Ferment

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**Ferment attends the Annual Conference of the
American Mathematical Society
Washington D.C.
Marriott Hotel,
January 14th-23rd , 2K**

Introduction

4 items of luggage accompanied me to Washington : two suitcases and two shoulder bags. One suitcase contained clothing for 10 days; the other held manifold copies of reprints, all bearing some relevance to mathematics, of articles, research papers, small Ferment Press books and assorted publicity. The intention was that the books would be sold, the

papers given away, while the articles, past issues of Ferment for the most part, would be used to generate subscriptions. These included the series on Alexandre Grothendieck, John Nash, René Thom, Alexandr Yesenin-Volpin; coverage of conferences on Fractals, Astrophysics, Ferment's Last Theorem, the Einstein Centennial Symposium; and others . The research papers were in the areas of   quantum theory, dynamical systems, set theory, epistemology , algebraic causation , the topology of relativistic time , symbolic dynamics , algebra and point-set topology.

In the merchandise I'd included several "calling card" items, things to present while introducing myself or the items of Ferment Press:

(a) 20 copies of an original puzzle book 'Circular Tangrams' . This holds 14 drawings with names like 'Penguin', 'Helmet', 'Crane ' , etc. The centerfold of the book is a stapled piece of blue cardboard holding 8 'tangram' pieces arranged in a semicircle. They must be cut out, very carefully to assure an accurate fit on the puzzle diagrams. Unlike the traditional Chinese tangrams, the borders of these pieces combine straight with circular edges.

(b) A collection of 5 essays, entitled "Pons Asinorum", dedicated to the proposition that one doesn't have to understand mathematics to make fun of it.

(c) Stacks of 3 business cards, to be distributed on the basis of my assessment of the importance, intelligence or sense of humor of the recipient. These are reproduced below:

Roy Lisker, Ph.D.
Author Journalist
Math-Physicist
Ferment Press
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Roy Lisker, Ph.D.
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Gadfly   Raconteur
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~ferment1/lisker.html/

Roy Lisker ,PhD
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(d) Buttressing my entitlement of "Doctor" were copies of all the letters received from the *Council of Autonomous Scholarly Support* (C.A.S.S.) , published in *Ferment Vol. IX#10 , January 18th, 1996* .

I could not have prepared more thoroughly comprehensive for creative participation in the conference . But what was *I* going to get out of it?

One of the shoulder bags held books, a Walkman portable tape player and a stack of cassettes for trains, buses, and restaurants of deplorable musical habits. [1] The other bag held notebooks, writing paper, journals and articles relating to projects to be worked on while on the road. 10 days is a long time to be idle.

Carrying such an abundance of goods I was thoroughly over-encumbered, an apt description of my entire way of life. In fact it was too much: prior to catching the AMTRAK train to Washington at 2AM, Monday morning, January 17th, at New York's Penn Station, some of the overflow was left in the safekeeping of friends.

New York City, January 16

Culture is the only reason for living close to New York City : New York for culture, Boston for higher learning, Philadelphia for home-comings.

Washington? For politics of course, though everybody who knows me knows I'm not political: me and the Pope.

Early that Sunday morning I consulted the New York Times for listings of concerts and plays. For some reason virtually every affordable performance event involved groups or individuals I'd worked with , or had some connection to, from 1976 to 1982 ; while every unaffordable event was being promoted or performed by people and organizations I've never had anything to do with in my entire life. That's Show Biz.

First a leisurely stroll fighting off panhandlers up Broadway from 59th and Broadway to the Mannes College of Music at 150 West 85th

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[1] I call this my "Swine-Whine Protection Kit". The name comes from the observation that most of the music in places of public accomodation sounds like the whine of a swine for its porcine mate .

Street. Distinguished scholar teacher and fiddle-player Joel Lester is now dean of this conservatory: I'd become acquainted with him in my contentious years of quantum entanglement with the Da Capo Chamber Players. May they (the years, not the ensemble) rest in peace. Currently in residence at Mannes is the Harid Quartet :Wendy Yun Chen, Yinzi Kong, Jessica Shuang Wu and Guang Wang , all Chinese . Canons versus cannons, sometimes one prevails , sometimes the other. These Harids stands as irrefutable testimony to the resilience of the European canon of classic music against the cannons of the Cultural Revolution. I mean, there must really be something (apart from the fact that passages from the works of Bach, Beethoven, Mozart and other paradigms possess my inner ear day and night) that gives the accumulation of scores from the middle of the 17th century to the present day a timeless legitimacy.

Anyway, at some date in the 80's in the Shanghai Conservatory,   3 willowy ,breath-takingly sensual and superbly gifted feminine stringists teamed up with a male celloist to form a string quartet that has evolved into one of the finest I've encountered in recent years. Their outpourings that afternoon included the Schubert String Quartets # 13 in A minor (Rosamunde) and #14 in D Minor (Death and the Salesman) , and the invincible Bartok #4 in Coal Miner.

This is the kind of performance event , free or at very low cost, available in New York City every day of the week. Sometimes I feel I ought to be grateful (though I'm not of course) for the non-materialization of anything resembling a career which would have allowed me to live in the City. I know I'd be too busy running around witnessing cultural phenomena to ever get any work done.

Indeed, even before the termination of that quartet about death I was out the door dashing down 8th Avenue to take in the current production of the Medicine Show Theater Ensemble, headquarters now

at 53rd Street around 10th Avenue. My years of collaboration with Medicine Show predate even the collapse of the wave packet that occurred with the Da Capo Chamber Players.   An entire issue of Ferment would be required to detail the many profitable joint ventures between the Medicine Show Theater Ensemble and myself from the mid-70s to only a few years ago. Suffice it for the moment to say that its animators, Barbara Vann, Jim Barbosa and Chris Brandt all seem to be doing very well, that the ensemble has miraculously survived 30 years of attack from the greatest onslaught of philistinism in human history and, I dare say will continue to do so. A few words about the play , a magico-politico farce by the late Russian playwright, Evgeny Schwartz:

A magician touched with megalomania has transformed a bear into a handsome young man - perhaps he isn't so handsome but that's another story . There is a mysterious curse (cast by a witch or some other agency) on the young man to the effect that if he's ever kissed by a beautiful young princess he will instantly turn back into a bear.

The magician is also an inn-keeper . Soon he finds himself playing host to a tyrant king with his entire court administration, his retinue and of course his daughter, a beautiful princess. The stage has filled up with tyrants : the magician, the king, his no-bullshit foul-mouthed queen, a greedy and ambitious Chief Minister, a ghoulish executioner, and a hunter who wants the princess to kiss the handsome young man , to turn him back into a bear so he can shoot him.

The play, in other words, is all about the meaning of "tyranny", as a good Stalin-era farce that was whisked past the censors ought to be, while the mechanism of the plot revolves around the far-fetched attempts of the princess and the handsome young man, each desperately infatuated with the other, to avoid kissing.

*Finally unable to resist the tyranny of nature the couple embrace ,
the court keels over with grief, the hunter aims his rifle ...... but just then
the magician arrives, waves his magic wand and cries "Ha-ha! I fixed it!
He doesn't turn into a bear after all!"*

Happiness ever after, and another trip to Siberia for its author
narrowly avoided.

Washington, D.C. , 6:20 A.M.
Monday Morning, January 17th

The Woodley Park station of the Red Line lies at the foot of the
Marriott Hotel, one stop after Dupont Circle and an 8-minute glide by
subway from Union Station. Of these facts I, on disembarkation from
the AMTRAK train, possessed none. Orientation took up the worse part
of half an hour, for it is a signal fact of modern American life that one is
always in situations in which either everything is made obvious or one
is hopelessly at sea. Thus although the connection with the Red Line
subway is embarrassingly simple, my struggles with "choice fatigue"
through Union Station's two dozen restaurants took upwards of half an
hour.

Above ground at Woodley Park my primary goal became that of
distinguishing the Marriott Hotel from the Zoo. Both are marked on the
map at approximately the same place. The problem would become even
more acute in a few days, with 4,000 mathematicians strutting and
stumbling through the lobbies of the building at all hours. Then I really
didn't know where I was!

For this is the IMY 2000: International Mathematics Year! *This*
annual meeting of the AMS would not be merely a conference of
mathematicians, nor a conference of meta-mathematicians, nor a meta-
conference of mathematicians; nor a meta-conference of meta-

mathematicians. *Rather was it to be a MEGA-CONFERENCE of mathematicians !* , (among whom there may well have been some meta-mathematicians, even some mega-mathematicians, although these tend to want to hide in their attics for 7 years at a stretch.)

All through the following week the Marriott would do its best to accommodate delegates (and their wretchedly suffering spouses) to the annual meetings of the *American Mathematical Society* (AMS) , the *Mathematics Association of America* (MAA) , the *Society for Industrial and Applied Mathematics* (SIAM) , the *Association of Women Mathematicians* (AWM) , the *Association for Symbolic Logic* (ASL), as well as minor gatherings of the *National Association of Mathematicians* (NAM) , the student mathematics fraternity *Pi Mu Epsilon* (ΠΜΕ) , the *American Statistics Association* (ASA), the *Isolated Teachers of Statistics* (ITS - I thought this was a joke but it wasn't) , and the *Rocky Mountains Mathematics Consortium* (RMMC)

This conglomerate conference would not fully metamorphose until Wednesday. The first two days, Monday and Tuesday, were given over to mini-courses on various subjects, including an intensive 12 hour indoctrination in Quantum Computation I'd registered for. This is a subject about which I knew nothing and know even less now, the significant difference being that I now know that I know less, which I didn't know before.

At 7:30 AM, as I walked through revolving doors, my principal uncertainty was still centered around whether if I were at the Marriott or at the Zoo. Since the Concierge directed me to a table around which were accumulated several receptionists , who redirected me to the gigantic ballroom where the Quantum Computation seminars would begin in another half hour, it seems reasonable to conclude that I was in the Marriott. It may have appeared odd to some to see me as I trundled

into the ballroom weighted down with two suitcases, heavy as millstones, and two shoulder bags stuffed with notebooks. This in combination with not much more than an hour's sleep the night precedent may have lent me a strange allure, though it is far more likely that those who glanced up at me thought, " *typical mathematician* ", then turned away and ignored me for the rest of the conference.

The effort of transporting heavy weights combined with the lack of sleep had induced a congenial state of mind which, while giving one the feeling of living intensely, makes one incapable of thinking coherently. Of course what I needed to accomplish was impossible :

(i) Attend the first two hours of the Quantum Computation mini-course until the coffee break

(ii) Get on the phone to Washington's 5 Youth Hostels to locate a vacancy

(iii) Hop into the subway system to register at one of them by noon , leave half my luggage at the hostel and bring the rest back to the conference;

(iv) Attend another 4 hours of quantum computation lectures

(v) Sell enough "Grothendieck's" , "Fermat's", "Pons Asinorum's" , "Einstein's " , etc., to cover the costs of the adventure

(vi) Meet lots of friends. Go out to dinner with some of them and talk up a storm until 10 PM. Finally :

(vii) Head back to the Youth Hostel and collapse around 11.

Such an undertaking may have been feasible in my heroic age. In fact the above description more or less fits the trajectory of my first day at the Fractals Conference in Cincinnati in September of 1987 (*Ferment V#7, January 1988*). Exhausting ? Yes. Impossible? No. My decision revolved around the following considerations:

(1) Without catching up on sleep I could not possibly absorb 6 hours of lectures.

(2) Nor was it likely that I'd be able to sell even a single Ferment Press book.

(3) This building, if in fact it was not the Zoo, was apparently already a hotel of some sort.

(4) What's money anyway? A pre-Cybernian artifact!

(5) My heroic age has passed. I've been in retirement since the mid-80's from a career that's never existed.

Even a decade ago it cannot be doubted that overpowering shame would have prevented me from doing what I'd already resolved to do before the end of the first lecture: to inquire at the reception counter of the Marriott Hotel if there existed a special rate for convention delegates for a single room for one night. Taking a long perspective over the entire conference, it is now clear that this was indeed the wisest, even the most practical course of action . Yet at the moment that this decision was made I felt only one thing: that 40-some years of revolutionary activities had culminated in the creation of a lazy, comfort-ridden, spineless wimp!

The decision made, the view cleared almost immediately. I found myself able just to sit back and listen to what Dr. Sam Lomonoco was trying to tell us. The audience sat in chairs arranged in long parallel rows covering about half the floor space of this immense ballroom. Sam is a gifted teacher; anxious to include everyone in his message, he used up so much of his time re-explaining the basics of quantum theory that he had only a few minutes left over to elaborate on quantum computation. This pattern was repeated in his next lecture on the following day, when he devoted 45 minutes of an hour-long lecture on quantum entanglement to a review of the theory of Lie Groups and Lie Algebras.

It being granted that Quantum Theory and Lie Groups are both difficult subjects -   let's say, they are both subjects in which the devil is in the details. To straighten out what's going on with a Lie Group, which is merely a marvelously brilliant   generalization of the idea of a rotation in space, one must keep distinct the notions of *the vector field, the integral curves, the flow, semi-regular flows, regular flows, irregular flows, the infinitesimal generator, the base manifold, the transformation group, the Lie group, the Lie group manifold, the one-parameter subgroups, the global group, the local group, the tangent plane to the base manifold, the tangent plane to the Lie manifold, the tangent bundle to the base manifold, the tangent bundle to the Lie manifold, the Lie algebra, The Jacobi Identity, the structure constants, the derivations, the adjoint representation, the exponentiation, the Lie derivative, the Lie bracket* ....

To grasp the essentials of Quantum Theory, which is a form of damage control over the effects of measurement at the sub-microscopic level, one only has to keep one's mind clear about the notions of *phase space, configuration space, position space, momentum space, Hilbert Space, Banach Space, de Broglie wave-particle duality, matrix mechanics, wave mechanics, Heisenberg formalism(matrices) , Schrödinger formalism (wave equations) , Dirac formalism , [2] , von Neumann formalism (Stieltjes Integrals) , Feynman formalism (Feynman Integrals) , Born's statistical interpretation , Birkhoff-von Neumann proposition lattices, Jauch-Piron lattices and other Quantum Logics, Jordan Algebras, the Copenhagen Interpretation, the Einstein-Podolsky-Rosen experiment, Aspect's Experiment, Bell's Theorems, Bell's Paradox, Bohm's Hidden Variables, Mackey's Measure Spaces, S-matrices, Pauli Matrices, Spin, Uncertainty,*

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[2] kets (vectors) , bras (functionals) , bra-kets (scalars) , ket-bras (operators) , ket-kets and bra-bras (both tensor products)

collapsing wave packets, Hermitian operators, Symmetric operators, Statistical operators, Hyper-maximal operators, Unitary operators, Vector operators, Dirac delta-functions , spinors, angular momentum vs. spin, eigenvectors, eigenvalues, probabilities, discrete spectra, continuous spectra, residual spectra, pure states, mixtures, expectations, dispersions , dispersion free states, linear manifolds, closed linear manifolds, linear transformations, closed linear transformations, continuous and bounded linear transformations, resolutions of the identity, resolvants..............

It's no mystery even the experts go confused. In fact, they're often more confused than the rest of us. Because they're experts.

In the course of a long career clinging to the fringes of the mathematics world I have been entertained by about 30 of these " Quantum Theory for Mathematicians " precises . Typically they will take a handful of the above notions, explain how they work, then claim that all of quantum theory is contained in them. This is true yet entirely misleading. It comes as no surprise to learn that one of the greatest quantumists , Richard Feynman is alleged to have said that there were only 10 people in the world who understood quantum theory, and he wasn't one of them.

Which reminds me of a story:

 In line with other efforts to stimulate the American Dream out of its inanition I will sometimes stand on street corners around campuses and hawk a small self-published book entitled   **"Introduction to the Ideas of Quantum Theory for The General Public"** . On the East coast the best location for doing this is in the vicinity of Harvard Square. As a general rule I find myself gravitating to a spot right in front of the camera store a block down from the *Au Bon Pain* on Massachusetts Avenue . Anyone familiar with the neighborhood know exactly where this is . A short distance away from there on most days one will discover

an unfortunate, obese, shabbily dressed woman. For a decade or more she has taken to sitting at this spot, intoning in a relentless sing-song: *"Quarter? Quarter? Gotta quarter?"* . She never says anything else. I've seen her sitting there even in the rain or icy winds.

One readily imagines the spectacle: some foreign visitor , perhaps a distinguished scholar, a man of great learning walks down Mass. Ave. parallel to high containing walls surrounding buildings which, for most of the Third World and even a good part of the First, are reputed to house America's premium institution of higher learning. As he nears the street crossing that will place him in front of the bricked entranceway to Harvard Yard he hears, rising against the cacophony of traffic :

" Quantum! Quarter? Quantum! Quarter? Quantum! Gotta Quarter? Quantum Theory for the Public! Quantum! Quarter! Quantum! Quarter!......

One summer afternoon a year ago I was out there doing my bit, when whom did I see strolling up the avenue, but Henry Louis Gates, Jr. , Dean of Afro-American Studies at the H School ! Mr. Gates is well known for his frequent appearances on television. So anyway, Mr. Gates walks past me and I, on cue, cried out to him " Quantum Theory, Mr. Gates? Are you interested in the ideas of the quantum theory?"

Gates glared at me, scowled, made a dismissive gesture with his right arm and hissed: " Don't need it. I read a book on the subject." This , by the way, is not atypical for certain vassal provinces of Academe, like Musicology, Sociology, Area Studies, Ethno-Feminist-Patriarchy Studies, Marxo-Freudo-Derridian-Chomskyo [3] -Althusser-Laçanian studies, etc., in which, indeed, reading even half a book (Who bothers to read the whole thing?) makes one an expert.

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[3] Lisker! That's enough!)

Quantum Physics, alas isn't like that at all. As he was scurrying out of sight, I found time to convey to him the apocryphal comment by Feynman recorded above. At the AMS conference, recounting the anecdote to mathematicians from Howard University I learned, after the hearty belly-laughs, how *they'd* treated Gates after he'd delivered himself of standard *de-kunst-ructionist* pseudo-anti-scientific verbiage .

Dr. Lomonoco prefaced his talk by reminding us that the field of Quantum Computation brings together Physicists, Mathematicians, Electrical Engineers and Computer Scientists. His ambition was to present a summary of quantum theoretic notions that all of these groups could understand.Thorough-going as he is, Sam tried to cover quantum theory as exhaustively as one could hope for in the short space of 45 minutes. Inevitably he failed.

It is hardly to his discredit that he made a number of mistakes: it really is impossible to slurp through this minestrone without getting at least a few things mixed up . One notorious source of confusion is in the distinction between eigenvalues and probabilities. The "eigenvalues" are the numbers that we call the "energies" (or energy levels) "positions", "angular momenta" etc., that is to say, the magnitudes of the physical world. The "probabilities" are the distributions of these things over the regions of space-time one is interested in. That sounds simple enough: but when one is working with equations like $\boxed{\Psi = a_1\phi_1 + a_2\phi_2 + \ldots a_n\phi_n + \ldots}$, where the ϕ 's come from the operator K that also gives the eigenvalues α_n , and the a_n 's (which go into the calculation of the probabilities) come from experiment, or from logic, or from initial conditions , (and when, in the case of *mixtures* , there is something called the *statistical operator W* , whose eigenvalues *are* the probabilities) , then it is almost impossible to

avoid mixing up the a's with the α's , which is something that Sam did, which I do, which everybody does at some time or another. After the lecture I pointed out the error to him. We agreed that it's impossible to avoid that kind of mistake .

Into this Bacchic revel the theory of quantum computation has introduced yet another notion, the *qubit* . This is a modification of the standard Shannon bit, (or byte as it's sometimes called) of computer science: it can be either 0 or 1, the difference being that it can be both simultaneously. That's known as superposition. An n-place "register" holding n-cubits can therefore be in $2^n - 1$ possible states all at once.

Some people imagine this to mean that a 'quantum computer' might be able to perform $2^n - 1$ operations at the same time! The problem of course is to get the information out of the registers: once you start asking questions the whole system falls apart. [4] But it has been calculated that if there is some way to obtain right answers 2/3rds of the time, then do the computation over and over again millions of times, one is bound to end up with the correct answer more quickly than one can with conventional computers. Who's to say? : the Rube Goldberg has yet to be built.

Most of the potential applications of quantum computation relate to cryptography. Since I tend to favor openness over secrecy in my daily life, I am not so convinced of its overwhelming importance. However , one can easily show - via a parable involving Alice, Bob and Eve - that since asking for information always introduces uncertainty, it's possible to set up a network of channels between Alice and Bob that can detect whenever Eve is trying to eavesdrop on their conversation , (unless she

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[4] That's Quantum Theory. Someday it may provide the basis for quantum jurisprudence: the crime disappears through the asking of questions about it.

initiates a new conversation in which case Bob needs some way of distinguished between Eve and Alice.)

In the audience sat a woman, an octagenarian teacher of mathematics who, intrigued by this interplay between Alice, Bob and Eve made frequent interruptions in a flustered, high-pitched slightly hysterical voice. Some people were annoyed, although some of her objections were cogent . My view was, and several of the colleagues I spoke with afterwards agreed with me, that by the time a mathematician reaches 80 she can do anything she wants to . However, for my half-comatosed intellect it all began to sound a bit like "*....then Eve started dating Bob who was engaged to Alice whose brother was going with Mabel who used to go out with Bob or was it Bob's father-in-law then Ethel had a baby which was sad since she didn't know if its father were Stewart or Jack that's Alice's brother by the way ....and...*"

Sam's lecture was followed by that of Peter Schor from AT&T, one of the world's authorities on quantum algorithms. He finished at 12 and I stood up to wander through the long corridors back to the registration counter of the Marriott, to ask if there were special rates for conference members for one night. A very sweet, small, very tired Japanese receptionist disappeared for a moment into a side office then returned:

" There are. How long do you want to stay?"

" One night".

" We are able to offer you a single room with double bed, chocolates on the coverlet, a dozen towels and 6 kinds of body lotion in the bathroom, paper flowers on the tables and Gideon Bible in the desk drawer, USA Today delivered every morning at your door, etc., etc......for the ridiculously low price of $126 a night." I gulped. I had only $200 on me and had not yet bought my return ticket back to Philadelphia.

" I'll take it!" I sighed

"One small detail: Washington's sales tax is only 14.5% . The total cost comes to....(some calculations) ... a measly $144!"

With the air of a man of the world used to negotiating far larger sums I whipped out my wallet and forked over the specie. In return I received a receipt and plastic electronic key for a room on the 5th floor.

As I staggered across to the elevator a bellhop raced across the polished parquet floor to grab my two suitcases. I gripped the handles tightly and shrugged him off . The look he gave me in passing was unmistakable : "Cheapskate!"

Apart from its cost the room was satisfactory: it had that quality of roominess one expects from rooms. Within a short time, my clothes shed, I was between the sheets. Two hours later I would return to the quantum computation seminar, just in time to learn that the talk scheduled for 1 o'clock about *anyons* had been incomprehensible to all but the speaker, if to him. Most of the book of nature is like that: the prerequisite for studying a subject is to already know it.

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Over the next 5 days the interleavings of encounters, meditations and events becomes ever more complicated, so much so that the chronological format ceases to be manageable. Far better to organize these transitory raptures and epiphanies under a small number of topics which, once established , can be followed, over-ridden, ignored or disdained, following the stochastic whims of the author:

(1) Homecoming :

Notes on a 50 year tug-of-war with the community of mathematicians. Neither they nor I can figure out where or if I belong.

(2) People, delightful and/or repugnant :

New encounters, acquaintances, friendships

(3) Featured speakies :

Brian Greene and Roger Penrose

(4) Legends of a Washington Youth Hostel

(5) Dinners / Conversations

(6) Washington D.C.

Perspectives on National Capitalism in the Nation's Capitol.

(1) Homecoming :

Reckonings with the ghosts of a half-century of an anti-academic career confronted me all through the Washington meeting. The first occurred in the intermission between the first two lectures of the quantum computation seminar. Following Sam's talk I was approached by a familiar face, that of an elderly white-haired and spectacled mathematician , black motorcycle jacket draped over other clothing. His name-tag read "J. Feldman".

"J." seemed unsure of himself, then ventured a guess : "Roy Lisker"?

I acknowledged same, but couldn't remember his first name. Pointing to his tag I replied " *Yes. and you're ...you!*" Do not imagine that I was unaware that Dr. Feldman's reaction might be that of someone who feels vaguely insulted and walks away. Not remembering his first name doesn't mean I didn't know *why* I didn't remember it:

During a return visit to the University of California campus at Berkeley in 1996, it was my habit, as in many other places, to stand on the campus selling Ferment Press books about mathematics and physics. Sometimes this was done in the shadow of Evans Hall, the squat oleaginous cubicle that houses the math department, the computer science department and much else besides.

Dr. Feldman was in the habit of slinking along the walls of the adjacent buildings whenever he caught me in this discreditable activity. The message in his manner was unmistakable : *I don't want anyone to think I know that crank!*   He is hardly unique in this regard: I have known mathematicians to cave in at the knees, hold their mouths to keep from vomiting, even walk by quickly holding their ass in both hands, when they've run into me trying to pass along books about their elite science to ordinary people.

As we waited for Peter Schor to initiate us in his specialty,   (the technicalities of constructing algorithms for the quantum computers of the future) , I persuaded myself that my indignation had been excessive . Jack (for the name did come to me soon afterwards) doesn't come off too badly relative to his peers. Most academics determine their identities via the catalog of persons they don't want to be seen talking to in public. Away from the limelight I've found Jack to be a kind and friendly human. A few minutes later I walked over to where he was sitting, smiled, said "Hello Jack", and passed along some articles relating to his field of research and to mathematics in general .

A more recent acquaintance recognized me during Brian Greene's marvelous talk about String Theory the next morning : Alan Durfee, teacher at Mount Holyoke College . He was part of the enthusiastic crowd at the Amherst College math department last year when I delivered a lecture on my search for Alexander Grothendieck in 1988 .

That talk sticks in my mind as being one of the very few moments in my entire life when I'd felt I might enjoy a university career in the sciences of Ars Combinatoria, Analysis Situs, Al-jabr , Gematria, Geometrica and the Higher Logic.

On the night of January 19th, the presence of (currently) Brandeis combinatorialist Ira Gessel collided with mine at the first floor bar in the lobby of the Marriott. It was around 7 PM and I was sitting in one of the discomfiting arm-chairs distributed around this locale , awaiting the arrival of a new acquaintance/colleague , Howard University cyberneticist Ely Dorsey . He and I intended to take in the scheduled sermon on Penrosism delivered by its prophet and founder . The table in front of me was being used to support one of my suitcases. Opened, it was filled with numerous copies of original papers. As people walked by my table they were button-holed and invited to select any papers that related to the fields that obsess them.

This very strange procedure from the lowest sub-basement of unprofessionalism resulted in the distribution of about 10 reprints. Indeed, one of my newly converted disciples was to be observed in an armchair a short distance away, intently checking my calculations in " *Non-Linear Algebra and Dynamic Systems* ".

A Russian mathematician started to scoop up a research paper on set theory. He threw it down with contempt when I remarked that it discussed the transfinite cardinals, the "Alephs". The gesture was blatantly anti-Semitic. [5]

It was in this fashion that I ran into Ira Gessel. In the 1980's he was the organizer of MIT's Combinatorics Seminar. Through his auspices I'd given a talk on "Linear Composition Operators on Cubical Matrices", which was well received. In the spring of 1981, after bringing

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[5]Not a fabrication. This in fact occurred.

the MIT administration to a grinding halt for one day (*New Universe Weekly, Vol. II#10 , April 30,1981*) I'd fled to the Hudson Valley and lost track of most of my faculty contacts at the Institute . Meeting Ira a few times over the years at conferences or on the Internet, he'd always been interested in what I was up to. After the exchange of greetings he received a copy of "Pons Asinorum" .

Richard Palais was another Brandeis acquaintance from my Greater Boston days. We connected on the morning of January 21 in the ground-floor lobby where registration booths had been set up for all the conferences . A large arena holding half a dozen great circular tables, it can be reached from the main floor via escalator. In the 1980's Palais had subscribed to New Universe Weekly (the early version of Ferment) for about a year. He'd recently come across a copy of Ferment's review of Sylvia Nasar's biography of John Nash " *A Beautiful Mind* " (*Ferment Vol XII#4, September 9th,1988: " A Beautiful Behind"*) . He feels I treated her too harshly : she isn't a mathematician after all, and her background research had been very thorough. He himself likes the book, which is okay with me: in fact I do praise its good points in the review, such as her narrative power and, yes, the exhaustive research . Further questioning revealed what I've discovered with most mathematicians who've reacted to Nasar's book (and to my review) as he has : they don't bother to read the biography carefully but are delighted that so many of their friends are mentioned. [6]

Back to the night of the 18th: Ely Dorsey did finally show up and we went to listen to Penrose. Lou Kauffman was already in the auditorium when we got there and the three of us sat together near the middle. On the way down the aisle I ran into Frank Morgan, chairman in

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[6]This may explain why some of the mathematicians who end up reading this issue of Ferment. who might otherwise find it offensive. will instead find it delightful!

1980 of MIT's undergraduate mathematics division, now at Williams College in western Massachusetts. I remembered him after reading his name tag .Frank regarded me with amazement and cried out : *Roy Lisker! Of all people! I can't believe it!*   Back in the 80's he'd excused himself from subscribing to New Universe Weekly because, as he put it, he'd never read anything so strange. This led me to wonder how he'd react to being told that Williams College was the *alma mater* of Ezra Pound . By the time I'd thought of telling him this he'd moved on.

During the afternoon coffee break on the first day of the quantum computation seminar a happy encounter took place with functional analyst Michel Lapidus . We'd first met at the International Congress of Math-Physicists meeting in August of 1983 in Boulder, Colorado. Coverage of this gathering inaugurated Ferment (September 14, 1983) . That summer is also notable as marking my return to mathematics research after a hiatus of 20 years.   Throughout that conference I engaged in activities that were dubious at best, when not outright dishonest (read Ferment Vol. I #1 and #2) . In my defense I plead: how else does one deal with a conclave of atomic physicists , not a one of whom has the slightest inkling that August 3rd and 6th are Hiroshima and Nagasaki Days, and who simply cannot understand why someone insists on wearing that black arm band ?

Michel Lapidus has always been a strong supporter of my work, is not the least bit upset that I don't fit the stereotype of an academic mathematician, does not glance nervously over his shoulder while talking with me in public. Whenever we meet he asks me if I've written anything recently and if I've got any Ferment Press books with me for sale.

His investigations are in Brownian Motion, Wiener and Feynman Integrals, Number Theory and Fractals : quite a range. Over coffee he

picked up a complete set of the articles about the search for Alexander Grothendieck. Then he introduced me to Patrick Ion, editor of Mathematical Reviews, who also bought a set.

His friendliness led me to consider that perhaps French mathematicians have a better understanding of where I'm coming from than do the Americans. I've had good luck with Michel , A. Grothendieck , René Thom, Costa de Beauregard, Michèle Vergne.............

Ah......... then I remembered how Dr. Hervé Jacquet at Columbia had chewed me out for trying to talk to him; and how Jean-Pierre Serre had sneered me out of his office at Harvard for proposing to sell him Ferment Press books relating to mathematics. (*" Paper! Paper!"* he'd snarled *"See! My desk is full of paper! Why should I buy your paper?"* Leaving his august presence I suggested timidly that he might consider reducing the $100+ prices on his textbooks from Springer-Verlag. He glared at me dumbfounded: was I posing some kind of problem in number theory?)

So it's not good to generalize. France has given us Joan of Arc and Gilles de Rais; Pierre Abelard and Bernard of Clairvaux; Charlotte Corday and Robespierre; Louis LeCoin and Marshall Petain; the Abbé Pierre and Cardinal Lustiger; DuBuffet and Buffet! So what does it prove? Nothing.

On the afternoon of Thursday January 19th the past caught up with me again in the person of Paul Zuckerman, mathematics professor , sometimes department chairman and administrator at the State University of NewYork (SUNY) at New Paltz. Paul noticed me sitting , once again, in the bar of the Marriott lobby [7] and came over for a chat.

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[7]That I spent so much time in the bar does not mean that I was in any danger of becoming an alcoholic . I didn't buy anything; the drinks were too expensive. Basically there isn't

From the cordiality of our mutual greetings one would never suspect that we had once been the bitterest of enemies. How truly incredible it is that time heals all wounds. Only a few decades ago we would not have remained in the same room with one another .

In 1981 Dr. Zuckerman was chairman of the SUNY- New Paltz mathematics department. New Paltz , New York is a charming college town in the Hudson Valley about 90 miles north of the City. I still maintain contact with friends there. Once in awhile it features in the pages of Ferment. He had invited me into his office to discuss a temporary teaching position for the approaching term. The department, he indicated, was strapped for personnel. Under the circumstances even so lowly a creature as I , with less than adequate credentials , had hireability . With desperation in his voice he urged me to move from Woodstock, New York some 35 miles away and find an apartment in New Paltz. There were other reasons for leaving Woodstock, mostly connected with the fact that my ambitions require that I live near a copious university . So what can I say? Not for the first time nor the last, I moved in with friends, generally a disaster for all concerned whenever it happens, but which, fortunately, never seems to abrade the strands of friendship beyond the nexus of excess proximity.

A lifetime's experience with this sort of thing should have informed me that the job existed only in the imagination of its proposer. There had never been the slightest chance that I would have any opportunity to protest its crummy salary. Dr. Zuckerman, it turns out, was setting me as "insurance", just in case one of the regular faculty should come down with Aids or undergo a nervous breakdown. He did this more than once: finally I realized that Dr. Zuckerman can't give the

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any other place to sit in the Marriott lobby if you want to meet people or watch the madness of crowds

time of day to people who aren't "official" without trying to exploit them. The only distinction he makes in this respect between the official and the unofficial is that the latter have legally defined rights that can't be abrogated.

The problem was that- in those days - I was in the habit of responding in kind. Possessing an impeccable portfolio of non-credentials gave me the maneuverability for spreading embarrassment far and wide, with at most minimal repercussions on my security . The situation came to a head one dark afternoon in the 10th floor Faculty Tower cafeteria (3 floors above the Math department) , where I skillfully precipitated an uncontrollable outburst of fury just when he was trying to impress some *real*   teaching candidate from a *real* university, (it may have been Vassar or some other nearby college) . I wasn't there when it happened, but I heard about it from reliable sources, that is to say, the waiters and waitresses on duty at the time.

Surprisingly we did make up after that, but unfortunately the notion got into my head after another one of his non-existent jobs fizzled,   to stage a one-man protest demonstration on the Faculty Tower's ground floor .To offer me non-existent jobs was bad enough; to propose an insulting salary for a non-existent job was the last straw! Paul showed admirable forbearance, but the Math secretary was sufficiently upset by such conduct unbecoming a professor [8]   that she called Security on me. Its representative arrived in due course. He didn't arrest me , just told me to move on: you don't pull stuff like that at *this* university!

Jack Feldman had informed Maurice Auslander, a noted algebraist, of my presence at the AMS conference . He kept a lookout for me and

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[8] as in, "You know the professors up there. They don't welcome the public walking in and out of their classrooms."

finally caught up with me on the morning of the January 21st. It was about 10 AM . When he discovered me I was sitting by one of the large circular tables in the ground floor lobby. Stacks of Ferment Press books were laid out in display, along with many and Tangram Puzzle books, calling cards and copies of "Pons Asinorum" and "Fermat's Last Theorem" to be given away as publicity. Richard Palais had just walked away when Auslander came over to ask me how I've been. The last time he saw me was 40 years ago ! He'd been at the University of Pennsylvania at the time that I'd , all unwittingly, convinced the entire Math department that they'd rescued an incipient Paul Erdös from the hicks of the Philadelphia high school system. The situation has been floridly caricatured in my one published novel, "Getting That Meal Ticket". An   excerpt from this was published in

Ferment (*Vol.X #5, August 20,1996*   )

   With the benefit of almost a half century of hindsight he could verify what I'd recognized in 1956 by the age of 17 : I've neither the genetic endowments nor the intellectual constitution of a Paul Erdös. What he, nor anyone else at Penn may not have understood at the time, is my undying gratitude to the gods for not making me a bona fide mathematical genius of the Erdös type. Indeed I envy nothing of the great theoremist's life or personality beyond his wanderlust and his boundless energy.

   I am grateful, I repeat, that I've never thought that people who don't do math are "brain dead". My letters never begin with "Hello X :Let N be an integer..." . I can use my own can-openers thank you. I also don't believe that culture (music, art, etc.) is silly when not outright stupid, or that the most important problem facing mankind is the number of ways of decomposing integers into kth powers of primes.

Had I been that kind of person I would have inoculated the hearts of my professors with infinite bliss . Somehow I suspect that the world would have been the loser. We really don't need more geniuses, what we desperately need are more independent minds that are not enslaved to prevailing indoctrination absorbed via "higher" education , which afflict (more than anyone else) its quondam priesthood , who ritually kow-tow daily to its implicit proscriptions   while loudly proclaiming their freedom of thought and action.

This is all beside the point. Maurice Auslander is a gentle soul. He and I carried on one of those sentimental conversations about olden days.

Finally I cannot forget to mention Lou Kauffman. He's been the subject of several past Ferment issues and I'm going to be talking about him a lot in the next installment.

Postscript

So what is the over-riding purpose of all this narration? I would call the reader's attention to the wide diversity of individuals , institutions and contexts invoked, and contrast them with the uniformity of the conclusions to be drawn from them:

In the 1950's, at the University of Pennsylvania, one is dealing with an insular Math department goggled-eyed with ludicrous myths of *wunderkinder* , brattish prodigies, home-grown geniuses of Titanic endowments who, history informs us , are the *fer-de-lance* in the advancement of the field. Except that history does not tell us that: what it tells us is that Mathematics was reborn in the West between the 16th and 17th century, and was the work of gifted amateurs all of whom did something else in their daily lives: Galileo, Fermat, Pascal, Descartes, Mersenne, Leibniz, Newton.

Not a single one of these founding fathers was primarily a mathematician. Galileo was a graphic artist, musician, physicist and superb writer. Pascal was equally physicist, theologian and man of letters. Fermat was a jurist. Descartes was philosopher and soldier. Leibniz was a diplomat, historian, philosopher, librarian and inventor, (admittedly not a very good one) . Even Isaac Newton, the greatest of them, exhibited far more diversity than most modern mathematicians.

At that time mathematics was considered an accomplishment to be maintained in wholesome relationship to all other intellectual activities. Today's mathematicians are pressured to specialize to the point that most of their comments on all other fields are silly, pointless or uninformed. Do we pay attention to Paul Erdös' views on modern music? von Neumann's politics? What about John Nash's theories of education? How long will we sit to listen to Jean-Pierre Serre's suggestions for improving the manufacture of paper? What about Feynman's views on feminism?

I suggest that the infatuation with prodigies and whiz-kids is not unrelated to the global unsavoriness of the ideology of over-specialization in all of modern science and overwhelmingly in mathematics. Compare the richness of mind of a Galileo, a Pascal, a Leibniz, with the narrow, indubitably powerful, perspective of any famous contemporary mathematician: even someone like Alexandre Grothendieck, whose vision of universal compassion has turned out to camouflage a venomous and vicious hatred towards everyone he's ever worked with. Indeed, the only mathematician I've ever dealt with who possesses anything resembling the breadth of vision of his 17th century counterparts is René Thom.

And what does it mean to baldly state that the administration of MIT was "brought to a grinding halt" on one day in the spring of 1981?

Only that a certain skillful psychopath was able to play on that unique combination of petty politics, arrogance, insularity, aloofness and pretension which characterizes the members of the MIT community, in such a manner as to bring their clubs , (normally intended for protection against the outside world), crashing down on their own heads.

Moving on to SUNY-New Paltz in the 80's. Here we read about a shabby administration, narrowly focused on credentials yet determined to take advantage of the pool of local talent in any way that it considers appropriate. We are talking of the same university that virtually gutted its entire music program to make room for a ludicrously pampered refusenik , the concert pianist Vladmir Feltsman, because of the glitter that his mere presence on the campus might shed on SUNY's bogus liberal pretentions.

And at the ICMP conference in Boulder, August 1983; what does one find? Nuclear physicists basking in the achievements of their glorious discipline , furiously swapping shop-talk on the anniversaries of the dropping of the A-bombs, not only unaware that there are many people around the world who consider these days of mourning, but that such anniversaries actually exist!

And what of the scientists at UC Berkeley, cringing in the shadows of their lofty towers at the sight of one of their rogue colleagues experimenting with a bold method for making the superior wisdom of science accessible to a wider audience?

Let us not forget the distinguished Jean-Pierre Serre carping that he's surrounded by too much paper. Or the bellicose Hervé Jacquet screaming like a *putois pourri* because some stranger from outside Columbia's Math department dares to approach him for unknown purposes.

What are we looking at? NOT a mass of individual errors, exceptional mistakes by misguided individuals! NOT a few rotten apples in isolation. NOT some tally sheet of the frailties and foibles of people and institutions!

NO! What is being depicted in this report is a broad sifting through a representative sample covering every sort of college and university in the country , of the moral, political and , above all, intellectual rot infesting an entire professional class for half a century! Nor should we forget that, although mathematics is the focus of these pages, it is only being used to typify a situation that percolates through all the sciences, that eats away at the core of the entire scientific establishment as it has flourished   since World War II.

Finally, in as much as science is that arena in which, beyond all other things , the United States vaunts its superiority over other nations, we are really talking about the corruptions of capitalism and imperialism as they affect peoples all over the world, not the least our own.

All this being said, the AMS conference added up to tremendous fun, of which I will have more to say in the next issue.

(To Be Continued)

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