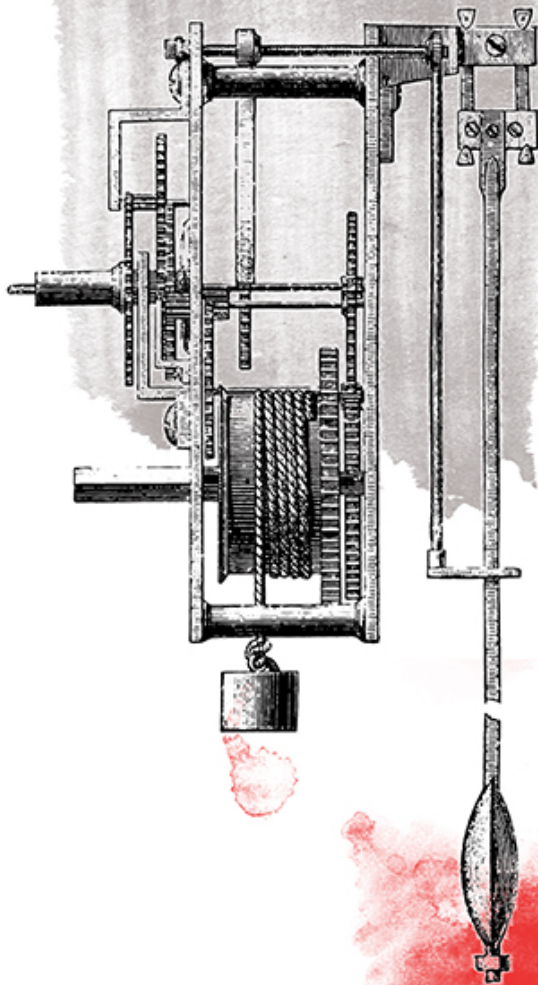


Pierre-Marie Gagey

Critique of Posturology

A psychology of discovery



CRITICISM OF POSTUROLOGY
A PSYCHOLOGY OF DISCOVERY

Pierre-Marie Gagey

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To the workers on building and civil engineering sites, of the Paris area, men, with whom I have laid the foundations of the postural clinical examination

To all members of the French Association of Posturology who contributed to our discovery

Covers design of the book : Isabelle Panaud
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KICK OFF

When starting to look for truffles, it is better to be accompanied by a truffle dog.

Forty years ago, a handful of therapists timidly self-proclaimed « posturologists¹ » because thanks to Dr. Jean-Bernard Baron², they sniffed out relations between posture and some human sufferings, misunderstood and badly treated by the medicine of our time. Sufferings perfectly and universally known however, but not readily acknowledged as diseases by doctors because they are based on no material evidence such as tissue damages or biochemical abnormality, taught by Faculty. The patient comes along only with subjective complaints: He suffers ... he suffers from back, neck, knees, feet pains, no matter where, but he suffers, and has been suffering for months and months, without finding a doctor who can make a diagnosis allowing to treat the root of his evil. Sometimes he may also feel dizzy with no abnormality of the most comprehensive examinations of the inner ear; here again the complaints are purely subjective.

First we thought that these complaints are not as subjective as they are said to be, because, all over the world, those experiencing these sufferings « say the same thing, with the same words.³ » For us, as for Professor Pierre Marie, this intersubjectivity founds the objectivity of the problem. Strengthened by the support of a master of Neurology, courageously and full of faith in our intuition of the role of posture, we set to work.

Forty years later that is success. Not only are these therapists capable of relieving — very easily! — quite a few of these sufferings, but above all we discover we are actors of a development of Neurology. Yes, no less than that! With us, time breaks into the topological space of Neurology and thus helps it to heal its patients!

This statement asks for explanations based on intelligence of the posture. Along the way we will find that this quest for intelligence shows « how » the minds of men work, which leads us to formulate this proposal, straight from Karl Popper: « Faith and Reason are the two pillars of scientific discovery. » I even think that it is possible to delete this latter, restrictive epithet. This proposal is not so much fashionable at the moment ... It does not matter because that has never been a criterion of truth! But it will justify our spending time on developing the arguments for

¹ J.O. du 6 Avril 1984

² Baron J.B. — Muscles moteurs oculaires, attitude et comportement locomoteur des vertébrés. Thèse de Sciences, Paris, 1955. < http://ada-posturologie.fr/Baron_These.pdf >

³ Marie P. (1916) Les troubles subjectifs consécutifs aux blessures du crâne. Revue de Neurologie, 4-5: 454-476. < <http://ada-posturologie.fr/PierreMarie.htm> >

understanding and accepting the assertion that restores the vitality of the medical science threatened by the conservatism of « evidence based medicine ».

THE INTELLIGENCE OF THE POSTURE

The story that we will be told is a true saga of the human spirit, a saga as we all love them, because it magnifies the power of our reason, but a reason conscious of its historical development.

The observation of the phenomenon of our relations with the forces of gravity dates back to times immemorial. At naptime, when overwhelmed by sleep, the head of the old sitting man drops. This observation, as old as the hills, has been conceptualized for a very long time. In « The parts of animals » Aristotle formally connects this head drop to a drop of the « tone⁴ »; it is not very easy to find what Aristotle exactly means by when using the word ... Something that has to do with sleep, of course, one would say today with vigilance, and also something that has to do with « the power of standing upright » according to the very words of Aristotle⁵. But it will take five centuries for the meaning of the word « tone » to be strongly identified by Galen⁶. To fight against gravity, the brain maintains a muscle activity that is not accompanied by a movement but only maintains the skeletal pieces to their place in space. « Call this activity 'tone' or any other name, as you like, it does not matter... » Galen wrote, aware of putting an end to sterile quarrels thanks to the power of his discovery: « There is a muscular activity, which is not accompanied by any movement. »

Five centuries to pass from the name to the definition of the concept of tone... How slow the intelligence of humanity!

Slow like the means of transport of the time... maybe? But not only... It will take fourteen centuries for the new advance of the intelligence of posture! Not because transportation then became slower, which is attested by Roman roads, but one had to wait for someone bold enough to denounce the university clericalism, to kill the father, criticizing this evidence, imposed on us as the truth for centuries: the « sublunary world » is unintelligible. This false evidence was based on a historical fact: the human intelligence became aware of itself in the sky. That is a fact easy to understand. Needless to remind this amazing knowledge of the movement of the stars in ancient civilizations, the fact is well known. Needless to insist on the simplicity of the movements of the stars observed by the ancients, their regular repetition, with no change, indefinite; these properties of celestial movements facilitate their intelligence, of course. Conversely, everything

⁴ The word "tone" is already effectively used by Aristotle in "The parts of animals" (652, b)

⁵ το δυνασται εσταναι ορθα

⁶ Galien, Opera Omnia, Tome IV, ch. 7 (195 Après J-C)

that happens in the biological world — « the sublunary world » as the Greeks said — is marked with the seal of change, corruption, disappearance. Obviously these things fluent, labile, changeable, borderline inconsistency, are « unintelligible ». The evidence is that heaven, not the earth, is the place of the durable, the incorruptible, the eternal, the intelligence, ideas... gods... How daring René Descartes had to be to criticize frontally these evidences! From the first page, the very first line of his « Treaty of man », he launches his challenge: « The human body is a machine⁷, » he writes, that is to say the human body is intelligible. We are so used nowadays to this new Cartesian evidence that we need to think in order to grasp how revolutionary it must have been. Three dates may help us:

- 1633: The Galileo affair,
- 1650: Death of Descartes,
- 1664 Issue of the first edition of the « Treaty of man » ... 14 years after the death of its author, while the manuscript seems dated 1648.

Descartes was certainly bold ... but he was not crazy! No question of being torn to pieces by the University experts. His revolutionary Treaty will be published after his death.

The boldness of Descartes frees minds and, just a few years after the publication of his « Treaty of man », Giovanni Borelli⁸ is interested in human gravity vertical, through an experience, he shows where this vertical in the body is, he draws it and publishes it; on his figure it passes through the human center of gravity and through the center of gravity of a heavy mass that man carries on his back: Descartes and Archimedes⁹ are united on this figure. This is « a first », at least in the western world. The « tout Paris » was already aware of it thanks to Molière, and was amused by the idea that we, too, have a center of gravity: « From your fall, ignorant, do you not see the causes, and that it has just moved apart from its fixed point, what we call the center of gravity¹⁰ ».

Spurred on by Descartes, the spirit of humanity is accelerating, 150 years will be sufficient for the consciousness of this gravity line to create a new question: « How is it, then, that a man sustains the perpendicular posture, or inclines in due degree towards the winds that blow upon him? It is obvious that he has a sense by which he knows the inclination of his body, and that he has a ready aptitude to adjust it, and to correct any deviation from the perpendicular. What sense

⁷ René Descartes, « Traité de l'Homme », Paris, 1664

⁸ Giovanni BORELLI De motu animalium, Roma, 1680

⁹ ARCHIMÈDE, 28-212 B.J-C, is the origin of the notion of physical body center of gravity

¹⁰ Molière, Les femmes savantes, 1672

then is this? ¹¹ » A new trap... Into which physiologists will fall for 120 years ... That question, in fact, is based on an evidence of this time: every function is assumed by an organ. We see with our eyes, we hear with our ears, we breathe with our lungs... That's obvious! Ah! EVIDENCES! And during the nineteenth century this evidence was further increased by the works with a microscope — the instrument of that time — which shows, grouped together in different organs, the differentiated sensory cells adapted to what they feel. That is obvious, we can see it: every function is performed by an organ... Keeping the line of gravity close to its equilibrium position is a function, therefore keeping the line of gravity close to its equilibrium position is assumed by an organ. The logic is perfect! Except that the main assertion is false... And here the physiologists of that time embark in order to discover of « the organ of balance ». And they discover a plethora of organs dealing with balance! ... The vestibular inner ear manages the balance (1828)¹², the vision manages the balance (1840)¹³, the neck muscles are involved in balance (1845)¹⁴, the sensitivity of feet intervenes in balance (1862)¹⁵, the eye muscles are also involved in balance (1911)¹⁶. They did not expect that, these unfortunate physiologists! ... Needless to say, all these discoveries sow trouble and confusion in people's minds. For more than one century doctors will simplify the problem by dealing only with the inner ear of patients who have balance disorders and / or dizziness...

Sign of the times, in 1948, salvation will come from the U.S.A; However the book, bringing the good news, will be still published in Paris¹⁷; Norbert Wiener simply reminds that the brain can integrate sensory information coming from different organs. Faced with such conceptual simplicity, one is amazed by the enormity of the blindness caused by this false evidence: every function is assumed by an organ. For over a hundred years it has prevented physiologists from imagining that the brain could integrate information from several organs... It is extraordinary... All the more extraordinary as the Greeks had already understood that « separate senses ... / ... come together as one, like when a double sensation arrives at the same time for the same object, for example the bile which is bitter and yellow.¹⁸ » The Greeks called it « the common sense. » This blindness of physiologists of the nineteenth century does deserve to be thought about a little: what is it due to then? Is it a fight of egos that focuses on each participant's

¹¹ Charles BELL *The hand*. Pickering. London 1837

¹² Flourens P.J.M. (1830) *Expériences sur les canaux semi-circulaires de l'oreille dans les oiseaux*. Mémoire lu le 11 août 1828. *Mémoires. Acad. Sci., Paris, IX (2e s.)* 455-466

¹³ Romberg M.H. (1840) *Lehrbuch der Nervenkrankheiten des Menschen*. Duncker, Berlin

¹⁴ Longet F.A. (1845) *Sur les troubles qui surviennent dans l'équilibration, la station et la locomotion des animaux après la section des parties molles de la nuque*. *Gazette Médicale de Paris*, 13: 565-567

¹⁵ Heyd W.H.S.C. *Der Tastsinn der Fußsohle als Aequilibrationsmittel des Körpers beim Stehen*. Thèse de médecine, Tübingen 1862

¹⁶ Cyon E. de (1911) *L'oreille organe d'orientation dans le temps et dans l'espace*. Alcan, Paris

¹⁷ Wiener Norbert (1948) *Cybernetics or Control and Communication in the Animal and the Machine*. Hermann, Paris

¹⁸ Aristote *Traité de l'âme*, Livre III

point of view and prevents him from looking beyond it? The clericalism of university graduates convincing each one that he, knows? Or the obscurantism of the rationalists that binds them to the reason of their time and makes them forget the historicity of the Logos? Defects common to the nineteenth European society, and of which the next step in the history of posturology will still suffer ... although it takes place in the middle of the twentieth century.

At that time some doctors had questions about the relationship they observed in some patients between the eyes and the ears¹⁹, one of them even chose for his medicine thesis a study of patients suffering at the same time:

- from dizziness, considered to come from the inner ear, the vestibular,
- and a malfunction of the motor muscles of the eye, those making the eyes turn in their sockets. The right eye and the left one no longer work very well together causing an imbalance between the eyes.

His Medicine thesis completed, Jean-Bernard Baron, was forced to admit that neither he nor anyone, understood anything about this « dizziness of heterophoria » to call what it is. But his curiosity was aroused; he began a science thesis, trying to understand. The planned protocol was simple: initiate a slight oculomotor imbalance in animals by cutting the least possible fibers of extraocular muscles ... and then watch what happens. He started working on fish. Some endured the intervention as if nothing had happened, others ended up with a massive hypertonicity of their paraspinal muscles on one side, which literally twisted them about themselves and made them turn round when they began to swim... a real « merry go round²⁰ »! ... But what could that mean? To explain this difference in post-operative behavior, Jean-Bernard has first thought of a difference of the operator behavior! ... Was he sure to have cut only one or two muscle fibers in all the animals? Given the rather hardy conditions of the interventions, doubt was justified. And it was easy to check the precision of the surgical gesture by controlling the oculomotor imbalance produced by the scalpel. There, Jean-Bernard did not expect to be so spoiled by the discovery that he was going to do... and that would spoil the rest of his life! The fish, which were turning around, were the LEAST disrupted from the oculomotor point of view... a total lack of proportionality between the cause and the effects, the opposite of the evidence shared by all the scientists of the time: that is common sense... There must be proportionality between the cause and the effects. Besides, that had been asserted by the Grand Master of Scientific Medicine of the nineteenth century about the toad venom; assertion that he had accompanied by an ukase, fine

¹⁹ They wrote in the journal *Oto-Neuro-Ophthalmology*, founded in 1930

²⁰ Children's rides at fairs

example of the obscurantism of the Enlightenment: « A fact the determinism of which is not rational must be rejected from Science.²¹ » That is to say: reason must submit to the facts... provided that facts be rational! The facts reported by Baron were not rational — ...for this time — They had to be rejected from Science... In fact, no one has understood this experiment by Baron, neither in Europe nor in America, where Baron went however in the hope of getting acknowledged. Yet, since 1899, we had known that, in some systems, a minimal cause could cause non-proportional consequences... We did so, thanks to a whim of King Oscar II of Sweden! To celebrate his seventieth birthday, he decided to offer a prize to the first person that would solve the problem of « three bodies » (these three imaginary bodies that rotate in an imaginary space but, hypothetically, are subjected to the real Newton's laws and no one could predict their courses). Henri Poincaré found the solution and, in the context, he found that this temporal series of chained events behaved in a weird way, a very small change in the initial conditions was likely to transform the movement of these imaginary stars completely²². But in 1955, this discovery was totally unknown in the world of medicine and physiology; the facts reported by Baron were therefore considered as non-scientific, according to the ideas of Claude Bernard. The more Baron insisted on the quality of his work, the more he aroused rejection and even derision in the end. A life blighted by his discovery. Baron died, forgotten by the medical professionals and, of course, completely unknown to the rest of the world ... except for a small team of women and men challenged by what he was saying.

The leader of this team was a doctor, Bernard Weber, student and collaborator of a quite brilliant doctor, Henri Laborit, that bothered by his new ideas about biological phenomena and complex systems, so much so that it was excluded from « La Presse Médicale » and forced to open his own magazine, « Agressologie ». Bernard Weber was the editor, which allowed us to express ourselves freely. Our small team consisted of very different personalities. There was a physicist, Guy Bizzo, who was working for the development of the Exocet at the central laboratory of the armament, he was obviously interested in this wonderful achievement of a cybernetic control system: the postural system! And he learned quite a lot ... if we judge by the fabulous success of the first firing of the Exocet²³. An ophthalmologist and an orthoptist, Claudie Marucchi and Françoise Zamfiresco, who treated children with strabismus and did know the limits of their knowledge and their power over the oculomotor imbalances. The General Grateau, head of Special Surgery service of the Val de Grâce, concerned with the pensions of dizzy

²¹Bernard Cl. Introduction à l'étude de la médecine expérimentale (1865) 3^e Partie, Chapitre 2, § II, Delagrave, Paris

²²Poincaré H. (1893) Les méthodes nouvelles de la mécanique céleste. Gauthier-Villars, Paris

²³During the Falklands War, for his first test in conflict, one Exocet totally destroyed the « HMS Ardent », a cruiser Her Majesty the Queen of England

patients²⁴. Jacques Boquet, neurologist, specialist of headaches, Pierre-Marie Gagey, an occupational physician in the Building and Public Works in the Paris area, who, from his Public Health observatory, had noticed that the medicine of his time was extremely ignorant about a matter concerning him: the dizzying effects of head injuries. In this ignorance, at the time, the workers on building sites were forced to wear a symbol of impending danger: the helmet ... This apparatus did protect them from scratches, but never has a helmet been of any use when a cinderblock falls right on the head of a worker... In the presence of a traumatized patient, suffering from dizziness, occupational doctors, not knowing the matter, were making decisions based on the risks that they, doctors, would be exposed to due to their decision: for these patients, the occupational physician refused to sign a medical aptitude certificate work at a height... Of course, if an occupational doctor authorizes a dizzy patient to work on a scaffold, he is preparing troubles for himself! The insurance expert doctor refused to grant them an invalidity pension equal to their loss of wages ... Clearly, anyone can complain of suffering from dizziness... especially when it can lead you to big money. So giving all the dizzy patients significant pensions is not necessarily very good for your career. Their doctor dissuaded them from trying to make recognized the injustice; they were the victims of... Obviously, that was the clay pot and the iron pot. Evidence after evidence, the unfortunate worker had only one thing to do, close his mouth and endure his double penalty: dizziness and injustice. Every week, I met one or two workers, victims of the effects of a head injury, hanging around on building sites, somehow busy on ground level. Only say about all these troubles that it is a « subjective syndrome » as was repeated in all the publications of the time²⁵, was a bit too fast, especially when the term « subjective syndrome » may have resonances of a pure subjectivity of the whole of the pathology. This semantic uncertainty maintained stupid quarrels between the supporters of the objectivity of these disorders and those who supported their psychic nature, more or less related to a traumatic neurosis. Over sixty years, doctors had not yet got the message they were sent by neurologists written by Pierre Marie, about the skull injured patients: « In all these patients, the descriptions of the troubles they experience are absolutely identical and spoken the same way. Of course, that cannot be a lesson learned. ²⁶» Here is a diagnosis that everyone can understand! No need to have done many medical studies to accept the idea that patients do not recite a lesson when they tell their suffering. In other words, this syndrome is completely objective because the criterion of

²⁴ Grateau P. (1992) Problèmes médico-légaux dans le diagnostic et l'évaluation des troubles de l'équilibre. In *Aspetti medico-legali dei disturbi dell'equilibrio*, Cesarani A., Alpini D, 19-32, Bi & Gi, Verona

²⁵ Lafon R, Labauge R, Minvielle J, Pages A. (1955) Le syndrome subjectif des traumatisés crâniens; aspects métaboliques et endocriniens. *Montp Med.*; 47(1):20-34

²⁶ Marie P. (1916) Les troubles subjectifs consécutifs aux blessures du crâne. *Revue de Neurologie*, 4-5: 454-476. < <http://ada-posturologie.fr/PierreMarie.htm> >

objectivity is precisely the intersubjectivity: « they all say the same thing. » This does not prevent everyone from living his own problems, according to his own history²⁷.

For occupational physicians Building and Public Works, the consequences of the ignorance of medicine on this subject were so blatant that 40 doctors of the APAS, my working place, agreed to participate in a major survey on this syndrome. The survey covered 10,000 workers. More than 4% of them were still suffering from after-effects of a head injury, that 9% of the cohort had experienced. The APAS spent a fortune on the exploitation of this survey: in 1974 the data were still entered manually in the computers of the time, using punch cards ... handmade, too! Benzécri had just published his algorithm of multivariate statistical analysis²⁸; the survey was among the first customers. In short, that was an international first, like the thesis by Baron ... And nobody paid attention to this work²⁹! Each doctor is too busy in his field, too busy with his patients, to spend some time on what is done elsewhere ... Do not look too much the causes of the ignorance of doctors « time is money », our American friends say according to their sense of reality. And French people are the last ones qualified to complain about their ignorant physicians, since they agree to pay them the same price as a hairdresser. But for our small team, this survey has been important; it strengthened our impression that the effects of a shock on the skull are not purely psychological. It said, another way, what Pierre Marie had taught us: the sequellae of head injuries are an objective reality that deserves to be also approached, by other means than psychiatry. And Baron gave us the key to this approach teaching us to pay attention to muscle tone and the gravity line. A fabulous inheritance had fallen into our hands: the legacy of thousands of years of life of the human mind, at least since Aristotle!

First— and for quite a long time, — I did not understand where this legacy led us. Head to the grindstone, we made contributions to understand what we were watching of that famous tone, at a level quite elementary. That was so amazing that we almost needed to pinch ourselves to make sure we were not dreaming! We were flabbergasted by our discoveries and had not the slightest temptation to deviate in order to see things from above and understand how all these discoveries disrupted the traditional ways to make medicine. At that time the first thing we had to do was to be sure that we were not just seeing things! A collective berline... nothing is more dangerous in fact than participating in a group whose members share the same evidence. All these shared evidences look like a proof, of course, and many people around us still believe that

²⁷ Ferrey G. (1995) *Abord psychosomatique des traumatisés du crâne*. Masson, Paris

²⁸ Benzécri J.P. (1973) *L'Analyse des données*. Dunod, Paris

²⁹ Amphoux M., Gagey PM, Le Flem A., Pavy F. (1977) *Le devenir du syndrome post-commotionnel*. *Revue de Médecine du travail*, 5, 1&2: 53-75 < <http://ada-posturologie.fr/Devenir%20du%20SPC.pdf> >

evidence is a criterion of truth: « Evidence based Medicine », a formula that often comes up in medical journals... Let's say no more about it!

We were lucky in this breakthrough discovery, as soon as we started talking, an avalanche of criticism fell upon us, starting with the 'Ordre des Médecins' who forbidding us to practice posturology. Blessed criticisms that have prevented us from making money with our knowledge, which kept us free from conflict of interest, while continuing to make sure we were not dreaming.

The perfect track to ensure that we do not dream is to entrust the observation of phenomena to somebody else, naive, preferably a machine, to avoid being criticized about the possibility of a non-verbal transmission of thought! And a machine did exist already, advanced enough, capable of measuring the position of the gravity line in the body space. It had been manufactured in the 50s by the Russian³⁰ and French³¹ separately. It simply measured the forces generated by the presence of a man standing motionless on a platform. A platform that measured forces ... What a big gift! ... That was an open door to the mechanics with all its rigor and its huge body of knowledge accumulated since Archimedes and Newton. Suddenly, the body lost all its conventional appearance to become just the place of forces, torques and moments in an extraordinary interaction between gravity and human muscles. Better! Our measurements of forces offered us figures... enough to do tons of statistics to convince us that there was a good chance that we were not dreaming. Indeed, the force platforms confirmed it, as soon the perception of the environment is changed, muscle tone adapts to this new perception, whereas the environment does not change, it is only its perception, which is modified. So this change in the perception created a sort of postural illusion! An illusion that deceives the postural system and offers us a way to manipulate the tone! As the postural system is very well organized, it does not respond any which way to the change in the information, it responds in a suitable manner. It is enough to know this manner in order to be able to manipulate the tone as you want; for example you deviate perception of the visual space in a certain direction by placing an optical prism before one eye, in a certain position, and you know in advance the tonic response you will observe³².

But careful! You cannot deceive the postural system no matter how! I learnt it the hard way ... In the 1980s I could modify the postural tone by the wearing prisms, thanks to Baron, but

³⁰ Babskii E, Gurfinkel V, Romel E, Jakobson I. (1955) [New method of investigation of resistance of man in erect position; method of stabilography]. *Fiziol Zh SSSR Im I M Sechenova*, 41(3):423-7

³¹ Laru L, Soula C. (1950) *Mesure des efforts dynamiques dans le mouvement volontaire; Actes colloque int. mecan.*, Poitiers, 5

³² Gagey PM (2016) The law of the canals and postural clinic, *MTPRehabJournal*, Vol 14 : 324-330 < <http://ada-posturologie.fr/LoiCanaux.htm> >

I could not do it wearing insoles. Yet I had made an experiment³³, showing in a fairly credible way the changes in postural information transmitted by the feet were as effective on the tone as those transmitted by the vision. During a presentation of this experiment, a podiatrist doctor was seduced by this potential opportunity to manipulate the tone of the whole body by the feet and he asked me permission to come and work with us. This doctor participated in our consultations for two years, he prescribed the soles as he knew make i.e. with significant elevations in certain areas of the soles, « corners » as he called them, that were well 10 millimeters high, on average. For two years, we have NEVER noticed anything — in terms of tone — with this type of soles... Until the day when a young podiatrist, Philippe Villeneuve, a student of Dr. René Bourdiol, came to the consultation and said: « But that is not that the proper way to do it! ... Three millimeters, no more ... That's how we get the tone move. » And he was right. The tone was moving when small wedges only a few millimeters high were put under the feet of subjects, at specific locations. The idea had originated in the 1950s, when a breath of mind had run through the minds of French podiatrists under the leadership of Dr. Lièvre, and in the writings of that time, we can already read this fact that small changes have more effect than significant variations³⁴. Reading these texts of the fifties, one is impressed by the insight of some clinicians who feel things even if they are unable to formulate them rationally in a satisfactory way. In 1950, small changes that produce significant effects ... no one was able to recognize that this was the effect of a nonlinear dynamical system. In the 1980s things were different, Baron's « fish merry go round » (1955) had confirmed the phenomenon at an experimental level, the weather equations of Lorenz (1972) had exposed the famous « butterfly effect »³⁵, all that remained was to connect it with the « three bodies theory » of Poincaré ... straightforward! Especially because Poincaré had made our work easy replacing the Cartesian space, $Ox Oy$, by another space, the phase space, where you can view at will, temporal series of chained events. You indicate the state of this series at time t on the abscissa and its state at $t + 1$, on the ordinates, and you can see the butterfly effect, with its chaotic appearance, as rigorous as the law of succession of these events can be.

Noting that the postural system reacts as a nonlinear dynamic system is one thing ... proving it is more difficult! Fortunately, a mathematician belonging to the center of the brain and

³³ Gagey P.M. Bizzo G., Debruille O., Lacroix D. (1985) The one Hertz phenomenon. In Vestibular and visual control on posture and locomotor equilibrium. Igarashi M., Black F.O., Karger, Basel, 89-92 < http://ada-posturologie.fr/One_Hertz.pdf >

³⁴ Ledos M. (1956) Architecture et Géométrie du pied. Édité par l'auteur, 7, rue de Duras Paris 8

³⁵ Does the Flap of a Butterfly's Wings in Brazil set off a Tornado in Texas?»

spinal cord of the Salpêtrière, Jacques Martinerie, came and helped us³⁶; his conclusions have significantly been confirmed since then.

It is understandable that all these theoretical developments on nonlinear dynamic systems were absolutely essential, if we consider the conclusions reached on the therapeutic level: a trifle can initiate much ... A truth difficult to accept and not at all in the logic of our contemporaries! For example, go and tell, an ophthalmologist that if he does not define the axis of his cylindrical corrections within one degree, he may cause his client postural problems ... You ask him five minutes more per prescription for all the astigmatic patients, for something he has not checked personally therefore is entitled to question, whereas undoubtedly, his time is limited! It is better to advise him to send his patients to an optician, familiar with posture, and able to check the postural relevance of his prescription. A piece of advice not time consuming for the ophthalmologist and the theoretical developments on nonlinear dynamic systems may help him to accept.

More radically these developments have put an end to all quackery charges raised by the discovery that posturologists treat with insignificant stuff. The potential effectiveness of minimal manipulation being now rationally proved, one has no right, in theory, to deny it without providing arguments. By cons ... this insignificant stuff is a real danger to the profession of posturologists: how many postural therapists are tempted to take advantage, in clear conscience — or a little less... — of this obfuscation of the causal link to say any odd thing, when you only have to keep silent. That is the strength of the mechanical reduction made by posturology: we simply see what happens, no need for rational discourse — or so-called such — to justify the recovery of the patient. What's the point, the patient is able to know if he is better, without our dispensing him our « evidences ». Of course there will always be a doubt on the role of our intervention: did I cure him? But we have the right not to have an answer: « I cared him, God healed him » Ambroise Pare already said. Moreover, we appear a bit silly when we spout lots of supposedly explanatory tales, drawn from neurophysiology or whatever it is, while we are simply an occupational doctor or a manual therapist. On this occasion, I would be happy, to quote the sculptor « Sutor nec ultra crepidam! » (Shoemaker keep to your field!), but, instead, I engage the podiatrists to look up at what is happening when they change something down under the foot! So let's say: for a posturologist, it is good form to treat ... without commenting.

³⁶ Martinerie J., Gagey PM (1992) Chaotic analysis of the stabilometric signal. In M. Woollacott & F. Horak (Eds) Posture and gait: control mechanisms. University of Oregon Books (Portland), Tome I: 404,407

To summarize this long story, I will take a practical example. I'm standing at rest, I lean slightly forward, the visual space around me — structured by the gravitational field of attraction through its vertical markers — goes back, necessarily. I can feel my muscles; they extend slightly, at least those opposing a forward fall. With a little practice I can even feel the pressure mount under my forefeet, this part of the foot toward which I lean. This whole series of effects are linked as normally as possible, of course, I am the person controlling this sequence, I perceive it as being the master of the situation, I have no reason to consider it as a kind of battle between the forces of gravity and the forces of my muscles! It is quite different if I, as a therapist, put a small wedge a few millimeters thick under the forefoot of a patient, that wedge, let's say, that « changes things » which deceives the postural system, and if I perceive that the patient's muscles, those which prevent his fall forward, extend slightly, but enough to push him back³⁷. Then it is not the patient who decides this movement, it is me who cause it by going inside the mysteries of his « gravity / tone dialogue » in the structures of his body machinery. I change something at the interface between the machine and its environment — there is a small wedge under the front feet — and the machine responds immediately to this new situation and in a logically structured way. My bursting into the body machine completely changes my vision of the phenomena, I can see only the two extremes of the equation: muscular forces against gravity forces, clashing in a permanent relationship that we call the body posture. All the intermediate mechanisms of the body machinery that come into play between these two forces are of secondary importance only. I make a reduction to the essentials: my understanding, our understanding of the relationship between gravity and us is first of all mechanical, we think about a relation of forces through the well-known categories of position, speed, acceleration, mass, couple, moment of inertia, etc. I don't care about all our knowledge of the spatial organization of the central nervous system, the nervous pathways and centers as neurologists say. The spatial organization is one thing, one aspect of the problem, but limited because it misses the temporal organization of phenomena completely. According to their history, neurons can integrate, only events that happen to them simultaneously. This is why the temporal structure of the chained events of the postural function imposes its law on the anatomical structure of neural networks, which know only one and the same way of functioning in time. Putting a small wedge under the forefoot of my patient, I modify the temporality of the phenomena: the wedge advances in space ... and in time, the contact of this part of the foot with the ground. With or without a wedge, if it is very thin, the neural networks receive more or less the same information, but the wedge initiates a modification

³⁷ Janin M. (2003) Modification de critères posturaux par des éléments rétrocapitaux, dits barres antérieures, d'épaisseurs variées. In B Weber et Ph Villeneuve (Eds) Pied équilibré et traitement posturaux. Masson, Paris: 146-150

of the timing, likely to transform completely the sensory integration of all the information. With us, Time breaks into the Space of Neurology, to help it treat its patients.

A PHENOMENON OF THE MIND

It happened like that! This long and slow discovery that the regulation of the postural tonic activity of man is played in the harmony of all our sensations, to the millisecond. But this long history shows us, indicates too, how the mind worked.

At the basis of this work, there are the cognitive mechanisms of each thinking body, of course, but also, and beyond, there is transmission between generations. The Greeks had already understood this participation of many in the progress of knowledge: « every philosopher explains some secrets of nature. What each in particular adds to the knowledge of the truth is probably nothing or only little; but the gathering of all these ideas provides important results.³⁸» This historical aspect of the phenomenon of mind, Karl Popper nicely calls it « The Psychology of Discovery » that strongly differs from the « Logic of Discovery », object of his major work. « The question of how a new idea can appear in the mind of man — be it a musical theme, a dramatic conflict, or a scientific theory — can be of great interest in empirical psychology but is not within the field of interest of the logical analysis of scientific knowledge.³⁹ » We do not know, for example, how this new idea appeared in the mind of Aristotle: « for the animals possessing it, the power to stand upright is related to their level of alertness. » But we know that, still today, we deduce from this « new idea » that changes in the level of alertness of an individual, under the influence of a drug for example, can be studied by measuring the changes in his postural stability⁴⁰; and this deduction is tested. There is no need to know the « how and why » of a new idea, to acknowledge its scientific dimension, that character is part of the logic of its statement, it should allow deductions, ascertainable or not.

In accordance with Popper, I consider capital this distinction between the fields of logic and psychology. As I see nothing to add to what Popper wrote about the logic of discovery, I shall focus only on the psychology of the discovery of posturology, as shown by its history: a phenomenon of the mind. An angle different from the recent studies about the psychology of discovery, focused on the subject⁴¹, not on history.

³⁸ Aristote Métaphysique Livre II, chapitre 1

³⁹ Karl Popper. La logique de la découverte scientifique, English translation by Nicole Thyssen-Rutten et Philippe Devaux. page 27 of the Payot edition, Paris, 1973

⁴⁰ Soulairac A. (1971) Electroencephalographic and statokinesimetric study of perphoxene in man. *Thérapeutique*. Apr;47(4):365-9

⁴¹ Csikszentmihalyi Mihaly. La créativité - Psychologie de la découverte et de l'invention. Robert Lafont, Paris, 2006.

Vikár La psychologie du talent et de la découverte scientifique. *Le Coq-héron*, 2013/2, 213.

Curir Anna Les Processus Psychologiques De La Découverte Scientifique, L'harmonieuse complexité du monde. L'Harmattan, 2014, Paris.

The major fact of this story is represented by incredible loads of misbeliefs! That have not stood up to criticism... It happened like that!

Aristotle was the first to be wrong. Currently, his statement about posture and vigilance is real so far... But he is wrong when he believes that « the sublunary world is unintelligible », what will block the development of biology for centuries... Let me explain. Aristotle does not understand at all the living world around him, while in the sky, everything is clear: « The order and stability, immutably defined, burst in heavenly things much more strongly than in our surroundings. For mortal things, what is most evident is the constant change of things, which makes them sometimes be one way, sometimes another, and they go randomly. ⁴² » Living things go randomly, while we understand, by the causes, what happens in the heavenly world: « What is an eclipse? This is deprivation of light. And this deprivation results from the interposition of the earth between the sun and the moon; what indicates the producing cause, and defines its object. ⁴³ »

However, this complex world around him, Aristotle understands it represents a jump in complexity compared to the celestial world, and Aristotle has clear ideas about the complexity, the whole is not simply the sum of the parts. And he also has questions: « There is a unity in the whole, it is not a sort of heap, it is « one » as the syllable. The syllable, indeed, is not only the letters that compose it, it is not the same as A and B. ... / ... In the dissolution, the syllable ceases to exist, while letters still exist. The syllable is something that is not only the letters, vowel and consonant; it is something else ... / ... which is the cause that this is a syllable. ⁴⁴ » But what is that « something », causing it to be a syllable? In the full range of the causes isolated by Aristotle in his world of beings, he can't find the one to account for these jumps in complexity. This is not the spirit. They are not gods, they themselves come from ...? « Where does all that was, is and will then be, come from, where have trees, men and women, wild animals, birds and fish that live in the water and the long living gods sprouted? ⁴⁵ » Aristotle can't find the cause of this jump in complexity, and he challenges anyone to give him an explanation: « Just tell me what makes unity from plurality? ⁴⁶ »

[Please note that this translation of the Greek sentence is very bad, « **ΛΕΚΤΕΟΝ ΤΙ ΤΟ ΠΟΙΟΥΝ ΕΝ ΕΚ ΠΟΛΛΩΝ** ». The term 'unit' which translates « **ΕΝ** » is an abstract word for a

⁴² Aristote. Les parties des animaux, Livre I, chapitre 1

⁴³ Aristote. Métaphysique, Livre VIII

⁴⁴ Aristote. Métaphysique, fin du Livre VII

⁴⁵ Aristote Métaphysique, Livre bêta

⁴⁶ Aristote. Métaphysique. Livre VIII, iii

concept, the concept of unity, while it should be a concrete term for the new thing that is « made » (« **ΠΟΙΟΥΝ** ») and not only « thought », which therefore has a dimension of being. The « Parts of animals » united in « one » are an animal, not a concept.]

Since it is unclear, since we cannot know the cause of what makes this new being, then, without a cause, one cannot understand ... «The sub-lunar world is unintelligible.» This conclusion of Aristotle seems weird to us! And indeed it shows some indecision of the concepts, say between the cause and the origin ... According to Aristotle, we know thanks to causes — as the eclipse of the moon — if we cannot know the causes then we cannot at all know... the logic is perfect, except that it cannot be applied to the concept of the origin that differs from the concept of the cause by its reference to a rupture. The concept of origin, in the meaning of creation, completely excludes the use of a series of beings, which cause themselves each other indefinitely. It is the affirmation of the break between the series of beings and the non-being. Nowadays you must be pretty dumb to assign to the origin of being to be a being! But the Greeks did not know the concept of creation, at that time only the Hebrews perceived some ambiguity in the relationships of the Origin to the being: « I am what I am ⁴⁷».

The critics of the false belief of Aristotle are very clear: this is not because we do not understand the origin of the being that one cannot understand the series of the causes that connect the beings.

Descartes goes on with another false belief, which allows him to oppose Aristotle. Times have changed, man becomes increasingly an engineer. Leonardo de Vinci, a hundred years ago, sketched a series of machines: vehicles, tanks and other war machines, flying machines, mechanical gears, and so on. And at the time of Descartes, the building of these machines, robots in particular, advances. The first pendulum clocks will be used as a models to Descartes: « A clock, made of wheels and balances, does not note all the laws of nature less accurately... / ... similarly I consider that the body of man is a machine, built of bones, nerves, muscles, veins, blood and skin, so that even though there is no spirit in it, it would move the same way as it does now ... / ... only because of the organization of its members. ⁴⁸ » An engineer understands the machine he invented very well, he, himself, has thought its organization. A gear wheel, part of the clock, has exactly the number of teeth necessary, according to the exact time that must be shown. Influenced by this mode, without being interested in the issues raised by the meanders of Aristotle's thought - though having the same little conceptual vagueness - Descartes, naively,

⁴⁷ Exodus 3,14 « אהיה אשר אהיה »

⁴⁸ Descartes Sixième méditation métaphysique

imagines God manufacturing the human body as a watchmaker makes his machine « God ... / ... implemented all the parts that are required to make it walk, eat, breathe and finally imitate all our functions that can be imagined, to proceed from the matter and depend only on the organization of the parts.⁴⁹ » The question of Aristotle is eliminated by a little trick, a « deus ex machina » ... This is the case to say! And that is successful: « The human body is intelligible » is an universal statement that allows a deduction: all our understanding of the world can be put in use to understand the body. For example the laws of geometrical optics, to understand vision: « The parts (of the retinal image) are reversed, i.e. in a position quite contrary to that of the objects; and that they are shortened, more or less on account of the various distances and situations of the things they represent.⁵⁰ » This statement of a remarkable fertility is not falsified so far. And the false belief that is the basis of this statement will seem validated by this success. God⁵¹, Supreme Being, Great Clockmaker of the world, will be an idea taken as a « cliché » by generations of Western thinkers who will not mind making God a being, « The » cause of the other beings, and they will even describe all his attributes! ... Until this idol of the human reason dies. Michel Onfray wrote delightful pages on the subject⁵². Descartes is not the only one to have promoted this idol, but one cannot deny though, that he is to blame a little... This is the real error of Descartes! One must never have read Plato's Phaedo to believe one minute that the error of Descartes is the invention of dualism⁵³, but anyway...

The false belief of Charles Bell and the nineteenth researchers is much coarser than that of Aristotle and Descartes, they were fooled by a false evidence of their time: a function is necessarily assumed by a body that we can see, we can touch, we can handle. This suspicion of doctors and physiologists towards what is not seen, is still difficult to eradicate, especially among our Anglo-Saxon friends ... We will not focus on it.

In the nineteenth Claude Bernard was wrong too, but for other reasons. He did feel that the physiologist is not concerned by the leap into complexity: « Living things appear as if they were all provided with an inner strength that makes the manifestations of life all the more independent of the changes of external influences as the being rises higher up the scale of the organization ... / ... we will add that the problem, concerning physiologists, is not to go back to the « first » cause of life but only to get to the knowledge of these essential physico-chemical

⁴⁹ Descartes, « Traité de l'Homme », première partie

⁵⁰ Descartes. La Dioptrique, Discours cinquième

⁵¹ Marion JL.(2013) Dieu sans l'être, PUF, Paris.

⁵² Onfray Michel Traité d'athéologie (Livre de poche)

⁵³ Damasio AR (2010) L'erreur de Descartes. Odile Jacob, publisher, Paris.

conditions of vital activity.⁵⁴ » And on this point, he was right. But, as a true son of the French Revolution, he believed that the reason makes the law, as he wrote in his main book, the introduction to the study of experimental medicine « A fact the determinism of which is not rational MUST⁵⁵ be cast aside by science. ⁵⁶ » Written by a man defending the experimental method, this statement is rather surprising, since one can read it like that: « The scientist must submit to facts (experimental method) provided that the facts are reasonable (quote) ». Bad luck for Claude Bernard, the facts are not always reasonable, with the meaning of the nineteenth century, they are sometimes chaotic, for example. We can see, again, how a belief can make us naive, not knowing all its tricks, hidden to us. Obviously Claude Bernard didn't not share our interpretation of his text but anyway, we can accept that, naively, he had not planned it. One is fooled by his own beliefs, seeing only one aspect of things ... and perhaps clinging irrationally to what is believed, at the time of Claude Bernard, people used to believe strongly to rationality, without asking too many questions... Strangely enough the popes of that time had questions about their risk of being wrong!

André Thomas was wrong. This neurologist of the twentieth century, unknown to the public but to whom a building of the Salpêtrière in Paris is dedicated, believed in the concept of equilibrium. He shared the evidence of his time: a man can stand upright because he is « in equilibrium » because his gravity line remains within his support basis — with all the ambiguity attached to the term « remains » that connotes some stillness. But André Thomas began to question himself about it. In the chapter of his magnificent book « Équilibre et équilibration⁵⁷ » where he is interested in defining the concept of « balance », he acknowledges that: « Balance cannot be considered as a state of rest when it comes from a body whose all the parts are endowed with activity. If the term allows confusion, it is better to delete it and modify the definition ». But the term « équilibration », which he has chosen to replace « equilibrium », does not achieve a sufficient semantics break to allow André Thomas to make a connection between all the tonic events he has remarkably observed and the stabilization of the human body. You can be imposed a belief so deeply by the group which you belong to that you cannot get rid of it... despite your intuition of its opposite. The concept of « stability » already existed at the time of André Thomas, why did he not use it, as he was so close to it: équilibration, stabilization...?

⁵⁴ Claude Bernard, *La science expérimentale*, Deuxième édition, Baillière et fils Paris 1878. Ch. 1, Du progrès dans les sciences physiologiques, pages 38 à 41

⁵⁵ This emphasis is mine

⁵⁶ Claude Bernard. *Introduction à l'étude de la médecine expérimentale*. Baillière et fils Paris 1865. 3^o Partie, Chapitre 2, § II

⁵⁷ André Thomas *Équilibre et équilibration*, Masson Paris 1940

Jean-Bernard Baron was wrong when he believed to the « facts ». He kept quoting to me Cabanis' proposals on the importance of « facts ». But unfortunately for Baron, Cabanis opposed the facts to the assumptions, for example in his praise of Vicq-d'Azyr: « Around the middle of the eighteenth century, the human mind suddenly took a new development. More reliable methods were applied to all the objects of our research. Physical science was no longer a hypothesis, but a science of facts. ⁵⁸ » Or in his praise of Hippocrates: « (He) felt that any general view that is not an accurate result of the facts is a mere hypothesis; so he began studying the facts. ⁵⁹ ». Certainly « Observation can give us some knowledge concerning the facts » Popper says in his 'Logic of Scientific Discovery' « But this awareness, this knowledge we can have does neither justify nor establish the truth of any statement.⁶⁰ » And Popper continues: « I do not think that epistemology must ask the question of how I can, having had the experience S, justify the description I make and defend it against doubt. In my view, epistemology should rather wonder about the way to control scientific statements with the consequences we deduce ... »⁶¹ And actually Baron, having had the experience of the role of ocular motor muscles on the attitude and locomotor behavior of vertebrates, failed to justify his description and to defend it against doubt. His experience has become credible by the international scientific community only when the statement was made that the attitude and locomotor behavior of vertebrates is controlled by a nonlinear dynamic system⁶². A hypothesis not falsified until now and whose therapeutic deductions are proving quite effective. A scientific statement must have the universal logic structure of a hypothesis that makes it likely to be criticized. PJG Cabanis has not been a good mentor for JB Baron... but how to scent the good master we can trust?

It happened like that ... This avalanche of false beliefs in the history of posturology has not prevented the knowledge from advancing! True or false, the belief is a driving force to discovery thanks to its included desire to know, and it cannot prevent the critical spirit to be at work.

⁵⁸ Oeuvres posthumes de Cabanis. Bossange frères, Firmin Didot, Paris, 1825 (p.183)

⁵⁹ PJG Cabanis Rapport du physique et du moral de l'homme. Tome 1. Crapelet, Paris, 1805 (p. 25)

⁶⁰ K. Popper La logique de la découverte scientifique Payot, Paris, 1973 (p. 97)

⁶¹ K. Popper La logique de la découverte scientifique Payot, Paris, 1973 (p. 97)

⁶² Martinerie J., Gagey PM (1992) Chaotic analysis of the stabilometric signal. In M.Woollacott & F. Horak (Eds) Posture and gait: control mechanisms. University of Oregon Books (Portland), Tome I: 404-407

THE PHENOMENON OF BELIEF

Throughout the preceding pages, I have used a whole terminology around belief, without bothering to define the terms; meeting them in their context is already a good approach. We can now try to summarize what justifies the use of these terms in this context.

The notion of discovery implies ignorance, as one cannot discover what one already knows. The history of posturology shows that this period of ignorance, which precedes a discovery, is rich in cognitive activity but such activity cannot proceed straight towards a goal that is unknown. Thus our thought development wanders depending on the circumstances: the head of an elderly who takes a nap, lunar eclipses, the first mechanical watches, the development of the microscope, the French Revolution, it all happens haphazardly, giving sometimes rise to vague ideas, intuitions, hypotheses, but not to certainty. Such uncertainty only allows at best saying « I suspect... » I guess it will rain tomorrow...I know that there is no certainty but only a vague suspicion. There are various terms expressing more or less the same idea: I have my own views, I have the feeling, I think, I hypothesize, etc. If I have chosen the terms of belief, that is indeed for lots of reasons that escape me (I rely on psychoanalysts to discover them for me!), but that is also because I am lazy, it is easier and quicker to agree on a term rather than drag another ten or so throughout the chapters...

I find it very clear, to evoke the thing and its opposite: « I believe / I know » forms an opposition the two terms of which lighten up each other, whereas we do not know what the opposite of hypothesis, of intuition, of « I think »... is, « I believe » is clearer.

Belief also includes a dimension of unconsciousness that I find relevant. Claude Bernard was clearly not well aware of all the implications of his belief.

Belief is sometimes required by the context: it would be wrong to say that Aristotle made the hypothesis that the sub-lunar world was unintelligible, instead of saying he believed it was. A hypothesis must be formulated; it is precisely the formulation of what we think. But Aristotle never made such a statement; he thought it was, he believed it was.

To believe sometimes connotes a commitment; not when you say « I believe that it will rain tomorrow », but, for example, to believe in the Socialist Party, which can lead to take his party card, to vote for its candidates, to choose such a newspaper, etc. all actions consistent with

this belief. The history of posturology is full of such commitments, already the simple fact of spending time and money on experiments to support his idea, without going as far as to take more or less important risks, such as to face the violence of the power of the courts of the « Ordre des Médecins », armed with financial and administrative penalties, as we dared... betting on the wisdom of our colleagues!

For these different/various reasons, I think the reader can accept that it is justified to use the terms of belief to describe the phenomena observed in the context of the psychology of discovery of posturology.

Karl Popper uses the same language but in a more general context: « Considering the subject from a psychological perspective, I am inclined to think that scientific discovery is impossible if one has no faith in purely speculative and sometimes very imprecise ideas, a faith that nothing guarantees from a scientific point of view and which is, to that extent, 'metaphysical'. » So Popper himself, who built the principle of demarcation between physical and metaphysical ideas, in order to distinguish them well logically speaking, proposes to bring them together psychologically speaking to describe the genesis of scientific discovery.

I really feel like omitting the « scientific » epithet that I find too restrictive. I am aware this sort of confusion of the physical and the metaphysical I propose there seems absolutely intolerable to many contemporary minds. You cannot mix faith in God and the faith of the scientist in his hypothesis. And they are right. Faith is specified by its object; it is not the same thing at all to believe that tomorrow it will be fine or believe that God is Father, Son and Holy Spirit. But the logic involved in the act of faith is the same, regardless of its object. Whatever the object of my belief, specifying it, it keeps the same logical structure: it is not yet knowledge, and it is aware of it. The Catholic Church, for example, does not say we « know » that God is Father, Son and Spirit, it says « we believe » that God is Father, Son and Spirit. The belief knows that on a speculative level, it is only an idea still unclear. It only « feels » the truth is in that direction: that is the way to look to find the truth. The discovery, whatever its purpose be, necessarily goes through this time of ambiguous relationship to the truth, it is not the sudden appearance of the naked truth that is given to know straight to the mind of man. So I think that belief is a psychological structure of the discovery of truth, identical regardless of the truth we pursue.

With this proposal, I walk onto a minefield! ... Because it is very deeply rooted in the minds of our contemporaries that belief is necessarily formally opposed to reason. This idea is so harped on as evidence, and all day long and by all sorts of media, it is almost a part of the

contemporary French culture. As witness this text I have just copied from Wikipedia: « Belief is the mental process experienced by a person who adheres to a theory or a hypothesis so much that he regards them as truth, regardless of the facts confirming or refuting this theory or this hypothesis. In this sense it is opposed to the concept of critical thinking.⁶³ » It is easy to see that this definition is not universal: we cannot imagine a scientist saying that he believes that his hypothesis is true, regardless of the facts that confirm or falsifies! So if we wanted to keep this definition — « the belief is » — we should forbid scientists to say they believe in their own hypothesis. This definition is not universal. If it is not universal, it is particular, particular to certain beliefs specified by a certain object. This definition found on Wikipedia thus reflects this conceptual vagueness that we denounce between the logic of the act of believing, affirmation we know we do not know yet, and the particular specificity of a particular faith assigned to it by its object. This is not the same thing to believe it will be fine tomorrow and to believe that God is Father, Son and Spirit.

I'm sure these reminders of elementary logic, « To believe is to say we know we do not know », « A belief is specified by its object », will not be enough on their own, to convince quickly and easily those who have ideas, still a little uncertain, about the belief and its logic. That's why I really feel like writing a full chapter completely outside the field of posturology, a mere verbal hook on the word « belief », but a chapter the justification of it is to take a historical look, less theoretical, on what is certainly still difficult here about belief.

⁶³ Copy made on July 26, 2016, required accuracy because texts easily change on Wikipedia

HISTORY OF AN UNSCIENTIFIC BELIEF

When I do not know, I usually shut my gob. So all I am going to debate about the subject relates only to the Catholic faith. I am too ignorant of the Jewish religion, and much more of the Muslim one, to venture there.

I consider as a fact of society today that a large majority of our contemporaries believe — therefore admit that they are not certain — that the belief of Catholics to the Church's dogmas is necessarily specified by its object as the submission to an idea they regard as the absolute truth, that is relieved, in particular of reason. First we have to congratulate our contemporaries for escaping this hideous religion that tramples their reason and their freedom ... such as it is submitted to them! But this is simply a mistake. However we must acknowledge that this error, this idea of dogma understood as something that has nothing to do with reason, is not unrelated to what can be said here and there, including in the Catholic Church itself! A good example of these disappointing statements is represented by those that sometimes surround presentations of the mystery of the Trinity, all Christians have certainly heard at some stage, that it was a mystery, thus incomprehensible: They are three, the Father, the Son and the Spirit, and this is only one God, as opposed to arithmetic facts.

The historical fact is that Christ has never spoken of Trinity; the concept itself is the product of human reason. It is simply wrong to say that the Catholic doctrine is opposed to the human reason since it is its outcome. Outcome of both reason and politics in the specific case. The political power at that time, felt concerned by the ideas of God circulating in society, and it was right because the idea of God is the most dangerous idea that is in the world! These days, we can see it again when men attribute this « absolute being », ideas or odd orders, such as to eliminate all those who do not think like his servants. So Emperor Constantine himself summoned all the bishops of the nascent Catholic Church to Nicaea in order to find an agreement on this explosive legacy they were bequeathed by Christ. For Christ had spoken of the Father and the Spirit, but without specifying the metaphysical relationship between the three, which raised an issue! The fathers of the council have agreed on a text that uses the metaphysical concepts of the Greek thought, so it is difficult to say that the dogma of the Trinity is unrelated to human reason. But this Nicene statement is actually not falsifiable by facts; it only indicates a direction of reflection to the human reason, seeking to understand. This text, in itself, explains nothing at all, or so little ... It explains even less as the metaphysical categories of Greek philosophy are not the cup of tea of our contemporaries! This text presents all the characteristics

of belief: it knows it does not know, but it has the intuition that it is good searching in that direction. The reason, at that time, could think of several directions of reflection, for example, that the Supreme Being must necessarily be unique, so when he appears as Father or Son or Spirit, those are only masks adopted by the unique Being, depending on circumstances. Fortunately the fathers of the council, well inspired by their knowledge of the history of Christ, have finally chosen the direction we know, and they expressed their choice with a certain metaphysical rigor, which excludes the confusion of the three while maintaining their union. The union in the distinction of persons. But trying to say things about love using the conceptual categories of Greek metaphysics is obviously to condemn oneself not to get very far. But how to do otherwise, at that time?

We can see, however, that this text of Nicaea has helped the Mystics in their torments. Live a life of love with God, so that His ego and mine are related, is a project that no human of sound mind can consider. But for Him, it's different. And as far as seducing is concerned, He knows how to behave. There is no question of making understand just a little the tragedy of such an adventure of love without using words that may sound sacrilegious, but yet relate the facts. God behaves like a « bastard »! After seducing his beloved by giving him joys, pleasures, fruitions, for weeks, months, years, He abandons his loved one. The repertoire of love songs is no short of poems and melodies that celebrate the suffering of unhappy love in human love, there, it is the same, maybe worse. The heaven is empty ... nothing, nothing, absolutely nothing. Praying is exacerbating the emotional void, pray, moreover, what's the point? It is time for man to understand that the term of his relationship with the divine ego is not limited to the sweetness of devotion but includes the distinction of the persons ... as the Fathers of the Council of Nicaea have said. If God abandons you, you're on the right track! The one that opens your heart and your mind to all men, to the whole Universe. All the mystics, and there's been quite a few in history, have lived this Trinitarian emotional experience. Only some have tried to say something about it and the little they have managed to express has stimulated the contemporary phenomenological thought. Husserl, Heidegger, Henry, Derrida for example, have found in the writings of Meister Eckhart a dynamic of thought about otherness and we benefit from it⁶⁴. Without being stuck when facing the abstraction of these philosophical discourses that cannot always be mastered by everyone they help understand better this sentence of Christ on the cross, « My God, my God, why hast thou forsaken me? » It is easily perceived as revealing the presence of otherness within/inside God. The dogma is anything but something that must not be

⁶⁴ See the Yves Meessen's thesis. Percée de l'ego : Maître Eckhart en phénoménologie . Thèse Philosophie. Poitiers. < <http://theses.univ-poitiers.fr/notice/view/46602> >

understood, it is rather our belief that there is something to be understood in that direction. Today, as we have understood something in the direction shown by the Nicene dogma, I believe in this dogma not only because it is part of the Christian message, but also because the reference to the « Trinitarian otherness » appears to me as the true cement of life in open society. This last statement that appears universal, even seems falsifiable by sociological facts, indeed, it can be deduced that a society that does not accept the Trinitarian otherness as a founding value of the union in the distinction is doomed to remain a society closed on itself and on its past. Its collective unconscious drives it to reject all forms of the other

To close this unusual chapter, I would add just my impression that the assimilation of the Trinitarian mystery in our culture is rather amazing; the kind of otherness it represents has almost become republican value! ...

PRAISE OF THE ERROR

After this unexpected digression — explaining???... — let's get back to our subject: criticism of posturology, a psychology of discovery. We noted in the chapter about the phenomenon of the mind that the history of the discovery of posturology was a remarkable succession of false beliefs that had not, however, blocked the progress of knowledge, on the contrary! .. . Thus, it occurs to me that all those who were wrong have to be thanked deeply for their errors!

First, thanks to Aristotle to have blocked by his mistake the development of life sciences for centuries because this delay draws our attention to an issue that is still waiting for an answer (I will not quote this question again, because I'm still unable to translate it properly).

Thank you to Descartes for his incredible naiveté that led him to classify God as a being in the series of chained causes, The great Watchmaker! Doing so, he released the development of biology and also showed that this Supreme Being, idol of human reason, was doomed to die.

Thank you to all physiologists of the nineteenth century who showed us that we can be intelligent and cultured and yet make a stupid mistake! ... This did not prevent them from bringing facts to our knowledge that contributed to its progress.

Thank you to Claude Bernard to have believed that it is the reason that makes the Law, one would hope that our legislators take advantage of this blunder.

Thank to you, Jean-Bernard Baron, who patiently trained me to the regulation of the postural tonic activity, your personal history, built on the belief to facts alone reminds us that what sets the mind on, is the verb.

I really would like to continue this litany of thanks including politicians ... except that this is not our topic ... and we would never finish! But still, I say thank you to Adolph Hitler who allowed us to see that a society exceptionally rich in men, intelligent and cultured, as the German society of the twentieth century was, can be the scene of what we know. Vigilance matters, in politics too.