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Pat's Prologues: Introductions to the First Two Airings of Math Medley, A Radio Talk Show

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stone in Basle. Today, the double helix carries both a biological meaning as well as an intimation of human destiny.

In my childhood, the circle persisted as a potent magic figure in the playtime doggerel "Make a magic circle and sign it with a dot." The interested reader will find thousands of allusions to the phrase "magic circle" on the Web. Magic ellipses or rectangles are less frequent.

The Buddhist mandalas which are objects of spiritual contemplation, embody highly stylized geometrical arrangements. The amulets and talismans that are worn on the body, placed on walls, displayed in cars; the ankhs, the crosses, the hexagrams, the outlined fish, the horseshoes, the triangular abracadabra arrangements and magical squares, the sigils (magical signs or images) of which whole dictionaries were compiled in the 17th century, the hex signs placed on house exteriors, all point to geometry in the service of religious or quasi-religious practice.

There is a multitude of geometrical figures signs employed in kabbalistic practices, each associated with stars, planets, metals, stones, spirits, demons, and whose mode of production and use is specified rigorously. Wallis Budge, student of Near Eastern antiquities wrote:

According to Cornelius Agrippa [physician and magician, 1486 - 1535], it is necessary to be careful when using a magical square as an amulet, that it is drawn when the sun or moon or the planet is exhibiting a benevolent aspect, for otherwise the amulet will bring misfortune

and calamity upon the wearer instead of prosperity and happiness.

Let semanticists and semioticians explain the relationship between our geometrical symbols and our psyches for it lies deeper than simple designation (e.g., crescent = Islam). The geometrical swastika, which over the millennia and cultures has carried different interpretations, is now held in abhorrence by most Americans. The memory of World War II is certainly at work here, but the geometry can go "abstract" and its meaning become detached from an original historic context.

Why has Salvador Dali (1904 - 1989) in his large painting *Corpus Hypercubus* in the Metropolitan Museum in New York, placed a crucifixion against a representation of a four dimensional cube? Art historian Martin Kemp has commented:

Dali's painting does stand effectively for an age-old striving in art, theology, mathematics, and cosmology for access to those dimensions that lie beyond the visual and tactile scope of the finite spaces of up-and-down, left and right, and in-and-out that imprison our common sense perceptions of the physical world we inhabit. The scientists' success in colonizing the extra dimensions is defined mathematically...

To be continued...The remainder of this article, including bibliography and notes will be issued online in HMNJ #27.

Pat's Prologues

Introductions to the First Two Airings of Math Medley, A Radio Talk Show

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Since May 1998 I've been hosting a weekly radio call-in talk show, "Math Medley." It appears to be the first of its kind, according to both the math and the radio grapevines. Each week I interview someone about "education, parenting, equity, and environmental issues with an underlying theme of mathematics," to

quote my opening patter.

It's been a joyous foray into show biz for a math professor. Everything is done by telephone—to and from anywhere! Some of my guests are experienced radio hams, but many are appearing for the first time. All

have been fabulous people to enjoy for an hour. They have included five past presidents of the National Council of Teachers of Mathematics (NCTM), the current president and president-elect, research mathematicians, K-12 classroom teachers, equity advocates and leaders in various environmental organizations. There have been shows on bailing out family finances, investing thoughtfully, and environmentally aware consumerism—all important environmental issues. You can see a list of past and future Math Medley guests and topics at www.csam.montclair.edu/~kenschaft.

Ten minutes into my first show a man called in to say he'd been reading a book called *The Bell Curve*, and he wondered whether there was any hope in what I was trying to do. Five minutes later he thanked me and my guest and said he had learned a lot already from the show! There was a hostile caller later that show who actually slammed up the phone at the the terrible suggestion that citizens of North Providence might pay taxes to educate children in Prah...vi-dence (said with dripping disdain). Since then, all callers have been respectful, even when they disagree. Two blind men have called in, a truck driver, many parents, a physician, and some math professors. Sometimes people accept our invitation to solve math problems on the air, and are willing to talk about solutions for five or ten minutes.

The first nine shows aired only in Providence, and Math Medley is now heard throughout Rhode Island and in nearby Massachusetts at 990 AM from 11:00 to noon. The show also can be heard in Arizona at 1100 AM, currently from 8:00 AM to 9:00 AM. Arizona is the only state that does not go onto daylight savings time, so there is a discontinuity twice a year; I hope strongly to keep the show at 11:00 AM Eastern Time. It can now also be heard live at www.renaissanceradio.com.

Even more exciting, the shows are gradually being "archived" by webCT, so you can hear them any time at www.webCT.com/math; then click on Math Medley on the upper right. As I write this, about sixty different shows can be heard there, but it appears that many more will soon appear. It isn't a completely predictable process.

Each week I write an introduction to the show. The first nine are somewhat representative, and they are reproduced below, slightly edited, to give the flavor

of Math Medley. Leads and support for publishing entire show transcripts would be appreciated. Support for the shows (other than my teaching salary) would also be welcome; I hereby express gratitude for the partial support from webCT, Texas Instruments, the American Mathematical Society, Burpee Seeds, and Breadman Breadmaking Machines—some in the form of advertising. I would also appreciate arrangements to syndicate to other stations; the host station has been very cooperative. If anyone would like tapes of the shows, I can provide them in limited quantities, two shows for five dollars. I own the copyright, so other stations are free to rebroadcast past shows lifted from the web as long as they either do not make a profit or share the profits with me.

I am grateful for National American Broadcasting Company for providing an opportunity for middle class non-professionals in radio broadcasting. Their technology has improved over the three years. The first shows were the least technically satisfying, so later shows are becoming archived sooner. The only show of the first nine now archived (as I write this) on webCT is Tom Banchoff's. Personally, I think almost all 165 shows thus far are worthy of both archiving: and transcribing so people can quickly read and scan them, but obviously I'm biased.

The common opening for all shows is omitted in the following transcripts. Alas, transcribing entire shows takes time and/or money, but the introductions can be taken from my word processor. The topics and guests of the first nine are "Recent Changes in Children's Math Education" with Claire Pollard; "Changing Expectations of Teachers and Kids" with John Long; "Girls and Math" with Joan Countryman; "Changing Forms of Testing" with David Capaldi; "Ethnomathematics" with Gloria Gilmer; "New Trends in Mathematical Research and Teaching" with Tom Banchoff; "Gender Issues and Standardized Testing" with Cathy Kessel; "Environmental Mathematics" with Barry Schiller; and "Hope" with Trina Paulus.

RECENT CHANGES IN CHILDREN'S MATH EDUCATION MAY 16, 1998, CLAIRE POLLARD

Today we will be considering "Recent Changes in Children's Math Education." My guest will be Claire Pollard, who is president of the Rhode Island Mathematics Teachers Association. She also is a Resource

Teacher in the Providence public schools, where her job is to help Providence teachers understand both math and how to teach it better.

I have two types of reasons for hosting a radio show to entice people into thinking about math. One is that I enjoy it enormously, and it seems sad to me that more people don't. I dream of a world where all people—well, almost all people—will enjoy math, in the same way that most people enjoy singing or dancing. Little children love math. At least, all the ones I meet in supermarket lines and waiting rooms do. I wish that our culture wouldn't destroy that enthusiasm as often as it does. Your joy with math—like singing—doesn't take from my pleasure a whit. I hope that Math Medley can help many more people enjoy math. I love making people happy when it doesn't cost me anything.

My other reason for this show is less cheery. It's that I really want there to be people on this earth a century from now. For that to happen, many people have to know math. For example, we need statistics to understand complicated facts. Moreover, sharing limited resources without violence requires that many people must understand fractions and big numbers much better than most adults do now.

I'm Dr. Pat Kenschaft, professor of mathematics at Montclair State University in New Jersey. My day job is teaching college and graduate students pure mathematics. Over the past decade I've won fourteen grants for helping elementary school teachers mathematically because I believe that the day job of my guest is one of the most important in the world. I've taught hundreds of elementary school classes in the past decade, but she's taught many more. Welcome to Math Medley, Claire Pollard.

**CHANGING EXPECTATIONS OF TEACHERS AND KIDS
MAY 23, 1998, JOHN LONG**

My guest today will be Dr. John Long, Professor of Education at the University of Rhode Island and co-chair five years ago of the Rhode Island special legislative commission on math and science reform. His topic will be, "The Changing Expectations of Teachers and Kids." This affects all of us, because some day we all will be at the mercy of today's children. No matter how much money we have, no matter how loyal our own children are, and no matter how high

the walls we build around our home, younger adults outside our family will affect the quality of our waning years. Therefore, their education will greatly influence whether they make our elderly years pleasant—or unpleasant.

The recent Third International Mathematics and Science Study—called TIMSS by its friends—placed United States fourth graders somewhat *above* the international median, a welcome relief from the First and Second International Studies, when our country's showing was embarrassing. One reason for the improvement has been the effort of about 200,000 of us around the country in what is called the "math reform movement." Two hundred thousand is not a small group—it's roughly the population of Providence. However, compared to the 50 million American youngsters in kindergarten through twelfth grade, it's not nearly enough. That's one of us for 250 school children. Math reform needs many more people involved.

United States eighth graders still placed a little lower than median in the recent TIMSS study, and our twelfth graders came out at the bottom of the international ladder. There were only two countries below us—Cyprus and the Union of South Africa.

The good news is that our youngsters do learn when they are taught. More good news is that when our teachers are taught the subject matter and good ways of teaching it, their students learn. A recent study of 900 districts in Texas found that teachers' expertise accounted for about 40% of the variance in school children's reading and math achievement. Indeed, the differences in black and white students were almost entirely explained by teachers qualifications and socioeconomic status. I am quoting from a blue-ribbon report *What Matters Most: Teaching for America's Future* led by two governors, one Republican and one Democrat. The report goes on to say that 28% of the math teachers in this country do not have even a minor in math. It is no wonder that our youngsters do not do well on international exams.

My guest today is Dr. John Long, professor of education at the University of Rhode Island and one of the state's leaders in the math reform movement. Welcome to Math Medley, Dr. John Long.