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**José Leite Lopes: *in memoriam***

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**José Leite Lopes: *in memoriam***<sup>1</sup>*F. Caruso*

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On June 13th of 2006, Brazil found itself intellectually impoverished, with the immeasurable loss of one of its greatest scientists, physicist José Leite Lopes, born in Recife on October 28th, 1918.

In his extensive scientific career, Leite Lopes was interested in a variety of subjects. Among them, the study of the electron and its interactions stands out, as the topic that was offered to him by Mario Schenberg in the beginning of his career. Also noteworthy was the attempt to unify the weak interactions, responsible for radioactivity, and the electromagnetic ones. In 1958, the prestigious magazine *Nuclear Physics* published the first correct evaluation of the mass of vectorial bosons. In this paper, Leite presents the hypothesis that there could be a neutral particle – 40 to 60 times heavier than the proton – mediating weak interactions, in much the same way as the photon mediates electromagnetic interactions. This conjecture, which was made, according to his own words, through the search for beauty in the laws of nature, was made ahead of its time and was a very important step towards the unification of electroweak interactions, which was remembered by Steven Weinberg in the Nobel Lecture of 1979.

Leite completed his doctorate at Princeton with Wolfgang Pauli and, roughly one decade later, worked with Richard Feynman, both of whom are Nobel laureates in Physics. The academic recognition he received for his work can be attested by the honorary titles bestowed upon him by five institutions and a range of awards accumulated in his lifetime, some of which deserve special mention: the Carneiro Felipe Medal from Brazil's National Commission of Nuclear Energy (1988); the *Ordre des Palmes Académiques* (1989) and the *Ordre National du Mérite* (1989) from the French Government; Álvaro Alberto National Science Award (1989), the Mexican Science & Technology Award (1993) and the UNESCO Sciences Award (1999).

Nevertheless, the true dimension of our loss does not lie here. I was reminded, thus, of Icilio Guaraschis words regarding the great Amedeo Avogadro: “*a man's great merits should not be measured by the intrinsic value of his work, but by the influence it had on his contemporaries and, above all, on the future of science.*” This is the real dimension of the great scientists and it is, deep down, this dimension that will make everyone miss this great protagonist of Brazilian culture.

If I had to choose one adjective to describe him, it would be *passionate*. His passion was transcendental: it far surpassed the frontiers of Science, spreading out to Education, Culture, Arts and, it can be said, to women and to life. This was the passion that always nourished

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<sup>1</sup>This is a slightly different English version of the obituary of José Leite Lopes published by the Brazilian newspaper *Folha de São Paulo*, Ano 86, n. 28.195, Seção “Ciência”, in July, 13th, 2006, p. A14.

his vivacious, contagious intellect. It was the engine propelling his complete, lifelong dedication towards the creation of an environment conducive to scientific development in Brazil, of a country that brought justice for all, even if that often meant showing strong opposition to authority. In this respect, Leite had a spirit reminiscent of the great Italian thinker, Giordano Bruno, who wasn't afraid to confront the powers that be, the arbitrary measures, the maintenance of the status quo, or any measure that would be used to stand up for truth, science and change.

His humanity was reflected in all of his accomplishments: in his constant concern for the scientist's ethical and social role in society, in the scientific education of young people, in his painting, in the way he felt moved when he recited Rilke in German, or when he spoke about love. He left us all a cubist self-portrait in the book *Idéias e Paixões* (Ideas and Passions), published by CBPF in 1999.

As a youth, Leite was lucky to have found an excellent teacher, who served as role model during his whole life. This great mentor, Luiz Freire, was greatly admired and respected by the young José and it was his educational spirit that was imprinted in the boy in such a way that time was unable to undo this influence.

For the entire duration of his career as a professor, which began at the age of 27, having been nominated Professor of Theoretical and Higher Physics at the Faculdade Nacional de Filosofia in Rio de Janeiro, Leite was also concerned about the quality of the education that was passed down to the students. For him, teaching and research were inextricably linked. For example, in 1960, he organized the 2nd Latin-American school of Physics in Rio de Janeiro and proposed to the Ministry of Foreign Affairs and to UNESCO the creation of a Latin-American Physics Center, which did in fact come to fruition. Between 1962 and 1964, he was the organizer behind the Physics Institute of the newly created University of Brasília, as well as its coordinator, and he accepted the challenge of implementing, with many of his colleagues, a new university, different from anything that had ever been attempted in Brazil. Sadly, this endeavor was cut short by the military coup. Leite was always thinking about education and the role that the scientist played in society, a fact that can be attested by his many publications on these issues. Indeed, he was the author of 22 books, among which one will find a number of textbooks as well as other books with his perceptions regarding Science. He also wrote about a hundred articles on education and scientific policy.

Another of Leite's continuous efforts, one which influenced many colleagues and future scientists, involved placing the country at the forefront of scientific research. In this regard, in 1949, with the support of Minister João Alberto Lins de Barros, of Nelson and Henry British Lins de Barros, Leite was one of the founders of CBPF (the Brazilian Center for Research in Physics), alongside Cesare Lattes and others. At CBPF, Leite occupied a number of positions of responsibility and scientific administration positions.

After being forced to retire from UFRJ (the Federal University of Rio de Janeiro) in 1969, due to the governmental decree based on AI-5, Leite was a visiting professor at the University of Pittsburgh in the academic year 1969-1970. Later, having been laid off from CBPF due to a presidential decision, he was visiting professor at the University of Strasbourg I, Université Louis Pasteur, between 1970 and 1974. The year he arrived, he founded along with Michel Paty and others the seminars on the Foundations of Science, which later formed the basis of the journal *Fundamenta Scientiae*, which unfortunately no longer exists. After a brilliant career in France, Leite returned to Brazil in 1981 to the Center he had founded, but his return was short-lived. It was only in 1986, after being offered a position of director CBPF by Renato Archer – then Minister of Science and Technology – that Leite returned to Brazil for good.

At the end of his term, Leite's time was spent giving conferences, painting and writing his memoir. More information regarding his works can be found in his virtual library (<http://www4.prossiga.br/Lopes/>).

This small tribute is not up to par with what Leite deserves – partly, I admit, due to the strong feeling of loss – but, above all, because it cannot reflect the pleasure of having spent time with Leite Lopes, sharing in his contagious idealism and enthusiasm, which seemed everlasting. And everlasting they are, in fact. Another of Leite's legacies is one of the most important archives on the History of Science in Brazil, which is found in its entirety due to the prompt and brave intervention of Sérgio Joffily, his former assistant, in difficult times. Above all, however, Leite's legacy is found in the hearts of everyone he met due to the example he set: we will all sorely miss this honest, generous, critical, perceptive, ironic, restless and, above all, passionate human being.