

Dan Barbilian/Ion Barbu: mathematician and poet

Abstract: Barbilian, born in Romania in 1895 and already writing for the *Gazeta Mathematica* at age 15, started a PhD in Göttingen in the era in which Hilbert was the dominant figure there. During the 20s Barbilian adopted the pen name Ion Barbu and published poetry which has entered the canon of Romanian literature. Returning to mathematics at the end of the decade, he completed his PhD and joined the faculty at the University of Bucharest, where he remained for the rest of his career, establishing a name in geometry and algebra. Both during his time as an active poet and later he sought to explain the connection he found between these two creative outlets. We examine the role translation plays in revealing the mathematics in his poetic creativity and consider whether his mathematics and poetry provide a test case for inter-semiotic translation.

Introduction

This has been one of the more unexpected projects I have been involved with in my academic career. As a prospective PhD student, Loveday Kempthorne came to explain the project she wanted to work on. A graduate with majors in mathematics and French literature, a Master's degree in International Relations, she now has a career with the Ministry of Foreign Affairs and Trade. Having been posted to Warsaw she has good knowledge of the Polish language and literature. And married to a Romanian has added a further European language. Her interest in Polish literature in particular had brought her into contact with the Translation Studies programme at Victoria, led by Marco Sonzogni.

Her project: Loveday wanted to study several modern (in the humanities' sense of "pre-post-modern") European poets who had in some way or another been influenced by or involved in mathematics. Specifically, she mentioned Stephane Mallarmé, the French symbolist, the Polish poets, Zbigniew Herbert and Czeslaw Milosz – a Nobel prize-winner – Velimir Khlebnikov, the Russian Futurist, and the French experimental group Oulipo (Ouvroir de littérature potentielle) whose members included poets and mathematicians, notably Jacques Roubaud - also a member of Bourbaki and who, incidentally was at the Auckland Writers Festival in 2014 discussing his recently translated novel "Mathematics", a semi-autobiographical account of his seduction into mathematics and Bourbaki.

And, finally, Loveday asked had I heard of Barbilian spaces? I had to admit I had not. Ah, well, she explained, Dan Barbilian was a Romanian mathematician of the 20th century who was also a poet, renowned in Romania writing under the name Ion Barbu.

Over the following three years, Loveday explored in depth three of these poets, the two Poles and Barbu. Marco and I acted as co-supervisors. What role had mathematics played in their poetry and how did this fit into the intellectual and political milieu of 20th century Europe?

Marco suggested the possibility of viewing their work through the lens of "inter-semiotic translation". As motivation for this approach, the leading 20th century literary theorist Roman Jakobson had, in his first major work, explored the poetry and creative activities of Khlebnikov who had studied mathematics at Kazan University and who sought to connect poetry to other artistic and intellectual forms including dance and mathematics. In a seminal essay on translation, written in 1959, Jakobson classified three types of translation:

intra-lingual, inter-lingual and inter-semiotic. The first concerns “rewording in a given language”, the second, which we would probably regard as ‘true translation’ concerns translation between languages and the last concerns ‘transmutation’ shifting between sign systems such as music, cinema, dance etc.

Of course, there are already fascinating inter-lingual translation challenges in converting poetry between languages. So perhaps the goal of an inter-semiotic translation in which mathematics forms one node is more than we could hope to achieve. In any case, this talk presents primarily Loveday’s vision, refracted by Marco’s prism and thoroughly distorted by my own.

Barbilian/Barbu

Dan Barbilian was born in Câmpulung, a city in the Carpathian Mountains of central Romania, in 1895. By the age of 15 he had entered high school in Bucharest and had discovered a passion for mathematics, leading him to write articles that appeared in the *Gazeta Matematică*, Romania’s leading mathematical publication of the time. He went to the University of Bucharest but his studies were interrupted by the war and he eventually graduated in 1921. By this time, Barbilian had discovered in himself an equal passion for poetry. He contributed to a literary magazine founded by a friend, [Sburătorul](#), adopting an ancestral form of his family name, Ion Barbu (in fact his grandfather’s name). In the same year 1921, his first volume of poetry was published, *După melci* (After Snails), and these poems, the titular one especially, have entered the canon of Romanian literature. The poems have been set to music, illustrated and animated – examples perhaps of inter-semiotic translation.

In the literary milieu of post-war Bucharest, Barbu started using narcotics (which may have had a more beneficial impact on his poetry than his mathematics). Nonetheless he retained the desire to progress in both domains. He was admitted, also in 1921, to the University of Göttingen, where he intended to study number theory under Edmund Landau. While he failed to complete his thesis there, his lecturers, especially of course Hilbert and Noether, and the people he met, like the great geometer Blaschke, had a profound influence on him. Friends included Emil Artin and Helmut Hasse. Returning to Romania in 1924, he continued to work as a poet, as well as reflecting on the relationship between poetry and mathematics.

Several leading mathematicians have noted the likenesses of mathematics to poetry: Russell, for example, wrote

Mathematics, rightly viewed, possesses not only truth, but supreme beauty – a beauty cold and austere [...] The true spirit of delight, the exaltation, the sense of being more than [hu]man which is the touchstone of the highest excellence, is to be found in mathematics as surely as poetry.

Weierstrass is quoted (in translation) as saying: “It is true that a mathematician, who is not somewhat of a poet, will never be a perfect mathematician”. And Kronecker observed: “Are not mathematicians veritable and innate poets? Indeed, they are, just that their representations ought to be demonstrated”. Yet few have taken this as literally as Barbu. He said in an interview, published in 1927:

I consider myself more of a practitioner of mathematics and less of a poet, and that only insofar as poetry recalls geometry. No matter how contradictory these two terms might seem at first sight, there is somewhere in the high realm of geometry a bright spot where it meets poetry.

Just as 1921 marked a year of significant development for Barbilian as mathematician and poet, so 1929-1930 was another milestone. Barbilian had enrolled to complete his doctoral studies back in Bucharest under the tutelage of geometer Gheorghe Tzitzieca, a former student of Darboux. His 1929 thesis was on finite groups associated to hyperelliptic functions. Then in 1930, his second published volume of poetry, titled *Joc Secund*, appeared. Several of the poems had appeared previously elsewhere but Barbu envisaged the volume as a whole and paid particular attention to the order of the poems. Literally, *Joc Secund* translates as “Second game”. But it has variously been translated as “Mirrored Play” or “Counter Play” – perhaps ‘art mirroring life’ or the Platonic conception of mathematics weakly reflected in reality? The poetic style he described as hermetic, reflecting a characteristic has had previously ascribed to Gauss (in an essay written in 1955):

I have noted Gauss’s hermeticism in his theorems. This derives from a particular concept in art theory, by which Gauss sees that a wise text, like an inscription, is brief and it is this that guarantees its durability.

This volume constituted Barbu’s last published poetry. He took up a permanent academic position in Bucharest that year. *Joc Secund* is suffused with mathematical allusions or images. Whether these are reflected in English translation depends much on the leanings of the translator.

The first poem, which gives the book its title, itself has no title and Barbu simply referred to it by its opening phrase [din chass dedus]:

Din ceas, dedus adâncul acestei calme creste,
Intrată prin oglindă în mântuit azur,
Tăind pe înecarea cirezilor agreste,
În grupurile apei, un joc secund, mai pur.

Nadir latent! Poetul ridică însumarea
De harfe resfirate ce-în sbor invers le pierzi
Și cântec istovește : ascuns, cum numai marea,
Meduzele când plimbă sub clopotele verzi.

My Romanian is almost wholly lacking so I defer to the translation of Băjenaru:

From time, deduced the depths of this calm crest
Entering through the mirror the redeemed azure,
Cutting on the sinking of the great rustic herds,
In groups of water, a second game, more pure.

Latent Nadir! The poet lifts up the sum
Of harps dispersed you lose in inverse flight
And song exhausts: hidden as only the sea hides
Medusas as they walk underneath the green chimes.

Barbilian’s mathematics

Barbilian published of the order of 60 mathematical works in his lifetime. While not among the first order of research in its time, some of his ideas have gone on to bear fruit in the work of others.

Two papers are frequently cited as being his most influential. One was a short piece that appeared in 1934, “Einordnung von Lobatschewsky’s Maßbestimmung in gewisse allgemeine Metrik der Jordanschen Bereiche” (A classification of Lobachevski's measurement in certain general metric of Jordan type regions). In this he introduced in a

convex planar region with boundary the new metric ... In the case that the region is a circle (ellipse?) he showed that the resulting geometry is that of Lobachewsky et al. Blumenthal later called these Barbilian spaces and, following an article in the American Mathematics Monthly, wrote that he had intended to pursue a project extending this work with Blaschke, but it eventually came to little.

This paper was wholly geometric but Barbilian was passionate about algebra and also much driven by Hilbert's axiomatic approach. This led him to develop further some work of the Danish mathematician Hjelmslev – perhaps he was also familiar with Hjelmslev's transformation of the hyperbolic plane? – who had studied modules over the dual numbers in order to explore projective geometries in such a setting: Hjelmslev spaces. Barbilian's two papers "Zur Axiomatik der projectiven ebenen Ringgeometrien" (On the axiomatics of plane projective ring geometry) seek to determine the limits to which one can weaken the algebraic properties of the ring and still build some reasonable form of geometry, albeit one rather different from projective geometry over fields. In commenting in the introduction on the oddity of these spaces, he remarks, unexpectedly, "Just as in aesthetics the extremely lyrical is considered anti-poetic, so we can justly describe the extreme Ideal as anti-geometric".

Are there echoes of Barbu's poetry in his mathematics? Personally I find some resonance between them. The reflective world of the "second game" seems somehow to find itself constructed mathematically in Barbilian's Apollonian spaces. In a more certain mode, Barbilian himself reflected on what he was trying to achieve in his poetry. In 1940, he wrote:

I consider myself an adherent of the Erlangen Programme in the sense of a logical system of ideas, and holistic points of view. [...] Mathematical research can lend its organisational characteristics to poetry, whereby disjointed metaphors take on a universal sense. Similarly, the axiomatic foundations of group theory can be assimilated into a larger moral concept of a unified universe. Without this, mathematics would be a laborious Barbary

Conclusion:

Solomon Marcus, a mathematician who has done much to build on Barbilian's marrying of 'the two cultures', noted "Ion Barbu left ineffaceable traces on Dan Barbilian and vice versa: Ion Barbu's work is incomprehensible without grasping the essence of Dan Barbilian's thinking and work".

In a letter from Barbu to fellow poet, compatriot and lover Nina Cassian in 1947, he wrote:

Do you not think, dear poet, that inventive poetry, in which a certain Ion Barbu tried to establish himself, is after all impure poetry: for had he done mathematics then (as he does now) his poetry would have gained in clarity; and would have put inventiveness into theorems and perfection into verse.

Coda

In a poem unpublished in his lifetime but later appearing in original Romanian in 1969 and, translated by Sarah Glaz and JoAnne Growey, in the Mathematical Intelligencer in 2006, Barbu expressed in both twisted and somewhat whimsical terms an affection for Göttingen and in particular Emmy Noether.

UT ALGEBRA POESIS (AS ALGEBRA, SO POETRY) For Nina Cassian
In my young days I strolled the lanes of Göttingen -
Where Gauss, beneath arched canopies of leaves,

Sealed once for all the vaults of higher geometries -
And curved a poem towards its last quatrain.

For easy Eden I scorned the learned muse
And nights without restraint unravelled me
As they drew forth a hook-nosed, exposed Eve
With hobbling gait and writing style abstruse.

I failed to see the transience of genius. The guilt is mine...
But for the Second Coming I watch and am prepared
To turn the magic helmet against my fevered head.

And algebraist Emmy, both common and divine,
Whose priest and standard-bearer I would dare emerge,
Surpasses Nina – transcendental and indescribably fair!

Loveday was able to visit Nina Cassian in New York in 2013 (less than a year before she died aged 89). She recalled how Barbu had influenced her own poetry through the medium of mathematics and though she rejected the idea that her own writing was mathematical – open to dispute in some senses if you read her poem *The inclined plane*.