

Chapter Eleven

Carl phoned the WPC's mobile number at 8am the next day from his bed in a ward at the Winchester hospital. Somehow the previous night he had struggled up the hill from the city centre to the hospital under his own steam. He had definitely been concussed and his insistence to himself at the time that he'd have recovered way before he'd made it to the hospital now seemed implausible. The emergency ward had instructed him to stay overnight and rest where they could keep an eye on his status. Not that he'd managed much rest. The ward had been invaded at regular intervals by the maladies of drunken brawlers, a toddler who had swung once too many times on a stair gate and an old lady who had mislaid her tablets a week back. The morning shift of nurses seemed to take great glee in talking loudly from 6am too. Carl wondered if Sasha enacted these little rituals.

WPC Thatcher reacted with great alarm when Carl told her where he was. He could hear her unload her child onto her husband before she reconnected to the conversation suddenly very serious. Carl assured her he was fine this morning and that the doctors were expecting to release him as soon as the morning round happened. He briefed her on the previous nights events. She still didn't sound convinced of his good health and insisted on his calling over the duty nurse to confirm the diagnosis. The nurse handed him back the phone after giving her account with a look that suggested she thought he was a common thug who had been in a fight.

"Carl, I'm really sorry I've mixed you up in all this," the WPC took up again, "I didn't think there was anything so sinister going on in this case. I want you just to drop the whole thing. We'll try to find this man who attacked you. In the meantime just keep to public places and don't go out at night." The WPC was worrying now how letting Carl into a possible crime scene would wash with her superiors. "You're really fine?" Carl proffered more assurances that he was just a bit bruised.

"Don't you want to know what the diary said?" he asked as the WPC was about to close off the conversation.

"Well," she wasn't supposed to be encouraging anymore of this she was sure, "go on then."

"The guy nicked the precise translations and I only decoded three entries. There was a piece I didn't understand about a ferry – we'll have to retranslate that. Then there was a bit about a girl called SukieG, like she was a girlfriend. He was excited about some chemical reactions and some physics. The most important bits seemed to be that he was scraping down old manuscripts and trying to sell them to someone he just called S. Oh and there was some stuff about looking at Newton's alchemy work on the web. So maybe this S found out he was being ripped off?" There was a pause while the WPC digested this information. "I guess there may be some of my own interpretation in that account," Carl suddenly thought he might have overplayed his detective work, "we should retranslate it."

“I’ll bring the diary up to the Institute this afternoon and you can show me how the code works. I don’t want you any more involved. I’ve got to head for my meeting now – just take today easy,” and with that she rang off.

The investigative team meeting, in a back room of the central Winchester police station, turned out to be considerably less traumatic than WPC Thatcher had feared. They began with the full report of the autopsy. It was now certain that Andreas had died from mercury poisoning. Said mercury was liberally present in his stomach lining so he had ingested it. Further there was clear evidence, both from blood samples and an investigation of his nasal passages, that he was fairly well stoked up on cocaine at the time of death. There was no evidence of a struggle or, indeed, anyone else even being present in his apartment. The conclusion was most certainly death by misadventure. Presumably, while high he had ingested something unwise from his chemical collection.

One of the young officers who had been going house to house had found an old lady, a Patricia Feltham, who clearly identified having seen Andreas walking to the Phi that day. She had described him as weaving as if intoxicated but assured them that he had not been seeking help or been under any apparent coercion. Another nail pounded into the case’s coffin. After this evidence Chief Inspector Bothridge pretty quickly leapt in to declare the verdict of their report clear. The body could be released to the family, who were already arranging the funeral, having flown in from Hamburg the previous day. Wrap up the loose ends by Wednesday was the instruction.

WPC Thatcher had to agree with the group’s conclusions and so when she came to report her findings, she was merely providing background. A typed summary of Andreas’ interactions at the Institute would be needed. The decoding of his diary was promising. She matter of factly revealed that Carl had been mugged on the Cathedral Green. A random mugging most likely, or perhaps someone who had been hanging about the crime scene the team thought. Everyone would be on the look out for a tattooed man but no one seemed excited by the prospect or, honestly, expected to make an arrest – just another nutter they supposed. The WPC inwardly sighed in relief that nobody had chosen to question her wisdom in involving Carl further. The evidence for misadventure was so strong that the mugger, whoever he was, did seem unlikely to be directly connected to Andreas’ death.

She relaxed back as much as the straight backed office chair would allow. She realized that she had been quite tense about how her news would be received. Now though she was more at ease, she could enjoy assimilating the evidence the rest of the team had accumulated. Crime shows on television would imagine them all pinning pictures on huge glass displays, or calling in the pathologist from the purpose built lab along the corridor. The reality was rather different with each of the team peering at photocopies of

the A to Z, part of the cascade of paper on the table in front of each of them, as different locations came up.

Two of her colleagues had teamed up to contact everyone in Andreas' address book. They had accumulated quite a list of dismayed women friends across the region. Amongst them was a Ms S Godstone the WPC noted – Carl's Sukie G perhaps? The chemical lab had provided them with a long list of the chemicals present in Andreas' apartment including mercuric sulphide of various forms as predicted by the autopsy. The WPC noticed the Chief Inspector starting to fidget as the clock hands approached half past ten; she surmised he had an imminent meeting elsewhere. Indeed two minutes before the half hour he broke in to the report details and concluded the meeting asking again for everyone's reports by 5pm the following Wednesday. He then positively flew from the room while the rest of the team mingled and collected papers. No one was talking about the case, which was considered all but wrapped up, and soon discussions turned to Portsmouth's fading hopes of remaining a Premiership football team that season.

The interminable wait for the ward doctor to make his round had been soul destroying and Carl had almost wished he'd never admitted himself. The final verdict had taken less than 5 seconds. The swish of the doctor's pen and an uninterested sweep of the eyes over Carl's wounds told him more about the doctor's need for sleep than about his own health, but he had been freed. He'd then struggled home, showered and extracted the driest clothes from the pile of newly washed in the bathroom. He only finally made it to his office at the Phi at half past eleven that morning when he was looking forward to catching up on his e-mails.

His office chair though was occupied. It was seminar day and his friend, Tom Buchard, had come up from Southampton to attend. Tom had been a postdoc in Manchester when Carl was doing his PhD there. They had shared the marking on a particularly depressing thermodynamics course, then come together to form the core of a fortnightly pub quiz team. Tom was generally taciturn when not talking physics, only occasionally offering a cynical observation on the world. Any suggestion that his jaundiced view of life was a result of the pressures of short term positions were dispelled when he acquired a lectureship in Southampton. He seemed to consider students as a disease vector; to his mind they came to his University from all across the country solely to cough in his lectures. In spite of this general scorn of humanity he was a trustworthy expert on all things soap operatic and had been the work horse behind several glorious quiz victories. He was also an extremely talented physicist.

Tom looked up from a newspaper he was scribbling on as Carl entered.

"A late start by even Phi's standards," he noted. He had a friendly, round face with light brown hair lapping around his collar. He regarded Carl and his new facial scars quizzically through his grey eyes, "Have you been in a fight without me?"

“It was a bit too one-sided to be called a fight.” Carl proceeded to give a quick recap of his sterling investigative work on behalf of the police.

“I’m not in danger of being dragged into this, I hope?”

“Not unless you get caught by the wandering policewoman. She seems determined to leave the investigation with a degree in particle physics. Actually I was worrying on the way in that she’d want to know what today’s seminar is about. It’s usually only 50:50 I can answer that, after I’ve sat through it.” Tom grunted in response

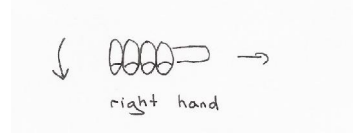
“Supersymmetry for the ignorant,” he suggested.

“Saying you add in a new particle for every particle we’ve already seen, so that unwanted quantum contributions to the Higgs mass neatly cancel particle by particle just invites too many questions about how the computations work,” Carl complained.

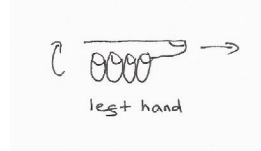
“I’d go for the symmetry angle. You add in new particles with different amounts of spin and put in a mathematical constraint that they must share properties like their mass with the particles already present. If you give the Higgs, which has no spin, a partner with the same spin properties as the electron then you can tie its mass to a scale as low as, well, as low as you like in principle I suppose.” Carl looked puzzled at this,

“Why do electrons and quarks get away with being so light?”

“If they’re massless they move at the speed of light. They spin relative to their motion,” Tom held up his right hand using the thumb to point in the direction of motion and curling his fingers in the direction he was imagining the particle’s spin,

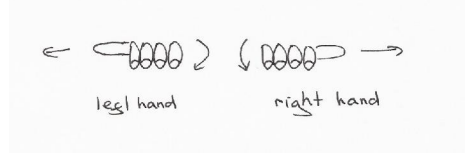


“There’s nothing you can do to change that direction of spin relative to the motion.” He now used his left hand to show the opposite direction spin with his two thumbs aligned, indicating the motion - the two types of spin were distinct.



“If the particle is massive though, you can accelerate until you’re going faster than it and hence see its relative motion to you reversed. The spin which is unchanged is now the

other way relative to it's motion," he reversed his left hand so the thumb pointed in the opposite direction and the curving fingers on each hand now went the same way.



"So for a massive particle the two spin states get mixed up. If you don't actively do something to generate that mixing, it never happens, so the particles have to stay massless."

"And the Higgs mechanism is the active thing we do to make them get mass," Carl continued for him, "Two electrons can make a Higgs but only if they have opposite spin because the Higgs itself has no spin. So when the vacuum is full of Higgs if one spin component hits the Higgs, it is naturally the other that emerges."

"That's the easy bit to explain. It's why we have to call the spinless partner of a quark a squark I can't deal with," Tom was always railing against the adhoc nomenclature of modern physics.

"That and the fact that you carefully set up a theory with equal mass partners for all the particles we know, then have to mess up that symmetry to explain why we haven't seen the partners yet. They just magically appear at the same mass as the Higgs to stop it getting any heavier than we want it."

"That's not fair. In these models you're only going to find the Higgs at the supersymmetry breaking scale because without supersymmetry it makes itself as heavy as it can. So that coincidence would always appear to happen. Anyway I thought you were trying to avoid explaining all this?" grinned Tom. Carl raised his hands in surrender. Tom glanced down at his newspaper where he'd been doing the crossword.

"Worship, six letters, every odd one an e?"

"Revere. Probably. Not really worship though is it?" Tom wrote the answer in and pronounced,

"I don't normally do cross words. They reveal how little in control your consciousness is. You don't know the answer, you don't know some more and then suddenly you do know. You've no idea where it came from. Very disturbing." Tom looked vexed.

"OK, coffee, come on."