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MILLION BUCK PROBLEMS

Scott W. Williams

Upon publication of its new novel, *Uncle Petros & Goldbach's Conjecture*, publishers Faber and Faber in Britain and Bloomsbury Publishing USA have offered $1,000,000 for individual(s) who solve Goldbach's Conjecture. Contrary to belief, this publicity stunt has precedence in Mathematics. This article is a result of my personal review of the history of a few famous unsolved problems whose statements can be understood by a person with an undergraduate mathematics degree or less.

When I was a student, the Burnside Problem, the Simple Odd Group Conjecture (1963), and the Continuum Hypothesis had just been resolved but the Riemann Hypothesis, the Four Color Map Problem, Fermat's Last Theorem, the Bieberbach Conjecture, the Poincaré conjecture, and the Goldbach Conjecture were all famous open problems. Ten years later, the Four Color Problem and the Alexandrov Conjecture were solved. In twenty years the Bieberbach Conjecture was proved. Thirty years later Fermat's Last Theorem is gone and just a few of the aforementioned problems remain, although others surface. A solution to any of these problems brings "fame" and occasionally one of the famous Mathematical prizes such as the Steele Prize, the $50,000 Wolf Prize, a special gold medal (along with a paltry $15,000) called The Fields Medal, informally known as the "Nobel Prize of Mathematics" or the real "Nobel Prize" for mathematicians, the Royal Swedish Academy of Sciences' $500,000 Crafoord Prize.

Attaching monetary value to mathematics questions is not new. In 1908 German industrialist Paul Wolfskehl established a prize of 10,000DM (approximatey $1,000,000 at the time) for a proof of Fermat's Last Theorem. Unfortunately inflation diminished the prize value so that in 1997 Wiles collected just $50,000. "The Prince of Problem Solvers and the Monarch of Problem Posers," the late Paul Erdös, who won the $50,000 Wolf Mathematics Prize, was famous for offering cash prizes for those mathematicians who solved certain of his problems. These prizes ranged from $10,000 for what he called "a hopeless problem" in number theory to $25 for something that he considered not particularly difficult but still tricky, proposed in the middle of a lecture. However, a million bucks is a first. Since Erdös' 1996 death, other mathematicians have continued this practice. Now a corporation offers one million dollars.

Concerning solutions of famous problems, some Fields Medal were awarded to:

Selberg (1950) for his work on the Riemann Hypothesis. Cohen, in 1966, for his resolution of the Continuum Hypothesis. Smale (1966) for his work on the Generalized Poincaré conjecture for n>4. Thompson (1970) for his part in the solution of the Odd Simple Group Conjecture. Bombieri (1974) for his work on the Bieberbach Conjecture. Faltings (1986) for his solution of Mordell's Conjecture. Freedman (1986) for his work on the Generalized Poincaré conjecture for n=4. Borcherds (1998) for his solution of the Monstrous Moonshine Conjecture. Oddly enough deBranges did not win one for his complete proof of the Bieberbach Conjecture even though he simultaneously proved a much stronger conjecture.

Perhaps via "fame" a solution will bring to some a modest fortune. The unsolved problems below (Goldbach's Conjecture, The Kolakoski sequence, The 3x+1 Problem, Schanuel's Conjectures, Box Product Problem, Odd Perfect

Number Problem, Riemann Hypothesis, Twin primes conjecture, Lost in a Forest Problem, Palindrome Problem, The Poincaré Conjecture) all have simple statements. Some of these problems (the Riemann Hypothesis and the Poincaré Conjecture) are usually taken to have more value to the field than others. However, there have been lesser problems which were not resolved by simply pushing the existing techniques further than others had done; but rather by introducing highly original ideas which were to lead to many developments. I, therefore, call them all million buck problems because I believe (the techniques involved in) their resolution is worth at least one million dollars to Mathematics.

Goldbach's Conjecture: On June 7, 1742, Christian Goldbach wrote a letter to L. Euler suggesting every even integer is the sum of two primes and this is unproved still today, though it is known to be true for all numbers up to $4 \cdot 10^{13}$. The closest approximation to a solution to Goldbach's Conjecture is Chen-Jing Run's recent result that every "sufficiently large" even number is of the form p + qr, where p,q,r are primes. For the **$1,000,000** prize, Faber and Faber in Britain and Bloomsbury Publishing USA, have issued a stringent set of requirements, which include publishing the solution to Goldbach's Conjecture. Contestants have until March 2002 to submit their applications and March 2004 to publish the solution. If there is a winner, the prize will be awarded by the end of 2004.

A still unsolved consequence of Goldbach's Conjecture is the odd Goldbach Conjecture, "every odd integer greater than five is the sum of three primes." This has been shown to be true for odd integers greater than $10^{7000000}$ and will probably fall when proper computing power is devoted to it.

Schanuel's Two Conjectures (not to be confused with the Schanuel Lemma or the Ax-Schanuel Theorem)**:** In 1959, Schanuel made two conjectures about the algebraic behavior of the complex exponential function. Stephen Schanuel offers **$2,000** , $1,000 each, for the published resolution of the conjectures in his lifetime. The Schanuel Conjecture is the following *independence property* (C,e^z): If $z_1, z_2, \ldots, z_n$ in C are complex numbers linearly independent over the rationals, then some n of the 2n numbers $z_1, z_2, \ldots, z_n, e^{z1}, e^{z2}, \ldots e^{zn}$ are algebraically independent. The Converse Schanuel Conjecture says that there is nothing more to be said. Explicitly, let F be a countable field of characteristic zero and E : F Æ F a homomorphism from the additive multiplicative group whose kernel is cyclic. The conjecture is that if (F,E) has the independence property, then there is a homomorphism of fields h : F Æ C such that $h(E(x)) = e^{h(x)}$. Either of the two conjectures would imply, for example, algebraic independence of e and p. [For the first take $z_1 = 1$, $z_2 = pi$; for the second, one must construct (F,E) with an element p such that E(ip) = -1 and so that E(1),p are algebraically independent.] On the other hand, we don't even know whether e +p is rational.

The Kolakoski sequence: Consider the sequence of ones and twos:

s = < 1221121222112111211121
221121121222122121221121
21122122112>.

A block of s is a maximal constant subsequence. We consider the blocks and their lengths. For example, beginning from the left, the first block <1> has length 1. The second block <22> has length 2. The third block <11> has length 2. Continue in this fashion and notice that the sequence l = <1221121221…> of block lengths is an initial segment of s. The Kolakoski sequence is the (unique) infinite sequence s of ones and twos, beginning with 1, for which the sequence l of block lengths satisfies l=s. Chris Kimberling (see http:/cedar.evansville.edu/~ck6/index.html) promises a prize of **$200** to the first person to publish a solution of all five problems below (He says chances are if you solve one, you'll see how to solve the others). Considering the last 4 questions as one, makes the Kolakoski sequence questions interesting:

i. Is there a formula for the nth term of s?

ii. If a string (e.g., 212211) occurs in s, must it occur again?

iii. If a string occurs in s, must its reversal also occur? (112212 occurs)

iv. If a string occurs in s, and all its 1s and 2s are swapped, must the new string occur? (121122 occurs)

v. Does the limiting frequency of 1s in s exist - and is it 1/2?

The Box Product Problem: Given countably infinite many copies of the interval [0,1], the typical (Tychonov) product topology on their product is topologically a copy of the Hilbert Cube. Give it Urysohn's 1923 box product topology instead (so open sets are unions of products of open intervals). The Box Product Problem asks, "Is the box product topology on the product of countably infinite many copies of the real line normal?" In other words, can disjoint closed sets be separated by disjoint open sets? In 1994, the answer was shown to be no for uncountably many copies, but in 1972 Mary Ellen Rudin showed that the continuum hypothesis implies yes for countably infinite many copies. What is known about the problem is no different whether the real line is replaced by the closed interval [0,1] or the sequence 2^{-n} and its limit, and is related to combinatorial questions in Set Theory. Scott Williams offers (with appeal to A Hitch-Hikers Guide to the Galaxy) a **$42** prize to the person who settles the box product problem in his lifetime.

The Collatz' 3x+1 Conjecture: Because it is easy to program your computer to look for solutions, many youngsters (and adults) have played with the 3x+1 problem: On the positive integers define the function F(x)=3x+1, if x is odd and F(x)=x/2 if x is even. Iterations of F lead to the sequences <1, 4, 2, 1>, <3, 10, 5, 16,…, 1>, and <7, 22, 11, 34, 17, 52, 26, 13, 40, 20, 10,…, 1>. The 3x+1 conjecture, stated in 1937 by Collatz, is "For each integer x, applying successive iterations of F, eventually yields 1." During Thanksgiving vacation in 1989 I programmed my desktop computer to verify the conjecture by testing integers in their usual order.

After 3 days it verified the first 500,000 integers satisfied the 3x+1 conjecture. Currently, the conjecture has been verified for all numbers up to $5.6 \cdot 10^{13}$.

For fun, consider the different conclusions to three slightly different versions of this problem obtained by exchanging 3x+1 for one of 3x-1, 3x+3, or 5x+1.

Odd Perfect Problem: Does there exist a number that is perfect and odd? A given number is perfect if it is equal to the sum of all its proper divisors. This question was first posed by Euclid. This question is still open. Euler proved that if N is an odd perfect number, then in the prime power decomposition of N, exactly one exponent is congruent to 1 mod 4 and all the other exponents are even. Using computers it has been shown that there are no odd perfect numbers $<10^{300}$.

Riemann Hypothesis: This is the most famous open problem in mathematics. In his 1859 paper *On the Number of Primes Less Than a Given Magnitude*, Bernhard Riemann (1826-1866) extended Euler's zeta function $\zeta(s)=\sum_{n=1}^{\infty}\frac{1}{n^s}$ for s a complex number. Riemann noted that his zeta function had trivial zeros at -2, -4, -6, ... and that all nontrivial zeros were symmetric about the line Re(s) = 1/2. The Riemann hypothesis says all nontrivial zeros are on this line; i.e., they have real part 1/2.

Twin primes conjecture : A twin prime is an integer p such that both p+1 and p-1 are prime numbers. The first five twin primes are 4, 6,12, 18, and 30. The Twin Prime conjecture states there are infinitely many twin primes. It is known there are 27,412,679 twin primes $<10^{10}$. Currently, the largest known twin prime is $2{,}409{,}110{,}779{,}845 \cdot 2^{60000}$, which has 18072 digits.

The Poincaré Conjecture: Henri Poincaré said, "Geometry is the art of applying good reasoning to bad drawings." For a positive integer n, an n-manifold has the property that each point has a neighborhood homeomorphic to n-space R^n. The manifold is simply connected if each loop in it can be deformed to a point (not possible if it, like a doughnut, has a hole). The Generalized Poincaré Conjecture says each simply connected compact n-manifold is homeomorphic to the n-sphere. Near the end of the 19th century, Poincaré conjectured this for n=3, and the Generalized Poincaré Conjecture has been solved in all cases except n=3.

Palindrome Problem: A palindrome is a phrase or word which is the same if you reverse the position of all the letters. A palindrome integer has the same property; e.g., 121. Here is an algorithm which one might think leads to a palindrome: Given an integer x, let x* be the reverse of n's digits, and F(x)=x+x*. Now iterate the process. Considering sequences of iterations of F, we have <29, 29+92=121> and <176, 176+671=847, 1595, 6546, 12002, 32023>. The examples show that iterations of 29 and 176 lead, respectively, to palindromes 121 and 32023. The Palindrome problem is "Given any integer x, do iterations of F lead to a palindrome." This is unsolved *even in the case x = 196*.

Lost in a Forest Problem: In 1956 R. Bellman asked the following question: Suppose that I am lost in a forest whose shape and dimensions are precisely known to me. How can I escape in the shortest possible time? Limit answers to this question for certain two-dimensional forests; planar regions. For a given region, choose a path to follow and determine the initial point which requires the maximum time to reach the outside. Then minimize the maximum time over all paths. For many plane regions the answer is known: circular disks, regular even sided polygonal regions, half-plane regions (with known initial distance), equilateral triangular regions. However, for some regions only approximates to the question are known for regular odd-sided polygonal regions in general and triangular regions in particular.

This article is dedicated to John Isbell. Concerning this article, I had personal correspondences with William Massey, Mohan Ramachandran, and Stephen Schanuel. All errors, however, are mine.

REFERENCES:

General references:

J Korevaar, Ludwig Bieberbach's conjecture and its proof by Louis de Branges, Amer. Math. Monthly **93** (7) (1986), 505-514.

For a wealth of information on some of the unsolved problems above, also see the MathSoft web page: http://www.mathsoft.com/asolve/index.html

Erdös references:

http://vega.fmf.uni-lj.si/~mohar/Erdos.html

http://www.maa.org/features/erdos.html

http://www-groups.dcs.st-and.ac.uk/~history/

Goldbach Conjecture references:

Chen, Jing Run: *On the representation of a larger even integer as the sum of a prime and the product of at most two primes*. Sci. Sinica **16** (1973), 157—176.

http://www.utm.edu/research/primes/glossary GoldbachConjecture.html

Schanuel's Conjecture references:

Chow, T. Y. *What is a Closed-Form Number*. Amer. Math. Monthly **106** , 440-448, 1999.

Macintyre, A. *Schanuel's Conjecture and Free Exponential Rings*. Ann. Pure Appl. Logic 51, 241-246, 1991.

John Shackell, *Zero-Equivalence in Function Fields Defined by Algebraic Differential Equations*, Transactions of the Amer. Math. Soc. **336** (1993), 151-171.

Jacob Katzenelson, Shlomit S. Pinter, Eugen Schenfeld: *Type Matching, Type-Graphs, and the Schanuel Conjecture*. ACM Transactions on Programming Languages and Systems **14** (4), 574-588, 1992.

IN THE NEWS

NAM's Blackwell Lecture: In 1994 NAM established a Lecture series in honor of the great African American Mathematician David Blackwell. The Lecture is given annually at the AMS Summer Meeting. This year's speaker is Arlie Petters, and it will be held in Los Angeles, California August 6 to 12, 2000. Dr. Arlie Petters holds the William & Sue Gross Chair in the Mathematics Department of Duke Univeristy. He is the first African American tenured faculty in the sciences/mathematics of Duke. He received his Ph.D. in 1991 from Massachusettes Institute of Technology. After a two year instructorship at MIT, he joined Princeton University where he had joint appointments in both Mathematics and Physics until leaving for Duke in 1998. Also in 1998, Petters was awarded Mathematics most prestigious Sloan Research Fellowship as well as a 5 year National Science Foundation Career Grant. Dr. Petters is chiefly interested in the Mathematical Theory of Gravitational Lensing and related areas (Singularity Theory, General Relativity, Theoretical Astrophysics). He has published 25 papers and one book.

NAM speakers announced : NAM's J. Ernest Wilkins Lecture is given at NAM's MathFest Conference each fall. The 2000 Wilkins speaker will be Dr. Scott W. Williams of SUNY Buffalo. NAM's W. W. S. Claytor Lecture is given at NAM's joint annual meeting with the AMS and MAA in January. The 2001 Claytor speaker will be Dr. Bonita V. Saunders of the National Institute of Standards and Technology.

Nominations for Board of Directors : NAM has nine positions on its Board of Directors that are elected by the membership. The term of each position is for a period of three years. In the Fall of 2000, nominations are being sought for the following three positions: Representative for Region B, Majority Institutions Representative, Vice President. Persons current in those positions (two of them) have indicated that they will not seek re-election. All nominations should be sent to NAM's Executive Secretary, Dr. Leon Woodson, by August 15, 2000 at NAM, Department of Mathematics, Morgan State University, Baltimore MD 21251-0001.

Posters of African and African American Pioneers in Mathematics and Science : The National Society of Black Physicists has published a poster and a book, they each have the title "The African American Presence in Physics." For information write to Physics Poster; c/o Dr. Ronald Mickens; Clark Atlanta University, Box 172; Atanta GA 30314. NAM has a poster available, while supplies last "African and African American Pioneers in Mathematics" can be purchased for a small handling fee. Contact the Editor of the Newsletter.

Mathematician Honored On May 7 2000, Lincoln University bestowed an Honary Doctor of Science degree upon Dr. Clarence F. Stephens. Stephens earned his Ph.D.(1943) in Mathematics from the University of Michigan. His method of teaching, honed at Morgan State College and perfected at SUNY Potsdam, is recognized as one of the most profound in producing successful mathematics majors.

Mathematician Dies : Dorothy E. Hoover, a trailblazing African American Mathematician, author and aeronautic research scientist in the 1940s, '50s and '60s, died February 7, 2000 of congestive heart failure. Dorothy had a BS from Arkansas AM&N College, and received an MS in Mathematics in 1943 from Clark Atlanta University.

SPOTLIGHT ON A MATHEMATICS EDUCATOR

HARRIETT R. JUNIOR WALTON

By Johnny L. Houston

Harriett Rose Junior Walton was the second of three children (and the only daughter) born to Rev. Ester James Junior, Sr. and Mrs. Mable Rose Junior in Claxton (Evans County) Georgia on September 19, 1933. During her early years, her parents moved to Glennville (Tattnall County) Georgia where she grew up and obtained most of her education prior to entering college. Both of her parents were teachers. Harriett was taught to read early; she was taken to school at an early age, enrolling in the third grade at the age of six. She always liked to study and always tried to excel. She ranked first among four graduates in the county in the 7th grade and first (Valedictorian) among four 9th grade graduates from Glennville Junior High School. There was no high school for blacks in Tattnall County in 1946 so Harriett and her brother Ester Junior, Jr. rode with their father daily to Walker High School in Ludowici, GA (a trip of 20 miles each way) for the 10th and 11th grades. She was Salutatorian in a class of 16 graduates. Harriett entered Clark College in Atlanta, GA (turning 15 years of age a few days after arriving) in September 1948 and graduated with a major in mathematics (ranking 4th in a class of 90+) in June 1952. Her mentor, Dr. Joseph J. Dennis, assigned her to teach a freshman mathematics class during her senior year at the college. She entered Howard University in the fall of 1952 with a University Fellowship. During her second year at Howard, she was a Graduate Teaching Assistant and a Research Assistant under Dr. David Blackwell. Dr. Blackwell directed her Master's thesis. She also studied under Drs. Elbert Cox, George Butcher, and C.C. Claytor, and graduated in June 1954 from

Howard University with a Master of Science degree in mathematics. A position as Instructor of Mathematics was assumed at Hampton Institute in the fall of 1954. While attending the annual meeting of MAA at the University of Pittsburgh in the fall of 1954, Harriett met a black woman who was a graduate teaching assistant there and decided that she wanted the same kind of experience. She was offered a Graduate Teaching Assistantship at Syracuse University and studied there during the period 1955-1957, graduating with a Master of Arts degree in mathematics. Dr. Abe Gelbart was her mentor there; he encouraged her to stay two years and complete a degree (1957) rather than leave after one year in order to get married. Harriett returned to Hampton Institute as Assistant Professor of Mathematics during the year 1957-58 academic year. In June 1958 she married James Walton and joined the faculty of Morehouse College in September 1958 during the presidency of Dr. Benjamin Elijah Mays; that union is responsible for four children and there are now three grandchildren. Having maintained an excellent record while working toward the Master's degree in mathematics at Howard U. and Syracuse U., Dr. Walton later earned the Ph.D. degree in mathematics education at Georgia State University in 1979. In order to prepare herself for the computer age in higher education, Dr. Walton followed the unusual path of earning the Master's degree in computer science in 1989 at Atlanta University while she was a postdoctoral student. In addition to carrying a heavy teaching schedule at Morehouse, Dr. Walton served as a part-time teacher at other institutions in the Atlanta University Center, at Georgia State University, and at Atlanta Junior College. She has been an active member of such prestigious honor societies as Phi Beta Kappa, Alpha Kappa Mu, Beta Kappa Chi, and Pi Mu Epsilon. Moreover, her professional memberships include: the American Mathematical Society (AMS), Mathematical Association of America (MAA), National Council of Teachers of Mathematics (NCTM), Georgia Council of Teachers of Mathematics (GCTM), National Association of Mathematicians (NAM), Benjamin Banneker Association, and Phi Delta Kappa.

In addition, her professional activities include (1991) Summer Fellow, Department of the Army; Speaker/Presider, NCTM annual and regional meetings; Committee Member/officer, MAA, AMS, NAM; Consultant, Atlanta and local area public school systems; Proposal Review Panels, NSF; (1985-87) Morehouse College Board of Trustees, Faculty Representative, and director of several mathematics institutes in the AU Center. She is also a published author. As a college professor, Dr. Walton has been primarily interested, first, in getting the best possible graduate education for herself (including additional studies at Georgia Institute of Technology, 1964-1966 and Emory University, summer 1966), and, second, in giving the best possible college education to her students; among her former students are mathematicians Geraldine Darden, Benjamin Martin, and Johnny Houston. She is known throughout the Atlanta University Center as a teacher who really cares for students and as one who generously helps those who come to her for tutoring. Because of her success as a teacher and as a scholar, Dr. Walton was chosen as a Fulbright Fellow to go to Ghana and Cameroon in West Africa in the summer of 1989 and as Teacher of the year at Morehouse in 1990. Other honors and awards include (1975-77) U.N.C.F./Dana Fellow, GSU.; (1965-66) NSF Faculty Fellow GA Tech/Emory U.; (1964-65) U.N.C.F. Fellow GA Tech, a 50 year member of Delta Sigma Theta Sorority, Inc. and two Distinguished Service Awards from NAM (of which she is a life member and was one of NAM's Founders in 1969). Although Dr. Walton has kept very busy as a teacher and counselor at Morehouse, she has found time to serve in the unusual capacity of Deacon at Providence Baptist Church and in leadership positions in professional organizations in mathematics; including serving as Secretary-Treasurer of NAM for approximately ten years. Because of her professional activities she is listed in several Who's Who and other publications: (1985) Who's Who Among Black Americans, (1982) Who's Who in Georgia, (1982) Men and Women of Science, (1974) Who's Who of American Women, (1974) Personalities of the South, (1971) Outstanding Educators of America, and (1951) Who's Who Among Students in American Colleges and Universities. In May 2000, Dr. Walton retired from Morehouse College after forty-two (42) years of service. She now plans to devote more time to her hobbies of cooking, sewing, singing, and gardening.

DUES

Now is the time to pay your dues to NAM. See the last page for membership information.

ENDOWMENT

NAM's Endowment Campaign is necessary to reduce dependence upon ever dwindling government and foundation financial sources. Please consider participating. A form is near the back of the newsletter.

MATH IN THE MOVIES

On occasion mathematics makes it into popular entertainment. The independent film Zorn's Lemon, the play Möbiustrip, and the recent off broadway play "The Five Hysterical Girls Theorem" (set at a 1911 mathematics conference) are clear examples. However, the usual appearance of our subject in the media is trivial. Here we examine the appearance of mathematics in on the big screen. At a later time we may extend this exposition to television.

1958 **Merry Andrew** : Danny Kaye musical comedy with a song about the Pythagorean Theorem.

1959: **Le Miroir a Deux Faces** : This is a French film about a mathematician and a professor of French which has been remade as **The Mirror has Two Faces** (1996) - see below.

1971 **Straw Dogs** : Mathematician beats the bad guys. Dustin Hoffman has moved to his wife's home town in Cornwall, England in the hope of getting some astrophysics done. His bored wife's flirtations lead to serious trouble. Somewhere along the line she mischievously changes a plus sign to a minus sign in a set of gravitational equations on a blackboard. Hoffman's response when he finally notices is by far the best and most realistic portrayal of a mathematician in action in the movies.

1980 **It's My Turn** - In the opening scene of this romantic comedy, Jill Clayburgh, playing a mathematics professor, proves the "snake lemma" of homological algebra: to an obnoxious graduate student. To the best of our knowledge, this is the most erudite mathematical scene in a major motion picture, though spoiled somewhat by a heavy handed portrayal of the grad student. There are some other pieces of math elsewhere. Jill has an exchange with a precocious boy about prime numbers. University administrator, probably a Dean, mentions to Jill Clayburgh that 'Group Theory is a really hard area to work in'. Jill's father, at one point, introduces his daughter as a mathematician who is working in finite simple groups. How many mathematicians have parents who know what they do? Jill, at one point working on the back of an envelope, is frustrated that she `can't quite get this 2-fusion problem to work out'. The movie ends on an up-beat note, mathematically, when the obnoxious grad student and Jill share (in a rather cryptic exchange) some clever insight that would lead to the solution of the classification problem. Interestingly enough, 1980 is also the more-or-less agreed date that the finite simple groups were classified.

1983 **A Hill on the Dark Side of the Moon** (Italian: Berget paa maanens baksida) - There is a mountain on the far side of the moon that the Soviets named after the great woman mathematician Sonya Kovalevskaya. The film is about her stay in Sweden and was advertised as the feminist movie of the 1980's, but to the opposite it says that to be a female mathematician you have to be ugly, neurotic, and a bad mother.' Mathematically they missed the point entirely about Sonya. The mathematicians Weierstrass and Mittag-Leffler also appear.

1987 **Wall Street** - Tel Lekatsas points out that financier Michael Douglas, after buying the airline company Charlie Sheen's father works for, tells Charlie : "Zero sum game. Somebody wins. Somebody loses."

1987 **Stand and Deliver** - A high school math teacher, played by Edward James Olmos, gets a group of inner city kids to learn calculus, amazing and threatening the educational establishment. Some decent calculus teaching is shown in this true story.

1988) **Big** - Tom Hanks plays a twelve year old boy whose wish to be big is granted by a magical arcade game. His ability to find work and even succeed mocks the adult world. At a dinner party, Hanks helps the young son, whom the real adults are ignoring, with his homework. In the process he offers a nice explanation of basic algebra. PG

1991 **Little Man Tate** - A bright 8-year-old is placed in a program for gifted children. Edie Bennett liked the scene where a teacher has several odd and even numbers on the board and asks how many of them are divisible by 2. Tate raises his hand and answers "All of them." PG

1992 **A Brief History of Time** - Biography of one of our greatest living physicsts, Stephen Hawking, though a bit light on his work. G

1992 **Sneakers** - Freelance spies track down an all powerful code breaking chip developed by a mysteriously funded mathematician named Gunter Janek. In a brief scene, the long-haired, white-suited Janek lectures on the possibility of finding a faster way to factor numbers, shouting lots of big math words, but not really explaining anything. Still, the film correctly points out that a breakthrough in factoring could happen and would be worth a lot to criminals and people who break codes. The mathematician Len Adleman advised on the making of this move.

1992 **Death of a Neapolitan Mathematician** (Morte di un Matematico Napoletano) - The story of an important Italian mathematician looking at the last week of his life before he kills himself in 1959.

1993 **The Man Without a Face** - Mel Gibson plays a former teacher turned recluse whose face is badly disfigured. He befriends a troubled boy and helps him prepare for a military school's entrance exam. In one of his lessons, Gibson shows the boy how to find the center of any circle by constructing the perpendicular bisec-

tors of two chords. The figure he draws isn't quite general enough: the chords share a common point and they needn't.

1993 **Jurassic Park** - Jeff Goldblum is a mathematician, specifically a (don't laugh) chaotician, who explains Chaos Theory in layman's terms. The character plays a much bigger part in the much better Michael Crichton novel of the same name.

1994 **I.Q.** - Walter Matthau as Albert Einstein plays matchmaker for his niece played by Meg Ryan. Judy Ann Brown's favorite scene is where Meg Ryan attempts to explain to Tim Robbins why she can't dance with him: she can only walk half the distance between them and then half again and half again and she will never reach him. Rhiju Das was impressed when Meg Ryan's character puts the Schrodinger equation on the board, in operator form.

1994 **Little Big Leagu** e - Bernd Ensing suggests this family movie about a boy who inherits the Minnesota Twins from his grandfather. He takes his homework to the ballpark, where the whole team struggles with a problem about two men wanting to paint a house: It takes the first man three hours to paint a house, the second one needs five hours. How long will it take both of them working together? Fun movie, but I found the solution unedifying.

1995 **Antonia's Line** (Dutch, English subtitles) - In this somewhat morbid chronicle of five generations of sturdy women, we see Antonia's granddaughter Theresa, who grows from a child prodigy to become a mathematician, lecturing on cohomology and reading a monograph on differential geometry in preference to nursing her baby. In a movie filled with stereotypes, we should not expect a woman mathematician to be anything but cold. One nit: Theresa says "X comma A" while reading a diagram during her lecture scene but it appears in the subtitles as "X.A". The translators must habitually change European commas into English decimal points..

1995 **Die Hard: With A Vengeance** - Bruce Willis and Samuel L. Jackson are given a five gallon jug and a three gallon jug, and must put exactly four gallons of water on a scale to keep a bomb from exploding.

1996 **Infinity** - A biography about the great Physicist Richard Feynman. There's a priceless scene where he has a calculating duel with a guy with an abacus. Feynman, using pencil and paper, adds a bit slower, but multiplies slightly faster, and really whips him in the cube root competition. Afterward, he explains it all to his fiancee.

1996 **The Mirror has Two Faces** - Hunk math prof Jeff Bridges explains the Twin Prime Conjecture (that there are infinitely many pairs of primes only two numbers apart) to dowdy english prof Barbara Streisand who actually gets it. She critiques his calculus teaching. Bridges proposes.

1997 **Good Will Hunting** - The movie begins by putting a hard problem on the blackboard: which is solved by a defiant, troubled working-class South Boston kid who happens to be a Ramanujan-level genius? But instead of a convincing solution, we get easy answers. Robbin William's soberly played shrink brushes past Hunting's intelligence to get at his abusive childhood, never contemplating genius as an equal source of pain. The women are either on a pedestal or deserve to be. The movie shows the outside of MIT, but not the inside.

1997 **Flubber** - Robin Williams explains Newton's Law of Gravitation to a life drawing class in this '90s remake of the 1961 Absent Minded Professor, and there is a lot of pseudoscience in the background — even the titles are filled with math symbolism.

1997 **Contact** - Jodie Foster is perfect when she defines prime numbers for a group of Washington bigwigs and is greeted by blank stares. Never before has the scientist's dedication to her/his work been expressed so positively in popular film.

1997 **Lost World** - This is a boring sequel to a good movie, Jurassic Park, but it has not even the mathadvertisement, the choatician doesn't speak his trade.

1998 **p** - This a movie about madness, not mathematics. The math, computer science, theology, and pharmacology are bad. (One faux pas is a suggestion that one could try all possible 216 digit numbers.) But they are brilliantly combined with music, and camera work to place us in the tormented mind of a paranoid obsessive seeking the central truth of the universe —which is excreted by computers just before they melt down — while he is pursued by Wall Street brokers and Hassidic Jews who know he is onto something.

For more see Math in the Movies: http://world.std.com/~reinhold/dir/mathmovies.html

ENDOWMENT

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THE PRESIDENT'S PERSPECTIVE

What is DATA MINING?

Modern computing facility has exacerbated the growing gap between the *generation* of data and our *understanding* of it. In other words: As the volume of data increases, inexorably, the proportion of it that people "understand" decreases rapidily. It is hard to find examples of anything, anywhere that has changed as fast as the quantity of stored information. While the information explosion has created new opportunities, it has also generated many new headaches in every field, from engineering to manufacturing to marketing to medicine, and to science in general. A few examples will give some appreciation for how fast the world's store of information has grown in recent years.

EXAMPLE 1: In 1900, the world population was 1.6 billion. Now the population is well over 6 billion. This is a factor of 3.75 over the century.

EXAMPLE 2: In 1900, the longest journey one could reasonably make was about 25,000 miles-the distance required to circumnavigate the earth. In 1969, the round trip distance to the moon was about 475,000 miles, which is 19 times as far.

EXAMPLE 3: In 1906 the Stanley twins established a world land speed record driving 122 miles per hour. The speed for the trip to the moon was close to 25,000 miles per hour-223 times as fast.

These are all impressive growths. However, they are next to nothing compared to the growth in corporate data. At the beginning of the twentieth century, no company had more than a few megabytes of data contained in ledgers, order books, and files. Today, the largest corporate data bases are measured in terabytes. That is to say some corporate data has grown by a factor of 100,000. In fact, there are single

Board Member on Nigeria Advisory Council

Dr. Jacqueline Giles has been appointed a member of the HCCS Nigeria Advisory Council. The Houston Community College representatives are working with Nigerian governmental officials, international corporations and Nigerian interest groups in the United States to design and fund pilot workforce training programs in three Nigerian states.

HOWARD-MARYLAND MATHEMATICS RESEARCH SYMPOSIUM

The symposium was held at Howard on Friday, April 28. It featured presentations by graduate students of the Departments of Mathematics of Howard University and the University of Maryland. Between 40 and 50 graduate students and faculty from the two universities attended the symposium along with the president of NAM, Jack Alexander.

Philippe Tondeur, Director, Division of Mathematical Sciences, National Science Foundation, gave an address, "The NSF Perspective of the Mathematical Sciences." Eight students gave 20 minute research presentations directed towards the graduate student audience and were meant to be accessible to the newer graduate students. These talks were:

Serge Bernard, UM, "A Multivariate Exponentially Weighted Moving Average Procedure for Monitoring Process Variability" Shea D. Burns, HU, "The Existence of Disjoint Smallest Ideals in the Left Continuous and Right Continuous Structures in the Stone-Cech Compactification of a Semi-Group"

Tasha Inniss, UM, "Stochastic Models for the Prediction of Airport Arrival Capacity Distributions"

Shurron M. Farmer, HU, "A Two-Age Class Single Species Climax Population Model"

Ndera Kessy, UM, "Characteristic Set of a Subalgebra in k[x]"

Jeffry Fleming, HU, Pointwise Estimates for Weighted Bergman Projection Kernel in C^n Using Weighted L^2 Estimates for the *d*- Equation"

Kimberly Weems, UM, "Maximum Likelihood Estimation in Misspecified Poisson-Inverse Gaussian Models"

Aneer Rukh-Kamaa, HU, "Generalized Symmetrizable Kac-Moody Algebras"

SPOTLIGHT ON A MATHEMATICIAN:

THYRSA ANNE FRAZIER SVAGER

1930 – 1999

By Johnny L. Houston

While at Antioch College as a senior (1950-51), Thyrsa Frazier obtained a very high score of the Graduate Record Exam (GRE). At the time of her professional retirement in 1993, no other Antioch student had made a score as high as Frazier's score."

Thyrsa Anne Frazier was born on June 16, 1930 in Wilberforce, Ohio. She was one of five children (4 girls, 1 boy) born to the union of and G. Thurston Frazier. She departed this life on July 23, 1999 in Wilberforce. She attended high school at the Wilberforce Academy where she graduated as her class Valedictorian in 1947. Matriculating to Antioch College in Yellow Springs, OH that same year, she earned the B.A. degree in mathematics from Antioch in 1951. In 1952, Thyrsa Frazier earned the M.A. degree in Mathematics from Ohio State University in August. After earning her Master's degree, Thyrsa accepted a position as Statistical Analyst at the Wright Patterson Air-Force Base in Dayton, OH. She spent the 1953-54 academic year as an instructor of mathematics at Texas Southern University in Houston, TX. In the fall of 1954, she began a long and distinguished career of thirty-nine (39) years at Central State University (CSU) in her hometown of Wilberforce, OH: (1954-59) Assistant Professor of Mathematics, (1959-66) Associate Professor of Mathematics, (1966-84) Professor of Mathematics and Computer Science, (1984-87) Vice President for Academic Affairs, (1987-93) Provost of Central State University. In 1965, she earned a Ph.D. degree in Mathematics from Ohio State University (OSU). Her Ph.D. advisor was Paul Reichelderfer and her dissertation title was "On the Product of Absolutely Continuous Transformations of Measure Spaces." Dr. Svager also did post doctoral study at OSU during the summer of 1985. Upon her retirement in 1993, CSU bestowed upon her the Honorary Doctor of Humane Letters and named her Professor Emeritus of Mathematics. In March 1995, Dr. Svager came out of her retirement to serve as Interim President of CSU for a short period of time. In addition to her full-time career at CSU, Dr. Svager served as an Adjunct Faculty member at Antioch College (cum 1964), Systems Analyst at NASA in Washington, D.C. (sum 1966), a visiting Professor at NSF's Institute for Secondary School Teachers at Antioch (1966-67), and visiting Faculty at the Educational Research Center at MIT (August 1969). Moreover, Dr. Svager participated widely in her profession and in University activities at CSU. She was the project director for seven major proposals that were funded; one by Health and Human Services (1981-84) establishing the first Microcomputer Lab at CSU (in Banneker) where 15 Computer Literacy Workshops were held, enrolling 184 participants from five (5) HBCU's.

At CSU, she chaired many of the major committees including Honors Convocation Committee, Computer Users Committee, the University Curriculum Committee, Promotion and Tenure Committee, University Relations Committee, Faculty Handbook Committee, Planning and Capital Improvement and the Faculty Welfare Committee.

Off campus, her professional activities included participating in a variety of activities including, NSF Peer Reviewers, MAA Panel Member, Ohio Board of Regant Panel Member, IBM, NCR and Digital Committee, Computing Conference Participant, and CSU Faculty Representative for Jack and Jill of America. Dr. Svager was very active in the area of scholarships. She made scholarly presentations at Regional and National Conferences. Her publications include a paper "On Strong Differentiability" of which the abstract appeared in the Monthly (1967) and two books: "Modern Elementary Algebra Workbook", Wm. C. Brown publisher (1967) and "Essential Mathematics for College Freshmen", Kendall-Hunt (1976), revised ed. (1983). Dr. Svager held memberships in Pl MU Epsilon, Beta Kappa Chi, Mathematical Association of America (MAA), National Association of Mathematicians (NAM), National Council of Teachers of Mathematicians (NCTM) and the Association for Computing Machinery (ACM). In addition to her professional activities, Dr. Svager was an active member of several civic and social organizations. In particular, she was a life member of the Alpha Kappa Alpha Sorority (AKA), a member of the Twentieth Century Club, the Wilberforce Chapter of Moles, Volunteers of the African American Museum and several others. Because of her civic and professional contributions she was inducted into the Greene County Hall of Fame. "Dr. Svager was known for her professional demeanor and a sense of humor. She was the epitome of a true academic leader," said Willie Houston, a CSU faculty member since 1980 who also served as Associate Vice President of Academic Affairs. "She was both well liked and feared by her students, from whom she demanded a lot", said Jacqueline Sovel–Downey, former member of CSU's Board of Trustees. Yours truly and some others remember her as one of the strong visionary professionals who was there in New Orleans in 1969 when NAM was founded.

DUES

Now is the time to pay your dues to NAM. See the last page for membership information.

BLACKWELL-TAPIA LECTURE SERIES

Honoring African and Hispanic Americans, Cornell University established a lecture series to honor two of the nation's most eminent mathematicians, David Blackwell of the University of California at Berkeley and Richard Tapia of Rice University. The lectures will provide a forum for the research of African-American, Latino and American Indian scientists working in the fields of mathematical and statistical sciences.

On May 7 and 8, 2000, a conference was held on the Cornell campus to inaugurate the series, to be called the David Blackwell and Richard Tapia Distinguished Lecture Series in the Mathematical and Statistical Sciences. Both Blackwell (who is professor emeritus and former chair of Statistics at University of California-Berkeley) and Tapia (who is the Noah Harding Professor of Computational and Applied Mathematics at Rice) attended the event, which included an opening reception and a banquet in their honor.

The lecture series, which will provide an honorarium of $1,000 for the guest lecturer, is being established at the intiative of Don Randel, provost of Cornell; Robert Harris Jr., vice provost for diversity and faculty development and professor of Africana studies; and Carlos Castillo-Chavez, director, Mathematical and Theoretical Biology Institute at Cornell and professor of biomathematics; and with the encouragement of Cornell President Hunter Rawlings.

Blackwell completed his graduate studies at the University of Illinois at Urbana-Champaign in 1941. He taught on the faculties of Southern University, Clark College and Howard University, where he was chairman of the mathematics department before joining the faculty of UC Berkeley in 1954. He has contributed to several areas of mathematics: set theory, measure theory, probability theory, statistics, game theory, and dynamic programming. His name is attached to a theorem in statistics, the Rao-Blackwell theorem, which is important in estimation theory and tests of hypotheses. He is an author of the classic book Theory of Games and Statistical Decisions . Blackwell was elected to the National Academy of Sciences in 1965. He also is a member of the American Academy of Arts and Sciences. He is the recipient of numerous honors and awards, including the R. A. Fisher Award and the John Von Neumann Theory Prize.

Tapia was born in Los Angeles to parents who immigrated from Mexico as teenagers, received his Ph.D. from the University of California at Los Angeles. In 1992, Tapia was the first native-born Hispanic to be inducted into the National Academy of Engineering. He has contributed to mathematical optimization theory and iterative methods for nonlinear problems. His current research is in the area of algorithms for constrained optimization problems and interior-point methods for linear and nonlinear programming. Under Tapia, the computational and applied mathematics department at Rice has become a national leader in promoting women and underrepresented minority Ph.D. recipients in the mathematical sciences. His recent honors and awards include: Lifetime Mentor Award, American Association for the Advancement of Science, 1998; appointment to the National Science Board by President Clinton, 1996; Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring Program, 1996

Gelonia Dent

Dr. Dent received a bachelor degree from the University of Georgia, Master degree from Clark Atlanta University and Ph.D. (1999) in Applied Mathematics specializing in Fluid Dynamics from Brown University. Her talk was "Sedimentation and Particle Interactions in Dispersed Two-Phase Flow."

Illya Hicks

Dr. Hicks received a bachelor degree from Southwest Texas State University where he also played football. In 2000 he received his Ph.D. from Rice University. The title of his thesis is "Branch Decompositions and their Applications. His talk was "Got Minor?"

Kimberly Weems

Ms. Weems received her B.S. from Spelman College and her M.A. from the University of Maryland, expects to receive her Ph.D. in Applied Mathematics later this year from the University of Maryland. Her talk was "An Influence Function Approach to Robustness in Mixed Poisson Models."

Johnny Houston, David Blackwell, James Donaldson, Eugene Madison

David Blackwell with former NAM Blackwell Lecturers Nate Dean and Mel Currie

Albert Bridgewater and Denise Stephens-Hawke

Some of the participants were Joan Barrera, Applied Mathematics - Cornell U.; Albert Bridgewater, President & Director of Minority-Serving Institution Forum; Felix Browder, President American Mathematical Society; Joe Buhler, MSRI; Carlos Castillo-Chavez, Director Mathematical and Theoretical Biology Institute - Cornell U.; Ariel Cintron-Arias, Applied Mathematics - Cornell U.; Mel Currie, National Security Agency; Nathaniel Dean, Computational and Applied Math - Rice U.; Lisa Denogean, Biometrics - Cornell U.; Gelonia Dent, Applied Mathematics - Brown U.; Barbara Deuink, National Security Agency; Persi Diaconis, Statistics - Stanford U.; James Donaldson, Dean CAS - Howard U.; Johnathan Farley, Mathematics - Vanderbilt U.; Harold Figueroa, Applied Math - Cornell U.; Maria Franco, Applied Mathematics - Cornell U.; Ted Greenwood, Program Director - Sloan Foundation; Edray Goins, Institute for Advanced Studies; Johnny Guzman, Applied Mathematics - Cornell U.; Robert Harris, Vice Provost for Diversity and Faculty Development - Cornell U.; Herbert Hethcote, Mathematics - Iowa U.; Illya Hicks, Computational and Applied Math - Rice University; Susan Holmes, Statistics - Stanford; Johnny Houston, Executive Secretary NAM; Eugene Madison, Mathematics - Iowa U.; William Massey, Mathematical Sciences -Lucent Technologies; Charles McCulloch, Biometrics - Cornell U.; Miriam Nuño, Mathematics - Claremont Graduate U.; Ricardo Oliva, Applied Mathematics - Cornell; Mason Porter, Applied Mathematics - Cornell U.; Richard Rand, Theoretical and Applied Mechanics - Cornell U.; John Rodriguez, Texas Instruments; Monica Romero, Applied Mathematics - Brown U.; Dámaris Santana, Biometrics - Cornell U; James Schatz, National Security Agency; Denise Stephenson-Hawk, Provost - Spelman College; Stephen Strogatz, Theoretical and Applied Mechanics - Cornell U.; Michael Todd, Operations Research - Cornell U.; Ralph Turner, Mathematics - Howard U.; Leticia Velázquez, Magnet Lab - MIT; Kimberly Weems, Mathematics - U. Maryland; Scott Williams, Mathematics - SUNY Buffalo; Erika Wirkus, Applied Mathematics - Cornell U.; Stephen Wirkus, Applied Mathematics - Cornell U.; Margaret Wright, Head Scientific Computing - Lucent Technologies; Abdul-Aziz Yakubu, Mathematics - Howard U.

For more information go to the web site http://www.biom.cornell.edu/blackwell-tapia.html

Monica Romero

Ms. Romero has a bachelor degree from Wellesley College and is a graduate student at Cornell University.

ENDOWMENT

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ON THE INTERNET:

Some web pages of HBCU Mathematics Departments that list faculty and their education:

Bowie State University: http://www. sem. bowiestate.edu/ math/mathhome.html

Central State University: http://cesvxb.ces.edu/COLLEGES/CPSfolder/facstaff.html

Clark Atlanta University: http://www.cau.edu/academics/artsSciences/departments/math/facultyStaff.html

Elizabeth City State University: http://www.ecsu.edu/ECSU/AcadDept/MathandCS/ecsu_cs_dept.html

Hampton University: http://ww2.hamptonu.edu/science/mathug/mathhome.htm

Howard University: http://138.238.61.55/~reb/

Jackson State University: http://stallion.jsums.edu/~math/

Morgan State University: http://www.morgan.edu/catalog/artscien/math/math.htm

North Carolina A&T: http://www.ncat.edu/~math/

Spelman College: http://www.spelman.edu/math/mathdept.htm

Texas Southern University: http://www.tsu.edu/departments/mathematics/faculty.htm

CALCULUS TRICKS FOR AN OLD DOG

I have taught Calculus II at least twenty times, who think there would be a new way of doing something. Yet over the past 30+ years, I have known several colleagues to publish improvements over the typical way something in calculus is presented. This term a colleague showed me Gilman's simple method for showing the harmonic series 1+1/2+1/3+1/4+… is divergent. You of course know the usual method of comparing to log x as the area under 1/x. Or the old method where the sum of the 2n-1 terms from 21-n to 2-n is >1/2. Here's another way: Suppose, to the contrary, S=1+1/2+1/3+1/4+⋯ is a real. As 1/(2n-1)+1/2n>1/n, we can group adjacent pairs of terms to show S>S+1/2, a contradiction.

COMPOSITION AND TERMS OF THE BOARD OF DIRECTORS

The Board of Directors shall consist of the three officers of the Board and of the Corporation: a president, a vice-president, and a secretary-treasurer, an editor; members at large representing special areas of concern::

Member R-A, elected to represent Region A;

Member R-B, elected to represent Region B;

Member R-C, elected to represent Region C;

Member M-I, elected to represent Majority Institution

Member C-C, elected to represent Community Colleges [added by Amendment in 1999]

Member O-A, elected to represent mathematicians outside of academia the Executive Secretary

All members of the Board shall be elected to a term of office for a period of three years and elections shall be staggered for continuity. Regular elections shall occur in the fall of each year and the persons elected shall be duly installed at the first Annual NAM meeting following the election.

The Executive Secretary shall be elected by the Board of Directors to serve for a period of five (5) years. The Editor is appointed by the Board of Directors.

Election Cycles: 1999, Cycle I: Member R-A, Government/Industry Member, President 2000, Cycle II: Member R-B, Majority Institution, Vice President 2001, Cycle III: Member R-C, Community College, Secretary/Treasurer; repeat cycles.

NEW CONFERENCES

CAARMS 6 to be held June 27-30, 2000

CAARMS- the Conference for African American Researchers in the Mathematical Sciences will held at Morgan State University. Speakers are:

Idris Assani , University of North Carolina (Chapel Hill)

Robert Bell , AT&T Labs R esearch Dominic Clemence, North Carolina A&T University

Edray Goins , Institute for Advanced Study

Carl Graham , CNRS, École Polytechnique

Charles Hagwood , National Institute of Standards and Technology

Johnny Houston , Elizabeth City University

Charles Isbell , AT&T Labs Research

Donald King , Northeastern University

Kathryn Lewis , Morehead College

Gaston N'Guérékata , Morgan State University

Desmond Stephens , Florida A&M University

Margaret Wright , Bell Labs, Lucent Technologies

Abdul-Aziz Yakubu , Howard University

CAARMS6 web page: http://cm.bell-labs.com/who/will/caarms6.html

DUES

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IN PLACE OF NOTHING

While learning elementary set theory, some students have trouble with von Neumann's approach. They are unable distinguish the empty set **0**, which has no elements, from the set **1** whose sole member is the empty set. Analogously, some readers might confuse a book about zero as a book about nothing. Robert Kaplan has written the former - *The Nothing that Is: A Natural History of Zero.* [Oxford Univ Press, 1999. Hardcover, $22.00. ISBN 0-19-512842-7]

First Kaplan presents an analysis of where zero comes from and attempts to use it in mathematics. It was interesting to trace the path from Babylon through India up to von Neumann. Despite his ignorance of the meager though significant Egyptian input and the usual undo credit to the Greeks (they invented the symbol "0"), who only took the knowledge of zero and mathematics along with gold from Babylonia, Kaplan weaves a good history.

This first part is very interesting to my mathematician alterego, while the second attracts my high school teacher interests and I don't teach high school. This latter part of the book is really geared toward the bright middle schooler and has a "fun with zero" flavor. It is peppered with descriptions of what happens when zeros are allowed to associate with the natural numbers. Note Kaplan's book not the only recent writing about nothing, there is also *Zero: The Biography of a Dangerous Idea* by Charles Seife

NAM'S ENDOWMENT CAMPAIGN 1999-2000

"A CAMPAIGN FOR THE PERPETUITY OF NAM"

PLEDGE – CONTRIBUTION FORM

The principal of the campaign is never to be spent; only the interest and dividends received from the investment of these funds may be spent. (Al life memberships will go toward NAM's campaign)

To help with the success of this campaign, we are requesting all members and friends of NAM to contribute what you can and to assist NAM by helping NAM to locate other contributors.

Please pledge the amount that you desire to contribute and please honor all pledges (where feasible) by paying in amount of $100.00 or more each payment toward the pledge. Persons may pay for a Life Membership over a period of one year by making four payments of $100.00 each.

Send to: Dr. Robert E. Bozeman, Secretary-Treasurer, NAM; Depart. of Mathematics;
Morehouse College; Atlanta, GA 30314; (404) 215-2613 (office); rbozeman@morehouse.edu

PLEDGE/CONTRIBUTION LEVELS

All contributions are tax deductible. (Please make checks payable to NAM's Endowment Campaign)

1. Life Membership (LM) in NAM $400
2. Bronze (B) ..... $500 - 999
3. Silver (S) ..... $1,000 - 4,999
4. Gold (G) ..... $5,000 - 9,999
5. Diamond (D) ..... $10,000 - 24,999
6. Platinum (P) ..... $25,000 - 99,999
7. Double Platinum (DP) ..... $100,000 - 249,999
8. Triple Platinum (TP) ..... $250,000 and higher

*(Any contribution of $500 or more from an individual will include life membership upon request)

Enclosed is my pledge/contribution in the amount of $ _____.___

Name: _____ Title: _____

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Bachelor Degree in Mathematics: Year ( ) Awarding Institution _____

Highest Degree: Year ( ) Awarding Institution _____

Ethnicity: African American ☐ Hispanic American ☐ White ☐ Other _____

Do you desire a Life Membership in NAM? Yes ☐ No ☐

NATIONAL ASSOCIATION OF MATHEMATICS MEMBERSHIP FORM

For new applications and Annual Membership Renewel
Membership Calendar Year January 1 – December 31

Name _____

Address _____

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Telephone : Home ( ) _____ Office ( ) _____

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SELECT APPROPRIATE MEMBERSHIP TYPE

☐ Student : $15 ☐ Individual : $25 ☐ Contributing : $50

☐ Sustaining : $75 ☐ Institutional : $100 ☐ Life : $400

PLEASE REURN THIS COMPLETED FROM AND MEMBERSHIP DUES TO :

Dr. Robert E. Bozeman, Secretary-Treasurer
National Association of Mathematicians;
Department of Mathematics
Morehouse College
Atlanta, GA 30314
(404) 215-2613 (office)
E-mail: rbozeman@morehouse.edu
Web page: (new) http://www.math.buffalo.edu/mad/NAM/NAM-index.html

INDIVIDUALS AND STUDENTS : Please complete below if you did not send NAM this information within the past three years.

List all degrees you currently hold. Circle the correct degree.

B.S. or B.A. : Area _____ Institution _____
M.S. or M.A. : Area _____ Institution _____
Ph.D. or Ed.D. : Area _____ Institution _____
Other : Area _____ Institution _____

Desired Participation in NAM:

☐ Institutional Representative (for NAM) Area or State Representative _____

☐ Committee Member (specify interest) : Interest _____

☐ Need additional information about the organizational structure of NAM

Ethnicity : African American ☐ Hispanic American ☐ White ☐ Other _____

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Region A: Southeast/West
South Carolina, Florida, Virgin Islands, Puerto Rico, California, Montana, Any state not in B or C

Region B: Mid-Atlantic
Kentucky, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Virginia, W. Virginia

Region C: Midwest/Southwest
Missouri, Oklahoma, IIllinois, Ohio, Mississippi, Tennessee, Texas

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