

Part III: The Systematic Practice of the Method of Broad Thinking on the Major Opposing Views, as the Only Way to See the Missing Facts and to adopt Functional and Wise Views for the Problems and Solutions at the Foundations of Light, Physics, Science in General, and of Society

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Abstract

We show here the missing way along history for growing functional, stable and wise broad views in physics, generally in science and society, instead of dysfunctional views that are based on missing facts and we show that this way brings the stability that is absolutely necessary for the inherently unstable science and society. This way is based on a systematic practice of the method for broad thinking on the major opposing views that empowers people to see the missing facts at the foundation of science and society, and to see and adopt the solutions for functional, stable and wise structures instead of ones dominated by crises, conflicts, wars, and self-destruction. This method was, long time ago, the basis for initiating the broad views of Atomism and Democracy, but was insufficiently practiced and later it was forgotten. We describe here the demonstration of this method for two major cases. One case is for the major opposing views on light in physics (a summary of Part I and Part II) which shows the missing fact at the foundation of light (how light spreads at large distances) and a mechanism-type structure for light instead of the current non-mechanism, physically impossible, structure (light spreads like waves, but nothing oscillates). In the second case the demonstration is for the opposing views of liberals and conservatives in society which shows the missing system at the foundation of society – the system for growing common ground and functional, stable and wise broad views, individual and society. These cases and demonstrations are important enough to show that this method can and must be systematically practiced in physics/ science and especially in society. Learning this method and these two demonstrations turns on the necessary “light” in physics and in society, and becomes the basis for a systematic practice of this method. This is necessary because, as M.L. King said, “Darkness cannot drive out darkness, only light can do that.” Therefore, in our time a system for spreading the concept and the practice of this simple method is absolutely necessary, such that this method becomes a habit for the regular individual and society. Indeed, in this model the individual and the society see the big-picture knowledge for growing functional common ground and functional, stable and wise broad views, science and society, instead of poor views, division, conflicts, wars, and self-destruction. Without this big-picture people, science and society live in darkness. We show here that such a system is easy feasible based on simple requirements in the science activity and in the Constitution of society. In our time this method can and must be practiced systematically to define and adopt a system for growing functional common ground and functional, stable and wise broad views instead of poor views, division, etc.

Keywords: *Method for broad thinking; Major opposing views; Functional, stable and wise broad views; Individual, science and society*

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I. Introduction

Along history the broad views in physics and in society were dominated systematically by missing facts at the foundations. As described in Part I and in Part II two clear and impressive cases of missing facts at the foundations are as follows [1, 2]. The first is the case, long-time-ago, of the theory of the caloric fluid for heat. In this theory the heat was considered and described with advanced math as a fluid which flows from hot body to a cold body. But such a view could not define physically this fluid, and it took a long and hard time for the physics community to realize that this is because there is a missing elementary fact in this view. Namely, the fact that heat in a body is produced not only by its vicinity with a hotter body, but also by a mechanical action on this body. For instance by hitting it with a hammer. It took a very long time and a big effort to include this mechanical action in the broad view at the foundation of heat – namely the kinetic theory of heat. The second impressive case of missing fact is the case of light. We describe in Part I and Part II that for centuries there was and still is a missing fact at the foundation of the physics of light, namely there was no verification for how light spreads at large distances. The views on light were based mainly on the verifications of how light spreads at close distances (the diffraction fringes). As shown in Part I and Part II these verifications were insufficient to see the physical nature of light and the verification of how light spreads at large distance is absolutely necessary. We show in Part I that there is alternative proof that light does not spread like the waves do and hence we show in Part II that a non-wave but periodic structure for light is necessary and feasible.

Why it took so long to see that there were missing obvious fundamental facts in the above two cases. We show in Part I, in Part II and here that the cause for not seeing them is the lack of a systematic practice of a method for broad thinking on the major opposing views. As mentioned above for heat the major opposing views were on how heat is produced in body, only by its vicinity with a hot body, or also by a mechanical action on this body. For light the major opposing views were how the diffracted light is produced by an edge, both by the edge material and by the space around it, [1] or only by the edge material, [5, 6]. By knowing this method an individual and a community have the power and the habit naturally to see this missing fact for light and hence, to grow functional, stable and wise broad views/ understanding of light, see Section III. We described shortly this method in Part I and II. Here we put the accent on the need to grow the habit for a systematic practice of this method. The third and enormously important case of a missing fact is the case of the missing system for common ground and for functional, stable and wise broad views in society, as we describe in Section IV of this paper. A systematic broad thinking on the major opposing views of liberals and conservatives clearly shows that this system is absolutely necessary but missing. This system is the basis for a functional, stable and wise individual and society instead of the current society which is dominated by dysfunctions, crises, conflicts, wars, and finally by self-destruction as was the case with all the civilizations along history-Greek, Roman civilizations for instance. This case makes crucial to adopt and practice systematically the method for broad thinking on the major opposing views of liberals and conservatives. With this method an individual and a community have the power and habit to see this missing fact for society and hence, to grow functional, stable and wise broad views/ understanding of the society. We describe this system in Section IV. But first we present a short description of the method of broad thinking on the major opposing views.

II. The Method of Broad Thinking on the Major Opposing Views (MOV) to see the Missing fact, the Real Problem and Solutions, which Necessarily Exist for any case of MOV

The electromagnetic wave approach to light was supported for hundreds of years by the innumerable observations and measurements

on the diffraction fringes [3, 4]. The wave approach to light describes in good extent the diffraction fringes for the macroscopic edges. However, the nature of these waves always raised a basic question. What is the medium that supports the propagation of these waves? No such medium could be identified. Even worse, the high rigidity necessary for this medium and the Michelson-Morley experiment denied the existence of such support. Many students keep asking how waves are possible but nothing oscillates [5]. No answer could be given by professors. Hence, we only could say “something is wrong”. And we spent a life trying to find what is wrong. Although the answer was simple it was not easy to find. After more than 20 years of searching around the light, electron and neutron diffraction, we started to realize that the light diffraction on an edge must provide the answer to the questions on the wave approach of light. Intuitively I started to see that the opposing views on origin of the diffracted light are major and there must be here a simple missing fact which can clarify if the diffracted light is born as waves (both inside and outside of the diffracting edge) or not as waves (only inside the diffracting edge). The answer provided by the Geometrical Theory of Diffraction [6, 7] is insufficient because although the diffracted light is born as rays only inside the diffracting edge, these rays still have the wave mathematical descriptions. Slowly, by a broad thinking I realized that these opposing views indicate the obvious: the existence of a fundamental missing verification, namely how light spreads at large distances, as the waves do, or not as waves do. This fundamental missing fact is not mentioned in the physics. In the following 10 years we developed and attempted this experimental verification [1]. We could not finish this experimental verification because of the lack in our small lab to measure at distances of 100 meters-500 meters. However, also slowly, we also found the alternative experimental [8,9] results which show that light does not spread like the waves do. Moreover, and also slowly, we found the significance of such a non-wave spreading for the structure of light, Part II [2]. The above experience can be summarized as a method of broad thinking on the major opposing views.

- Identify the major opposing views at the foundation of a theory.
- Identify the missing verification at the basis of these opposing views, which necessarily exists for any case of major opposing views. And find the answer to this missing verification (light has non-wave spreading in space for the case of light) which is the missing fact [1].
- Find the broad view, instead of the two major opposing views, which fits the fact which was missing.

This is the method that is necessary to be practiced by professors and students for naturally recognizing this missing experiment for light and its results, instead of ignoring them for hundreds of years [1, 2]. Such a method empowers the individual and science to avoid repeating in the future cases like the missing fact for light and the missing fact for heat (namely producing heat by mechanical action). From our lifetime work on light we found that both the case for light and the case for heat happened because the method of broad thinking on the major opposing views in a field was not used systematically in the university. If the student is taught and allowed to practice this broad thinking he/ she will see the missing fact/ experiment, and hence, the theories that are based on a missing fact will not survive/ repeat. On this line of thought, sooner or later this method will become a basic system in the education in science, to grow scientists who have the big-picture knowledge, in excess to the method for fast thinking for detailed knowledge. This method is also absolutely necessary for the society science, as described in Section IV. Indeed, a broad thinking on the major opposing views in society, namely those of liberals and conservatives, shows quickly that a major and simple system is missing in society/ democracy, namely the system for growing/ developing common-ground based functional and wise broad views/ big-picture knowledge-see Section IV.

III. The Demonstration of the Method for Broad thinking by Application on the Major Opposing Views on the Nature of Light, to see what is Missing, Namely the Proof that Light does not Spread like the Waves do, and to

Define/ Adopt a Functional Structure for Light

In Part I and II we practiced for a long time the method of broad thinking on the major opposing for how the diffracted light is produced (as waves both inside and outside of the diffracting fringes, or as non-waves only inside the diffracting fringes) [1-2]. Only by this practice we could see that the spreading of light at large distances (the whole space) is the only property which can decide by yes or no if light really spreads physically like waves, while the fit of the waves for describing the diffraction fringes is insufficient for this purpose. Only by this practice we started to see that the fringe space is too limited and hence, brings the possibility of misinterpretation. Only by practicing this method we could see that the experiment for verifying if light is spreading like waves at large distances is necessary in principle, and is crucial. However, very surprisingly and tragically, this experiment was totally missing along history. As described in detail in Ref. [1], this experiment uses the simplest diffraction case, in which a beam of light falls perpendicularly with its axis on the line and the plane of a straight edge. Practically, this experiment verifies if there is a dependence of the diffracted light at large distances in the geometrical shadow, on the changes in beam thickness traversal to a single straight edge, while the distribution of light along the straight edge remains the same. If this dependence exists, as the wave theory for light fundamentally predicts, then the wave approach to light spreading is physically true. If there is no dependence then light cannot spread physically like waves. We attempted this experiment for many years, but could not finish it because of the lack of resources to measure at 100m-500m. Our detailed description and attempt for this experiment, presented in the previous Part I, will empower big labs to perform this absolutely necessary experiment. However, our previous article, Part I also shows the alternative experimental proof that the answer to how light spreads also comes from comparing the well-known wave results for the diffraction on macroscopic holes with relatively recent data for the diffraction on nanoscopic holes [8,9]. This comparison clearly shows that light does not spread physically like the waves do, which clearly demonstrates the necessity of a new, mechanism-type, non-wave but periodic structure for light in free space. Such an alternative answer regarding the spreading of light also makes absolutely necessary to perform the above missing experiment, as a direct way that convinces anybody from the current physics establishment on how light is spreading. Part II shows, by a broad thinking on the nature of light, that such a new structure for light is feasible based on the concept of finely dispersed matter or dark matter, with immense consequences in physics. This would be the start for further developments, or for alternative and better developments.

IV. The Demonstration of the Method for Broad Thinking by Application on the Major Opposing Views of Liberals and Conservatives, to see, define and adopt what is missing - namely, The System for Common Ground and Functional, Stable and Wise Broad Views

The role of the method: The method of broad thinking on the major opposing views is the simple method which was used long ago to initiate the broad concepts of Democracy, Atomism, Olympics, Hippocratic Oath, etc. This is a simple method which can be understood and used by any regular individual. It consists in a simple broad thinking on the Major Opposing Views (MOV) of liberals and conservatives, to see the facts missing from the structure of society which necessarily exist in each case of MOV, and hence, to see the real problems and solutions or the big picture knowledge. Without being aware of this method, the individual naturally and inevitably falls into the trap of growing poor views, as is greatly told by the following saying. “Our mind is like a garden. Our thoughts are like seeds. We can grow useful flower-type views, or we can grow weed-type views which are damaging for humanity.” The flower-type views are the functional and wise views grown by the broad thinking on MOV, and weed-type views are grown by a too simplified thinking without being fully aware of this method of broad thinking on MOV the individual does not really see the immense importance to control his/ her reactions, that is to be “always humble and kind” rather than aggressive, as a well-known country song

tells this method is necessary because, as M.L. King said, “Darkness cannot drive out darkness, only light can do that.” The application of the method for broad thinking on the major opposing views in society, namely those of liberals and conservatives, shows quickly that a major and simple system is absolutely necessary and feasible but missing in society/ democracy, namely the system for growing/ developing common-ground based functional and wise broad views/ big-picture knowledge. And it must be practiced systematically to grow the broad views which prevent a destructive division, conflicts, wars, and finally self-destruction.

The path towards the system for common ground and functional broad, stable and wise view: We recognize here by a broad thinking on the major opposing views of liberals and conservatives, that the current constitutions in the world are incomplete, that is, they do not cover a fundamental need for the individual and society. This is the need for a simple and feasible system for common ground that empowers the people and society to naturally and wisely reduce the Major Opposing Views (MOV) that is, the destructive division in society. Such a system would naturally grow stable, functional and wise elections and society, instead of a society dominated by divisions, crises, conflicts and wars. But such a system was tragically missing all along history, why? Is such a system impossible? We show here that very surprisingly this system is possible and is also easy feasible and beautiful.

Without such a system the structure of society is essentially unstable and damaging for people that is, it is an essentially flawed structure. Without this required, simple and practical system/ way to grow Common Ground (CG), Functional Big-Picture Views/ Broad (F-BPV) and Simple Wisdom (SW) on the MOV of liberals and conservatives, the political parties and the candidates in elections, inevitably and effectively transform their interest for winning the elections, into a bad division in society, as the founders of the USA Constitution feared [10]. They do this by using a simplistic/bad thinking and by blaming on the other candidate/ party. Without a system for growing CG/ F-BPV, a partisan propaganda is pushed more and more and more [11-13]. As a result, as we saw in the 2020 US elections, heavily divided and destructive elections happen, and for sure, as history shows, it will get worse if the need for growing some CG/ F-BPV/ SW between the parties and between people, is not solved. Hence, a simple system for some CG/ F-BPV/ SW would be of immense importance. Such a system for growing CG/ F-BPV/ SW was missing all along history of humanity, and without it all the civilizations were not only dominated by crises, conflicts, wars, but also suffered a final self-destruction, including the Greek and Roman civilizations. Also, such a self-destruction began in Germany between 1915-1945, and in Russia after 1917. Therefore such system for CG/ F-BPV/ SW is totally necessary to avoid the darkness of the world.

We describe here a simple and feasible system that requires and empowers the elected people to perform a simple method/ activity and report the results before the elections, if they want to participate in the elections. This activity is a simple broad thinking for a report on the Major Opposing Views (MOV) of liberals and conservatives, to see the missing facts and the big-picture knowledge and hence, to systematically reduce MOV. This system also includes an activity for spreading this broad thinking on MOV to the regular people. These simple activities are necessary in the structure of society for growing the Common Ground (CG), Functional Big-Picture Views (F-BPV), and a Simple Wisdom (SW). Such a system was absolutely necessary all along history for growing a stable, functional and wise election process, individual and society, instead of a society dominated by divisions, crises, conflicts and wars. But such a system was not recognized and not adopted a long history. Such a simple system has to solve two problems. First, the individual, both inside the parties and among the regular people, has a clear weakness to recognize what was missing a long history in society that is, to recognize the necessity/ feasibility of a system for common interest and a functional and wise big picture for MOV and society. How people can start practicing a little broad thinking on MOV and hence, to start recognizing the immense necessity of a system in this respect? Second, what system will convince the parties for an effort to reduce the MOV? Is it feasible and simple such a system for growing CG/ F-BPV?

We show here that a simple and effective system for growing CG/ BPW/ SW can be defined and demonstrated. This simple and effective system grows the model of the individual empowered by the method of broad thinking on the MOV in society, to see the common ground and the wise big picture/ knowledge in society. Such a model of the individual is attracted to grow CG/ BPV/ SW, in everybody's best interest. What system can grow this model of the individual? How can this system be demonstrated? The necessary system in this respect is as follows. We show here that a simple and effective system for growing CG/ BPW/ SW can be defined and demonstrated. This simple and effective system grows the model of the individual empowered by the method of broad thinking on the MOV in society, to see the common ground and the wise big picture/ knowledge in society. Such a model of the individual is attracted to grow CG/ BPV/ SW, in everybody's best interest. What system can grow this model of the individual? How can this system be demonstrated? The necessary system in this respect is as follows.

The system for common ground and functional, stable and wise broad views: The following two simple but fundamental requirements are necessary in the Constitution for establishing the practice and habits for common ground and functional broad views in everybody's best interest.

- The parties and the candidates are required to know and to demonstrate by some results, before the elections if they want to participate in these elections, that they know and practice a little the method of broad thinking on the Major Opposing Views (MOV). This method easily grows common ground and the big-picture views, as we demonstrate by two major cases/ examples of MOV, one in society as described here - the MOV of liberals and conservatives as described in this section, and one in science - the MOV for the structure of light see Section III and Ref. [1, 2]. By satisfying this requirement, immediately and in time, the parties and the candidates necessarily grow the model of the individual who sees the common ground and a wise big picture/ knowledge in society, who sees what was missing a long history in society, and hence, who sees his/ her limits and become humble and kind rather than aggressive. By doing these the candidates will become attracted to grow CG/ F-BPV/ SW, in everybody's best interest, and hence, to avoid a permanent harm to the whole society, a harm which naturally grows in time to the level of self- destruction.
- The regular people also need to become aware of this easy-to-learn method and of its demonstration examples (for the structures of light and society) that is, of the benefits from using it. Developing habits by practicing this method is an essential need [14]. This method empowers people to see the missing facts, the positives, the negatives and the big-picture-knowledge for the MOV of liberals and conservatives. By a simple learning of these missing facts/ big-picture, the individual is attracted to, and can naturally and easily grow broad, functional and wise views, and hence, escapes from the current aggressive/ destructive propaganda/ disinformation cycle which grows major opposing views. By knowing this method and results the individual follows the model of a broad and wise thinker on MOV who can build the big-picture knowledge that is absolutely necessary for growing a stable, functional and wise society and science instead of ones dominated by division, crises, conflicts, wars and finally by self-destruction. Without this model the individual remains, no matter how smart he/ she is in some narrow domains/ areas, at an insufficient/ primitive/ aggressive level regarding the functionality and wisdom in science and society, that is the individual remains in darkness and wilderness. The model of a humble and kind broad thinker on MOV should become the basis for a candidate in elections.

These two simple and fundamental requirements make possible and attractive to grow a Stable, Functional and Wise Society (SFWS). They recognize the necessary good models for society and individual, models which were missing all along history. In these models

the individual has to have knowledge/ experience/ habit for:

- The method of broad thinking on the Major Opposing Views (MOV) that is necessary to see the missing facts in each of these MOV and to grow the big-picture in society.
- A little common ground and a big-picture view by applying this method to: The MOV of liberals and conservatives to see the stable, functional and wise structure for society. A case of MOV in science to see the functional and wise structure for light and science. With the above requirements this knowledge/ experience/ habit for the individual is easily developed in a relatively short time.

Therefore, the society needs a system/ way to recycle old non-practical views and reduce this “dirt” accumulation, by growing common ground, functional and wise views. Growing in a fast way the necessary common ground is obviously impossible. But a constitutional requirement for the parties and candidates would allow to slowly grow common ground in society for the benefit of everybody. A system for broad knowledge would extend the current schooling for simple knowledge, like one plus one is two, to the broad knowledge level. Even more, this constitutional requirement would be the basis for introducing a simple and practical recycling business of old and poor views, that is profitable for both the individual and the society, in a similar way as the metal recycling is profitable for everybody. It is useful to see such a method/ system for slow and wise mind cleaning, in the common interest, as being similar in some good extent with the slow filtering of the dirt from the oil in an engine, which is necessary for greatly extending the life of the engine/car.

How to implement the two constitutional requirements, and how to bring them to practice: The inclusion of the above two requirements in the Constitution and in the practice will take a considerable effort. The aggressive spirit of a large fraction of people will oppose recognizing that we all the people need a system for common ground and for functional and wise views on the major opposing views of liberals and conservatives.

- Supervising that the first requirement is practiced by the parties and candidates who want to participate in the elections, will require a non-political system aside the existing government. The name of this system could be The House of Wisdom (HW), or The House for Growing Common Ground and Functional and Wise Broad Views. A national HW is composed of the HW for each state. Defining a simple form for the state HW will take a considerable effort. An attempt to define this state HW is as follows.

The state HW should be a part of, and nominated by the state high school system which is in principle a non-political and knowledge-based organization. Such a state HW should have at least three members from each County. The nomination of a member for HW should be based on his/ her reported experience in the above method of broad thinking on the major opposing views, and in its applications to the structures of society and of science. The state HW should have the power to interact with the parties and with the candidates, to advice and help them to establish a minimum of common ground and of functional and wise broad views, and to grade (pass or fail) their report on the common ground of the election candidates. Based on this broad knowledge, HW should have the power to decide if a candidate can participate in the state and in the national elections. The state HW should organize communities for common ground in each County, to help the information and decision process. HW should organize national meetings (The National Assembly for Growing Wisdom) for spreading the interest of people in the benefits of common ground, of functional and wise views, and of wisdom. This HW is absolutely necessary for growing wise minds in a democracy, in the same way as filters are necessary for having clean oil in the car engines.

- In order that the above Constitutional Requirements for Common Ground (which bring a huge benefit for people) can grow and becomes a standard in society, it is also necessary a system/ process for spreading/ educating the above method and applications among the regular people. For the regular people, the school system needs to make available a simple/ elementary class about this method and its applications, and a simple test on the internet, in schools and in community centers. This class would teach the broad thinking method on the major opposing views, and its results to see the immense benefits from its applications to the structure of society and in science.

To encourage taking this elementary class and test, for the benefit of society, the people who are poor should receive a small payment, as a reward for work for the benefit of society (which is a kind of recycling process for those in need). The test would show if the person taking it, is aware of the benefits from using the above method of broad thinking. Such a class, test and reward will naturally spread the interest and practice for common ground and functional and wise broad views, and hence, for the model of the individual as a broad thinker who is aware of the intellectual virtues necessary to see the big-picture truth and avoid falsehood. Looking for the big picture, humility, caution and carefulness are among the intellectual virtues, while gullibility, carelessness and closed-mindedness, idleness, rigidity, obtuseness, prejudice, lack of thoroughness, and insensitivity to details and big-picture, are intellectual vices [13]. Habits for practicing the intellectual virtues is a major necessity [14]. All these would bring a recycling process for the poor views in society, and will grow a functional, stable and wise model for the individual and society.

Conclusion

This paper shows the feasibility of a broad intelligence method and system for growing functional big-picture knowledge/ views for light, physics, science and society and hence, for growing a functional, stable and wise Humanity, instead of one dominated by divisions, crises, conflicts, wars and finally by self-destruction. By a systematic practice of the method for broad thinking on the major opposing views the science and society will grow the habits necessary for such big-picture knowledge/ views, and will necessarily grow a functional, stable and wise model for the individual and society.

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