Letter from the Editor

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Arthur Rimbaud, in a famous letter to Paul Demeny dated 15 May 1871, wrote that the poet must *être voyant, se faire voyant* (be clairvoyant, to make oneself clairvoyant) : this is the only way to arrive à *l'inconnu, et quand, affolé, il finirait par perdre l'intelligence de ses visions, il les a vues!* (to the unknown, and even if, terrified, he ends up losing the intelligence of his visions, at least he will have seen them).

It might seem as undue as audacious to set the name of the author of the *Illuminations* alongside that of Henri Poincaré (in spite of the fact, a negligible coincidence, that both happened to be born in 1854). Yet, outward appearances notwithstanding, it must be recognised that Poincaré was an innovator and a visionary, one who transformed the mathematics of his day in a way that was no less profound than the way Rimbaud transformed poetry. Poincaré too, though obviously without blatant excess or intemperance, was an iconoclast.

Paul Appell recalled that when Poincaré was a student at the École polytechnique, his clairvoyant reasoning and conviction that evidence was beside the question was quite irritating to his examiners. Similarly, when he defended his doctoral thesis on 1 August 1879, Poincaré's 'geometric interpretations' perplexed the members of his thesis committee. In their report they wrote, 'the author is not yet able to express his ideas in a clear and simple manner'. To the request of the committee to rework part of the dissertation in order to render it more accurate and legible, the young aspiring mathematician answered without mincing words that he had 'many other ideas in his head'.

Poincaré made originality a *modus operandus*. He expressed this in a letter to Gösta Mittag-Leffler written in February 1899:

J'ai l'habitude, quand je lis un mémoire, de le parcourir rapidement de façon à me donner une idée de l'ensemble et de revenir ensuite sur les points qui me semblent obscurs. Je trouve plus commode de refaire des démonstrations que d'approfondir celles de l'auteur. Mes démonstrations peuvent être généralement beaucoup moins bonnes mais elles ont pour moi l'avantage d'être miennes [4, pp. 194–195 (Letter 80)].

(When I read a memoir, I have the habit of first running through it quickly so as to get an idea of the whole, and then returning to the points which seem obscure to me. I find it more convenient to redo the proofs rather than going into those of the author. My proofs may be much inferior in general, but for me they have the advantage of being mine.)

Poincaré's capacity to rethink a problem *ab ovo*, without preconceptions, and his formidable gifts of intuition and imagination were certainly determining factors for his extraordinary mathematical creativity. However, not less relevant was his own particular vision of mathematics, which stood in clear contrast to the dominant formulation of his day. In *La science et l'hypothèse* we read:

Les mathématiciens n'étudient pas des objets, mais des relations entre les objets; il leur est donc indifférent de remplacer ces objets par d'autres, pourvu que les relations ne changent pas.

Mathematicians do not study objects, but the relations between objects; to them it is a matter of indifference

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if these objects are replaced by others, provided that the relations do not change [3; Eng. trans. p. 25].

This concept allowed him to take advantage of the powerful instrument of analogy, which is capable of revealing *l'harmonie cachée des choses* (the hidden harmony of things' [2, p. 336], to jump with incredible dexterity from one area of mathematics to another, without merely using old instruments in new contexts, but successfully reinventing them each time in unexpected perspectives.

To say that Poincaré was a scientist ahead of his time would clearly be a sesquipedalian bit of foolishness. While many of his most visionary intuitions—from the theory of chaotic dynamical systems to algebraic topology—would indeed have to wait even decades to be accepted by the scientific community, that constituted only a marginal phenomenon of latency, due to a set of aggravating circumstances that we needn't analyze here. At a century from his relatively early demise, this great innovator has become in all senses a 'classic', just like Rimbaud. A classic in this sense is one we never tire of reading, not only because we marvel at the beauty of his inventions, but because, to use the words of Italo Calvino [1], he 'has never finished saying what he has to say'.

Translated from the Italian by Kim Williams

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Author Biography

Claudio Bartocci is associate professor of mathematics at the University of Genoa. His research interests are focused on the following topics: algebraic geometry and mathematical physics, history of the mathematical thought in the nineteenth and twentieth centuries, philosophy of mathematics. His recent books include: *Una piramide di problemi* (Raffaello Cortina, Milan, 2012); *New Trends in Geometry: Their Role in the Natural and Life Sciences*

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