Noesis

The Journal of the Mega Society
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EDITORIAL
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Ron Hoeflin sent a postcard suggesting a table of contents for each issue. That sounds too much like work. Instead, I'll just run a list of the stuff in each issue--no page numbers, 'cause I never know exactly how long everything's gonna be when it's put together at the print shop.

FROM CARLOS BIRO

Dear Rick,

Thank you very much for the information on the Mega Society. Meanwhile I have also received four issues so far of Noesis. I find that this is not what I am looking for, so I do not plan to ask for one of the tests, or to join in the event that I would be accepted. I wish to make it clear that this decision is entirely due to personal quirks of mine: I don't particularly enjoy reading about psychometrics, or about mathematics. I like to talk about weather, politics, scenes observed out in the streets or about gourmet food . . . with intelligent people. I have found such "conversations" through corresponding with a few members of ISPE and I am happy.

In any event, I remain,

Cordially yours,
Carlos E. Biro

MANY ANALOGIES & OTHER PUZZLES FROM PETE POMFRIT
AS WELL AS SOME ANSWERS

[Ed's comment: I asked for all he's got, and he keeps sending them. The standard A : B :: C : ? format is a pain to type, so I'm just gonna let Windows set up a table with three words across. Supply the missing fourth word. Pete, I'm also stringing together what you submitted as many separate sets of questions. This string of items will be split among the next several issues. Numbers in parentheses on some items

indicate the number of letters in the word which completes the analogy. **Readers: it's your job to select items you think might be suitable for the short form test.]**

1. JAMES	STEWART	STEWART
2. SODIUM	CALCIUM	CHILE
3. 90, 180	COMPLEMENTARY	360
4. MOSSES	BRYOLOGY	DEFINING TECHNICAL TERMS (10)
5. FILMS	FASHION DESIGN	OSCAR (6)
6. KISS	OSCULATION	STRETCH AND YAWN (13)
7. KITCHEN	CULINARY	KITCHEN VEGETABLES (7)
8. 6	1 1/2	BOLL (6)
9. 1 TO 3	7 TO 3	SUBTRIPLE (18)
10. 3	8	CUBIC (16)
11. 2621	2118	HAVEN (4)
12. JESUS	BUDDHA	NATIVITY (6)
13. BEES	APIPHOBIA	RIDICULE (14)
14. A WALK	A COOL WALK	PROMENADE (8)
15. APES	FLAMINGOES	SHREWDNESS (5)
16. CAT	FELINE	FLYING-PHALANGER (9)
17. REFRACTION	DIOPTRICS	REFLECTION (10)
18. WHOLE	INDIVIDUAL	VERNATION (6)
19. TORRID	ASCIAN	TEMPERATE (11)
20. STRAIGHT	LEIOTRICHOUS	WAVY (12)
21. 10	11	JUDAN (9)
22. WILD HORSES	CORRAL	WILD ELEPHANTS (5)
23. MOTHER	MATERNAL	STEP-MOTHER (8)
24. $1000	$100,000	GRAND (4)
25. RED, YELLOW	GREEN, BROWN	BLUE, PINK
26. WATER	VINEGAR	HYDROMEL
27. (GOLDEN) STATE	CALIFORNIA	(GOLDEN) CHAIN
28. CORNEA	IRIS	KERATITIS
29. FORWARD	BACKWARD	LORDORSIS
30. 3	2	AI

NUMBER SERIES

A. 2 6 4 5 7 5 1 3 1 1 0 6 ?
B. 4 9 7 1 4 9 8 7 2 6 9 4 ?
C. 499, 503, 509, 521, 523, 541, 547, 557, ?
D. 10, 18, 32, 56, 96, 160, 256, 384, 512, ?
E. 6, 13, 12, 3, 23, 1, 13, 11, ?
F. 0 5 8 8 2 3 5 2 9 4 1 1 ?
G. 1 7 7 2 4 5 3 8 5 0 9 0 ?
H. 6, 9, 8, 20, 770, 18, 22, 29, 28, ?
I. 4, 11, 31, 89, 259, 761, 2251, 6689, ?
J. 2 1 5 4 4 3 4 6 9 0 0 3 1 ?
K. 0, -2, -3, 8, 95, 684, 4991, 40256, ?
L. 6, 8, 28, 58, 726, 3336, 523740, ?
M. 6, 35, 143, 323, 667, 1147, 1763, ?
N. 3 1 8 3 0 9 8 8 6 1 8 3 ?
O. 7 3 8 9 0 5 6 0 9 8 9 3 0 ?

[Here's an easy one I just thought of: 1, 2, 1, 2, 1.41, 1, ? And here's an impossible one: 1, 0, 0, 1, 1, 1, 0, 1, 1, 0, 1, 0, 1, 1, 1, 0, 1, 1, 0, 1, 0, 1, 0, 1, 1, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 1, 0, 0, 1, ?   Ed.]

ANSWERS TO POMFRIT'S ANALOGIES FROM ISSUE 74

1. ARONDIGHT	2. GLUCK	3. REDBREASTS
4. CARUCATE	5. VERMEER	6. ASCALAPHUS
7. TRAMMEL	8. CLOACOPAPYROLOGIST	9. TANAISTE
OR ELLIPSOGRAPH		
10. CALLIPYGOUS	11. EXONYM	12. SAIKEI
13. POCKET	14. NOTARIKON	15. MERCAPTAN/THIOL
16. KAJAWAH	17. IMPERIAL	18. DIRIGO
19. CLIO	20. UROPYGAL	21. SUCURUJU
22. PARAPH	23. VARICELLA	24. PISTOLOGY
25. PULVILLI-	26. TESSARADECAD	27. SHEWEL
28. PAASCHE	29. OKIMONO/NETSUKE	30. PROVECTION
31. FERRET	32. CONTUMACY	33. PETRISSAGE
34. PHAEDRA	35. MARRYAT	36. GLUBBDUBDRIB
37. PROPAROXYTONE	38. SOLANDER	39. SCOUSE
40. HAMZA	41. GANESA	42. HYPATAETHRAL
43. ILLINIUM	44. BRINELL	45. OMERTA
46. TERRELLA	47. BELGIUM	48. PECKSNIFFIAN
49. BURLADGRO/BARRERA	50. GNOMON	

Ask Kevyn

Kevyn vander Jeenius, who lived in St. Louis for several years but who currently resides elsewhere -- perhaps everywhere -- is the world's premiere smart alec. Third in the succession for the Bohemian Crown, Kevyn shows up occasionally at the P-rade, the largest Princeton alumni gathering in North America. He is, sorta, the Senior Vice President of a corporation dealing in medical litigation consulting and also, kinda, partner in a firm for emergency room systems analysis. His grandfather invented the field of system analysis. According to some sources, "vander Jeenius" is not a real name.

Dear Kevyn:

I've been pondering this for a long time and have asked other columnists -- no luck. Please help me out! My question is this: **Do fish ever get thirsty?**

> B. G.
> Albuquerque, New Mexico

Dear B.:

Well, lungfish sure do. These quasi-amphibious fish live in regions of Africa where lakes tend to dry up during the summer. Somehow lungfish have evolved the ability to skip about on land -- sometimes for weeks or longer! -- until they can find water again. Most fish, however, suffocate if removed from water: their gills are designed to extract dissolved oxygen rather than to get it from air (which is about 80 % nitrogen).

Dear Kevyn:

Here's another riddle for you! My aid Ada went out on a sedate date on the town with some winsome twins, but she still had a bad time. Why?

> William Saffire
> Arlington, Virginia

Dear Bill:

She had a heAdache. And most likely YOU gave it to her.

Dear Kevyn:

Why do weather forecasts always come in units of 10 %? For instance: "40 % chance of rain"; or "30 % chance of snow". Is there some secret room where a cabal of ten meteorologists get togther and vote?

> Dr. Mitchell Feigenbaum
> National Laboratory
> Los Alamos, New Mexico

Dear Mitch:

Sounds good to me: I'm suspicious of a Weather Bureau that has no windows.

Dear Kevyn:

Mom bought a modem for her Mac II SE, and with it I've been trying to access a "Classified" file in an IBM mainframe somewhere on the third floor of the Pentagon. To get past security, I need the prime factors of this number: 21, 474, 835, 136, 412, 655, 213. Thanks for your help!

> Connie Hacker
> Aspen, Colorado

Dear Connie:

What an intriguing hobby! I hope you don't rack up too big a phone bill. Here you go: 9, 999, 999, 379; and 2, 147, 483, 647. Be sure to write back soon and let me know if you dig up anything interesting.

Dear Kevyn:

Leaving aside the issues of sexism, why do you suppose someone as brilliant, charming, and motivated as Hillary Rodham never even ran for any elective office (except in school), whereas her less brilliant, less charming, less motivated husband has reached the Oval Office?

> Margaret Thatcher
> London, Great Britain

Dear Maggie:

In weathering the storms of democratic politics, a moral masthead of rubber is often as useful as one of stone. (Get the drift?)

Dear Kevyn:

What number comes next: 1, 11, 21, 1211, 111221,...

> Prof. John Conway
> Department of Mathematics
> Princeton, NJ

Dear John:

312211. (Try reading each numeral out loud.) Don't you have more constructive things to do? Proving Fermat's Last Theorem or something?

Dear Kevyn:

Is Oliver Stone's directing a film about who REALLY shot J.R.?

> Jim Garrison, Esq.
> New Orleans, Louisiana

Dear Jim:

Not on my planet. I won't make any claims on yours.

Dear Kevyn:

If you were the ONLY PERSON who knew that a GREAT BIG COMET was on an imminent collision course with the earth, and that everyone had only, say, about ten minutes left to live -- what would you DO?

> John "Home Alone" Hughs
> Chicago, Illinois

Dear John:

Would it matter?

Dear Kevyn:

What's the major difference between being merely "suspicious" by nature, versus actually being a full-fledged "paranoid"? (PLEASE leave me anonymous and don't print my address!!!)

> Ken Keasey
> 13███████████████████a
> Mexico City, Mexico

Dear Ken:

Why do you ask ME? Just what exactly are you insinuating here?

Dear Kevyn:

In real life, does good always defeat evil?

> George Lucas
> Pasadena, California

Dear George:

Sure does! Whoever WINS writes the history; whoever writes the history decides who was GOOD. (For instance, how many "Westerns" did the Pierce Nez make?)

Dear Kevyn:

My myna bird Myno holds intelligent conversations! How do I get on Dave Letterman's "Stupid Pet Tricks"?

Barbara Bush
Outland

Dear Barbara:

Lately Dave's to switching his networks more often than neckties. However, before you try to contact him, I suggest you have a chat with a psychiatrist.

Dear Kevyn:

Do people ever call you "Kevin Costner", in spite of the fact that they know perfectly well that this is NOT your name?

Kevin Kline; Kevin Bacon
West Beverly Hills, California

Dear Kevins:

Only if they have nothing better to say. Speaking of which -- that is, of Kevin Costner and of having nothing to say -- is it just me, or does superstar K.C. have the most monotonous delivery since the Pony Express?

Dear Kevyn:

Roll a pair of **unbiased,** ordinary cubic dice exactly one billion times. What's the MOST LIKELY outcome?

Prof. Herbert Taylor
Department of Mathematics
U. of Southern California
Los Angeles

Dear Herbert:

Tendonitis.

Dear Kevyn:

Which English language words have all the vowels in order? Which English language words end in "dous"? What is the longest English language word of which no other word can be made from any permutation or combination of its letters? What would be the last word in an annagram dictionary?

Dr. Richard Lederer
Concord, New Hampshire

Dear Rich:

You need to get out more often. "abstemious"; "abstentious"; "arsenious"; "caesious"; "facetious"; "fracedinous" -- "tremendous"; "stupendous"; "horrendous"; "hazardous"; "Aldous", counting names -- "syzygy" --"TV" or "tux".

Dear Kevyn:

Suppose I murder my spouse, then sell the rights for the story to NBC. How much money would I need to turn a profit?

J. C.

Cleveland, Ohio

Dear J.:

Assuming you're convicted and sentenced for 25 years but get out on parole after 15; further assuming you'd want $ 25,000 for each year of incarceration -- you'd need $ 375 thousand. But if you hire Al Dershewitz for defence, you might avoid prison altogether!

Dear Kevyn:

Why are your answers always so flippant?

Marilyn vos Savant
Manhattan, New York

Dear Marilyn:

Search me. Why?

P.S.   The post office neglected to cancel your stamp. Mind if I reuse it?

A REALLY REALLY Long Letter from Kevin Schwartz

1032 Centre Street
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February 5, 1993

Dear Rick & company,

Who out there plays *wei-chi* (*i-go* / "Go")? Dad and I are bored silly from grinding the computer into dust over and over (even when taking a nine-stone handicap); yet there is only so much we can learn from playing just each other. Between six-Kyu and three-Dan (amateur), we are probably somewhere around two- to four-Kyu. Any takers?

Don't know a **Short Form** from chloroform -- must catch up on those back issues -- but with the characteristic Arrogance of Ignorance which makes these "HIQ" societies such fun, I offer some "hubrish" comments on some of the puzzles published in the January 1993 issue of Noesis -- plus some additional puzzles to annoy everyone. Speaking of which... nothing makes me go all misty-eyed like memories of those childhood holidays, unfolding those wrapping-blocks to find the toy tesseracts inside...

14)   To be or not to be; what the heck is the question? W's face, composed of numerals -- plus rotations, inversions (9, 6, 8, two 2s, two 1s, two 0s, two 7s) has line symmetry, except for the 7-7 mouth, which has point symmetry. Is it a New Age / New Guinea mask?

15)   The distance from the equilateral's midpoint / axis to any vertex is anything LESS THAN $1/2$ -- otherwise the rotating triangles could touch one another. Base less than: $(3^{.5}) / 2$; height less than: $3/4$; area less than: $(3^{1.5}) / 16$ -- just over 32.475 percent.

18)   Does this analogy belong on the **same test** with those fiendish number sequences? Would you bother to pour flour through cinderblocks after sifting it through a finely graded sieve? "Menshevik" may once have been esoterica, but thanks to a peculiar chain of events in St. Petersburg during the fall of 1917 (Ten Days that Shook the World)...

19)   Hi, Arthur. I owe you some letters. Sorry. If it's any consolation, I think your test formula is nifty. Get a patent & sell it to ETS; maybe you'll be the next **Bill Gates**! To solve your puzzle: start in two dimentions (circle divided by lines) and extrapolate algebraically.

20)   Probably NOT what you intended, but **PENISOLATE** is a key word in James Joyce's sotospeak pun*ovel* (ha, ha), Finnegan's Wake. "Pen I solate" would mean something like "I change into a pen" (or, divided into "Pen I so late": "I'm still scribbling at this ungodly hour!"). Eliminate the "o!", and you get... well, quite a different denotation. But

still functional. Well, so to speak. All of these meanings were **intended** by Joyce. Trust me on this. No, really. All right, I'm just head-in-the-bag guessing. So sue me.

SOME EVEN MORE ANNOYING PROBLEMS

A)   Punctuate the following sequence of words to make it comprehensible:

that that is is that that is not is not is that it it is

B)   Punctuate the following sequence of words to make a SINGLE sentence:

John where Steve had had had had had had had had had was right

C)   Find the next number in this sequence:

2;   12;   1,112;   3,112;   132,112;   1,113,122,112;   311,311,222,112;   _____

D)   Given a Rubic's Cube™ with N squares per edge, what is the minimum number of twists, $F(N)$, which can always restore a randomly scrambled cube to its pristine state?

E)   A small mass, 10 kg, sits one third of the way up a meter-tall frictionless wedge of slope X^0. Said wedge, 35 kg, lies atop a frictionless, flat field. When the cube is released, what, in terms of "X", is the formula for the velocity of the the wedge? Ditto, for the cube?

F)   When you turn on a hose attached to an S-shaped water sprinkler, said sprinkler spins in the opposite direction of the water spewing out. If you place this sprinkler at the bottom of a tank of water and let the water DRAIN OUT (backward) through it -- which direction will it rotate, and why?

G)   List four words, **plus** a famous name, which end: "-dous".

H)   List six words, each containing a, e, i, o, u -- in that order. Also list a word which has these six vowels adjacent (NOT in that order).

I)   What is the longest word from whose letters no other word(s) can be extracted?

J)   What would be the last words in an anagram dictionary?

K)   List all 26-letter pangrams (sentences containing the entire alphabet,) you can think of.

L)   "Bach" and "Cage" are composers whose names can be played on the piano -- the tunes being mathematical inversions of each other. ("H" represents B-natural whenever "B" represents B-flat.) What is the **longest word** which can be played on the piano?

M)   mourning : morning :: elegy : _____?
(Hint: the answer relies STRICTLY on semantics, not on phonetics.)

This concludes the test. Put down your pencil and erase all your answers.

_____

Prais(e) for Michael's analogy paris / pairs. Still, aren't answers to #s 3, 9,104, 105, & 106 available in other tests? Also, #s 107 & 108 each have AT LEAST two elegant solutions -- depending on whether one prefers squares or "semordnilap" (# 93).

Can anyone imagine ANY sort of experiment which could verify the existence or non-existence of Free Will[1] ? I can't. Do we even agree on a single meaning for this expression? While humans are not self-consciously passive vessels, as Dr. Dick observes, we must not confuse our awareness with true freedom. For instance: suppose you're re-reading your favorite novel. You can almost FEEL it happening. Intellectually you know the fates of the myriad characters, yet you are still conscious of their decisions, of their choices...

Let's try a more profound level. A "Method" actor attempts to hurl himself into his role so as to feel he IS that other person. He forces himself to BELIEVE that the scripted words are really spilling forth spontaneously from within his own "soul". What if life were but a stage, and we but poor Methodless actors that strut and fret...

That seeming-consciousness of decision-making neither obviates predetermination nor even provides particularly strong evidence in favor of Free Will is one of the central paradoxes explored in Lewis Carroll's "children's" classic Through the Looking Glass. But that's another paper for another rainy day.

Signing off,

Kevin L. Schwartz
Saludictorian, Starfleet Academy

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[1] We can all march down Pennsylvania Avenue screaming, "Free Will -- or die!" As if Hillary cared.

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The Cruelest Month
Ides, 1993   1:40 am

Dear Rick,

Thanks for your very kind and fortuitously timed call. I've been sick the last
few months -- in and out of the hospital; delirious at times ("the best of times"?)
-- and you really cheered me up. I'll gladly submit discs rather than paper --
except I use a Mac rather than a PC. Would that still help?

I suspect the labor of Sisyphus was really an early writer's block metaphor:
endless loops -- like a bugged computer program -- with no hope of respite nor
of tangible results. Even for something as simple as a shopping list, my wires
burn out. Ask any of my correspondents how far behind I am! To make CERTAIN
to mail this letter, rather than revise it to death, only to scrap it and then start
anew, I'll blitz through it, print it, seal it, stamp it, adress it, mail it -- and leave
regrets for when I awaken in the morning. Ready, set, go... (Bang!)

Of computers and loops: Robert Dick's computer parable is loopy. It assumes
God is NOT omniscient: otherwise God would know about all the "bugs" instantly;
it assumes God is NOT omnipotent; otherwise God could go back in time and clear
out the "bugs" before they existed. Life is but Tetris, a square-fused piece that
flits and falls its tour across the screen; and then (blip!) is seen no more.

In the next year I hope write for <u>Sassy</u> (Jane Pratt's bobby-soxer mag) and / or
for the television series <u>Class of '96</u> . Any help, especially re <u>'96</u>, will be greatly
appreciated. My own undergraduate "experience" consisted of showing up to
classes, meetings, rehearsals; and of avoiding parties and (ick!) girls.

Recently I perused my yearbook. Scribbled all over were: "You're a wierdo --
but you can be tolerated. Sometimes." Or: "Speak English for a change. No one
knows what the hell you're talking about." Those were the nicer comments.

Also working on poems and various essays. Hoping to revise a Socratic Dialogue
on time travel and Self-Identity -- in particular, to add a section about what
constitutes "evidence" for time loops, as the room seems to crowd up with
supernumerary Socrates. Maybe I'll submit my rough draft. Later. Maybe.

Who out there plays go? I wonder: would it work on a big, irregular board with
a long perimeter and with three or more players? To experiment, graph paper
and M&M's should suffice. Plus some go-playing companions.

⁎ See what I mean?

Put on your headphones; time to unleash my polemic:

As a whiny Liberal, I admit bias. I find <u>MASH</u>, <u>Anything But Love</u>, <u>Roseanne</u>, <u>Arsenio Hall</u>, <u>Doonesbury</u>, <u>For Better or For Worse</u>, <u>Sylvia</u> much funnier than Leno, Carson, <u>Major Dad</u>, <u>Saturday Night</u>, <u>Outland</u>.

"Political Correctness" should not be, but often is, defensive and obfuscating. Hard to wring belly laughs from the premis one should be considerate of other people's feelings. Nevertheless, <u>Tiger</u>, a Princeton University mag, had a **hilarious** collection of "Politically Correct Jokes" years back. The humor came from the shocking disparity between the expected nasty, racist, sexist ending and the out-of-the-blue -- yet somehow perfectly logical -- PC conclusion.

Conservatives, down to a mere 90 % of America's discretionary income and political power, see themselves as "outsiders," so they go for the jugular. Doubtless southern whites felt similarly during the Reconstruction. Nothing quite so funny as a FREE slave, eh? (Tell me Noam Chomsky and Ralph Nader have more power than, for instance, Pat Robinson. Go ahead, say it. I'll try not to laugh.) Besides, it's easier to joke about how many bases the military will shut down than to laugh about our Salvadorian death squads.

With the recent downfall of many so-called "socialist" -- *de facto* "opposing-American-business-interests" -- governments, in America the Left Wing is seen as cliche, passe, uptight. No one laughs at the fall of Nazi Germany, of Junta Argentina, of South African Apartheid. The two-way street of American politics has Big Business on the one side and Big Business on the other.

End of diatribe. Thank you -- thank you. Please don't throw fruit; just make checks payable to Amnesty International. Time for some "jokes":

Q.   How many Megarians does it take to change a lightbulb?

A.   Three, sort of. The first formulates a Unified Lightbulb Theory; the second pokes holes in it; the third wonders if lightbulbs really exist; so finally someone normal changes the damn bulb.

Recently, after helping Dad write and mail 1500 letters (gasp), I made this up:

Q.   How does a Southern Californian save postage on a mass mailing?

A.   By putting all the addresses on one envelope.

Grammatical question in <u>Noesis</u> 79, p. 1 3A: was the quote intended as a secondary **subject** or **object**? Making a bracelet is adorably sweet; it's the kinda thing my cousin Warren would do. He majored in physics, but now he sculpts; makes Dardic instruments; plays Dravidian music. This fall my brother Brandon continues what's become a family tradition: off to Princeton to major in physics, mathematics, or EE. When he graduates maybe he'll get me a job.

Sleep is my primary activity; but like Hamlet's, mine is restless and filled with nightmares ("which dreams indeed are ambition"?). Moan about how many weeks since I got more exercise than reaching for the remote. When not bedridden, I concertize around Boston. Also sketch cello goddesses from my orchestras. Do you realize in the years since graduation I've met -- lemme see -- about two people my age or younger? (Whenever I go to the store, the clerks ask: "Oh! Is today a school holiday?") What a life.

Chris Langan: I'd like to read your papers, but don't have your address. (Hey, can someone send me a Mega directory?) How can an editor follow everything published under his or her name? Do you think the Arts editor for The New York Times tries to watch each play, attend each concert, preview each film.... Like Rick, I'm skeptical of "universal" theories: whenever someone announces he understands Everything, science falls apart. Lord Kelvin, 1895; Russell and Whitehead, 1900; Einstein, 1920; Dirac, 1935; Feynman, 1960; Hawking, 1980...

Bob Hannon: Sorry I owe you so many letters. Nothing personal. Did A.E. set out to prove mathematically c remains constant -- or did he begin with that as his assumption based on the evidence of the Michelson-Morley experiment (which seemed to indicate the earth was not moving!)? Einstein fused Maxwell's non-relativistic electrodynamics with the relativity of Newton, the Lorentz transformations, "Minkowsky space-time" -- plus smatterings of Weyl, Poincare, etc. -- to derive "Special Relativity". The "twin paradox" resolves itself neatly thanks to the Doppler effect.

Special Relativity was no longer cutting edge by 1910. General Relativity, posited in 1916, earned Einstein his place in the history books and made him the most famous scientist since Newton. It predicted that the universe is expanding -- not verified until 1923; that space-time "bends"; that gravity and acceleration slow time. Excepting Feynman's Quantum Electrodynamics, it's the most rigorously tested theory in the history of science. Even once these two theories are outdated, as they no doubt will be eventually, we can't toss out the evidence which supported them; future theories must incorporate the current ones as smoothly as the current ones incorpated Hamiltonian / Gaussian physics.
                                                ^
What do you have against Einstein? I think he was pretty sharp. Violinist, poet, essayist, philosopher... even without his science he'd be a good Megarian. His dissertation was so complicated the physics department described it as a work of mathematical genius -- but certainly not real physics; whereas the mathematics department described the same treatise as a masterstroke of physics -- but certainly not real math. (Mandelbrot faced the same problem in the 60s & 70s.)

Then three papers in the spring of 1905. The first proved the existence of atoms -- this seminal work of condensed matter physics was also arguably the greatest single paper on chemistry in history. In another paper, using Planck's work as a springboard, he began the construction of quantum mechanics -- the most important scientific discovery of the century. Let's not forget Special Relativity, which was based only loosely on the Lorentz transformations: the central ideas were about the nature of time itself. Then years of work which lead to his 1916 papers on General Relativity, which stated mass is energy; space-time curves; mass slows time, etc. It predicted gravity waves and an expanding universe -- both later empirically ratified. Plus, with Poincare and a few others, Einstein founded what York four decades later named Chaos theory.

Admittedly, Einstein's pet projects of quantum relativty and a unified field theory dead ended. Half a century later, has anyone solved these riddles? Not unless you count superstrings and other unproveable "theories". Enough!

Rick: Did any of the problem solutions I sent in work? **Re number sequences on short form IQ tests.** Between any arbitrarily close irrationals lie infinite transcendentals; addition, subtraction, multiplication, and division permit an unimaginable number of non-recursive sequences based on known constants. Factorials, changes in "base"; primes; perfect numbers; squares-which-are-also-cubes -- combined with the former set we find an impossibly large mess. The question is not whether the solution is merely "elegant", but how well the question correlates at all levels of ability.

Jeff Ward's puzzles are intriguing, although I don't know "Battleship". Ten dots diagonally will sink any ship length 10; twelve will sink any ship length 9. (I'll get back to you on 8 and 6. Must not lose this momentum.) What branch of mathematics? Some twig of algebraic geometry? Why not ask Professor **John Conway** (Math Dep't; Fine Tower; Princeton, ████████ -- or find his more precise address in whatever <u>Noesis</u> had his $ 1000 thrackle puzzle) -- he's a world-calibre specialist in mathematical games. *NJ 08544? 08542?*

Speaking of Princeton mathematiticans -- who is **Geraldine Brady?** Is she a Megarian? Is she on the university mathematics faculty? I don't remember her; then again my memory is hardly what... what was I saying? Oh, yes: her puzzles look Langdonoid. I'll leave the first shots to someone less dyslexic.

Re **Kottke's** physics questions:

1) Why isn't five pounds plus five pounds just ten pounds? (Or ten pounds / cross-section of the wire?) I'm being obtuse, but what am I missing?

2) **Ball-stacking** is simple, and smaller balls will not necessarily decrease the amount of wasted space -- balls of diameter 9 % will waste more space than those of diameter 10 %! To make most efficient use of stacking space: mix large balls with tiny, tiny balls; those with infinitesimal balls; etc. In the limit as the number of sizes approaches infinity and as Rmin approaches 0, the balls fill the entire space. Ball-**packing** is non-trivial and cannot be used on any "test".

3) No trivial solution. You must know how keenly the bat can discriminate between different wavelengths. See next problem.

4) No trivial solution -- although Marilyn vos Savant might make one up for you (see below). If pianos produced only pure sine waves, an infinitesimal time would suffice to distinguish between diverging waves. The less pure the sine wave -- from overtones and "noises" -- the more ambiguity in the pitch. At a certain level a full cycle is required just to define a cycle. A piano or flute has simple Fourier waves: A, A', faint E'... (If you whistle inwards, you can get something frighteningly like a sine wave -- but it's unstable unless you have unlimited breath.) Alas, no cycle ever repeats itself exactly -- unless you use computer sampling.

Moreover any real instrument will have a "warbly" beginning to the note. Piano pitches tend, because of the striking mechanism, to start high and then sink towards the note: as the hammer pulls away, the length of the string free to vibrate gets longer and longer, so the vibration slows. Harpsichords, by contrast, rise to the pitch. Even leaving aside the hopelessly complex issues of different types of intonation -- and types of vibrato -- violins wobble all about. Why? Even in a perfect pendulum, despite Galileo's approximations, vibrations are not quite identical. Semi-elastic strings are infinitely more complex. Plus you have friction, changes in bow speed...

"Perfect pitchers" can rarely determine a note after hearing less than, say, a twentieth of a second; just as no one catches an individual frame passing when sitting through Casablanca. Time required depends upon the octave, the accoustics, the shape and stability of the wave, the background noise, the volume... Under most circumstances a pure note played for one fifth of a second followed by a half second of silence should suffice; but once at a noisy dinner party I tried to determine what note my water glass produced, and it took me over a minute to be certain it was a flattened D#. (The further a note is from A harmonically, the more challenging it can be to place it. D#, the tritone, is as far as it's possible to go.)

To complicate matters still further: in my experience, it's easier to determine an A # than a G #, despite identical "distances" harmonically: the harmonic direction is important also. (Thus an ever-so-slightly flat second flutist can make a perfectly-in-tune first flutist sound sharp -- a nasty trick!) Under very special circumstances, with extremely complicated overtone systems, musicians listening to the same noise will not necessarily "hear" the same note. This is a sonic analogue of the picture of the wine glass whose "negative space" turns into two opposing faces. The more closely we examine this problem, the messier it gets. Not a test question -- but maybe a good dissertation topic. Keep it up!

5)   I'll get back to you. Should be a simple trigonometric explanation.

6)   Um -- leave a thermometer out all night and mark the lowest point? You can use wind-chill apparatus or evaporation techniques to determine how quickly heat dissipates. I don't know what sort of answer you want.

7)   Assuming no friction of any kind, isn't it just sin (x)? If you include air friction, rotational kinetic energy, etc., you're way outta my league.

Russ: please forgive me for all the letters I owe you. Think of that glacier stuff Rick spoke of. Maybe it comes with the name "Kevin".

I'd love to meet, talk, and / or correspond with Marilyn -- she seems like a nifty person (even though I love ragging on her). However, when writing for the general public, she does not take the high road of logical rigor. Were she to read the great Richard Feynman had a childhood IQ score of 125, she would announce: millions of Americans are smarter than Feynman! (If you don't believe me, look up her book The Omni IQ Quiz Contest!)

Russ, do not take Marilyn too seriously as an intellectual or as a mathematician: she is a witty Parade columnist. It's difficult to write for an audience in the tens of millions, with IQs ranging from 80 to 170 +. Unlike, say, Ann Landers,

Marilyn does NOT research her answers: she spends up to five minutes per problem. (Try this experiment. Read a Dear Marilyn question while covering up the answer. If your solution requires much longer than five minutes, either 1) you're out of practice -- or 2) you're seeing more in the question than the general public will. Practice being low brow.

In this case Marilyn is closer than you give her credit for: you're being picky about the word "combination". Is "BAR-ROOM" the same message as "ROBO-ARM"? No -- so factorials are completely irrelevant. Only an insignificant fraction of permutations would yield any coherent message, nasty or nice. Marilyn's is not the best possible answer, but it's okay. Actually, it may be low... Once again, the solution gets messier as you examinite it more closely.

Rick, about those GREs: who's taking what, and why? Just for self-improvement -- or do those nasty buggers somehow improve your transcript? You probably already know, but just in case: a standard college physics curriculum does not necessarily correspond with the content of the GRE — make sure to check up on the specifics of the exam. Probably lotsa Hamilton-Jacobi; partial diffy-q; fluid dynamics; procession; Bessels; Fouriers; thermo; electrodynamics....

If Cyd Bergdorf's psycho-mag flies, PLEASE sign me up for a ticket. I work on the Triple Nine Psychometrics Committee and find all this stuff fascinating.

Oops! It's 2:11, WAY past my bedtime. Must get up early tomorrow: more concerts coming up (as always). Th-th-th-that's — Bye for now!

Your "squishy wuss",

Kevin L. Schwartz

P.P.S. Body-1 could be "F" ⬛ — assuming she wants a 180° rotation.

B-2. could be "0" 8 — if she wants a topological "pull"

B-3,4: " Just thought up a proof... but I'm too busy to write it out just now."

zzzzzz z z z zzzz

THE LICENSE PLATE PROBLEM

3313 Circlewood Court
Grapevine, TX 76051-6520
April 25, 1993

Rick Rosner   Robert J. Dick
Editor, Noesis   13 Speer Street
5139 Balboa Blvd, #303   Somerville, NJ 08876
Encino, CA 91316-3430

Dear Rick and Bob,

In my letter to you of March 20, I mentioned that I was submitted my
proposed solution to Marilyn Vos Savant's licence plate combination
question (from "Ask Marilyn" column in Parade Magazine) owing to not
having received an answer from her.

This reports that I have subsequently received an excellent letter from
her, pointing out as Bob had done, that I had failed to consider the
repetitious use of the letters and numerals in the solution. Copies of
her letter and my return thank you are enclosed FYI.

My thanks to Rick for publishing the puzzle and to Bob for his correct
solution. Of course, I note that Rick proposed that perhaps the
solution didn't prohibit repetition in his comments following my letter
in Noesis, so both of you correctly perceived the solution.

Cordially,

Russ

Robert D. Russell

Enclosures

PARADE

P U B L I C A T I O N S,   I N C.

April 17, 1993

Robert D. Russell
3313 Circlewood Court
Grapevine, Texas 76051-6520

Dear Mr. Russell:

Thank you for your letter regarding the license plate
question and answer. The base number 42,072,307,200 you cite
includes only license plates in which every letter/number is
different, but we noted in the column that our figure includes
plates like ZZZZZZZ and 0000000. (By the way, we used the term
"combination" in its popular sense, not its mathematical sense,
preferring it to a word like "permutation," which would be
unfamiliar to most readers.)

Thus,

$$n^{(n)} = n!$$

is not relevant to the situation we specified. If we use
^nR_r for the permutations with replacement (R denoting
repetition), then

$$^nR_r = n^r$$

whereas (P denoting non-repetition)

$$^nP_r = n^{(r)}$$

Also, the total number you cite includes license plates that
have fewer than the full seven characters, but we noted in the
column that our figure includes only the seven-character
combinations. (And for practical purposes, we deleted hyphens
and blank spaces too, noting that the original reader didn't
include them, either.)

Thanks again for writing and helping to keep us on our toes.
We're pleased to know you're a reader.

Sincerely,

Marilyn vos Savant

Marilyn vos Savant

MvS/rr

3313 Circlewood Court
Grapevine, TX 76051-6520
April 25, 1993

Ask Marilyn
Parade Magazine
750 Third Avenue
New York, NY 10017

Dear Marilyn,

This is a note of appreciation for your letter of 17 Apr 93, in which
you explained your answer regarding the license plate combination
question listed in your 24 Jan 93 "Ask Marilyn" column of Parade
Magazine.

Your comments were exact: I erred in assuming that the numbers and
letters would be used without repetition.

Also thank you for the formula for using permutations with
replacement:

$$_nR_r = n^r$$

   Somehow this formula does not appear in my book on combinations
   and probabilities -- it's handwritten in now.

Thank you also for writing a column in which clear thinking and problem
solving are so entertainingly presented. A little more focus on the
intellect would do this country good, as success in business, science,
and much of the arts depends upon it.

Also, in further appreciation of your taking the time to write, I
decided it was time to purchase a copy of your book, Ask Marilyn. So I
visited my friendly Waldenbooks store to pick up a copy. They no longer
had it in stock, so I placed an order and encouraged them to keep it in
stock.

Reading your column in each Sunday's Parade Magazine is one of the main
reasons I subscribe to the Fort Worth Star-Telegram. Keep up the good
work!

Cordially,

Russ

Robert D. Russell

cc: Editor, Parade Magazine

bc: Rick Rosner,
    Robert J. Dick

Editor:

This letter is a response to Robert D. Russell's question regarding an item in Marilyn Vos Savant's newspaper column.

In the column, a reader wanted to know how many possible license plates can be issued if each plate contains a maximum of seven characters. Each character may be any of the ten numerical digits or twenty-six letters of the alphabet. Marilyn's answer was 78,364,164,096, while Mr. Russell came up with a different answer, 43,521,414,336. Russell also was unable to determine what method Marilyn used in arriving at her answer.

I think I can explain Marilyn's answer. Assuming 36 possible characters and seven positions, the number of possible combinations is 36^7. This is exactly equal to Marilyn's answer. However, I don't think this really answers the reader's question because Marilyn's approach assumes that all seven positions must contain a character. A better approach would include the assumption (as Russell's did) that the license plate may contain at most seven characters, but may contain fewer. The minimum number of characters permitted would depend on the jurisdiction. (For example, California requires that a license plate contain at least two characters.)

If we use Russell's assumption that the plate may contain as few as one character, the correct answer becomes:

$$36^7+36^6+36^5+36^4+36^3+36^2+36^1 = 80,603,140,212$$

Although Russell used an assumption more in line with what the reader wanted to know, his answer is wrong because he used the wrong formula. His formula assumes that a character can never be used more than once per plate (e.g., that a sequence such as ABC122 would not be permitted because the 2 appears more than once).

Jeff Ward