

Notes on The Periodic Table by Primo Levi

ARGON

Describes the inert gases. They don't do much, they don't mix well but they are quite prevalent. Then he likens them to his older 'relations', by which means the local Jewish community in Northern Italy whom he grew up calling uncle and aunt. Gives a few vignettes of individual characters and lots of examples of the local Jewish dialect (Piedmontese combined with Hebrew) which they used.

Noble, inert, and rare: their history is quite poor when compared to that of other illustrious Jewish communities in Italy and Europe. It appears that they arrived in Piedmont about 1500, from Spain by way of Provence..... they settled in various agricultural localities in southern Piedmont, introducing there the technology of making silk, though without ever getting beyond, even in their most flourishing periods, the status of an extremely tiny minority. They were never much loved or much hated.... Nevertheless, a wall of suspicion, of undefined hostility and mockery, must have kept them substantially separated from the rest of the population if what my father told me of his childhood in Bene Vagienna is true. His contemporaries, he said, on coming out of school used to mock him without malice, greeting him with the corner of their jackets gathered in their fists to resemble a donkey's ear and chanting, "Pig's ear, donkey's ear, give 'em to the Jew that's here." As is always the case, the rejection was mutual. The minority erected a symmetrical barrier against all of Christianity (goyim, narelim i.e. "Gentiles," the "uncircumcised"), reproducing on a provincial scale and against a pacifically bucolic background the epic and Biblical situation of the chosen people.

HYDROGEN

The excitement of two 16-year olds who get illicit access to a chemistry lab and can't wait to do experiments.

We had no doubts: we would be chemists, but our expectations and hopes were quite different. Enrico asked chemistry, quite reasonably, for the tools to earn his living and have a secure life. I asked for something entirely different; for me chemistry represented an indefinite cloud of future potentialities which enveloped my life to come in black volutes torn by fiery flashes, like those which had hidden Mount Sinai. Like Moses, from that cloud I expected my law, the principle of order in me, around me, and in the world.

Discussion questions: Can we envisage this excitement for knowledge in our own teenage children? Do we think in Jewish analogies?

ZINC

First reference to Fascism. In the university laboratory he is given the task of making zinc sulphate. You need an impurity to make the zinc react with the sulphuric acid.

I am the grain of salt on mustard. Impurity, certainly, since just during those months the publication of the magazine Defence of the Race had begun, and there was much talk about impurity, and I had begun to be proud of being impure. In truth, until precisely those months it had not meant much to me that I was a Jew.... A Jew is somebody who at Christmas does not have a tree, who should not eat salami but eats it all the same, who has learned a bit of Hebrew at 13 and then has forgotten it.

Discussion question: Does anti-Semitism reinforce Jewish identity?

IRON

About his university friend Sandro, from a poor rural background, who introduced him to nature/mountaineering and the experience of overcoming strenuous/dangerous feats. Sandro could walk/climb for days in any weather with just some bread & veg in his pockets. He was killed early in the war, a Resistance fighter caught by the Fascists.

Chemistry and physics... were the antidote to Fascism.. because they were clear and distinct and verifiable at every step, and not a tissue of lies and emptiness like the radio and newspapers.

POTASSIUM and

Rumours are reaching Italy of Nazi atrocities. Levi got a job in the Institute of Experimental Physics. Caused an explosion/fire, from which he drew the moral:

One must distrust the almost the same, the practically identical, the approximate... The differences can be small but they can lead to radically different consequences... The chemist's trade consists in good part in being aware of these differences, knowing them close up and foreseeing their effects. And not only the chemist's trade.

NICKEL

A lieutenant in the Italian army (unsympathetic to Fascism) recruits him to an isolated mine where his job is to extract nickel from rocks left over in the valleys from another process. His identity was kept secret. He loved experimenting with different methods. During this period he wrote the stories Lead and Mercury.

LEAD

Fictional story about an ancient expert who travels the world looking for lead deposits and shows the locals what it can be used for (e.g. pipes and mirrors) and makes money. This is Primo Levi visualising the origins of his profession of industrial chemist.

MERCURY

Rather sexist story, but again the theme of processing a substance from nature into a saleable commodity. A fictional Corporal Abrahams and his wife Maggie live alone on Desolation Island until four men wash up from shipwrecks and all have their eye on Maggie. A volcano erupts leaving copious supplies of mercury, which Corporal Abrahams distils and asks a passing trade ship to sell and bring four women for the men. Corporal Abrahams decides to keep one of the new women and cede his wife to one of the other men.

PHOSPHORUS

June 1942 Primo Levi receives another job offer. Relocates to a Swiss Company in Milan seeking a cure for diabetes based on extracting phosphorus from various plants and testing it on rabbits – knew it was bad science and unlikely, but he carried on with the work he was instructed to do; unlike his colleague Giulia, who got away with doing no work and practising cookery for her impending marriage. He falls in love with her but she's committed to her fiancé. They remain lifelong friends. References to fascist culture e.g. the Hotel Suisse has to be re-named in Italian Albergo Svizzera.

GOLD

Gold is the story where he gets arrested as a partisan in late 1942. With two comrades Aldo & Guido he is marched for several hours to an Italian militia barracks. He is separated from his comrades and

interrogated regularly but not treated too badly. On the march he managed to drop and bury in the snow his note book of addresses, and eat his false identity card. He meets a non-political prisoner who lives as a gold-panner and describes his way of life. Of course, extracting metals from nature appeals to Levi. In this story gold represents freedom - the most precious thing in life.

What wouldn't I try? During those days, when I was waiting outrageously enough for death, I harboured a piercing desire for everything, for all imaginable human experiences, and I cursed my previous life, which it seemed to me I had profited from little or badly, and I felt time running through my fingers, escaping from my body minute by minute....Of course I would search for gold: not to get rich but to try out a new skill, to see again the earth, air and water from which I was separated by the gulf that grew larger every day I felt gripped by a painful envy for my ambiguous companion, who would soon return to his precarious but monstrously free life, to his inexhaustible trickle of gold, and an endless series of days.

CERIUM

Set in Auschwitz in November 1944. At the beginning of the story he explains that he's working in a chemical laboratory and has moved on to a different moral plane from his upbringing i.e. he steals - anything he can sell for food to survive. *"I stole everything except the bread of my companions."* This was not easy because he had no containers in which to remove liquid chemicals. He finds an unlabelled jar in the laboratory, which surprises him because *"Germans never forget the labels"*. The jar contained small rods. He stole three, and with his friend Alberto they worked out it was iron-cerium from which the flints of cigarette lighters and welding torches are made. Something to light cigarettes with was a marketable commodity, so he stole the rest and the two worked through the night under their bed-sheets scraping the rods down to the right size for a cigarette lighter. He acknowledges they might have caused a fire. *"This is how we won the bread which kept us alive until the arrival of the Russians"*. Sadly Alberto was then taken on a death march and disappeared.

CHROMIUM

Literary note: striking juxtaposition of stories. After the last one, about surviving hunger, this one begins "The entree was fish, but the wine was red."

Story set in mid-1950s, dining with work colleagues & discussing why fish is usually accompanied by white wine. Then they talk about other traditions with origins lost in the mists of time, and sayings still in the language but left over from obsolete trades. One colleague told how he had worked in a varnish factory and found ammonium chloride amongst the ingredients of an anti-rust paint and even though that substance but the corrodes iron; the management couldn't explain why & didn't want to change an old formula. Coincidentally Levi realises he is responsible for that bizarre paint formula. He worked in the factory 10 years before his colleague in 1946-47 and was tasked to solve the problem of paint which had gone bad and 'livered' i.e. turned into the texture of liver. He enjoyed the challenge and found what had gone wrong with the ingredients ('2 or 3' drops of something had been transcribed as 23) but also found a remedy: to add ammonium chloride which made the ruined paint flow freely again. This ingredient had then stayed in their formula for new paint!

In this story he also talks about his urge to write his experiences in Auschwitz:

The things I had seen and suffered were burning inside of me; I felt closer to the dead than the living, and felt guilty at being a man, because men had built Auschwitz, and Auschwitz had gulped down millions of human beings, and many of my friends, and a woman who was dear to my heart. It seemed

to me that I would be purified if I told its story, and I felt like Coleridge's ancient mariner, who waylays on the street the wedding guests going to the feast, inflicting on them the story of his misfortune.

Later in the story he refers briefly to meeting the woman who would become his wife and gave him a new impetus for life.

SULPHUR

Short story about a man called Lanza whose job it is to light a furnace at night and get it to a specific temperature, and on one occasion there is a blockage which nearly causes an explosion but he resolves the problem without calling anyone for help. Again, in this story we see the satisfaction of solving a scientific problem.

The kettle was building up pressure... Lanza felt all his hairs standing on end, like the tail of an enraged cat: and he was enraged, in a murderous, wild rage against the kettle.... His fear had turned into anger, and when his anger had simmered down it left his head cold and uncluttered. And then he thought of the most obvious thing: he opened the valve of the suction fan, started it going, closed the vacuum breaker, and stopped the pump. With relief and pride because he had correctly figured it out, he saw the needle rise up all the way to zero, like a stray sheep that returns to the fold..... He looked around, with a great need to laugh and tell it to somebody and with a feeling of lightness in all his limbs... Lanza went to the main gate and met Carmine, who was coming in. He told him that everything was going well, left him the work orders, and began pumping up his bike's tires.

Discussion question: Why does he have the urge to tell, and then not tell? Does this relate to Levi's own urge to tell about Auschwitz? And to the survivors who never told their story?

TITANIUM

Titanium is used as a white pigment in paint. Light-hearted story about a little girl Maria watching a decorator paint a room white. She wants to touch the new whiteness and he tells her she can't. She steps towards a newly painted door, and he chalks a circle around her and tells her she must stay in the circle. She can't find any way out of it. When he goes into the next room she calls him back and asks if she can leave. He takes a cloth and wipes away the circle. Then she moves happily away because he has broken the spell. Interpretation of this story perhaps something to do with the joy of freedom?

ARSENIC

Working as a self-employed chemist. An old man came to see him, talking in Piedmont dialect, and brought a bag of sugar which he said he suspected contained another compound. After analysis it proved to be arsenic. The old man wasn't surprised. He said he was a cobbler, and a young man who had set up business in competition with him had given him the sugar. The old man had no wish to press charges but intended to tell his competitor that he'd rumbled him.

NITROGEN

Commissioned by a squalid cosmetics factory to acquire alloxan. This required uric acid and Levi went by bike (with new wife) to a chicken farm where they collected some droppings which he processed unsuccessfully. He also tried to get snake droppings but discovered that pharmaceutical companies had cornered the market.

TIN

Humorous story. He was enticed away from his job in the lakeside varnish factory to join his friend Emilio in a start-up business run from the apartment of Emilio's parents. Entertaining descriptions of the father, who is a character, and of how the flat was taken over by their chemistry equipment and smells, and of how they borrowed cooking receptacles for dissolving tin in hydrochloride acid (to make a component for mirrors). Primo was newly married and this enterprise didn't make him enough money so he decided to get a job again. Primo was regretful but Emilio immediately began to formulate ideas for his next business and to dismantle the laboratory. Their one item of real value was a ventilation hood, and they employed some workmen to lower it from the window. Something went wrong and it crashed to the ground but all Emilio said was "I thought it would make more noise".

URANIUM

By now working as a sales representative, or what he called Customer Service, which he found trying. One of his clients, Bonino, had read one of Primo's books, and this inspired him to tell Primo his own story of the end of the war. He saw a small German plane landing in a field, and 2 men got out and politely asked the way to Switzerland. He told them and in gratitude (presumably for helping them escape retribution) they gave him a rock which they said was uranium. Primo looked doubtful and his colleague promised to send him a piece of it the next day, which he did. Primo then got down to analysing it, enjoying getting his hands dirty like earlier in his career. It turned out to be cadmium, which Bonino could have found in his factory. Primo was amused and almost impressed that someone should have the nerve to invent such a wild story.

SILVER

Goes to university reunion. Doesn't have much to say to the organiser, Cerrato, but asks him if he has a chemistry story to tell for this book. The story is about faulty X-ray papers and investigating why some batches developed spots the shape of beans. The clue came from one of the factory guards who was a fisherman and said that the new tannery upstream turned the water brown on certain days. It turned out that the overalls in Cerrato's factory were laundered in water from that stream. The culprit was polyphenol from the tannery on the workers' clothes.

VANADIUM

Perhaps the most famous story. The varnish company had imported a batch of resin from Germany which was not hardening, so they complained. A Doktor Mueller replied saying the problem could be cured by adding 0.1% vanadium naphthenate. Levi knows this is a common surname in Germany, but there was a Doktor Mueller who was an inspector in the laboratory at Auschwitz. Levi suspects it is the same person because he mis-spelled 'naphthenate' in the letter and used to mis-pronounce similar names. In Auschwitz Mueller had asked Primo why his beard was so long, and Levi had replied he had no razor and the inmates were shaved only once a week. The Doktor wrote an authorisation for two shaves a week and a pair of leather shoes.

Levi says "*Duty first*" and sets about trying to acquire some vanadium naphthenate. Simultaneously he makes enquiries about Mueller, gets his address and sends him a copy of *If This Is A Man* (Levi's renowned 1947 book about his Auschwitz experience). He says he had desired & dreamed about an encounter with '*one of the others*':

Not to take my revenge: I am not the Count of Monte Cristo. Only to re-establish the right proportions, and to say "Well?"

Mueller is not the ideal antagonist because he had felt at least some temporary pity or professional solidarity with another chemist. Nonetheless Levi waited eagerly for the reply, which he received in March 1967. Mueller said he had read the book and would like to meet; Levi had made the strongest impression of him of all the prisoners. So parallel correspondences take place about the resin and about Auschwitz. Mueller said he deplored the events which took place at Auschwitz but at the time “had never gained knowledge of any proviso that seemed aimed at the killing of Jews”. Levi considers his points in a balanced way:

His condemnation of Nazism was timid and evasive, but he had not sought justifications. He sought a colloquy: he had a conscience and he struggled to soothe it.

Levi writes a reply saying he is willing to forgive his enemies if they show repentance. But before he posts it M phones him to say he is coming to Italy soon, and could they meet. Levi agrees but Mueller dies suddenly the next week, so they don't meet.

Note. According to his biographer, Levi did not encounter Mueller through work but was put in contact by Mrs Hety Schmitt-Maas. She was a Catholic anti-Fascist who tried after the war to investigate the causes of what had happened. Levi had a long correspondence with her. The real Mueller was Dr Ferdinand Meyer, and Hety thought Levi's literary presentation of him was unfairly harsh.

CARBON

Poetic account of the life of a carbon atom from prehistory, to a limestone rock ledge, detached by a pick-axe and sent to the lime kiln, caught by the wind, dissolved in the sea, carried on the wind again into a vine leaf. Then:-

It is the destiny of wine to be drunk, and it is the destiny of glucose to be oxidised. But it was not oxidised immediately: its drinker kept it in his liver for more than a week, well curled up and tranquil, as a reserve aliment for a sudden effort; an effort that he was forced to make the following Sunday, pursuing a bolting horse.

It becomes carbon dioxide again and enters a cedar tree for 500 years. It gets eaten by a worm, becomes part of a pupa then an insect's eye etc. etc. until it arrives in a glass of milk drunk by the author and into his brain and is now guiding his writing.

Note. One interpreter has said: “Levi speaks of the “atom,” which, inserted as part of an architectural structure, is “subjected to complicated exchanges and balances”. By this he seems to mean the Jews and their history. ... Levi's description of how carbon is involved in the creation of wine and how it is stored in the human liver to be activated in exacerbated circumstances refers to how the Jews were destined to be abused and, in a sense, kept in reserve for those moments in history when the world needed to lash out at a scapegoat.”