

# VUE D'AMÉRIQUE

## TRUTH AND PRESENCE: POETIC IMAGINATION

## AND MATHEMATICAL PHYSICS IN GASTON BACHELARD

In the stacks of the Sterling Library at Yale University, thirty years ago, I happened as a graduate student in philosophy to be reading Gaston Bachelard's *L'activité rationaliste de la physique contemporaine* while my closest friend at the time, a graduate student in French, happened to be reading his *L'eau et les rêves*. This coincidence was gratifying, although it did not seem remarkable; neither of us found the other's interest alien. I refer to it not from romantic nostalgia but because it now occurs to me that this personal conjunction of science and the humanities antedated by five years C.P. Snow's *The Two Cultures and the Scientific Revolution*<sup>1</sup>, an essay which suggested that it ought to have seemed remarkable, since according to Snow a great gulf was, if not fixed, at least being busily dug, between the domains to which these works belonged. Of course Snow believed rather complacently that he himself embodied a rare and difficult combination of the two, but he seems not to have realized how thoroughly his problem had been anticipated, or how satisfactorily it had been solved, by a professor at the Sorbonne who had begun his career as a provincial French postman.

As far as that goes my own double interest, in science and in poetry, antedated by many years my encounter with Bachelard. Bachelard somewhere acknowledges a debt to his father in the matter of building fires; I owe a debt to mine both for his habit of reciting Milton and for his curiosity about the sciences, especially astronomy. He possessed some of the works of those great popular writers, both

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<sup>1</sup> C.P. Snow, *The Two Cultures and the Scientific Revolution*. Cambridge: The University Press, 1959.

distinguished scientists, Sir James Jeans and Sir Arthur Eddington, and I read them while I was still in school; in the latter's *The Nature of the Physical World* is a passage that Bachelard may have known and would certainly have liked. "One day," says Eddington, "I happened to be occupied with the subject of 'Generation of Waves by Wind.' I took down the standard treatise on hydrodynamics, and under that heading I read" [and there follows a paragraph of mathematical symbols]:

And so on for two pages. At the end it is made clear that a wind of less than half a mile an hour will leave the surface unruffled. At a mile an hour the surface is covered with minute corrugations due to capillary waves which decay immediately the disturbing cause ceases. At two miles an hour the gravity waves appear. As the author modestly concludes: 'Our theoretical investigations give considerable insight into the incipient stages of wave-formation.' On another occasion the same subject of 'Generation of Waves by Wind' was in my mind; but this time another book was more appropriate, and I read:

There are waters blown by changing winds to laughter  
And lit by the rich skies, all day. And after  
Frost, with a gesture, stays the waves that dance  
And wandering loveliness. He leaves a white  
Unbroken glory, a gathered radiance,  
A width, a shining peace, under the night.

The magic words bring back the scene. Again we feel Nature drawing close to us, uniting with us, till we are filled with the gladness of the waves dancing in the sunshine, with the awe of the moonlight on the frozen lake. These were not moments when we fell below ourselves. We do not look back on them and say: 'It was disgraceful for a man with six sober senses and a scientific understanding to let himself be deluded in that way. I will take Lamb's *Hydrodynamics* with me next time. 'It is good that there should be such moments for us. Life would be stunted and narrow if we could feel no significance in the world around us beyond that which can be weighed and measured with the tools of the physicist or described by the metrical symbols of the mathematician<sup>2</sup>.

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<sup>2</sup> Sir A. S. Eddington. *The Nature of the Physical World*. London: J.M. Dent and Sons (Everyman's Library Edition, 1935, pp. 304-305.

Eddington suggests here that the business of life will draw one's attention now to the scientific side of things, now to the poetic; there is no thought that the two functions will be exercised by different people, or belong in the life of the same person to separate periods, say youth and maturity.

Critics are fond of chopping great thinkers into two, the early and the late, and this is nearly always misleading, as the most obvious examples show (Marx, Wittgenstein, and Sartre come immediately to mind). Some people have tried to do this with Bachelard, as if he turned from science to poetry, but even the sequence of published works is more complicated than that. If it is necessary to identify periods there are at least four, the first two overlapping: 1) an initial preoccupation with scientific thought, from *Essai sur la connaissance approchée* (1928) to *La philosophie du non* (1940); 2) the working through of a theory of the elements and the corresponding forms of the imagination, from *La psychanalyse du feu* (1938) to *La terre et les rêveries du repos* (1948); 3) a reconsideration of the thought processes of science in the light of a new rationalist epistemology, which includes *Le rationalisme appliqué* (1949), *L'activité rationaliste de la physique contemporaine* (1951), and *Le matérialisme rationnel* (1952), three works that Roch Smith has called a "trilogy," a view supported by Bachelard himself<sup>3</sup>; and 4) the new poetics of the three last works, *La poétique de l'espace* (1957), *La poétique de la rêverie*, and *La flamme d'une chandelle* (both 1961). So at the beginning of this paper I state my confidence in two kinds of unity: that of Bachelard's career, and that of the possible embodiment of both science and poetry in a single individual that that career exemplified.

In the stacks of the Sterling Library, however, the rest of the Bachelardian corpus was still in my future. I was reading *L'activité rationaliste* for a quite specific reason, namely to advance an inquiry into the ontological status of fundamental entities in physics. Electrons, protons and the rest are never observed directly, so they remain theoretical constructs; what we observe are the consequences of interactions in which we suppose them to have participated--

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<sup>3</sup> "Je considère que [ces] trois livres ... ont une unité de vue." (Personal communication: letter from Bachelard dated December 13, 1956).

bubble chamber tracks, clicks from Geiger counters--and these consequences are always macroscopic and more or less familiar. This is still a topical problem, though not in the form of bewilderment about waves and particles that Eddington dramatized with his "wavicle," which was a wave, as I remember, on Mondays, Wednesdays and Fridays, and a particle on Tuesdays, Thursdays and Saturdays. Now, with the benefit of hindsight, I would rather be inclined to say: why did we ever suppose that the habitual images experience equips us with in the local "flat region" of macroscopic observation would be adequate to remote reaches of physical reality - the microscopic, the cosmological, the relativistic? Getting physical theory right means being ready to leave the comforts of the flat region, to depart from the simple image.

Now two things about Bachelard seem to me particularly memorable and important: on the one hand the tenacity of his rootedness in what I am calling the "flat region," the familiar, the everyday, the down-to-earth, but on the other hand the audacity of his speculative departures from this solid base, his persistence in following his arguments where they lead, whether into the gloom of psychoanalytic depths or the vertigo of relativistic speed and distance. The polarity of his work between science and poetry is, as I have already noted, notorious; I find no less remarkable the polarity between the postman and the philosopher. On the whole it seems to me that it would be a good thing for more philosophers to have been postmen. The metier may not be accidental: apart from the letter-scales Bachelard refers to as having given him his idea of weight, there is a hermetic side to the postman's activity - he is the point of contact with the world beyond, he brings sealed messages from distant origins; there is no knowing what marvels or portents they may not contain; at the same time nothing can surprise him, he is the very image of persistence and reliability, of local intimacy and homely order. And when the postman himself leaves for the outside world--for Dijon, for Paris--he takes with him this imperturbable sense of the familiar, and his concern continues to be with the firm materiality of the world, now from the scientific point of view.

It is, however, the point of view of a *new science*, a "nouvel esprit scientifique" one of whose effects is gradually to undermine that

materiality. The old science, beginning with Galileo, say, made its object the mathematical representation of *observable* relations; Newton added the modern concept of force, but that had its own familiar representation in muscular effort. Microscopes and telescopes, etc., merely extended the flat region, they did not lead outside it. It was towards the end of the nineteenth century that the existence of entities hitherto unsuspected, with entirely new properties, began to force itself on scientific attention. The electron was discovered when Bachelard was eleven, and he was a young man during the heady days at the beginning of the century when relativity and quantum theory were undergoing their dramatic development from marginal conjectures to fundamental disciplines of physics.

The initial reaction to the opening of these new domains was sometimes overdone, and Bachelard did not escape the temptation to which so many of his contemporaries succumbed of making a mystery out of the absence of an imaginable substantiality at the quantum level. In *Le nouvel esprit scientifique* he says:

Instead of attaching properties and forces directly to the electron we shall attach quantum numbers to it, and on the basis of the distribution of these numbers we shall deduce the distribution of the places of the electron in the atom and the molecule. The sudden dissolution of realism should be clearly understood.... Thus chemistry, which was for a long time the 'substantialist' science *par excellence*, finds the knowledge of its own matter progressively dissolving. If we judge the object according to the proofs of its objectivity, we must say that the object is mathematizing itself and that it manifests a singular convergence of experimental and mathematical proof. The metaphysical gulf between mind and the external world, so unbridgeable for a metaphysics of immediate intuition, seems less wide for a discursive metaphysics that attempts to follow scientific progress. We can even conceive of a veritable displacement of the real, a purging of realism, a metaphysical sublimation of matter. Reality first transforms itself into a mathematical realism, and then mathematical realism comes to dissolve itself in a sort of realism of quantum probabilities. The philosopher who follows the discipline of the quanta - the schola quantorum<sup>4</sup> - allows himself to think the whole of the real in its mathematical organization, or better, he accustoms himself to

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<sup>4</sup> The *scola cantorum* is a well-known school of music in Paris.

measure the real metaphysically in terms of the possible, in a direction strictly the inverse of realist thought. Let us then express this double supremacy of numbers over things and of the probable over numbers by a polemical formula: chemical substance is only the shadow of a number (*L'ombre d'un nombre*)<sup>5</sup>

This is terribly confused. It is simply misleading to suggest that there are numbers in the objective world and that they somehow replace a materiality that has dissolved away. If the world ever was material, it has not ceased to be so just because we can't *picture* its materiality. Before, we could have a pictorial representation as well as a mathematical one; now we can manage only the mathematics, but it is no more constitutive of the world than in the former case. The epistemological basis of science is still in ordinary macroscopic objects; our immediate world is still Euclidean and Newtonian; but we have learned that the rough-and-ready world-picture of the flat region, with its colors and sounds, its solids and spaces, is inadequate for the representation of basic physical truths.

What gets in the way of a relaxed and uncomplicated acceptance of this limitation seems to be a need on our part to have an image of matter. It is difficult to attribute reality, materiality, or substance to the world there physically is without attributing to it the imaginative contents that have hitherto accompanied these ideas. There is no way of getting rid of these imaginative contents but their existence poses a problem for scientific understanding. The fact that *La formation de l'esprit scientifique* and *La psychanalyse du feu* were published in the same year is not accidental: in the former Bachelard is concerned not only with the proper formation of the scientific mind but also with the fact that it is deformed by its habitual expectations, while in the latter he looks at a particular case, the habitual association of substantiality and fire. "In this book when we talk of our personal experience we are demonstrating human errors," he says, in the "Introduction" to *La psychanalyse du feu*, and he continues:

Our work is offered, then, as an example of that special psychoanalysis that we believe would form a useful basis for all

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<sup>5</sup> Gaston Bachelard. *Le nouvel esprit scientifique*. (Paris: Presses Universitaires de France, 1934), pp. 79-82.

objective studies. It is an illustration of the general theses put forward in our recent book, *La formation de l'esprit scientifique*. The pedagogy of scientific instruction would be improved if we could demonstrate clearly how the fascination exerted by the object *distorts inductions*. It would not be difficult to write about water, air, earth, salt, wine and blood in the same way that we have dealt with fire in this brief outline. ... If we succeeded in inspiring any imitators, we should urge them to study, from the same point of view as a psychoanalysis of objective knowledge, the notions of totality, of system, of element, evolution and development. ...In all these examples one would find beneath the theories, more or less readily accepted by scientists and philosophers, convictions that are often ingenuous. These unquestioned convictions are so many extraneous flashes that bedevil the proper illumination that the mind must build up in any project of discursive reason. Everyone should seek to destroy within himself these blindly accepted convictions. Everyone must learn to escape from the rigidity of the mental habits formed by contact with familiar experiences. Everyone must destroy even more carefully than his phobias, his "phillias," his complacent acceptance of first intuitions.<sup>6</sup>

It is clear from this passage, among other things, that Bachelard's project at this time was a full-fledged deconstructionism *avant la lettre*.

There are now two directions in which the Bachelardian work must obviously go - toward the dissolution of the scientific image, and toward the exploration of what this turn uncovers, namely the richness of the material image in its own right, and not just as an obstacle to scientific understanding. What led to the other works on the elements was just the realization, which dawned *after* (but no doubt as a result of) the writing of *La psychanalyse du feu*, that the domain of the imagination has its own constructive materiality<sup>7</sup>. The former direction is taken in *La philosophie du non*, and leads from the image to the concept, not now as a mathematized abstraction but as a postulated object more real than anything merely imaginable. Just as

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<sup>6</sup> Gaston Bachelard, tr. Alan C. M. Ross. *The Psychoanalysis of Fire*. (New York: Beacon Press, 1964), pp.5-6.

<sup>7</sup> Personal communication (see note 3 above). "Quand j'ai écrit le Feu je ne me rendais pas compte du rôle de l'imagination matérielle".

in surrealism (in which Bachelard at this time was deeply interested, to such a degree that Breton called him "the philosopher of surrealism") the domain of the everyday is transcended, by an appeal to the unconscious, towards the poetically marvelous, so in Bachelard's "surrationalism" the familiar image is transcended, by an appeal to critical reason, towards the physically fundamental.

In one way or another what is cut away from the image has to be found in the rectified concept. We could therefore say that the atom is exactly the sum of the criticisms to which its first image has been submitted. Coherent knowledge is a product not of architectonic reason but of polemical reason. By its dialectics and its criticisms, surrationalism in a certain way determines a surobject. The surobject is the result of a critical objectification, of an objectivity that preserves of the object only what it has criticized. As it appears in contemporary microphysics the atom is the very paradigm [type] of the surobject. In its relations with images, the surobject is exactly the non-image. Intuitions are very useful: they are good for destroying. In destroying its first images, scientific thought discovers its organic laws. The schema for the atom proposed by Bohr a quarter of a century ago has in this sense behaved like a good image: nothing remains of it.<sup>8</sup>

(I translate "*surobjet*" as "surobject" rather than as "superobject" to maintain consistency with "surrealism" - and hence "surrationalism" - even though it is a rebarbative term. The use of this prefix in recent thought presents some interesting contrasts: "*Ueberich*" in German becomes "*surmoi*" in French but "superego" in English, which seems right - but if "*surréalisme*" had by the same token become "superrealism" I cannot help feeling that the understanding of the movement would have been very different, perhaps indeed improved.)

But if for science nothing remains of the image, the images that nevertheless remain lose nothing of their poetic value. Since this is the aspect of Bachelard's thought that has become the most familiar, I can afford to dispense with a catalogue of what those

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<sup>8</sup> Gaston Bachelard. *La philosophie du non*. (Paris: Presses Universitaires de France, 1940), p. 139.

images are and concentrate on some problematic aspects, with the remark however that if he had done nothing but identify the species of the material imagination that would have been enough to establish him as one of the century's seminal figures in the domain of poetics. It is perhaps not without significance that this work had its origins in a therapeutic situation, the psychoanalysis of fire described in an earlier citation.

Fire is the least material of the elements, and its elemental status is the most obviously unscientific. If we ask what fire is, the scientific response is quite straightforward: it is the hot and therefore visible gaseous product of an exothermic chemical reaction, usually one of oxidation; and this is as far as it could possibly be from the poetic response, in which it is warmth, passion, domesticity, life. The two poles do not interfere. What this means is that it is relatively easy to perform the required psychoanalysis; we are not really *aux prises* with materiality (indeed as remarked above the material imagination is not in play at the time of *La psychanalyse du feu*). However as Bachelard works through the elements things get stickier, as it were, and by the time of *La terre et les rêveries de la volonté* there is a kind of collision of matter and imagination that seems to compromise the distinction between science and poetry.

... before the spectacle of fire, water, sky, reverie that looks for substance under ephemeral aspects was in no way blocked by reality. We really confronted a problem of *imagination*; it was a matter precisely of *dreaming* a profound substance for the fire, so lively and so brightly colored; it was a matter of immobilizing, faced with running water, the substance of this fluidity; finally it was necessary, before the counsels of lightness given us by breezes and flight, to imagine in ourselves the very substance of this lightness, the very substance of aerial liberty. In short materials no doubt real, but mobile and inconstant, required to be imagined in depth, in an intimacy of substance and force. But with the substance of the earth, matter brings with it so many positive experiences, the form is so evident, so striking, so real, that it is hard to see how to give body to reveries touching the intimacy of matter. As Baudelaire says: "The more positive and solid matter is in

appearance, the more subtle and laborious is the task of the imagination<sup>9</sup>.

The resolution of this conflict is to be found in the admission that the substantiality of earth is just as imaginary as the substantiality of any other elements - that is, material and imagination belong together on the side of poetry, *neither* has anything to do with science. To the question whether images of density, hardness, massiveness, substantiality, etc. tell us anything at all about how the physical world really is, the brutal answer is NO. They tell us about our world, with its vertigo and its viscosity, but not about the world science has to deal with. This doctrine is hard to accept because we want science to be about ordinary objects, not "surobjects" inaccessible to us, or accessible only through the operations of reason, and because as Bachelard says the impression of contact with the real material of things is so strong. But science is under the rule of reason and it *does* compel us to conclude that the physical world is beyond the reach of the material imagination; and Bachelard believes that this conclusion has to be accepted according to what he calls

the cogito of mutual obligation, [which], in its simplest form, should be expressed as follows: I think you are going to think what I have just been thinking, if I inform you of the episode of reason which has just obliged me to think beyond what I previously thought.<sup>10</sup>

What we have to "think beyond" is, once again, the image. It is not just images of materiality that are suspect; in contemporary physics *nothing* is given to the imagination, not even something "hidden" - what there is seems less discovered than invented. In the works of the trilogy "surrationalism" gives way to "applied rationalism," a more modest way of handling the same problem, and the atoms of an earlier citation from *La philosophie du non* have been generalized into particles, but the message, though expressed differently, is by now familiar:

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<sup>9</sup> Gaston Bachelard. *La terre et les rêveries de la volonté. Essai sur l'imagination des forces*. (Paris: J. Corti, 1948): 2.

<sup>10</sup> Gaston Bachelard. *Le rationalisme appliqué*. (Paris: Presses Universitaires de France, 1949), p. 58

Particles are situated at the boundary between invention and discovery, just where we think applied rationalism is active. They are precisely "objects" of applied rationalism. When we studied matter in an attempt to resume it in its four elements, in its four kinds of atom, phenomenology offered seductive images: fire has a spark, water a drop, earth has a grain, air can be felt in the movement of dust. Here, nothing. No natural "corpuscularisation." Nothing, absolutely nothing in common knowledge that could set us on the track of the isolation of a particle. And all the images are deceptive.<sup>11</sup>

By now the point seems sufficiently established. Yet there is something unsatisfactory about it even from the scientific point of view. It is as if, in looking for the truth about the world, which is now to be expressed in formal rather than materially imaginistic terms, we had somehow forgotten that it was there. The parts of the world - its particles - are yielded only by the application of reason and only when I am attending to them with a certain concentration of thought and from a particular point of view. But all the while the rest of the world is there, as it were peripherally; I can't, precisely, be attending to *it*, and yet its being there is a condition of my having anything to attend to in the first place.

In a remarkable paper delivered to a philosophical congress in Lyon in 1939 Bachelard speaks of "the idea of the Universe [which] presents itself as the antithesis of the idea of the object," and introduces the lapidary formula: "The Universe is the infinite of my inattention." The truth about objects has to be complemented by the presence of the world, immediately and globally; our sense of this presence is matter of intuition rather than of knowledge, it comes not from the accumulation of facts but from a kind of phenomenological totalization.

Experience of the Universe, if we admit that this concept has a sense, prepares no multiplication of thought; as far as I am concerned the idea of the Universe immediately and definitely dialectizes my objective thought. It breaks my thought. The *I think the world ends* for me with the conclusion: *therefore I am not.*

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<sup>11</sup> "Et toutes les images sont trompeuses." Gaston Bachelard. *L'activité rationaliste de la physique contemporaine*. (Paris: Presses Universitaires de France, 1951): 87.

In other words the *I think the world puts me outside the world*. Meditate on the other hand on the axiom of the philosopher of the universe: everything is in everything. Listen to him sing, like a poet, his *Einführung* among the forms and the light, the breaths and the perfumes. Look at him in his paradoxical attitude: it is in opening his arms that he embraces the world! But - strange conclusion - this Universe that totalizes all qualities keeps none of them as a specific quality. Or at least if it does keep one one soon sees that it is only the valorization of a reverie.<sup>12</sup>

This is where the image comes back into its own. The quality of the Universe is in effect the quality of the moment of my apprehension of it, not now with scientific concentration but with poetic openness; it is the product of the non-specific awareness that Bachelard calls reverie, waking but not active, alert but not intentional. The image, specifically the literary image, offers us this kind of relation to the world, or rather offers us a new content for it. Literature is significant, and its significance derives in part from its lending new significance to the world. In Bachelard this process goes through three stages, in which the image is first directly signifying, then metaphorical, and finally a creator of its own "unreality." The first is found in *L'air et les songes*:

How can we forget the signifying action of the poetic image? The sign here is not a reminder, a memory, the indelible mark of a distant past. To deserve the title of *literary image* it has to have the merit of originality. A literary image is a sense in the state of being born; the word - the old word - comes to receive from it a new signification. But this is not yet enough: the *literary image* must enrich itself with a *new oneirism*. To signify something other, and to make for other dreams, such is the double function of the literary image<sup>13</sup>.

"To make for other dreams": it is not that we needed the image to have dreams in the first place, to live the reverie that yields the Universe in the mode of presence rather than (scientific) truth,

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<sup>12</sup> Gaston Bachelard. "Univers et réalité," Textes des communications du IIe Congrès des Sociétés de Philosophie. (Lyon, 1939): 63-65.

<sup>13</sup> Gaston Bachelard. *L'air et les songes: Essai sur l'imagination du mouvement*. (Paris: J. Corti, 1943) : 283

but it offers us a renewal of that presence under a different sign. However the relation *between* signs that this originality of the literary image generates is nothing other than metaphor, and some years later, in this passage from *La terre et les rêveries du repos*, Bachelard suggests that poetry gives access through its metaphoric shifts to something like a true dream, a truth of its own:

In all its objects, Nature dreams. From this point, if we faithfully follow the alchemical meditation of a chosen substance, a substance always *gathered* in Nature, we arrive at this *conviction of the image* which is poetically salutary, which proves to us that poetry is not a game, but rather a force of nature. It elucidates the dream of things. Thus we understand that it is the *true metaphor*, the doubly true metaphor: true in its experience and true in its oneiric thrust.<sup>14</sup>

The imagination here, however, is still as Bacon might have said "hung with weights," held down in this as in the other book about the earth (cited above) by the evident reality of the material, convinced by its experience rather than freely adventuring. It is only in the period of the last poetics that the imagination is given a power of its own, liberated not only from the burden of experience but from metaphor itself. Thus in *La poétique de l'espace* Bachelard says:

Academic psychology hardly deals with the subject of the poetic image, which is often mistaken for simple metaphor. Generally, in fact, the word image, in the works of psychologists, is surrounded with confusion: we see images, we reproduce images, we retain images in our memory. The image is everything except a direct product of the imagination. ...

I propose, on the contrary, to consider the imagination as a major power of human nature. To be sure, there is nothing to be gained by saying that the imagination is the faculty of producing images. But this tautology has at least the virtue of putting an end to comparisons of images with memories.

By the swiftness of its actions, the imagination separates us from the past as well as from reality; it faces the future. To the *function of reality*, wise in experience of the past, should be added a *function*

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<sup>14</sup> Gaston Bachelard. *La terre et les rêveries du repos. Essai sur l'imagination de l'intimité*. (Paris: J. Corti, 1948): 323.

of *unreality*, which is equally positive, as I tried to show in certain of my earlier works<sup>15</sup>.

Such a "function of unreality" is clearly incompatible with scientific truth, whose concern must in the end be with the real even if on the way to its formulations it passes through the *philosophie du non*. But it is not incompatible with presence, especially if we construe the *prae* of *praesens* as *temporally* before; the future is axiomatically unreal, but it is the task of the imagination to face it, not in the mode of knowledge and the determination of parts but in the mode of creativity and transcendence towards the whole. So Bachelard quotes with approval these words of Jean Lescure: "Knowing must be accompanied by an equal capacity to forget knowing. Non-knowing is not a form of ignorance but a difficult transcendence of knowledge. This is the price that must be paid for an oeuvre to be, at all times, a sort of pure beginning, which makes its creation an exercise in freedom"<sup>16</sup>.

The poetic presence to the world that is always a pure beginning transcends scientific knowledge but does not thereby belittle or annul it. I revert now to the duality from which I began, between science and poetry, in the light of Bachelard's itinerary. We left the truth about the real, some pages back, in the care of a strictly *unimaginable* but mathematically compelling "applied rationalism," in order to pursue the power of the image towards an immediate presence to being. This presence is characterized in *La poétique de l'espace* as a possession of the subject by the image, as a reverberation that constitutes a "veritable awakening of poetic creation ... in the soul of the reader"<sup>17</sup>. These two extremes--on the one hand mathematics with no image at all, on the other an image that fills the whole space of subjectivity--seem to stand in complete opposition to one another, to have nothing in common. For Bachelard however (as

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<sup>15</sup> Gaston Bachelard, tr. Maria Jolas. *The Poetics of Space*. (Boston: Beacon Press, 1969): p. xxx.

<sup>16</sup> Op.cit., pp. xxviii-xxix.

<sup>17</sup> Op.Cit., p. xix.

for Eddington) they are clearly not opposites but complementaries. It may be helpful in closing to consider their complementarity through the mediation of language.

Language is a common resource of science and of poetry, but the roles it respectively plays in them illustrate at once their separation and their continuity. Language--the language of logic and of mathematics--is the only medium we have for representing the truth about objective physical reality, inaccessible as it is to the imagination. On the other hand language is incapable of representing the immediacy of presence, which is yielded only by the imagination, although in poetry it can as it were prepare the imagination for presence. Language, in Heidegger's terms, is "the house of Being," by which we are to understand that if we make (*poiein*) a place for being, by means of poetry, Being may come to dwell in it. Presence to Being however is not linguistic, it is not the same as presence to poetry - the latter is merely propaedeutic to it. Bachelard seems to have had an independent understanding of this in his doctrine of the reverberation of the poetic image, the image that "has touched the depths before it stirs the surface"<sup>18</sup>.

These two functions--the discursive ground of science that is constituted by language and the unspoken intentionality of poetry that is prepared by it--are both eminently human functions. The subject does not vacillate between them but occupies their intersection, an intersection that is not a point but a place, the place where our life, with all its scientific complexity and poetic intensity, takes place. What Bachelard reminds us, in his person no less than in his writings, is that the complexity and the intensity are departures from, and equally rooted in, the familiar materiality of the simple image; that, given a willingness to do the necessary work, whether rational or imaginative, scientific truth and poetic presence are both accessible, to postmen as to philosophers.

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<sup>18</sup> Ibid.