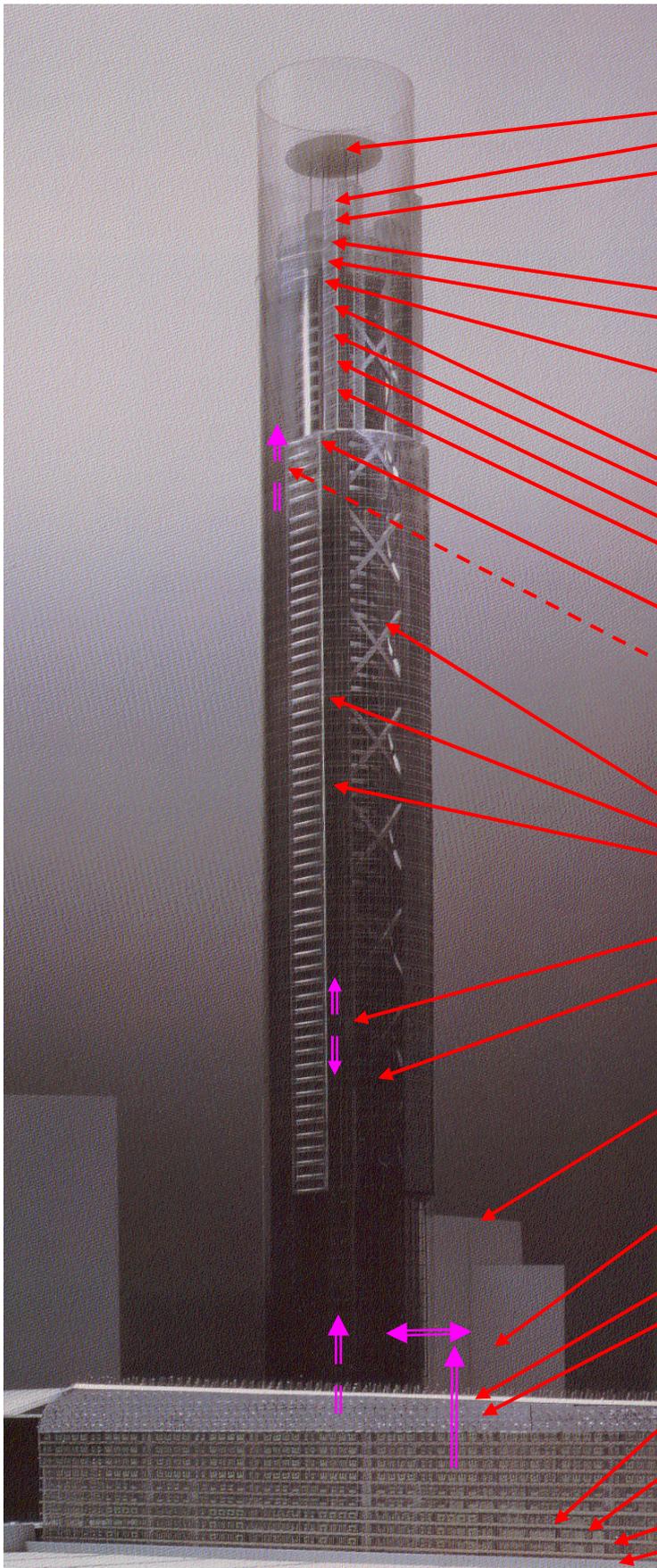
RELATIONSHIP, EXPRESSABLE WITH A 'TERMINATION RELATOR'
Abstraction/ adjective (English Terminations: -ed, -ing, ...)
Phenomenon/process (English Terminations: -ation)
Agent of phenomenon (English Terminations: -er, -or)
Person/ profession (Terminations in Spanish: -logo, -asta, -ista, -dor)
Medium necessary for the development of the phenomenon (Spanish Terminations: -dor)
Realización de la acción del fenómeno/ gerundio gramatical (English Terminations: -ing; ...)
Verb/ action (English...: -ed, -ate, -en, -er, ... , -sion; -tion;); At the same time, grammars subdivide verbs into 'Mood,' 'Tense,' 'Number,' 'Person,' etc., forming a more specific tree of 'Terminations'
Possibility of implementation/ feasibility (English...: -fy)
Property with future development potential (Spanish...: -bilidad)
Way/ method associated/ grammatical adverb (Spanish...: -mente)
Property associated with the way the process/ phenomenon is carried out (Spanish...: -idad, -era . English...: -ity)
Effect of phenomenon
Resulting quality/ property/ state (English...: -ness)
Resultative state adjectival (gramatical partiple) (English...: -ed)
Set of objects resulting and/or associated (in relation to the phenomenon) (Spanish...: -aria, -aje, -alla,, ...)
Original etymological root ; and/or affix (linguistic unit added to another) prefix (added at the beginning) infix (added in the middle) suffix (Termination added at the end)
Commonly used acronym
Science/ associated study (English...: -ogy, ...)
Associated place/ site (English...: -ory, ...)
Behavioural tendency (English...: -ism ; Spanish...: -ismo, -ófilo, -filía, ...)
Associated antonym (=Boolean inverse/complement) (Spanish...: a-, in-, anti-, des-, ...)
Reciprocal/ Functional inverse (usually not differentiated)/ Reflexive inverse (Spanish...: -se)
Associated object (often extrinsic, and therefore different from the effect)

Source: "La percepció i la intuïció infantil: les 'Terminacions' dels nens" ("Infantile perception and intuition: children's 'Terminations' " (C. UDINA, 1999, 10 pages in Catalan).

RELACIÓN, EXPRESABLE CON UN RELACIONADOR DE "TERMINACIÓN" (Ejemplos de "Acción", "Acto", "Actualidad" y "Forma")	Código	Acción	Acto (=Acción personal)	Actualidad	Forma
Abstracción/ adjetivo (Terminaciones en castellano: -ico , -tivo , -al , ...)	-D	activo	(activo, actual)	actual	formal
Fenómeno/ proceso (-ción)	-F	Activación (inicio de la acción/ fenómeno)	Actuación	Actualización	Formación
Agente del fenómeno (-ante , -dor)	-H	Activador/ Activante	Actuante		Formador (objeto)
Persona/ profesión (-logo , -asta , -ista , -dor)	-B	Activista	Actor (genérico)		Formador (persona)
Medio necesario para el desarrollo del fenómeno/ (-dor)	-J	Activador	Actuador	Actualizador	Formador (medio)
Realización de la acción del fenómeno/ gerundio gramatical (-ando)	-G	activando	actuando	actualizando	formando
Verbo/ actuación (-ar , -er , -ir); a la vez las gramáticas sub-dividen el verbo en "Modo", "Tiempo", "Número", "Persona/s", ... formando un árbol más específico de "Terminaciones"	-V	accionar (iniciar) activar (favorecer)	actuar	actualizar	formar
Posibilidad de realización/ factibilidad (-ble)	-S	activable, accionable (mecánicamente)		actualizable	formable
Propiedad de factibilidad futura (-bilidad)	-R	Activabilidad, Accio- nabilidad (mecánica)		Actualizabilidad	Formabilidad
Manera/ método/ adverbio gramatical asociado (-mente)	-N	activamente		actualmente	formalmente
Propiedad asociada a la manera de hacer el proceso/ fenómeno (-idad , -era)	-M	Actividad (propiedad)	(Actualidad)		Formalidad
Efecto del fenómeno	-E				ConFormadura
Cualidad/ propiedad/ estado resultante (-izado)	-Q	activizado	(actualizado)	actualizado	formalizado
Estado resultante adjetivado (participio gramatical) (-ado)	-P	accionado/ activado	actuado		formado
Conjunto de objetos resultantes y/o asociados (en relación al fenómeno) (-aria , -aje , -alla , ...)	-O				
Raíz etimológica originadora; y/o afijo (unidad lingüística añadida a otra) prefijo (añadido por delante) infixo (añadido al medio) sufijo (desinencia, terminación añadida por detrás)	-A				(Morfo-) forma- -morfo; -forme/a*
Acrónimo habitualmente utilizado	-K				
Ciencia/ estudio asociado (-logía , ...)	-C				Morfo-logía
Lugar asociado (-ería , -teca , ...)	-L				
Tendencia comportamental (-ismo , -ófilo , -filía , ...)	-T	Activismo	Actitud (acto reiterado)		Formismo
Antónimo (=inverso booleano/ complementario) asociado (a- , in- , anti- , des- , ...)	-X	Inacción, inactivo			informe (sin Forma)
Recíproco/ Inverso funcional asociado (habitualmente no se diferencian)/ Inverso reflexivo (-se)	-Z	Reacción			formarse
Objeto asociado (frecuentemente, extrínseco, y por ello diferente del efecto)	-Y	Accionador	Acta (Documento)		

Source: "La percepció i la intuició infantil: les 'Terminacions' dels nens" ("Infantile perception and intuition: children's 'Terminations' " (C. UDINA, 1999, 10 pages in Catalan).

11. OUTLINE OF THE GLOBAL MODEL OF THE PSYCHE (1999)



THE SYMBOLIC SYSTEMS OF LIFE (The different Semologies)

- NON-INTRINSIC (-M, +S, -N (no natural stability))
 - Politics. Economy.
 - Current Logic and Reasoning.
 - Linguistic grammar and syntax.
 - SEMI-INTRINSIC (-M, +S, ± N (with increasing stability))
 - Exact Logic and Reasoning
 - Mathematics (Number Systems, Geometric and Topological Algebraic Structures, ...)
 - Intrinsic Semantics (**Conceptual Systems**)
 - THOUGHT (-M, +S, +N)
 - Level 4 (Method)
 - Level 3 (Knowledge)
 - Level 2 (Composite/ abstract concept)
 - Level 1 (Simple/sensitive concept)
 - CONSCIOUSNESS (-M, +S, +N) (Conscious Memory)
 - ↑ Dream Interpretation
 - FEELINGS (-M, +S, +N) (Unconscious memory)
 - ↑
 - PERCEPTION
 - Intuition ↓
 - Emotions. Traumas
 - Affections
 - INSTINCTS AND SENSATIONS (Reflex Memory)
 - Sensitive images
 - Identification (=Level 0 Thinking, Level 00 Sign Management ("Artificial Intelligence"))
 - HORMONE CODING (+M, +S, +N)
 - n-Protein **Cluster** Coding
 - ...
 - ...
 - Coding of cellular proteins
 - GENETIC CODING (+M, +S, +N)
 - Gen
 - n-Codon **Clustering** (Instincts, Hereditary forms, ...)
 - ...
 - Second Codon Clustering (= "Phrases" = =Protein Interpretation)
 - First Codon Clustering = "Words" = =Amino Acids Interpretation)
 - Codon (triad of carbon bases = "letters")
 - DNA carbon bases
- ↔ are transfers of information

Project for the "Tour sans fin" (Paris - La Défense)
Architect: Jean NOUVEL. Photo: Georges FESSY ("Le Sketch" 65/ 66).

ANNEX 1: CLASSIFICATION OF EXISTENTIAL SYSTEMS

The traditional sciences, for centuries, were physics, chemistry, geology and biology, including medicine. And mathematics (which, by the way, is of the type !-M, +S!) as a representation support for all of them. On the other hand there were the "letters" whose treatment was not only unscientific but explicitly avoided, and especially philosophy (with the exception of logic).

This perspective is clearly obsolete, as has been explained, and the point is to expose the different systems that exist and to put in each case its corresponding science that studies it, with the appropriate methodology. And here it is immediate to see that there are more types of systems than the traditional material systems studied by the **material sciences (+M, -S)**. In them, the intervention of some information system is not explicitly manifested, but as has been said, this does not prevent that such information can exist underlyingly.

Science must therefore also consider systems whose dynamics derive from information systems, bearing in mind that the methodology of their treatment can no longer be the same as the methodology of material systems.

And in turn, that within these systems, a distinction must be made between those that

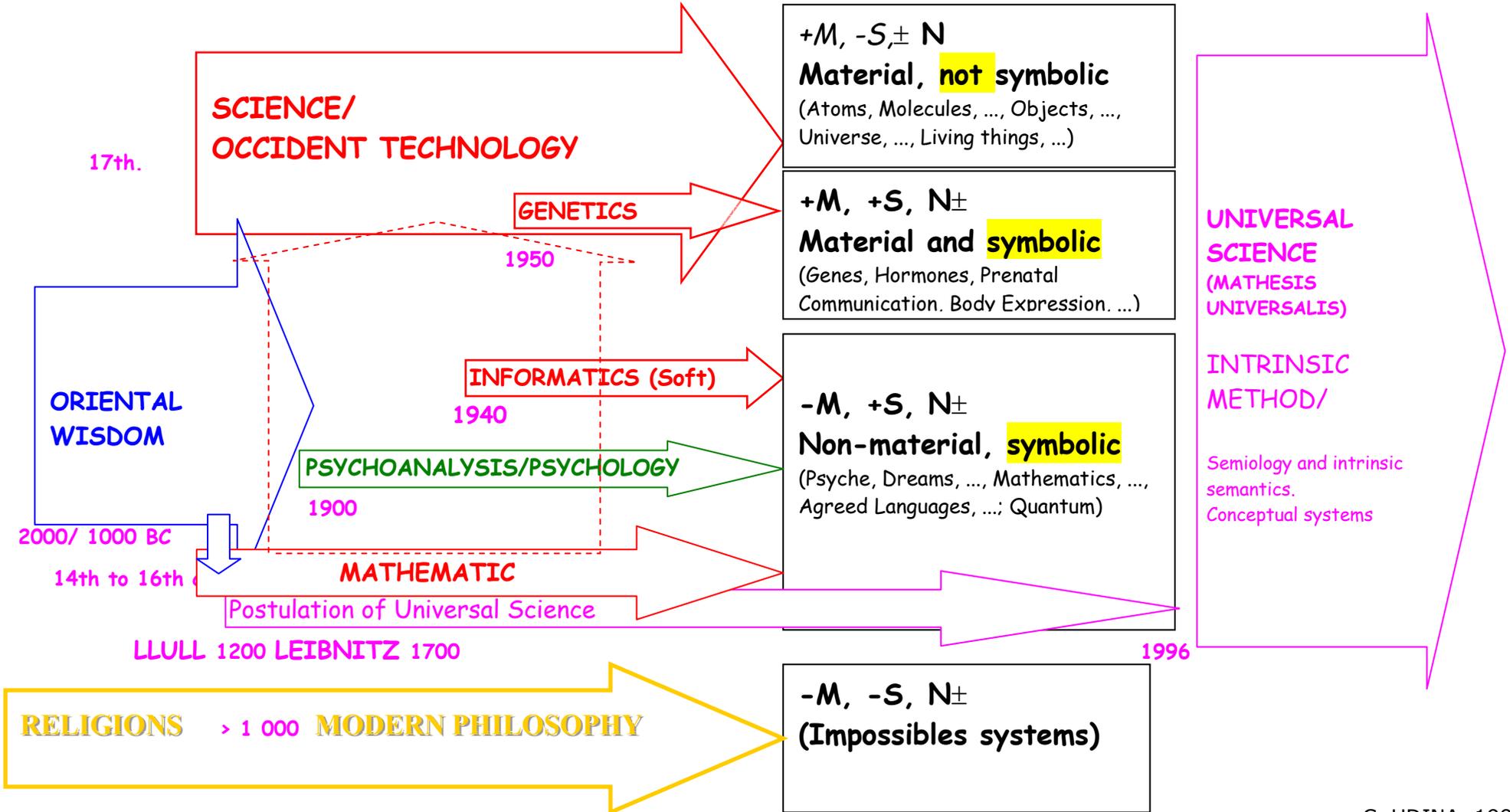
- information is **directly** supported by matter (**+M, +S**), as in the case of DNA for genetics, proteins for immunology and hormones (I insist, whose definition is no other than "molecular sign"), etc.
- the support of the information is **not directly** material but of virtual symbols (**-M, +S**), regardless of whether or not these symbols finally have any material support (electromagnetic, polarisation, neuron, phoneme, writing, ...), as in the case of the psyche and languages of all kinds.

The differences in their characteristics are also clear. For example, the symbolic ones have the characteristic of "copying", something denied to the exclusively material ones: a new molecule results from new available atoms, not from the copy of another molecule as happens with the reproduction of living beings. This is why the possibility of copying characterises information, and computer science has made this spectacularly easy in the last few years.

And among the symbolic systems, those with direct material support (+M, +S) are specific/dedicated, i.e. for only one or a few specific functions (this is why the immune system records infections). They do not have the possibility of functional versatility to admit any type of function under conditions of compatibility, which, on the contrary, virtual/informational sign support systems (-M, +S) allow. This is the case of the psyche and "languages" (languages, computer programming, ...), insisting that with material "plasticity" the functioning of the psyche would be absolutely unthinkable. And precisely because of the virtuality of the direct support, a brief episode of lack of oxygenation, or death, inevitably erases all the information of the psyche.

By the reference in the following table to LEIBNIZ's "Mathesis universalis", it should be added that the different systems that we can find in nature are not isolated, but are structured in a tree-like form and have ALWAYS been generated FROM OTHERS, either by "complexation" and/or processes of "methodological transfer". In his day, BERTALANFFY (1901-1972) proposed a general theory of systems, with the disadvantage that since it did not contemplate the above or the underlying informational perspective, it has not been useful.

COGNITIVE ACTIVITIES AND COMPLEXATION SYSTEMS ADDRESSED



C. UDINA, 1999

Note that mathematics and computer science fall into the "versatile" systems (-M, +S), which allows us to understand the applicability of the former to represent the many systems studied by science, or the universal use of computer science applications. And also that the systems studied by psychology and psychoanalysis fall into the same group, so why is their scientificity denied?

ANNEX 2: ALGEBRAIC DUALITY AND STAR OPERATOR

For those who are not familiar with it, we suggest reading "Instructions for climbing a ladder" (by J. CORTÁZAR in "Historias de cronopios y famas"). It is hilarious how difficult it is to describe textually, literarily, a dynamic process. A video is necessary ("A picture is worth a thousand words"). In contrast, the concept of a staircase, which is equally sensitive and visual, is understood and can be described or drawn by a young child. What is the difference? Despite its sensitivity, the former is dynamic, involving movement, and the latter static.

Similarly, a small child can tell us where a path is, but it is impossible for him/her to describe verbally the action of walking. This is due to the fact that until the age of 6 years the child does not perceive the dynamics/movement well, let alone understand it, which is clinically proven. But this, as I said, corresponds to the "Knowledge of children at the age of 6", and we are still at the age of 3... As long as I do not explain it in this more informative series, it can be seen in the references [10] and [11].

At the age of 2 the child intuitively constructs exact concepts (see [2] and [14]), and at the age of 3 he also intuitively manages "Terminations" (which faithfully reflect phenomenology and which opened the way to "Grammars"). Until the age of 6, the child does not mature the comprehensive perception of movement, and therefore cannot conceptualise something as sensitive as phenomena. For example, fire, which is perceived only as another material object, although it should not be picked up because it burns. But as the understanding of phenomena matures (initial state → final state), the way is given to abstracting explicit relationality, which makes it possible to perceive and manage the level of strict "Knowledge" (the "a**R**b"), the third structural level of thought.

And here, the most surprising thing is that this evolution from the static to the dynamic is what has generated our current language, the current alphabetic-syntactic language. Thus, from the sensitive but static concept of "way" we move on to "walk", the action, the verb with which syntactic language is structured. Or from state → to be; from act → to act; from fact → to do, etc., etc., etc., etc. And if verbs (such as "camin-ar", "est-ar", "actu-ar", ...) are "Terminations" that are perceived/managed from the age of 3, their full syntactic management must still wait a few years, with the "Transcategorisation" between expressions such as "La niña rubia" <> "La niña de pelo rubio" ('The blonde girl' <> 'The girl with blonde hair'), which will be seen in the corresponding document ("...6 years").

And even more surprising is that all these intuitive processes are mathematically described by mathematics with the "Algebraic Duality", more specifically with its "Star operator" of differential geometry (formalised by Bourbaki in the middle of the last century in a more general way).

The traditional duality (an opposition: good - bad, right - left, ...) should not be confused with the algebraic Duality which implies a contrast between:

- things (the static), and
- that which defines the evolution of things (the dynamic),

but in a comprehensive/non-arbitrary way. To better explain this universal and reiterated representation and its relation to the cases presented here, an example may help. Let us suppose a set, that of the natural numbers, something inert, static in itself. And suppose that we establish a correspondence between:

- this set of numbers

- with a set of mathematical functions/equations between these numbers (representing the changes associated with the "variables", i.e. the dynamics).

Numbers/ Points/ Elements/ Matter (E):

Functions/ Information/ Management (E*):

1, 2, 3, 4, 5, 6, ..., n **ALGEBRAIC DUALITY**

Identity	Double	Triple			n times	
1 → 1	1 → 2	1 → 3			1 → n	
2 → 2	2 → 4	2 → 6			2 → 2n	
3 → 3	3 → 6	3 → 9			3 → 3n	
....	
n → n	n → 2n	n → 3n			n → n ²	

That is to say:

- the Identity (a mathematical correspondence or function) is one of the possible duals of the number "1" (a Number),
- the Double (another correspondence/function) is one of the possible duals of the number "2" (another Number),
- etc. etc. etc. etc.

The best known case that gave rise to the formalisation of this mathematical correspondence was the algebraic duality between:

- the "Derivative" (of a function expressing a geometric "object"), and
- its "Point Differential" (a local function that allows to calculate the changes, the dynamics of the environment of that locality).

Consequently, this intuitiveness of the "Star operator" is what, in today's civilisation, allowed the appearance of syntaxes! Insisting that it is a process not related to the "biological", but due to "informational and methodological transfers". Language, like consciousness, does not have a biological origin/basis.

In mathematical notation it is a correspondence between a "Base Space" "E" and the "Dual Space" "E*", it is, of the functions between the elements of "E" (the asterisk/star is commonly used as a symbol for such an algebraic Duality).

$$E \xrightarrow{*} E^* \text{ (Dual of E)}$$

But this well-known duality of traditional mathematical analysis only manifests itself fully in three-dimensional spaces/structures, so it seems more representative to use the name of its generalisation to differentiable varieties, the so-called "Star operator", because of its greater general applicability and at the same time its detailed and specific definition.

But not only the child and its cognitive evolution, or syntaxes, etc. Life has been possible for 3.5 billion years for the same reason, because this operator describes the passage from DNA (static matter) to the codon (information that manages the dynamics of life) already explained. If the reader returns to these explanations of genetics, it is possible that he will now understand them better, on the understanding that:

- the 1, 2, 3, ... of the initial set (E), are material components of the cell, the infinite possible material groupings of DNA sequences;
- the functions (of E*), which correspond to the above elements of E, are the dual codons and their groupings (including genes). In each case they manage a chemical synthesis in the cell, in which the materials 1, 2, 3, ... on the left of the function (as if they were the "x" variables) are in this case the cellular materials/molecules, with which the codons (as managers/catalysts) manage the obtaining of the essential amino acids and/or proteins required by life, and which are the 1, 2, 3, ... on the right (as if they were the "y" variables) resulting from the management of the codons.

In the reference [3] "L'exactitud a les ciències" it is discussed whether this correspondence can be considered as exact in its application to genetics as that of any mathematical formula.

Finally, another case is repeatedly dealt with in this paper: the also strict algebraic duality that can be considered between:

- the body (the material, structural but static) and
- the psyche (what manages the dynamics of the body, and more especially in psychomotor management),

all that DESCARTES advanced, and FREUD developed.

Finally, and returning to the stimulus, this is nothing other than an "Element of the dual", so that, seeing the ignorance of science in these natural correspondences, one can understand the misunderstandings that this concept generates, excluding the phenomena it represents from the "scientific".

Especially because of the inheritance/recognition of JUNG, today psychological and psychoanalytical therapies have come very close to Eastern wisdom (Zen, Yoga, ...) whose concept of "Energy" is basic. Unfortunately, this is an unfortunate translation/adaptation of the term, which creates misunderstandings and above all rejection of traditional material science. It is not "Energy" in the interpretation of physics, but its corresponding algebraic dual. Energy (oriental) is another element of the dual E*. This is therefore a misidentification but confirms the intuitiveness and naturalness of what the "Star operator" relates: the managed and the manager. The "Energy centres" are virtual centres that stimulate/manage the activity that brings into play the strict/potential energies of the organism. And by understanding this concept correctly, the orient wisdom can be harmonised with the science of the "occident".

So, beyond a timely representative, we are faced with:

- a natural methodology of evolution of phenomena between material (+M, -S) and "informational" systems ($\pm M, +S$);
- Another example of the "methodological transfer", in this case from the natural to the mathematical, which therefore makes it possible to interrelate and unify the traditional material sciences with the informational sciences, including psychology and psychoanalysis.

Be it with the "Star operator", or with the "Transfers ...", when there is a coincidence, or two, or even three, ..., it can be argued to be fortuitous, but a reiteration and so general (physics, life, psyche, ..., language, mathematics, ...), and from such distant times, science has called it "Law" since ever. "Law of algebraic duality" (or "Law of static transfer \rightarrow dynamics") as it could be called in this case. Whether it is recognised or not is another matter.

ANNEX 2: EXPERIMENTAL CONFIRMATION WITH OPTOGENETICS, OF THE FUNCTIONING OF THE SYNAPSES PRESENTED HERE (2021-03-13)

My research does not start from, or focus on, the neurological, but rather on the cognitive.

Even more broadly, my research is about the fact that, in the three different possible domains,

- that of inert matter,
- that of life and
- that of behaviour,

what **ultimately governs their corresponding dynamics is the underlying information** corresponding to each case (the ignored underlying quantum information of physics, the genetic information, and the psychic information).

It is for this reason that specific contributions such as the neurological ones on synapses from the end of the 90s by LLINÁS, I only became aware of them less than a year ago, when I wrote this new document. In the same way, the contributions with **optogenetics modulation** of more than 10 years ago (DEISSEROTH *et alii.*) on these synapses, I have not been aware of them until these very days.

The document shows that both contributions complement each other. And in turn, both lines of work allow for empirical confirmation of what has been presented. This is important because it demonstrates beyond any doubt the radical paradigm shift proposed by this document. And historically, it is well known how difficult it is to change established paradigms, however erroneous they may one day turn out to be. It usually takes a generation for the detractors of the paradigm shift to die, and of course... for those who brought it about to die. Or worse, they are punished at any level (SERVET, ..., SEMELWEIS, ...).

In a nutshell, the DEISSEROTH experiments operate "On/Off buttons" at a distance. That is to say, nothing to do with the term "synapses" (=contacts), but "ContactSchranke" (=contact barriers), which can be opened [ON] and closed [OFF] at a distance, which, as has been said from the beginning, was already described by FREUD much more than a century ago. I therefore insist on the misnomer "Synapses" (=contacts), because they are "ContactSchranke" (=contact barriers), which open [ON] and close [OFF], which in turn restores the importance of the contribution of the neurologist FREUD, so often underestimated as such a neurologist. And his transcendental contribution as an exceptional and interdisciplinary scientist, who with his so-called "Entwurf einer Psychologie" advanced no less than 125 years neurological, psychological and also linguistic research.

The experiments deal with pathological/dysfunctional cases ("OFF" fixed) which are repaired with an intervention of genetic technology, which makes it possible to activate the functionality at a distance ("OFF" → "ON") by means of the experimenter's LASER management. When the state is not pathological and there is no problem with the possibility of contact ("ON") or non-contact ("OFF"), what can manage the passage, or not, of psychic information, given that it cannot result from the synapse itself, as we already know (LLINÁS)? The aforementioned **remote-controlled switches**. Since synapses have been functioning for many millions of years, before scientists started playing with lasers, and if we do not believe in a mystical action— which would not be scientific— there is only the action of the information itself that reaches the wrongly called "synapse". Information that may be conscious, but above all, and in most cases, it is unconscious. And in dream states it is obvious that it is only unconscious.

The examples of the old trams of my childhood and the current "Tele-tack" of the motorways, set out in the document are totally correct and exemplary. I insist once again that since RAMON y CAJAL and FREUD, well over a century ago, **it is unquestionable that what circulates through the nerves is information** (what else can signals be, if not information?).

I think I should insist on the example already cited. A walk in the forest on a spring morning generates pleasure, optimism, positive stimuli, ..., but exactly the same place in the evening, only with less light, the same environment generates fear, prevention, negativity. During the day the unconscious positive information from the memory activates the opening of the barriers ("ON"), but the negative information from the memory is retained ("OFF"). At night, the opposite happens. It is the unconscious itself which, preferably, governs in every circumstance which information should pass through, and which should not.

The intervention of so-called optogenetics is to be understood as the neurological technology that makes it possible to simulate the most basic natural/functional/dynamic behaviour of the psyche. It is simply an update, with today's technologies (genetic and LASER), of the stains of the late 19th century that made anatomical/static diagnosis possible. As also explained at the beginning, FREUD himself made contributions in this technology with gold chloride, which was later used by RAMON y CAJAL in his studies.

This new approach also helps in the understanding of processes such as sleep, dreams, memory, or various pathologies such as some of those already discussed in this paper. This, in addition to what has already been explained in detail: they enable various basic faculties of knowledge and the emergence of language ("Bahnung", ...).

It should be added, then, that even without this specific neurological confirmation, if one has the slightest insight, there are many other well-known facts which also confirm what is stated in the document, such as that every child makes syncopated steps, that every child intuitively uses the "(linguistic) terminations" without being taught them, etc., etc., etc., etc., etc. And no doubt there are many children.... Many more than there are laboratory experiments that can be done... **There is no need for further 'experiments'; we only need to observe the common behaviour patterns of millions of children.**

Incidentally, the linguistic hypotheses of previous decades have already been dismissed, even by CHOMSKY himself in a display of his intellectual honesty. This document, the precedent of children's knowledge at the age of 2 and those that will follow, explain how human knowledge and language are possible on the basis of psychic information and the processes of information transfer through psychomotor activity, as well as resolving LEIBNIZ's tercentenary challenge of his "Characteristica universalis".

CUC 2021-03-13

ANNEX 3: FURTHER EXPERIMENTAL CONFIRMATION OF THE FUNCTIONING OF THE SYNAPSES PRESENTED HERE (2024-07-17)

On 17 July I received an e-mail from an Internet expert and historian Andreu VEA ("Como creamos Internet" 2013, 576 páginas; recently [2023] translated to English "Internet pioneers: How we created the Internet") saying:

Today I bring you an answer to something I have always wondered about, but until now no one (of those I have asked) has been able to give me an answer: **How the Brain Decides What to Remember**

from information provided by Yasemin SAPLAKOGLU, from Quanta Magazine, on an article by Wannan YANG, György BUZSÁKI, et al. 'Selection of experience for memory by hippocampal sharp wave ripples'.

Strictly speaking, the article does not provide the answer requested by Andreu, but simply provides new information, but that raises new questions, unless the reader has already read this article and understands that the wave is associated with the unconscious command to activate, or not, the 'Contackschranke' or 'Synapse'.

The answer to its functioning does not lie in the synapses or in its neurotransmitters, as LLINÁS has already demonstrated without being taken into account, but it comes from far away ...

In 2009, L. MONTAGNIER published an article entitled 'Electromagnetic Signals Are Produced by Aqueous Nanostructures Derived from Bacterial DNA Sequences', in which he asked the scientific community what this surprising discovery could mean. When I heard about it, I wrote to him about the importance of his discovery as the missing link confirming the transfer of quantum information (still ignored by physicists, as I explain in [19]) to genetics information, i.e., the origin of life*. Although without quoting me, this led him to the 2014 experiment [13].

* See the letter at <https://www.sistemaconceptual.org/pdf/LucMONTAGNIERENG20100318.pdf>

What matters here is that if, almost 4 billion years ago, DNA generated electromagnetic radiation that supported information transfer, we should not be surprised that, after millions of years of evolution, elements of the animal nervous system similarly support such information transfers, which are undoubtedly much more complex, for the management of the 'Contackschranke' or 'Synapses'.

FINAL REFLECTION

Little has changed in half a millennium. Miquel SERVET (1511–1553) was burned alive by the "Holy Inquisition" for proposing the circulation of blood. Today, proposing the circulation of information from the unconscious through the nervous system, without being burned at the stake, is a taboo, a censurable topic. The precedent set by LLINÁS's contribution, or the recent contributions of optogenetics by DEISSEROTH (Annex 2) and YANG (Annex 3), which **unequivocally confirm this proposal** on the remote functioning of synapses, are completely ignored.

REFERENCES

My Web site: <https://www.sistemaconceptual.org/>

Recent and upcoming translations in: https://vixra.org/author/carles_udina_i_cobo

[0] "The 'Representation of knowledge', and the 'Global model of the Psyche' ". 2024, English and Spanish-castillian, 19 pages+19 pàgines: <https://vixra.org/abs/2508.0186>

[1] D. N. SALATINO "El proyecto de FREUD" (2013)

https://www.researchgate.net/publication/260088291_El_Proyecto_de_Freud

[2] C. UDINA "How to improve (once and for all) our learning and knowledge acquisition" (2020, **video** in two parts). In Spanish-Castillian

First video (34' minutes, 300 MB)

<https://vimeo.com/415106311?quality=720p>

Second video (33' minutes, 200 MB)

<https://vimeo.com/415104656?quality=720p>

[3] C. UDINA "L'exactitud a les ciències" (2007). 25 pages in Catalan

<https://www.sistemaconceptual.org/pdf/ExactitudCienciescomplet.pdf>

[4] J. M. BLASCO "The falsifiability of psychoanalysis. FREUD, POPPER and the common sense" (2019) 21 pages in Spanish-Castillian

<https://www.epbcn.com/pdf/josep-maria-blasco/2018-05-12-Freud-Popper-y-el-sentido-comun.pdf>

[5] C. UDINA "L'ús dels diccionaris: "ludoteca", "botànica", i "signatura" (1998, in "Triptic")

<https://www.sistemaconceptual.org/pdf/Triptic.pdf>

[6] C. UDINA "Philosophy of technology" (2020) 5 pages in Catalan

<https://www.sistemaconceptual.org/pdf/FilosofiadelaTecnologiaBUNGE.pdf>

[7] C. UDINA "Explanation of recent neurological observations on "Interbrain coupling", based on historical contributions by LEIBNIZ, BOOLE, FREUD, PIAGET, MARTINET, and HUBEL-WIESEL" (2019) 4 pages in Spanish-Castillian

<https://www.sistemaconceptual.org/pdf/ExplicacionInterbrainCoupling20190215.pdf>

[8] C. UDINA "What is consciousness-raising?" (2007, 89 pages)

English: <https://vixra.org/abs/2507.0023>

"Què és la conscienciació?" (Catalan): <https://www.sistemaconceptual.org/pdf/Conscienciacio.pdf>

[9] C. UDINA "¿Que es la inteligencia?" ("What is intelligence?") (2008,. 37 pages in Spanish-Castillian

<https://www.sistemaconceptual.org/pdf/QueEsLaInteligencia.pdf>

[10] C. UDINA "El kerigma del pensament. L'estructuració del pensament i del coneixement" (The structuring of thought and knowledge. The kerygma of thought.) (2007) 52 pages in Catalan:

<https://www.sistemaconceptual.org/pdf/Kerigmapensament.pdf> English translation in progress

[11] C. UDINA "Mathematical Basis of the Conceptual System (intrinsic and exact)" (2015). 79 pages in Spanish-Castillian

<https://www.sistemaconceptual.org/pdf/MatematicaSC.pdf>

[12] C. UDINA Letter to Luc MONTAGNIER (2010-03-18)

<https://www.sistemaconceptual.org/pdf/LucMONTAGNIERENG20100318.pdf>

[13] L. MONTAGNIER "La memorie de l'eau" (2014)

<https://www.dailymotion.com/video/x3sbctn> (français)

[14] C. UDINA "The knowledge of the child at the age of 2 years" 2019, 29 pages.

English translation: <https://vixra.org/abs/2507.0185>

Spanish-Castillian: <https://www.sistemaconceptual.org/pdf/Conocimiento2.pdf>

[15] C. UDINA "Children's rights, at BioCultura 2009" (2009). 26 pages in Spanish-Castillian

<https://www.sistemaconceptual.org/pdf/BioCultura2009CAS.pdf>

[16] C. UDINA "Les relacions del llenguatge" (1999). 104 pages in Catalan

<https://www.sistemaconceptual.org/pdf/Relacions.pdf>

[17] J. ELGUERO "La actitud de los científicos ante los proyectos de investigación" (2013).

<https://culturacientifica.com/2013/02/28/la-actitud-de-los-cientificos-ante-los-proyectos-de-investigacion-por-jose-elguero-bertolini/>

[18] C. UDINA "The 'miracle' of a 23 weeks very premature new born: matter or information?" (2010, 21 pages in Catalan): <https://www.sistemaconceptual.org/pdf/Miracle23setmanes.pdf>

English translation in progress

[19] C. UDINA "Information or dilation?" (2016, 18 pages)

English: <https://vixra.org/pdf/2306.0122v2.pdf>

Spanish: <https://www.sistemaconceptual.org/pdf/InformacionODilatacion.pdf>

[20] C. UDINA "Heuristics of Number systems and Conceptual systems" (2019, 9 pages)

English: <https://vixra.org/abs/2507.0218>

Spanish: <https://www.sistemaconceptual.org/pdf/CaracteristicaUniversalis-SC.pdf>

TWO OTHER CONSIDERATIONS: HEURISTIC

A) MORE THAN A CENTURY ABSURDLY LOST, DESPITE FREUD RAMON y CAJAL AND LLINÁS (2020-06-12)

1884 (FREUD) and 1892 (RAMON y CAJAL), demand the need to propose a "psychic" functioning in support of the neurological, by means of symbolic systems ($\pm M$, $+S$), although it was impossible in those years to formulate it in this way, and even less so what type of systems were involved, whether ($+M$, $+S$), or ($-M$, $+S$).

1895. FREUD in his "Project of Psychology" establishes new "revolutionary" concepts such as:

Erinnerungsspur = "to keep track of the memory, of what has been memorised".

Contactschranke = "**Contact** barriers", which later, in 1900, was formulated by SHERRINGTON under the name of Synapses ignoring FREUD's contribution since the "Project..." was a private communication which was not found until 1950. Synapses were not confirmed until LÖWI (Nobel Prize 1936 for it). Moreover, it has already been said that the Greek name, which is simply equivalent to "contact", is less fortunate, as it omits the primary function of "barrier". So medicine should recover the name of FREUD.

Bahnung = "the realisation/exercise of the psychic process of selective retrieval of memory elements".

but which, despite its total success and fully informational approach, did not allow him to go further because of his limited knowledge at the time.

1899. With his "Interpretation of Dreams" FREUD implicitly and rightly raises the necessity of symbolic systems of symbolic support ($-M$, $+S$). On this point RAMON y CAJAL (who, as has been said, successfully focused his work on the physiological field) diverges, so that his interpretation of dreams remained a dead end. He has not been able to learn from his successes or his mistakes.

Regardless of respect and tolerance for people who believe that the Earth is flat, or who do not accept the "Evolution of Species" (as long as it does not imply imposition on third parties), it would be unthinkable today for a physics or biology graduate to argue this in an exam. They would not get the degree. Just as in medicine it would be unthinkable to deny the circulation of blood. That is why it is hard to understand that in the field of neurology there are tendencies that a century later deny the psyche as "a special form of existence, distinct from material reality" (FREUD). But the medical faculties do not prevent it, and in some cases even encourage it. The same goes for the many journals that publish in this line, which must be considered clearly a-scientific. Their results lead to futilities such as those described in [5] and [7], or even aberrations such as those of BUNGE [6].

THE UNEXPECTED SOLUTION AND THE REASONS

The methodology that presides over this document, like all the others I have referenced, is so novel and unexpected, that it initially generates disbelief (and to this day, it has been almost 25 years). And from disbelief, the usual thing is to move on to all kinds of fallacies ("ad hominem", ...) instead of trying to understand what one reads. Because of this long experience, I felt it necessary to explain how I arrived at this new paradigm, and also on my own (which generates even more incredulity), that is, how I arrived heuristics.

At the end of 1978, the Nuclear Medicine Department of the Hospital del Mar commissioned me to implement the computerised technique for calculating regional cerebral blood flow with radionuclides (Xenon 130), abbreviated "rCBF". This was one of the first attempts to study the dynamics of the brain, which gave rise to the later ones that exist today. In addition, the lack of knowledge of the technique by the medical staff meant that I also had to study these medical aspects in order to facilitate the diagnostic interpretation of the data obtained. At the end of

1979 I issued a report to the Director of the Hospital (E. BOSCH i MONEGAL) suggesting its cancellation due to the costs involved, given the basic deficits of the hospital in those years and that the patients did not require such a notably invasive test, because it was only done for doctors' curriculum purposes

Although I was not yet familiar with FREUD's work, the previous rCBF studies and my knowledge of computer science (a discipline that FREUD did not know, which gives much more merit to his contributions), already allowed me to understand that physiological studies could not be used to draw conclusions about cognitive processes.

It also coincided with the fact that in September 1979 I had to resolve a serious incident of radioactive contamination with strontium 90, which pointed to a secret attempt by the Spanish military to try to have an atomic bomb in order to strengthen itself in the face of the political "Transition". This led to my being made responsible for improving radiological protection (elimination of hundreds of scanning devices, controls on professional staff, hospital protection measures, diversion of waste trains from nuclear power plants by new *ad hoc* routes, ...), and also for a UNESCO MAB-10 ("Man And Biosphere") programme, for Barcelona, where among other things I proposed the possibility of a "universal" Thesaurus that would allow searches to be exchanged between different scientific databases and libraries, in the form of a "Universal Algebraic Product" between "Categories" of languages.

In 1986, due to a political change suppressing all of the above and therefore my responsibilities, I decided to devote my little committed time to the above, given that it did not require significant resources and I was able to maintain my computing responsibilities in another Department. Therefore, from 1987 onwards, I extended my research to the problem of knowing "how do we know?", analysing the different elements produced by human thought (obviously including language), from their final effects and without any limitation. The opposite perspective is that of synthesis, restricting itself to the study of neurological phenomena, trying to discover from them how cognitive processes are generated.

I proposed to determine which were the intrinsic characteristics of thought and knowledge, and which were the extrinsic ones, using a computer programme that simulated aspects of the mathematical theory of "Endomorphism", but managing cognitive elements. Something analogous to what KLEIN had already proposed for geometry in 1872 with his "Erlangen Programme", and which led to the current extraordinary development of this discipline. But it was surprising that when explaining this geometric-algebraic methodology used in research, an immediate rejection was generated, without paying attention to the fact that the results obtained fully justified it (and when analysed in depth, its wisdom and common sense is understood). The scientific community not only behaves as criticised by MANDELBROT and LAFONTAINE, but its marked dogmatism (inherited from the still latent medieval religiosity of science) does not allow new contributions to be made beyond those that are "permitted" or "convenient". Thus, even in the face of recognised and centenarian "black holes", only retired scientists dare to criticise, such as "...it must be replaced by some other kind of theory that we cannot even imagine now" (A. LEGGETT, Nobel Prize in Physics 2003), but if the solution is proposed with an "unimaginable" theory, i.e. different from the prevailing orthodoxy, the scientific community refuses to consider it. It only reacts to new empirical data in flagrant contradiction with the accepted "theories", and even then, it tries to hide it (see [19]).

To better understand this difference of a useful intrinsic treatment, or the uselessness and ambiguity of the extrinsic, I quote ZIPF's Law "of brevity", from 1940, which I have recently come across. It is about what has always been known, the comfortable tendency to economise in language, in what is most used. For example, the use of the abbreviation "'t" ("can't") instead of "cannot" in the English negation, despite the fact that it generates frequent misunderstandings, no doubt serious, because it is a para-polysemy due to the similarity of both expressions that represent totally opposite concepts, to which in English pronunciation and above all for non-native speakers there is also the possible confusion with the similar pronunciation of "whores' cunt" (= "cunt"). Or the hardly understandable Andalusian popular speech, ... The Law of ZIPF involves "discovering the garlic soup", and as we have seen, a totally extrinsic study, of formal aspects, and even simply curious ones. But today, 80 years later, this Law continues to provide numerous bibliographies in the field of linguistics.

It was also decisive that in 1986 I started a period of psychoanalysis of more than 5 years (with E. ROS i BERRUECO) which led me to "discover" and become familiar with the "Symbolic systems with symbolic support" (-M, +S), which characterise psychic behaviour.

The study of the manifestation of language in children has a number of peculiarities that need to be noted. The first is that linguistics is an exclusively normative and authoritarian discipline (Language academies, etc.), which means that the scientific perspective of the linguistic phenomenon is not considered. With honourable exceptions (MARTINET, HJELMSLEV, ...), linguistic studies are extrinsic, like those mentioned in the previous paragraph, and the intrinsic ones are hardly ever carried out by linguists, but more often by people from other disciplines (P. FABRA, ...).

In turn, this normative and authoritarian attitude of linguists makes any link with mathematics impossible.

As we are seeing in the article and in this heuristic analysis, the let's call it "traditional" neurology, undervalues psychology, and much more psychoanalysis, or directly ignores them, which makes it impossible to solve problems that have a psychological basis, which is precisely the basis of language.

Although it is even worse to try it from philosophy, whose most representative example was WITTGENSTEIN when he failed with his "Tractatus" to solve the challenge of LEIBNIZ's "Characteristica universalis" (which could not be otherwise since he ignored any psychological and mathematical perspective), so he said it was impossible, the so-called "second WITTGENSTEIN", creating a disinterest in dealing with this transcendental Leibnizian proposal, a disinterest that surprisingly has survived until today. Like the saying that "The mountain was unreachable, until someone who did not know it, simply climbed it". But even worse, from philosophy it is possible to arrive at what has already been said about BUNGE ([6])

In the words of a mathematician, Marcus du SAUTOY:

"Mathematics is a place of escape, a place where we can escape very easily. People who have difficulties in social communication find security in mathematics. There are many cases of mathematicians who have had a very difficult family history, and they find security in mathematics, and it replaces the insecurities in their life".

This allows us to understand the usual reality of the "allergy" of mathematicians to anything psychological, and the fact that mathematics has never tried to find an interrelation with psychology.

Currently, mathematical bibliography is still being generated on "Characteristica geometrica" (also by LEIBNIZ), when it is unnecessary since KLEIN already resolved this challenge two centuries later, by proposing the study of the invariants of transformations, that is, the intrinsic aspects. But it seems that mathematics is not aware of this, because it is what LEIBNIZ already demanded two centuries earlier, since for him:

*"The laws of nature are based on the **intrinsic** properties of things".*

And even more:

"...with this method, one could treat mechanics almost like geometry, Finally, I have no hope that we can get very far in physics until we have found some such method to reduce its burden of imagination" (Letter from LEIBNIZ to HUYGENS, 1679-09-08).

LEIBNIZ's "demands" in physics (mechanics), mathematics (geometry) and language became the most far-reaching scientific "prophecies" known. Thus the challenge of physics began to be met more than a century later by the progressive

- equivalent generalising formulations of LAGRANGE (1788) and HAMILTON (1833) and also on the basis of the transcendental mathematical contributions of LEIBNIZ himself (his differential calculus of 1676);

- a century ago, the current formulations of the "Tensors" (which are precisely a "universal" Product for the algebraic Category of multilinear Applications representing physical phenomena, just as their *Characteristica universalis* is a "universal" Product for the Category of Languages), as for example Claude GODBILLON's "Géométrie différentielle et mécanique classique" has shown more recently, following to the letter Bourbaki's previous formalisations, a reference book integrating Intrinsic Differential Geometry and Tensor Algebra, leading to a brilliant and definitive synthesis of mechanics.

It is significant that half a century after the edition of the above-mentioned book (1969), I have not seen that it has been related to the "method for dealing with mechanics", nor to the "Characteristica geometrica" both of LEIBNIZ. That is to say, 300 years later, LEIBNIZ's proposals, nor his thought, are still not understood.

And in what was not even solved, since it has been insistently reiterated as impossible, his "Characteristica universalis", today there is nothing correctly treated from mathematics*, perhaps because it is necessarily linked to language and cognitive understanding (from the field of psychology), aspects unfriendly to mathematicians, and despite the fact that LEIBNIZ has been one of the most transcendent mathematicians, if not the most.

* As for example the "Pattern theory" of U. GRENANDER, because if language is intuitive in children of 2 and 3 years of age, it is stupid to look for abstruse models, which, without a doubt, no known fact justifies, are beyond the reach of these children, as stated in 2.3.

Worse, even in the same line as WITTGENSTEIN almost a century ago, or of PARKINSON in 1973, today you can also read in a current mathematical article:

"This, and other developments related to linguistics and artificial intelligence, lead me to consider LEIBNIZ's phrases in his "Characteristica universalis" as fundamentally **utopian**, ..." (S. XAMBÓ, 2018).

It is very risky to contradict someone as brilliant and unequivocally transcendent as LEIBNIZ* without first being able to demonstrate that he was wrong about such a thing, and even more so when, completely the other way round, today it is no longer a utopia... (see the bibliographical references, or more briefly the video [2]). Like WITTGENSTEIN, "he who cannot catch them, says they are green".

* In addition to LEIBNIZ's genius in all fields and his wise intuitions, it can be added to what is expressed in [2] "Another is that he also anticipated the development of the basis of computing MORE THAN 3 CENTURIES AGO! by having analysed in 1703 the binary positional number system, knowing correctly that it was the virtual methodology MOST SUITABLE for calculation, as opposed to the mechanical limitations of the calculators that he perfected".

In line with the above-mentioned incoherence about the denial of the necessary "unimaginable" solutions, LEIBNIZ himself already warned: "It will be very difficult to form or invent this language...". But today mathematicians are obstinate in finding the solution with their same old formulas and in their own restricted field, ignoring, as has been reiterated, sciences such as psychology, which are inescapably involved in language.

One may ask, why so many references to LEIBNIZ in a paper so closely linked to FREUD? Because of their mutual contributions to language as [14] and [20] make even clearer. Part of the "Characteristica universalis" is justified by the Freudian contribution as this paper shows. And there is more, as for example [8] and [2] show. A relationship between two brilliant and unique geniuses of reference for science today, but which is not recognised either, since science is still limited to the sectorial perspectives with which they had to start due to the limitations of those years. But like it or not, the reality studied by science is unique and interdisciplinary, and even more so in the case of human behavioural phenomena.

In the face of any scientific challenge (such as those compiled by the magazine "Science" in July 2005), today there are thousands of scientists trying to solve it, so that even if they try their best, as in a lottery, someone finally gets it right. If there is no one seriously trying because of all the deficiencies and prejudices explained, the "black hole" in explaining the faculty of

language is understandable. So that it has even become an annoying, utopian, and therefore ignored challenge.

In my case, getting the solution right, and in a single attempt, on the first try, was not a lottery. And my first wise move was to follow my intuitions and disregard any background which, as we have seen, would only have distorted the situation. Undoubtedly this had some drawbacks, such as not knowing at the time various contributions such as those of FREUD's "Project...", that of LLINÁS, and even that of LEIBNIZ himself in the "Characteristica universalis", but they did not prevent me from making progress. Nor did they prevent me from relating them years later to further reinforce and complement my work, as in the case of LLINÁS only a few days ago*.

* Thus, for example, until this writing of "...the 3 years." I have not been able to relate that the "Law" of LLINÁS is explained with the development of the functioning of FREUD's Bahnung, which has been illustrated with the examples of the trams of the 60's or the "Tele-tac" of today (p 26).

It is different in the case of LEIBNIZ's "Mathesis universalis" which was permanently present in my work. I knew it from my physics studies because of the great challenge of the "Unification of the 4 forces", which is only a small part of the "Mathesis universalis". And so it is because of my interdisciplinary interest, which led me to have knowledge in genetics, biology, medicine (especially because of my previous work in radiation protection, an eminently interdisciplinary discipline with physics, chemistry, biology, epidemiology, ...), added to those of mathematical computer science and psychoanalysis.

My conviction that it was possible to meet this other challenge of LEIBNIZ, led me not to rule out any minimally related resource, so that only those of physics, chemistry and derived "material" disciplines could be excluded in this research. Proof of this is that in my writings of 1996 there are repeated allusions to the "Mathesis universalis", due to the different elements that appeared in this challenge ("Methodological transfer between different systems", "Intrinsic Semiology", "Intrinsic Semantics", "Processes of complexation", ...).

Thus in 1996 I obtained a detailed "Representation [of the processes] of knowledge", together with a computer simulator of them, which also allowed the definition of exact concepts. Since it worked perfectly in practice, for example allowing a child to learn much faster and more comprehensively (See video [2]), I could consider the success of the Representation validated and I did not consider it necessary to go deeper into other aspects such as the neurological support of knowledge.

Despite the aforementioned proven practical utility (in learning, in disambiguation, in documentary search, in artificial reasoning, etc., etc., etc., etc.), this work was not understood. Probably because of its very novelty, which prevented it from being published. For example, journals such as those on psychology and mathematics ("...Mathematical Psychology..."), strictly speaking, are not such, there is no claim to establish strict links between the two disciplines, only the use of mathematical statistics in clinical studies in psychology (ANOVA, ...). It would be like the link between psychology and computer science by the fact of using computers to write things in psychology.

Even in my demonstrations, it was argued that there was computer cheating because what was taught was "Impossible". No matter how much it is said, true "innovation", possibilism, is only something pursued and held back.

Not even "if I don't see it, I don't believe it", because even if I saw it, it was not "believed". And furthermore, despite the fact that its theoretical foundations are perfectly verifiable empirically in order to see its certainty, it is surprising that no option has ever been given to do so, to defend it, and thus to demonstrate its correctness. For my part, I have always looked for critical help to be able to improve or rectify, without finding it. It has been hard work on my own.

And to my surprise, what I thought was the greatest contribution of the work, the integration of neurology, psychology-psychoanalysis, cognition, language and mathematics (and computer

science to simulate it), has possibly been what has prevented it from gaining credibility, because no one yet imagines that such integration is possible.

The relationship of my research with LEIBNIZ's "Characteristica universalis" was not until 1999, when I fortuitously met this tercentenary challenge and realised that I had already solved it with my "Representation of knowledge" and the "Conceptual system (intrinsic and exact)". Out of respect for LEIBNIZ and his tercentenary anticipation, today I prefer to express myself in terms of his "Characteristica universalis".

Just a couple of years ago, talking to a prominent psychoanalyst (J. M. BLASCO) and quoting FREUD's "Bahnung"/"Facilitations" to me, I immediately recognised what in 1996 I called "Terminations" and which is an important part of my knowledge work, extensively dealt with in those years.

It contrasts the intuitiveness and importance of "Terminations" as something phenomenological and intrinsic, which has also made grammars and derivatively syntaxes possible, with their current obscure, arbitrary and normative linguistic status (and different for each language). This makes it possible for the future to improve the understanding and learning of all these linguistic disciplines, assuming that they are approached from this phenomenological perspective. It should be remembered that the major characteristic of Latin is its declensions.

Thus, one must insist on the surprise that the contribution of FREUD's "Project...", which has been known for 70 years, has never before been related to this very basic phenomenon of language, which is managed intuitively by children at the age of 3. This absence can only be understood by all that has been said above about the totally different, and erroneous, ways in which language and knowledge have been treated until today.

A few weeks ago, when writing this document of the "Knowledge ... 3 years" to reinforce the content of the video [2] and to explain more pedagogically the writings of 1996, when I read FREUD's "Project for psychologists", I could see that my work gave continuity to what FREUD could not do because of the limiting situation of those years already explained.

And a week ago, when I was interested in LLINÁS' contribution, I immediately recognised what I had already explained about his relationship with FREUD's Bahnung and Contactschranke.

Although the LLINÁS Law does not contradict the basic line of argument presented here, but rather justifies it, as it is entirely compatible with it, this is not sufficient to validate the specific hypotheses put forward in the brief. Compatibility is necessary, but not sufficient. For example:

- with structuring by complexation, or
- the type of support in neuron or glial cells for the most basic informational elements of the psyche.

But there are also other known phenomena which indicate that the solution given in this paper, if it is not this one, must be very close (as in the case of GAMOV, where the important thing was the "dual" matter-information association, regardless of the fact that his proposal-example was not the right one in the end). And as usual, as long as no inconsistency is found and/or there is no other hypothesis that improves it, all the above is fully valid for giving new and consistent explanations, which avoid the inconsistencies and contradictions existing in current science.

Amongst many others, one of the multiple applications of my work is the possibility of learning without presence (= "on-line"), which would have solved the problems that teachers in schools and universities have had in this epidemic. That is why I have tried again to disseminate it (with the video [2] and this series of articles*), added to the fact that over the years, the scientific community has progressively understood the importance of information.

* These articles on children's knowledge at 2, 3, 6, 10 years of age and reasoning and logic, as well as video, were offered to the "Societat Catalana de Tecnologia" of the "Institut d'Estudis Catalans" (IEC) at the end of 2019, but were rejected because of their antagonism to the philosophy of BUNGE, which had

just been the subject of publications and tributes in these Institutions, something difficult to understand in Institutions of this scientific-technological nature. I don't have as much patience as Lynn MARGULIS pleading with 20 magazines, but luckily I have more resources today. For example, preprints.

So, when rewriting the works of 1996 in this 2020, I have taken into account the current knowledge that I did not need at the time, in order to link it together and thus make it easier to explain my work from other people's knowledge. This has also meant that I have been able to explain immediately issues that were still outstanding in these areas.

How can it be explained that neurological aspects can be explained from the knowledge of cognitive structures and processes? This should not be surprising if one takes into account the processes of "methodological transfer..." that I have repeatedly mentioned. If such processes are taken into account and no "creationism" (or the dogmatism already mentioned) is considered valid, but only causality in science, then the bases that make human knowledge possible must necessarily derive from other previously existing "faculties" that are "recycled", which makes it possible to establish structural and functional homologies with the functioning of the previous neuronal level (and more previously the genetic one), as well as to know what to look for, and what not to look for, in those previous levels.

Rev. 2020-07-16

THE LINKS BETWEEN LEIBNIZ AND FREUD (Addendum 2021-12-22)

The letter "Project of Psychology" was lost for 55 years, and so much the better, because for Freud it was a dead end and he could not make it disappear like some of his early writings. In the following 70 years, until today, it has been a profusely quoted and commented writing, but to which no continuity has been added. It is another thing to note that terms such as "ContactSchranke" anticipated that of Synapsis, but without assessing and arguing, as has been done here, that the latter name is totally correct.

LEIBNIZ proposed his "Characteristica universalis" aware that "It will be very difficult to form or invent this language or this Characteristica universalis". The intuitive phenomenon of the relationality of the "Terminations" is a part of this "Characteristica", which, as we have seen, is explained precisely by FREUD's intuitions from his "Project".

In other words, continuity has been given here to both works, one centenary and the other tercentenary, as well as linking them together to explain part of the "mysterious" emergence of language in children. And in the case of the "ContactSchranke", to solve an important and misunderstood process in neurology, the so-called synapses.

Who would have imagined all this a few months ago?

Since it is a personal pleasure to be able to link two of my most admired geniuses, I can still establish a new and important link between them. As already noted by EULER, LEIBNIZ was also the forerunner of mathematical topology with his "Geometria situs" (= geometry of situation or position). The structural perspective of algebra and the dynamics of geometry are complemented by the study of the specific characteristics of the place where they are applied. If in the Knowledge of children at 2 years of age we have spoken of an algebraic extension of positional number systems to all concepts without exception, that is to say, whether they are quantitative or not, this extension is further reinforced by the fact that this extension also occurs at the topological level. Let's see, what are, if not the "Terminations" in question? Well, the specific study of the environment of a conceptual situation-position, since the analogue to a point of the mathematical space is a concept of the conceptual space. And what is its environment to be considered? Well, all the possible variants and applications of this concept, all its derived-associated secondary concepts.

Because of how misunderstood it is, I repeatedly affirm that Homo did not evolve to think, but rather to move, to feel and to sentiment, because "thinking" is usually done badly, conditioned by its unconscious. And that he hardly invents anything, but simply applies existing faculties that he recycles to solve new evolutionary situations. In this respect I also cite repeatedly the

article by GOULD and LEWONTIN on the fortuitous significance of the interstices of St. Mark's Cathedral in Venice. If FREUD's *Bahnung* explains this process of intuitive relationality of the knowledge of 3 year olds, Mathematical Topology, which begins with LEIBNIZ, can be considered yet another recycling, in this case of these intuitive cognitive processes of the 3 year olds.

Finally, something much more basic must be remembered. Long before Freud, the unconscious was already a concept under debate. One can look for antecedents in Greek philosophy (ARISTOTHELES, ...), but a minimally explicit unconscious has no place until DESCARTES (1596-1650) with his differentiation between "Body and Mind", which today should be understood as "Body and Psyche". But we have to wait half a century until LEIBNIZ (1646-1716) who already exposes a formulation in line with the present one, but more than 200 years before FREUD (1856-1939)!

Scholars of the history of philosophy are accustomed to differentiate between them both in their conceptions, but to my mind they forget the context, not only the chronological one, two whole centuries, but above all their personal profiles and their radically different dedications. LEIBNIZ, with an easy and comfortable childhood despite the early death of his father, no one has ever thought of him as a neurotic, just as, on the contrary, it is clearly known about Freud, whose difficult childhood and his later dedication to neurosis and sexuality are motivated precisely by his own personal problems. The Freudian perspective on the unconscious is markedly "negative". On the contrary, LEIBNIZ's adult dedication is to the "positive", for he was an incomparable genius in the field of scientific (mathematics, ...) and technological creation (calculators, precursor of today's computer science, ...), and above all of knowledge (*Characteristica universalis*, ...).

One may speak of two different perspectives in their application (analogous to the different perspectives implied by the "Terminations"), but they are intrinsically about the same thing (the "main" concept).

Without even I bothering to delve into FREUD's biography to learn about his knowledge of LEIBNIZ, he undoubtedly knew of his contribution, which he fully incorporated. He also knew DESCARTES and SPINOZA, but improved or corrected their contributions. LEIBNIZ was also a precursor of the Freudian unconscious.