concentration

for Greg

Everyone gave Emma the same advice: if you can sew don't tell anyone, especially not any man. Though she felt guilty about it, she ignored the advice, since sewing was important in her life as a topologist. When Emma couldn't sleep, which was often, she would get up, turn on a powerful light, and sew together layers of brightly coloured fabric to make seemingly impossible surfaces and volumes: Moebius strips and Klein bottles, of course, but also structures in higher dimensions with analogous properties, or which projected to them in simpler spaces. She began doing this one night when a problem in her doctoral thesis was frustrating her, and it led to her first source of fame, a lattice-like but connected space whose fixed points indicated families of solutions to partial differential equations in a mere five dimensions.

Years later, when a reporter getting background for her recent Fields medal asked her where her remarkable intuition about hardly describable structures came from, she described her method of a sharp light in a dark room. The reporter didn't know what to make of it, and was about to change the subject when Emma insisted. "But it's important. It corresponds to something very basic about space. You have to pull the stitches really tight, so they connect the surfaces. It's the going through that matters."

Sewing became a central working method for her, when a problem was keeping her awake. Especially one problem that had haunted and frustrated her for years. Until it was solved, by someone else, with a novel and ingenious method. And a student of hers, one she had no high opinion of, a man with barely disguised stone-age attitudes. Zeno. The central device was what he called 'asymmetrical isomorphism'. (That's sleeping on your side, he said, isomorpheusm – but nobody got it.) After his thesis defence, before he took up his first job, a tenured position that MIT had offered to prevent anyone else getting him, she asked him the kind of question the reporter had asked her. "It was my grandmother's dementia" he said. "There's a new drug her doctors are experimenting with. Somnifoc. If she takes it every night she sleeps twelve hours a night, and takes another four hours to wake up. But in her remaining eight hours she is as sharp as she ever was." He explained how when he got to graduate school he found everything much harder. A different level of sophistication. The demand for originality was particularly hard to meet. One night, his good sense numbed by days of worry and sleeplessness and his sense of his own failure, he took a large dose of his grandmother's medicine, to get through the night. A larger dose than any doctor would prescribe. He slept for fourteen hours, and when finally he awoke and when finally he could talk, he had the solution to a problem from a first year seminar that had been handed out just to give them a little humility.

From then on he took somnifoc regularly. He had a friend in the biochemistry programme who cooked it up for him. He slept most of most days -- so that's why he often missed exams and didn't hand in assignments, thought Emma -- and he soon became the department's star student.

MIT is not just a place for asocial geeks. There are philosophers and musicians and poets as well, and some of them became his friends. In the hour a day he had time for social life, that is. They learned of his discovery, and the address of his biochemist. It wasn't even illegal. Within a few months the Cambridge Renaissance had begun. There were still wild parties, spontaneous brunches, and late night random encounters -- but they were all very very short, even if more ingenious, wild, spontaneous, random. Everyone needed their few hours of sharp creative time to be sharp and creative. A philosopher formulated what she called Zeno's paradox. Someone is awake sixteen hours a day during the first year, eight during the second, four during the third, and so on forever. Are they immortal, or do they have a life of only twice the length they would have had? A musician turned the puzzle into an opera, *The Makropulos Series,* after Janacek but very different. It never ended but it didn't take long.

There is a competitive side to originality, and a problem of comprehension. Anyone who wasn't on somnifoc would have trouble following the proofs, understanding the music, getting the jokes. People who had no ambitions to lead their fields found that they had to descend into the fertile darkness for increasingly long periods, to stay on the right side of the line between what was interesting and what was boring and stupid. Life was becoming very different: it's a ratchet racket. Larger and larger doses became the norm. The new mathematics, physics, music, and joke-telling would have made no sense only ten years before. They still made no sense to seventy percent of humanity, who had no need for accomplishment, and found a good living caring for, exploiting, and producing children for the

thirty percent who lived shorter and shorter, more and more intense, more and more focused lives. Someone calculated that the conscious life span of the thirty percent was now shorter by twenty percent: they lived longer, but more of it was asleep. And just sometimes you did not wake up, making your friends envious of the clarity and focus you had achieved.

Emma adapted. She took somnifoc and regained her preeminence. She still sewed, but now it was on waking, when the night's ideas needed to be caught and crystallized. At first she felt that her life had contracted. Brighter stones on a shorter string. But she could now see what she had not understood before, a point about time rather than space, that her life was the thread holding different coloured surfaces together. The thread had to be pulled tight, or they did not get joined. It's the going through that matters.