

Eveline Pye: Poetry in numbers

Statistics is dry, practical, unimaginative? Unpoetical? Too many people think so. Is there poetry in numbers? **Julian Champkin** talks to Eveline Pye, statistician and poet of statistics, to disprove it.

Numerical Landscape

Like a tracker, I smell the earth
on my fingers, listen for the slightest
echo as I stare out at a world
where bell-shaped curves loom

as mountains and negative exponentials
foretell dangerous descents, imminent
disaster. All around, cliff edges crash
down to restless seas while a solitary

outlier shines in the southern sky: a freak
of random sampling or a guiding light?
Are others buried deep, confounded
by experimental design? On my path,

a decision tree, so many branches spring
from its trunk, so many choices. Statistics
feels like poetry – endless searching,
never-ending uncertainty.

“Statistics feels like poetry.” Tell that to the average poet, or the average English literature or humanities graduate or indeed the average Joe, and he or she is likely to laugh in your face. Statisticians know the Joy of Stats. Few others do.



Eveline Pye reads to an audience at the Centre for Contemporary Arts in Glasgow

So a statistician who is a poet, or a poet who is a statistician, to most people would seem odd. The two cultures – arts and sciences – hardly mix. And when the statistician's poems are actually about statistics, about the joy and the excitement and the beauty and the pain of them, and of their impact on suffering humanity and, come to that, on the suffering (or joyful) statistician as well, and when they have been published to appreciation and acclaim in a dozen or more of those slim magazines that are the literary equivalent of peer-reviewed journals, it seems more of a black swan still.

Meet Eveline Pye, statistician. And poet.

Born just outside Glasgow, her degree is in statistics, from Glasgow University. "It was a toss-up. I had an English teacher who told me I should read English and a maths teacher who told me I should read maths. It was a hard one, but I decided that maths would give me more freedom. But also I didn't think I would have enjoyed writing literary criticism for four years and back then it wasn't possible to do a degree in creative writing. Statistics seemed so much more creative. It is much more exciting to be having problems to solve and solving them."

Hampstead or Greenwich Village arts-partiers tend not to get that last bit. It goes against the stereotypes. If you want a synonym for "boring, mundane, technical, dull, soulless", they say, try "statistician" or "number-cruncher"

I had an English teacher who wanted me to read English and a Maths teacher who wanted me to read maths. I decided that maths would give me more freedom

– the two must mean much the same. But to spend your life extracting hidden truths – what could be more satisfying?

She made her choice, and after Glasgow graduated, married, and went off to Zambia to work in a copper mine all more or less at once. "I was in the operations research department. In some ways it was a great place to go. I was 21. My life until then had been fairly limited. I was young, I was naïve, but I was given a lot more authority, much greater responsibility,

Statistics

A computer printout

A stack of paper
Like a shallow box
Filled with facts
Inviting me
To join them

I slide my fingers
Between overlapping sheets
And browse between the columns
Letting numbers lead me
Into dark tunnels

Until pictures appear
On cave walls and
Trends emerge
Out of random rock

A journey into uncertainty
Borehole deep
Below superficial knowledge
I search for a richer vein

(Previously appeared in *Orbis*)

than I'd have had in Britain at that age. There were all sorts of complications. It was very hard for them to get a handle on having a woman working at a mine. In the office I had to wear a skirt, at the plant I needed trousers, so I'd go to work in a skirt and change at the office.

"The copper was purified by electrolysis. A problem was to reduce the amount of lead in the cathodes, because it tends to make the wires brittle. So quite a lot of my time was spent analysing lead levels and working out an optimal sampling strategy for cathodes."

The Hampstead arts-partiers might think that their point has been made. Can you get more boring, more mundane, more technical, or more soulless than a working life analysing the lead content of cathodes? No material at all for poetry there.

Chingola Tankhouse

Have you noticed that none of your stickhands have any teeth?
Well, I'm sure they do
put sugar in their tea.

But do you not think it might be something to do with the job, poised above tanks jabbing spaces between cathodes with a stick while acid fumes hit them in the face.

You're not convinced.
Well here it is.
I can be very scientific when I want to be.

The control group were matched for age, sex, tribal origin and grade within the company. A Mann Whitney U-test was carried out and the null hypothesis was rejected, resulting in the conclusion that the stickhands have significantly fewer teeth than the control group. Your attention is drawn to the Dental Surgeon's report on page 47.

Quote

NONE OF THESE MEN HAVE ANY TEETH

The Medical Specialist fund gives in and I get big white wally smiles every time I set foot in the tankhouse.

My boss tells me they don't pay me to cause trouble and I laugh so hard I nearly open my mouth.

(Appeared in *West Coast*)

Health and safety was fairly rudimentary in Zambian copper mines in the 1970s. "Yes", she says, "the stickhands in the tankhouse really did lose their teeth from the acid fumes."

She spent eight and a half years in Zambia, and did not read or write any poetry. "I read novels but never poetry. I didn't take up writing till years later." That came after her return to Scotland, with two young children. "I went to local evening classes. I took whatever subjects were being taught on a Tuesday, because that was the day my husband was free to look after the children." So the first term was Women's Studies, the next was Architecture, and "then there was 'Creative Writing', which happened to be taught by a poet. He insisted

that each of us write a poem. That was my first poem ever and he said it wasn't bad and told me to go away and write another. My second and third poems got published –and that was it." She lisped in numbers, and the numbers came.

Poetic types were as baffled as Zambian copper miners had been. They found her statistical love an alien and incomprehensible passion. "Their stereotype of a person who is soulless is a mathematician or a statistician or an actuary.

"There is a well-known poetry magazine called *Orbis*, and someone had written a poem saying that number crunchers were sexless and without a soul. I wrote a letter to the editor saying 'unfair'. Along with it I sent the little poem, 'Statistics', and the editor published it. It really did bother me to read that criticism in the magazine. No one is arguing with that view, and it needs to be argued with."

When her children were older and in school she returned to full-time work, lecturing at Glasgow Caledonian University, on statistics, not on poetry. Universities should be producing Renaissance men and women, at home in both cultures. It is an uphill struggle. "I spend a lot of time with people with an arts background and some of them feel my work must be very dull. They don't understand why I don't want to give up statistics and write full time. Of course, statistics is more likely to pay the mortgage than poetry, but I also find it a very worthwhile activity. I am always surprised that so many people have a negative attitude to statistics. Some even take a pride in their lack of mathematical skills. Odd really. You would never get a statistician being proud of bad English. When they find out what I do they try to be nice. They say things like 'You don't look like a statistician' – which is kind of hard to find an answer to.

"I wrote a poem called 'Love of Algebra' as a kind of reply to all that. Tell them the title and they think you are joking. But I can read it out to them and it says it all." (Read it in a future issue of *Causeway* magazine, which wants to publish it first. We are quite happy to promote poetry magazines, in the faint hope that they might repay the compliment and promote statistical ones.)

Her daytime job also involves people who do not naturally relate to statistics. "It is an enduring passion, to try to find a way to get students to be enthusiastic about numbers

Why can't numbers be beautiful too?

We all talk of beautiful words, art, buildings and they're not part of the natural world, either. An x in Algebra is no more abstract than an idea in philosophy, just more useful.

But it can't be use that makes the difference. Keats found beauty in a Grecian urn, surely practical at some time and no one is blind to the beauty of symmetry.

We all get Blake's awe of the tiger's stripes. Why not awe at Gaussian curves? Of course, I know there is no great beauty in a single number, in a four or a seven or an eight, but it is the same

with the alphabet. Where is the wonder in a b or a k or a t ? It is only the combinations, the meanings, the relationships between the letters that make the words and sounds we love.

– And so, why can't my numbers be beautiful to me? Why the scorn, the doubt in your face? Do you think I am brittle and dusty as old paper? Look again. See the numbers shine in my eyes.

and about statistics." Though she is with the Department of Engineering and Computing, a lot of her lecturing is to non-mathematical students, often to students who did not realise that they were going to be studying stats as part of their degree. "My students have included dieticians, physiotherapists and optometrists; we have a very big Faculty of Health here. At the start of these courses many students don't appreciate how much an understanding of statistics will help them in their chosen career.

"I start the dieticians analysing qualitative data from focus groups and semi-structured interviews before we collect quantitative data – we talk about the government's 5-a-day fruit and veg initiative, the effects of high doses of caffeine, or sugar versus sweetener – I find a problem based approach works well". At that point the numbers begin standing up and begging to be taken notice of. "Then no one ever says 'Why are we doing this?' What they do say is 'This is really hard'. But no-one says 'I cannot see the relevance.'"

Why does she think there is such initial resistance from students who, with the right teaching, can grasp the point of it all? "Some

Scaffolding

They need to trust you describe their reasoning in detail. Each premise must be laid bare.

"Why did you do that?"

Where did *that* number come from?"

I follow each step searching for the wrong idea, the mistaken concept.

Sometimes, all I gift is one new thought like... "Dividing *can* make a number bigger", and it's as if their minds inflate.

It's like blowing air into someone else's lungs. You have to stop as soon as you can.

You need them to breathe again – all on their own.

students have only ever come across the word 'statistics' on news broadcasts when it is used in quoting government statistics. They don't understand it is about analysing data, not just counting the people in different categories. That *would* be boring!"

If many arts people have no enthusiasm for numbers, what of the reverse? Are numbers people illiterate, or unlitrary, or neglectful of or incapable of appreciating fine writing and literature and poetry?

"At work I don't say much about poetry. Whenever I have mentioned it people seem surprised but not antagonistic. It has been more difficult to get people with a background in English literature to recognise that stats is creative and interesting. Their view is that people who are poets are interesting and creative; people who are statisticians only care about numbers, not people. But being an effective statistician is very much about people – about

Solving Problems

How do you know the right thing to try? he says, jabbing paper with his finger. Good question, I say, playing for time as I have no answer he wants to hear. Solving these equations is part intuition, but first, you learn to manipulate x 's and y 's until decisions are made in your fingers, not your head – like typing an access code at the ATM, changing gear in the car or signing a cheque – until it all becomes muscle memory – the same way Reubens painted hands, again and again or Keats scribbled rhyme after rhyme – and then you go with the flow and, if you are lucky, there is a sweet, sweet moment as the plum falls into your eager hands, and if not, you try, and try – on and on until your head bursts.

trying to understand the problems they have, then trying to feed things back and explain your findings. I work with all sorts of people who need statistics, interesting and exciting people; they find that very surprising.

“And statistics have huge human consequences. I am very interested in questionnaires and the design of them. It's very easy not to give enough thought to the feelings of the people who are filling them in. Unless you are very careful about design, people give a very small amount of thought to it and just give a 'don't care' answer, or else too small a sample to be useful bothers to fill them in at all. Your questions should grab the questioner's interest; so unless you understand people, and are interested in people, unless you've done the focus groups and have listened to people and

Unless you have listened to people and to what they are saying your questionnaires, and your statistics, just won't work

what they are saying, your questionnaires, and your statistics, just won't work.

“I tend generally to get very involved in the topics I am teaching. From the podiatrists, I learned about bunions. From physiotherapists I can tell you about exercises and bad backs,

and about lazy eyes from the orthoptists. Currently it is clinical physiologists and lung disease. You'd be hard pressed to find an area I haven't been involved with.

“I love being presented with large data sets that you have not had a chance to organise. You are researching them, looking for some kind of ideas and inspiration, that same kind of inspiration of trying to find out what the truth is, what's going on, what's really happening under the surface.

“Data has been influenced by people. In Zambia, in the tankhouse we found the night shift was doing much better than the day shift and we couldn't work out why. Every time we collected the data it was the same. It took us ages to find the answer. On the nights that we were collecting data, someone put an extra metallurgist on duty. Because he was standing around watching people they worked more carefully. Those personal things are often

missed. It was a fact that was hidden in the data. We were looking for all kinds of explanations; we found the right one just by talking to people.

“This year I've been involved in an arts project called Clydebuilt. They select four poets, and find a mentor for each. I have been very lucky to have Liz Lochhead as my mentor. This January she was appointed Makar, or Poet Laureate of Scotland. She has actively encouraged me to write poems about maths and statistics. Liz is also a cultural fellow of my university and with her support, I've been given some university time for poetry – as long as the poems I write promote mathematics and statistics. I hope to encourage an appreciation of poetry among science and maths staff: within the university the idea of poetry in all areas should become more acceptable. Poets and statisticians are both coming out of their ghettos.”

Black Swan

I might be dusting or perhaps just smiling, staring out the bay window
in a dream
while somewhere close, nuclear warheads trundle down the potholed road
and I am concerned that,
though they say the risk is low, no one says what 'low' means and though
there may be
a number trapped on a hard disc, no one knows if it's even halfway
near to being right
and then there's the MOD's internal report for the shiplift at Faslane,
for when it cradles
Trident submarines, I worry they had to black out their own best guess
so we don't know the chance
of a platform collapse, or a plane crash, a fire, an explosion, or even being
peppered with plutonium.
It is as though the MOD believe disasters won't happen to them or us,
as if they believe
all swans are white, because every swan they ever saw was white,
as if they think
they understand the fickle migration of birds while beyond their ken,
a butterfly flaps
its chaotic wings, the wind changes direction and somewhere far away
a black swan
takes to the air, lifts its heavy body upwards, defies gravity and soars
above us.

Invisible in the night sky except for its blood red beak –

a dark arrow
coming towards us
changing everything.