

One of my closest friends, Maurice Gross, died a few days ago in Paris - his life cut short by a cancer whose existence was unsuspected a few months ago. We met at MIT almost forty years ago. Maurice obtained his PhD at the University of Pennsylvania with Zellig Harris, I obtained a PhD at MIT with Noam Chomsky. Coming from different sides of the taxonomist-generativist aisle during that period when methodological tempests swirled in linguistic teacups around the world, our initial interactions were amicable, but heated, and they remained so throughout our shared lives. I sorely miss him.

Specifics of Maurice's early life and education I do not know, mainly because he and I found so much excitement in the present and future, that we rarely dawdled in the past. Details aside, he began as a linguistics professor at the University of Paris, and I at New York University, in the late 1960s. We shared many professional interests, which I outline later. Here I present the man. We shared in each other's personal growth and the growth of our families. My favorite memory of our interacting families focuses on an annual event. The Gross family visited NYU every August for the past fifteen or so years, and at each visit, we would go to the Lobster Place - the large wholesale lobster distribution center in lower Manhattan - and buy half a dozen eight to ten (often larger) pound lobsters and bring them home for dinner. Several years ago the 'lobster lady' took the kids back to the tanks (like small swimming pools) and hauled out some 15-20 pounders. My favorite part of my favorite memory is the children scurrying around after the giant lobsters, who - totally confused on land, would sometimes spin around and send the kids flying.

The tragedy of a beloved friend's death lies not in its suddenness or its permanence but in the merciless theft. Maurice's death robs me of some future as well as some past. In my disquiet during the hours since Maurice died, I have recounted so many of our memories. Visits to the zoo, the aquarium, rural New Jersey, and especially drinking beer at Nathan's Original Hot Dog on the boardwalk at Coney Island watching the sun go down. Our kids grew up, married, and had kids. For the past two years my daughters babysat (or babysitted?) for Maurice's granddaughter. Visits to the zoo were always pleasant, but perhaps some of the happiest short trips involved simply walking to the Hudson River and taking the commuter ferry boats back and forth across the river towards dusk. We ferried us and the baby carriages over to Jersey City, then walked along the waterfront watching the slowly moving sun play with shadows among the buildings in Manhattan.

For years we always wanted to stop at one of the outdoor cafes and carefully study the sun setting, and perhaps the sunset. But we always pressed on, saying 'next time,' 'we'll do it next year.' But now there is no next year to look forward to. No more Maurice to pal around with. My main thoughts of Maurice focus on his talent to enrich the life experience - the moment by moment living - of all those about him and to enhance the happiness and self-understanding of everyone who knew him.

Maurice and I often discussed the progressive (-ing) and perfective (-ed) verb forms in English versus French. I cannot come close to his insights since, not only was he fluently bi-lingual, he could recite (sometimes seemingly endless) passages of poetry and literature in French and English going back to the 1500's, maybe even earlier. I shall lard my essay with Maurice's favorite topics: the progressive, time, and noun-verb contrasts, but fear not, in deference to non-linguists, no paradigms or rules are offered. Unless you are a linguist or lexicographer, you may not even notice that the essay bristles with odd verbal and nominal forms, just the type of English words and expressions that Maurice loved. He tirelessly listed new words, expressions, and idioms he encountered in New York.

Maurice felt that French suffered no loss in not having a progressive verbal inflection. I sometimes suggested that this was because he, growing up French, never had a progressive form to lament the loss of. C.S. Peirce, a lefty, a favorite philosopher of Maurice, said that people who were left-handed were more intelligent than right-handed people in a way that right-handed people could not understand. I suggested that languages with progressive forms could express ideas that could not be grasped by speakers of languages lacking progressives, gerunds, and participles. Just joshing. Maurice understood tense, aspect, and verb forms better than anyone I ever met. He had incredible insights into the assortment of nominal forms and verb forms in many languages, and structured his computerized dictionaries to bring out the salient properties in order to facilitate their parsing and tagging. Anyway, I leave it to his students, of whom there are many, to discuss his technologies. His contributions to the field will be permanent and enduring. I focus here on the more fleeting memories of the feisty man my barbs can no longer provoke to a verbal joust.

There is a difference between 'the sunset' and 'the sun setting.' 'I saw the sun set' does not mean 'I saw the sun setting,' and vice versa. Some languages make a big deal about this virtue of aspect. Maurice and I liked to watch how the sun, while setting, climbed up the sides of the buildings at sundown. In the final minutes of the sun's setting, the horizon brusksly cuts off the sun's rays, and the side of a tall building would become the stage of a celestial light show. First, the whole side of the building is illuminated. Next, a crisp demarcation line appears near the building's base: above the line is sunlit, below the line is shadow. In a few minutes, the line creeps from the bottom of the building to the top. But here is the moment of excitement that makes the hour of nursing a beer and patiently watching worthwhile. In the very last seconds, the sunlight only glistens on the very top floor of the building, then sparkles off the tippy-top of the roof, and then blinks out, as quickly as a candle in a thunderstorm, or a human life. Thomas Mann suggested these observations are best performed in Venice, Italy, where the pastel-colored buildings reflect off of each other and the water. Maurice and I always planned to hold a

conference there, perhaps at the big hotel on the beach. I guess not, now.

Maurice touched so many lives so deeply, both linguists and non-linguists. On various visits to Paris I met Maurice's colleagues, family, and friends - and it is an enormous group. This essay aimed at all avoids linguistic Arcana - almost. Every rhetorical effort has been made to make the English expressions difficult to translate into French, although my sense of grief can readily be conveyed.

Right now I sit at late afternoon watching the sun going down through my apartment window in Lower Manhattan. I see myself with a blank stare reflecting in the glass at this shortest sunset of the year while I blankly stare at the horizon at the setting sun. Maurice and I often stared together through this window at the sunset to catch the final 'blip' as the sun disappears behind the hills in New Jersey, but we rarely stared blankly, or even had blank stares, even though we were looking at New Jersey. I want those who render this essay into French for Maurice's family and friends, not simply to translate my Maurice-memories as if this were a page torn from a cookbook. The translator should pause and mention that, this is what it says, but it could also mean this or that or the other thing, and maybe all at once, or none of the above. When you translate this into French with full consciousness of the words, phrases, and clause structure, and you sense the multiple ambiguities, and feel the rhythm of the words, then you are communicating to your audience the source of the excitement Maurice felt about language. As you grapple with the incongruities that necessarily arise trying to fit the well-rounded English gerundives and participles into the boxy square French verb paradigms, you drink from the same well and contemplate the same puzzles that animated our professional interactions. I can offer no greater gift to Maurice than to write about him using English word clusters, idioms, phrases, and structures that are insoluble in French. This is as much a letter to Maurice as to his family and friends. Some of the ideas in this paragraph would have elicited from him an instantaneous pithy reply. I lament the loss of those replies.

Carving up a watermelon with the kids on the sweltering beach at Coney Island, and at other choice observation points, Maurice and I discussed the possibility of capturing these last few seconds of sunset and imagined having a camera take thousands of pictures a second, perhaps triggered by a photosensitive trigger, to capture the sunlight, the glistening, and the sparkle off of the World Trade Center, the Woolworth Building, and the Chrysler Building. Maurice told me that Galileo discussed the first and last rays of the daily sun glistening off the alpine mountain tops during sunrise and sunset in his proof that the moon has mountains. He had a deep and profound understanding of the history of European culture and the development of science.

Maurice and I collaborated at the most profound intellectual level - What

does it all mean? What are profitable areas for research? - but, despite frequent discussions and plans, never produced any single co-authored anything. We shared students. Some of mine worked with Maurice in Paris, and I hosted several of his. We worked mainly on two large projects. I leave it to Maurice's Paris colleagues to discuss his main works. The following are the two areas where he and I collaborated.

One, a quite abstract topic. I believe, and tried to convince Maurice, that Rene Descartes, a French philosopher from the 1600s, strategically composed all of his works to be systematically ambiguous between two contradictory and mutually inconsistent meanings. Each train of thought makes perfect sense, but they argue against each other. Just as the sentence, 'You can't take politics too seriously,' is ambiguous between opposite readings, Descartes organized everything he wrote in this style - which he learned by studying St. Augustine. Since Maurice spoke French, he and I discussed the various possible meanings: semantic, pragmatic, rhetorical, and so on, of Descartes' words, sentences, phrases, and essays. Linguists love word games. Apparently, Mark Twain's double-edged one-liner about German opera: 'Wagner's music is not as bad as it sounds,' cannot be translated into French as a one-liner, but fits snugly into a single German sentence since the German verb system aligns closely with the English. We spent hours analyzing the entries in the Dictionary of American Slang, trying to find alignments between the French and English. We increased each other's vocabularies immensely and broadened our understanding of synonyms for body parts and analogies for basic human body functions.

Our discussions, drawing on Maurice's knowledge of French versus English literary styles of the past four hundred years, his linguistic scholarship, and his understanding of the scientific views of the 1600s, deepened my grasp of the vise in which Descartes found himself and the incredible loneliness of his final years. Sooner or later I will publish the rhetorical structure of ambiguity in Descartes, fully footnoting Maurice, but such a project takes time and the eyeball power to pour over small print, both of which in find in increasingly short supply.

As Maurice and I grew older together, our attitudes towards the aging Descartes changed. Maurice rarely discussed his experiences concerning WW II and the Holocaust, but their reality tempered his thinking. When these topics arose, his demeanor changed and he uncharacteristically would remain silent for minutes on end. He saw the harried persecuted abandoned Descartes in a light I could not and never will. We could never agree why Descartes wrote in the ambiguous style he did. In our discussions, we probably learned more about each other than anyone else. Only in discussing the harassment of philosophers in the 1600s did Maurice ever bring up his personal experiences, emotions, and feelings about war, persecution, concentration camps, and the raw naked underbelly of life.

Maurice's interests and studies covered so many dimensions and delved so deeply into various phenomena, that I find him impossible to characterize tersely. So I present him only from my perspective and ignore his studies of literature, the history of science, the comparative cultures of England and France, and other topics that he often discussed with considerable insight.

The second area of collaboration yielded some products I discuss in a later essay, but no articles or books. Maurice convinced me completely that the competence model of human language is a finite state grammar and that the performance model is more powerful, perhaps a phrase structure grammar - sort of the reverse of the Chomsky and Miller position of the 1960s. While this has immense theoretical implications for theories of human theorizing about theories of language structures, these 'theory' issues loom as large as Tiny Tim when placed back-to-back against the gargantuan issue of practically implementing models of human language on a computing machine.

Maurice and I worked on developing a computerized grammar that can read newspapers, web pages, books, and any computer-readable text and from these sentences extract information that directly correlates with information about the state of financial transactions, currency transfers, and so on, that are often represented as tables and charts in newspapers. Since the human sentences generally refer to 'movements' and 'changes' and not 'states,' Maurice and I concluded that the semantic representations should be 'movies' and not 'pictures.' Further, the sentences may yield a 'state of belief', but not particularly a 'state of knowledge.'

Louis Menand broadly presents the relevant 'pragmatic' concepts in 'The Metaphysical Club: A story of ideas in America.' No longer can I get excited over a drop-everything-and-read-it book, recommend it to Maurice, and later discuss it at length with him. Even last night as I wrote this essay, I started to clip an article from the newspaper to send to him. Anyway, Maurice would have loved the book, and since Menand lives in NYC, we might have called him up. I am somewhat shy, but Maurice could be bold as brass, or at least, bolder than I. To know Maurice was to increase one's social circle, sometimes incrementally, but often by large quanta.

In simple terms, the 'semantic' output of a computer that reads and digests syntactically and semantically the financial pages of a newspaper should be a motion picture that helps you define your 'belief system.' That is, the output should be somewhat like a motion picture weather map, that may lead you to take an umbrella or leave it home.

In a nutshell, Maurice and I concluded that the sentences of human language discussing financial data do not have 'meanings' that correlate in any interesting or insightful way with the static two-dimensional figures, tables, charts, and graphs

printed in newspapers. The semantics, or rather pragmatic meanings, of sentences have meanings that correlate better with 'motion pictures,' or with Macromedia Flash movies. The meanings of sentences correlate with change, processes of change, rates of change, types of change, and so on - not with snapshots of 'stable states' or 'daily closings.' In short, if a computer analyzed the 'meanings' of the sentences in newspapers, it would present those 'meanings' not as tables of figures, or as static figures on a computer screen, but rather as motion pictures, somewhat like moving weather maps. Just as one can decide to take an umbrella or not based on beliefs formed from looking at an animated 'weather map' on TV, by looking at a 'money movie' one might decide whether bonds, money market funds, or a wad of greenbacks you could feel as a lump under your pillow would best help one weather the financial turbulence reported in the papers.

NYU sports the most exotic assortment of cutting-edge computer graphics equipment available, and as a corollary, has a vast army of sleepless students that stay up all night learning how to use it. Maurice often came to the Linguistics Department where a cadre of my students have worked on aspects of this 'motion picture pragmatics.' Aquilles Este, a Visiting Professor of Graphics Design from Venezuela, came to my laboratory and taught us how to use all of the Adobe and Macromedia programs to implement the real time pragmatic movie displays.

Rather than burden this essay with technical details, I present an example in another essay aimed more at practicing linguists.

Maurice's finite state computational grammar, implemented by his group at LADL, constitutes the most complete syntax based computationally implemented lexicon of French available. It also seems to be the most complete computational model of any language.

Our second project involved three steps. We had to: (1) Develop a semantic, or rather a 'pragmatic,' analysis of the meanings of data concerning money, finances, stocks, bonds, and so on - basically as Macromedia Flash movies. (2) Develop the computerized grammar that could read and analyze all the sentences in computer readable form in all European languages, plus USA English. And (3), correlate the real-time, daily, minute-by-minute grammatical analysis of millions of sentences analyzed in step 2 with 'pragmatic' interpretations of the data in the semantic system of step 1 in order to come up with an intelligible measure of 'what's happening right now?' and more importantly 'what will happen in a few hours or days?'

This second project involves enormous technical problems, all of which I ignore here. Instead, to communicate the flavor of our interactions, let's only consider one of Maurice's favorite topics: time, tense, progressive, aspect, perfective, and how human languages expand and compress semantic time using

syntactic and morphological tricks. Let us focus more on the man, and the ideas he shared with me about time, rather than on technical details of our project.

This second project that Maurice and I mulled over forms the flip side of the twinkling skyscraper problem - which requires a high speed camera taking thousands of pictures a minute in order to slow down a phenomena that can be so fast that if you blink, you lost it. The sun setting at sunset is a 'slow-down-the-data to see the information' problem.

Maurice and I focused on the 'speed-up-the-data to see the information' problem, or one might say, the 'time-lapse' photography problem. Age provides a vantage point from which one can review many of life's events in time-lapse - loves that came and went, carrying children home from the hospital one day only to see them get married shortly thereafter, gloating over a bundle in the stock market one year and gritting one's teeth over a depleted 401k plan a few short years later. My wife and I often recount in a few happy minutes events that took ten or twenty years to unfold. Such shared memories define 'living together' and 'growing old together.' Aside from my wife, I partake of shared memories with scant few. With the loss of Maurice, I have lost a major fraction of my shared memories, whose colorful details I must now recount only for myself since they sound a faded black and white when I tell them to my contemporaries caught up in their own memories and quite dated when recounted to my children and their generation.

Maurice and I spent hours together scouring old bookstores in NY and Paris, walking along the Seine and the Hudson, eating confit de canard, Peking duck, lobsters, and hot dogs. Occasionally washing it all down with a Nathan's draft or a bottle of Burgundy. After our discussions, we both probably learned something from each other, but almost always I separated from Maurice with doubts where I was previously certain, and aware of open doors where previously I had seen only fog and haze. We provided bearings and perspective for each other through life's ups and downs. We were each other's compass. In any moment of great joy or sadness, we would connect, especially in those mind-numbing cases where we could not even bring ourselves to talk about what caused us to connect. Despite the convenience of e-mail, we more usually talked on the phone, and thank heavens, across a dinner table for six weeks every summer.

We shared the values that count. Family, friends, students, and the 'full catastrophe,' as Zorba, the Greek, called the flesh and marrow of life's journey. Maurice and I agreed on broad plans and overarching views, but differed on almost every imaginable specific. This can yield profitable collaboration, but few tangible works. I think Maurice was one of the most creative, imaginative, and talented linguists of our age. Rather than extol Maurice by pulling up basic agreements we had, which would certainly embarrass him, let me point to one of our most

fundamental differences, a place where we agreed on almost everything vague, general, and remote, but could never agree on such mundane, sub-lunar, phenomena as: what to call it, basic technical terms, what it meant, how best to write it up, which parts to reserve for ourselves, and so on. My thinking tends towards programming computing machines that exist only on the drawing boards. Maurice developed functioning products using existing resources that set new standards for accuracy, efficiency, and elegance.

For those computationally inclined, our most fundamental difference can be summed up: Maurice was a software person, and I am a hardware person. He wanted to write programs to solve problems. Invariably I wanted to build a machine specifically suited to the task. He had no interest in my soldering iron collection that spanned my career from working on vacuum tube circuits, to individual transistors, to microchips, and beyond. I had little interest in elegant programming, since once I had a working algorithm, however rude and inefficient, a diet-coke stoked student lusting for an A+ could make it sparkle through the latest compiler as a term paper. We speculated as to why programming tasks leave the US for overseas 'free trade zones' while machine design stays here, carried on behind locked doors.

Machine design and circuit design, therein lies the rub and the hub for implementing aspects of human intelligence in silicon, and soon perhaps, its organic substitute. As one of my EE circuit design buddies declared: Build the circuits, cover them with red and white phosphorous, pack them in epoxy with the battery - as powerful as dynamite - ready to short circuit and rain the phosphors on the dolt who cracks the epoxy. Tout the battery as 'lasts ten hours at full power' rather than as .00001 kilotons, and jet the gizmos out to the non-English speaking programmers with the English label: 'Not user serviceable. Return to manufacturer for repair' rather than 'Woe unto he who attempts to reverse engineer this torpedo.'

Linguists studying modern human languages are only 'reverse' engineering a brain, that might as well be encased in an epoxy coated bomb, to find the underlying EE machine. Their data, modern language, consists of a self-correcting program that modifies its own code. We have lost the compiler - the soft mass that pulsed inside the ancient fossil crania on display in museums - and the source code underlying the chatter used by the early hominoids excitedly as they grinned and stammered through their show-and-tell sessions around their bonfires. Hence: EE >> CS. QED. Maurice liked CS. Devil's advocates to the last, my students and I would goad Maurice on and on. Boy, could we get Maurice going! I remember one night after he lectured at NYU we went to the Bavarian Inn on 86th Street about twenty five years ago... But I have no time or space.

Maurice was more of a Cartesian than I was in that he felt that the human mind used language as a 'universal device to deal with all contingencies,' as I more-or-less

misquote Descartes from memory. I sympathized, but my thinking aligns more with that of Konrad Lorenz, the ethologist, who thinks that animals (and animal parts, both hard and soft) are machines. Evolution is the invention of new machines that match emergent tasks, not reprogramming an old machine to deal with new tasks. Each species of fish is a different machine, and not a 'universal' or 'generalized' fish running different programs - with the exception, perhaps, of pseudo-speciation in the duck and goose, as Lorenz suggests. Anyway, let this drop, since it is a topic that can only be properly discussed over Peking Duck, or when eating foie gras and splashing a chilled Sauterne to and fro in a long stemmed glass. Maurice was generous to a fault. For our millennium party in NYC, which he alas could not attend, he gave us two pounds! of foie gras for our guests. Also, it is morning, not evening. I have tea, not burgundy. And Maurice is not here to fight back.

Maurice, a linguist and computer scientist, would say: write a program. I, a product of the MIT Instrumentation Lab before tackling linguistics, would retort: build a machine. Much of our thinking was fueled by choice Bordeaux and well-chilled pear brandy, often after a resplendent cheese course and a garlicky salad. The discussion was often conducted long after everyone else had gone to bed - and sometimes gotten up and gone to school. We had only one cardinal mandate: The discourse must go on until the cheese, the salad, and everything else disappeared, since as Maurice pointed out, this made cleaning up easier and gave us a reason to walk to the Union Square green market, where we could replenish supplies and visit the Strand bookstore.

Maurice had thousands of stories to tell, and in the short times we had together, he was able only to unfold some of his best. My life, and the lives of many of my students, friends, and colleagues, were improved and made the richer by Maurice. His personality, his manner, his lifestyle, and his teaching brought people together productively. Some of my best friends I met through Maurice.

My brain teems with shared memories, some perhaps to be recounted at another time. But without Maurice there to share them with me, they lose their luster and shine, and at most elicit a smile, but no laughter. There is infinitely more joy in breaking bread and partaking of shared memories with a friend while the sun is setting than there is in simply remembering them alone and trying to write them down at sunset.