<u>Book Review</u>

Strange Attractors: Poems of Love and Mathematics

Reviewed by J. M. Coetzee

The highest type of intelligence, says Aristotle, manifests itself in an ability to see connections where no one has seen them before, that is, to think analogically. The spark of true poetry—according to one influential school of poets—flashes when ideas are juxtaposed that no one has yet thought of bringing together. Scientific discoveries often start with a hunch that there is some connection between apparently unrelated phenomena.

So there are a priori grounds for thinking of poetry and mathematics together, as two rarefied forms of symbolic activity based on the power of the human mind to detect hidden analogies. In other words, an anthology like *Strange Attractors*, which brings together a hundred and fifty poems with some degree of mathematical content, makes more a priori sense than, say, a collection of famous speeches with some mathematical content.

There is a further, more mystical argument that poetry and mathematics belong together (have an analogical relation). Among poets there are some who believe that, the mind being part of nature, certain operations of the mind—not necessarily the most rational operations—allow us insights into nature that are essentially *true*. And in Western science there is a tradition going back at least two and a half millennia that sees mathematics ("Number")

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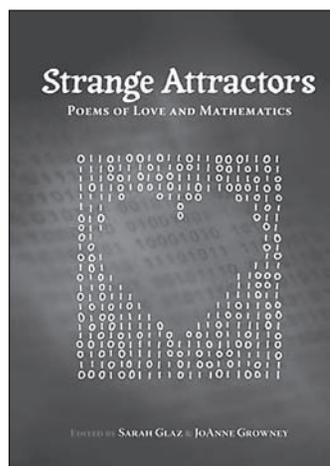
as inhering in the universe: when we speak mathematics, we speak *the* universal language.

The question of how exactly poetic thinking diverges from mathematical thinking has seldom been attacked by poets in their poetic work. Wordsworth treats the question glancingly in his long autobiographical poem "The Prelude", where, as a creative person self-confessedly haunted by the question of how the creative mind works, he contrasts poetry, whose truths somehow inhere in the world, with mathematics as an "independent world, / Created out of pure intelligence".

A third parallel between poetry and mathematics has to do with elegance. Just as there are poets who will wrestle for months to get an insight down on paper in its most jewel-like form, because to them the truth of the poem is inseparable from its expression, so there are mathematicians who believe that, if a given proof is lengthy and messy, then, no matter how ironclad its logic, there must be a better proof—briefer, more elegant—waiting to be uncovered.

The subtitle of *Strange Attractors* is "Poems of Love and Mathematics", a phrase whose ambiguity is probably deliberate. In their brief introduction, the editors claim, not strictly accurately, that the common theme linking the poems they have selected is love; they interpret love broadly to include not only romantic love, familial love, love of nature,

and love of life, but also "the love that focuses on mathematics and mathematicians."

The natural sympathies between love and mathematics are most easily felt if you are, say, a Christian poet with mystical leanings, like Dante. Dante is represented in the anthology by a passage from the end of the *Paradiso* in which he summons all his mental powers to comprehend the torrent of love pouring forth from a divine creative Mind whose order of intelligence is infinitely above his own. Failing in that attempt ("mine were not the wings for such a flight"), he turns away, only to be pierced, suddenly, with a great flash of light: for an instant he is at one with "the Love that moves the sun and the other stars."

An anthology is by definition not a unity. Though it inevitably expresses the tastes of its editors, it is not required to have an argument. Taken together, the poems in *Strange Attractors* make no unified statement about love, about mathematics, or about the relations between love and mathematics. The following comments thus deal not with the collection as a whole but with a handful of its more outstanding constituents.

The Israeli poet Yehuda Amichai writes a soberly moving poem based on the notion of our life story as a book of problems to be solved—for example, "A man…leaves from place A, / and a woman…leaves from place B. When will they meet, / will they meet at all, and for how long?" Only late in life, when we come to the end of the book, do we get to see the page of answers and discover "where I was right and where I went wrong."

In "The Accounting" Jon Davis contrasts the experience of completing a tax return, as a kind of bare-bones reliving of a year, with the vivifying allure of the erotic. Davis is only one of several poets, among them the Chilean Pablo Neruda, who see counting in general (not just accounting) as a way of imposing an artificial and even deathly order on reality. Thus, despite her whimsical tone, Mary Cornish is steely in her opposition to a Platonic realm of pure Number. Numbers can only be referential, says her poem "Numbers". Forty-seven divided by eleven leaves a remainder of three—not three in the abstract but "three boys beyond their mother's call, / two Italians off to the sea, / one sock that isn't anywhere you look."

Poems like these, hostile to the purity of pure mathematics, are counterbalanced by what one might call Pythagorean poems, in which mathematical entities belong to a higher reality. The prime numbers in particular seem to follow mysterious laws of their own, laws to which human beings have no access (see Helen Spalding's "Let Us Now Praise Prime Numbers").

Len Roberts writes a powerful piece about children in a third-grade arithmetic class, learning to manipulate numbers, unaware that those very numbers, manifested in seconds ticking by, will rule their destinies.

In "Mathematician" Alissa Valles explores a character type not uncommon in the profession: wary or even timid in its emotional dealings, limiting its energies to scanning the life around it for regularities. Can such people be rescued, Valles implicitly asks, or are they simply not wired for human connection?

Roald Hoffman, a Nobel prizewinner in chemistry, is also a notable poet. In one image after another he identifies a subtle phenomenon in our psychological life: the moment, abstracted from the passage of present time, that holds in potential a future that will unfold as soon as the ticking of the seconds resumes. He gives to the poem that collects these images—some ecstatic, some menacing—the title, only partly ironic, "Why Does Disorder Increase in the Same Direction of Time as That in Which the Universe Expands?"

In the epigraph to a much lighter poem, "Sex and Mathematics", Jonathan Holden quotes Wittgenstein: "About that of which we cannot speak we have to be silent." Holden sets forth a poetic argument for the experience of orgasm having the shape of the graph $y = 1/x$. Wittgenstein does not get it quite right, he suggests: it is only at the asymptote, at the paradoxical moment when we attain the never-to-be-attained ultimate ecstasy, that language must fall silent.

Several other poems in the anthology are based on the mise en abyme that we encounter in the paradoxes—like the paradoxes of Zeno—involving infinite recursion. In "Yes" the Australian poet David Brooks asks: What if, in my last moment on earth, the whole of my life were to flash before my eyes, including this last moment when the whole of my life flashes before my eyes, and so forth to infinity? Would my life stand up to being infinitely re-viewed? His answer: Yes, because you (the beloved) are in it.

One philosophical theme that comes back again and again is the disjunction between our personal sense that we are free agents and our objective knowledge that we are behaving according to laws that can be formulated with great precision. Thus in "Figures of Thought" Howard Nemerov reminds us that, as he closes in exultantly for the kill, the fighter pilot follows the same logarithmic spiral course as the heliotropic bug drawn to the candle flame.

Among the finest poems in the book is Ronald Wallace's "Chaos Theory", which reflects a sensibility genuinely shaped by—rather than merely playing with—the world-view (or universe-view) of present-day cosmology. What is the point of the Socratic enterprise of trying to discern the laws governing one's private life, Wallace asks, when in our thinking about the universe, at every level from
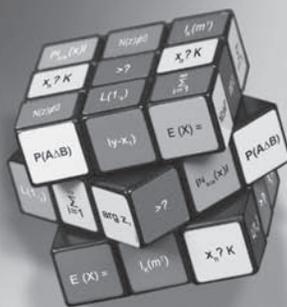
the subatomic to the galactic, we have abandoned the idea of determinacy?

During the 1950s and 1960s an art movement named concrete art, with a branch called concrete poetry, flourished in Europe and Latin America (it was less strong in the Anglosphere). Affiliated with these concrete poets were followers of the Surrealists of the 1930s.

The Surrealists had held that, since our deepest creative forces are unconscious, images that rise up unbidden from the unconscious may reveal deep poetic truths. The concrete poets asked themselves: If deep images are dictated by unconscious associations so outré as to seem random, then may we not be able to fabricate equally deep—or at least equally striking—images by collocating words randomly, using randomizing procedures within the rules of natural-language syntax (with perhaps some semantic constraints superadded)?

Concrete poetry never made much headway: it was the musicians rather than poets who were best able to exploit mathematical procedures and the new cybernetic technology. But concrete music and concrete poetry were only one manifestation of a wider Zeitgeist in the years around 1960. In the plays of Beckett and Ionesco, with their formulaic patter; in the poetry of the early John Ashbery, with its loopy, dreamlike logic; in the general enthusiasm among intellectuals for structuralism, that is, for systems of thought that seemed to run themselves without need for intervention, we can detect an underlying scepticism and even despair about what human agency can achieve.

That phase in the history of poetry—a phase in which mathematical models had real prestige—is underrepresented in *Strange Attractors*. Carl Andre's poem "On the Sadness" is the sole substantial example. Readers intrigued by Andre's poem—which does not lend itself to being excerpted because its force depends on giving an impression of endlessness—may want to look at *Against Infinity*, an anthology of "mathematical poetry" edited by Ernest Robson and Jet Wimp (Primary Press, 1979), and in particular at the work of the American poet Emmett Williams.

If there is a bias among the poets of *Strange Attractors*, it is toward number theory, the infinitesimal calculus, and the mathematics of indeterminacy. There is not much about geometries, Euclidean or otherwise: the territory of strange spaces and eerie topologies is in effect abandoned to filmmakers like David Lynch. Though it makes nods towards a few of the big names (Catullus, John Donne, Emily Dickinson), the book concentrates on the contemporary English-language poetry scene. Two-thirds of the poets represented are still alive; half of these are women. There are no duds among the poems, but overall they tend to be witty rather than profound. Included is a useful set of biographical notes.