

Chapter Six

The old grey plastic, standard police issue clock on the wall said 6pm when WPC Thatcher glanced up at it from her paper work. She'd be in trouble with her husband tonight. The preliminary autopsy report on Andreas had come in though and she wanted to give it a skip read before she left. Thankfully there was usually a one-sided summary to aid digestion of the rather technical full report. She dug it out of the manila leaf file and read.

The subject had taken a small dose of cocaine before death indicated by blood levels and powder found in the nostrils. Mild intoxication would be expected.

The stomach was empty consistent with vomiting.

They hadn't found his lunch at the site of the body or in the flat reflected the WPC. Thankfully it would probably be Stu who was sent to walk the route from the Green to the Phi in search of the evidence rather than her.

Subject's shirt was soaked in saliva and gums grey with severe hemorrhaging. Teeth loose.

Charming and weird she thought. The interpretation followed,

First evidence of heavy metal poisoning. Proceeded to brain examination: outer brain engorged with blood and ventricles flooded. Consistent with mercury poisoning. Analysis of hair showed 200 ppm Hg – chronic poisoning. Mercury could have been breathed in as vapour or ingested as mercury salt (eg Hg(II) Cl₂). Note: liquid mercury can not be ingested.

Subject would have been expected to display some of shakes, convulsive fits, or giddiness immediately after poisoning, although a wide spectrum of reaction strength possible. If long term poisoning, typical behavioral changes include lack of energy, unsteady gait, loss of memory, paranoia.

Wow, so this alchemist had eaten his elixir of life! The WPC shook her head in amazement. A candidate for the Darwin awards for people who cleanse themselves from the gene pool? Time for home then, she decided, her sympathies evaporated.

Access to the Royal Oak pub was down a narrow alley off Winchester's main shopping street. A 'ye olde' painted board at the mouth of the alley displayed the required regal deciduous and a claim to be the oldest pub in the country. Carl ducked into the passage

way and up the flight of stairs to enter. This was the usual Wednesday night drinking hole for the Phi postdocs.

A small gathering was already underway perched round a toadstool of a wooden table tucked up against a flashing electronic quiz machine. Carl noted there were the three hardcore of the group only tonight (well four including himself). Kay, wearing her customary denim jacket, was sat with her back to the window, hands grasping a pint glass. She exchanged waves with Carl as she saw him approach. Next to her on one side was the broad set Paulo in his fading, royal blue, Italian football shirt. He flicked his hand in recognition at Carl too, sending a small plume of smoke across the room from his cigarette. Judging by the grin on Paulo's face, he was involved in his favourite pursuit of goading the final member of the group Andre. Andre had his back to the door and was clearly vigorously arguing a point. From half way across the room Carl could see they were just embarking on the latest round of drinks so he veered off to the bar to catch up.

The seating areas were a collection of small rooms on various levels linked by wooden stairs. The oak beams and flooring at least hinted at the past unlike the chrome covered theme bars elsewhere in town. It was a quiet, midweek night and Carl barely had to wait to be served. He carried his pint glass across to the table where his colleagues were settled and manoeuvred a stool into place.

"Hi guys." Whatever they had been disputing when he arrived seemed to have been put aside. All three of them looked at him expectantly. Paulo, leant back against the game machine, blew a stream of smoke over his shoulder away from the table and with a grin got straight to the point,

"Tell all." Kay gave a small wince at the directness of the Italian but was clearly as eager to hear Carl's story as Paulo. Andre was more inscrutable. He was Dutch, tall, wore neat round wire glasses and had short cropped fair hair. He had that Germanic sense of self possession that always left Carl slightly unsure what the real Andre was thinking.

Carl had been trying to decide on his way to the pub how much he was allowed to make public of what he knew about the Andreas case. The police had not directly sworn him to secrecy. Had they just assumed it was obvious? Well, tough luck, they should have said, he decided! He gave a brief recap of what he knew to his friends; the finding of the body, Andreas' flat, drugs, alchemy books and codes. The atmosphere turned quite subdued and a little shocked. Everyone there knew Andreas well. Thankfully he'd barely ever come to these pub meets since he was always off on some other social call (or had he really been brewing potions at home Carl wondered?). It would be the events which Andreas had most participated in that would be hardest in the coming week or more.

The conversation's quiet but heart-felt platitudes could not damp Paulo's natural mischievous and provocative spirit for long though and he rather eagerly went for the heart of the conspiracy,

"What are all the police's theories then?"

“Number one is just natural causes I think,” Carl thought he should start down to earth, “heart attack or some such.”

“Nah too dull,” said Paulo, rubbing his unshaven jaw, “taken out by a drug dealer?”

“What in suburban Winchester?” scoffed Kay, “More likely drug induced natural causes.”

“If he was working with chemicals he might have poisoned himself,” suggested Andre.

“How about mugged for his alchemical treatise by a rabid collector?” Paulo was determined to think outside the box.

“Random mugging for cash perhaps..” proposed Kay.

“The police officer was asking about academic disputes,” said Carl. The rest of the group seemed not to have considered a murderer in Phi. “Anyone for Prof August with a knife in the garden?”

“Couldn’t have been Fields he’d never have been able to catch him,” Paulo was clearly scanning the Phi staff and assigning probabilities, “Heh Carl, was it you?” Kay spotted this was an upsetting line of enquiry for Carl, so interrupted,

“Enough! Keep that one to yourself Paulo. So anyway which are the police chasing the most?”

“I shouldn’t think they commit to a theory – that would harm the investigation,” Andre was considering the matter seriously, “They must just chase all the possible leads and see where they go,”

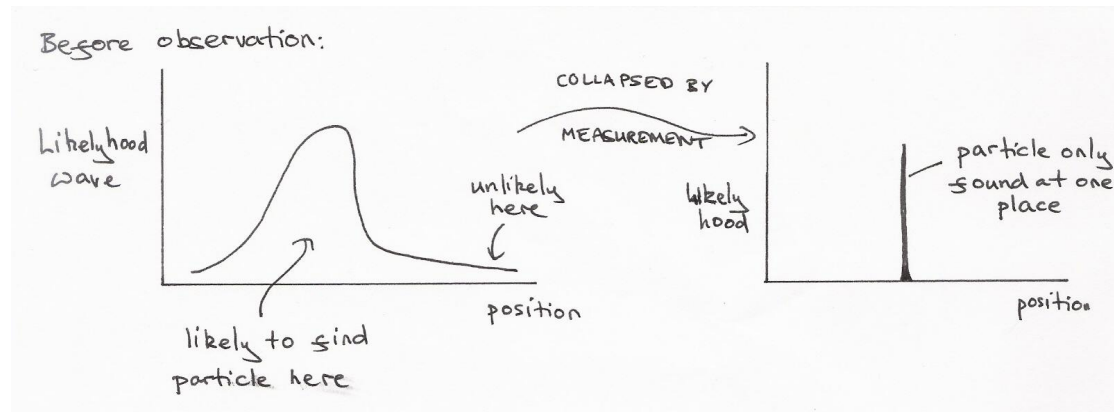
“Ah, all these explanations must be true in some part of the Universe’s wave function!” Paulo jumped in gleefully to Kay’s groan. Carl looked blankly round the group.

“Andre heard a radio show about quantum mechanics this morning,” explained Kay.

“Oh God, don’t tell me Melvyn Bragg or Andrew Marr were trying to prove they know science too.” Carl sunk his face theatrically into his hands. Andre was nodding confirmation. “Why do radio four presenters and New Scientist get so hung up on 1920s physics?” Carl bemoaned. “So what was the story?” Paulo sighed and gathered everyone’s glasses for a refill. He clearly wasn’t up for the repeat.

“They started with a guy from King’s College explaining that when travelling over very short lengths, such as the distance across an atom, particles don’t behave like billiard balls,” explained Andre. “Instead they’re described by a wave. The bigger the wave is somewhere the higher the chance that the particle will be found at that place. The

problem though is that if you have only one particle, the theory predicts the probability of various places it might end up. In practice though, it ends up in just a single place (of course). You have to do many copies of the experiment to see that the final outcome is random and described by the wave.”



“OK, so this is the usual wave function collapse discussion.” added Carl.

“Yes, but the physicist made a real hash of defending it because he insisted on using the Copenhagen interpretation that Bohr and Heisenberg proposed. Basically, he said that because quantum theory gets the answers right for the chance of the particle ending in different places, that the theory was the whole description. The outcome must be truly random and there’s no question to ask about how the particle chooses where to be in an individual experiment.”

“Well you can’t knock that view too hard. It is probably the favourite philosophy of working physicists and was as you say pioneered by the people who invented the theory!” Kay was showing signs of being a Copenhagenist. “The theory is also hugely successful describing all the properties of atoms; for example – if there was a hole in the theory it would show up somewhere in trying to do those sort of calculations.”

“But it makes no sense to forbid someone from asking the question how an individual particle decides where to end up. We don’t know the answer to that. And that’s what everyone else on the program said and frankly this guy was completely out-argued. He just kept repeating the same line and it didn’t win over anyone.” Andre pleaded.

Paulo returned with four pints and an array of packets of crisps which he opened and spread liberally over the table. He’d been thinking of new provocations while at the bar.

“You should listen more to Nature, Andre!” he plunged in. “Quantum theory works so quantum theory is right. If it says that many outcomes are possible for where a particle ends up, then there are many outcomes! In this case the right thing is the many worlds interpretation. The particle really ends up in every possible place and there are different Universes or bits of the quantum multi-verse (whatever you call it) in which each outcome happens. In each of those Universes there’s an Andre saying ‘why did it end up

there?’ But really it didn’t if you take all the Universes into account.” Point made he set about lighting a new cigarette.

“It’s just words though Paolo!” Kay thrust back. Carl could see that Kay thought Andre was making serious points whilst she thought Paulo was just looking for an argument. Well, that was probably right.

“You haven’t removed the collapse from probability to a particular outcome. You’ve just said that when it occurs you generate lots of parallel universes with different outcomes. If you then evolve those Universes forward, they pay no attention to the other Universes. In a truly quantum theory, in which the wave evolves, all possible past outcomes are taken into account to predict what will happen in the future. What happens in our future though depends only on the actual position of a particle, once we’ve measured it to be somewhere.

“Kay, I think I’ve won you into admitting there’s something we don’t understand because you’re discussing the collapse which you shouldn’t in the Copenhagen interpretation.” Andre continued to be earnest about the issue. “I think we should just own up to there being something we don’t have a theory of.”

“But this has been really hugely explored.” Kay was off again, “The obvious idea is that there are some hidden properties of particles that determine the outcome, and quantum theory somehow averages over your ignorance of those properties giving you chances of outcomes. But if you try to include those properties it’s been proved you have to include something else insane. Information has to travel infinitely fast, faster than the speed of light, for example. So there is no acceptable resolution. Quantum mechanics must be the full answer. In any case this is a theory that gets the magnetic interactions of an electron correct to eleven significant figures – it’s just correct! ”

Andre looked morose and appealed to Carl instead,

“What do you think Carl?”

“I think I’m halfway between Kay and Paulo!”

“Sitting on the fence is not allowed,” growled Paulo, this was one of his favourite English expressions.

“No, look the problem comes about when a person, a thing made of trillions of atoms, interacts with say an electron to ask where it is – that’s a measurement. Now you should describe those trillions and one particles using quantum mechanics. But we can’t because we don’t have a big enough piece of paper to write it all on. So we don’t really fully understand the problem in quantum mechanics. Lots of strange things happen when many particles interact like self awareness in human brains. I guess I think that if you could do that calculation in total you’d see how Paulo’s view is basically right but that there is a good explanation for why different Universes don’t mix after the measurement. It seems

like there's room within quantum theory to fix the problem. Since the theory gets everything so right, it must be all there is and so that must be the answer. Not much of a proof though." Andre shook his head giving up and headed for the toilet.

The conversation lapsed to allow some beer drinking.