

ArtScience: The Essential Connection

ANDRE LWOFF: A MAN OF TWO CULTURES

Andre Lwoff (1902–1994) received the Nobel Prize in Physiology or Medicine in 1965 along with his two colleagues Jacques Monod and François Jacob for their discovery of feedback inhibition as a form of metabolic control in bacteria. Lwoff spent most of his career as Director of Microbial Physiology at the Institut Pasteur in Paris, moving to the Cancer Research Institute in Villejuif in 1968. He loved the south of France and had a summer home (an ancient fortress called the “Mas Guillaume”) in Banyuls on the Mediterranean Sea, where he often spent time painting. In 1972, he retired there to paint full time [1].

Lwoff’s interest in arts came naturally, as his mother was a sculptor and painter [2], and it is likely that he acquired an interest in, as well as some skill at, drawing and painting as a child. He did not, however, develop his talents until middle age, focusing his early efforts on developing his scientific career.

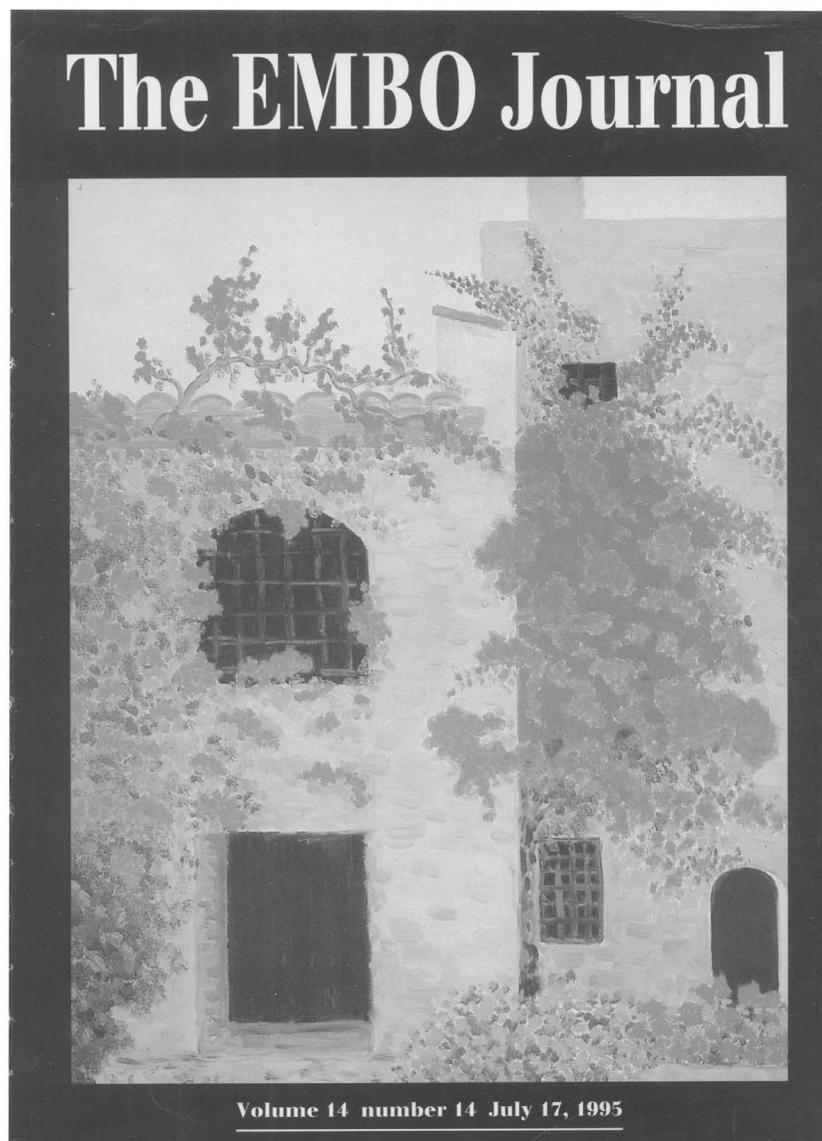
Lwoff was fortunate in finding, at the age of 19, the perfect scientific and artistic mentor in Edouard Chatton (1883–1947), a zoologist who specialized in pathogenic microorganisms. The two men eventually published 55 papers together. As a younger colleague has commented, “‘Master’ and ‘pupil’ had in common perseverance in their scientific work, conception and observation, a critical sense and rigor but also a great artistic sensibility that painting and drawing in the exceptional surroundings of Banyuls-sur-mer . . . fulfilled” [3]. Indeed, all of Chatton’s students remarked on the extraordinary illustrations that accompanied his lectures: Chatton took the time to paint color portraits of all of the major microbes and their diagnostic features on large boards that he displayed at the front of the class. Students were expected to copy these, but few achieved the beauty and precision of the originals. Under Chatton’s tutelage, however, Lwoff at least became “enchanted by the

beauty of the forms he discovered under the microscope” [4].

The search for elegance and beauty was an essential component of the method that Lwoff learned at Chatton’s hands. Lwoff wrote that one of the rea-

sons he became a microbiologist rather than, say, a physicist, was that “I do not like either mathematics or statistics. . . . I like to see things, not calculate probabilities” [5,6]. Seeing things meant, as his colleague Jacob relates, that “he liked

Fig. 1. Andre Lwoff, *Summer House, le Mas Guillaume, undated*, cover of the *EMBO Journal* 14, No. 14 (1995) <www.nature.com/emboj/index.html>. Reprinted by permission of Macmillan Publishers Ltd. Lwoff’s colleague Agnes Ullmann notes, “This was the first time that John Tooze [Editor of the *EMBO Journal*] agreed to put something non-scientific on the cover of the journal” (personal communication 13 January 2009). Subsequently, *EMBO Journal* covers have featured the artwork of dozens of artistic scientists.



to work by himself, with his own hands, helped by his wife, Marguerite . . . For him, science was an affair of the senses” [7]. Indeed, so important was this sensual approach to his material that Jacob goes on to say, “Science he practised as an artist; indeed, he was above all an artist” [8]. The same sentiment was echoed by another of Lwoff’s collaborators, Agnes Ullmann: “Lwoff . . . was, above all, an artist. As Jacques Monod noted, he revealed the same talents in every domain: elegance, sensibility, precision, finesse, freedom; in a word, style” [9].

Related to this artistic approach to science, Lwoff also cultivated an unusual method of “working by intuition” [10] rather than by reason or theory. “That which is important, as much for art as for science, is intuition,” Lwoff wrote, “but neither can one ignore inspiration and chance, which are of great importance especially to the scientist” [11]. This intuitive methodology tied together art and science for Lwoff: “The creator always obeys intuition. When it produces in me the explosive need to paint, it is stronger than I” [12]. Thus, just as he let intuition guide his experimental work, he also let it guide his painting: “In making a painting, I never reflect. It is my spontaneity, my sensation, my feelings, that guide me to such or such an expression. There is no theory that intervenes. . . . There is no preceding thought” [13].

It is not clear what changed an occasional hobby into a passion, but at the age of 57, six years before he won his Nobel Prize, Lwoff discovered that art was not something that he could ignore [14,15]. In the words of Ullmann, “He was encouraged by a friend of his, Marcelle Wahl, who was a physician and painter. He realized his first still life in her studio. From then on, he never stopped painting” [16]. He exhibited his paintings professionally, primarily through the Parisian Gallerie Aleph, where he had major shows in 1978 and 1985 [17,18]. In some cases, he also sold his paintings in aid of Soviet dissidents or the Pasteur-

Weizmann Council [19]. Many of his friends and colleagues bought paintings, and the Institute Pasteur, where he worked for so many years, retains at least one as a reminder that Lwoff was more than just a scientist.

For Lwoff, being an artist as well as a scientist was not something extra; it was what made life worth living, what made him a complete person. “It [art] is that which has helped me to love life more” [20]. Indeed, his colleagues often described him as being a “man of great culture and great refinement” [21]. As an individual with utmost respect for words and their histories, Lwoff thought long and hard about what such a refined, cultured person should be. His answer, in his own words was,

To be cultured is . . . to apprehend the unity of human creations, to assimilate “globally” in the sense of Andre Malraux, or “ascendantly” in the sense of Roger Caillois, that which is the essential or essence of civilization. To be cultivated is to integrate the diverse constitutive elements of cultural taste and to construct a system of retrospectives that will be an instrument to effect judgment and taste. It is hardly possible to conceive of a cultivated person insensible to the creative art of symbols and beauty, the universal art that transcends particular civilizations and that confers on culture its unity, which is to say its generality. . . . A person—artist, writer, scientist—whose knowledge is limited solely to his professional activity and who would not therefore have a right to be called a cultured person could nonetheless be the creator of original works or new concepts that are elements of knowledge and of culture. One could thus be a creator of cultural value without being a cultured person [22].

Lwoff succeeded in being both a creator of cultural value and cultured—no easy feat.

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References

Unedited references as provided by the author.

1. Lwoff A. Autobiographical note, <http://nobelprize.org/nobel_prizes/medicine/laureates/1965/lwoff-bio.html>.
2. Soyer-Gobillard, M-O, 2002. Scientific research at the Laboratoire Arago (Banyuls, France) in the twentieth century: Edouard Chatton the “master”, and Andre Lwoff, the “pupil”. *International Microbiology* 5: p. 37.
3. Soyer-Gobillard [2] p. 37.
4. Lwoff A. 1965. Interaction among virus, cell and organism. Nobel Prize Lecture, <http://nobelprize.org/nobel_prizes/medicine/laureates/1965/lwoff-lecture.html>.
5. Lwoff A. 1966 In Cairns, J., Stent, G.S. and Watson, J.D. (eds), *Phage and the Origins of Molecular Biology*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press, pp. 80–99.
6. Jacob F. and Girard M. 1998. André Michel Lwoff. 8 May 1902–30 September 1994. *Biographical Memoirs of Fellows of the Royal Society* 44, p. 261.
7. Jacob and Girard [6] p. 261.
8. Jacob and Girard [6] p. 261.
9. Ullmann A. 1995. Andre Lwoff (1902–1994): remembrances. *The EMBO Journal* 14 (14), p. 3291.
10. Jacob F. 2002. Andre Lwoff. Celebrations nationale. Ainay-le-Château (Allier), 8 mai 1902–Paris, 30 septembre 1994, <www.culture.gouv.fr/culture/actualites/celebrations2002/lwoff.htm>.
11. Pavlovic R. 2006. *La pensée creative et scientifique contemporaine. Entretiens, essais et discours. Tome I 1979–2003*. Colomars: Melis Editions, p. 87.
12. Pavlovic [11] p. 92.
13. Pavlovic [11] p. 91.
14. Pavlovic [11] p. 87.
15. Pavlovic [11] p. 92.
16. Ullmann [9] p. 3290.
17. Soyer-Gobillard [2] p. 42.
18. Soyer-Gobillard M-O, Schrevel J. 2003. André Lwoff (1902–1994), Nobel Prize of Medicine, as protistologist. *Protist*, Vol. 154, p. 468.
19. Ullmann [9] p. 3290.
20. Pavlovic [11] p. 92.
21. Jacob [10].
22. Lwoff A. 1981. *Jeux et Combats*. Paris: Fayard, p. 252.