Penny black stamps, gunpowder, rocket fuel and more interesting explosives

As an inquisitive little boy, from around the age of nine and later as a rather more lethal teenager I developed an interest in making bangs. These events usually started mushrooming in significance a month or so before Guy Fawkes night. It was possible for boys even younger than nine to purchase fireworks from the corner shop outside school, where an old-style threepenny bit would purchase three penny bangers and where even louder bangs could be bought for less than twopence.

At the time, immediately post war, every street had periodically spaced communal dustbins and "pig bins" for domestic food refuse. It was pitch dark; the streets were only dimly lit by gas lamps. On the way home from school - armed with our or five carefully purchased bangers we delighted in placing a lit penny banger just inside the top of one of these bins, replacing the lid at a rakish angle and then legging it. Seconds later a loud bang was followed by the satisfying clatter of the lid being blown off and rolling down the street. I suppose it was just harmless fun. Boys will be boys after all.

Slightly less harmless - at around the age of eleven we discovered that the son of the local pharmacist had a philately business which he ran from a second counter in the pharmacy. We would visit the shop to see him after school and make the odd purchase of common stamps, eventually asking to see and even to purchase Victorian penny reds. Having stoked up his interest we would then ask to see one of his prized Penny Blacks. He would proudly open up a special folder to show us and we would then casually ask if we could purchase a couple of ounces of one of the three main constituents of gunpowder, which we knew could be made to either explode or propel rockets. Three visits, by different pupils over the space of a week or so ensured that we had soon accumulated sufficient supplies to make a quite creditable bomblet. We laboured over the mixture, carefully grinding the components to ever finer powder and in tiny quantities, just in case there should be an accidental detonation! Testing of the mixture was achieved in two stages. Firstly a small pinch was lit by a match. If it burnt fiercely but quickly we would then proceed to the second stage, which entailed taking a small pinch, placing it on a brick and hitting it with a hammer. There would then be a suitable bang and the hammer would recoil offering up the traditional smell of sulphur dioxide - and

on at least two occasions the acrid stench of singed hair and / or eyebrows and / or eyelashes! Having perfected a reasonably lethal (in our view) mixture we would then fill a small piece of aluminium tubing with some of the mixture and fit about three inches of JETEX fuse into the end of the tube - lighting it and "retiring immediately" as advised on all the best fireworks. The results were disappointing. There was a satisfying roar and a long tail of violet coloured flame and smoke belched from the tube. We had failed to enclose the mixture so that it wouldn't explode and it was too heavy a piece of tubing to produce any noticeable thrust. either. A long discussion between two of us ensued. Were we trying to produce a bang or a rocket propellant? My best friend suggested that all rockets had a *venturi* so we repeated the experiment - this time stealing one of my grandmother's coveted steel thimbles, and having drilled a hole in it, we force fitted it into our aluminium tube, which we had the foresight to attach to a foot square plate of heavy gauge aluminium ("in case it accidentally takes off") and repeated the experiment with satisfyingly dramatic results. Fortunately I had had the foresight to halve the "propellant mixture"

So much for our rocket propellant. The explosion was heard over a large area. We were temporarily deafened. Unfortunately the family greenhouse stood only ten feet away - or rather it used to. It had already assumed a drunken angle due to years of neglect, so the effect of being subjected to our impromptu but accidental terrorist attack had hastened its demise somewhat. Our widowed neighbour - thinking that their gas geyser had terminally malfunctioned, rushed upstairs - only to meet head on half way up the stairs with her descending naked daughter who had been bathing and assumed that mum had been blown up by the gas cooker. We never found more than a few fragments of the aluminium tubing and hastily retired indoors waiting for the furore to die down and our hearing to return to normal.

Fast forward three or four years. I am now a prefect, a respected member of the science sixth form; I wear a white coat and have managed to obtain the job of lab steward (one of three) in the Physics department. I arrive at school an hour or so before the students and leave at least an hour afterwards. This was a wonderful experience. It meant that we had to prepare all the experiments that the Physics teachers required - and this could be for classes of any age from 12 to 18. It gave me an enormously solid grounding in physics. But it gave me something else as well. Adjacent to the Physics department was the Chemistry department, and that too had two or three lab stewards. Between us we had access to just about all the basic materials, the time, the authority, the expertise (so we thought) and equipment to manufacture a fairly sophisticated set of explosives. And of course we did so. I imagine that if

we had been able to do so we might even have tried to find out about nuclear materials, but of course no uranium was to be had! We had all the kit to make nitro glycerine (basis of dynamite); trinitrotoluene, (TNT to you) and the chemistry lab stewards even made a creditworthy batch of mercury fulminate, which really went with a tremendous bang. For fear of censorship I will refrain from spilling the complete can of beans but two anecdotes are worthy of telling.

The first concerns gun cotton. Nitrocellulose. Looks like cotton wool. Having all the basic ingredients to hand, I managed to make a batch. I was very disappointed. I had started with cotton wool and the resulting stuff was obviously still cotton wool, or looked like it.... I had made enough to stuff a two pound golden syrup tin, and it had to be thoroughly dried out as the finishing process. Naturally enough I felt guilty about leaving a tin full of soggy pseudo cotton wool lying around in the lab so I took it home with me. Our house was not centrally heated so I sat toasting myself and the "cotton wool" in front of a coal fire whilst I did my maths homework. Stuck on a tricky problem in coordinate geometry I remembered the soggy tinful of "cotton wool", now nicely drying out in front of the fire. I took the tiniest wisp of the stuff and wafted it towards the flames. This was no longer cotton wool, as evidenced by the worrying whoof!! and disappearance of the "cotton wool" whilst still inches away from the flames. Repeating the exercise with another couple of wisps confirmed my success. I now had a worryingly effective pound of gun cotton and had no idea how unstable it might be! My first thought was to fill the can with water again and the second was whatever we should do next? Eventually I disposed of it wisp by wisp, but it took a very long time.

The second anecdote concerns a home-made hand grenade. The (censored) mixture was tamped into the bottom half of a brass tube, which had been plugged at the base with a pilfered rubber bung. A small hole in the midriff of the tube admitted the by now familiar length of JETEX fuse and the remaining mixture was carefully poured into the top half of the brass tube. A second rubber bung was forced (very, very carefully!) into the top of the tube and the device was primed ready to go. Now we realised that the bungs needed to be held securely in place so the brass tube had had some fingers cut at each end - the idea being to better restrain the bungs from popping out prematurely. Imagine my horror when in a maths lesson I realised that the low tap tapping I could hear was a fellow lab steward bunking off a free study period and completing the assembly of the two or three devices in the adjacent prep room - BY HAMMERING the brass fingers into place. No explosions happened, so I think we had a guardian angel keeping guard. The devices were finally taken out to the lightly wooded and well isolated hills after dark and tested satisfactorily, but we never found any

significant damage afterwards and we never EVER made any explosive devices thereafter.

We all lost touch with one another for some years but I can tell you that one of us became MD of a respected multinational in the chemicals business and even now is still working and chairman of a couple of pharmaceutical companies!

The moral to this little group of stories is a difficult one to draw. We were certainly using our initiative and inventiveness, but we really took risks several orders of magnitude greater than students are allowed to take these days. Indeed, as a judge at a finalists' day for Gifted and Talented (G&T) students of science, when I asked a group of teenage girls to show me their experimental work, the very first thing which they did - absolutely in unison - was to don protective eyewear! I wonder who benefitted most from their explorative activities. Well I am still alive and without any significant wounds for my troubles. However if any one ever gave me a chance to go on a course to learn how to use plastic explosives I would jump at the opportunity without question. As my wife says:- "Seventy seven years old - going on seven".

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