

PERSPECTIVE

Developmental Twists: A Colourful Character

Tsuku Mogami

I've been through three revolutions, flown over countless battlefields and been saluted by presidents, so being called a 'problem' wasn't easy to take. It first happened in 1968, a time of great unrest in my country, so I let the insult pass as I had other things on my mind. But when the abuse was repeated the following year, I decided enough was enough: there was no recourse other than to confront the perpetrator, a certain Lewis Wolpert, directly.

As luck would have it, the perfect opportunity arose a few days later, while he was asleep in his London home. He was dreaming about Paris on Bastille Day (I later found out he began a Parisian love affair on this day in his youth). As he roamed the streets draped in my colours, I waved to him and shouted: "Excuse me, but exactly why do you think I'm a problem?"

"Sorry?"

"Are you trying to get rid of me? It's been tried before you know." I was thinking of 1848.

"Oh, I see. No, not at all."

"Then why..."

He came over and told me that he was using me as a metaphor. It seems metaphors are quite common in his field, like 'cell' which means room, or 'development' which derives from the French for unfurl. He explained that he'd been puzzling over how a fragment dissected from a polyp was able to regenerate the adult form. "How is that possible?" he said. "I'm using you as a metaphor to abstract the problem. You're such a famous pattern and you can be of any size. It's as if a small piece cut out from you was able to recreate all your colours, in the right order and proportions."

"Well that doesn't happen, and there's no need to cut me up to demonstrate."

"Metaphors are never perfect – it's the imperfections that make them sing. Gets people to think outside the box, allows problems to be posed succinctly. Terribly important in science. A skill you can learn."

I wasn't convinced. "But why use me? Why not my Italian or German relatives?"

"Who knows? Perhaps I liked the alliteration. Look here, the interesting thing is that I found only two theoretical possibilities for how organisms can regenerate their patterns. One has regions producing or degrading substances that can switch the identities of border cells. The system arrives at a balanced state, the final pattern, without cells ever knowing exactly where they are. The other possibility is that the ends of the system produce substances that diffuse to form gradients. Cells interpret this positional information

and adopt one fate or another, recreating the pattern. You know this conversation is rather interesting. I should write it down..."

That was how our discussion ended. Still, he had reassured me of his honourable intentions, so I considered the matter closed. But during the 1990s some of his colleagues started calling me a 'model' instead of a 'problem'. Were they referring to my good looks? Was this another metaphor? Being of a flappable disposition I found the new allusion disconcerting, so I got in touch again.

This time he was dreaming of the Eiffel Tower illuminated in my colours. "Why am I now being called a model?" I shouted down to him.

"You again. Good to hear from you!"

"You haven't answered my question."

"Oh, there's nothing at all to worry about dear boy. A model is just a way of describing a hypothesis, a possible solution to a problem. You remember how I said there were two possible explanations for how organisms regenerate their patterns: balance or positional information? Well I strongly favoured the second hypothesis and your name became associated with that. You became a model rather than a problem, a possible answer instead of a question."

"Not sure if I prefer problem. More open-ended."

"Problems and models go together: you need one to appreciate the other. Listen, it's terrific talking with you. Before you disappear this time, can I invite you to come back for further chats?"

I took him up on his offer and over the years we discussed many topics – science, art, religion, the French revolution, depression, aging. I believe we became quite close because in 2014 he wrote: "I have weird dreams but do not remember them well. I have in the past dreamt that I was hanging from the tail of an elephant and once, when feverish, that I had changed into an umbrella and had difficulty opening it; more recently, I have dreamt that I am a metaphor." I like to think that metaphor was me. Not that we always agreed, mind you. He would often draw sharp lines where I only saw fuzzy boundaries. Yet even when we argued, he always made his point with charm. There was a disarming honesty about him.

Sadly, Lewis Wolpert died this year. But whenever I hear myself being called a 'problem', it takes me back to our first encounter in Paris on Bastille Day, and the stimulating conversations that followed. From that single word, a fragment of speech, I can regenerate our entire relationship, his character and ideas. How is that possible?

Read other 'Developmental Twists' articles by Tsuku Mogami

Mogami, T. (2021). Developmental Twists: The Scan. *Development* **148**, dev200108. doi:10.1242/dev.200108

Mogami, T. (2021). Developmental Twists: Only Human. *Development* **148**, dev200204. doi:10.1242/dev.200204

Mogami, T. (2021). Developmental Twists: Back to Back. *Development* **148**, dev200268. doi:10.1242/dev.200268