

Parking Lotto

I had an interesting experience yesterday (23 August). My wife Alice had to talk at the National Psoriasis Foundation in Orlando during the weekend so the family used the cheap summer fares for a chance to see Disneyworld. Our routing home was Orlando-Miami-NYC (don't ask). Hurricane Andrew arrived this morning in Miami. Well, yesterday at Orlando the final word from the airline was that if you went to Miami, you were "on your own" and "the Miami airport is all glass." There was a noticeable time warp that occurred at the airport entrance. While we were driving from Orlando, Andrew was reported as due to hit Miami in 14 hours. Once we were inside the airport, the only word we could hear is that it would be "soon," and tensions were getting pretty high. We decided to chance it, in part because there were no seats available leaving Orlando for anywhere. We were also encouraged by the words of a wise pilot, who noted that they would not fly a plane into Miami unless they were darn sure that the plane could get out. Extrapolating (dangerously?) I concluded that the airline would not allow its four o'clock flights to fly in unless it expected they would all get out. Bottom line: we left Miami at 5:45 in calm weather. But no flights were landing—the four o'clock batch was the last.

Readers may be interested in an impressive compendium of puzzles entitled *Index to Mathematical Problems 1980-1984*, edited by Stanley Rabinowitz and published by MathPro Press. Also, my NYU colleague Dennis Shasha has just written *Codes, Puzzles, and Conspiracy*, a second Dr. Ecco book. Finally, our frequent contributor, Nob Yoshigahara, has written a book including a few problems from "Puzzle Corner." Nob's book is in Japanese; the only word I can read is "Puzzle" set in big type on the cover.

Problems

N/D 1. We begin with a computer-related problem that Max Hailperin heard



SEND PROBLEMS, SOLUTIONS, AND COMMENTS TO ALLAN J. GOTTLIEB, '67, THE COURANT INSTITUTE, NEW YORK UNIVERSITY, 251 MERCER ST., NEW YORK, N.Y. 10012, OR TO: GOTTLIEB@NYU.EDU

from Albert Faessler. A primitive pythagorean triple (PPT) is a triple of positive integers (a,b,c) such that $a^2+b^2=c^2$ and $a, b,$ and c have no common factor (this last condition is what makes the triple "primitive"). The area of a PPT is $ab/2$. Euler found that the smallest area shared by three PPTs is 13123110. What is the next smallest area shared by three PPTs?

N/D 2. Gordon Rice wants you to find (non-equilateral) triangles containing a 60-degree angle. How about a 30-degree angle?

N/D 3. Tom Harriman wonders for what values of X does the following "infinite exponential" converge.

$$X^{X^X}$$

Speed Department

Speedy Jim Landau sent us a speed problem from Eric Weill. To avoid the 5-dollar parking fee at Atlantic City casinos, it is necessary to place a bet. What bet should you make to get your free parking with the least risk?

Solutions

JUL 1. We begin with a bridge problem from Richard Hess, who (I guess) always seems to get low point count hands and likes to see how far they can go. Inspired by the 1991 Jan 1 problem, Hess asks for the lowest number of high card points that North and South can have (combined) and still make 7NT against best defense.

The following solution is from Edward Sheldon: South is assumed declarer, and West is on lead. North/South (NS) must have the ace of every suit in the West hand. Therefore West cannot have 13 cards of one suit. If West has 3 or 4 suits, NS must have 3 or 4 aces, for 12 or more points. Since at least one solution of less than 12 exists, there is no minimum solution where West holds more than 2 suits. For all minimum solutions, West holds exactly 2 suits. Further, all 13 NS tricks must come from the same 2 suits, to avoid a third NS ace. There are 26 cards in 2 suits; with 13 in the West hand, the other 13 must be played one per trick to win a grand slam; therefore they must all be in one hand.

Assuming West and South share the hearts and spades, with South arbitrarily long in spades, and that East holds all the point cards in clubs and diamonds, the following 11-point solution is obvious:

West	South
♦ K	A, Q, J -> 2
♥ K -> 2	A

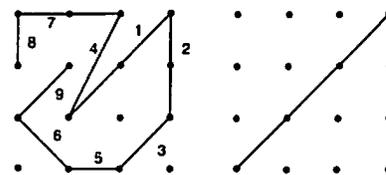
This solution is also a minimum. South's aces have already been proved necessary, and since the West spade K must be singleton, the spade Q and/or J cannot be moved to the West hand, and by the 2-

suit restriction, they cannot be moved to the East hand, thus they must stay in the South hand. Since all 4 honors are necessary, no lower solution exists and the above is a minimum solution.

JUL 2. Matthew Fountain suggests we tackle the "hold that line" problem devised by Sid Sackson and appearing in his book *A Gamut of Games*.

"Hold That Line" is a game in which two players alternate drawing straight lines between dots on a 4 x 4 dot field. The player to draw the last line loses. The first diagram shows a game in which the lines are numbered in the order they were drawn. Restrictions are that lines after the first shall only be drawn from the free end of a previously drawn line. All lines must be straight and start and end at a dot. A line may connect more than two dots if all are in a straight line. No line shall be drawn to a previously connected dot or cross another line.

The second diagram shows a game in progress where the first player has drawn his first line along a long diagonal of the field. Is this a winning or a losing move? There can be no ties.



GAME LOST BY FIRST PLAYER

GAME IN PROGRESS

Steve Altkhuler advocates a "copy your opponent" strategy. The second diagram shows an easy win for the first player. S/he has divided the board in half, and can now mirror whatever move the second player makes onto the other half of the board. Thus, the two halves will always remain identical, and whenever the second player is able to make a move, the first player will be able to make the same move on the other half.

This strategy means there are many other first moves which guarantee a win for the first player. Using spreadsheet-type notation on a 4x4 board, not only is A4-D1 a win, so are: A1-D4, A2-D3, A3-D2, B1-C4, and C1-B4.

This being the case, "Hold that line" now has all the strategic appeal of tic-tac-toe, unless you ban first moves that bisect the board.

JUL 3. Geoffrey Landis has found our previous cryptarithmic problems (where you are given an arithmetic equation such as $XXX + Y = YZZZ$ and must find which digits to assign to each letter, in this trivial case $X=9, Y=1, Z=0$) "rather uninteresting." So he offers a challenge. Find a cryptarithmic problem with (precisely) two solutions based on two (completely) different keys, i.e., no letter is assigned the same digit in both solutions. I would not be surprised to find that Nob Yoshigahara has a few dozen of these sitting under his socks in his bureau.

Bob High sent us some that even "make sense."

- ONE

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toward a second field, studies of the relationship of gender and science. Her works in this field include her biography of Barbara McClintock, *A Feeling for the Organism* (written several years before McClintock won her Nobel Prize); articles on the relationship between gender, the conception of science, and the idea of objectivity; her volume, *Reflections on Gender and Science*; and continuing work on the relationship between gender-linked concepts and work in biology. In the last five years, Keller has increasingly turned toward studies of the history of the life sciences, in particular of molecular and evolutionary biology. Keller expects to teach at both the undergraduate and graduate level; her courses will focus on gender and science and on the recent history of evolutionary biology. Next year, she will oversee the weekly Monday-afternoon STS Colloquia.

Hugh Gusterson, an anthropologist who has studied nuclear weapons production, joined the faculties of the Anthropology/Archaeology Program and the STS Program as assistant professor. Gusterson received a bachelor's degree in modern history from Cambridge University in 1980. He subsequently studied cultural anthropology at the University of Pennsylvania, where he received a master's degree, and at Stanford, where he received a PhD in cultural anthropology in 1991. He is currently a Weatherhead Postdoctoral Fellow at the School of American Research in Santa Fe. Gusterson is best known for his ethnographic studies of nuclear weapons producers and their opponents at the Livermore Laboratory. He has also written on orientalism and the discourse of nuclear deterrence. In STS, his teaching will focus on the ethnographic and cultural study of science and technology. . . . Victor McElheny and Eugene Skolnikoff, '50, SM '50 (VI), PhD '65 (XVII), attended the second meeting of the Working Group on "Cultural Aspects of SETI" in Santa Cruz last May. . . . Leon Trilling headed a workshop for 60 middle-school teachers last July at MIT. The theme of the workshop was "How Does a City Work?"

The Mellon Fellowship Committee has selected three Fellows in the History and Social Studies of Modern Life Science for the academic year 1992-93. The Fellows will participate in STS seminars, colloquia, and workshops while pursuing their research at MIT. According to Charles Weiner, committee chair, their research interests are especially relevant to the theme of the 1993 Mellon Workshop on international aspects of genetic engineering and biotechnology, including cultural and political significance. The 1992-93 Mellon Fellows are Richard Doyle, Michael A. Fortun, and Herbert Gottweis. Doyle is an instructor in the Department of Rhetoric at the University of California at Berkeley. He is in the final stages of writing his doctoral dissertation, "On Beyond Living: Vital and Post Vital Rhetorics in Molecular Biology," and has taught "The Rhetoric of Technology" at Berkeley. His next project will deal with the use and impact of computers and computational metaphors in contemporary molecular biology. Fortun is completing his doctoral dissertation, "Mapping Genes, Science, and Society: Charting the Human Genome Project," in the Department of History and Science at Harvard. He has also served as a teaching fellow in the history of science. His next project will be an historical and sociological study of the context of the genome project in molecular biology and in the political economy of the biological sciences and the biotechnology industry. Gottweis is assistant professor in the Department of Political Science at the University of Salzburg. He is editor of the *Austrian Journal of Political Science*; his published works include studies of the politics of biotechnology in Europe. At Salzburg he has taught a course entitled "Biotechnology, Politics, and Society in Comparative Perspective." At MIT he will focus on completing his book, *Retextualizing Life: Genetic Engineering and the State in Western Europe* (MIT Press). Gottweis is a member of the Advisory Committee for the Mellon Workshops.—Graham Ramsay, STS Program, MIT, Room E51-128, Cambridge, MA 02139.

PUZZLE CORNER

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ONE
ONE
ONE
ONE
ONE
ONE
ONE

MANY

Solutions are: ONE = 362, MANY = 5068; ONE = 438, MANY = 6132.

TWO + ... + TWO = WAYS (29 TWOs).
Solutions are: TWO = 147, WAYS = 4263; TWO = 271, WAYS = 7859.

TRICKY
TRICKY

EUREKA

Solutions are: TRICKY = 152697, EUREKA = 305394; TRICKY = 436901, EUREKA = 873802.

Other Responders

Responses have also been received from S. Althuler, J. Grossman, D. Garcia, W. Hartford, R. High, D. Kahn, J. Keilin, J. Libby, E. Lund, A. Ornstein, G. Rice, J. Rosenthal, D. Wachsman, and R. Yassen.

Proposer's Solution to Speed Problem

Go to a 5-dollar crap table and bet 5 dollars on "Come" and 5 dollars on "Don't come" simultaneously.

GAZETTE

MIT ALUMNI JOB LISTINGS

- ▶ A bi-weekly bulletin giving employers the opportunity to reach experienced MIT graduates, and MIT graduates the opportunity to scan the market.
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Deceased

The following deaths have been reported to the Alumni/ae Association since the *Review* last went to press:

James M. Ralston, '16; June 13, 1992; Trenton, N.J.
Harvey M. King, MAR '23; July 6, 1992; Ft. Walton Beach, Fla.
Howard A. Lockhart, '23; June 18, 1992; Haverhill, Mass.
Arthur R. Stuckey, '23; July 15, 1992; Tucson, Ariz.
Hyman J. Verner, '23; June 9, 1992; Pikesville, Md.
Neil L. Olken, '24; December 12, 1988; Newton Centre, Mass.
George A. Whinery, SM '25; July 9, 1992; Grand Rapids, Mich.
Avedis M. Kazazian, '27; January 27, 1988; La Canada, Calif.
Robert G. Loomis, '29, SM '30; August 30, 1991; Manchester, Conn.
Michael Anthony, '32; July 13, 1992; North Falmouth, Mass.
Robert H. Hansen, '32; May 19, 1992; Lakeside, Calif.
Norman M. Johnsen, '34; January, 7, 1992; Atlantic Beach, Fla.
Willard F. Fixby, '35, SM '36; July 12, 1992; Novelty, Ohio
J. Lawrence Tobey, '36; June 24, 1992; Wenham, Mass.
William A. Williams, SM '36; February 4, 1990
Herbert P. Gusdane, '37, SM '38; December 1, 1991; Mentor, Ohio
Charles J. Palmer, SM '37; July 26, 1992; East Sandwich, Mass.
William J. Pattison, '37; June 28, 1992; Camden, Maine
Norman E. Weeks, '38; July 8, 1992
Donald B. Peck, '39; July 1, 1992; Bloomfield, Conn.
William W. Pomeroy, SM '40; July 14, 1992; Alexandria, Va.
Michael B. Bever, SM '42, ScD '44; July 17, 1992; Cambridge, Mass.

Robert V. Coleman, '44; January 9, 1992; McLean, Va.
Frank J. Huddleston, '45; April 8, 1992; Bowie, Md.
Keith Knutzen, '47; October 14, 1991; Bronxville, N.Y.
Richard C.B. Berry, '48, SM '49; August 8, 1992; Danielson, Conn.
Earl D. Hoyt, '48; June 6, 1992; Menlo Park, Calif.
George G.C.K. Mah, PhD '48; May 28, 1990; Evanston, Ill.
Manfred G. Wentzel, '48; June 14, 1992; Indian Harbor Beach, Fla.
Nesbit L. Duncan, '49; June 15, 1992; Belmont, Mass.
Richard W. Henderson, '50; July 13, 1992; Colonia, N.J.
Bernard Edelman, '53; June 28, 1992; La Mesa, Calif.
Howard W. Wong, '53; August 30, 1990; Silver Spring, Md.
Arthur W. Haines, '54; August 6, 1992; Sacramento, Calif.
William N. Talmers, PhD '54; July 9, 1992; Flushing, N.Y.
John R. Segal, PhD '59; January 31, 1990; New York, N.Y.
Immo-Ragnar H. Nordstrom, '60; April 27, 1992; Fair Haven, N.J.
Robert Akullian, '70; July 20, 1992; San Jose, Calif.
Sandra A. Wadsworth, MAR '74; September 15, 1991; Brookline, Mass.
Steven K. McClung, '84; July 11, 1992; Atkinson, N.H.

Correction: April's Deceased List erroneously listed the date of death of Laurence Edmund Noble, '23, of Enid, Okla., as August 9, 1992. It was actually Mrs. Laurence Edmund Noble, '23, the former Gladys Farmer, who died on that date; her late husband was an alumnus of Harvard. Our apologies for the error.—Ed.