The Computation of Poetry

By Charles Day

My nadir as a programmer happened in grad school. I’d written a Fortran program to calculate the column density of a stellar atmosphere—at least, that’s what the program was supposed to do, but it had a bug. Fortunately, the VAX I was using had a chatty, helpful compiler that told me where the bug was and what was wrong—sort of.

The trouble was that even when I printed the code and stared at the recalcitrant line, the bug remained hidden. In the end, I finally saw my error: I’d spelled “GOTO” with two zeros instead of two Os. The characters are next to each other on the keyboard, and when printed, they looked almost identical. The error was trivial—even funny—but it soured my view of programming forever. Now, as a writer and editor, I reassure myself that writing is so much more forgiving than coding. If a word doesn’t fit, I can pick another. English is much more flexible than Fortran.

But one form of literary endeavor, poetry, shares some properties with programming. “Predict” has several synonyms, for example—including foretell, prophesy, forecast—Shakespeare picked “prognosticate” for his 14th sonnet:

Or else of thee this I prognosticate:
Thy end is truth’s and beauty’s doom and date.

Unlike the alternatives, “prognosticate” fits the rhyme and meter. It also echoes a four-syllable word that appears near the beginning of the poem (“astronomy”).

The English sonnet is nicely balanced between form and function. Its 14 lines, typically in iambic pentameter, can have any one of several rhyme schemes with strictures light enough to inspire poets to artful, not forced, contrivances.

But some poetic forms in other languages are difficult to follow in English, the top of my list being cynghanedd. This centuries-old Welsh form stipulates the order in which consonants should appear within lines. Gerard Manley Hopkins, an English poet who learned Welsh, wrote cynghanedd-like lines, but not in full accordance to the rules.

Which makes me wonder: could a computer be programmed to write cynghanedd in English (or German, for that matter)? What would such a feat mean? If a reader couldn’t tell the difference—that is, if our computer bard passed a Turing test—would it matter?

And then there’s the authorship. Whoever programmed the poetry generator must know and appreciate the rules and subtleties of cynghanedd, so whatever art and skill a computer cynghanedd might show lies as much in the program as in the poem itself. Freed by the power of computation, you could conceivably invent poetic forms so complex that only a computer could write in them.

These speculations aren’t wholly whimsical. Just as a particular poetic form might stipulate rhyme scheme, meter, length of lines, length of poem, and, yes, the pattern of consonants, so, too, might an accurate, complete model of human consciousness. What would it mean if only a computer could follow those rules?

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Cynghanedd Example

One form of cynghanedd requires repeating the order of consonants in the first and second halves of a line, as in this example from Tudur Aled (c. 1465–1525):

Os marw bun, oes mwy o’r byd?
Mae’r haf wedi marw hefyd.

If the girl dies, what’s left in the world?
Summer has died as well.

Some leeway is allowed for rhyming.