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## Chapter 3

### More Education

I was too smart for elementary school and at age 10, after a few months of home study, the Board of Education agreed to allow me to enter high school. It was first my extended exposure to the big world of humanity. It reminded me of my first taste of Philadelphia tap water, and I didn't like it. The human psyche has extraordinary flexibility, and gets used to anything.

My fellow students scorned me as an incorrigibly conceited brat. To me they were all savages and dumb brutes. It is understandable that we didn't get along. Their notions of what high school was all about were just about covered by dating and race riots, whereas at the time I entered the research that would culminate in my deservedly famous paper on the disintegration of the moons of Jupiter was well advanced. It was published in my junior year, and would be my passport to freedom. I was glad to get out of there.

High school was a dangerous place. Submerging a ten year old prodigy in its cannibalistic culture was sheer folly. The events in its classrooms on a typical day invite comparison with a deranged mind simultaneously afflicted by imbecility and frenzy. This week four career criminals in training would pull a girl into the boy's lavatory and gang-bang her. The following week some kid was pushed off the roof. Every sports event was the pretext for a bloody riot. In my junior year members of a local teen-age gang ran over a teacher with an automobile. Finally the school began

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stationing cops in the corridors; this happened a few months before I left. That the school was not on the official list of the worst high schools in Philadelphia was only because it was not considered to be located in a "bad neighborhood" - ergo, one with a sizable black population.

I was a horrible kid but I was not a public menace. I might be happier now had I been a bit more vicious and stupid then. It is perhaps regrettable that the labors of my burgeoning genius took up all the free time I might otherwise have used to exteriorize the delinquent in me.

I didn't get along with my teachers either, though in their defense it must be admitted that they had to put up with a lot of bullying. Once in every term I would witness an assault on a teacher. Putting up with continual threats and abuse was accepted by them as part of their job description . Sometimes they were knifed, although I never saw this happening . Normally, one was led to believe , such things were customary in schools " in another part of the city" .

Sometimes they over-reacted. I was not present in the chemistry lab on the day that the teacher removed his belt and cracked out the front teeth of some young thug; but one afternoon, while in a class in mathematics, I watched an instructor break a blackboard pointer over the back of another punk . This was wrong of course, and he was reprimanded. If he'd asked me I would have told him that mathematical skills can't be developed that way.

The noise-infested atmosphere stank with obscenities, curses, whistles, sniggers and cat-calls. Above our heads, in every direction flew spit-balls, rubber erasers and pieces of chalk . The very walls

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vibrated with insult. Every ten minutes or so, some student bounded out of his seat to pummel another one across the room. If a fight broke out in the corridors the classroom would be empty in a matter of seconds. And above the ruckus blood-curdling young throats brimming with hysteria and rude malevolence would scream murderous threats to all and sundry, which they had every intention of carrying out.

In those rare intervals in which there was a semblance of order, the climate of violence was supplanted by overpowering tedium, as each student took an eternity to reveal what he didn't know. The miseries of this toxic environment served only to increase my obstinacy and determination. It was a waste of time to prepare ; very quickly I stopped doing any of the official classroom assignments. Instead I doggedly pushed on with my research in Celestial Mechanics. It took 3 months to write up everything, then another month to complete the footnotes, research references and compile the bibliography.

When it was all finished it was given to my father. He tried to read it but found that he couldn't. He passed it to some of the senior scientists at the Franklin Institute where it generated a lot of controversy. Ultimately it was recognized as a credible piece of work, and the Institute published it that summer. Within a month the Sargasso Sea of sloth and depravity that passes for high school in our society would be replaced by life imprisonment in the academic world . I was only 13.

Philadelphia's four principal institutions of higher learning are Temple University , the University of Pennsylvania, Zelosophic University and Philomathean College. They all fought like wildcats and coyotes to get me. Everything was offered me, from a

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full professorship upon completion of my studies, to guaranteed tenure at the age of 20, to the promise of a endowed chair specially drawn up in my name . Assessing these perks at their real worth took time, but by September of 1948 the choice had been narrowed down to Zelosophic U.

The university tailored a curriculum to my special needs: all studies outside the hard sciences would be at the undergraduate level; mathematics, physics and astronomy were at the graduate level. Upon completion of the requirements for the Bachelor's Degree, there would be a concurrent bestowal of a Ph.D. *cum laude* in mathematics.

It now seems advisable, even necessary, to back-track several years and present an account of my development as a mathematician through childhood up to my entrance into graduate school. Following this, there will be a brief summary of the major ideas in my treatise predicting the disintegration of the moons of Jupiter. Some readers may find this discussion too technical ; they won't miss anything by skipping to chapter 5.

I am convinced that, apart from the unfortunate victims of Alzheimer's disease , major brain damage, birth defects or genetic retardation, there are no innate differences in human intelligence. Healthy brains are all endowed with much the same equipment. Active versus inactive intelligence is quite another matter! Unquestionably there are enormous differences in the way people employ their intellectual capabilities. Many so-called talents and aptitudes are stimulated to growth by events in early life, enhanced by supportive environments or, conversely, crushed through neglect. In my case the sight of the serial number on my

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incubator during the three first months of life should not be dismissed as a possible causative element in the formation of my mathematical aptitudes.

Whatever the case may be , I'd invented the concept of the full zero in decimal notation before learning how to walk. This tool, indispensable to all arithemetical computation , mind you, had evolved slowly over 5 thousand years and was unknown in most of Europe until the early Renaissance. If the family legend that my mother's ancestry includes a few Native Americans is correct, I may be part Mayan: the Mayan were comfortable with the full zero long before it was understood anywhere else in the world.

"Zero " is very different from "Nothing" : "Zero " implies the existence of other numbers, "One" for example. In the same way, "No Credit" implies the existence of credit, "No Dice" the existence of dice, etc . The "Empty Set" , which mathematicians consider a legitimate kind of set, should also be included in "Nothing" . " Nothing" , in point of fact, is as immense as the universe. If one is in agreement, or at least in sympathy, with Bertrand Russell, who defined 2 as the class of all sets of 2 objects, one might argue that "Nothing" is the class of all negations of all identifiable objects: no credit, no dice, no panhandlers, no bananas, no idea, on and on.

Parmenides made the case thousands of years ago: anything that has "Being" cannot be objectified without positing the existence of its negation. Yet the absence of any specific entity is a vanishingly small piece of the bottomless well of "Nothing". The generosity of "Nothing" is such that in its ample construction one also finds "Not Everything". It is a great impropriety to claim that

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"Nothing exists", as this implies that "Nothing" implies the existence of "Something", and is thereby a member of Nothing. Yet by the rules of Set Theory, no set can be a member of itself.

I can't remember any time during my childhood when I'm not been obsessed with the quest to construct a mental image of "Nothing". It took me years to realize that this would never happen. It is simple enough to picture the absence of specific objects, however something else always pops up in its place. Sitting in front of the opened refrigerator, gazing at a bottle of 7-Up, I found that by remembering the look of the shelves when they are empty, I could mentally remove the bottle. Mentally removing the shelf exposed the back wall. Concentrating on the kitchen wall blocked out the refrigerator. Imagining how this might be knocked down, I stepped into the other rooms of the house, easily left by stepping outdoors. Then came the night sky, and the stars. With a great effort of imagination I projected myself into outer space, then, by removing the stars, into empty space. This obsessive game of mine could have continued indefinitely, were it not for the voice of my father yelling at me to close the refrigerator door or take responsibility for the electric bill.

Alas, empty space is not "Nothing". It has 3 dimensions. To a first approximation it accommodates all the theorems of Euclidean geometry. By the patient cultivation of my spatial imagination it eventually became possible for me to picture empty space as a relativistic Riemannian manifold! A fascinating object: not "Nothing"! .

*"Not Nothing?"* Another idea to place into the category of all "Nothings"! Yet the negation of "Nothing" is "Something".

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Therefore "Something" is part of "Nothing" ! This should give one some idea of how all-inclusive "Nothing" is.

Hard and unforgiving experience has taught me that it is as impossible for the human mind to intuit the concept of "Nothing" as it is to visualize "Infinity" . My convictions have not altered since my explicit formulation of this discovery at the age of 9.

Much later I

realized that, even had I succeeded in visualizing "Nothing" , I wouldn't have remembered what it had looked like; once one is thinking of "Nothing " one is of course thinking of something.

Frankly, there was something spiritual destructive about my all-enveloping quest for the being of nothingness. Sitting hunched over on my bed, my covers wrapped about me for security and warmth, I would stare at some innocuous spot on the wall. With a near psychotic obstinacy, I strained sensitive brain fibers, concentrating every microgram of psychic energy towards imagining that there was no wall in front of me, nothing beyond the wall, nothing on earth, no planet earth, nothing in my mind...

All such experiments ended in failure. Sometimes my persistence took me across the threshold of a mental crisis. When that happened, my precipitous descent into depression would render me incapable of functioning for days. I must have done irreparable harm to my psychic at that time. Had I gone on this fashion, it would have turned me into an incurable psychotic by puberty; only the deep conviction that I had important things to give to the world prevented this. By age 11 I'd abandoned all efforts at visualizing "Nothing". Clearly mankind was never destined to know what "Nothing" looks like.

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"Infinity" posed fewer problems; while the 4th dimension was a snap! My earliest mental images of the 4th dimension were constructed at the Agape Institute. It was a Euclidean 4th dimension of course; I've never been able to visualize Einsteinian space-time. For several years it was possible for me to interpret every object in my visual range as the flat projection of a higher dimensional reality. Only with difficulty can I convey the thrill of being able, at will, to pop out of this universe and examine it dispassionately, like the surface of a map.

There was nothing mysterious in this accomplishment: my 4-dimensional reality was built directly out of materials from the world we normally inhabit. In much the same way that one can imagine a cube formed from 6 square pieces taken from the same piece of cardboard, my mind had developed the capacity to construct a 4-dimensional space from the elements in my surroundings. With maturity this ability has been lost, along with many other genetic endowments.

Often the results were strange indeed. In the privacy of my bedroom I constructed a hyper-room. My bed, all the furnishings, and the objects on them, were transmuted into the flat hyper-planes of hyper-furnishings! Another empty room could be constructed from the substance of a single chair! The very hollowness of this room was constructed from the substance of the chair. Though it stood, immobilized, on the rug covering my floor, yet it was also simultaneously visible outside my windows, without ever having gone through any walls.

I inverted all the closets: their emptiness appeared on the outside, all other objects in the room became the inside, with my own body as the border between the two domains. From this



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construction I extracted hyper-objects, and hyper-conglomerations of objects from inside the closet, to be hung in a 4-dimensional hyper-room whose limits were defined by its hangers, hooks and shelves.

My fancy carried me along thus as I created a furniture hyper-jungle, both terrifying and beautiful, its lianas and creepers of tables and chairs dangling freely through my body, which, dispersed through the room like a cloud of ink suspended in a glass of water, had surrendered all pretense at rigidity, yet with no loss of connectedness.

A hyper-flower opened up, filling the entire room with its stamens and pistils, sending out boulder-shaped blocks of pollen. Under the pressure of my concentration it transmuted wondrously to a grove of banyan trees surrounded by a sea of thick creepers and vines, in whose grip all of the room's furnishings were entangled and crushed to bits. Each particle of dust careened about the room before swelling into a new piece of furniture, as my neighboring environment bubbled up into a wild, unruly froth of chairs, tables, planks, books, papers, pencils and pens, clothing, panes of glass, dancing all through hyper-space in continuous hydrodynamic turbulence, all things passing freely through one another without collision.

Lord knows what would have happened to me had I continued on in this fashion! Fortunately these mental exercises could not be carried over into the classroom, where I had to cope with the sudden intrusions of the grating pederastic voice of Dr. Baumknuppel demanding:

*" Now , Rendel, vat bad zingz did you zee in your dreamz lest night?  
"*

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4-dimensional adumbrations of Dr. Baumknuppel were a challenge to my budding ability, which I undertook with extraordinary zeal. Through quite complicated algorithms involving homological algebra and topological surgery my mind was able to fabricate a hyper-Baumknuppel. It performed all of his obsessive tics simultaneously. His bizarre speech mannerisms lay frozen like a chunk of spittle emerging on the surface of his hyper-lips. Stuffing his whole body into his mouth, I inverted his skull so that his miasmatic thoughts were diffused like a jet-black brain-slime over the entire room, pouring forth so fetid a stench that I had to plug up my mouth and nose.

Having developed this toolbox of 4-dimensional visualization techniques I then began applying them to other objects, including my father. It led me to many valuable insights into our complex, unhappy relationship. All the intricately tangled skeins of love and hate which imprisoned us like the exuded guts of a sea cucumber, blossomed forth astonishingly into myriads of iridescent sigma-flowers on the volcanic lavalands of extra-galactic planets. Every injury, every wound, every grievance, every thoughtless act (on both sides) came out into the open, suspended in a plasma of psychic lymph and sinew, shedding bitter seeds of future retribution, so many ionized gamma galactic gravitons quantizing numberless hyper-fields with presentiments of future sorrow and woe.

Likewise every tenderness, every occasion for happiness and joy sprang, so many bleating force-fields of ecstasy, coursing potent and alive through the sidereal arteries pulsing polarized metachronic energies of faith and redemption, like so many

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mighty new-born neutron stars calved off the thighs of some bellowing Demigorgon on the Cosmic Boundary.

4-dimensional conceptualization, briefly summarized, enabled me to get through childhood without going bonkers. That this was destined to happen anyway at a much later date, is beside the point. Were it not for this early training in 4-dimensional visualization I might still be back in the asylum. It also lay the foundations for later achievements in mathematics .

Based on my personal experience I'm convinced that there is no substitute for those who would be geniuses in childhood to pushing one's mind to the brink . I'd already put arithmetic and algebra past me by the age of 6. From the great void between the ages of 7 and 9 I emerged with a solid mastery of geometry, calculus, statistics and topology. Complex analysis, differential equations, modern logic and differential geometry, without being studied, but effortlessly absorbed by some unconscious process . Taken all in all, yours truly, Aleph McNaughton-Cantor was a fully professional mathematician by age 12! I immediately started looking around for difficult problems to solve.

This rough sketch of my mathematical development is best rounded out with a few general observations on the nature of mathematical genius. The difference between a person with an aptitude for mathematics and the rest of the mankind, is that he enjoys doing math , although to much of the rest of the world it tastes like castor oil. However, the difference between the normal person with mathematical aptitude and a mathematical genius, is that the former still finds mathematics hard work, while for the latter mathematics is the only subject that is easy. All things else that are of interest to normal human beings, politics, religion, love

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affairs, making money, sports, art, etc. are just about impossible for him to deal with.

A mathematical genius lives, eats, dreams, breathes mathematics. He will have no other mistress to him. One can go so far as to say that a mathematical genius is a mediocrity of a certain kind: he never does anything that does not come easily to him. He has no spiritual merit, as the very scope of his achievement derives from his refusal to strain himself in the least way. This must surely be incomprehensible to people to whom the prospect of doing mathematics is about as welcome as a prolonged bout of constipation. However the mathematical genius feels exactly the same way about any endeavor *except* mathematics. One should not be surprised, therefore, at the historical tendency for mathematicians to do their greatest work in their teens and early 20's, exceptionally lazy phases in the normal life cycle of the human animal.

Given that mathematicians tend to be boring outside their chosen specialty, it comes as no surprise to learn that geniuses are insufferable bores to the  $N^{\text{th}}$  power, that they are exponentially boring! Heaven help the convict forced to spend a month in jail with a mathematical genius! Any civilized society must deem such proximity a form of cruel and unusual punishment.

A genius, any kind of genius, is like a machine built to do just one thing: all of its circuitry is wired to that end. What may be impossible for any other kind of machine is precisely the function for the performance of which it was brought into the world. Snip one connection and it auto-destructs, degenerating quickly into a block of metal covered over with silly knobs and switches, and

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wires running all over the place. The mathematical genius, far and above all other kinds of genius , is hopeless in all things but his craft. In human relations in particular he is a real pain in the ass.



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