Word Ways

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REMEMBERING WILLARD ESPY

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In 1972 Willard Espy published his first book of wordplay, aptly named, *The Game of Words.* Ross and I both read it and sadly shook our heads. It would have been a much better book, we thought, if Espy had known of Word Ways and talked with us.

Ross and I were in our third year of publishing Word Ways, and I was exploring every avenue that I thought would bring us new subscribers. That summer I wrote to Espy and sent him a sample copy of the journal. I didn't hesitate to suggest that he might benefit from subscribing. He did not reply,

About five days before Christmas that year, I got a phone call from Louise Espy. She told me she'd like to give her husband a set of the back issues of Word Ways if we could get them to her before Christmas. With only five days left, we didn't trust the postal service to deliver in time, and so Ross took the journals in to New York and hand delivered them to Louise.

Willard (or Wede as we came to know him) became an instant fan of Word Ways. He wanted to know more and to talk with us. So one summer Sunday afternoon he and Louise rented a car and drove out from Manhattan to our home in Morristown, New Jersey for dinner. Thus began a friendship which lasted from that day until Wede's death in 1999. Several times we went in to New York to have dinner with the two of them in their apartment in the East 60s, and he invited us to the launching party in Greenwich Village for *Another Almanac of Words at Play.*

Wede grew up in Oysterville, a small fishing village on the end of a long, narrow, Oregon peninsula. The Espys maintained the house as a summer home and invited us to visit them if we were ever in Oregon. One summer, around 1980 we planned a trip out West, and arranged to visit Oysterville. Wede showed us the sights of the village. We had dinner, conversed during the evening, and then drove back up the peninsula to our motel.

"The next time you're coming out West," said Wede, "stay with us. We'd love to have you." We did have another trip to the West Coast some years later. We arranged with Wede that we would come to Oysterville on a certain date, and he repeated the invitation to stay with them. We happily accepted.

Once again we spent a very pleasant afternoon with Wede and Louise. As the hour grew later, Louise asked, "Where are you spending the night?" I looked at Ross. Ross looked at me, and both of us looked at Wede. Apparently Wede had completely forgotten his invitation and had neglected to tell Louise that we were coming. It was an embarrassing moment, but one typical of Wede. He liked his bourbon which sometimes

resulted in a memory lapse. Louise recovered quickly, produced a delicious dinner, and made up the bed in the guest bedroom. All was saved.

After Wede died Ross occasionally had dinner with Louise when he went in to New York to see the ballet. Appropriately, Louise gave me Wede's copper jigger to remember him by. I keep it polished and displayed in my bookcase next to his books.   I have not forgotten him.

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WILLARD ESPY: A COINCIDENTAL ENCOUNTER

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Next month marks the 110th birthday of recreational linguist extraordinaire Willard Espy (b. Dec. 11, 1910; d. Feb. 20, 1999).

I had read his books well before I began writing about wordplay. As I was researching my first book in the late 1980s, I wrote to Wede (the soubriquet by which he was known to friends) several times with questions. He always responded with helpful answers. When my books were published, I sent him copies and he replied with cordial letters saying that he had enjoyed them, although by then he had serious vision problems.

Both of our day jobs were in marketing and advertising, so that was still another mutual synergy. I suggested we meet; his Manhattan apartment was almost precisely one mile south of mine. That didn't happen, which I attributed to his ill health, or perhaps because I was just one of many fans.

Then, some years later, there came a remarkable twist of fate. . . .

Politically, I'm a libertarian. A longtime friend, Andrea Millen Rich, operated Laissez Faire Books, the major bookseller in this field.

Andrea and her husband Howard occupied a magnificent apartment just off Washington Square. From time to time, they hosted elegant receptions for their favorite authors, and I was on the invitation list. Luminaries such as John Stossel and Thomas Szasz sometimes attended.

On this occasion, it was a party in honor of Richard Cornuelle (pronounced *cornell*), a writer of cerebral works on politics and economics. When I arrived in the lobby, an attractive elderly couple was waiting for the elevator. I guessed that they were headed to the same event, so I introduced myself.

"I'm Willard Espy," said the prepossessing mustachioed fellow, "and this is my wife, Louise."

I was so surprised that you could have knocked me over with . . . a father! I said that we had corresponded, but he didn't appear to recall that.

Then I challenged Wede: "What are you doing here? Are you a libertarian?"

"No," he responded. "Dick Cornuelle and I are old friends from college."

All evening, Wede and Louise sat quietly in a corner. I couldn't resist whispering to other guests: "Do you know who that is?" But of course, only the linguistic cognoscenti would have recognized his name or face.

I regret that Wede and I didn't get to know each other better. But after his death, I became acquainted with Louise, who invited me to several parties at her home and even to lunch at an exclusive city club where Wede had been a member. During one such meeting, she presented me with a nice gift: several of her husband's lesser-known books that I didn't own.

Whenever I think of that chance encounter, I'm reminded of the classic "worlds colliding" *Seinfeld* episode.

ANOTHER PRESIDENT PREDICTION

Jeremiah Farrell
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This puzzle was suggested by Chris Morgan who recalled my Tuesday, November 5, 1996 crossword in the *New York Times* that predicated the win between Clinton and Bob Dole in that day's election.

This puzzle concerns this November's election.
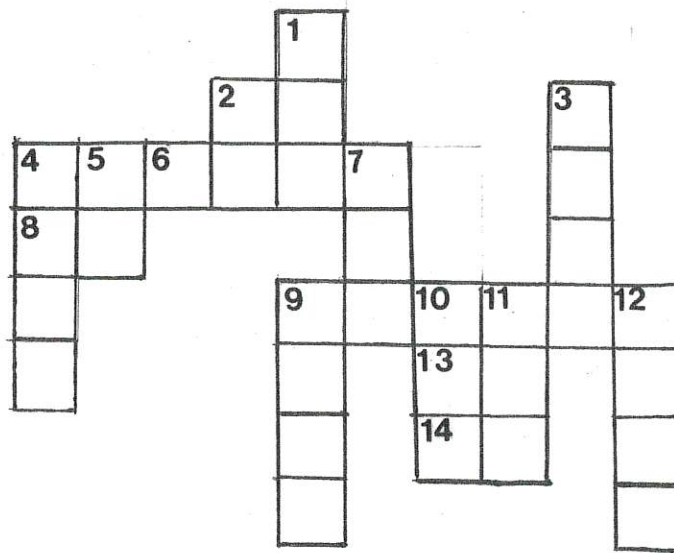
Across
  2 Atomic No. 20
  4 ____elected this November
  8 Not out
  9 See 4-across
 13 Medical injection
 14 Parent

Down
  1 Seal
  2 Chemical symbol
  3 Food type
  4 Containers
  5 Chemical symbol
  6 Chemical symbol
  7 Sold out: abbr.
  9 Blocks
 10 Small taste
 11 Girl's name
 12 Fog

The Answer

2 Down   Cesium or Curiem
5 Down   Indium or Radon
6 Down   Deuterium or Uranium
7 Down   Standing Room Only

All Definitions appear in *The Chambers Dictionary, 12th Edition.*

			1 C					
		2 C	A			3 S		
4 B	5 I	6 D M E	N	7 S		O		
8 O	N			R		U		
N		9 J O	10 S 11 E	L P	12 H			
E		D A	N A	13 I V		A		
		M	14 P A		Z			
		S			E			
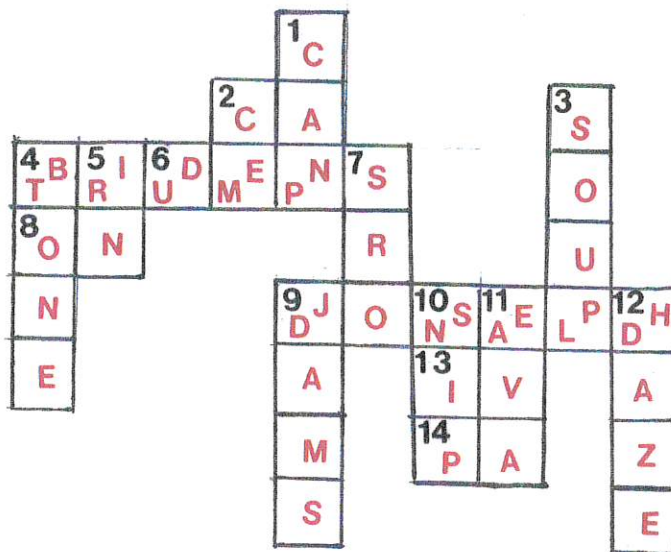
TENNIS PALINDROMES

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Disinterest in tennis should not prevent wordplay lovers from enjoying these personal palindromes (PDs). Jeff presented an article on palindromic names in the August 1996 *Word Ways*. A few were tennis players. Here we add to them a few more, and a very large list of palindromes incorporating tennis names, first or surname. We attempted all past #1s, slam winners, and May 2020 top 100s, often failing.

There are four parts, alphabetical by surname within each part: 1. palindromic names; 2. reversals; 3. near reversals; 4. longer. For each player named we give country, active period and highest rank #; d if in doubles; wins in slams—Australian Open (A), Roland Garros (F), Wimbledon (W), US Open (U)—and year-end tour championships (T), Olympic gold (O), Fed Cups (FC), Davis Cups (DC) and Hopman Cups (HC).

1. Palindromic names

Anna
Blinkova [Russia, 2016-...; d#45]
Kalinskaya [Russian, 2016-...; d#72; Nick Kyrgios' latest girlfriend]
Kournikova [Russia, 1995-2007; #8, d#1; d 2A]
Schmiedlova [Slovakia, 2011-...; #26]

Ana
Bogdan [Romania, 2007-...; #59]
Ivanovic [Serbia, 2003-16; #1; F 2016]

Bob
Bryan [US, 1998-...; d#1; 16d (6A, 2F, 3W, 5U), 4 mixed d (2F, W, U); 4d T; O, DC] (+ Mike Bryan, part 3.)

Cilic
Marin [Croatia, 2005-...; #3; U 2014]

Dod
Charlotte ('Lottie') Dod won the first of her 5 Wimbledon singles titles in 1887 at age 15, still the youngest champion ever. She also won the British Ladies Amateur Golf Champs, played twice for England at hockey, and won a silver medal in archery at the 1908 Olympics. Surely one of the most versatile sports champions of all time. [UK, 1887-1908?; pre-rankings but ≈ #1?; 5 W]

Kaia K.
Kanepi [Estonia, 2004-...; #15]

Seles
Monica [Yugoslavia, US, 1989-2003; #1; 9 (4A, 3F, 2U), 3T; HC, 3FC] (+ see part 4)

And lesser known pros: current: **Hannah** Collin [GB] and **Eve** Zimmerman [US];
retired: Angela **Kerek** [Germany] and Sylvia **Sabas** [French].
Eve is also the name of the fictitious female in an online/video tennis game.

2. Reversals

[A]
'An Ire take, Ekaterina!'
Alexandrova's coach says absorb opponents' anger and throw it back at them. [Russia, 2016-...; #25]

No's re DNA, Anderson.
Kevin, like Roddick (cf) but unlike Murray (cf), denies it's in his genes. [S.Africa, 2007-...; #5]

[B]
Bertens 's net reb!
Kiki stands out from other Dutch players as a tennis 'rebel'. Net is a pun. [Dutch, 2009-...; #4] (+ part 3)

[C]
Carrena-Busta at sub? An err a/c!
Pablo has no substitute. [Spain, 2011-...; #15]

'Teragram Margaret'
Court didn't actually weigh a billion kilos, but seemed to play as tho she did! [Australia, 1960-77; #1, d#1; record 24 (11A, 5F, 3W, 5U), d19 (8A, 4F, 2W, 5U), mixed d 21 (4A, 4F, 5W, 8U); 2 dT; 4 FC]

[D]
Sino-bled, Delbonis.
Federico has two ATP titles but has never won in China. [Argentina, 2007-...; #33; DC]

Del Potro, or top led.
Juan Martin was long a top 10 player, but he was never actually #1. [Argentina, 2005-...; #3; U 2009] (+4)

[F]
Marton: 'No tram.'
Marton Fucsovics' answer to Navratilova in part 3 (Martina: Can I tram?). He instead bummed a ride with a Hungarian Uber driver and fan. [Hungary, 2009-...; #31]

[G]
Gaston: Not sag! (or **Gaston did not sag.**) (or **Gaston, o do not sag!**)
Gaston Gaudio stayed strong a long time. [Argentina, 1996-2011; #5; F]
For Hugo Gaston the third PD (palindrome) is encouragement, not history. Yet in his first year as a senior he reached rd.4 of 2020 FO, beat Wawrinka, and took Thiem to 5 sets, advancing his ranking by 82 places! [France, 2018-...; #157; Jr. d #2; boys A.]

Air ad, Daria.
Two Daria's get free TV 'ads' when they play and admiration for playing well:
'Dasha' Gavrilova [Russia, Australia, 2010-...; #20; HC] / Kasatkina [Russia, 2014-...; #10]

Gibson? No, 's big!
Answering the question 'Was Althea Gibson a minor player?' No way, she was huge, the Jackie Robinson of tennis. Some say better than Serena Williams, who idolised her. This PD is enlarged in part 4.
[US, 1951-58; #1; 5 (F, 2W, 2U), 5d (1A, 1F, 3W), mixed d U]

[H]
Hale in ad, Daniela H.
The lovely Hantuchova is still popular enuf in Slovakia and Monte Carlo, her current home, for earning ads, where her robust health still shows, or will. [Slovakia, 1999-2017; #5, d#5; 4 mixed (A, F, W, U); FC, HC]

a 'no-lop Polona'
Polona Hercog isn't usually eliminated in round one of tournaments. [Slovenia, 2006-...; #35]

'Not yell' Lleyton
This reversal of Hewitt's first name is popular in Australian fandom because so ironic, as he popularised the 'C'mon!' shout after winning a point. Or make this into a [false] sentence: **Lleyton did not yell.**
[Australia, 1998-2016 singles; still active in doubles and as DC captain; #1; 2 (W, U)].

[K]
Madison: 'No's I dam.'
Both Madisons block out negative thoughts. [Keys, US, 2009-...; #7]; [Brengle, US, 2005-...; #86]

A vote: 'Mr. Ed!'   UK, Kudermetova?
Veronika wins our vote for runing fast like a horse in pursuit of Wimbledon success. [Russia, 2013-…; #38]

Kyrgios, so I gryk.
Gryk is Greek for gripe, and redneck spelling of Greek, half Nick's heritage. [Australia, 2013-…; #13; HC]

[M]
'I, lo, jam!' Majoli
Iva Majoli could push opponents into the corners.   [Croatia, 1991-2004; #4, F; HC] (+ part 3)

A nit's irk, Kristina
Mladenovic irked and made her opponents feel like lice or nitwits.
[France, 2009-…; #10, d#1; 4 d (2A, 2F), 2 mixed d (A, W), 2 d T, FC, HC]

'Mottram's smart, Tom!'
Tom Okker's coach's warning before Okker, altho favourite, was upset by Buster Mottram in Johannesburg final in 1975. He lost to Mottram again for a 2-2 record.
[Mottram, UK, 1974-82; #15]
[Okker, Dutch, 1964-81, #3, 2 d (W, U)]

'My DNA.' Andy M.
Innate skill is Murray's secret of success, we claim he claims. [2005-…; #1; 3 (2W, U), 2O, T]

[S]
Air 'Am Maria!'
Sharapova was vain in her heyday but deserved it. [Russia, 2001-16, 2017-20; #1; 5 (A, 2F, W, U), T, FC]
Two other Marias aren't so vain, but deserve to be. Maria Sakkari [Greece, 2015-…; #20] (+ part 3)
Tatiana Maria [Germany, 2005-…; #46]

Stan = nats.
Stan Smith and Stan Wawrinks were both given great nats—natural abilities.
[Smith: US, 1964-85; #1; 2 (W, U), T; 5 d (A, 4U)]   (+ see 4 for more)
[Wawrinka: Swiss, 2002-…; #3; 3 (A, F, U); dO, DC]   (+ see 2 [Gaston] and 4 for more)

[T]
'Roly' at Taylor?
No, that name's no longer thrown at Taylor Townsend. She's lost a lot of weight. Her size led to her being denied early support by the US WTA—despite reaching #1 in girls' junior ranking! [US, 2012-…; #61, d#64]

[W]
Gnaw, Wang!
Both Wangs gnaw away at opponents' resistance. [Wang Qiang, China, 2006-…; #12, highest ranked Chinese since Li Na (cf)] / [Wang Yafan [China, 2012-…; #47]

[Z]
'Natasha—ah, Satan!'
Zvereva was such a wicked, feared doubles player she must have been created or aided by the Devil!
[Belarus, 1988-2002; #5, d#1; 18 d (3A, 6F, 5W, 4U), 3 dT; mixed 2A]

I as I, as Saisai!
Zheng Saisai plays her own way, not copying some idol or coach. [China, 2008-…; d#15]

Nil, Lin?
Zhu Lin is definitely not nil! She has a doubles title and does well in singles too. [China, 2012-…; #69]

3. Near reversals
[A]
Agassi's Saga
This should have been the title of Andre's book.   [US, 1986-2006; #1; 8 (4A, F, W, 2U); DC, O]

AI? Rot! Civic, I, Victoria.
Victoria Azarenka doesn't cheat using artificial intelligence. She's a law-abiding citizen.
[Belarus, 2003-...; #1, d#7; 2A, 2 mixed (F, U); mixed O]

[B]
'Sob, a Babos!'
Timea Babos often saddens her opponents, after or even before a match, especially in doubles.
[Hungary, 2011-...; #24, d#1; 4 d (2A, 2F) + 3 dT]

Tug, Agut!
Keep pulling your weight, Roberto Bautista-Agut and you'll win a slam eventually.
[Spain, 2005-...; #9; DC, Mediterranean Games gold]

Boris: 'I rob!'
Becker stole his opponents' thunder. (The EU might apply this PD to Boris Johnson!)
[Germany, 1983-1999; #1; 6 (2A, 3W, 1U), 3 T, 2 DC, HC, d O; coach of #1 Djokovic]

ad: 'Nil ebb Belinda'
Bencic was fading, but, as her 'ad' notes, has made a strong comeback to top 10.
[Swiss, 2012-...; #4; 2 HC (with Roger Federer)]

I Kiki.
Bertens gave this answer to 'Me Tarzan' when she met him in the jungle. [see part 2]

Bolt, lob!
Coach says Alex needs to throw more lobs into his strong groundstroke game. [Australia, 2009-...; #125]

Brady, *drab?*
Jennifer certainly isn't boring, beating several players ranked above her this year. [US, 2014-...; #25]

Mike, Kim
This formidable duo of #1s (Mike Bryan and Kim Clijsters [see part 4]) never played together, but Mike played her vicariously via twin brother Bob Bryan (part 1) in the 2012 USOpen mixed doubles. (They lost.)
[Mike, US, 1998-...; d#1; record 18 d (6A, 2F, 4W, 6U); 4 mixed d (2F, 1W, 4U); 5 T; O, DC. Mike has two more slams and 1 more T than Bob, who was out with injury for two years.]

[C]
1. **Danielle in ad?**
2. **'S nil loco, Collins.**
Yes, Collins will be in demand for advertising, if not already. She also has Ad in innumerable games.
2. But she wasn't crazy to go to college instead of jumping straight in to a career. [US, 2016-...; #23]

'Air, O Coria!'
'Let me breathe!' often said opponents of Guillermo 'El Mago' Coria. [Argentina, 2000-09; #3]
His younger brother Federico [2010-...; #86] isn't so dangerous, but has just reached highest rank.

Borna can rob.
Borna Coric can and often does steal wins from higher ranked players.
[Croatia, 2013-...; #12, junior #1; DC]

'Ten rock!' Cornet.
Alize has nine titles, 6 + 3d, and aims for at least one more to feel she really 'rocks'. [French, 2006-...; #11]

'Dr. of War', Crawford.
Jack considered tennis an armed conflict requiring surgical skill.
[Australia, 1926-51; #1; 6 (4A, F, W); d (same 6); mixed d 5 (3A, F, W)]

[D]
Xel, Alex!
Alex De Minaur's fans cheer with this abbreviated, lazy spelling of excel, coined by fans, who've probably already seen this backwardism. [2015-...; #18]
Can also be applied to Alexander Zverev [see 4], unless his fans never think of Sascha as Alex.   And to fans of another Australian: Alexei Porpyrin [2017-...; #87].

'Novak!': Avon
Djokovic is cheered by Avon Tennis (UK) despite his not being British. (see 4 +Nadal & Federer below.)
[Serbia, 2003-...; #1; 17 (8 A, 1 F, 5 W, 3 U), 5 T, DC, 2 HC; 2nd in win %, 83.1; record $ earnings]

'On! I *do!*' Dodin, O.
Oceane Dodin talks *and* plays a good game. [France, 2011-...; #46]

[E]
1a. **Yore, Roy?**
1b. **No's re 'mere' R. Emerson!**
2. **'Emmo, homme!'**
Roy 'Emmo' Emerson was no trivial force to relegate to history! 'Emmo homme!' is what the French shouted after he won 8 F slams in singles or doubles. [Australia, 1953-83; #1; 12 (6A, 2F, 2W, 2U; record 10 slams in a row in finals in which he appeared); d 16 (3A, 6F, 3W, 4U); 8 DC]

Marina: 'Can I ram!'
Marina Erakovic can indeed ram the ball down opponents' throats, but is too polite to do it maliciously.
[New Zealand, 2005-18; #39, d#15] (see also Karlovic in 4)
'Ram' is a handy reversal word that can apply to tennis play. Rather than bore you by sticking in 'rams' all over the place, we've brought them all here (from parts 3 & 4) to get all the boredom done and over with.
  [B] **Q: T' lob, Marion? A: No, I ram bolt, Q.**
Bartoli, asked if the lob is her best shot, says no, it's hurling down lightning bolt serves, God-like.
Q is the questioner, not the supernatural Star Trek character. [France, 2000-13; #7; W]
  [M] **Zen it, ram, Martinez!**
When Conchita was 'in the zone', or zen, she rammed them.
[Spain, 1988-2006; #2; W; 5FC; now coach for Garbine Muguruza (see below)]
  [N, T] **Martina, tan it, ram!**
Martina Navratilova [see below] hit it hard enuf to 'tan' the ball.
Likewise Martina Trevisan [Italy, 2010-...; #83 from #144], who gained renown for upsetting Kiki
Bertens (#7, see 2) in 2020 FO with her rams. She was similarly brutal in upsetting her way to the QF over
Camilla Giorgi [Italy, 2006-...; #26], plus [cf. both below] Cori Gauff (#49) and Maria Sakkari (#20, another rammer, see below).
  [P, W] **Mark, ram!**
Mark Philippoussis had such a powerful ram his nickname was 'Scud' after the missile.
Mark Woodforde, another Australian, was more successful overall, in doubles. A net rammer.
[MP: 1994-2015; #8; 2 DC, HC]
[MW: 1984-2000; d#1; 12 d (2A, F, 6W, 3U), 5 mixed (2A, F, W, U), 2 dT, dO]
  [P] **Mary, ram!**
Mary Pierce had a big ram. Detractors say 'Mary had a *little* ram.' (A little ram is a lamb!)
[France, 1989-2006; #3, d#3; 2 (A,F), d F, mixed W; 2FC]
  [R] **'Marvel, burn Rublev, ram!'**
private thoughts of Andrey's opponents [Russia, 2014-...; #10; boys F] (+ part 4)
  [S] **Maria: I ram!**
Maria Sakkari is just copycatting all the other rammers. [Greece, 2015-...; #20] (see above)

'Re-go Roger'
Federer the Goat's nickname after making a famous comeback from injury and hiring coach Stefan Edberg.
[Swiss, 1998-...; record longest open era #1, 310 weeks; 20 slams (6 A, F, 8W, 5U) (Record for males, but matched by Nadal at 2020 FO. Both are also in danger of being surpassed by Djokovic [above] with 17.);
103 titles, 2nd to Connors 109; 6 T (record), DC, 3 HC (record), d O] (see also Edberg in 4. + Nadal below, and compare Ken Rosewall in part 4)

'Ferrero's sorer, ref.'
Juan Carlos's coach explains to referee why he needs a medical time out. [Spain, 1997-2017; #1; F; 3DC]

'I rock!': Cori.
'Coco' Gauff surely does! Youngest ever Wimbledon qualifier. A future #1, many say.
[US, 2018-...; #49] (cf Erakovic/Trevisan above)

Gen novel, Evonne G.?
Goolagong Cawley was most novel, an Australian Aboriginal champion. Is it in the bloodline (gen)? The only Oz women's world #1 since her, Ash Barty [see part 4], is also part Aboriginal and proud of it.
[Australia, 1967-83; #1; 7 (4A, F, 2W), 6 d (5A, W), mixed FO; 2 T; 3 FC]

1. **'Fargo Graf'**
2. **Far gone, no, Graf?**
3. **...Far gone, no Graf.**
1. Fargo could be Steffi's nickname, after the military cruiser. And a pun, Far Go. She went extremely far! 2. And wasn't she 'far out' in her brilliant career?
3. But eventually she aged, retired and became 'far gone' as a professional player. (+ see Bedene in part 4)
[Germany; #1 377 weeks, a record; 22 (4A, 6F, 7W, 5U), dW; 5T, O, 2FC, HC.]

A 'no miss', Simona!
Halep rarely misses a return. Not amiss but yes a Miss. [Rumania, 2006-...; #1; F, W] (+ part 4)

Nine, Henin?
Well, almost nine. Justine Henin won seven slams and retired young or should easily have reached nine.
[Belgium, 1999-2011; #1; 7 (A, 4F, 2W), 2T, O, FC] And looking ahead...
Nine, Kenin?
Sofia is young and has already won a slam, so nine is not unthinkable. [US, 2017-...; #4; A] (+ below)

Martina: 'Can it, Ram!'
Not another ram?! No, it's Hingis' fictional mixed doubles partner Rajeev Ram [US, 2004-...; d#5, dA, d mixed A]. Is she telling him to shut up or to clinch the point?
[Swiss, 1994-2017; #1, d#1; 5 (3A,W,U), 13d (5A,2F,3W,3U), 7 mixed (2A,F,2W,2U), 2T, 3dT, HC] (+ pt 4)

He is Hsieh?
No! But Hsieh Su-Wei, as recent women's world #1, plays doubles better than most male pros.
[Taiwan, 2001-...; #23, d#1; 3 d (F, 2W), d T]

A 'nat', Ana.
Ivanovic and Bogdan [part 1] were/are both 'naturals' of seemingly inborn talent. Compare Wawrinka in 2.

Rue baju, Jabeur?
Is the Malay jacket someone gave Ons Jabeur not appreciated? [Tunisia, 2010-...; #31] (+ part 4.)

[K]
a 'if', O, Sofia
Will Sofia Kenin continue to climb and reach #1 some day? [see Henin above + part 4]

Kingnik
This is a fan of Billy Jean King, not only of her tennis but of her role in advancing women's rights, founding the Women'sTennis Association, fighting for equal pay, and many other major achievements and honours. She is most famous for proving a top woman could beat a top man (Bobby Riggs in 1973). Altho he was retired and well past his peak he had earlier beat Margaret Court (see part 2) in a similar 'battle of the sexes'. Is this perhaps why Court complains of the large number of lesbians in professional tennis?
[US, 1959-90; #1, #1d; 12 (A, F, 6W, 4U), 16 d (F, 10W, 5U), 11 mixed (A, 2F, 4W, 4U); 11 FC as player or captain]   [Riggs, US, 1933-59; #1, d#1; 3 (W, 2U) + 3 pro U, d W, mixed 2 (W, U)]

Korda, Dr.? OK.
Petr Korda acted like a doctor of tennis with his surgical precision—and had illegal medical help! (Caught doping.)   [Czech, 1987-99; #2; A, d A]

Kramer = pre-Mark.
Jack Kramer was well before two Australian Marks (Woodforde and Philippoussis—see Erakovic in 3).
[US, 1937-54; #1; 3 (W, 2U) + 2 pro (W, U); 6 d (2W, 4U), mixed U, 2DC]

Art epic, I, Petra.
Petra Kvitova deserves to toot her own horn. [Czech, 2006-...; #2; 2 W, 6 FC (record), HC]

Now, Kwon?
Has Kwon Soonwoo's time come? [S.Korea, 2018-...; #69]

[M]
Avid, Iva!
Iva Majoli being advised to be keen. And she was! [see part 2]

On I ran. Name? Mannarino!
Adrian always maintains a fast game and usually runs deep into tournaments. [France, 2004-...; #22]

'Medvedev dem!'
Give them the full Medvedev treatment, Daniil. [Russia, 2114-...; #4] (+ part 4.)

Has net re Mertens? Ah!
Yes, Elise Mertens is a net winner in two senses, overall results and tennis court net coverage.
[Belgium, 2013-...; #12, d#2; d U]

Moya? Say Om!
Om ('the all') could well be the fans' name for Carlos Moya. He not only reached #1 but coaches a #1 Nadal [cf.] and coached #3 Milos Raonic. [Spain, 1995-2010; #1; W; DC] (+ 4) /   [Raonic, Canada, 2008-...; #3]

'**Moody doom!'**
Slogan of the era (1927-38) of scary Helen Wills Moody. [US, 1919-38; #1 (9 years [record]), d#1; 19 (4F, 8W, 7U), 9 d (2F, 3W, 4U), 3 mixed (W, 2U); 2 O; record stretch of 158 wins without losing a set]

Garbine: 'Men, I brag!'
Muguruza deserves to brag and has a game the equal of many male pros. [Spain, 2012-...; #1; 2 (F, W)]

Are t' sum T. Muster? A+!
Thomas Muster got the top grade in his day. [Austria, 1984-99; #1; F]

Lad, a, Nadal?
Rafael Nadal is old in tennis terms, but still young. Since he rivals Roger and Novak as tennis 'GOAT' (greatest of all time) perhaps better to call him a 'kid' rather than a 'lad'? Rafa is now tied with Federer's slam record; the 'King of Clay' with 13 FO easily holds the record for one slam] (+ part 4)
[Spain, 2001-...; #1; 20 (A, 13F, 2W, 4U); O, d O; 5 DC]

Martina: 'Can I tram?'
Navratilova is asking about getting to the Aussie Open in Melbourne. Compare Fucsovics in part 2. She lost a battle of the sexes against Jimmy Connors in 1992, another dumb move. (+ part 4)
[Czech, US, 1975-2006; long time #1 and d#1; 21 (3A, 2F, 9W [record], 4U), 31 d (8A, 7F, 7W, 9U) (record), 10 mixed (A, 2F, 4W, 3U); 8T +11d T (record); 4 FC] / [Connors: see part 4]

Olmedo dem, lo!
Alex Olmedo didn't treat his opponents well. [Peru, US, 1960-77; #2; 3 (A, W, U) + d U]

Lie not, O'Neil.
Chris, don't be falsely humble. Be honest, admit you were great, the last Australian male or female to win the Australian Open singles title, back in 1978, and the only female to win both junior and senior AO.
[Australia, 1973-81; #80; A + girls A] (see also McEnroe/Newcombe)

1. **'Naomi moan'**
2. **Osaka, so...!**
3. **No Osaka soon?**
1. the common reaction of players who realise they face Naomi Osaka;
2. implying that you know what to expect from Naomi—trouble!
3. Is she retiring? Or is 10-20 years considered soon? [Based on 'No Osama soon.'])
[Japan, 2013-...; #1 (first Japanese ever); 3 (A,2U)] (+ part 4)

Anus (ole!), a fart: Rafael Osuna
'El Pelon', 1963 US Open winner is the only Mexican to have reached #1 and the Hall of Fame. Here he seems to have eaten too much chili con carne. [Mexico, 1958-69; #1; U, 3d (2W, U); O (demo)]

Perez arc: a craze rep.
Ellen Perez represents a small but strong base of crazed fans. [Australia, 2012-...; d#41]

No's re tepid, I, Peterson!
Rebecca Peterson denies she's less than hot. We must agree. [Sweden, 2012-...; #43]

1. **A nil or a Karolina?**
2. **Now Anil or a Karolina won?**
1. Both Karolinas, Pliskova and Muchova, are far from nothings! Especially Pliskova, but increasingly her compatriot Muchova, who is coming on strong, top ten soon they say.   2. Either could beat Anil blindfolded carrying a ball and chain. (Of course Anil means with *him* blindfolded and carrying a ball and chain. ha ha)
[Ka. Pliskova [Czech, 2009-...; #1 but no slams; 3 FC] / K. Muchova [Czech, 2013-...; #21].

Aid a Nadia?
Tool aid! A Nadia 'loot'.
Nadia Podoroska made a surprise splash into the FO 2020 semis, upsetting #3 seed Svitolina. She used her racket as a tool to 'steal' Elina's place. She's the third female qualifier in history to reach a slam SF.
[Argentina, 1916-...; #48 (up 83!)] (+ see 4)

Li's ipso, Pospisil!
Coach telling Vasek Pospisil to emulate (be same as) Li Na [see 4]. [Canada, 2007-...; d #4; d W]

[R]
An 'I + ka' by Rybakina.
Elena credits herself and her attendant spirit for her recent successes. [Kazakstan, Russia, 2016-...; #17]

[S]
Any ray, Aryna?
Yes, Aryna Sabalenka radiates a bright ray of hope to her fans of reaching #1 some day. Also a ray of joy from her easy smile and giggle. [Belarus, 2015-...; #9, d#2]

An 'if' as #1, Safina?
No if as #1 for Dinara Safina, who was for awhile. But she never won a singles slam, so some say an iffy #1. Still, she reached three slam finals and won a doubles slam. [Russia, 2000-11; #1; dU; FC] (+ part 4)

An 'erg' DNA, Sandgren? A!
Is Tennys Sandgren's high energy in his genes? [US, 2011-...; #41]

Am rah's arts, Astra Sharma.
Her talent is of the cheer-producing sort. [Australia, 2011-...; #85; finalist in A mixed, 2019] (+ part 4)

'No Miss' Simon.
Gilles Simon rarely missed a return. And a Mister not a Miss! Compare Halep. [France, 2002-...; #6; DC]

An ire take, Katerina.
Beautiful Siniakova is good natured and can absorb others' anger, same as Ekaterina Alexandrova (part 2).
[Czech, 2012-...; #31, d#1; 2 d (F, W)]

Sinner, Ennis?
Sinner is Siren? Nis?
Was Jannik Sinner inspired by his favourite jazz singer, Ethel Ennis, when he upset Zverev in 2020 FO? Also a pun: jazz singers often 'brag' about their sinful ways. Other possible explanations for his budding greatness are mermaid magic and a friendly goblin. [Italy, 2018-..; #46] (+ see part 4)

I gag—'Iga!'
I gag in astonishment as unseeded Iga Swiatek makes a big splash winning 2020 FO without losing a set.
[Poland, 2017-...; #17; F] (+ part 4)

[T]
Tiafoe: he of a 'it'.
Frances surely has the 'it' factor. He's magic to watch. [US, 2015-...; #29] (+ part 4)

Is *Apis*, 'tis Tsitsipas. *'I?'*
Stefanos Tsitsipas resembles *Apis*, the honeybee, fast, 'busy', a buzz to watch and surrounded by honeys. Relevance is added by the fact that Apis was a mythical Greek king. Is he modest, or amazed at this comparison, or offended? [Greece, 2016-...; #5; T] (+ part 4)

Agnostic, I, Tsonga?
Probably not, Jo-Wilfried Tsonga's playing seems inspired by God. [France, 2005; #5; DC, HC]

[V]
Anno Donna?
Donna fan? Nod!
Is this Vekic's year? She surely has us as fans. [Croatia, 2012; #19]

[W]
'Wane?' re Serena W.
Is Ma ill? I, Williams? *I?*
Serena does seem to have waned enuf that she's looking increasingly unlikely to win that Court all time record-tying 24th slam. But she denies that having a baby is the reason.

[US, 1995-...; #1, #1d; 23 (Open era record) (7A, 3F, 7W, 6U), 16 d (4A, 2F, 6W, 2U), 5 T, O, 3 d O, FC, 3 HC; record female prize money.] (+ part 4)

No Williams ma ill, I won!
Variant of preceding PD, but here Serena and Venus both play better if Mom is well.

Sun, eve, Venus
This nice progression in time means Venus Williams plays well at all hours. Really well, we should say. Imagine how much more she would have achieved if she didn't have that much loved but pesky sister. We turn this unoriginal palindrome into a tennis rave.
[Venus, US, 1994-...; #1, #1d; 7 (5W, 2U) 14d (4A, 2F, 6W, 2U), 2 mixed (A, F); O, 3 dO, FC]

We 'nil' or 'A' Caroline W.?
Which? A definite A+, no one 'nils' Caroline Wozniacki! [Denmark, 2005-2020; #1; A; T]

[Z]
Zarazua, rauz a raz!
Colloquially speaking, Renata emanates a good vibe (rouses a razzle) and entertains audiences with her skill and flair. She nearly upset Elina Svitolina [see 4] at 2020 FO. [Mexico, 2016-...; #149, d#135]

4. longer palindromes
[A]
Damn! I, Agassi, miss again. Mad!
Yes, it's maddening when a player as good as Andre misses twice in a row. [see part 3] (anon.)

'God's, eh?' said I, Ashe's dog.
Arthur's pet, like many fans, believed Ashe was God's chosen one.
[US, 1959-80; #1-2; 3 (A, W, U); 2d (A, F); 4 DC]

'Dr.' Auger-Aliassime, miss ail, are guard.
Felix is advised to be on guard and avoid serious injury (and covid-19!), which he's done so far in his young promising career as a tennis 'doctor'. [Canada, 2017-...; #17]

Tracy, a hay-cart?
No, Ms. Austin moved fast and maneuvered well on court! [US, 1978-94; #1; 2 W; mixed W; FC]

[B]
'O, dons Barty my trabs!' 'No do!'
Ashleigh Barty denies she is is wearing Azarenka's training shoes.

A TRIO TRIO (a palindromic fiction)
chapter 1. **Met re Barty: 'Trabert 'em!'**
chapter 2. **Tony Trabert re Barty: *'Not!!'***
chapter 3. **'Defy Trabert re Barty!' Fed.**
1. Meet Ash Barty's motto: 'Emulate Tony Trabert!' She tries to model herself on him.
2. Trabert, now aged 90, emphatically forbids Ash to compare herself to him.
3. Roger Federer, a great fan of Barty, tells her to disregard the frozen opinions of an old man.
(Your authors wonder if Tony's disrespect was due to unconscious racism. Barty is part aboriginal—see Goolagong in 3. He disgraced himself in 1977 by striking two anti-apartheid demonstrators with his racquet. Certainly not proof of racism, but strange. (And no disrespect for his great tennis!)
[AB, Australia, 2010-...; #1, d#5; F, T; dU]   [RF, see 3]
[TT, US, 1945-63; #1, d#1; 5 (2F, W, 2U) + 2 pro F; 5d (A, 3F, U); DC, later DC captain]

Far gene debt, Bedene, Graf.
Steffi and Aljaz, though unrelated, both owe their genetic ancestries, ancient as well as recent, a debt for giving their bodies and abilities a big head start.
[Graf, see part 3]   [Aljaz Benene, Slovenia (again; played for GB from 2016 to 2018), 2008-...; #43.]

O, got Tomas a motto: 'Go!'
It worked—Tomas Berdych went far. [Czech, 2001-19; #4; 2DC, HC]

'Tennis net reb, I.' Kiki Bertens in net.
She can be an innovative and effective net player. [see parts 2 and 3]

Borg nixing rob.
Bjorn Borg was an impeccably honest player for a superstar! Still he did rob a lot of players of big wins.
[Sweden, 1973-83; #1; 11 (6F, 5W), 2 T, DC]

'Art, or obey eye.': Borotra.
Jean Borotra 'the Bounding Basque' made this astute comment on the 'art' of tennis. And some artist! He was one of the
famous 'Four Musketeers' from France who dominated tennis in the1920s and early 1930s (with Jacques Brugnon [1920-48;
#9; 10 d, 2 mixed, 5DC] and [cited above] Cochet and Lacoste).
[France, 1920-56; #2, d#1; 4 (A, F, 2W), 9 d (A, 5F, 3W), 5 mixed (A, 2F, W, U); 6 DC]

1. **Don Budge, big nads. Dang! 'I beg, dub, nod.'**
2. **'Call a beg!' dub Budge ball a/c.**
3. **Net did Budge peg > dub 'Did Ten'.**
1. Don Budge's opponents might 'beg' for mercy, dub him one of the greats, and nod in respect when beaten. Big nads is a
joke (how could we know?) but can also be interpreted as a pun for big [tennis] balls.
2. Speaking of which, Don's balls, as noted in preceding, made opponents beg for less.
3. Don's nickname might well be Did Ten, since he did net ten slams: the six amateur slams that became the grand slams of
the later Open era, plus four of the three Pro Tour slams, equivalent to grand slams for pros.
[US, 1932-55; #1, d#1; 6 (A, F, 2W, 2U) + 4 pro; 4d (2W, 2U), 4 mixed (2W, 2U)]

[C]
I hit air pace, Capriati, hi!
Jennifer Capriati hit it hard and called its speed 'hi'. Or is she just being friendly?
[US, 1990-2004; #1; 3 (2A, F), O]

Spot sign: Ah, Chang is tops!
Michael Chang was tops as a player and is still top class as a coach for Kei Nishikori.
[MC, US, 1987-2003; #2; F; DC] / [KN, Japan, 2007-...; #4]

Won, Kim! (I know.)
Kim Clijsters won an awful lot! You knew too? (+ see Mike Bryan in part3)
[Belgium, 1997-2009, 2012-20; #1, d#1; 4 (A, 3U), 2d (F, W), 3T, FC]

Eva: 'Hit it, eh!' Cochet: 'It? I have.'
Henri Cochet is here playing social mixed doubles with actor Eva Gabor.
[France, 1920-58; #1; 7 (4F, 2W, U) + 1 Pro, 5d (3F, 2W), 3 mixed (2F, U); 6 DC] (+ see Borotra above)

1. **No fine t' so melt till Little Mo's 'ten if' on.**
2. **Darned 'Little Mo' to melt Tilden? Rad!**
1. No penalty to melt from the heat waiting for Maureen Connolly to win ten slams. If she had not been injured and retired so
young she surely would have won a tenth. Nine is still the record for a 19 year old.
2. As to Bill Tilden [see below], she couldn't have melted him in tennis as she was about 20 years too late. Nor could she melt
his heart as he was famously gay.
[Mo: US, 1949-54; #1; 9 (A, 2F, 3W, 3U; 1st woman to win all 4 in same year [1953]), 3 d (A, 2F)]

No Connors gags, Ron, no con.
Famous Australian runner Ron Clarke was also a good tennis player. Here he is assured that a proposed charity match
with Jimmy Connors will have no pranks or deception.
[JC: US, 1970-96; #1; 8 (A, 2W, 5U) + 2d (W, U), 109 ATP titles (record), T, DC]

No evil repo o' Cooper—live on!
Ashley Cooper's reputation can't be 'repossessed'. A rare #1 in both singles and doubles, a feat only achieved by 8 men (Budge, Rosewall(?), Riggs, Trabert, Newcombe, McEnroe, Edberg) and 8 women (Moody, Court, King, Navratilova, Hingis, Venus and Serena Williams, Clijsters). All 15 profiled herein.
[AC, Australia, 1953-62; #1, d#1; 4 slams (2A, W, U), 4 d (A, 2F, W), DC]

1. **Yo, bat so, Costa. Boy!**
2. **Revel, Costa, man on a mat so clever.**
1. Albert really hit the ball well. 2. He also excelled on indoor carpet surface courts.
[Spain, 1993-2006; #6; W 2002, the last palindromic year in our lifetimes; DC]

A ham, I, Jim? Aha!
Serious as a player, Jim Courier is a ham as on-court interviewer. [US, 1988-2000; #1; 2 A, 2 F; 2 DC]

[D]
Del Potro motto: 'Be not stone bottom or top-led.'
'Don't be dead last or worship the guys at the top too much. Find your own way to success,' says Jean Martin Del Potro. [extension of a reversal in part 2]

Guru, an 'I, me', De Minaur? Ug!
Alex is modest, not an egotistical 'guru'! [see part 3]

On, Dimitrov! Or timid? No!
Grigor Dimitrov seems totally devoid of faintheartedness. [Bulgaria, 2006-...; #3; T]

1. **Novak saw a loco law—ask Avon!**
2. **'Pa Roger stir oft new, Novak, cull luck.' Avon went for its re-go rap.**
3. **Nole v. Art I travel on?**
1. Anil's grand-godson Avon is a Djokovic fan and disagrees with the crazy 2020 US Open disqualification.
2. Avon further asks for Djokovic frequently to disturb Federer, twice father of twins (or 'Father' of tennis).
3. Novak Djokovic prefers tennis to Art and travels solely in the direction of tennis art. [see part 3]

[E]
1. **Dig reb deal a la Edberg ID.**
2. **He tops an orb as Rog reb deal a la Edberg, or 'SABR' on a spot, eh?**
1. Stefan Edberg was a rebel only in the sense of being an outstanding tennis star, and of rebelling against boredom to become Federer's coach. 2. He helped Federer return to the top, e.g., by teaching him the 'SABR' trick, 'Sneak Attack By Roger'. [See Federer in 3.]
[SE, Sweden, 1982-96; #1, d#1; 6 slams (2A, 2W, 2U), 3d (2A, U); 3 T (1+2d); 4 DC]

No, Syd, Emerson is a cat at a casino's remedy, son.
Bit cryptic but seems to say Roy Emerson was a good bet to gamble on. Syd is you, a fictional reader, not a son of one the authors. Bet you didn't know you were fictional. [see part 3]

1. **It's Errani! (In arrest, I.)**
2. **Spot Sara Errani in arrear as tops.**
1. I find her play arresting. 2. Having fallen from the top, she is 'owed' a return after her doping suspension.
[Italy, 2002-...; #5, long d#1; 5 d slams (2A, F, W, U); 3 FC]

An elder Evert revered Lena.
Tennis 'Elder' Chrissy Evert had great respect for Lena Rice.
[CE, US, 1972-89; #1, d#13; 18 (2A, 7F, 3W, 6U), record 34 slam finals; 3d (2F, W), 4 T, 8 FC (record)]
[LR, Irish, 1889-90; W; invented overhead smash]

[F]
1. **Golden, I, Federer! A rare, redefined log.**
2. **Re-redefine 'men', I, Federer.**
1. Roger rewrote the tennis log or record book. [see part 3; + see Edberg above]

2. He also rewrites the notion of manhood, not as a macho toughie but as a socially aware gentleman.

Training of Fognini > Art!
Fabio's training is the secret of his tennis—Art to behold. [Italy, 2004-... #9; d A] (+ see Goffin below)

Now re-enrol ya, Taylor, 'ne'er won'.
Taylor Fritz hopes to rewrite his slam record, having won none yet. [US, 2015-...; #24]

[G]
Re pot (sativa) v. a Vitas toper?
We rudely ask whether Vitas Gerulaitis was a *Cannabis sativa* smoker or a heavy drinker. If either, they didn't affect his marvelous game. [US, 1971-86; #3; A; d W]

1. **Tiny? Gibson? No, 's big, y' nit!**
2. **Gibson: 'I blame dem albinos big!'**
1. Althea Gibson was indeed big, the Jackie Robinson of tennis. [expansion of a reversal from part 2, cf.]
2. A bit of understandable reverse racism, encountered not only in tennis but also in her parallel career as a pro golfer, a rare combination reinforcing her reputation as a super athlete.

In? If Fognini in, in Goffin, I.
David Goffin assumes that if Fognini (cf above) is 'in' with a chance so is he.   [Belgium, 2009-...; #7]

1. **Are no women novel? Evonne, Mo won era!**
2. **sun, Evonne, mown Eden (no Venus!)**
1. Evonne Goolagong Cawley and Maureen 'Little Mo' Connolly were both very novel in similar and different ways, and both dominated their eras.
2. This is a tennis lover's old memories of Wimbledon, the manicured grass paradise (mown Eden) and 19 yo Evonne Goolagong beating Billie-Jean King then Margaret Court to win the ladies singles title in 1971. Jeff prefers the elegance of Evonne to the power and grunt of modern players as typified by Venus Williams. Anil likes them equally, except for the unpleasant grunts. [see all four bios earlier]

1. **Lair: easel A-Z nog, O Gonzales' aerial!**
2. **Damsel A-Z? 'No go!' > Gonzales mad.**
These two PDs are difficult and inelegant but included because Pancho is such an important player and early favourite of both authors.   1. Pancho's antenna homed on the full A-Z palette of his noggin's tennis know-how and power.   2. Pancho was a ladies' man, with an A-Z phone book. When one of them rebuffed him it made him angry. Or does this mean he was mad to expect every one of them to succumb?
[US, 1949-74; #1 eight yrs. (record); 2U + 15 pre-Open pro majors; 2d (F, W)]

'Gulliksons got togs, no skill. Ug!'
'Twins Tim and Tom had fancy clothes, but not the skills to match.' This critic's view of the Gullikson twins is a bit harsh as both got to #15 in the world and #3 or 4 in doubles. Like the Bryan twins, one (Tim) was right-handed, the other left-handed. Both were also, after retirement, coaches for top players.
[US; Tim 1977-88; #15, d#3 / Tom 1976-87, #15, d#4; mixed d U]

[H]
Hey! Repel (aha!) no Miss Simona Halep. (er, yeh!)
She's hard to beat off—or beat! [see 3]

'Tim, also slam it!'
His coach is advising Tim Henman not just to go for placement but apply more brawn. Might also apply to Tim Mayotte or Tim Gullikson (see above).
[Henman, UK, 1992-2007; #4] / [Mayotte, US, 1981-92; #7—see 3]
 /100
Spot sign I hit it, I, Hingis—tops!
The sign or proof is Martina Hingis's winning record. [see 3 and Navratilova below]

Did well, Lew did!
Lew Hoad surely did very well, another great from the era dominated by Australians.
[Australian, 1950-72; #1; 4 (A, F, 2W) + 2pro; 8d (3A, F, 3W, U); mixed F; 4 DC]

[I]
Siren? Si, Isner is.
John Isner is not a mermaid but a warning sounder. His serve is arguably best ever. [US, 2007-…; #8; HC]

'No it!' A Goran is in a rogation:
'Sin net!' tad Ivanisevic, 'I've sin, avid at tennis.'
Goran as a youngster was already praying for forgiveness for his sin of ODing on tennis. (2 PD sentence)
[Croatia, 1988-2004; #2; W; DC, HC, Grand Slam Cup 1998; now coaching Nole Djokovic (cf.)]

[J]
Th' girl aloof, Ons is no fool alright.
Ons Jabeur isn't stupid, above worrying about shocking Muslims as a partly uncovered Arab woman. [see 3]

[K]
Set, a: M. Erakovic, Ivo K. are mates.
Marina Erakovic and Ivo Karlovic are both Croatia-born so form a 'set', but she's now NZ based. Not sure they're mates but surely have met and talked Croatian. They were never doubles partners.
[IK: 2000-…; #14; DC]   [For ME see part 3.]

1. **Now a 'IFO Sofia' won.**
2. **'Meet serial fret, Sofia. I foster flair, esteem.'**
1. Kenin, an Identified Flying Object, has won the Australian Open.
2. Confront your worries, Kenin's new coach says, and encourages flair and respect for tennis. [see part 3]

1. **Reb, re-known, won! Kerber**
2. **'O Kerber, often go jog net for Eb re KO!'**
1. Sounds like a successful and rebellious comeback from a slump for Angelique Kerber.
2. Your biggest fan, Ebenezer Scourge, wants you to go to the net often to KO your opponents for him.
[Germany, 2003-…; #1; 3 (A,W,U)]

1. **Or easy eke, Keys. 'Aero!'**
2. **'No? Si? Damn it, I hit in, Madison!'**
1. Many of Madison's win seem so easy we could say 'she flew'.
2. Madison Keys' doubles partner is struggling with her calls here. [see part 2]

'Tis banner, a Karen nabs it!
Karen Khachanov carries the flag for Russia (along with Medvedev and Rublev, cf). [2013-…; #8]

'He'd assign, I kill, I, King.' (Is sad, eh?)
Maybe Billy Jean King didn't like 'killing', but that was her job when the director assigned her a match. Did doing it make her sad? [see part 3]

Kramer, revel, call a clever remark.
Jack Kramer liked friendly on-court banter, whether playing friendly or pro matches. [see part 3]

Net re UK: non-Kuerten.
Gustavo Kuerten won slams, but not Wimbledon, nor any other UK titles. [Brazil, 1995-08; #1; 3F]

On den o' DNA? (Basic, I.) Petra's is art epic. Is abandoned? No!
I say good genes is a basic beginning for Petra Kvitova's epic tennis art. And Petra didn't abandon tennis after her crippling knife attack. Praise the God or Goddess of Tennis! [expanded from part 3, cf]

[L]
1. **Tell Lacoste, 'Gone, no get, so call Let!'**

2. **'No net!' So-call Lacoste, non?**
1. advice to Rene from the sideline: 'Since you missed it, try to get it called a net serve.'
2. Rene's answer to that silly sideline remark? Or is it saying he usually got the ball over the net. 'Non' is 'not' in Lacoste's language. [France, 1922-32; #1; 7 (3F, 2W, 2U); d3 (2F, W); DC] (+ Borotra, Cochet)

Revalue 'I'd adieu Laver.'
Never count Rod out!, they said in 1968, late in his career but the year before his unprecedented second Grand Slam, winning all four slams in second year of the Open era where amateurs and pros could both enter. His first Grand Slam was in 1962, his final year as an amateur before turning pro. During those five years of ineligibility for amateur slams he won 8 pro equivalents for 19 slams. (compare Rosewall's 23)
[Australia, 1956-79; #1; 11 (3A, 2F,4W, 2U) + 8 pro (1F, 4W, 3U); 6d (4A, F, W), 3 mixed (F, 2W); 5 DC]

Did ya hold 'n eland DNA, Lendl? Oh ay, did!
No wild 'n elan in a Lendl. 'I won.'
1. Ivan is swift and silent, reminding us of an eland! He agrees. Metaphor or DNA taken as a booster drug?
2. He usually won, but without craziness or flair (no exclamation mark!). He's also had a very successful coaching career for Murray and A. Zverev. [Czech, US, 1978-94; #1; 8 (2A, 3F, 3U); DC]

Anil deified Li Na.
True, and not just because they are 'name mates'. Na was the first slam winner from China and massively increased interest in tennis in China. [China, 1999-2014; #2; 2 (A, F)]

No exile; fan, amaze—poll Lopez a man, a Felix eon.
Feliciano (Felix) Lopez is an 'in' player who fans amazement in both singles and doubles. Poll Felix as a real man and star of an era.   [Spain, 1997-...; #12, d#9; dW, 5 DC]

[M]
Tap DNA 'n' ho—John and Pat!
The McEnroe parents obviously had good tennis genes. This can also be applied to John Newcombe and Pat Cash who, though not blood kin, were good mates and both had good tennis genes. Both Johns achieved the rare distinction of reaching #1 in both singles and doubles. (See Cooper for a list of both #1 holders.)
• John McEnroe [US, 1976-94 (d -2006); #1, d#1; 7 (3W, 4U), 3T; d 9 (5W, 4U), 7 dT, mixed W; 5DC]
• Patrick McEnroe [US, 1983-98; #28, d#3; dW, dT, jr. dF]
• John Newcombe [Australia, 1960-81; #1, d#1; 3 jr. A, 7 (2A, 3W, 2U), 17d (5A, 3F, 6W, 3U), 2 mixed (A,
   U), 5DC] His was also the rare feat of winning AO as both junior and senior, same as Chris O'Neil (see 3).
• Pat Cash [Australia, 1982-97; #4, d#6; W; 2DC]

Hana v. ___? OK, I'ld name Mandlikova! Nah?
Like most players, Hana Mandlikova could be her own worst enemy.
[Czech, Australia, 1978-90; #3 (Jr. #1); 3 (2A, F, U), T, d U; 4 FC (Czech)]

'No! Medvedev! Demon!'
Some players' reaction when facing Daniil Medvedev. [see part 3]

Li, aver plea: 'Go Gael, prevail!'
asking Li Na [see above] to support the fan appeal for Gael Monfils to win [France, 2004-...; #6]

O dig Moya? Say 'OMG!' I do.
Fan, asked their opinion of Carlos Moya, replies very affirmatively. [see 3]

[N]
1. **Is rat's, a Rafael? Gnat? O not! Angle a far A+ star? Si!**
2. **Rafa is an igniting in Asia far.**
3. **Re-go rotor, e.g., Nadal danger o'/to Roger.**
1. Nadal is no midge[t], nor manipulated by some rat!
2. He always fires up the crowds when he plays in China or Japan.
3. Rafael and Federer rotated wins. [see both in part 3]

1. **O he's at sane mage game, Nastase—ho!**
2. **Yell 'O veil I Ilie volley.'**
3. **Romania foe (volatile!) sat, sane. Ilie Nastase lit a love, 'O fain amor!'**
1. Ilie Nastase played like a sober magician.   2. He faked out his opponents with veiled volleys.
3. Ilie was bipolar (volatile), like this disconnected two-message PD. Altho sane and a major foe of players he was famously free and easy with his love, further making him a foe of others.
[Romania, 1966-85; #1; 2 (F, U), 4T; 3d (F, W, U), 2 mixed W] (+ see Santana)

an I-trample-'Help!'-Martina
Both famous Martinas, Navratilova and Hingis, were merciless to their foes. [see both in part 3]

Ha on foe of Noah!
The trite Ark joke backfired on Yannick Noah's foes. [France, 1977-96; #3; F, dF; now French DC captain]

[O]
'Decide, Naomi Osaka.' So I moaned, 'Iced.'
After winning the 2020 US Open final, the physio asked Naomi how she wanted her tired legs treated.

[P]
'To trek rapid I Parker tot.'
Not. Frank's speed did not tot up his whole talent. [US, 1930-71; #1; 4 (2F, 2U); d3 (F, W, U); 2DC]

Won KO, older Fred. Look now.
Fred Perry is now best known as the last British male Wimbledon winner (1936) until Andy Murray in 2013. 'Older' in history, not in age. This could also apply to Fred Stolle [see below].
[Perry, UK, 1929-56; #1; 8 (A, F, 3W, 3U) + 2 pro (U); d 2 (A, F); mixed (F, 2W, U); 4 DC]

1. **No yaks, or 0 dope, Podoroska yon.**
2. **Aid a noted 'ace', date-set a decade to Nadia!**
1. Nadia used neither dope nor Tibetan cattle to aid her. I don't think anyone suspected her of cheating with yak power, but doping is hinted at merely by her outstanding, surprising performance.
2. Give Podoroska some publicity, dedicate the 2020s to her! [see part 3]

[Q]
Straining, off on a flu fret, Sam Q = masterful fan of Fognini arts.
Sam Querrey hopes it's just a touch of flu, not covid. Despite it, and tho he's a master of the power game, he admires the artistry of Italian player Fabio Fognini. [Sam: US, 2006-...; #11] [Fabio: see Goffin above]

[R]
Tap top spot, Pat.
Pat Rafter reached #1. For two other Pat's (Cash, McEnroe) who didn't quite reach #1, see McEnroe.
[PR, Australia, 1991-2002; #1; 2 U, d A, DC]

Eh? Cornet x ten = Roche!
Eh, Cory? Not Tony Roche!
Alize Cornet is good [see part 3] but with a tenth of the accomplishments of Tony Roche. Even more so Cory Parr, who disappointed after an outstanding record in college tennis at Wake Forest, Anil's Alma Mater.
[Roche, Australia, 1963-79; #2, d#1; F; d 13 (5A, 2F, 5W, U), mixed 2 (A, W), 4DC; even more outstanding as perhaps best coach ever (four #1s: Lendl, Rafter, Federer, Hewitt, and former World No. 4 Jelena Dokic]
[Dokic: Australia, 1998-2014; #4; HC] / [Parr: US, 2009-...; d#272] / For the others see earlier.

1. **Roddick, nay? A Yank 'Cid d'or'!**
2. **'Na! Nary DNA!' Andy R. (Anan?)**
1. Roddick was a US golden hero. 2. He claims the opposite of that other great Andy, Murray [See part 2], saying he developed his skill by hard work. 'Anan?' means do you fail to understand this?
[US, 2000-12, -15 d; #1; W; DC]

1. **'Now I do recall awe.' So Rosewall: 'Ace Rod, I won!'**

2. **Call a 'We sort it,' Rosewall a/c.**
1. Ken Rosewall has awesome memories of games past beating RodLaver [see above].
2. Ken could usually sort out a winning strategy. Counting pre-Open era pro equivalents, KR won more singles slams (23), and counting doubles and mixed more total slams (33), than any male past or present, and more total than anyone but Court (64!) and Serena (39). This is usually overlooked when talking about slam records. They talk about Serena needing one more slam to equal Court's singles record, but never confront Federer or Nadal to better Rosewall's 23. He was also the only player to win a major in three decades, and the only one ever to hold slam titles on all three surfaces at once. He's well respected but deserves more, to be a part of any GOAT discussions.
[Australia, 1956-80; #1, d#1?; 8 (4A, 2F, 2U), +15 pros (2U, 5W, 8F); d 9 (3F, 2W, 2U), mixed U; 4 DC]

1. **Novel bura, Rublev. On!**
2. **Now, men, Rublev arts: 'Travel, burn 'em!' (Won!)**
1. Andrey Rublev is a new bura [blizzard from the north] from Russia, a force to reckon with.
2. He has the basic 'arts' of a tennis hit-man! [see Erakovic in 3]

[S]
In it, a baseline stone, not senile, Sabatini!
Gabriela Sabatini was a rock, immovable on the baseline. Even when older, she was always 'in it' to win!
[Argentina, 1985-96; #3, d#3; U, 2T, dW]

Drawn it, Safina? Ran I fast inward!
Dinara Safina didn't hold back or draw things out, moving fast in any direction. [see 3]

1. **Won if a Safin—ow!**
2. **Drawn it, Safin? A ran I fast inward!**
1. Marat Safin usually won—and pained his opponents.
2. He stole the second PD from his sister! After retiring he continued his thieving ways by becoming a politician. [Russia, 1997-2009; #1; 2 (A,U); 2DC]

1. **A tsar PM, a Sampras. Ta!**
2. **Part not so banal, Pistol Pete plots: 'I plan a Boston trap.'**
Pete Sampras was dictator and 'prime minister' of tennis in the 90s. Thanks for the show!
2. This is just before his win over John McEnroe (cf) in the seniors Champions Cup final in Boston 2009, a match a bit banal compared to the live Tour, but not too much, still semi-dignified stuff.
[US, 1988-2002; #1; 14 (2A, 7W, 5U), 5T; 2DC]

1. **Man at nastier a fare, it: Santana, M.**
2. **Wo! We sat, Santana ran at Nastase, wow!**
3. **'Model fires aces at Santana.' 'Man at Nastase case.' (Rifle, Dom?)**
1. 'Manuel the Man' Santana was more unkind to opponents than most players.
2. A spectator relates an incident in a fiery match between Santana and Ilie Nastase.
3. Two headlines, plus a Dom(inic) Thiem thought. Those English tabloids can't leave the old tennis heart-throbs alone. Dom wonders if he'll need a gun not a racquet to beat those old publicity magnets.
[Santana: Spain, 1956-77; #1; 4 (2F, W, U); dF; O (demo)] / [Nastase and Thiem - see 4.]

'Sax I esteem.' Meet Seixas.
This cool character, Vic Seixas, enjoys saxophone music and is still alive at 97! Are these facts related?
[US, 1940-70; #3; 2 (W, U); 5d (1A, 2F, 2U), 8 mixed (F, 4W, 3U); DC]

O Diego, lone super-rep, use no loge! (I do.)
An appeal to Diego Schwartzman from a fan in a courtside box: 'You are the only short-player 'super-rep', so keep playing, don't become a spectator like me!   [Argentina, 2010-...; #8]

Age Monica Seles a/c in Omega.
The ultimate tennis player until stabbed by a frenzied fan of Graf in Germany. [see part 1]

'OK!' Sam rahs Astra's arts, a Sharma's KO.
Davis Cup teammate Samantha Stosur cheers Astra Sharma's skill, especially her knock-out forehand.

[Sharma: 2011-...; #85; reached SF at 2020 A mixed]
[Stosur: Australia, 1999-...; #4, d #1; U; d3 (A, F, U), mixed 3 (A, 2W), d 2T]

Demon Sinner is a siren 'n is no Med.
Jannik Sinner is a person of great energy and skill (demon: Chambers Dict.). He sounds a warning but is no Medvedev (yet). Alternatively, he is no Medic for his opponent's ills. [see part 3]

'Stun' Smith's a motor, bro, to mash Tim's nuts.
Stan Smith was a stunner and played like a machine who could crush the 'balls' of many good players like Tim Mayotte (cf), figuratively and I bet occasionally literally. [see 2 with Wawrinka]

Stolle, do me no lone model—lots!
We desire plenty of tips from and examples of Fred Stolle's impressive style, not just one.
[Australia, 1958-72; #2, d#1; 2 (F, U), 10 d (3A, 2F, 2W, 3U); mixed 7 (2A, 3W, 2U)]

Tennis set won now Tess in net.
We cite Tess Sugnaux, a good net player but lowly ranked, to utilise this nice old PD. [Swiss, 2012-...; #413]

1. **On a nil eon, O Elina? No!**
2a. **Deft Elina ran? 'I let Fed.'**
2b. **'Elina to net is at a site not anile!'**
1. Instead it's been a very full eon for Elina Svitolina. [Ukraine, 2010-...; #3; T]
2a. Roger Federer's fictional mixed partner Svitolina let him do all the running, while she remained ably in backcourt. 2b. He replied that she's not too old to run to the net herself!

1. **Agitate, get at Iga.**
2. **Aging is a sign, Iga.**
1. Advice to Iga Swiatek opponents: to upset her, upset her.
2. She surely shows no sign of aging yet at 19. But later, watch out for it. [see part 3]

[T]
1. **Cynic in 'I' mode, Dominic: 'I = NYC!'**
2. **Basic in 'I'm odd.' Dominic is a B+.**
3. **Dominic named a mix I made 'Mancini Mod'.**
1. Dominic Thiem cynically feels he 'owns' or 'is' New York now that he's won the USOpen. It could get worse if he later becomes #1, as many expect. (This insult is the PD's presumption. The authors disagree!)
2. B+ means not yet A—in the big three. Of the top four he's the odd man out.
3. Thiem appreciated his compilation of mod music I call Henry Mancini type music. Like many tennis players he used music to relax or inspire him. [Austria, 2011-...; #3; U]

Tiafoe dived in snide video 'fait'.
Fake news! Doctored video of Frances Tiafoe throwing a match in France. [see part 3]

'Set!' (A Tig agitates.)
Patricia Maria Tig agitates her foes when she wins a set. [Romania, 2009-...; #58]

1. **'Tennis, an owned!' lit Tilden. Won as in net!**
2. **Tilden nabs banned lit.**
1. Bill Tilden, but rarely his ball, was in the tennis 'net', meaning tennis 'owned' him—and he owned tennis in his day. (Like Thiem #1 above?) 2. He was gay (jailed twice for sexual offences involving young boys, and banned from various events and venues) and had a penchant for gay literature.
[US, 1912-46; #1; 10 (3W, 7U) + 3 pro (W, 2U); d 6 (W, 5U), mixed 5 (F, 4U); 7 DC (record)]

[U]
Ya, Yasutaka, aka t' us a 'Yay!'
Yes we cheer Yasutaka Uchiyama, the #3 ranked Japanese male. [2011-...; #78; 5 ATP titles]

Nab, run, I win! – Urban
Faye Urban in 1969 was the last Canadian to win the Canada Open (Roger's Cup) before Bianca Andreescu. Faye was known as 'Canada's First Lady of Tennis' in 1950s/60s. She later captained Canada's FC team.
[FU, no dates or rank found] / [BA, Canada, 2017-…; #4; U–first ever Canadian slam winner]

[V]
One Venus = sun, even! O?
Bigger than a planet, Michael Venus? A wild exaggeration of course but a top doubles specialist. Even more applicable to Venus Williams (cf). [US, New Zealand, 2006-…; d#8; d W]

'Spit saliva!' Vilas tips.
Guillermo Vilas recommends this as a substitute for smashing racquets when self-disgusted.
[Argentina, 1968-92; #2; 4 (2A, F, 2U), T]

At a Doc: 'Sad re Verdasco data.'
Fernando got a scary diagnosis. Possibly true, probably fiction. [Spain, 1999-…; #7, d#8; dT; 3DC, HC]

Tie Volkov, OK? Love it!
Aspiring Russian players would love to emulate Alexander Volkov's achievements. Even moreso to emulate another Russian Alexander Volkov, champion mixed martial artist. [tennis A.V.: Russia, 1988-98; #14]

[W]
I made Wade 'Okay, ya KOed!' Awed am I.
When someone soundly beat Virginia Wade they were usually amazed at themselves.
[UK, 1968-86; #2, d#1; 3 (A,W, U), T; 4d (A, F, 2U)]

O no, gnat stang! Gnat? Stan? Go 'No!'
No! Not midge[t]s, Stan Wawrinka or Stan Smith, but they sting or stang like one. [see 2 for both]

Stamina man, I, Mats.
Mats Wilander had great endurance, yes, but that isn't what made him great. No marathoner (except Wozniacki! cf) has ever been a tennis star. [Sweden, 1980-96; #1; 7 (3A, 3F, U), d W; 3 DC]

1. **Wow? O, Serena can—ere sow ow!**
2. **An ere sis, I, Serena.**
3. **Sun ever on or in 'Iron ore' Venus.**
1. Serena Williams wows her opponents before being a pain in the end!
2. Venus Williams came first birth-wise but Serena came before her most of their parallel careers.
3. Venus is tough as iron, and you can see the light of passion shining on (and in) her when she plays.
[For both, see part 3]

[X]
'De luxe car' at a race Xu led.
Xu Yifan has earned enuf easily to afford a luxury car. But this PD is meant metaphorically, as the classy 'Xu car' (Yifan) leads the race as China's top doubles player. Hsieh Su-Wei is d#1 but is from Taiwan.
[China, 2014-…; d#7; d Elite Trophy]

[Y]
A gazy, sure pro. Fete for Peru's Yzaga!
Jaime Yzaga was a thoughtful, confident player. On retiring, he served as Peru's Davis Cup captain and is celebrated in his country. [Peru, 1985-97; #18]

Ya nay a Dayana Y.?
Nay! We surely don't nay Dayana Yastremska, a powerful, rising future superstar! [Ukraine, 2015-…; #21]

Revere my Ymer ever!
This can apply to either of the Swedish Ymer brothers, Mikael [2015-…, #60] or Elias [2014-…, #105].

[Z]
1. **'OK, no Zverev zonk!' 'O?'**
2. '**Ye, no more, Zverev, zero money!'**
1. the plea of Sascha (<u>Alexander Zverev</u>)'s opponents, and his reply
2. Imagining one of Sascha's sponsors is not happy   [Germany, 2013-...; #3; T]

"HOOTIE" PALINDROMES

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"Too hot to hoot," one of the more familiar English-language palindromes, is also the preeminent member of a colorful family of related palindromes hereinafter referred to as *hooties*. (Perhaps *hooters* would have been the more natural name for this owl-linked clan, but that name now seems lost to commerce.) Thanks to the researches of O.V. Michaelsen (see Note 1), we know that the first appearance of "Too hot to hoot" in print was most likely in the "In Mystic Mood" column in *Farmer's Wife* magazine's issue for May 1911. This was a puzzle column written by Morton Lewis Mitchell, who, as was the custom among many puzzlers of his era, masked his identity, signing his column "Molemi." In this untitled poem with which Mitchell introduced his palindrome, the reader is challenged to supply the missing letters. It's probably not entirely by accident that Mitchell's verse brings to mind the first few stanzas of Edgar Allan Poe's poem "The Raven"; one can readily imagine Mitchell thinking of Poe's raven and smiling as he wrote

> 'Twas a night succeeding days
> Of Midsummer's fiercest blaze;
> Silent as a graveyard ghost
> Sat an owl upon a post.
> "Come," said I, "O strigine fowl!
> Why so silent? Speak, O owl!"
> The owl gave just one glance at me;
> "*oo *o* *o *oo*, to whoo!" said he.

What, exactly, constitutes a hootie? Good question. A hootie is hereby defined as any lexically acceptable palindromic passage in which the word "too" and the unbroken trigram "oot" occur in corresponding positions in opposite halves of the passage. Due to its venerability and popularity (see Note 2), "Too hot to hoot" is often assumed to be the progenitor of the hootie family, but it was not, in fact, the first hootie ever published, or even the second. The first was "Too fat a foot," which appeared in G.R. Clarke's 1887 book *Palindromes*, and the second was "Too far afoot" (another palindrome attributed to Molemi), which, again according to Michaelsen, was first seen in print in the March 1, 1906 edition of *Inter-Ocean*.

This article surveys the eighteen genera known to the author of the family Hootidae with the object of identifying and displaying the more significant palindrome species in each genus. In what follows, each genus exhibit is divided into two sections: a section for previously published palindromes (if there are any), wherein the composers of the palindromes, when known, are identified, and a second section in which "new" palindromes—i.e., palindromes which were recently contrived by this writer—make their public debuts. Comprehensiveness is not claimed for the listings of previously-published hooties, as a number of potential hootie sources, such as the various Internet palindrome repositories, had to be left uncanvassed for this article.

In order to impose some limit upon the lexical latitude of this survey, its palindrome vocabulary is restricted to words listed in boldface type in *Webster's Third New International Dictionary* or

in any Merriam-Webster collegiate dictionary, to their reasonable inflections, and to familiar or well-known proper names. Initialisms, abbreviations, acronyms and logograms are disallowed. Dialect words are acceptable, except as substitutes for common words, e.g., "fer" for "far," "yer" for "your," etc.; standard English *is* the standard here, where very common words are concerned.

One further detail of the listings needs explanation. By convention or just by force of habit, the word "too" is usually situated in the first half of a hootie, with its corresponding "-oot"-word thus appearing in its second half. There is no necessary reason for this, as the "too" is permitted to occur in either half. Shifting the "too" from the first to the second half does, however, alter the entire architecture of the palindrome. As it may be of interest to analytically-inclined readers to know whether a given hootie's "too" is a lefty or a righty, whenever, in what follows, a hoot-ie's "too" occurs in its second half, it will be labeled with a "(2ND)," space permitting. If both a "too" and an "-oot"-word occur in *both* halves of a hootie, it will be labeled with a "(both)."

A HOOTIE FAMILY ALBUM

Each hootie genus is based on one particular "-oot"-word, after which it is named. The eighteen genera currently comprising the family Hootidae, to the best of our knowledge, are these: Afoot, Bandicoot, Boot, Bootlegger, Coot, Foot, Footsore, Galoot, Hoot, Kootenai / Kootenay, Loot, Moot, Root, Soot, Soothsaid, Toot, Underfoot and Zooty. Following is a selection of representative hootie members of each of these genera.

AFOOT

Previously published:

TOO FAR AFOOT.   *~ Molemi,* in Inter-Ocean, *March 1, 1906*

TOO FAR, EDNA, WE WANDER AFOOT**.**   *~ By either Leigh Mercer or Dmitri Borgmann. This palin-drome was not among the 100 palindromes that Mercer con-*tributed to Notes & Queries *between 1946 and 1953, but it* was *among those that he passed along to Howard Bergerson in the 1960s, and it was also among those that Dmitri Borgmann gave to Martin Gardner for Gardner's notes to Dover's 1961 reissue of C.C. Bombaugh's* Oddities and Curiosities. *Apparently, at some point in the 1950s or early 1960s Mercer and Borgmann shared their collections of palindromes.*

TOO FAR AWAY…A WAR AFOOT.   *~ Leigh Mercer, in Bergerson's* Palindromes and Anagrams, *1973.*

New:

TOO FAST ARE RATS AFOOT. / TOO FAST *ARE* WE RATS AFOOT! / TOO FAT**:** A BAT AFOOT**.**

TOO FAR IS WASSAMASSAW, SIR, AFOOT. / TOO *FAR*, AFTON? O, NO, *NOT* FAR, AFOOT.

AY, NOT TOO FAST — IT'S AFOOT, TONYA! / AY, NOT *TOO* FAST — FAT TAFT**'**S *AFOOT*, TONYA!

TOO FACILE! RON, SIR, IS NO "RELIC" AFOOT! / AS LI SAW, TOO FADED, AFOOT, WAS ILSA.

TOO FALLIBLE, MAC SAW, WAS "CAMEL BILL," AFOOT. / A RAT AFOOT'S TOO FAST, ARA?
(2ND)

****, IT**'**S TOO FAMILIAR, TAN OWEN — NEW ON A TRAIL, I'M AFOOT *STILL*, EH?

AY! NOT TOO FAR AWAY, A PAPAW ASSAYER — FREYA'S — SAW A *PAPAYA* WAR AFOOT, TONYA!

BANDICOOT

The name "bandicoot" has been applied to two quite different kinds of mammal. More common-ly, it refers to any of several related small rodent-like marsupials of Australia which are charac-terized by long snouts. The other "bandicoot" is a very large eutherian rat native to south and southeast Asia, now usually called a "bandicoot rat." (Cf. Arthur Conan Doyle's "giant rat of Sumatra.")

New:

   DID I, TOO, CID, NAB A BANDICOOT? I *DID!* / DID I BANDICOOTS TOO, CID, NAB? I DID!   (2ND)

   MAY A BANDICOOT, TOO, CID, NAB A YAM? / MAY A BANDICOOT RAT STAR TOO? CID, NAB A
                                                         YAM!
   RATS STAR *TOO*, CID! NABLUS, OMAHA, MOSUL — BANDICOOT RATS *STAR!*

BOOT

Previously published:

   TOO BAD I HID A BOOT.   ~ *Contributed by Leigh Mercer to the* Notes & Queries *issue of 30 August, 1952.*

New: NO, 'TIS TOO BOT-GNAWN (A LOT ROT!) A FAT ORTOLAN, WANG, TO BOOT! SIT ON…

   TOO BAD ILSA SLID A BOOT**.** / TOO BAD A HOBO HAD A BOOT. / TOO BAD EDA FADED A BOOT.

   TOO BAD EVA WAVED A BOOT. / TOO BAD ELI**,** FED**,** DEFILED A BOOT / TOO BAD EMIL SLIMED

   A BOOT. / TOO BAD, EH? SARA SHED A BOOT. / NO, TOO BAD EMMA JAMMED A BOOT *ON!*

   TOO BAD EVA RAVED "A BOOT!" / TOO BASIC IS A BOOT. / TOO BASILAR, AL, IS A BOOT.

   TOO BAD EDNA LANDED A BOOT. / TOO BAD, ED — I, "OVAL AL," AVOIDED A BOOT!

   TOO BOTTLE–FED A "CADE" WAS ALLEN, ELLA SAW EDA CADE FELT, TO BOOT**.**

   NORA BOOTED A GENERAL — A RENEGADE, TOO, BARON! / TOO BAD! I, BRO, *FORBID* A BOOT!

   SPAM! NO, TOO BASIC, IVY**!** LATIN ITALY, VIC, *IS* A BOOT — ON *MAPS!* / BO *BOOTS* US BOOBS?
                                                      — US *TOO*, BOB? (2ND)

BOOTLEGGER

New:

 "REG, GEL TOO BASE LES, A BOOTLEGGER!" / "ROGER, GREG! GEL TOO BOOTLEGGER GREGOR!"

   SAID "LIS, A BOOTLEGGER" AUTHOR EDIN SNIDER, "OH, TUAREG, GEL TOO BASIL DIAS!" (2ND)

COOT

Previously published:

   "TOO COOL," GINA NIXED DEX, "IN AN IGLOO, COOT!"   ~ *J.P. in "Kickshaws,"* Word Ways, *Aug. 2012*

TOO "CASINO–DRAWN–IN," IN WAR, DON, IS A COOT? / ON IS A "COOTS–TOO" CASINO?   (2ND)

"HE'S TOO CERISE–DOTTED A CADET TO DESIRE COOTS, EH?"   (Question asked at West Point amid
                              a siege of measles?)

TOO CAESAR–EIDETIC, ERDOGAN, A "GOD," RECITED "I ERASE A *COOT!"*
                              (Recep Tayyip Erdogan, imperious president of Turkey)

 A NEW ORDER CAN TOO CARE! VOTE GOD, LAW AND *EDNA*, WALDO! GET OVER A COOT —
    NACRED ROWENA!

FOOT

Previously published:

TOO FAT A FOOT! ~ *G.R. Clarke,* Palindromes, *1887* / NEVER A FOOT TOO FAR, EVEN. ~ *Leigh Mer-
                              cer, in* N&Q, *16 October, 1948*

TOO FLAT! A FATAL FOOT. ~ *John Connett, May 1996*

New: O, NAY! *NOT* TOO FAT A FOOT, TONYA, NO! /   NO, "STEEL–FOOT SID" IS TOO *FLEET*, SON.

NO, *STILL* IT'S TOO FLAT! A FATAL FOOT — STILL IT, SON! / TOO FALLEN, NELL, A FOOT?

 "OGDEN! RAW SIR, I RECAP: TOO *FLAT* A FOOT'S TOO *FATAL*!" FOOT–PACER IRIS WARNED; "GO!"

WON'T I *TOO* FEEL FEAR, RAE? FLEE! *FOOT* IT, NOW! / WE FOOT–TONER AIDES, EDI, ARE *NOT*
                              "TOO FEW"! (2ND)
DEEPS–DOG, STIR A *FOOT* TOO FAR, IT'S "GODSPEED!" (2ND)

FOOTSORE   New: "EROS? TOO FOOTSORE!" / **"**NO HERO'S *TOO* FOOTSORE, HON."

Eros, banished to Hades, reacts to being grumpily escorted beyond the river Styx by boatman Charon:
 "NO, DORTY LUDDITE FOOL, DO *NOT* — RAIL — I'M A FOOTSORE *DEITY!* RECROSSED, A HYBRID
ANIMAL AM I, NADIR?" BY HADES' SORCERY TIED, EROS, TOO FAMILIAR TO NOD, LOO–FETID,
DULY TROD ON...   (2ND)
                              ("Dorty" is a useful word employed by Scots to describe someone who
GALOOT   is peevish or sulky.)

New: (Somewhat confusingly, "laggard" is both an adjective and a noun, both usages denoting dilatoriness.)

TOO LAGGARD AM I! I'M A *DRAG*, GALOOT! / NAT'S TOO "LAGER–AWARE," GALOOT STAN?

"TOO LAGGARD," OTTO NEEDLED IFNI–DENNED INFIDEL DEE, "*NOT* TO DRAG, GALOOT?"

SAL IS TOO "LAGGARD," DELIVERYMEN?... EVIL LIV! ENEMY REVILED, DRAG GALOOT SILAS!

GALOOTS, TOO, LAG. / "GALOOTS" LAG, EH? SOMETIMES, SEMITE MOSHE, GALS *TOO* LAG!

LO! GNOMES, EBON ASGARD, DO *TOO* "LAGER UP" A "PURE" GALOOT — ODD "RAGS," AN
    OBESE MONGOL!

HOOT

<u>Previously published</u>:

TOO HOT TO HOOT.   *~ Molemi (Morton Lewis Mitchell), in his column "In Mystic Mood" in* Farmer's Wife, *May 1911*

TOO "HOT–TONSILLED," NEW LWOW OWL WENDELL IS, *NOT* TO HOOT?   *~ J.P., in "Kickshaws,"*
                                                Word Ways, *Aug. 2012*
                    (Lwow, once Lemburg, is now Lvov.)

<u>New</u>:

NO, 'TIS TOO HOT, TOT, TO HOOT! SIT ON…   /   TOO HOT, O BUBO, TO HOOT?   ("Bubo" is a poetic
                                                name for an owl.)

TOO HOT A GASBAG GAB–SAGA TO HOOT?   (The anagram "a gasbag**:** gab saga" is also a palindrome!)

TOO HOT, TONY RANA–CANARY, *NOT* TO HOOT?   (The term "rana-canary" is meant as a kenning for
                                                a hoot owl residing on a rana's princely estate.)

"TOO HILLY, DINAH, AN IDYLL!" I HOOT. / "TOO HIP! A CANINE, MEN, IN A *CAP*!*"* I HOOT.

AY, NOT TOO HIP A ROTE NOTE–TONE TO RAP, I *HOOT*, TONYA. /   TO HOOT, SIS, IS TOO HOT!

In ancient Egypt's underworld, the king of the owls huffily replies to a question put to him by the god Osiris:

"TO 'HOOT,' STIFF OSIRIS, *SIR*, IS OFF — IT'S TOO HOT!"   (Little wonder Osiris was stiff; he'd recently
                                                been cut to pieces by Seth and reassembled by Isis.)

["…AND EDNA, *TOO!* HA!" EVA GALLED DELLA, CERNAN RECALLED**;** DELLA *GAVE* A HOOT**.**
     AND EDNA…"]
                    (A 61-letter palindromic window in running text recently discovered in S.O. Fausse's
                    1982 Harper book, *How Low the Moon*. Or so we're unreliably informed.)

KOOTENAI / KOOTENAY

Also "Kootenay / Kootenai." This dual-nationality river's name is spelled "Kootenai" where it loops into the U.S. and "Kootenay" where it begins and ends in Canada.

<u>New</u>:

A RAD ERA! DIANE TOO KOOTENAI DARED, ARA!   /   DI? DIANE *TOO* KOOTENAI "DID"?

YES, MA, RYANE *TOO* KNEW OWEN "KOOTENAY" RAMSEY!

                              (<u>Ryane</u> Clowe is a well-known professional hockey player.)

LOOT

<u>Previously published</u>:

TOO LONG, NO LOOT,   *~ Joachin and Maura Kuhn, in* Rats Live on No Evil Star: the BackWords Puzzle Book, *1981*

TOO LOTH TO LOOT?   *~ Joachin and Maura Kuhn, in* Rats Live on No Evil Star, etc., *1981*

TOO LOTH TO "GO GOTH" — TO LOOT? / TOO LOTH, TOGAED (ILL IDEA!) GOTH, TO LOOT?

TOO "LOTTO–NEEDY," DEE, *NOT* TO LOOT? / TOO LOTTO–NUTS, STU, *NOT* TO LOOT?

ARID, WE LOOT! TOO *LEWD*, IRA? (2ND) / TOO "LEWD," IRA? FIE! IF ARID, WE *LOOT!*

MALE, WE'RE TOO LEWD A LOT, TONY, *NOT* TO!…LAD, WE *LOOT* ERE WE LAM!

TOO LIMITING IS ED'S "SENSUOUSNESS" DESIGN! I, TIM, I *LOOT!* / NO, LOOT TOO, LON.

MOOT

As a noun, a "moot" was once something like a town meeting, or the place of such a meeting; now it's a hypothetical case argued by law students. As a verb, to "moot" a topic means either to broach it or bring it up for discussion, or, oddly, to render it unimportant or academic. As an adjective, "moot" usually describes something that is open to question, irrelevant or insignificant.

Previously published:

TOO MAD A MOOT.   ~ *Joachin and Maura Kuhn, in* Rats Live on No Evil Star, *1981*   ("moot" as a noun)

New:

TOO MOOT, DEX! INSTILL A *MANIA* IN A *MALL*? IT'S NIXED — TOO MOOT!   (both)   ("moot" as an adjective)

LA! *GOALS*, LAO? GET A CAVE! WE'RE TOO *MOTIVELESS* A PASSEL, EVI, TO MOOT, ERE WE VACATE, "GOALS," LAO GAL!   ("moot" as a verb.)

ROOT

Previously published:

TOO RAW A ROOT.   ~ *Joachin and Maura Kuhn, in* Rats Live on No Evil Star, etc., *1981*

"TOO ROTTEN, O ROCOCO CORONET, TO ROOT?"   ~ *J.P., in "Kickshaws,"* Word Ways, *August, 2012*
(Mad King Lear, attempting to use his royal headgear to grub for roots, or root for grubs, or whatever.)

New: TOO RAPID, I SAY! NOTE, TONY, AS I DIP A ROOT… / NO, ROOT AN ANANA TOO, RON. (2ND)

"TOO ROTTEN, ROCOCO CORNET, TO ROOT?" (Irate college football fan to blasé band member?)

TOO ROTTEN — OR ABASED ON ODES — A BARONET TO ROOT? / NO, ROOT TOO, RON. (2ND)

"TOO *ROTARY*, MYRA, TO ROOT?" / "TOO *ROTATIVE*, EVITA, TO ROOT?" / TO ROOT TOO, ROT!

TOO RAW? ANGIE, I GNAW A *ROOT!* / TO ROOT, SABAS TOO ROT. / TOO ROTENONE TO ROOT?

MAY A *TOO*–REGAL AGE ROOT A YAM? / NO! ROOT NO "STUNT NUTS" ON TOO, RON!   (2ND)

TOO ROTORUA-MODAL A LAD, O MAURO, TO ROOT?   (If Rotoruans were noted for their restraint…)

SALAD–ONION SPINS RAP; "LET SAP ROSA GAB! A TURNIP'S TOO "RADISH," SID, A ROOT —
    SPIN RUTABAGAS, OR PASTEL PARSNIPS, NO?" I NOD, ALAS…   (Spinning up a rhubarb?)

SOOT   <u>New</u>:   WE SOOT EWES *EBON*, EVE, ERE, EVEN OBESE, WE TOO SEW.   (2ND)

TOO "SÈVRES," O TIM, *AM* I TO SERVE SOOT! / NO, SOOT ST. SIMON'S "NOMISTS" TOO, SON.

ALLEN WAS WON — TOO SOTTED A CADET TO SOOT NOW, SAW NELLA**.** / NO, SOOT *TOO*, SON.

TOO SOTTISH TO BEWARE MAC'S CAMERA, WE BOTH SIT TO SOOT**.** / I SOOT SPA SAPS TOO, SI.

"AH!" (HE WETS A CIGAR**.**) "TO SOOT *TOO,* SOT TONY? OR, ROY, *NOT* TO SOOT TOO? SO
    TRAGIC A STEW, EH? HA!"   (both)

AH! AH, EVIL … DID *I* NO EVIL? CALLED "TOO SOTADIC," I TARRED ELI ERE I LED ERRATIC
    IDA TO SOOT DELLA, CLIVE! ON *I* DID LIVE, HA, HA…

SOOTHSAID

<u>New</u>:

"AY, NO TREES, DI — ASH TOO SERE!" SOOTHSAID "SEER" TONYA. / "DI, ASH *TOO* SHALL EBB,"
    ARAB BELLAH SOOTHSAID. / "GAD, DI, ASH *TOO* SETS A TASTE!" SOOTHSAID DAG.

TOOT

<u>New</u>:

TOO TOTALED, ADELA, TO TOOT? / TOO TOTALLED WAS OTTO, SAW DELLA, TO TOOT.

'TIS TOO *TAME*, LOGY GOLEM, A TOOT — SIT! / TO TOOT, I ROAM AS A MAORI *TOO*, TOT! (2ND)

MALIGN, I, TOO, TERESA LAP — *ALAS!* — ERE, TOOTING, I LAM**.** / TO TOOT'S A GAS TOO, TOT!

ROVER "TOOTS" *TOO*, TREVOR! / TO TOOT TOO, *HOOT* TOO, TOT! / TO TOOT, *TOT* TOO, TOT!

UNDERFOOT

<u>New</u>

I SAW, TOO, FRED "NULLIFY MOTION" — A HOT "DAFT FAD," TO HANOI — TO MY FILL**;** UNDER-
    FOOT WAS I…

IN ININI SIT I, TOO, FRED, NUDE… "DUNED" AND, EDNA, "DENUDED" UNDERFOOT IT *IS* IN ININI!

ZOOTY

<u>New</u>:

AS A GOD, AY, TIU'S TOO "ZOOTY" — TOO *ZOOT–SUITY* A DOG, ASA!   (both)

(Still, Tiu did at least give us Tuesday.)

Those are the eighteen established hootie family genera known to us, but there are potentially several score more waiting to be established. (See Note 3 for two lists of potential hootie "-oot"-words.) All that is needed to bring a new hootie genus into being is to use some heretofore neglected "-oot"-word in a passable palindromic passage and then to publish that passage somewhere (such as in some dedicated wordplay journal like this one). Of course, novel palindromic formulations in existing hootie genera are also always of interest to hootie observers.

HOOTIE VERSE

Historically, "Too hot to hoot" came in on a verse, and it seems only fitting to conclude this article in like manner. The following end-to-end-palindromic poem was first seen in North America in Howard Bergerson's 1973 palindrome and anagram omnibus, *Palindromes and Anagrams*. Bergerson reports that it was composed by George Marvill and first appeared in the *New Statesman* of May 5, 1967. In Bergerson's book, it bears the title "Palindromic Conversation Between Two Owls"; whether this was Marvill's own title or Bergerson's addition, it's a problematic title in that, read as a conversation between *two* owls, the poem is logically inconsistent—the two birds seem to switch sides midway in their argument. Notice, however, that if we suppose that this verse is actually a conversation between *three* owls, then there is no longer any logical inconsistency. Below, labels in parentheses identify the speaker (hooter?) of each line of Marvill's poem in a "three-owl" interpretation of his dialog:

PALINDROMIC CONVERSATION BETWEEN [THREE] OWLS

(Owl 1) "Too hot to hoot!"
(Owl 2) "Too hot to woo!"
(Owl 3) "Too wot?"
(Owl 1) "Too hot to hoot!"
(Owl 2) "To woo!"
(Owl 3) "Too wot?"
(Owl 1) "To hoot! Too hot to hoot!"

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

If dogs be palindrome "gods" then rats must be palindrome "stars," and there are surely enough "rat"-infested palindromes on record to support that conclusion. Three of the more familiar ones are "Rats live on no evil star," "Do not start at rats to nod" and "Was it a rat I saw?" Indeed, as readers may recall, this article has itself rather heedlessly introduced several new members of the palindromic rat pack, two of which are "Too fast are rats afoot" and "Too fast *are* we rats afoot!" In recognition of this mostly underappreciated rodent rout, we've cobbled together this mash-up quatrain of old and new palindromic prose in which the palindromic unit is the line:

A POST–APOCALYPSE DOCTOR'S DIET ADVICE

"Do not start at *rats* to nod —
    Too snide, too booted in soot —"
"Doc, note, I diet on *cod;*
    Too *fast* are rats afoot!"

NOTES

Note 1: Credits where due: The author is much indebted to Faith Eckler, whose fact-finding prowess substantially assisted this article. And like anyone else sufficiently interested in palindromes to wonder about the names of their composers and their first appearances in print, he owes a debt of gratitude to O.V. Michaelsen, who has delved into "many a quaint and curious volume of forgotten lore" in order to illuminate the 19th- and early 20th-century roots of modern wordplay. Many of the fruits of Michaelsen's researches, including the information in this article concerning "Too hot to hoot's" first publication, may be found in his 1997 Sterling book *Words at Play*. Another useful source of information on palindrome attributions is Michael Donner's 1996 Algonquin book, *I Love Me, Vol. I*. See also A. Ross Eckler's 1996 St. Martin's book *Making the Alphabet Dance,* wherein is reproduced Michaelsen's listing, by year, of each of the 100 palindromes contributed by Leigh Mercer to *Notes & Queries* from 1946 to 1953.

Note 2: Following its first publication in 1911, the next appearance of "Too hot to hoot" in print known to me was in Martin Gardner's notes to Dover's 1961 reprint of C.C. Bombaugh's *Oddities and Curiosities*. "Too hot to hoot" has subsequently been cited by Marvill (the *New Statesman*, May 5, 1967) Espy (*The Game of Words*, 1971), Bergerson (*Palindromes and Anagrams*, 1973), Stuart (*Too Hot to Hoot*, 1977), J. & M. Kuhn (*Rats Live on No Evil Star*, 1981), Terban (*Too Hot to Hoot*, 1985), Donner (*I Love Me, Vol. 1*, 1996), Michaelsen (*Words at Play*, 1997), Lederer (*The Word Circus*, 1998), Grant ("Too Hot to Hoot" in *Word Ways*, Nov. 2011) and probably a few other works. In short, the 1911-vintage palindrome that is the hootie eponym has, over time, attained true palindrome celebrity, the only member of its family to do so.

Note 3: Although most of the shortest "-oot"-words in the language ("boot," "hoot," etc.) have now been used in hootie palindromes, scores more likely-palindromizable "-oot"-words remain unhootified thus far. Two lists of such words follow, the first one comprising "-oot"-words that appear as headwords in Webster's Third, and the second one consisting mostly of "-oot"-words which are *not* headwords in Webster's Third, but rather the plausible inflections of such words. A hootie based on an "-oot"-word from List A becomes a species within the genus bearing its "-oot"-word's name, as does any hootie based on some inflected form of that word, e.g., most List B words. Web3 is also, incidentally, rife with other "-oot"-words which do not appear to be especially amenable to palindromization, but which might possibly, with effort, be so utilized.

List A: Probably-Palindromizable "-oot"-Words Which Are Headwords in Web3

bootee	dooted	footpace	freebooter	refoot	soothsay
booter	footage	footpath	freebooty	rootage	soothsayer
bootery	footback	footrace	hooter	rooted	sootless
booth	footband	footrail	hoots	rooter	soots
bootlace	footbath	footslog	looter	rootery	sooty
bootleg	footed	footstep	mootable	rootle	stooter
bootless	footer	footstock	mooth	roots	tenderfoot
bootstrap	footing	footstool	mooting	rootstock	tooter
booty	footle	footwalk	mootness	rootworm	tooth
cahoot	footless	footwall	mootstow	rooty	toothed
cooter	footling	footway	Nootka	sooth	toother
cooty	footmark	footy	Nootkas	soothe	tootle
doot	footnote	freeboot	poot	soother	tootling

List B: Probably-Palindromizable "-oot"-Words Which Are Mostly
Plausible Inflections of Headwords in Web3

bootees	footbacks	footrails	mooter	resooted	sooted
booters	footbaths	foots	moots	resooter	sooter
booths	footled	footsteps	mootstows	resoots	soothed
booties	footles	footstocks	poots	rootages	soother
bootlaces	footmarks	footstools	reboot	rootier	soothsays
bootlegs	footnoted	footwalks	rebooted	rootled	sootier
bootleggers	footnotes	freebooted	rebooter	rootler	tooted
bootstraps	footpaces	freeboots	reboots	rootles	toothed
cooted	footpaths	hooted	reroot	rootless	toother
cooters	footraced	looted	rerooted	rootlet	tootled
dooter	footracer	loots	reroots	rootling	tootler
doots	footraces	mooted	resoot	rootstalks	tootles

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

A late addendum: A nineteenth hootie genus, "Nootka," is heard from:

"NOT NADIA'S ANORAK — TOO 'NOOTKA,' RONA!" SAID ANTON.

"NOT NADIA'S KAYAK — TOO 'NOOTKA,' YAK!" SAID ANTON.

"DIAS, LEN RODE NOOTKA YAKS — AND EDNA'S KAYAK, TOO!" NED OR NEL
SAID.   (2ND)

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Another late addendum: Through an oversight, two palindromes qualifying as hooties which
were composed by Jeff Grant and published in his November 2011 *Word Ways* article "Too Hot
to Hoot" were omitted from this article's main listings. They are

TOO DOTY TO DOOT   and   TOO SOT TO SOOT.

 Hootie rules permit the use of most dialect words that appear as boldface headwords in Web-
ster's Third, and "doot" and adjectival "sot" are both such words. "Doot" is Scottish dialect for
"doubt" and "sot," used as an adjective, means, according to Web3, stubborn or obstinate, in
English dialect. "Doty," said primarily of timber, means partially decayed. (Alternatively, in
southern U.S. vernacular, "doty" means weak-minded, said especially of old people.)

Note that "Too doty to doot" establishes a twentieth hootie genus, "Doot"; accordingly, here is a
clutter of its colloquially-conversing Caledonian congeners to keep it company in its clade:

'TIS *TOO* DONE, NO DOOT — SIT. / 'TIS *TOO* DONE, VIC, I'VE NO DOOT — SIT.

TOO "DONNISH," SARAH? OH, A RASH SIN, NO DOOT! / I DOOT STATS TOO, DI.

TOO DOTTILY, LILY, "LIT" TO DOOT? / NO DOOT, WAR'S RAW TOO, DON.   (2ND)

TO DOOT, "TOOT" TOO, DOT. / TOO DOTY A WAY TO DOOT! / O, *DO* DOOT TOO, DODO!

TOO "DONATIVE," SIR, *IS* EVITA, NO DOOT. / TOO DYNAMIC, NANCI — MANY DOOT!

TOO DYNAMIC A "TSAR" IS IRA, STACI — MANY DOOT! / TO DOOT, "TUT–TUT" TOO, DOT.

"TOO DONE IN," NODS IDA, SAD, "IS DONNIE, NO DOOT." / NO DOOTS? US TOO, DON!

NO DOOT, DAMSON ELF LENO'S MAD TOO, DON. / (NO DOOT, *D**N* MAD TOO, DON!)

ME TOO, DON — EVIL *IS* ABSURD DRU'S BASIL!…I'VE NO *DOOT*, EM! / O, DOOT! (I, TOO,
                                                                                                                                       DO!)
TSETSES TEST! NAT'S TOO DOTTED A CADET TO *DOOT*, STAN — TSETSES TEST!

TOO "DOTY," AS RAE HAS IT, OTIS, A *HEARSAY* TO DOOT? / OMENS *TOO* DEE-DEE DOOTS,
                                                                                                                                  NEMO?
EVEN TOO DOTY, A WRONG NIFFER — EFFING NORWAY? — TO DOOT, NEVE?

                (A "niffer," in Scottish dialect, is a trade, exchange or bargain, according to Web3.)

                                ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

"O, DINEROS WON; A TAD TOO HIP A ROTE NOTE–TONE*
TO RAP, I HOOT *DATA* NOW, SŐREN — I DO!"

* Replace the compound "note-tone" with its inverse, "tone-note," and both the meaning and the
palindromicity of the sentence will be unchanged; replace it with either "note" or "tone" alone,
and the meaning of the sentence will *still* be the same, as read in either direction, but the sentence
will no longer be palindromic—it will read "note" in one direction and "tone" in the other. (An-
other workable replacement for "note-tone" could be "mirror rime," a kenning for a palindrome.)

MEAN SIDEWALKS

ANIL
Perth, Australia

• SOME REDEFINITIONS by Captain Kidding, word pirate

antibody a person who would rather be incorporeal (like Sheldon in Big Bang Theory)

et cetera what you say when you've run out of ideas and don't care to admit it

from time immemorial what you say when you don't know how long it's been

goes without saying a saying

It's like a jungle out there. much quieter and more peaceful than civilisation

mason a Mamma's boy

mistake shoplift

politicians people who go around with their heads in the crowds

pot belly result of getting stoned on pot often and pigging out on munchies

prelate 1) early or on time; 2) still living

presumptuous before you are splendid, but sure you will be one day

raindrops Precipitation decreases.

rock and roll a cradle lullaby

safecracker a firework that doesn't explode

satisfactory where they turn female employees into satis (suttees)

thrive divide into three (after halve)

• NEWORDS

blues-blood hereditarily disposed to suffer and/or sing the blues

fakt fake 'fact' [actually Polish for fact, no slur intended]

Neandering wandering around like a lost caveman

northpaw a left-handed person in the southern hemisphere
[actually used informally or jokingly to mean a right handed person in northern hemisphere]

retweeter a baby-talking coward (or not new? see Quiz answers below)

rickety-split as fast as my old body can run

• QUIZ (answers below)
1. What's red, gray and blue, and over 150 years old yet still alive?
2. What's the difference between ACCOUNTANT and LIBRARIAN?
What do you call it when you lose your shorts in a game of strip poker?
4. The CASSOWARY is a marvel, a concoction of eleven different animals. Can you name
them? Can you find more than eleven animals hiding, mostly scrambled, inside the giant bird?
5. What's special about the words TWO and TWEETER?

• HOMOPHONIC DEFINITIONS
In May 2019 I presented 65 homophonic synonyms. Here are a few more.

bowls balls   (bowling balls, regional accent)

Carrie Nation   Carry 'Nay, shun!'   (a WCTU prohibitionist)

commence come-ins   (or: **commencement** come-ins meant)

disdain 'This stain!'

embarrassed Am bare-assed!

random ran dumb   (not knowing where it's going)

SOB   Asshole be.

And two homophonic antonyms:

accepted excepted

right angle wry tangle

• THE CAT'S PER
This is the dark side of the cat's meow, a purr-version of a dozen per- words. This type pun has been done before, but I think these are all new.

perambulation the catwalk

percent feline currency (Coins only. Cats have no interest in paper money except to chew on.)

perforce This unit for measuring the strength of a purr was long overdue.

perfume angry cat on a hot tin roof (What a smell!)

perjury the panel of dishonest judges at a kitten singing contest

permissible an allowable but skippable per

permissive a catty epistle that takes lots of liberties

peroxide what wicked vandals used to bleach my pussy

perseverance de-purring (Some other cat got its tongue, after tireless attempts.)

persister meow (a purr sibling) which goes on and on

personally male kitten's intimate human friend

perverse shockingly twisted poems composed or sung by cats

• RUMOR
McDonald's is to be taken over by Donald Trump once his term ends. It's supposedly a sealed deal. Because he dislikes ethnicity he plans to rename them all Donald's.

• An Intimate Meeting
MEET MEET MEET MEET M**E**T MET
(This is why met is past tense of meet. Once you meet you've met.)

QUIZ ANSWERS.

1. The US civil war.
2. A charade: one is a bookkeeper, the other a book keeper.
3. short
4. ass cory cow cowry cray crow orca oscar ray roc sow. ?+ saw (sawfish)

5. Yes, both are spelled exclusively on the top row of the qwerty keyboard. That's only part of the answer. Two is the only number so spelled. Tweeter is the longest common word I could find easily that's composed purely of letters laterally adjacent on the keyboard. My runner up is the informal 'sadass', a word describing its own effort to get counted as a word. Can you beat tweeter?

Retweeter I've listed as a new word above (baby talk for retreater, a coward), and it's not a Scrabble word, but it is listed in the online Wiktionary and commonly used online. Even retweetery, the act of retweeting, is used online but isn't common and is not in any dictionary.

• CONFESSIONS

Sometimes I maze myself.

I'm constantly rehearsing my defense for Judgement Day.

I work my butt off. That's the only part of me that gets any wear and tear.
(except my fingers and mouth)

I had a fast fast today. It lasted nearly two hours. I'm improving.

Ages 1-2 were the happiest, most carefree time of my life. So how come I can't recall any of it?

I've been called ambidextrous—both a prick and a wanker.

Worries Free? Yes, They're Free!
When Aussies tell me 'No worries, mate!'
I tell them, 'I'll find something.'

Bird Ways

Roger E. Rondeau
Dayton, Ohio

Birds are part of the allure and the voice of nature. They're beneficial in so many ways. They control the bug population by feeding on mosquitoes and other detrimental insects, they get rid of carcasses, they pollinate our plants, and germinate our shrubs and trees with their droppings. They sustain us. Geese, ducks, chickens, turkeys, quail, pheasant, and partridge alight on our dinner tables. Chickens even feed us before they're born. Birds also save lives, like the canaries that warn us of toxic air in coal mines or the carrier pigeons that delivered our military messages during WW1 and WWII.

But, as a bird watcher and word lover, I'm at a loss as to why birds don't get any linguistic respect. As attractive as birds are, why are almost all avian words so unattractive? If you felt a need to insult someone, it would be duck soup to use any of the flock of negative bird idioms and phrases. Take the noun 'birdbrain,' that word perches all birds on the same stupid tree. Also, the male of many birds is a cock, which is the basis of several unflattering expressions like cockeyed, cocky, cocksure, cockamamie, and worse. And how about the word 'hawk'? This bird is a soaring, majestic hunter while the word means to bring up phlegm, to hard sell something, and to politically push for war. There's a long list of ugly bird words and phrases to choose from: chicken livered, chicken feed, hawk-nosed, pigeon-toed, dumb dodo, loony, old buzzard, hen-pecked, old crow, old coot, no spring chicken, pile of guano. You could also flip someone the bird.

Some other words that fail to flatter our feathered friends: chicken feed, chicken out, lame duck, sitting duck, dead duck, ugly duckling, empty nester, jail bird, strange bird, odd bird, silly goose, cold turkey, wet hen, wild goose chase, quack (a charlatan doctor), grousing (complaining), albatross (a burden, usually around someone's neck), peacock (a vain person), magpie (a talkative person), jay (another idle chatterer), killing two birds with one stone (sharia law for the birds), winging it (not trying hard), have a bird (be agitated), lay an egg, eat crow, for the birds, egg on your face.

Besides 'wise as an owl,' 'eagle eye,' 'free as a bird,' complimentary bird words are as rare as hen's teeth.

There are a few other types of birds worth mentioning: rude birds, like the mocking bird; sad birds, like the blue bird; and gregarious birds, like the velcrows.

Large Word Squares in Latin

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Abstract: Large word squares have been pursued in many languages, but large word squares in Latin appear to have remained unexplored, despite the form's origins in ancient Rome and despite the benefits offered by Latin inflectional endings. New word squares constructed in Latin are shown to surpass in size those created in other languages to date, most notably by attaining the holy grail of logology: the first known non-tautonymic ten-squares consisting entirely of solid, uncapitalized words in a single language. Additional results, also consisting entirely of solid, uncapitalized Latin words, include double eight-squares, a double nine-square, and eleven-squares.

Word squares date back to ancient Rome, and two examples—the famous SATOR square and the less famous but equally palindromic ROMA-OLIM-MILO-AMOR square—have been found in several sites from classical antiquity, including the ruins of Pompeii. In modern times, large word squares have been pursued in numerous languages from Spanish to Icelandic to Esperanto, as well as multilingual squares, but despite the form's Roman origins there appear to have been no attempts at constructing large squares in Latin.

In considering this strangely neglected topic, one should begin by noting a key advantage of Latin, namely its extensive and overwhelmingly regular system of inflectional endings. Construction of large word squares has customarily begun by placing the bottom words first with the goal of creating letter combinations that end many words, such as -ING or -ESS in English. In Latin, if the words in the bottom rows combine to produce nothing but common inflectional endings, such as -NTUR or -ATIS, there is good reason to hope the remainder of the square may be filled. Of course, other languages such as French and Spanish have highly inflected verbs as well.

Latin's inflectional endings also mean that nearly all Latin words of eight letters or longer end in the letters S, M, R, E, I, T, A, O, X, or U. The next most frequent final letter is N, which often ends words of Greek origin, but even this reflects a sharp drop from X and U. The final word in any large Latin word square is therefore likely to consist entirely of these ten ending-friendly letters, an observation that greatly refines the set of potential starting points for constructors.

Due to these structural benefits and the historical appeal of bringing the word square back to its roots, I have sought to push the boundaries of large word squares in Latin using only solid, uncapitalized words.

The largest double word squares to date have been double eight-squares, but we are not aware of any that consist entirely of uncapitalized words. The finest one constructed in English is generally agreed to be Jeff Grant's TRATTLED-THAMNATA square ("Double Word Squares," Word Ways, February 1992), which contains only two capitalized words. As he noted at the time, this was an improvement on the work of Palmer C. Peterson, a prolific formist who constructed at least 250 double eight-squares but never found one that came so close to the uncapitalized ideal.

In Latin, I have been able to meet this ideal by constructing the following double eight-squares, each of which consists entirely of uncapitalized words. For additional elegance, the 32 words in these two

squares can all be found in a single dictionary, namely Hederich (see references at end of article).

```
EMERCARI        EFFLETOS
NIVEORUM        GELATOTE
ONOSMATI        ENATURIS
DELAMBAT        SEMENTAS
ARANEATA        SOMNIATO
RARANTUR        ERADAMUR
EVENTURI        RURATURI
SISTARIS        OMISERIS
```

The words in the grid are explained below.   Verb forms are active and indicative unless stated otherwise, and some word forms have multiple meanings beyond those given; for example, EVENTURI could also be masculine genitive singular or neuter genitive singular.   The English definitions are sometimes translated from Hederich and sometimes taken from other sources.

First square:
EMERCARI is the infinitive of the deponent verb *emercor* meaning "buy."
NIVEORUM is the masculine genitive plural form of the adjective *niveus* meaning "snowy."
ONOSMATI is the dative singular of the noun *onosma*, a flowering plant of the forget-me-not family.
DELAMBAT is the third person singular present subjunctive form of the verb *delambo* meaning "lick."
ARANEATA is the feminine nominative singular of the perfect participle of the verb *araneo*, which means "be full of cobwebs."
RARANTUR is the third person plural present passive form of *raro*, a verb meaning "refine" or "make rare."
EVENTURI is the masculine nominative plural of the future participle of the verb *evenio* meaning "come to pass."
SISTARIS is the second person singular present passive subjunctive form of the verb *sisto*, which means "place" or "cause to stand."
ENODARES is the second person singular imperfect active subjunctive form of the verb *enodo* meaning "untie" or "free from knots."
MINERAVI is the first person singular perfect active form of the verb *minero* meaning "mine (for metal)."
EVOLARES is the second person singular imperfect active subjunctive form of the verb *evolo* meaning "fly out or away."
RESANANT is the third person plural present active form of the verb *resano* meaning "heal again."
COMMENTA is the feminine nominative singular of the perfect participle of the deponent verb *comminiscor*, which means "invent" or "contrive."
ARABATUR is the third person singular imperfect passive form of the verb *aro* meaning "plow."
RUTATURI is the masculine nominative plural of the the future participle of the verb *ruto* meaning "dig up."
IMITARIS is the second person singular present form of the deponent verb *imitor* meaning "imitate."

Second square:
EFFLETOS is the masculine accusative plural of the perfect participle of the verb *effleo* meaning "exhale."
GELATOTE is the second person plural future imperative of the verb *gelo* meaning "freeze."

ENATURIS is the ablative plural of the future participle of the deponent verb *enascor* meaning "be born from" or "exit."

SEMENTAS is the second person singular present form of the verb *semento* meaning "bear seed."

SOMNIATO is the masculine ablative singular of the perfect participle of the verb *somnio* meaning "dream."

ERADAMUR is the first person plural present passive subjunctive form of the verb *erado* meaning "scrape off" or "obliterate."

RURATURI is the masculine nominative plural of the the future participle of the verb *ruro* (or its deponent twin *ruror*) meaning "live in the country."

OMISERIS is the second person singular perfect active subjunctive form of *omitto*, a verb meaning "dismiss" or "omit."

EGESSERO is the first person singular future perfect form of the verb *egero* meaning "bring out."

FENEORUM is the masculine genitive plural of the adjective *feneus,* which means "of hay."

FLAMMARI is the passive infinitive of the verb *flammo* meaning "enflame."

LATENDAS is the feminine accusative plural form of the gerundive of the verb *lateo*, which means "hide." This verb is usually intransitive, but the *Oxford Latin Dictionary* (OLD) and Lewis & Short both confirm this verb can also be transitive.

ETUNIATE is the second person plural present imperative of the verb *etunio,* meaning "discharge liability." If not for this word, every word in the second square would be found in Gaffiot as well as in Hederich.

TORTAMUR is the first person plural present passive form of *torto*, a verb meaning "torture."

OTIATURI is the masculine nominative plural form of the future participle of the deponent verb *otior*, meaning "be at leisure."

SESSORIS is the genitive singular of the noun *sessor*, meaning "one who sits."

Anagram aficionados may have noticed a bond linking these two squares: ONOSMATI in the first square is a transposal of SOMNIATO in the second.

These two squares illustrate a general trend among large Latin word squares, namely the preponderance of verb forms. One reason is that a given verb generates dozens of distinct forms, more than adjectives and far more than nouns. The other reason is that verbs' inflectional endings tend to be longer; many verb endings are four letters or longer (-ARIS, -ABATUR, -ENTUR, etc.), while only three inflectional endings for nouns are four letters long (-ORUM, -ARUM, -IBUS). A construction approach based on maximizing the collective frequency of final trigrams or tetragrams will therefore naturally draw upon a large number of verb forms.

There does not appear to be a published double nine-square consisting of solid dictionary words in any single language, whether uncapitalized or not, though Jeff Grant's tongue-in-cheek "A Word Square of the Future" (Word Ways, May 1992) sought this goal in English by introducing five coined words. Another step toward this goal occurred in French with Jean-Charles Meyrignac's 9x8 word rectangle, as reported by A. Ross Eckler and Faith W. Eckler ("A Near-Perfect French 9-by-8 Word Rectangle," Word Ways, November 2007). The dream of a double nine-square remained unfulfilled, however, and it was estimated that one would be as difficult to construct as a traditional ten-square.

Once again, Latin is up to the task. The following 9x9 double word square consists entirely of solid, uncapitalized Latin words. As a bonus, it comes close to being a single-source square because

seventeen of its words can be found in Hederich; the sole exception, DERUPEREM, can be found in Lewis & Short.

```
ADAMPLIAS
DEMIRANDO
PRISANTUR
LUCESCENT
OPERIENDI
SEMINATAE
URITABANT
RENATANTI
AMISISTIS
```

ADAMPLIAS is the second person singular present form of *adamplio*, a verb meaning "enlarge."
DEMIRANDO is the neuter ablative singular form of the gerundive of the deponent verb *demiror*, meaning "wonder at."
PRISANTUR is the third person plural present passive subjunctive form of *priso*, meaning "seize."
LUCESCENT is the third person plural future form of the verb *lucesco*, meaning "start to shine."
OPERIENDI is the genitive form of the gerund of the verb *operio*, which means "cover."
SEMINATAE is the feminine nominative plural form of the perfect participle of *semino*, meaning "sow."
URITABANT is the third person plural imperfect form of *urito*, a frequentative verb for "burn a lot."
RENATANTI is the dative singular of the present participle of the verb *renato*, "swim back."
AMISISTIS is the second person plural perfect form of *amitto*, meaning "send away."
ADPLOSURA is the feminine nominative singular of the future participle of *adplodo*, meaning "strike against" or "applaud."
DERUPEREM is the first person singular imperfect subjunctive of *derupio*, which means "tear away." Lewis & Short cross-references *derupio* to *deripio*, and the latter does appear in Hederich.
AMICEMINI is the second person plural present passive subjunctive form of *amico*, meaning "render favorable" or "make friendly to oneself."
MISERITAS can be a rare noun meaning "misery," but in Hederich it is the feminine accusative plural form of the perfect participle of the deponent verb *misereor*, meaning "have pity."
PRASINATI is the masculine nominative plural of the adjective *prasinatus*, meaning "dressed in green."
LANCEABAS is the second person singular imperfect form of *lanceo*, which means "wield a lance."
INTENTANT is the third person plural present form of the verb *intento*, meaning "direct against."
ADUNDANTI is the dative singular of the present participle of *adundo*, a verb meaning "be abundant."
SORTIETIS is the second person plural future form of the verb *sortio*, meaning "draw lots."

The next step is the holy grail of logology: the perfect ten-square. For more than a century, formists have sought to produce a non-tautonymic 10x10 word square consisting of solid, uncapitalized words in a single language, but no such solution has been found. Most prolifically, the late Rex Gooch generated hundreds of computer-generated ten-squares, leaning heavily on proper names. His DESCENDANT square ("Some Superior Ten-Squares," Word Ways, November 2002) is generally considered the best English-language ten-square to date, but even this square contains two capitalized place names, two taxonomic names (one of which is capitalized), and one hyphenated word. Attempts in other languages have likewise approached the goal, such as the French REMEURTRIE square by Michel Laclos; published in his book *Jeux de lettres, jeux de l'esprit* in 1977, that square appears to consist of seven dictionary words, one plausibly coined variant, one less plausibly coined phrase, and one non-word. As

far as I can determine, the most nearly perfect solution in any language to date has been the RASKAKKERS square in Dutch, constructed by Bob Lucassen and posted to his blog Unnecessarily Complicated in 2017; it consists of nine solid, uncapitalized words and one proper name, a pluralized demonym.

In Latin, the holy grail can finally be attained with the following ten-square, which consists entirely of solid, uncapitalized words found in major dictionaries:

```
DECOCTRICI
EXOBRUERAM
CONDURAREM
OBDUCIMINI
CRUCIFIGIS
TURIFICATI
REAMICABAS
IRRIGABANT
CAENITANTI
IMMISISTIS
```

DECOCTRICI is the dative singular form of *decoctrix*, the feminine word for "spendthrift," found in Hederich.
EXOBRUERAM is the first person singular pluperfect form of the verb *exobruo*, which means "dig out" or "disengage" and appears in Hederich.
CONDURAREM is the first person singular imperfect subjunctive form of *conduro*, which means "make hard" and is found in Hederich.
OBDUCIMINI is the second person plural present passive form of the verb *obduco*, meaning "lead towards" or "cover over" and found in Hederich.
CRUCIFIGIS is the second person singular present form of the verb *crucifigo*, which means "crucify" and appears in Hederich.
TURIFICATI is the nominative plural of the noun *turificatus*, found in Hederich and meaning "one who offers incense (to the gods)."
REAMICABAS is the second person singular imperfect form of the verb *reamico*, meaning "love in return." This word is found in the *Thesaurus Linguae Latinae* (TLL), whose R volume is currently being published in fascicles and is therefore not yet available in the digital edition; a copy of the fascicle containing *reamico* is available in the reference collection at the Library of Congress.
IRRIGABINT is the third person plural future form of the verb *irrigo*, meaning "irrigate" and found in Hederich. The imperfect form IRRIGABANT would fit just as well, but IRRIGABINT was chosen because the square did not include any other verbs in the future tense.
CAENITANTI is the dative singular form of the present participle of the verb *caenito*, which means "dine often" and found in Georges.
IMMISISTIS is the second person plural perfect form of the verb *immitto*, meaning "send into" and appearing in Hederich.

The words in this square are more familiar than the brief summaries above might suggest. The verbs *obduco*, *conduro*, *irrigo*, and *immitto* are so common as to appear in even the most abridged of dictionaries, and *crucifigo* is commonplace as well; encountering such everyday words in a large word square is a pleasant surprise, like finding EXISTENCE in Eric Albert's nine-square. Even the three

least common dictionary entries would be readily recognizable from other sources. *Decoctrix*, which is also an entry in Hoven, is formed as the feminine agent noun from the verb *decoquo*, which appears in nearly every dictionary. The verb *reamico* is the common prefix *re-* combined with *amico*, a verb that appears in most dictionaries and was used above in the double nine-square. Likewise, nearly every dictionary contains *cenito* or *coenito*, the more common spellings of *caenito*, and some dictionaries accommodate this spelling variance with a categorical cross-reference such as "*caen-*: see *cen-*."

The above ten-square can be covered by three sources: eight words in Hederich and one each in Georges and TLL. Although I have not yet found a single-source ten-square, the next square comes extremely close because the first nine words appear in Hederich, while the tenth word appears in Hederich only as *strito* rather than the needed *stritto*. This is particularly heartbreaking because the spelling *stritto* is more common, appearing in Gaffiot, Lewis & Short, and OLD, for example. This square is also unusual for consisting entirely of verbs.

```
FRICABATIS
RENODABINT
INCALLATUR
COADULTURI
ADLUDIABIT
BALLISTANT
ABATATURAE
TITUBARENT
INURINANTI
STRITTERIS
```

FRICABATIS is the second person plural imperfect form of the verb *frico*, meaning "rub."
RENODABINT is the third person plural future form of *renodo*, which means "untie."
INCALLATUR is the third person singular present form of *incallo*, meaning "render callous."
COADULTURI is the masculine nominative plural of the future participle of *coadolesco*, meaning "grow up with."
ADLUDIABIT is the third person singular future form of *adludio*, a verb meaning "caress" or "play or frolic (with)."
BALLISTANT is the third person plural present form of the verb *ballisto*, which means "shoot."
ABATATURAE is the feminine nominative plural form of the future participle of *abato*, which means "beat down" or, in legal contexts, "abate."
TITUBARENT is the third person plural imperfect subjunctive form of *titubo*, meaning "walk unsteadily, stagger."
INURINANTI is the dative singular of the present participle of the deponent verb *inurinor*, which means "plunge or dive in."
STRITTETIS is second person plural present subjunctive form of *stritto*; this verb echoes *titubo* because *stritto* means "be unsteady on one's feet."

As referenced in the introduction, I produced these squares by selecting final rows that combined to produce common endings and therefore maximize the chance of completing the rest of the grid. The next four ten-squares, which are unrelated to the two preceding squares but have the same final three rows as each other, show how fecund a single well-chosen combination can be.

```
DESIDERATA     CAPISTRATA     PROSPIRATA     DESFODRATA
EMUNIRERIS     AZEMPRERIS     REBURNERIS     ESCARIERIS
SUBTREMENS     PERPLACENS     OBIRASCENS     SCATESCENS
INTREMENTI     IMPROBANTI     SURREPENTI     FATISCENTI
DIRIPIATIS     SPLORANTIS     PRAESENTIS     ORESCENTIS
EREMITTANT     TRABATTANT     INSPECTANT     DISCEPTANT
REMEATURAE     RECANTURAE     RECENTURAE     RECENTURAE
ARENTARENT     ARENTARENT     ARENTARENT     ARENTARENT
TINTINANTI     TINTINANTI     TINTINANTI     TINTINANTI
ASSISTETIS     ASSISTETIS     ASSISTETIS     ASSISTETIS
```

For brevity, the words in these squares are alphabetized with their lemmata and sources given in lieu of full grammatical explanations: ARENTARENT (*arento*, Hederich); ASSISTETIS (*assisto*, Lewis & Short); AZEMPRERIS (*azempro*, Du Cange); CAPISTRATA (*capistro*, Lewis & Short); DESFODRATA (*desfodratus*, Du Cange); DESIDERATA (*desidero*, Lewis & Short); DIRIPIATIS (*diripio*, Lewis & Short); DISCEPTANT (*discepto*, Lewis & Short); EMANABERIS (*emano*, Gaffiot as transitive); EMUNIRERIS (*emunio*, Lewis & Short); EREMITTANT (*eremitto*, Du Cange); ESCARIERIS (*escario*, Du Cange); FATISCENTI (*fatisco*, Lewis & Short); IMPROBANTI (*improbo*, Lewis & Short); INCONCANTI (*inconco*, Du Cange); INTRIMENTI (*intrimentum*, Lewis & Short); INSPECTANT (*inspecto*, Lewis & Short); MARCESCENS (*marcesco*, Lewis & Short); OBIRASCENS (*obirascor*, Lewis & Short); OBSCULTANT (*obsculto*, Du Cange); ORESCENTIS (*oresco*, Gaffiot); PERPLACENS (*perplaceo*, Lewis & Short); PRAESENTIS (*praesens*, Lewis & Short); PROSPIRATA (*prospiro*, Hederich); REBURNERIS (*reburno*, Du Cange); RECANTURAE (*recano*, Hederich); RECENTURAE (*recino*, Hederich); REMEATURAE (*remeo*, Gaffiot); SCATESCENS (*scatesco*, Hederich); SEMIVORATA (*semivoratus*, Ramminger); SPLORANTIS (*sploro*, Du Cange); SUBTREMENS (*subtremo*, Ramminger); SURREPENTI (*surrepo*, Lewis & Short); TINTINANTI (*tintino*, Lewis & Short); TRABATTANT (*trabatto*, Du Cange); VAENEUNTIS (*vaeneo*, Lewis & Short).

The next step is the eleven-square.   No one has come close to achieving an 11x11 word square using dictionary words in any language, whether solid and uncapitalized or not, and few have ventured to try. The two eleven-squares published in Word Ways were both constructed by Rex Gooch ("The Eleven Square, Take One," August 2004, and "The Eleven-Square, Take Two," May 2005), but these two squares collectively contain only one English word.   There do not appear to have been any eleven-square attempts in other languages, but Latin stands ready to tackle this challenge:

```
RESCISSEMUR
EXTENTERARE
STENDERERIS
CENSEREMINI
INDEFINITAM
STERILITARI
SERENITATIS
EREMITARIOS
MARITATIONI
URINATIONEM
RESIMISSIMI
```

RESCISSEMUR is the first person plural future passive form of the verb *rescisso* meaning "discover (something unexpected)," found in Calepino. Although entities being discovered would not typically be people, it would be reasonable to use this verb for learning of unexpected guests at a party, for example.

EXTENTERARE is the infinitive of the verb *extentero*, found in Gaffiot and meaning "disembowel."

STENDERERIS is the second person singular imperfect passive subjunctive form of the verb *stendo*, which is an entry in DMLBS; it is defined as an apheretic form of *extendo*, a versatile verb whose primary meaning is "extend" or "stretch out." The citation in DMLBS uses a passive meaning related to the valuation of land, but in the second person passive it is more reasonable to use a passive meaning found in OLD under *extendo* that refers to people, namely the sense of "lie in death."

CENSEREMINI is the second person plural imperfect passive subjunctive form of *censeo*, which means "value, esteem" and is found in Hederich.

INDEFINITAM is the feminine accusative singular form of *indefinitus*, an adjective in Hederich meaning "indefinite." This is the first of four words whose meanings are clear from their English cognates.

STERILITATI is the dative singular of *sterilitas*, a noun in Hederich that means "sterility."

SERENITATIS is the genitive singular of *serenitas*, which means "serenity" and appears in Hederich. This particular inflected form may be familiar because Mare Serenitatis is one of the most visible features on the Moon.

EREMITARIOS is the masculine accusative plural form of the adjective *eremitarius*, which means "living a hermit's life" and is found in Niermeyer.

MARITATIONI is the dative singular of *maritatio*, which is found in Hederich and means "wedding" or "marriage."

URINATIONEM is the accusative singular of *urinatio*, which means "urination" and is found in Ramminger.

RESIMISSIMI is the masculine genitive singular of the superlative form of the adjective *resimus* meaning "turned up" or "bent back," which typically describes noses and is found in Hederich. The comparative form of this adjective occurs in the works of the 15th-century physician Paolo Giovio, and there is no reason the most turned-up of three noses would not be described by the superlative. The form RESIMISSIMI is appropriately masculine because the usual Latin word for "nose" is masculine.

Using the same final three rows, I have also constructed a second eleven-square, but this second one is less appealing because the words are generally less common, and two of the verbs occur in forms that are grammatically sound but somewhat unlikely to occur in everyday contexts.

```
SCISSURAMUR
CONTENERARE
INFAMATORIS
STAMINAMINI
SEMILIMATAM
UNANIMITATI
RETAMINATIS
AROMATARIOS
MARITATIONI
URINATIONEM
RESIMISSIMI
```

SCISSURAMUR is the first person plural present passive form of the verb *scissuro*, meaning "cut (cloth, as to make garments)" and found in DMBLS. Because it is passive, a first person form in the literal sense seems impractical for anything but sentient fabric, but it becomes more natural if the verb is taken figuratively. If the comradely idiom "we are cut from the same cloth" were translated into Latin, it would use this form of the verb: *scissuramur ex eodem panno*.

CONTENERARE is the infinitive of *contenero*, a verb in Du Cange meaning "make tender."

INFAMATORIS is the genitive singular of the noun *infamator*, found in DMLBS and meaning "slanderer."

STAMINAMINI is the second person plural present passive form of *stamino;* Hederich defines this verb as "spin (thread)," while Stephanus defines it as "support (a vine) with stakes." This is the other word form that seems unlikely to arise in everyday use, though admittedly there is nothing to prohibit a human from addressing inanimate objects; for example, a vintner who spent the morning placing stakes to support grapevines might look at the vines with satisfaction and say *nunc staminamini* ("now you are supported by stakes").

SEMILIMATAM is the feminine accusative singular of the adjective *semilimatus*, found in Hoven and meaning "half-polished."

UNANIMITATI is the dative singular of the noun *unanimitas*, which means "unanimity" and appears in Lewis & Short.

RETAMINATIS is the second person plural present form of the verb *retamino*, found in de Serres and meaning "befoul, particularly with excrement." This is a mercifully rare verb.

AROMATARIOS is the accusative plural of the noun *aromatarius*, meaning "dealer in spices" or "apothecary" and found in Lewis & Short.

The last three words are the same as in the previous eleven-square.

Latin-savvy readers may have noticed opportunities to modify the word squares presented above by changing letters or words; such opportunities are numerous because any square is likely to be found in a sweet spot where favorable letter combinations occur. As always, the simplest way to modify a square is to change a single letter on the diagonal of a non-double word square. Using the top rows of the first two ten-squares as examples, DECOCTRICI could be replaced by RECOCTRICI (the dative singular of *recoctrix*, a feminine adjective found in Hoven meaning "able to reenergize" or "able to reforge"), and FRICABATIS could be replaced by TRICABATIS (the second person plural imperfect form of *trico*, defined in DMLBS and Du Cange as "delay").

Less trivially, some non-diagonal squares can be changed. For example, the first eleven-square could be modified by changing EXTENTERARE to EXTENTERATE (the second person plural present imperative form of the same verb), while URINATIONEM would be changed to UTINATIONEM (the accusative singular of *utinatio*, defined in DMLBS as "wish" or "expression of a wish"). The DECOCTRICI square could include two rare letters, X and J, if its third and fourth words were changed to CONJURAREM (the first person singular imperfect subjunctive form of *conjuro*, meaning "conspire") and OBJICIMINI (the second person plural present passive form of *objicio*, meaning "throw towards"), both found in Gaffiot.

Even the double word squares are amenable to change. For example, the lower left corner of the double nine-square can be changed to O, or the word AMICEMINI can be replaced by ALITEMINI. For larger modifications, favorable sets of words in the right and bottom positions of a double word square can be retained while words in the upper left quadrant are reworked. As one such challenge, the reader is

invited to modify the EFFLETOS-EGESSERO double eight-square to incorporate an aquatic plant, a precious stone that Pliny believed had magical properties, forms of verbs meaning "make lukewarm" and "live through a year," and a flexible space that can variously be filled with G, R, or V.

Better still, the reader is encouraged to construct entirely new squares.   Latin has been shown to support the construction of word squares and double word squares that are larger than those constructed in other languages to date and that consist entirely of solid, uncapitalized dictionary words.   Now that eleven-squares have been constructed, it is reasonable to expect a double ten-square would be possible, and one might even be daring enough to pursue a twelve-square in Latin.   To quote the Aeneid, *audentis Fortuna iuvat:* Fortune favors the bold.

References
- Calepino, Ambrogio; *Ambrosii Calepini Lexicon* (1537)
- de Serres, Jean; *Synonymorum libellus ex optimis latinae et graecae linguae scriptoribus congestus* (1579)
- *Dictionary of Medieval Latin from British Sources (DMLBS)*, ed. R. E. Latham, D. R. Howlett, and R. K. Ashdowne (digital 2016, accessible via Logeion)
- Du Cange, Charles du Fresne, Sieur; *Glossarium mediae et infimae latinitatis* (1678)
- Gaffiot, Félix; *Dictionnaire illustré latin-français* (1934; digital 2016, accessible via Logeion)
- Georges, Karl Ernst; *Ausführliches lateinisch-deutsches und deutsch-lateinisches Handwörterbuch* (1879)
- Hederich, Benjamin; *Lexicon manuale latino-germanicum* (1739)
- Hoven, René; *Lexique de la prose latine de la Renaissance* (2006)
- Lewis, Charlton T., and Short, Charles; *A Latin Dictionary* (1879)
- Niermeyer, Jan Frederik; *Mediae Latinitatis lexicon minus: Ab-Zucarum* (1954)
- *Oxford Latin Dictionary (OLD)*, ed. P. G. W. Glare (1968)
- Ramminger, Johann; *Neulateinische Wortliste* (2008, online)
- Stephanus, Robertus; *Dictionariolum latino-graeco-gallicum* (1582)
- *Thesaurus Linguae Latinae (TLL)*, Bavarian Academy of Sciences (1894 to present)

NURSERY FREE VERSE

ANIL
Perth, Australia

I'm looked down on by most modern poets, who use only free verse and disdain rhyme. I here humbly seek to make amends by writing some free verse. To suit my childish mentality I start on Nursery Rhymes, translating some classics into Nursery Free Verse. I hope they'll like me now.

Mary, a Backwoods Narrative

Mary was a young otherwise anonymous farm girl.
She had a pet snow-white lamb.
It was a brilliant titanium oxide-white cutie.
It followed her everywhere, o'er hill and dale.
Even (illegally) to school one day!
The young students were delighted.
The story seems to end there.

A Small Young Lady with the Strange Name of Peep, *Bo* Peep, aka *Little* Bo Peep, with the Very Adult Job of Shepherding

This peculiar girl has carelessly misplaced an entire flock of sheep.
She was supposed to be watching over them.

'Leave them alone,' a voice from heaven advised.
'They're not as stupid as you and will find their own way back.
They'll be embarrassed and apologise.'

We are not told from where the voice came.
Nor why it gave a hoot.
Nor whether it was correct.

I suppose it's up to us to imagine all those details.
How dare them.

Another Small Very Young Unmarried Woman Meets an Arachnid in the Woods

The young lady's name was Muffet, first or last name not specified.

She walked in the woods for so long that her milk curdled.
Dear me.

She didn't realise this until lunchtime.
After a long search she *finally* found a nice soft tuffet to sit on to eat.
(What is a tuffet anyway? I always took it to mean her tush.)

She set table for her lactarian breakfast of milk with milk.
Then she found the milk had separated into curds and whey.
She cried.
She tried to re-mix them.
She couldn't achieve the taste of fresh milk.
Still she seemed to enjoy it and wasn't bothered.

All this soon became irrelevant.
A harmless Spider politely say down at her side.
It was the size of her Father, she said.
It just wanted to be friends.

She didn't realise this
and was scared tuffet-less.
But she was no arachnocidal maniac
nor a brave killer in general,
so she merely screamed her bloody lungs out
and ran like Grendel himself was bearing down on her.

Anyhow, she got away safely if badly shaken.
This, unlike most Nursery Free Verse,
can be presumed to have had a happy ending.
You're welcome.

The Story of an Incredibly Nimble Candlestick Jumper

Well, the title pretty well says it all in this supershort NFV.

One missing detail is how big the candle was.
Was it so big that his clearing it was an exceptional feat.
Did he set a Guinness Record for candle jumping?
Otherwise, so what?

Another detail is of dubious importance.
What is the speedy jumper's full name?
The Rhyme says his name was Jack.
A likely alias, I bet.

Jack (or whatever his true name is) had this to say:
'Contrary to crass rumours and gross misinterpretation,
I am *not* a dog.'

LETTER FROM MARTIN GARDNER TO TAPAN KUMAR MUKHERJEE 27 April 88

Sir, I am sending a copy of letter received by me from Martin Gardner who was one of the founding fathers of the journal Wordways along with Dmitri Borgmann. I shall be happy if you will consider it for publication of the letter in your journal for the benefit of readers who might be interested in it. I am a regular reader of the journal that offers huge knowledge and enjoyment of the language for the variety of ways words are put in place. The contributions to the journal are ample testimony to resilience and richness of the English language.

Thank you very much indeed.

Tapan Kumar Mukherjee
c/o D. Mukherjee
Subhas Pallee, Burdwan 713101
West Bengal, India

Martin Gardner, Pres.
Woods End, Inc.
104 Woods End Drive
Hendersonville, North Carolina 28739

New address → *110 Glenbrook Drive*

Dear Mr. Mukherjee: 27 April 88

     Thank you for your letter and your kind comments about
my writings. Although I have never been to India, I have always
had a great fondness for India's history and culture, and it
is a pleasure to know that I have readers there.

     I wish I could send you some of my books, but I get
so many requests for them from overseas readers who do not
have access to them in libraries, and it has become so enormously
expensive to pay for postage on books sent out of the US, that
I have been forced to adopt a policy of not responding to such
requests. I know that you did not make such a request, but
I want to explain why I have to adopt such a policy.

     I am enclosing a bibliography of all my books except
books for children, and books dealing with conjuring that sell
only in magic stores. My Whys of a Philosophical Scrivener is
a sort of confessional of all
the things I believe, from God to democratic socialism. My
Ambidextrous Universe, about left-right symmetry in science,
has been out of print for about a decade. Late this year
I will be revising it and updating it for a new edition. My
Scientific American columns have been appearing in books,
of which there are now a dozen such collections. The 13th will
be published late this year by W. H. Freeman under the title
of From Penrose Tiles to Trapdoor Ciphers. I still have two
or three more books to go before I exhaust all the columns.

                         all best,

                         Martin Gardner

MAGIC SQUARES REVISITED

Jeremiah Farrell
Indianapolis, Indiana

A word puzzle. What do the three phrases have in common?

(1) A late rate.
(2) Area rates.
(3) Large area.

Of course they are all nine letters long but also they have one letter used three times two letters used two times and two letters used one time. Also, each can be used in a 3x3 word square thusly:

A	R	T
L	A	E
E	T	A

A	E	S
R	A	E
T	R	A

L	E	R
A	A	A
E	R	G

Some definitions. AAA is American Automobile Association, Tae Kwon Do is a Korean martial art, LAE is a Papua New Guinea seaport, RAE Dawn Chong is an actress, AES Alienum (L) means debt, LER is a village in Norway, and TRA-La is an interjection expressing joy.

The basic idea here can be extended indefinitely but must require numbers instead of letters.

We introduce here a curious infinite class of n x n magic squares each with magic constant n^2. In addition we propose some entertaining puzzles and games using moveable pieces for several small values of n. Three typical examples employing their n^2 triangle of numbers follow.

n = 3

```
      3
    2 3 4
  1 2 3 4 5
```

4	1	4
3	3	3
2	5	2

n = 4

```
       4
      3 4 5
    2 3 4 5 6
  1 2 3 4 5 6 7
```

1	5	6	4
6	4	3	3
5	5	4	2
4	2	3	7

n = 5

```
          5
        4 5 6
      3 4 5 6 7
    2 3 4 5 6 7 8
  1 2 3 4 5 6 7 8 9
```

1	8	4	7	5
8	6	3	6	2
4	5	5	5	6
7	4	7	4	3
5	2	6	3	9

As usual each of these cases has constant sums along each row, column and two main diagonals. Their magic sums are respectively 9, 16, and 25. We note that the case n = 1 is trivial but the case n = 2 can only be magic, say, on the diagonals.

2	1
3	2

There is only one example not counting rotations or reflections as different for the n = 3 case but there are multiple solutions for all n greater than 3.

GENERATING INFINITELY MANY EXAMPLES

It is well-known that except for n = 2, 3 or 6 orthogonal diagonal Latin squares exist. (1) Recall that an n x n diagonal Latin square will use the numbers {0, 1, 3, . . . , n-1 so that every row, column and the two main diagonals use each of the n numbers exactly once. A pair of such squares will sometimes superimpose so that the n^2 pairs 00, 01, . . . , (n-1)(n-1) occur exactly once. They are then called orthogonal. An example for n = 4 could be

00	32	23	11
13	21	30	02
31	03	12	20
22	10	01	33

This square may be changed to one of our special 4 x 4 examples by adding each pair of numbers and then increasing each entry by one. The result is

1	6	6	3
5	4	4	3
5	4	4	3
5	2	2	7

This technique will yield examples for all n greater than 3 except for the case n = 6. Leonard Euler (1707-1783) toward the end of his life stated: "A very curious question is the following: A meeting of 36 officers of 6 different ranks and from 6 different regiments must be arranged in a square in such a manner that each orthogonal contains 6 officers from different regiments and of different ranks". Euler could find no solution to this problem and conjectured that no Latin squares existed for n = 4k+2. In 1901 Tarry proved that n = 6 was indeed impossible by checking all possibilities and 60 years later R. C. Bose, E. T. Parker, and G. G. Shrikhande proved the other cases possible.(2)

For our squares, the cases n = 3, 4, and 5 are given above and for n = 6 we offer this 2-band construction using the outer numbers of the 6 x 6 triangle.

```
              6
            5 6 7
          4 5 6 7 8
        3 4 5 6 7 8 9
      2 3 4 5 6 7 8 9 10
    1 2 3 4 5 6 7 8 9 10 11
```

1	10	9	8	2	6
9					3
8					4
7					5
5					7
6	2	3	4	10	11

The center 4 x 4 uses the 16 numbers from the inner triangle arranged so that their magic sum is 24. This can be accomplished by adding 2 to each entry of any previous 4 x 4. For instance, using the 4 x 4 above yields:

3	8	8	5
7	6	6	5
7	6	6	5
7	4	4	9

THE 2-BAND CONSTRUCTION IN GENERAL

x

1	.	.	.	n
.		(n-2)x(n-2)		.
.		square with		.
.		constant n(n-2)		.
n	.	.	.	2n-1

The left "x" label appears to the left of this square.

The outer 2-band on any n x n triangle of numbers will include n, n and 1, 2n-1 which will be placed on the corners of the n x n as shown. There will be left over two sets of pairs of values that sum to 2n. That is, two copies of

List (I) 2n-2, 2n-3, 2n-4, 2n-5, . . . n+4, n+3, n+2, n+1
        2 , 3 ,   4 ,   5 ,. . . n-4, n-3, n-2, n-1

The interior square can always be made by adding 2 to any previous (n-2)x(n-2) square.

The x will be the sum of n-2 entries in the top row or the left column and x = n^2-n-1 = (n-2)(n+1)+1. Note that four consecutive entries in List (I) always can be made to sum to 4(n+1). For example 2n-2, 4, 2n-3, 5. We use this fact to generate our infinite set of magic squares.

n = 4k case. Example n = 8, n-2 = 6
      List (I) becomes
      14, 13, 12, 11, 10, 9
       2, 3, 4, 5, 6, 7
      and x will be 14, 4, 13, 5, 10, 9
      opposite x will be 2, 12, 3, 11, 6, 7
      Each increase of four to n can always be made to sum to 4(n+1).

n = 4k+1 case. Example n = 9, n-2 = 7
      List (I) becomes
      16, 15, 14, 13, 12, 11, 10
       2, 3, 4, 5, 6, 7, 8
      x becomes 16, 4, 15, 5, 12, 8, 7
      and opposite 2, 14, 3, 13, 6, 10, 11
      If n is increased by groups of four we always make these sum to 4(n+1).

n = 4k+2 case. Example n = 10, n-2 = 8
  (I) 18, 17, 16, 15, 14, 13, 12, 11
       2, 3, 4, 5, 6, 7, 8, 9
      There 14, 8, 12, 11 and the other 14, 13, 7, 11. As usual any additional fours will be made to sum to 4(n+1).

n = 4k+3 case. Example n = 7-, n-2 = 5
  (I) 12, 11, 10, 9, 8
      2, 3, 4, 5, 6
      Two x's are again necessary. They are 12, 4, 11, 5, 9 and 12, 4, 11, 6, 8. Additional fours are treated as usual.

Since $x = n^2-n-1$ and the total sum of the pairs on List I is $(n-2)2n$ we will for all n have a sum opposite to x of $(n-2)2n - x = n^2-3n+1$ so when the endpoints n and 2n-1 are added one obtains the proper sum of n^2 for both the bottom row and the right-most column. The diagonals are always correct.

Changing the (n-2)x(n-2) center square will generate a new n x n square. For a given center we can permute the top x and the left x (with the appropriate opposites) and also create new n x n squares but it is not known in general the number of different squares of order n that exist.

It is of some interest to note that Albrecht Dürer's 1514 engraving *Melencolia I* that includes a 4 x 4 magic square can be turned into one of our 2-bands.

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

Dürer

7	3	2	4
2	4	5	5
3	3	4	6
4	6	5	1

Converted

The conversion starts by replacing the numbers 1, 2, . . ., 15, 16 with 0, 1, . . ., 14, 15 then converting each entry into its two-place base 4 number. These two-place numbers are added and increased by one to complete the conversion.

This technique will not work in some cases. An example that fails on the diagonals is

1	14	0	5
10	9	7	4
13	2	12	3
6	5	11	8

which converts to

2	6	1	7
5	4	5	2
5	3	4	4
4	3	6	3

SOME INTERACTIVE PUZZLES AND GAMES

We shall use the following set of 25 monominos for our suggested puzzles and games.
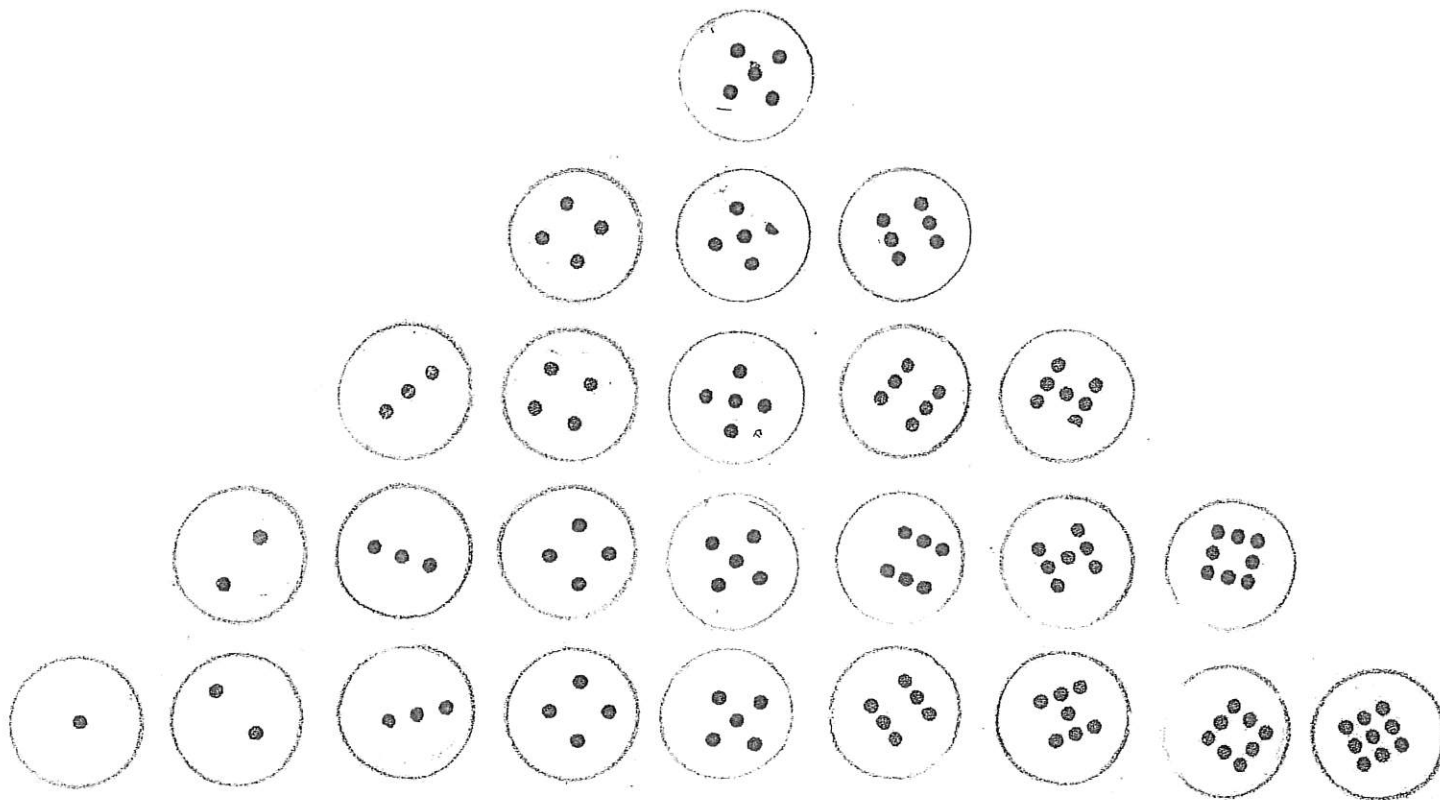
Any triangular subset of 9 pieces can be arranged into a 3 x 3 magic square (the left-most triangle will have constant 9). Also, any triangular set of 16 pieces can form a 4 x 4 magic square. The full set will be used to construct 5 x 5 squares.

The 4 x 4 squares have some special arrangements which will be illustrated using the left-most triangular set of 16 monominos. The hardest magic square is to place the 16 pieces on a grid so that:

     (1) Every row and column sum to 16.
     (2) All 8 diagonals (including the broken ones) sum to 16.
     (3) The nine 2 x 2 squares each sum to 16.
     (4) The four corners sum to 16.

Some mathematical background. There are $(16!) / (4!)(3!)(3!)(2!)(2!) = 6054048000$ ways of filling the grid with the 16 tokens that will look different to the eye. If we don't count reflections and rotations as different this reduces to 756756000 different placements.

Our solution requirements make this puzzle one of what is called by Dame Kathleen Ollernshaw (1912-2014) a most-perfect magic square. This remarkable lady published when she was 87 years old (*Most-Perfect Pandiagonal Magic Squares*, The Institute of Mathematics and its Applications, 1998, Great Britain, University Press, Cambridge) a complete solution set for all 4k=n such squares. With her co-author David Brée, this was the first time a complete enumeration of an infinite subset of magic squares was completed. Of course she used the number set 0,1,2,. . ., 15 instead of our 16 tokens.

For the 4x4 case, Dame Ollernshaw found 48 basic solutions, not counting reflections or rotations. Hence our puzzle can have at most 48 basic solutions.

PUZZLE II. A slightly easier puzzle is to use the 16 tokens to complete a 4x4 traditional magic square that sums to 16 on every row, column, and the two main diagonals. It is known that there are 880 basic solutions to this puzzle using the numbers 0,1, . . ., 14,15. Therefore there can be at most 880 solutions to our puzzle.

An even easier puzzle is to place the pieces in a semimagic square. This kind of square traces back to Leonard Euler and requires that only the rows and columns sum to the magic constant 16.

THE GAMES. For two players. The tokens are mixed face down and the players each draw eight at random. The players alternately place a token of their choice on the grid. They have previously decided to abide by the requirements of one of the three puzzles described above. Last to be able to play a token is the winner.

THE MOST-PERFECT 4x4 PUZZLE GAME SOLUTION

5	5	4	2	5	5
5	1	6	4	5	1
4	6	3	3	4	6
2	4	3	7	2	4
5	5	4	2	5	5
5	1	6	4	5	1

The bold 4x4 outlined grid represents one solution. The border cells mark the start of a tiling of the plane by the solution grid. Alternately it can be regarded as a folding of the 4x4 into a torus. There are 36 sets of four squares that sum to the magic constant 16.

(1) Lines of four: Four rows, four columns and 8 diagonals. The broken diagonals may also be traced intact on the 6x6 grid.
(2) 2x2 squares: Each of the 16 entries can be thought of as the lower right-most entry in a 2x2 square yielding 16 more sums of 16.
(3) Four 3x3 squares with corners

$$1\text{-}4 \ , \ 6\text{-}5 \ , \ 6\text{-}3 \ \text{and} \ 3\text{-}4$$
$$4\text{-}7 \quad 3\text{-}2 \quad 5\text{-}2 \quad \quad 4\text{-}5$$

THE GREEK CROSS 5x5 MAGIC SQUARE
A PUZZLE GAME

The common symbol for five   on a die or a domino has the shape of a Greek Cross. The 25 tokens are used on a 5x5 grid in our puzzles or games.

THE PUZZLES. We require that all 25 tokens be placed on the grid so that the grid always will be magic in one of three ways.

(1) The rows and columns all sum to the magic constant 25. This is the easiest of the puzzles and the square is called semimagic.

(2) The square also sums to 25 on the two main diagonals. This puzzle is a bit harder and the square is a traditional magic square with constant 25.

(3) The hardest puzzle is called a pandiagonal magic square where all 5 rows, all 5 columns and all 10 diagonals (including the broken ones) sum to the magic constant 25.

The ultimate construction will also display small Greek crosses that all sum to 25. Perhaps the solver can spot nine such crosses each centered on one of the 3x3 center nodes of the grid. If the 5x5 grid is folded top to bottom and left to right to form a torus, it is possible to locate a total of 25 small Greek crosses, each that sum to 25.

GAMES. Tokens can be distributed evenly to two or more players and they alternately place a token of their choice on the grid under the rules of one of the puzzles. The last to be able to play wins.

Some mathematics. Not counting rotations or reflections as different there are $(25!) / (5!)(4!)(4!)(3!)(3!)(2!)(2!) = 856,262,777,040,000$ different ways of placing the tokens on the grid. It is known (Sloane A006052*), that the number of traditional fundamental magic squares of order 5 is 275,305,224.

This number should be multiplied by 8 to account for rotations and reflections. Also, since we use the numbers 1 through 9 instead of 1 through 25 the total number of solutions for us could be less than Sloane's figures.

To vary the games or puzzles we sometimes like to place initially all five   s and start from there. There are 53,130 ways to place these five on the grid. (Beware! Some of the arrangements cannot be completed to a magic square.)

*Sloane, N.J.A. Sequence A006052 in "An On-Line version of the Encycolpedia of Integer Sequence" at http://www.research.att.com/-njas/sequences/eisonline.html .

A GREEK CROSS SOLUTION

9	3	6	4	3	9	3
7	1	7	6	4	7	1
4	7	5	4	5	4	7
2	8	2	5	8	2	8
3	6	5	6	5	3	6
9	3	6	4	3	9	3
7	1	7	6	4	7	1

The bold-face 5x5 grid is a solution. The outer border describes the folding of the grid into a torus so as to identify 25 small Greek crosses that each sum to the magic constant 25. The 25 are each centered at one of the 25 entries in the 5x5 grid. For example, the cross centered at 1 is

$$\begin{matrix} 9 & & 6 \\ & 1 & \\ 4 & & 5 \end{matrix}$$

and so on.

There are larger 5s that sum to the constant also. For example, the center 5 and the 4 corners work

$$\begin{matrix} 1 & & 7 \\ & 5 & \\ 3 & & 9 \end{matrix}$$

The reader is invited to count the different ways for herself.

REFERENCES
(1) Layine, C. F. and G. L. Mullen, *Discrete Mathematics Using Latin Squares*, 1998: John Wiley & Sons, Inc.
(2) Gardner, Martin, "Euler's Spoilers", Martin Gardner's New Mathematical Diversions from *Scientific American*, 1966, Simon and Schuster, New York, NY.

MARY'S LITTLE MULE

ANIL
Perth, Australia

This sequel to all the variations of Mary Had a Little Lamb in past Word Ways is from my upcoming poetry collection, *101 Animal Universes*.

After Mary's Little Lamb Ran Away

For to give her life renewal
Mary got a little Mule,
dyslexically coloured bule,
which she called her precious Jewel.

Once she dragged the 'mule' to school
which of course broke every rule.
Kids there laughed and called it fool,
teased it like some kind of ghoul.

Heated by this ridicule
Mule got mad and lost its cool,
kicked up in the vestibule,
broke kids' legs, the careless tool.

Cops agreed is wasn't cool,
threw Mule in the swimming pool,
taught it how to toe the rule
and control that high joule fuel.

shock ending:
In shame Mary ate toadstool
with a poison molecule,
left behind poor orphan Jewel.
(Which I think was very cruel.)

QUIPS OF THE TONGUE
More Amusing Media Boners, with Puckish Rejoinders

DON HAUPTMAN
New York, New York
donhauptman@nyc.rr.com

Recently, at a neighborhood French bistro, I spotted on the menu a side dish identified as "pommel frites." A *pommel* is the knoblike protuberance on a saddle, or part of a sword. Not quite as tasty!

Typos on menus have long been convenient targets for ridicule. Another French term, *prix fixe*, is often rendered as *prefix*—or numerous other creative misspellings.

Now there's another domain for amusing bloopers: dictation on mobile devices. Speech-recognition technology has improved considerably since the earliest systems, when users had to spend hours "teaching" the software to recognize their voices. Still, as with AutoCorrect, interesting transcription errors abound. I usually neglect to jot them down, but here are a few that I experienced and noted: *Audubon* became "*autobahn.*" *Barbuti*, "*bar booty.*" *Mill and Locke*, "*Mel landlocked.*" *Operetta*, "*a Beretta.*" And *prima donna*, "*pre-Madonna.*" Got any of your own risible examples?

As in my 17 previous *Word Ways* roundups of funny errors, the media provide the most fertile territory for sightings by dedicated blooper snoopers, who are always armed with snappy comebacks. Consider the following. . . .

The Wall Street Journal, April 17, 2020:

"'They've been thrust in the stoplight at a level of scrutiny that's typically applied to the biggest tech companies in the world,' Mr. Stamos said."

‣ **Well, the worst that can happen is a traffic ticket.**

The West Side Spirit, N.Y.C. community weekly, June 11-17, 2020:

"We see true need, poverty and desperation every single day right in front of our eyes and yet most have just become immured and do nothing or very little."

‣ **So we're emotionally walled off?**

Bullseye, National Public Radio, July 22, 2018:

"She walked in to use the restroom and spilled her guts to the bartender."

‣ **Ma'am, it's in back on the right.**

New York Post, March 3, 2020:

"But SJP Chairman Steve Pozycki had called Perry's decision 'a dangerous precedent'. . . . Many real estate lawyers greed, arguing that revoking permits retroactively would. . . ."

▸ **As if the industry doesn't get enough criticism on that front.**

The Wall Street Journal, December 29-30, 2018:

"Then again, maybe somebody at AT&T is reckoning with the question of whether it really makes sense to try to replicate Netflix's business model. . . . How many steaming services will consumers really support?"

▸ **Have no fears. As usual, the executives will work everything out in the sauna.**

Sometimes, typos and other mistakes are subsequently caught and corrected. I found the following three specimens in the Corrections column of *The New York Times*. As always, the retorts are my own.

December 3, 2019:

"An article on Thursday about Frank Sheeran, whose life inspired 'The Irishman,' misstated the given name of an organized crime figure killed in a shooting in 1972. He is Joseph (Crazy Joe) Gallo, not Vincent (Crazy Joe) Gallo."

▸ **We take no responsibility, however, for the moniker.**

May 30, 2020:

"The Horror Roundup on Page 56 [of the *Book Review*] misstates the title of a novel by Grady Hendrix. It is 'The Southern Book Club's Guide to Slaying Vampires,' not 'The Southern Book Club's Guide to Killing Vampires.'"

▸ **Doesn't matter to the vampires.**

September 17, 2019:

"An Op-Ed article on Saturday about performance-enhancing drugs and technology referred incorrectly to the classification of ostriches. They are birds, not mammals."

▸ **Did the editors have their heads in the sand?**

Credits: For spotting the "greed" typo, thanks to Iris Bell, N.Y.C. Article title: I thought I had invented it, but a Google search proved that at least 16 clever people had anticipated me.

MISSING POSITIVES

ANIL
Perth, Australia

Many negative words beginning with in- and some with im- do not become positive words by simply dropping the negative prefix—e.g., perious is not a word. I found no un- words of interest.

QUIZ: Pick which of the words in this list are *not* words with the prefix removed. All in- words here use the negator in-. Words using in- meaning in or into are of course excluded.

1. immaculate 27. inexpugnable
2. immarcescible (unfading, imperishable) 28. inexpungible
3. immitigable 29. inexorable
4. immune/immunology 30. infamy
5. impeccable 31. infant/infantile
6. imperseverant (can't perceive or persevere) 32. infantry
7. implete 33. infidel
8. impostor 34. infirmary
9. impromptu 35. infusible
10. impunity 36. ingrate
11. inalienable 37. inimical
12. incessant 38. iniquity
13. incognito 39. innocence
14. incommunicado 40. innocent
15. incondite (poorly constructed or composed) 41. innocuous
16. inconnu/inconnue (unknown person/woman) 42. inopinate (unexpected)
17. inconsequent 43. inquinate (corrupt, defiled)
18. indefeasible 44. inquorate (having quorum)
19. indefectible 45. inscient
20. indemnity 46. inscrutable
21. indiscerptible (inseparable) 47. insolent/insolence
22. inedita (unpublished literary work) 48. insouciant
23. inept 49. insuperable
24. inert/inertia 50. intenable (can't be held/maintained)
25. inevitable 51. intenible (can't hold or contain)
26. inevitably 52. intestate

ANSWERS to MISSING POSITIVES by Anil
These have missing positives: #s 2, 4, 10, 12-16, 20-24, 26, 28, 30-34, 36-39, 42-43, 47-48, 51.

Notes:
36. ingrate (Altho grate is a word, it does not mean gratitude or a grateful person.)
37. inimical (also enemy, with emy not a word)
43. inquinate (Quinate is two words [5-parted, and of quinic acid] but they don't mean undefiled.)
45. inscient (Scient is a word so this is not a correct answer, but inscient is of interest as a self-opposite, depending on whether the in- prefix means in(to) or not. Can you name any other pairs of words that use both prefixes and are self-opposites?)
51. intenible (This has the same etymology as 50 intenable. Tenable is a word but tenible is not.)

My main sources were *Collins Scrabble Dictionary* for words less than ten letters and *Chambers Dictionary* for longer words. If doubtful, several other dictionaries were consulted including *Webster's Third*.

WORDS ENDING IN TWO DIFFERENT VOWELS

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AE ALGAE BRAE CONVOLVULACEAE   DIOSCOREACEAE   ERIOCAULACEAE

FAGACEAE GRAMINEAE HAEMODORACEAE   IRIDACEAE JUNCACEAE

LILIACEAE MYRICACEAE NYSSACEAE ONAGRACEAE PUNICACEAE

RUTACEAE SABIACEAE TRIGONIACEAE URTICACEAE VOCHYSIACEAE

WINTERANACEAE XYRIDACEAE ZINGIBERACEAE

AI ASSAI   BONSAI CHINGHAI DUBAI MENAI   NANHAI   QINGHAI

RAI   SAMURAI   THAI   YANTAI

AO BILBAO CACAO GAO LAO MAO QINGDAO TAO

AU AARGAU   BEAU   CHATEAU   ESAU FRAU GATEAU LUAU

MACAU NASSAU PLATEAU QUENEAU   TABLEAU

EA AREA BROWNSEA CORNEA   DOROTHEA   ERITREA   FLEA

GALEA   HORNSEA IDEA JUDEA KOREA LEA MEDEA

NIVEA   PLEA RHEA SEA THEA UREA WINCHELSEA

XANTHORRHOEA YEA ZEA

EI ACULEI BRUNEI MACRONUCLEI NUCLEI PRONUCLEI SUBNUCLEI

EO BORNEO CAMEO GALILEO LEO MIMEO NEO OLEO

ROMEO STEREO THEO VIDEO ZAPATEO

EU ADIEU   LIEU MILIEU

IA ASIA BACTERIA COLOMBIA DAHLIA EUPHORIA FREESIA

GEORGIA HERNIA INDIA JULIA KIA LATVIA MALAYSIA

NIGERIA OLIVIA PENNYSYLVANIA QUADRIPLEGIA RUSSIA

SUBURBIA TANZANIA UMBRIA VICTORIA WISTERIA XENIA ZIA

IE AUNTIE BRIE COLLIE DIE EERIE FIE GOALIE HIE INDIE JENNIE KATIE LIE MARIE NIE OVERLIE PIE QUICKIE ROSIE SUSIE TIE UNTIE VIE WILLIE YACHTIE

IO AUDIO BIO CHEERIO CURIO DARIO FOLIO IMBROGLIO MARIO ONTARIO PATIO RATIO STUDIO TRIO VIBRIO

OA ANTHOZOA BOA COCOA DERMATOZOA ELEUTHEROZOA GENOA HALLOA MOA QUINOA SAMOA WHOA ZOA

OE ALOE BOE CANOE DOE FOE HOE JOE LOOE OBOE POE ROE SHOE TOE WOE ZOE

OI BOLSHOI HANOI MELNOCHROI ROI SAMOI XANTHOCHROI

OU BIJOU CARIBOU KABELIOU LOU MARIBOU SOU THOU YOU

UA ANTIGUA BORDONUA CHIHUAHUA DECIDUA GARGANTUA LINGUA MENSTRUA NICARAGUA PADUA QUA SKUA

UE AVENUE BLUE CLUE DUE ENSUE FLUE GLUE HUE ISSUE LEAGUE MISCUE OVERDUE PRUE QUEUE RESCUE SUE TISSUE UNTRUE VALUE

UI PITOHUI YANQUI

UO DUO QUO

PALINDROME vis a vis CARCINIC: Short Note

Tapan Kumar Mukherjee
West Bengal, India

It is well known that the word palindrome was first introduced by Henry Peacham in 1638. The word is a dithematic one consisting of two parts : palim meaning again and drome meaning ways and running. But we should remember that the original Greek word for palindrome was carcinati meaning crab-like. Semantically speaking, the close affinity of the Greek word with its modern English counterpart lies in the fact that it points to the movement of crab on sea shore. It can move forward and backward, sideways right-handed and left-handed with equal ease and felicity. In this sense the crab can be said to be an ambi-dexterous creature who can move with equal facility dexterously (right-handed) and sinisterously (left-handed) if we may be allowed to use this expression. We tend to appreciate dexterity of people as all good works are done by right hand, and we condemn the sinister design of people as all evil deeds are carried out mostly by left hand. So when we are dealing with palindrome words or numbers we are metaphorically moving our mind and carrying out mental exercise just like a crab, moving forward and backward, right-handed and left-handed as per the demand and requirement of the item under our intent consideration and acute scrutiny .

TAUTONYMIC VOWELS

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The vowels in each word are tautonymic.

A E A E C<u>A</u>STL<u>E</u>G<u>A</u>T<u>E</u>   HAPPENSTANCE   JASPERWARE   LACERATE

MASTERCLASSES   NAMEPLATE   PALEFACE   RAGGLE-TAGGLE

SALEABLE   TABERNACLE   VAL-DE-MARNE (N France)   WATERGATE

A I A I AIR-RAID   ANTICLASTIC   ASTIGMATISM   BRAINDRAIN   DAIRYMAID

GAINSAYING   GARIBALDI   HAIRSPRAYING   LAMINARIN   MAINSAIL

MAINTAIN   NAMIBIA   PAINSTAKING   RAINMAKING   SATYRIASIS

SNAIL-MAIL   TANIZAKI (a first name)   VACCINATING

WAITANGI (National Day in New Zealand)   ZAMINDARI

A O A O ANGLO-SAXON   APPROBATORY

A U A U CAUCASUS

E A E A   DERMAPTERAN   NEANDERTHAL   WHEATEAR   WHEATMEAL

E I E I   ZEFFIRELLI   ZEITGEIST

E O E O   PHENOMENON

E U E U   EURYSTHEUS

I A I A   IMPARTIAL   IRANIAN

I E I E   INEDIBLE   KIDDERMINSTER   LISTERINE   NIMBLEWITTED   NINETIETH

RIVERSIDE   SILVERSIDE   WINKLE-PICKERS   WINTERISE

I O I O   INTORSION

I U I U   INUKITUT

O A O A COCACOLA

O E O E LONESOME   OVERCOME   SOMEONE   WHOLESOME

O I O I   POISONING

O U O U OUTBOUND OUTPOUR

U A U A UNARGUABLY UNNATURAL

U E U E QUEUED

U I U I   UNDILUTING UNDISPUTING

TAUTONYMIC PHRASES

The same two vowels are repeated in the second word.

A E A E   STANLEY MATTHEWS (footballer)

I E I E   FRIED RICE   RICE FIELD

O A O A   LOMBARDY POPLAR

"PERFECT" MAGIC SQUARES

Jeremiah and Karen Farrell

Martin Gardner's informative *Scientific American* essay "Perfect, Amicable, Sociable" is updated in his 1977 book <u>Mathematical Magic Show</u> (see Appendix). In the essay Gardner asserts:

> ONE WOULD BE hard put to find a set of whole numbers with a more fascinating history and more elegant properties, surrounded by greater depths of mystery—and more totally useless—than the perfect numbers and their close relatives, the amicable (or friendly) numbers.
>
> A perfect number is simply a number that equals the sum of its proper divisors; that is, of all its divisors except itself. The smallest such number is 6, which equals the sum of its three divisors, 1, 2, and 3. The next is 28, the sum of $1 + 2 + 4 + 7 + 14$. Early commentators on the Old Testament, both Jewish and Christian, were much impressed by the perfection of those two numbers. Was not the world created in six days and does not the moon circle the earth in twenty-eight? In *The City of God*, Book 11, Chapter 30, St. Augustine argues that although God could easily have created the world in an instant, He preferred to take six days because the perfection of 6 signifies the perfection of the universe. (Similar views had been advanced earlier by the first-century Jewish philosopher Philo Judaeus in the third chapter of his *Creation of the World.*)

Euclid had proven that $2^{n-1}(2^n-1)$ was always a perfect number whenever (2^n-1) was prime and 1000 years later Leonard Euler proved that all even perfects were given by this formula. No odd perfect numbers are believed to exist and only finitely many evens are now known.

Primes of the form 2^n-1 are called Mersenne primes after a seventeenth century mathematician who studied them.

Amicable numbers are generalizations of perfect numbers. These are pairs in which the sum of the divisors of one is equal to the other. The smallest pair are 220 and 284. This pair was known to the Pythagorians.

If the chain that leads back to the original number has more than two links the number is called "sociable".

By 1977 only 24 perfect numbers were know and Gardner's list follows.

	FORMULA	NUMBER	NUMBER OF DIGITS
1	$2^1(2^2-1)$	6	1
2	$2^2(2^3-1)$	28	2
3	$2^4(2^5-1)$	496	3
4	$2^6(2^7-1)$	8,128	4
5	$2^{12}(2^{13}-1)$	33,550,336	8
6	$2^{16}(2^{17}-1)$	8,589,869,056	10
7	$2^{18}(2^{19}-1)$	137,438,691,328	12
8	$2^{30}(2^{31}-1)$	2,305,843,008,139,952,128	19
9	$2^{60}(2^{61}-1)$		37
10	$2^{88}(2^{89}-1)$		54
11	$2^{106}(2^{107}-1)$		65
12	$2^{126}(2^{127}-1)$		77
13	$2^{520}(2^{521}-1)$		314
14	$2^{606}(2^{607}-1)$		366
15	$2^{1,278}(2^{1,279}-1)$		770
16	$2^{2,202}(2^{2,203}-1)$		1,327
17	$2^{2,280}(2^{2,281}-1)$		1,373
18	$2^{3,216}(2^{3,217}-1)$		1,937
19	$2^{4,252}(2^{4,253}-1)$		2,561
20	$2^{4,422}(2^{4,423}-1)$		2,663
21	$2^{9,688}(2^{9,689}-1)$		5,834
22	$2^{9,940}(2^{9,941}-1)$		5,985
23	$2^{11,212}(2^{11,213}-1)$		6,751
24	$2^{19,936}(2^{19,937}-1)$		12,003

The twenty-four known perfect numbers

In April 1979 David Slowinski and Harry Nelson found the 27th Mersenne prime of 13,395 digits. Nelson signed for me a copy of this prime at a Gathering for Gardner meeting in Atlanta.

THE 27ᵀᴴ MERSENNE PRIME

As of "D-Day" 2020 the number of known perfects was 51 which has 49,724,095 digits with a Mersenne prime of 24,862,048 digits.

A Perfect Magic Square will have as constant a perfect number. For example here is a 3x3 with constant 6.
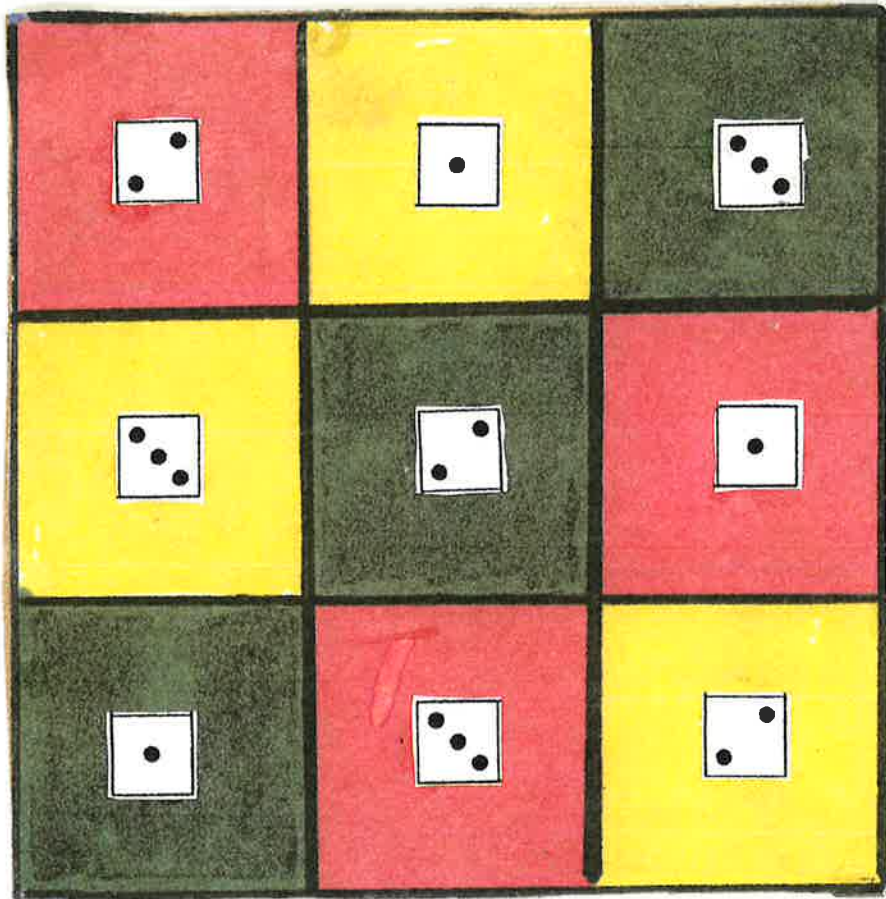
If we allow the numbers 0, 1, 2 and 3 to be used in a 4x4 we ask the reader to use each number four times to fill the square with constant sum 6 in every row, column, and all eight diagonals

including the broken 2x2s and 3x1s. As another puzzle use the letters NODE in a 4x4 so that legitimate words can be anagrammed in all sixteen sets of four.
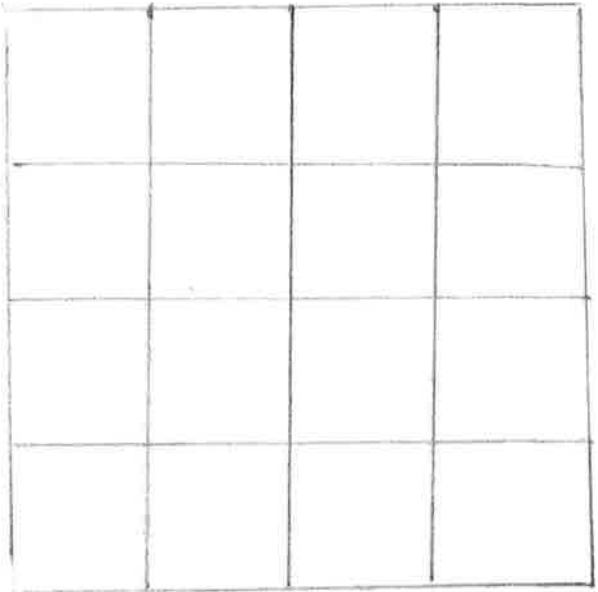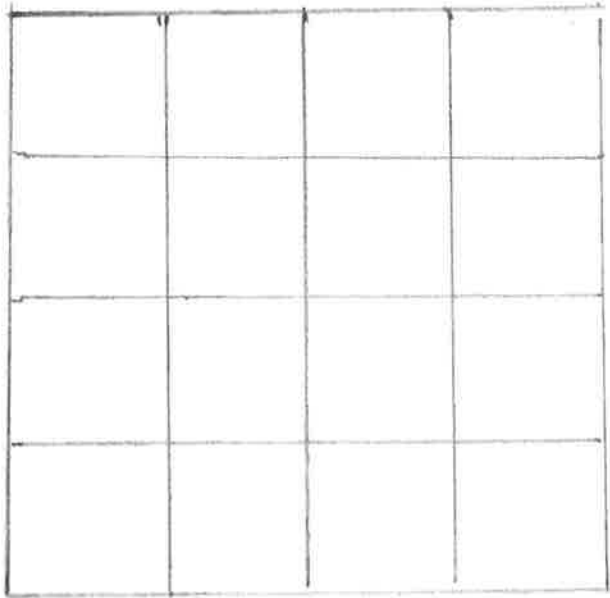
An example of a perfect 28 using 16 different dominoes from a double-nine set follows.
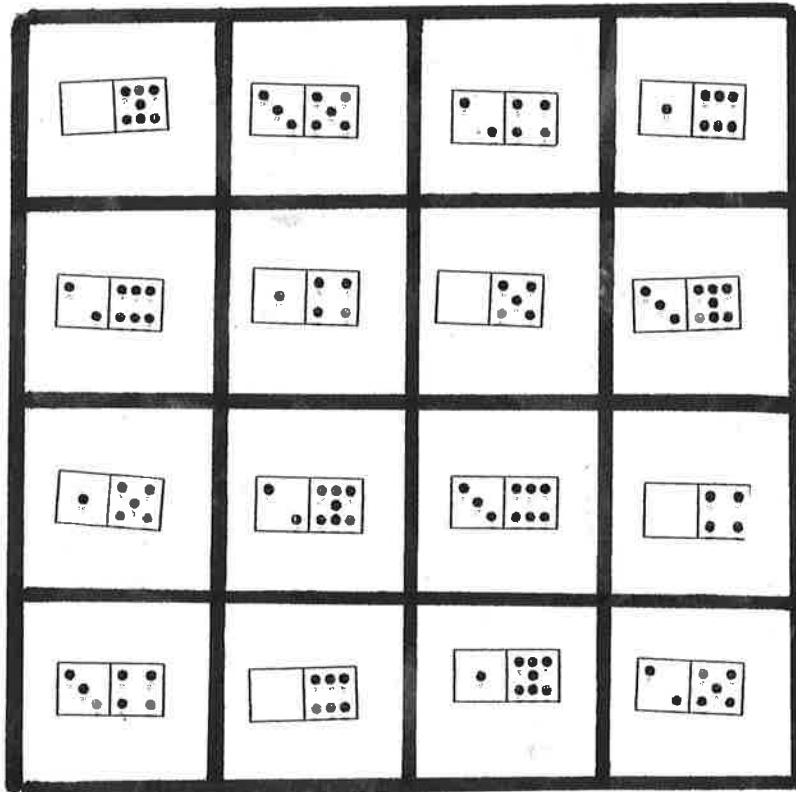
Gardner's popular work "Annotated Alice" has now grown to be more wordy than the original Lewis Carroll Alices. As an exercise place five copies of ALICE with five copies of 1, 2, 4, 7, and 14 so that all rows, columns and diagonals anagram to ALICE and sum to 28. Also we insist that in the five copies of each letter of ALICE all five numbers are used.
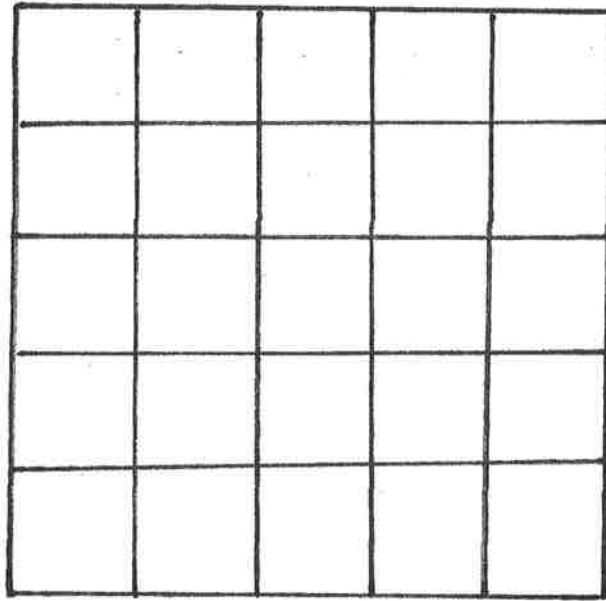
In the next example place four each of the numbers 120, 123, 125 and 128 into the 4x4 square to make it magic with constant 496, the third perfect.
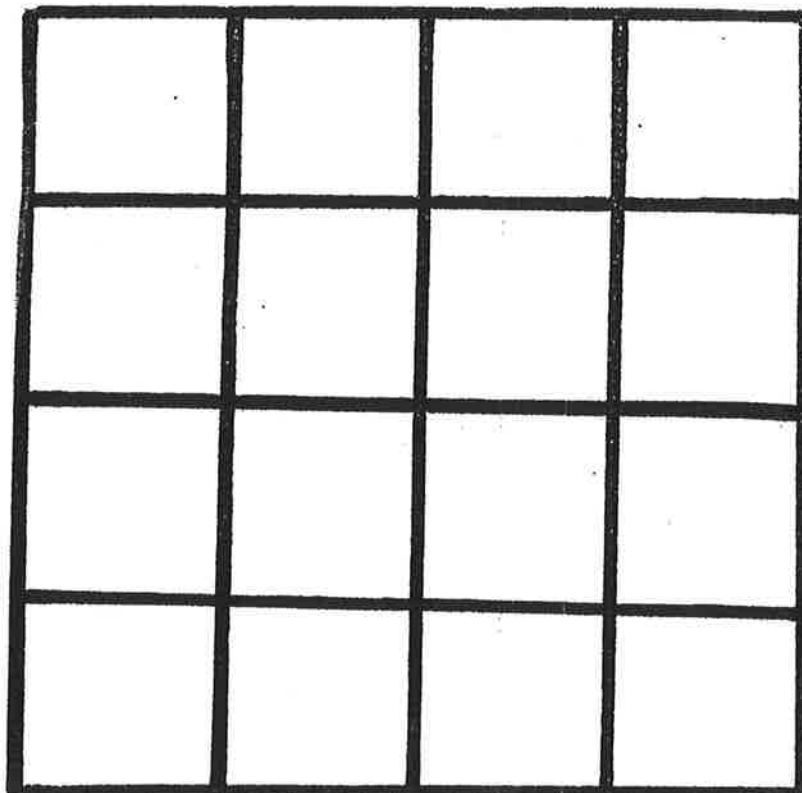
Another example. Place 25 different dominoes from a double-nine set so that the result is magic with constant 45. Then add 90.2 to each entry to obtain a magic sum of 496.
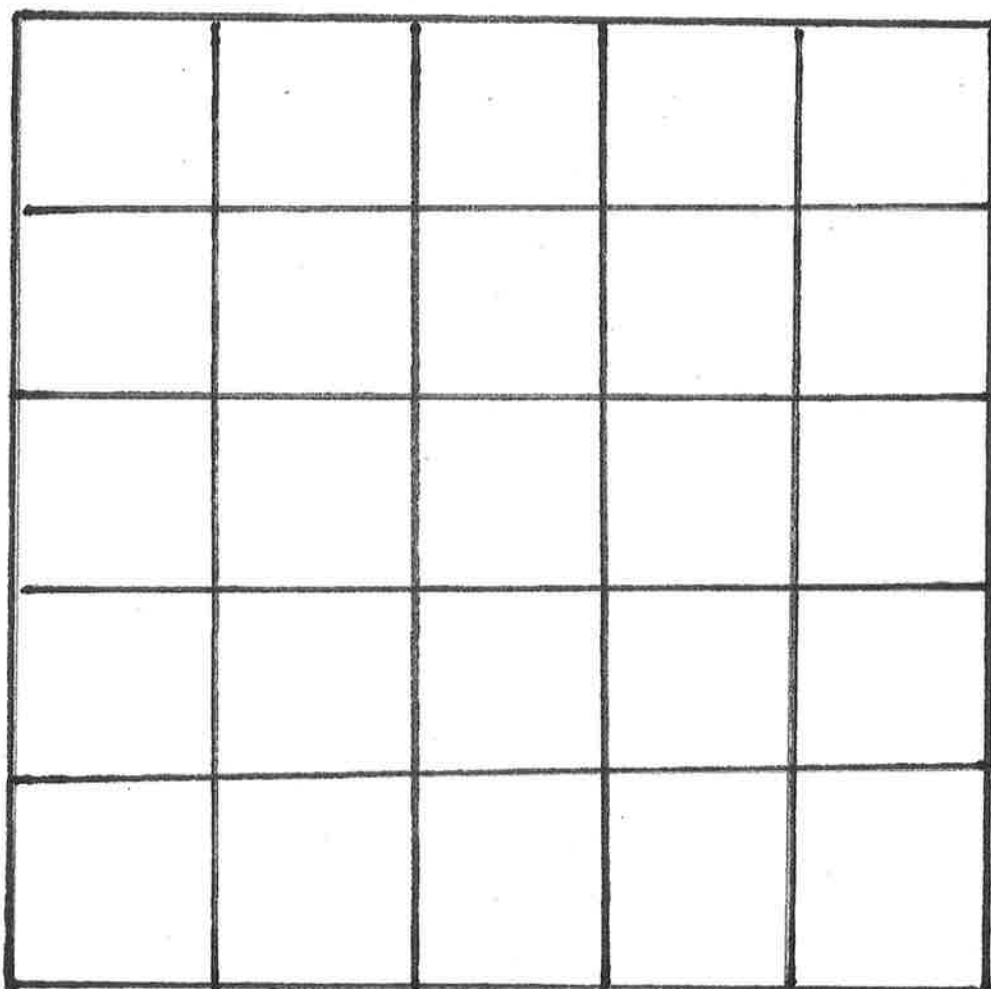
Another problem. Use each letter of the word IMPERSONAL five times in a 5x5 to form meaningful pairs as entries that magically anagram into the word IMPERSONAL.

Our answer to IMPERSONAL uses pairs from Chamber's Dictionary with 16 chemical elements and 9 others with only SL meaning "Solitictor at Law" unusual.

Other magic squares with interesting constants are of course possible.

One example we like uses 2, 3, 8, 15 with constant 28.

2	8	15	3
15	3	2	8
3	15	8	2
8	2	3	15

Another that might interest young children could use the 16 playing cards aces, twos, threes and fours. They would be asked to arrange the cards into a 4x4 square with constant 10. One of many solutions follows with a red-black checkerboard arrangement.

AS	4D	3S	2D
3H	2C	AH	4C
2S	3D	4S	AD
4H	AC	2H	3C

MARTIN GARDNER

Martin Gardner

Mathematical Magic Show

MORE PUZZLES, GAMES, DIVERSIONS, ILLUSIONS
& OTHER MATHEMATICAL SLEIGHT-OF-MIND FROM
SCIENTIFIC AMERICAN
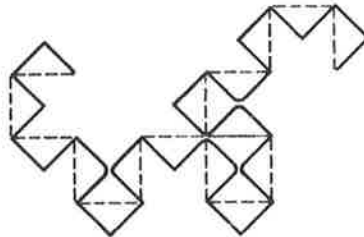
WITH REPARTEE FROM READERS,
AFTERTHOUGHTS FROM THE AUTHOR
AND 133 DRAWINGS & DIAGRAMS

New York   1977
ALFRED A. KNOPF

SOME POSSIBLE ANSWERS

2	1	0	3
0	3	2	1
3	0	1	2
1	2	3	0

N	O	D	E
D	E	N	O
E	D	O	N
O	N	E	D

A 1	L 7	I 2	C 14	E 4
C 2	E 14	A 4	L 1	I 7
L 4	I 1	C 7	E 2	A 14
E 7	A 2	L 14	I 4	C 1
I 14	C 4	E 1	A 7	L 2

125	123	120	128
120	128	125	123
128	120	123	125
123	125	128	120
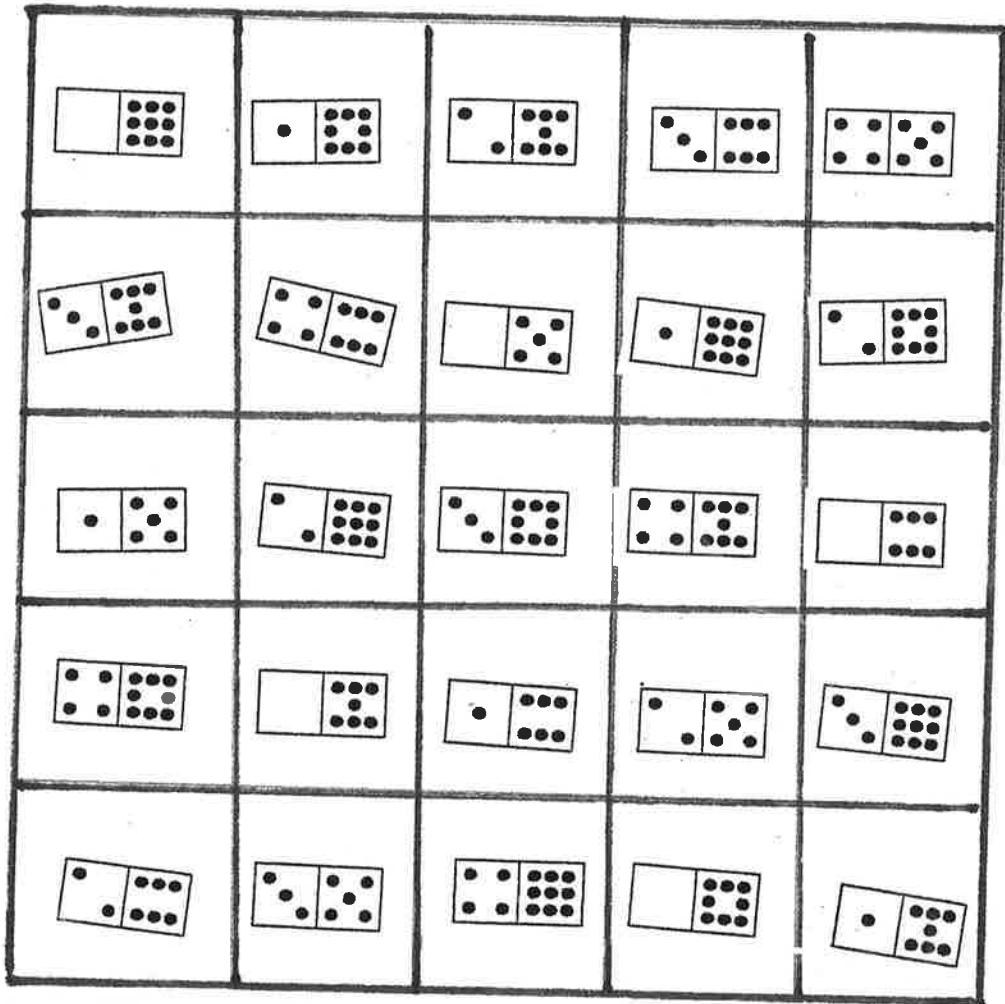
PA	ME	IN	LO	SR
NO	SL	AR	PE	MI
ER	PI	MO	SN	AL
SM	NA	EL	IR	PO
LI	OR	PS	AM	NE

PALINDROMIC VOWELS

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In *PALINDROMIC VOWELS AND TAUTONYMIC VOWELS (WW May 2019)* I included a small number (20 in all) of single words having palindromic vowels. The lists below offer a much larger selection.

3-LETTER PALINDROMIC PATTERNS

PATTERN 111

aaa AARDVARK ALASKA ANAGRAM BALTHAZAR BANANA CALLAGHAN

CANADA DAMARA FARADAY FARAWAY GALAHAD HAGGADAH

JACAMAR JAKARTA KAZAKHSTAN KAMPALA LAMBADA MALAYA

MALACCA MANHATTAN NAGALAND PANAMA PARAGRAPH

RAMADAN SAARLAND SAMANTHA TARANTASS VALHALLA

WAKASHAN YAHATA ZAANSTAD

eee BREEZE CHEESE DECEMBER DEEPER DEFERRED ELEMENT EVEREST

ESTEEM FLEECED FREEZE FETTERED GEEZER GREENE HEELED

MERCEDES MESSENGER METERED NEEDLE PERVERTED RESTLESSNESS

REVENGE REVERTED SEPTEMBER SETEE SENTENCE SEVERED

SHEPHERDESS TEETER VEERED WHEREVER WESTERNER YESTREEN

iii BIKINI CRITICISM DIMINISH DISMISSING FINISHING GINGILI HIGHLIGHTING

INTRINSIC INVITING INDIGNITY INFINITY KILLIFISH LIMITING

MIMICKING NIHILISM PICNICING RIMINI SIMPLISTIC TIMIDITY

VISITING WHIRLIGIG

ooo BONOBO BOOKWORM CHLOROFORM CHRONOLOGY DOORSTOP

FOOTCLOTH GODHOOD HOOKWORM HOROLOGY KOMONDOR LOGWOOD

MOORCOCK NOMOLOGY OOLOGY ORTHODOX PROTOCOL ROOFTOP

SOLOMON TOMORROW TORCHWOOD TORONTO VOORSKOT WOODWORK

ZOOLOGY

uuu CUMULUS JULLUNDUR TUMULUS UHURU USUFRUCT

PATTERN 121

aea AGENDA   ANNEAL ANTHEA ARENA ARSENAL BASKETBALL CADENZA
CAMERA DAYDREAM   FRATERNAL GALENA HARDHEADS JACK-THE-RAGS
KATTEGAT   LACERTA MACLEAN   MATERNAL   NATTERJACK PATERNAL
RACETRACK SALESMAN TRADESMAN VALETTA WALDEMAR ZAREBA

aia ALTRINGHAM ASIA ATYPICAL BASICALLY CAMILLA CARDINAL DAHLIA
DAVINA   FAIRBANKS GAIA   HABITAT JAINA   KAINGA LATVIA
MALVINAS MANILLA MAXILLA NAIAD   PAGINAL PARSIFAL PARTISAN
RADIANT   SAIDA   TANIA VALIANT VANILLA WAISTBAND   ZANZIBAR

aoa ALLOA ANDORRA ANGORA BAROGRAPH CHARCOAL DASHBOARD
FASHODA GALLOGLASS HALLOA KAOLACK LANDOWSKA MACDONALD
NARROWCAST PADOVA PAVLOVA RHABDOMANCY SAMOA TRAVOLTA
VALONA   WALLBOARD   XANTHOMA   YAROSLAVL ZAMORA

aua ABDULLA ACTUAL ARUBA BARUCHAN CAUDAL DRACULA
FACTUAL GLANDULAR HAUPTMANN JAGUAR JANUARY KAUFMAN
LAUDA ((Niki)   MAURRAS (surname) NAUMACHY PADUA PAPUA
RAMBUTAN SATSUMA SATURDAY TRAUMA VANGUARD VASCULAR
WANCHUAN   YAPURA   ZASTRUGA

eae BEAKER BEATEN CREASE DEADEN DESCARTES DRESSAGE EARNED
EASTER ENTRANCE ESTATE FEASTED GREASE HEALER HEATED HEAVEN
JEANNE KERKRADE LEASE LEATHER   MENACE MESSAGE   NEARED
PLEASE REACTED   SEARCHED SWEATER SEAMEN TEACHER TEASE
TENABLE   TREATMENT VEALER VENABLES (surname) WEAKER YEARNED

eie BERRIED CHESHIRE DENISE EIDER EIGER EMPIRE ENGINE ENCIRCLE
FERTILE FESTIVE GENIE HELIER (Saint) JELLIED JESSIE KERNITE LESLIE

LEGIBLE MERRIER NEITHER NELLIE PEIRCE (surname) RELIEF RELISHES REMINDED RETIRE SELFISHNESS STERILE TERRIER VELIGER VESICLE WESTMINSTER YENISEL

eoe BELLOWED CELLPHONE DEVOLVED ENCODED FEOFFMENT GEORGE HELLHOLE JEROME KETONE LEOBEN MELLOWED NEOPHYTE NEOTENY PEOPLE REMORSE RESTORE SETOSE THEOREM VELOCE VETOED WELCOME WENDOVER XEROPHYTE YELLOWED

eue BEGRUDGE BEMUSE CERUMEN DEDUCE DEUCE EDUCE ENDURE ETUDE FESCUE FREQUENT GESTURE HERCULES JEJUNE KERFUFFLE LETTUCE MEUSE NEUTER PREQUEL REDUCE REFUTE RESCUE SEDUCE SEQUEL TENURE VENTURE WELL-JUDGED ZESTFULNESS

iai BIGAMIST CHIANTI DIALLING DIARIST FINALIST GIGANTIC GRIMALDI HITACHI INVADING JIANGXI KIGALI LIKASI MIGRATING NIGHTMARISH PIANIST RIVALLING SCIATIC SIGNALLING STIGMATISM TRIACID VIVALDI WIGWAGGING ZIGZAGGING

iei BLISTERING CHISELLING DITHERING FILTERING FIDGETING GINGERING GLISTENING HINDERING ICEBLINK ICENI INSERTING KINESIS LISTENING LIMERICK LIGHTWEIGHT LIMELIGHT MICHELIN NINEPINS PILFERING RIPENING SHIELDING SILENCING TIGERISH TINKERING VIEWING WHISPERING WHITENING YIELDING

ioi BIONICS CIPOLIN DIOPTRIC DOMINGO FIBROID GIORGI HISTORIC INFORMING INGOING IRONING ICONIC JINGOISM KNICKPOINT LIONFISH MINORITY MITOTIC NICOTIC PILLOWSLIP RIBBONFISH SHINTOIST SIPHONING TRICHOID TRIPODIC TRITONIC TIVOLI VIOLIN WINNOWING ZIONISM

iui BICUSPID BISCUIT CHIRRUPING DILUTING FIGURING HINDUISM INDUCING INJURING INSULIN INSULTING ISSUING JIBUTI KIBBUTZIM LINGUIST LITURGIST MISUSING PICTURING STIMULI TRIUMVIR WINDSURFING

oao BORAZON   COACHWORK   DORADO   GOALPOST   HOARFROST

KORSAKOFF   LOCARNO   MOGADON   NONAGON   ORLANDO

POMPANO ROADBLOCK SOAPBOX SOPRANO TOMATO   TORNADO

VOLCANO   WONNACOTT (surname)   XOANON

oeo BOREDOM   CODEWORD   DOVZHENKO   FOREWORD   GOVERNOR

HOEDOWN   KORERO   LOVELORN   MONDEO NOVELLO   OCELOT

OTHELLO OVERWORK PROSPERO ROMEO SOMBRERO   TOLEDO

oio BONINGTON COIN-OP CORRIDOR DOMINO FOISON GOLLIWOG HORIZON

LOTION   MONITOR   MORRISON   NOTION OHIO OMICRON   ORION POIROT

POISON ROBINSON   SOLITON   TORSION   VOMITORY WOFFINGTON (surname)

ouo BOURBON CONDUCTOR   CONJUROR CORDUROY DOUGHBOY FOURFOLD

GOURMONT (surname) HOUNSLOW   JOURNO MOUFLON   NONJUROR

OUTBOX   PROFUMO (surname) ROUGHSHOD SOUTHPORT   TOUCHDOWN

VOLTURNO WOUNDWORT   YOUNGSTOWN

uau BUKAVU   CUSANUS (surname) DUNABURG   FUMANCHU   GUSTAVUS

JUNGFRAU LUCANUS MUTATUM   NUNAVUT QUANTUM SCUTATUS

SUBSTRATUM   TUSSAUD   TUVALU   UNLAWFUL   URANUS

ueu BUCKETFUL BUTTERCUP CUPPERFUL DUMPERFUL FUNNELFUL GUTTERFUL

HUMERUS   JUVENTUS KUMMERBUND   LUTETUM LUXEMBURG   MUSEUM

NUCELLUS   NUCLEUS PUNNETFUL   RUEFUL SUBGENUS SUCCESSFUL

SUPERBUG   TUNEFUL   UNDERTHRUST USEFUL UTERUS

uiu CURIUM   DUBNIUM   DUTIFUL FRUITFUL JUJITSU JULIUS LUPINUS

MUIRBURN   PUFFINUS THULIUM

uou BUCKHOUND BULBOUS CUPROUS DUMBFOUND FULVOUS FUSCOUS

FURLOUGH   GUMMOUS HUMOUR MUCOSUS QUORUM RUGOSUM

SHUNT-WOUND TURNROUND UNWOUND XUZHOU

4-LETTER PALINDROMIC PATTERNS

PATTERN 1111

aaaa ALABAMA ATHABASCA BALACLAVA CASABLANCA CATAMARAN

DAMARALAND JACARANDA KALA-AZAR MAHARAJAH NARAYANGANJ

PARAMATTA RAT-A-TAT-TAT SCARAMANGA TARMACADAM

eeee BEJEWELLED DEFERENCE EFFERVESCENT ESTEEMED EVERGREEN

FREESHEET GEE-GEE HEEDLESSNESS KEEPERLESS LEVEELESS

MENDELEEV NEEDLESSNESS PERSEVERE REDEEMED REENTERED

SEVENTEEN SLEEPLESSNESS SLEEVELESS TEETERED TENNESSEE

VENEERER WEEKENDER ZEBEDEE

iiii CRITICISING DIMINISHING GINGIVITIS KILLIKINICK MISSISSIPPI

NIHILISTIC

oooo COLONOSCOPY GOODWOOD LOCOMOTOR NONORTHODOX ODONTOLOGY

uuuu KUKURUKU (a place)

PATTERN 1221

aeea ASKELETAL BATTERSEA FATSHEDERA GATESHEAD HAMMERHEAD

JAMESETTA PANETELLA STATEMENTAL

aiia ALICIA ANTICLIMAX ASPIDISTRA BASILICA FAMILIAR MAGICIAN

MAGNIFICAT MARITIMAL PARISIAN PARTICIPANT PATRICIDAL

PYRAMIDICAL STATISTICAL

aooa ARTHROPODA GASTROPODA MALODORANT SARCOSOMA

auua AUGUSTA ANGUSTURA AUTUMNAL AVUNCULAR

eaae CELLARAGE CLEARANCE DEBATABLE DEGRADABLE DEMARCATE

EARACHE EATABLE EMBARRASSED ENLARGABLE ESCALATE

ESCAPADE FLEABANE HEPTAVALENT LEAFAGE MEATAXE

NEAR-MARKET PEAR-SHAPED REARRANGE SEAKALE TEACAKE

VERANDAED

eiie CENTILITRE DEFINITE DEIFIED FEMININE FERTILISE GELIGNITE

MEDICINE REVISITED SENSITIVE TERRIFIED VEINLIKE WEIRDIE

eooe CELLOSOLVE ENDOSCOPE ENDOSPORE FESTOONED GEOLOGER

LEONORE MESOSOME METRONOME NEOPHOBE PRECOOKED

REBOOTED SELF-COLORED TECHNOPHOBE THERMOSCOPE

VELODROME XENOPHOBE YELLOWSTONE

euue RESTRUCTURED

iaai INSTAMATIC

ieei DIGENETIC DISHEVELLING INTERCEDING INTERESTING

INTERVENING MIDDLEWEIGHT NINEEIGHTHS WINTERWEIGHT

iooi BIOLOGIC CHIRONOMID CHIROPODIST HISTOLOGIST ISOMORPHISM

LIPOTROPIC MICROSCOPIC TRICHOLOGIST VIROLOGIST

iuui DISULPHURIC SIPUNCULID

oaao PROCLAMATORY PROPAGATOR

oeeo CHOLESTEROL FORGET-ME-NOT MONTENEGRO

oiio FORTISSIMO MONILIFORM POSITION PROHIBITOR VOLITION

uaau SUBTHALAMUS TUTANKHAMUN

ueeu UNEVENTFUL

uiiu RUBIDIUM UMBILICUS

uoou HUMOROUS UNSORROWFUL

5-LETTER PALINDROMIC PATTERNS

PATTERN 11111

aaaaa ABRACADABRA

eeeee BEEKEEPER DEFENCELESSNESS FREEWHEELED

iiiii INDIVISIBILTY PRIMITIVISTIC

ooooo ORTHODONTOLOGY

PATTERN 11211

aaeaa   CHANDRASEKHARAN

aaiaa   ASAHIKAWA (a place)

aaoaa   MALACOSTRACAN

aauaa   CAMPANULATA   NAMAQUALAND

eeaee   DETESTABLENESS   EVENHANDEDNESS   PRESENTABLENESS
        SLEDGEHAMMERED   VENERABLENESS

eeiee   BENEFICENCE   DECEPTIVENESS   EXCESSIVENESS   EXPERIMENTED

eeoee   BENEVOLENCE   ELECTROMETER   REFLECTOMETER   WHERESOEVER

eeuee   EXECUTEE

iiaii   IGNITABILITY   MILITARISTIC

iieii   INDIGENISING

iioii   IRIDOSCHISIS

iiuii   BILIRUBINIC

ooaoo   CHONDROPATHOLOGY

ooeoo   COLOPEXOTOMY

uuouu   FUKUROKUJU

PATTERN 12121

aiaia   ASTIGMATICALLY   GAILLARDIA   LAMINARIA   MAGISTRATICALLY

        STRATIGRAPHICAL

aoaoa   SAVONAROLA

auaua   ACUTANGULAR

eaeae   ELACERATE   EXAGGERATE EXASPERATE   HEARTSEASE

eieie   ENGINELIKE

eoeoe   TESTOSTERONE

eueue   GEMUSESUPPE

iaiai   BIPARTISANSHIP DILAPIDATING   INACTIVATING   INVALIDATING

ieiei   INTERFINGERING   MISDELIVERING

ioioi ISODIMORPHIC

oaoao ROMANO-SAXON

oeoeo PROLEGOMENON

oioio OVIPOSITOR

ueueu SUPERSUCCESSFUL

PATTERN 12221

aiiia ARTIFICIAL

PATTERN 12121

aiaia ASTIGMATICALLY   MAGISTRATICALLY STRATIGRAPHICAL

aoaoa SAVONAROLA

auaua ACUTANGULA

eaeae   DELACERATE EXAGGERATE EXASPERATE   PEACEABLE

eieie   ENGINELIKE

eoeoe BENZOPHENONE   TESTOSTERONE

eueue GEMUSESUPPE

iaiai   INACTIVATING   INVAGINATING   INVALIDATING   BIPARTISANSHIP
        DILAPIDATING

ieiei   MISDELIVERING

ioioi   ISODIMORPHIC

iuiui   TRISUBSTITUTING

oaoao   ROMANO-SAXON

oeoeo PROLEGOMENON

oioio OVIPOSITOR

ueueu SUPERSUCCESSFUL

PATTERN 12221

a i i i a ARTIFICIAL   SACRIFICIAL

e i i i e HELICITIES LEGITIMIZE

i o o o i NITROHYDROCHLORIC

PATTERN 12321

e a i a e   PREVARICATE

e a o a e REASONABLE

e u o u e EUROBUSES

o i a i o CONFISCATION   CONSTIPATION

o i u i o NONINCLUSION

u i o i u LUBRITORIUM

6 --LETTER PALNDROMIC PATTERNS

e i e e i e LEICESTERSHIRE

a a a a a a TARAMASALATA

i i i i i i INDIVISIBILITY

o i e e i o NONINTERVENTION

7 --LETTER PALNDROMIC PATTERNS

a u i o i u a   AUDIOVISUAL

VOCALIC PHRASES

a a a a a   PANAMA CANAL

a a a a a a   FARAWAY ALASKA

e e e e e   DECEMBER FREEZE   SEPTEMBER BREEZE

 i i i i i i VISITING RIMINI

o o o o o o   TORONTO'S   ROOFTOPS

a i i a   PARISIAN MAGICIAN

e a a e   SEA WATER

a e a a e a   TRADESMAN'S AGENDA   ANTHEA'S CAMERA

a i a a i a   DAVINA'S WAISTBAND

a o a a o a   MACDONALD'S PAVLOVA

a u a a u a   LAUDA'S JAGUAR

e a e e a e   ESTATE ENTRANCE

e i e e i e   JESSIE'S BERRIES

e o e e o e   PEOPLE WELCOME

e u e e u e   HERCULES RESCUED

i a i i a i   PIANIST FINALST

i e i i e i   LIGHTWEIGHT LIMERICK

i o i i o i   HISTORIC MINORITY

i u i i u i   MISUSING INSULIN

o a o o a o   ORLANDO'S ROADBLOCK

o e o o e o   GOVENOR OVERWORKS

o i o o i o   BONINGTON (Chris - mountaineer)'S HORIZON

o u o o u o   CONDUCTOR'S CORDUROYS

u a u u a u   JUNGFRAU'S SUBSTRATUM

u e u u e u   SUCCESSFUL JUVENTUS   LUXEMBURG MUSEUM

u i u u i u   FRUITFUL MUIRBURN (moorburn - encourages new growth)

u o u u o u   QUORUM HUMOUR

We finish off with H E R C U L E   P O I R O T
                                    eue   oio

Some New Magic With
"Most-Perfect" Magic Squares

By Jeremiah Farrell

In 1998 in his article "Magic Squares Cornered" appearing in NATURE (1) Martin Gardner reports

> Dame Kathleen Ollerenshaw, one of England's national treasures, has solved a long-standing, extremely difficult problem involving the construction and enumeration of a certain type of magic square. The solution comes in a book written with David Brée. (2)

Dame Kathleen Ollerenshaw (1912-2014)
D.B.E., D.S.U., D.L., C. Math.

Most-perfect squares of order n x n have three properties. One, they are pandiagonal which means every row, column and ALL diagonals, including the broken ones sum to the same constant. Secondly, every 2x2 sub-square must sum to this constant and thirdly every pair on a diagonal ½n apart sum to half the constant. These properties force the order n to be 4m, m=1, 2,. . . . Hence the first example is of order 4x4 and the second of 8x8. Using the 16 numbers 0, 1,…,15 for n=4 and the 64 numbers 0,1,…,63 for n=8 yields these two examples among others. The constant in either is $2(n^2-1)$ and the diagonal hop sums to n^2-1.

13	3	4	10
6	8	15	1
11	5	2	12
0	14	9	7

Constant = 30

Diagonal hop sums to 15

0	62	2	60	11	53	9	55
15	49	13	51	4	58	6	56
16	46	18	44	27	37	25	39
31	33	29	35	20	42	22	40
52	10	54	8	63	1	61	3
59	5	57	7	48	14	50	12
36	26	38	24	47	17	45	19
43	21	41	23	32	30	34	28

Constant = 126

Diagonal hop sums to 63

Red card A — IS YOUR NUMBER HERE
1 4 8 13
2 7 11 14
?

Red card B — IS YOUR NUMBER HERE
0 5 9 12
3 6 10 15
?

Blue card A — IS YOUR NUMBER HERE
1 4 9 12
3 6 11 14
?

Blue card B — IS YOUR NUMBER HERE
0 5 8 13
2 7 10 15
?

Green card A — IS YOUR NUMBER HERE
0 2 12 14
1 3 13 15
?

Green card B — IS YOUR NUMBER HERE
4 6 8 10
5 7 9 11
?

Yellow card A — IS YOUR NUMBER HERE
0 4 9 13
2 6 11 15
?

Yellow card B — IS YOUR NUMBER HERE
1 5 8 12
3 7 10 14
?

White card A — IS YOUR NUMBER HERE
2 6 10 14
3 7 11 15
?

White card B — IS YOUR NUMBER HERE
0 4 8 12
1 5 9 13
?

Our new magic performed on the 4x4 square starts with noting that the square can be regarded as a torus by bending the top red around to join the bottom red and joining the left and right blues to complete the doughnut shape. We supply five colored cards with all the numbers shown on either front or back. Now no matter how the cards are actually turned there will always be exactly one number showing on all five cards or not showing on all five cards. This number is the "Key" and can be changed to another by flipping the cards. As the cards lie here the Key=5.

The subject is to privately choose one of the 15 numbers and secretly choose to tell the truth to all questions or to lie to all questions. Once the subject's answers are given the magician looks quickly at the most-perfect square and correctly names the selection.

METHOD: The magician knows the Key, here 5, and traces the Yes (or No) response from the Key. The white card denotes a diagonal hop. For example suppose the left sides are showing and 4 is chosen. Telling the truth yields red=yes, blue=yes, and yellow=yes. The magician starts at the Key=5, jumps, say, yellow to 14 then red to 3 and blue to 4. Note that if the subject lies the yeses would be green to 11 and white a hop to 4.

The next page depicts a common two dimensional drawing of a four dimensional hypercube along with the "most-perfect" magic square. The parts of the 4-cube are given by the generating function $y = (1+2x)^n$. For n=4 this gives

$$y=1+8x+24x^2+32 x^3+16 x^4$$

Thus there are in the 4-cube 16 points, 32 lines, 24 squares, 8 cubes and 1 hypercube. All these parts may be found exactly in the magic square as follows. Turn the square into a torus and each of the 16 numbers forms a 2x2 square with each number at the bottom right. For example

     7-0   or   0-14
   10-13   13-3

  Down to   2 – 12
            9 – 7

Also each of the four rows of 4 and columns of 4 yield 8 more 2x2 squares. The 8 cubes are formed from the magic square using the four double rows and the four double columns. For example

  0-14-9-7   The 32 colored lines are obvious -
  13-3-4-10

It may be possible to obtain other larger hypercubes from higher order most-perfect squares.

There is also an extension of the 4-cube to 5 dimensions. Notice on the magic square the unique diagonal hops of pairs that sum to 15: 0-15, 1-14, 2-13,....7-8. This turns the square into half a 5-cube. The magic can now be performed using the five cards shown. As usual no matter how the cards are turned there is always exactly one number, the key, that appears on all five. The cards displayed have key=5. When the subject secretly chooses a number and privately chooses to either lie to all cards or tell the truth to all, the magician can quickly locate the subject's selection from the magic square. For instance, suppose 8 was selected and the subject chooses to lie. In any order her responses would be with left sides up: Red No, Blue Yes, Green Yes, Yellow Yes, and White Yes. From the key=5 we trace 5 blue to 2 green to 12 yellow to 7 hop to 8.
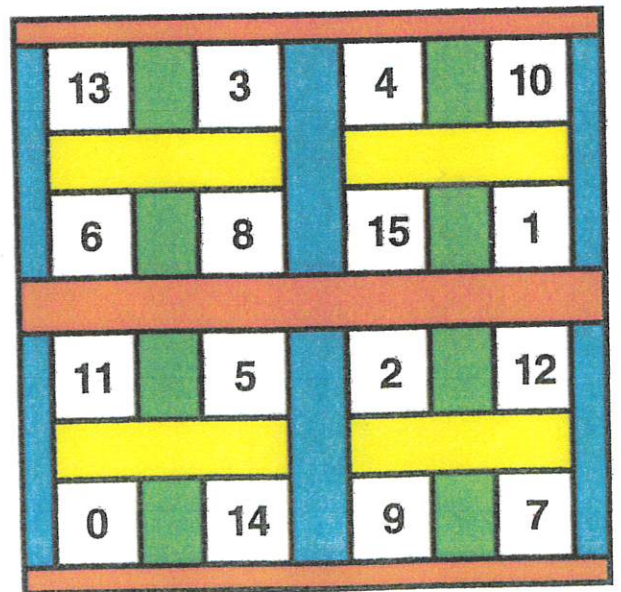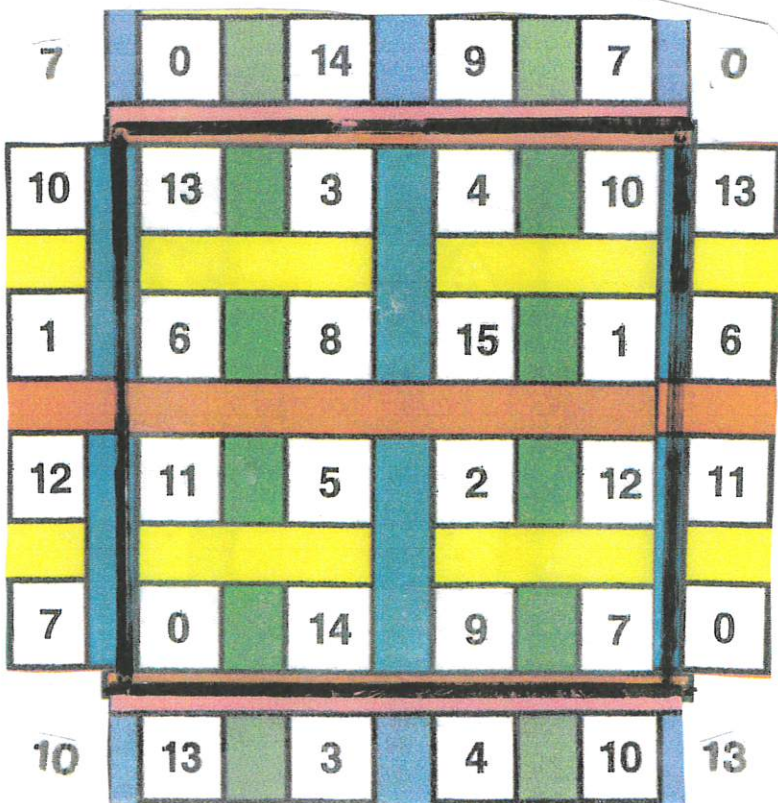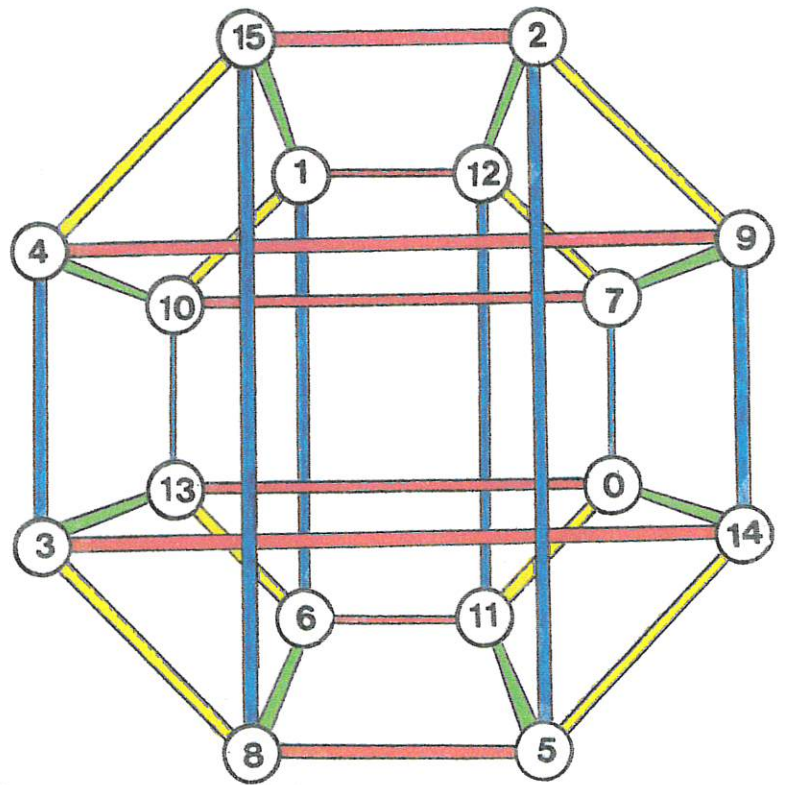
To perform similar magic on an 8x8 most-perfect square we start by using the following square and the five colored cards on red, blue, green, yellow and white.

0	62	2	60	11	53	9	55
15	49	13	51	4	58	6	56
16	46	18	44	27	37	25	39
31	33	29	35	20	42	22	40
52	10	54	8	63	1	61	3
59	5	57	7	48	14	50	12
36	26	38	24	47	17	45	19
43	21	41	23	32	30	34	28

These cards each have half of the 64 numbers 0, 1, 2, . . . 63 on in special ways and towards the end of our trick we will ask the questions to be answered truthfully by the subject. (1) Is your number even? (2) Is your number 32 or greater?

The colored cards are

Red

0	18	34	48
1	19	35	49
4	22	38	52
5	23	39	53
10	24	40	58
11	25	41	59
14	28	44	62
15	29	45	63

Blue

2	16	32	50
3	17	33	51
4	22	38	52
5	23	39	53
10	24	40	58
11	25	41	59
12	30	46	60
13	31	47	61

Green

0	20	36	48
1	21	37	49
2	22	38	50
3	23	39	51
12	24	40	60
13	25	41	61
14	26	42	62
15	27	43	63

Yellow

0	16	32	48
1	17	33	49
4	20	36	52
5	21	37	53
10	26	42	58
11	27	43	59
14	30	46	62
15	31	47	63

White

1	16	33	48
2	19	34	51
5	20	37	52
6	23	38	55
9	24	41	56
10	27	42	59
13	28	45	60
14	31	46	63

The subject is to secretly choose a number from the 64 numbers and separate the five colored cards into two piles, one with the choice on each and the other without the choice on them. Then the subject tells correctly the answer to the two questions. By looking at the most-perfect square the magician correctly names the choice.

METHOD. The 8x8 is turned into a torus similar to the 4x4 case. Either pile of colored cards will locate the correct 2x2 square containing the subject's choice on starting at the Key 54-8.

<div align="right">57-7</div>

The white card is a single diagram hop. When the answers to the two questions are known the choice is identified.

As an example suppose 37 is the choice. One pile of colored cards contains the green, yellow and white cards and the other pile red and blue. Using either pile the magician finds the current 2x2. From the Key 54-8 trace green to 52-10,

            57-7   59-5

yellow to 36-26 and then white

        43-21

A hop to 27-37, and locates

        20-42

the choice 37 once the two questions are answered.

The reader will note that this magic is similar but much harder to fathom than the old chestnut trick using base two cards.

Martin Gardner remarks that the authors for the first time were able to find all the most-perfect squares of all orders. For example, not counting reflections or rotations there are 48 4x4s and 368640 8x8s. When you reach 36x36 the number is 2.76754×10^{44} - around a thousand times the number of pico-pico-seconds since the Big Bang. Gardner adds

> This solution of one of the most frustrating problems in magic-square theory is an achievement that would have been remarkable for a mathematician of any age. In Dame Kathleen's case it is even more remarkable, because she was 85 when she and Brée finally proved the conjectures she had earlier made. In her own words, "The manner in which each successive application of the properties of the binomial coefficients that characterize the Pascal triangle led to the solution will always remain one of the most magical mathematical revelations that I have been fortunate enough to experience. That this should have been afforded to someone who had, with a few exceptions, been out of active mathematics research for over 40 years will, I hope, encourage others. The delight of discovery is not a privilege reserved soley for the young."

Perhaps the reader would prefer an alternative to the two questions that must be answered truthfully in the 8x8 case. This can be accomplished by using the following two orange cards instead.

0	16	36	52
1	17	37	53
2	18	38	54
3	19	39	55
8	24	44	60
9	25	45	61
10	26	46	62
11	27	47	63

0	16	32	48
2	18	34	50
4	20	36	52
6	22	38	54
9	25	41	57
11	27	43	59
13	29	45	61
15	31	47	63

They are to be added to the two piles of five cards under the same provisos. The key 2x2 with 7 as the lower right is transposed by either pile into another pile (unless one of the four members of the key is chosen) and the magician traces the new 2x2 from the lower right across the oranges with the solid or dashed sides. That is, the four entries of the 2x2 will be, starting at the lower right entry as follows. Neither orange stays on lower right, both oranges cross the dashed and solid lines, and one of the oranges goes across only the dashed or solid lines. If that new entry occurs on any of the colors that is the subject's choice. If not, then this is the "not" pile and the subject's choice is the diagonally opposite choice.

For example suppose the subject chooses 39. The two piles will then be first red blue, green, dashed and second yellow, white, solid. If the magician traces the first pile it goes from key 7 to 39 and from the second pile it would lead to 22 but 22 does not appear on either yellow, white or solid so this is the "not" pile and the subject's choice is the diagonal 39 instead.

In summary, the red, blue, green, yellow and white cards identify the proper 2x2. Then the oranges locate one of the four entries starting at the lower right. If the pile is noted to be the "hit" pile that entry is the choice. If the pile is noted to be the "not" pile, the diagonal is the choice.

REFERENCES

(1) Magic Squares Cornered", Martin Gardner, NATURE, vol. 395, 17 September 1998.
(2) *Most Perfect Pandigonal Magic Squares, Their Construction and Enumeration*, by Kathleen Ollerenshaw and David Brée. ISBN 0 90501 06X. From The Institute of Mathematics and Its Applications, Catherine Richards house, 16 Nelson Street, Southend-on-Sea, Essex, SS1 1EF U.K.

November 1996
Hendersonville, NC
Martin and Charlotte Gardner
with Karen Farrell

November 1996
Hendersonville, NC
Martin and Charlotte Gardner
with Jeremiah Farrell

Martin Gardner and I in Norman, OK, 2004

TRIPLE WORD LADDER PHRASES

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Consider the 3-word phrase VAN LED WAY. *Changing the <u>first</u> of the 3 letters in each word* makes another phrase, **J**AN **W**ED **R**AY. Repeat the exercise to make a third phrase, **I**AN **F**ED **M**AY.

VAN LED WAY
JAN WED RAY
IAN FED MAY

VAN. JAN and IAN form a word ladder; LED, WED and FED form word ladder; WAY, RAY and MAY form a word ladder.   These are Triple Word Ladder Phrases.

Another example is:

RON HIT MAN
DON LIT PAN
JON BIT DAN

A similar exercise *changes the <u>second</u> of the 3 letters in each word* to make another phrase.

THE HOT TIP	SHE HAD ACE
TOE HIT TAP	SUE HID AXE
TIE HAT TOP	SEE HUD AGE

Here *the <u>third</u> of the 3 letters in each word is changed* to make another phrase.

LEN HIT BIN	REG HAS RIB
LET HIM BID	REP HAD RIG
LEO HID BIB	RED HAT RIM

WORDS CONTAINING CANADIAN PROVINCE & TERRITORY ABBREVIATIONS

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The August 2020 edition of *Word Ways* ran my article *Words Containing US State Abbreviations*, where I sought the smallest set of words containing all 50 US state abbreviations. My search also extended to seeking the smallest set of words containing the abbreviations for the 50 states, the District of Columbia, and the various US territories.

In this article, I repeat the exercise for the more modest group of abbreviations for the Canadian provinces and territories. There are just 13 of these:

AB	Alberta		NU	Nunavut
BC	British Columbia		ON	Ontario
MB	Manitoba		PE	Prince Edward Island
NB	New Brunswick		QC	Quebec
NL	Newfoundland and Labrador		SK	Saskatchewan
NT	Northwest Territories		YT	Yukon
NS	Nova Scotia			

As with the US state abbreviations, the challenge is to find the smallest number of words which contain all the abbreviations. Obviously, it's necessary to find some words which contain more than just one abbreviation. For example, FONT contains both ON and NT. Here's my best shot, with just 6 different words:

cantons dabchick moskonfyt openly qcepo unbenumb

AB	Alberta	d**ab**chick
BC	British Columbia	da**bc**hick
MB	Manitoba	unbenu**mb**
NB	New Brunswick	u**nb**enumb
NL	Newfoundland and Labrador	ope**nl**y
NT	Northwest Territories	can**t**ons
NS	Nova Scotia	canto**ns**
NU	Nunavut	unbe**nu**mb
ON	Ontario	cant**on**s
PE	Prince Edward Island	o**pe**nly
QC	Quebec	**qc**epo
SK	Saskatchewan	mo**sk**onfyt
YT	Yukon	moskonf**yt**

5 of the 6 words are in the *Oxford English Dictionary* (OED). The sixth word, **QC**EPO, is worth comment. The OED does contain a couple of words with the QC digram, but both are capitalized - KA**QC**HIKEL and Q'E**QC**HI both appear in an OED quote at the main entry QUICHÉ*,* the Mayan language of a people inhabiting the western highlands of Guatemala. However, **QC**EPO appears uncapitalized in *Dorland's Illustrated Medical Dictionary*, 24th edition, where it is defined as 'the tubercle type of dermal leishmaniasis', a nasty chronic skin disease. For some reason, the word has disappeared from the more recent 28th edition of *Dorland's*.

The abbreviation NL for Newfoundland and Labrador was introduced in 2002, when it was changed from NF. The same 6 words would still have been a valid solution before that date as the NF digram appears in MOSKO**NF**YT.

The QC abbreviation for Quebec was introduced in 1991. The abbreviation prior to that date was PQ, when **QC**EPO could have been swapped out for the OED's U**PQ**UIVERING or *Webster's Third*'s PO**PQ**UIZ.

If anyone can get the minimum set of words down to just 5, I would love to hear of the improved solution.

TRANSPOSING OPPOSITES

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Two words having opposite meanings have their letters rearranged to make a phrase.

A B O V E - B E L O W = L O B A B O W E V E

A D D - S U B T R A C T = D A D'S T U B C A R T

A F T E R N O O N - M O R N I N G = O N O N E F R O N T M A R G I N

A I R - W A T E R = I R A T E W A R

A L W A Y S - N E V E R = W A S V E R Y L E A N,   A S E V E R Y L A W N

A N G E L - D E V I L = G I V E N E D A L L

A N I M A L - P L A N T = N A N L I T A L A M P

A N K L E - W R I S T = L A W T I N K E R S

A N S W E R - Q U E S T I O N = N O T E, S Q U A R E W I N S

A R M S - L E G S = M E L 'S R A G S

A R R I V E - D E P A R T = A R I V E R P A R T E D

A R R I V E S - D E P A R T S = P A T'S R E A R D R I V E S

A R T E R Y - V E I N = E V E R Y T R A I N

A T T I C - B A S E M E N T = C A N 'T B E A T T I M E S

B A S E - T O P = B O A P E S T

B E N T - S T R A I G H T = T I G H T A S B R E N T, B R I G H T A S T E N T

B E S T - W O R S T = B E R T S T O W S

B I R T H - D E A T H = H I T T H E B A R D

B I T T E R - S W E E T = I S B E T T E R W E T

B O Y - G I R L = G L I B R O Y

C A M E - W E N T = W E C A T M E N

C A T C H - D R O P = P A T C H C O R D

CAT - DOG = TAG COD

CAT - MOUSE = CAME TO US

CENTIGRADE - FAHRENHEIT = THE TIGER HEAD IN FRANCE

CHEAP - DEAR = PA REACHED

CLEAN - DIRTY = A DRY CLIENT, TRY ICELAND

CLOSED - OPEN = CONE SLOPED

CLOSE - OPEN = NOEL COPES

COLD - HOT = HOLD COT

COUNTRY - TOWN = TRY COUNT NOW

CRY - LAUGH = UGLY ARCH

DECREASE - INCREASE = SEE, I NEED RACE CARS

DIES - LIVES = VILE SIDES

DIFFERENT - SAME = MARE FINDS FEET

DIFFICULT - EASY = AS IF I DEFY CULT

DISTANT - NEAR = INSTANT READ

DIVIDE - MULTIPLY = TILL I DUMPED IVY

DORSAL - VENTRAL = ALL OVER STRAND

DOUBLE - SINGLE = BLUE DOLE SIGN

DRY - WET = WRY TED

EAST - WEST = STEW TEAS   WEST SEAT   WET SEATS

EITHER - NEITHER = I, THE HEIR, ENTER

ENTERS - LEAVES = LEE NEARS VETS

EVENS - ODDS = NED'S DOVES

FALL - RISE = SELL FAIR

FALSE - TRUE = REUSE FLAT

FAR - NEAR = REAR FAN

FAST - SLOW = SAW LOFTS

FASTEN - UNDO = FAT NUN'S ODE

FAT - THIN = THAT FIN

FELL-ROSE = ELF'S LORE

FIND-LOSE = DON'S FILE

FINISH-START = HIS FIRST TAN

FIRE - WATER = REWIRE AFT

FRESH - STALE = TEARS FLESH

FUTURE-PAST = PUT US AFTER

GOES-STAYS = GAY TOSSES

GUILTY - INNOCENT = NOTICE TINY LUNG

HARD - SOFT = OH, DRAFTS

HATE -LOVE = LEAVE HOT

HEAD - TAIL = DIAL THEA

HUGE-TINY = THE 'IN' GUY

JOIN - SEPARATE = APE'S EAR JOINT

LAND -SEA = DAN'S ALE

LEAST-MOST = TOTAL MESS

LEAVE - RETURN = REAL VENTURE

LEAVE - STAY = A YALE VEST

LESS-MORE = ELMS ROSE

LIES-TRUTHS = RUTH'S TILES

LOSES-WINS = LESS IS WON

MAD-SANE = DAMN SEA

MASTER - MISTRESS = STAR MISSES TERM

MINUS-PLUS = SINUS LUMP

NARROW - WIDE = REAR WINDOW

NEW-OLD = LED NOW

NOISY-SILENT = SENT NOISILY

NOW - THEN = NOT WHEN

OPEN - SHUT = POE HUNTS

OVER-UNDER = RUE VENDOR

PALM-SOLE = SLAM POLE

POLITE-RUDE = I RULE DEPOT

POOR - RICH = RIO PORCH

PORT - STARBOARD = TRAPS RAT BROOD

ROOT - STEM = TORE MOST

SAVE - SPEND = DAVE'S PENS

SCOWL-SMILE = I SMELL COWS

SHORT - TALL = SHALL TROT   THAT ROLLS

SINK - SWIM = WINK MISS

SLEEP - WAKE = KEEP WALES   PELE WAKES

SOUR-SWEET = OUR SWEETS

START -STOP= POST TARTS

SUMMER-WINTER = MEN STRUM WIRE

TAME -WILD = MA WILTED

TOMORROW - YESTERDAY = TROY TOWED ROSEMARY

The Longest Words Using The Fewest Letters

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Claude Shannon may be remembered as the father of information theory for the formula engraved on his tombstone, but it's not the only measure of entropy he helped devise. *Metric entropy* gauges the amount of information proportionate to the number of unique characters in a message.

Within the English language, the maximum metric entropy individual words can attain is 0.5283 binary digits (or bits). This is the value of any three-letter word composed of three different letters (e.g., WHO). Multiplying 0.5283 times the number of distinct letters equals 1.58, and 2 raised to the power of 1.58 yields the same number of letters. These values hold true for any trigram with three different letters in a 26-letter alphabet.

Measurements differ for written text involving other characters including numbers, punctuation, even spaces. Distinguishing between uppercase and lowercase would double the number of letters to 52. Adjusting for word frequency would further alter values as trigrams like WHO occur far more often in written English than, say, KEY. (How much more often? We found 3,598,284 instances of WHO in Project Gutenberg versus 58,863 of KEY, or 61 times as many.)

Our lexicon derives from three primary sources: Merriam-Webster, Webster's, and the Moby II wordlist, with a combined 382,843 words. Of these we find some 2,000 trigrams made up of three different letters, including WHO and KEY, tied for highest metric entropy.

At the opposite extreme we find much longer words with greater redundancy. The single word with the lowest (0.1150) metric entropy, DICHLORODIPHENYLTRICHLOROETHANE, with 31 letters also happens to be the longest word in all three wordsets. It is the chemical name of an insecticide known more commonly by its acronym DDT (occurring 213 times more frequently in Project Gutenberg). While DDT is also a trigram, its metric entropy (0.3061) is lower than that of WHO or KEY as it contains two rather than three unique letters.

Scientific and medical words tend to have the lowest metric entropy, along with palindromes (WOWWOW) and compound words consisting of repeating units (WALLAWALLA). Outside these overlapping categories remain long words consisting of few distinct letters. Here are some of the less technical ones:

Word	Metric entropy	Letters	Unique	Ratio
Humuhumunukunukuapuaa	0.1155 bits	21	7	33%
Antidisestablishmentarianism	0.1192 bits	28	12	43%
Antiinstitutionalists	0.1304 bits	21	8	38%
Possessionlessness	0.1306 bits	18	7	39%
Transubstantiationalist	0.1326 bits	23	10	43%
Senselessness	0.1337 bits	13	4	31%
Antitintinnabularian	0.1352 bits	20	8	40%
Superincomprehensibleness	0.1372 bits	25	13	52%
Antinationalization	0.1384 bits	19	7	37%
Noncondescendingness	0.1385 bits	20	8	40%
Overrepresentativeness	0.1386 bits	22	10	45%
Nonconscientiousness	0.1402 bits	20	8	40%

Successlessness	0.1431 bits	15	6	40%
Sleevelessness	0.1433 bits	14	5	36%
Nonsententiousness	0.1441 bits	18	7	39%

The last word on this list falls into a more rarefied class—autological—and thus makes an appropriate stopping point.

References

Golomb, Solomon W. (1984) "Amalgamate, Chemist!," *Word Ways*: Vol. 17: Iss. 1, Article 6. Available at: https://digitalcommons.butler.edu/wordways/vol17/iss1/6

Merriam-Webster Collegiate Reference Application Programming Interface. Available at: https://www.dictionaryapi.com

Project Gutenberg DVD (2010). Available at: http://www.gutenberg.org/wiki/Gutenberg:The_CD_and_DVD_Project

Project Gutenberg Etext of Moby Word II. Available at https://github.com/dwyl/english-words

Sebastian, Anthony and Merriam, Renee (1988) "On Reflexivity in Words," *Word Ways*: Vol. 21: Iss. 3, Article 2. Available at: https://digitalcommons.butler.edu/wordways/vol21/iss3/2

Shannon, Claude E. and Weaver, Warren (1949) *The Mathematical Theory of Communication*, University of Illinois Press: Urbana and Chicago.

Soni, Jimmy and Goodman, Rob (2017) *A Mind at Play: How Claude Shannon Invented the Information Age*, Simon & Schuster: New York.

Webster's Revised Unabridged Dictionary. Available at: http://www.gutenberg.org/ebooks/673

REMOVING LIKE LETTERS FROM A WORD TO LEAVE ANOTHER WORD

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In the November 2017 WordWays p 286 in *Removing Like Letters To Leave A Word*, I removed like letters <u>from 2-word phrases</u> to leave a single word.
In the current article, I remove like letters <u>from a single word</u> to leave another single word.

1. <u>REMOVING THE FIRST AND LAST LIKE LETTERS TO LEAVE A WORD</u>

ADESPOTA - DESPOT   BLOB - LO   CHEMIC - HEMI   DAPPLED - APPLE
EASE - AS   FIF (five) - I   GONG - ON   HEATH - EAT
IPITI (the smallest S. African antelope) - PIT   JUBARAJ (an Indian crown prince) - UBARA
KINK - IN   LAPEL - APE   MODEM - ODE   NAIRN - AIR
OREGANO - REGAN   PRIMP - RIM   RACER - ACE   SAILS - AIL
TABLET - ABLE   URUBU - RUB   VIV (a first name) - I   WHEW - HE
XEROX - ERO   YEARLY - EARL
ZEREZ (old Xeres, a wine-famous town in Andalusia) - ERE

2. <u>REMOVING NON-DOUBLED LIKE LETTERS</u>

ASIAN - SIN   BABY - AY   CLICKED - LIKED
DANDY - ANY   BERATES - BRATS   HALF-LIFE -HALLIE (surname)
GORGE - ORE   SHEATH - SEAT   DIARIES - DARES
SKUNK - SUN   BLANDLY - BANDY   SMARMY- SARY (old 'sorry')
CONVENT - COVET   OBOE - BE   PIPS - IS
FORGERY - FOGEY   SPASM - PAM   TITS - IS
RUINOUS - RINOS   VALVE - ALE   WALLOWS - 'ALLOS
MAXIXE (a dance) - MAIE (old 'may')
POLYNYA (a space of open water in the midst of ice) - POLNA (Belarus)
CZARITZA (Russian empress) - CARITA (Bolivia)

3. <u>REMOVING DOUBLED LETTERS</u>

- AA   KIAAT (a S. African tree) - KIT

- BB   BABBLE - BALE   BLUBBER - BLUER   BOBBLE - BOLE   COBBLE - COLE
DABBLE - DALE   FLABBY - FLAY   GABBLE - GALE   HOBBLE - HOLE
JABBER - JAER   LOBBER - LOER   MOBBER - MOER   NIBBLE - NILE
PEBBLE - PELE   RUBBLE - RULE   SHABBY - SHAY   TABBY - TAY
WEBBED - WEED

- CC   ACCRUE - ARUE   ECCLES - ELES   MOCCA - MOA   OCCUR - OUR
SOCCER - SOER

- DD	ADDLE - ALE	BEDDING - BEING	CODDLE - COLE	DADDY - DAY
	EDDY - EY	FADDY - FAY	MUDDLE - MULE	NEDDY - NEY
	ODDER - OER	PADDLE - PALE	RIDDLE - RILE	SADDLE - SALE
	TODDY - TOY	WEDDED - WEED		

- EE	BEERY - BRY	CAREER - CARR	EERIE - RIE	FEELING - FLING
	GEEING - GING	PEEING - PING	REFEREE - REFER	STEERING - STRING
	TRAINEE - TRAIN	WEEING - WING		

- FF	AFF - A	BAFFLE - BALE	COFFIN - COIN	DOFFING - DOING
	FLUFF - FLU	GAFFS - GAS	HUFFED - HUED	MOFFAT - MOAT
	OFFER - OER	PIFFLE - PILE	RUFFLE - RULE	SUFFER - SUER
	TOFF - TO	WAFFLE - WALE	YAFFLE - YALE	

- GG	BEGGAR - BEAR	COGGLE - COLE	DOGGER - DOER	EERIE - RIE
	FOGGY - FOY	GAGGLE - GALE	HAGGLE - HALE	JUGGLES - JULES
	LOGGED - LOED	MUGGER - MUER	NIGGLE - NILE	PIGGED - PIED
	RAGGLE - RALE	SOGGY - SOY	TIGGED - TIED	WIGGLE - WILE

- HH   ACHHORN (Austria) - ACORN

- II   HAWAII - HAWA   PENIIS (pennies) - PENS

- JJ   HAJJI - HAI (old 'hay')

- KK   TIKKA - TIA (Maria)

- LL	ALL - A	BULLY - BUY	CULLED - CUED	DRILLED - DRIED
	FRILLED - FRIED	GULLY - GUY	HELL - HE	ILLS - IS
	JOLLY - JOY	KELLY - KEY	LOLL - LO	MALL - MA
	NELLY - NEY	PILL - PI	RALLY - RAY	SALLY - SAY
	TRILLED - TRIED	WELL - WE	YELL - YE	

- MM	BRIMMER - BRIER	COMMON - COON	DIMMED - DIED	EMMER - E'ER
	FEMME - FEE	GEMMOLOGIST - GEOLOGIST		HEMMED - HEED
	JAMMY - JAY	LEMMY - LEY	MAMMY - MAY	PAMMY - PAY
	RIMMEL - RIEL	SUMMING - SUING	TRIMMED - TRIED	

- NN	ANN - A	BUNNY - BUY	CONNED - COED	DONNING -DOING
	FENNEL - FEEL	GONNER - GOER	INN - I	JONNY - JOY
	KENNY - KEY	LENNY - LEY	MANN - MA	NANNY - NAY
	PINNER - PIER	RUNNER - RUER	SENNA - SEA	TINNED - TIED

- OO	BOOING - BING	COOLING - CLING	FOOLING - FLING	MOOING - MING
	OOZING - ZING	SOOTED - STED	WOOING - WING	

- PP	APPLE - ALE	BOPPER - BOER	COPPED - COED	DIPPED - DIED
	FLIPPER - FLIER	GUPPY - GUY	HAPPY - HAY	KEPPEL - KEEL
	LAPPING - LAING	NAPPY - NAY	PEPPER - PEER	SAPPY - SAY
	SKIPPERS- SKIERS	STIPPLE - STILE	TIPPER - TIER	ZIPPER = ZIER
				(a surname)

- RR	BARRY - BAY	CARRY - CAY	DERRY - DEY	FERRY - FEY
	GARRY - GAY	HARRY - HAY	LARRY - LAY	MARRY - MAY
	PARRY - PAY	TARRY - TAY		

- **SS**	ASS - A	BESS - BE	CARESS - CARE	DURESS - DURE
	ESSEN - EEN	FLOSS - FLO	GASSY - GAY	HESS - HE
	JOSS - JO	LESSER - LEER	MESS - ME	NEARNESS- NEARNE
	PISSED - PIED	RISSOLE - RIOLE	SUSSES - SUES	(surname)
		(place in Colombia)		TESSA - TEA
	VESSEL - VEEL			

- **TT**	BATTLE - BALE	CATTY - CAY	DITTO - DIO	FATTY - FAY
	GUTTY - GUY	HOTTER - HOER	JETTY - JEY	LETTER - LEER
	MOTTO - MOO	NETTED - NEED	OTTER - O ' ER	PITTED - PIED
	RATTLE - RALE	SETTER - SEER	TITTER - TIER	WETTED - WEED

- **VV**	NAVVY - NAY	SAVVY - SAY

- **XX**	EXXON - EON

- **ZZ**	FIZZLE - FILE	MUZZLE - MULE	PUZZLE - PULE	RAZZLE - RALE
	SOZZLED - SOLED			

4. PHRASES

BOBBY BOY	ROBBY ROY	FIDDLES FILES	MIDDLE MILE (of a race)
SADDLE SALE	MUFFLE MULE	YELLS 'YES'	JAMMY JAY
MAMMY MAY	BONNY BOY	GRANNY GRAY	SOOTY STY (pig)
APPLE ALE	SKIPPER SKIER	GARRY GAY	LARRY LAY
MARRY MAY	PASS PA	BETTER BEER	RATTY RAY
DAZZLE DALE	JAZZY JAY	MUZZLE MULE	

ALLITERATIVE PANGRAMS

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A *pangram* is a text that contains each letter of the alphabet at least once. Some celebrated examples:

- "The quick brown fox jumps over the lazy dog."

- "Pack my box with five dozen liquor jugs."

Short pangrams are fiendishly difficult to devise, optimal examples (i.e., containing all 26 letters exactly once) relying on abbreviations or rare words that obscure the meaning of the text:

- Mr. Jock, TV quiz Ph.D., bags few lynx.

- Cwm fjord bank glyphs vext quiz.

It is interesting to consider what constraints, in addition to minimizing the length, we might place upon the construction of pangrams. Previous work has treated variants such as *pangrammatic windows* (naturally occurring rather than purpose-built pangrams) [1, 5, 8, 12, 15, 16], *panalphabetic windows* (pangrammatic windows that contain all the letters of the alphabet in order) [2, 14], *palindromic pangrams* (pangrams that read the same backwards and forwards) [3, 11, 17], *pangrammatic ladders* (word ladders that contain every letter of the alphabet) [2, 10], *pangrammatic lists* (lists of words that contain at least one word starting with each letter of the alphabet) [13], *self-enumerating pangrams* (a pangram that accurately inventories its own letters) [9, 18, 19], and many more [7]. In this article, we introduce the *alliterative pangram*, a pangrammatic text in which every word begins with the same letter. For example, here is one 47-letter specimen for the letter A:

- Awed Avar Afghans admix atypic, arabesque, azulejo ankhs.

As with other pangrammatic constructions, the principal concern with alliterative pangrams is to minimize the length, though it is also important to ensure that the text is grammatically correct and encodes a complete and meaningful utterance. While some allowance can be made for poetic word order, one can't simply throw all sense of syntax out the window. The use of abbreviations, obsolete or specialized terms, and (well-attested) proper names is likewise permissible, though these are to be avoided if possible.

One of the greatest challenges in producing a full suite of alliterative pangrams (i.e., one for each of the 26 letters of the alphabet) is the composition for X. This is because there are no common words that start with an X and that also contains a Q, J, or W. Here are some options and workarounds:

- There don't seem to be any "proper" words at all that start with X and contain a J. But in times past, the final i of lowercase roman numerals was often written as j. The *Oxford English Dictionary* has hundreds of such citations, both ordinal and cardinal. So it is probably acceptable for one to use, say, *xvj* to mean "16" or "16th".

- Perhaps the only attested X-words that also contain K are the Greek proper name *Xenakis* and the word *xebeck*, a variant spelling of *xebec* (a type of sailboat).

- Likewise, the only X-words containing a Q seem to be *xebeque*, which is another variant of *xebec*, and *xiquima*, a variant spelling of *jicama*, a Central American vegetable.

- The only X-words with W seem to be a few archaic spellings (like *xwld* for *should*) that haven't seen use since the 15th century, and so should be avoided at all costs. But the *OED* and many print sources [4, 6] do refer to a 18th-century porcelain painter by the name of Philippe Xrowet (also known as Xhrouet, Xhrouuet, Croix, or Secroix). Using this name may be preferable to the alternatives.

Below is a list of 12 alliterative pangrams, written by the author, which readers are challenged to improve upon and to expand to the remaining 14 letters of the alphabet:

A (37): Amplify and advect awrong Ajax's Abkhaz aqua.

B (46): Bipeds, bivouacking by Bamford, bequeath blowzy bijoux.

C (44): Crafty, cawing caziques carjacked complex, crafted Chev cabs.

D (47): DJ Dvorak deoxygenizes Depew's deformable discotheque.

E (48): Elfin Ezequiel extrajudicially embows evoked esophagi.

F (47): Faquir Fitzpatrick fed Freyja Fanshaw foxglove flambe.

G (66): Gretzky's grewsome glitchy genuflexion grieved gaping Garboesque Gujaratis.

I (45): Impawning idols infrequently inject Izhevsk ibexes.

J (45): Jock Japeth's jovial jerquing jynx jumboized jewfish.

Q (57): Qom Qajar Qadhafi quiveringly quizzes quixotic Quapaw Quebeckers.

X (57): Xerodermatic Xrowet xylographs xarif Xanakis's xvj Xuzhou xebeque.

Z (62): Zolaesque, zaftig Zhdanov zaps Zhangjiakou's zanthoxylum zebec Zionward.

X-words not being in abundance in English, the example for X is particularly cryptic, even in light of the discussion above. In case clarification is needed, the pangram can be paraphrased as follows:

> Dry-skinned Xrowet (the 18th-century porcelain painter) makes a wood engraving of the 16th xebec (sailing ship) from Xuzhou (a Chinese city), owned by a xarif (a Middle-Eastern money changer) named Xanakis.

References

[1] Ralph G. Beaman. The pangrammatic window. *Word Ways*, 5(3):160–161, August 1972.

[2] Howard W. Bergerson. Kickshaws. *Word Ways*, 13(3):175–185, August 1980.

[3] Dmitri A. Borgmann. *Language on Vacation*, chapter Pangrammatic Perplexities, pages 130–133. Scribner's, 1965.

[4] Jeff Brown. Linda Roth on detecting the hand of the artist: Sèvres painters on porcelain. *Shards: A Newsletter of the China Students' Club of Boston*, 7(3):5–6, 2004.

[5] Eric Chaikin. Joaquin through the pangram window. *Word Ways*, 39(2):71–73, May 2006.

[6] Carl Christian Dauterman and James Parkerr. The porcelain furniture. *Metropolitan Museum of Art Bulletin*, 18(9):274–284, 1960.

[7] A. Ross Eckler. Pangram variations. *Word Ways*, 10(1):41–44, February 1977.

[8] A. Ross Eckler. Shakespeare's pangrammatic sonnet. *Word Ways*, 39(2):138, May 2006.

[9] Leonard Gordon. On pruning trees for pangrams. *Word Ways*, 25(3):159–161, August 1992.

[10] Leonard J. Gordon. Minimum-length pangrammatic ladders. *Word Ways*, 23(2):125, May 1990.

[11] Jeff Grant. Palindromic pangrams. *Word Ways*, 11(2):98–99, May 1978.

[12] Sean A. Irvine. A 42-letter pangrammatic window. *Word Ways*, 45(4):313–316, November 2012.

[13] Mark Isaak. Two new pangrammic challenges. *Word Ways*, 35(4):307, November 2002.

[14] Michael Keith. Panalphabetic windows in literature. *Word Ways*, 34(1):74–76, February 2001.

[15] Mike Keith. New record pangrammatic windows. *Word Ways*, 35(4):243, November 2002.

[16] Mike Keith. Sub-60-letter pangrammatic windows. *Word Ways*, 39(1):3, February 2006.

[17] James Puder. Varieties of palindromic pangrams. *Word Ways*, 32(1):34–47, February 1999.

[18] Lee Sallows. In quest of a pangram (part 1). *Word Ways*, 25(1):3–8, February 1992.

[19] Lee Sallows. In quest of a pangram (part 2). *Word Ways*, 25(2):74–79, May 1992.

NEW G4G AUCTION

By Jeremiah Farrell

The 14th Gathering for Gardner affair is tentatively scheduled for Atlanta in April of 2021. Meanwhile G4G has decided to run an online auction on Sunday, November 8th through Sunday, November 15th 2020. G4G can be reached at g4gfoundation.org.

G4G Board of Directors:
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What follows are two reprinted articles that demonstrate some Wordplay from earlier G4Gs.

MAGIC SQUARE MAGIC

JEREMIAH FARRELL
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I had heard the rumors for years. Somewhere, deep in the back woods, there existed an enclave of mentalists with some clever new prediction tricks. In fact, I finally learned that the group, the mysterious MOUSTERIAN cult, is led by my good friend Edith, known to readers of Word Ways as Scrubwoman Edith. Her last appearance on these pages was in the August 1999 issue in "Edith Plays Word Treblecross".

Mousterian headquarters is in the remote unincorporated village of St. Wordbuch, Maine. There Edith performs as the magicienne Madame Edith Camus-Brown. She has given me permission to describe several of the Mousterian tricks but she and I reserve all rights for their commercial reproduction.

Before the magic tricks are revealed, we must introduce Edith's concept of a magic word square. The diagrams below and on the next page show examples of 3x3, 4x4 and 5x5 squares. Notice that each cell consists of a bona fide dictionary entry from the American Heritage Dictionary (3rd edition) of Merriam-Webster's New International (2nd or 3rd editions).. No letter is duplicated in any row or column; for the 4x4 and 5x5 squares, the main diagonals also have this property. These are truly "word" squares, not merely square arrangements of letters that happen to form words. They also each have their own magic constant--every row and column can be transposed into the name of the square.

EN	MA	IR	SO	UT
IS	TO	NU	ME	RA
MU	RE	AS	IT	NO
AT	IN	OM	UR	ES
OR	US	ET	AN	MI

MOUSTERIAN

| AS	IR	ED	TO
DO	ET	IS	RA
IT	AD	OR	ES
RE	SO	AT	ID

ASTEROID

Each of the squares has a mathematical counter-part. For ADONIS, set A=0, N=0, O=1, I=2, D=3 and S=6, then add the numerical values of each of the letter pairs. One obtains a square that is magic on the integers 0 through 8. The famous lo-shu square, reported by W.W.R. Ball and H.S.M. Coxeter in their book *Mathematical Recreations and Essays* to be many centuries old, can be had by adding one to each entry. Similarly, ASTEROID becomes nu-merically magic when the following letter values are added: A=0, S=0, E=1, I=2, O=3, T=4, R=8 and D=12. For MOUSTERIAN, set A=0, M=0, E=1, I=2, O=3, U=4, N=5, R=10, S=15 and T=20. In each case, the numerical magic constant is the number obtained by adding all letter values in the name of the square.

AD	IN	SO
IS	DO	AN
NO	AS	ID

ADONIS

The same procedure can be used for magic cubes. In MOUSETRAP, every set of three words, in any of the three dimensions, transposes into MOUSETRAP. The cube can be turned into a numerical one by determining the *misgraph* of the configuration. The misgraph is the graph of letters that are never used together to form any of the words in the cells. Here the misgraph is the disjoint set OAU (Hawaiian, to mew as a cat), MRS and PET. Set O=0, M=0, P=0, A=1, U=2, R=3, S=6, E=9 and T=18 and we have a number magic cube on summing the letters.
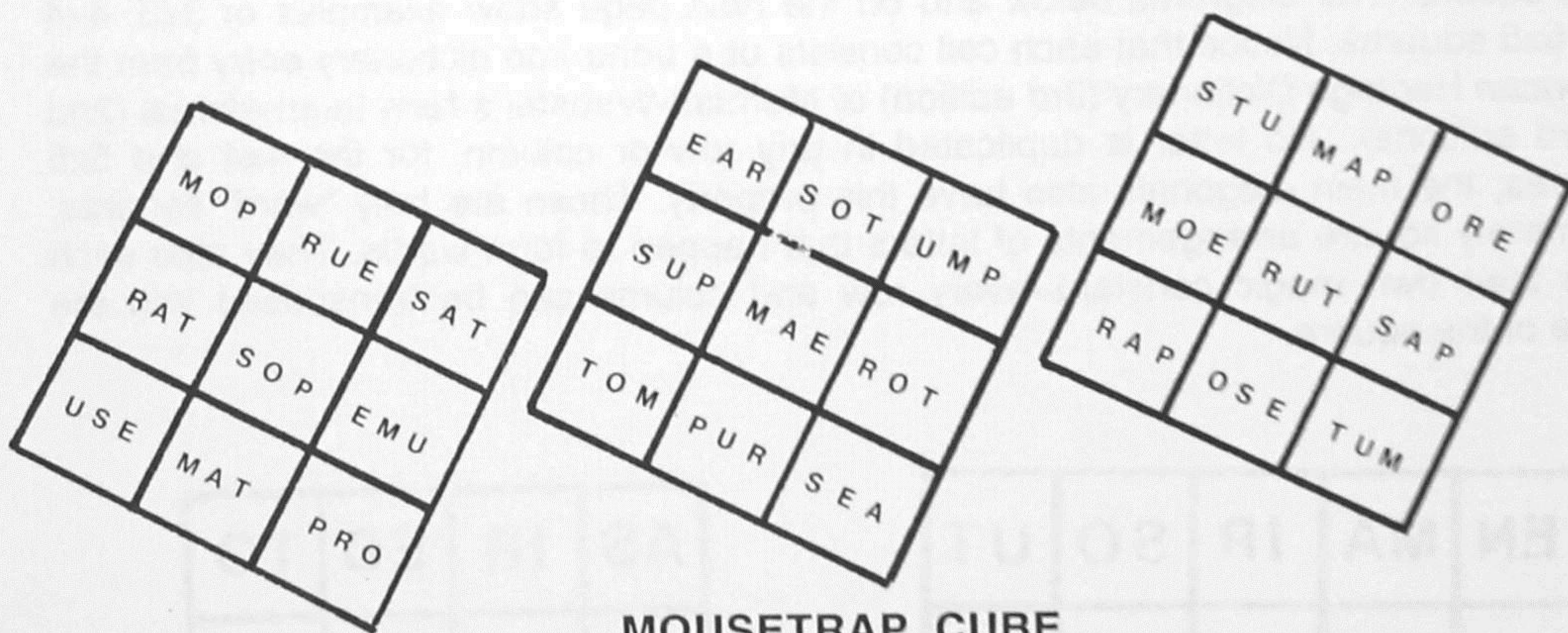
MOUSETRAP CUBE

It is worth mentioning that ASTEROID has many other cells that transpose into the magic constant. Any four cells symmetrically placed about the center point always yield ASTEROID--for example the four corners AS, TO, RE, and ID, or the four DO, IT, RA and ES, and so on. This square seems as fecund as the famous square etched in 1514 by Albrecht Durer in his work *Melancholia*.

|			
16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

ASTEROID also answers an old problem of Ozanam (1723) on how to arrange the 16 honor cards from an ordinary deck so that each row and column contain exactly one suit and one honor. Simply take the vowels as the suits and the consonants as the honors.

The mentalism that Edith performs can best be introduced using ASTEROID as a base. Obtain 16 blank cards and print the 16 words of ASTEROID on them. Edith has someone (let us suppose her friend Mark does the honors) arrange the cards in a 4x4 grid so that no letter is repeated in any row or column (ignore the diagonals). Mark does this with Edith's back turned and when it is completed, he turns the cards over. Mark then is instructed to choose four cards, either four cards on the corners of some quadrilateral in the grid or four cards so that there is exactly one choice per row and one choice per column. The former is called a *quad,* and the latter is called a *stagger.* His original placement of the cards is called a *mix.* It is also possible to obtain a mix by interchanging any two rows or any two columns as often as one likes. Because of certain properties ultimately connected with the theory of determinants, under any mix the cards remain simpatico for Edith's purposes.

Suppose Mark has selected a quad. He is then to choose one of the quad by marking it with a coin, and turns over the remaining three key cards of the quad. Edith is told the keys and can immediately name the marked card. Suppose Mark gives her the key cards ET-SO-AT of the quad. Edith has determined that in ASTEROID each letter in each half of the misgraph must occur exactly once with all others, or exactly four times, or exactly twice with some one other letters also occurring twice. Thus, for the vowels E-O-A-? the missing ? can only be I, and for the consonants T-T-S-? the missing ? can only be S, making the unknown card IS. The same technique works for a scatter. For example, suppose the keys DO-AT-ES are given. The vowel must be I and the consonant R, and so the marked word is IR.

ASTEROID
MISGRAPH
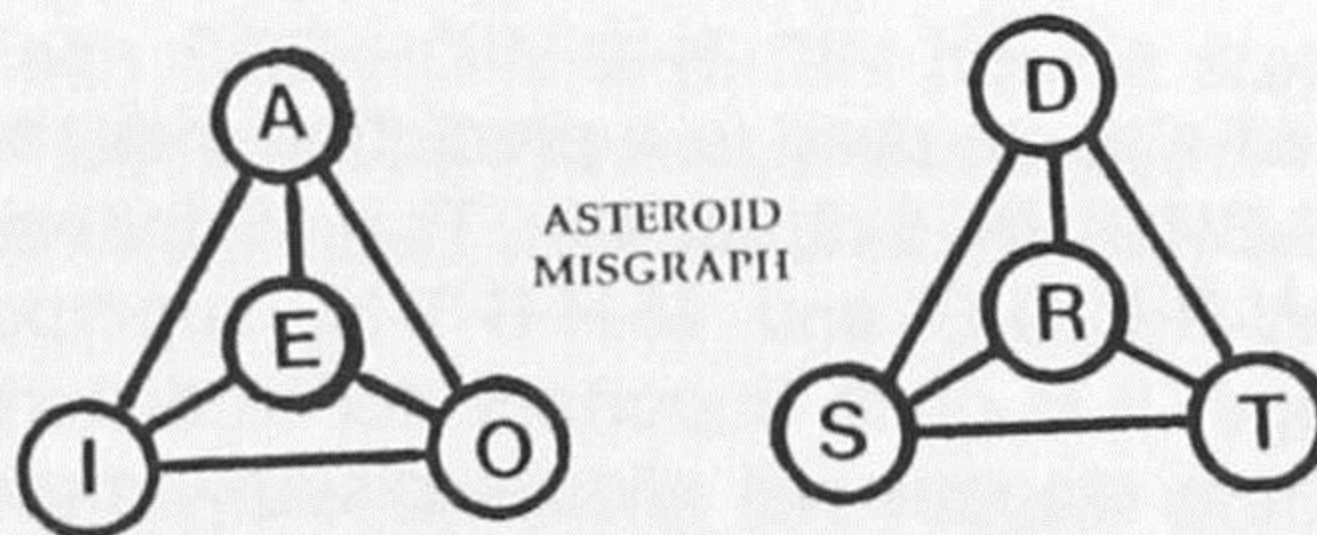
It would not take long for this trick's secret to be discovered, and thus Edith ordinarily uses the more elaborate FLYING SAUCER grid. The 16 three-letter words are again printed on cards. Here there are three disjoint parts to the misgraph. The three sets are F-N-G-C, I-A-U-E and L-Y-S-R. They may be recalled by using the stylized Flying Saucer label provided below.
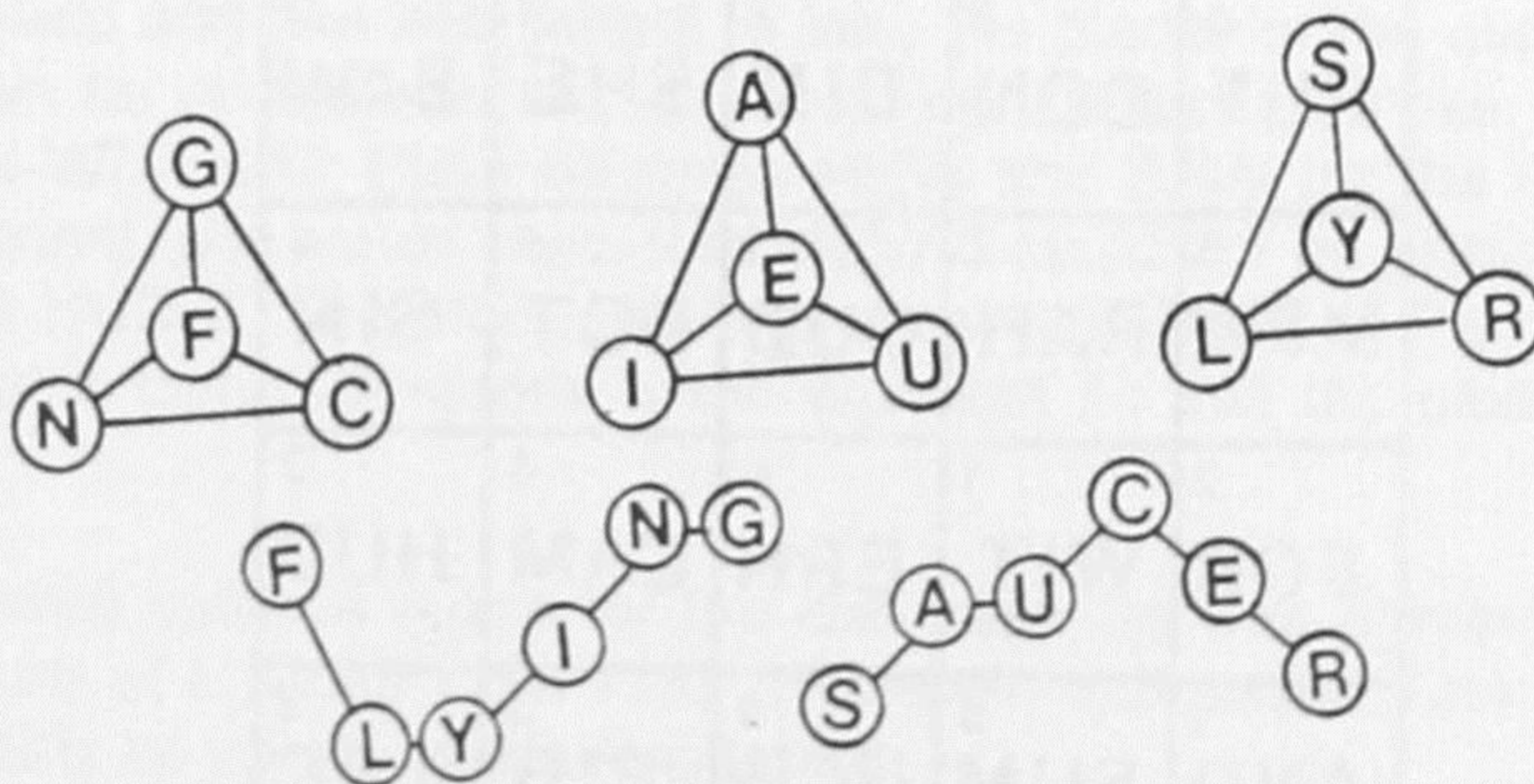
The trick works the same as before. Mark gives, say FEY, LEG, and ERN (from a stagger, but Edith does not need to know this), and Edith uses F-N-G-? to obtain ?=C, Y-L-R-? to get ?=S, and E-E-E-? to get ?=E. Hence the unknown is SEC.

GAS	FEY	NIL	CUR
ERN	CAL	GUY	IFS
ICY	SUN	FAR	LEG
FLU	RIG	SEC	ANY

FLYING SAUCER

The MOUSTERIAN square could also be used in a prediction trick, but instead we proceed to the more baffling EDITH CAMUS-BROWN 5x5 square. The 15 letters in the misgraph are in three disjoint sets: A-E-I-O-U, W-R-C-D-S and M-H-B-T-N, superposed in the pentagonal misgraph diagram on the next page. It is quite important not to disturb the cyclic order of the letters because the distribution for a stagger will always display some sort of symmetry with respect to the pentagon. The symmetry may sometimes be too ambiguous for us to be able to identify a quad so we will only use staggers. We illustrate with an example.

5 CHI	4 BED	3 SAT	2 WUN	1 ROM
4 RUT	3 CON	2 DIM	1 SHE	5 BAW
3 MEW	2 RAH	1 CUB	5 DOT	4 SIN
2 SOB	1 WIT	5 ERN	4 CAM	3 HUD
1 AND	5 SUM	4 HOW	3 RIB	2 TEC

EDITH CAMUS-BROWN

EDITH CAMUS-BROWN
MISGRAPH
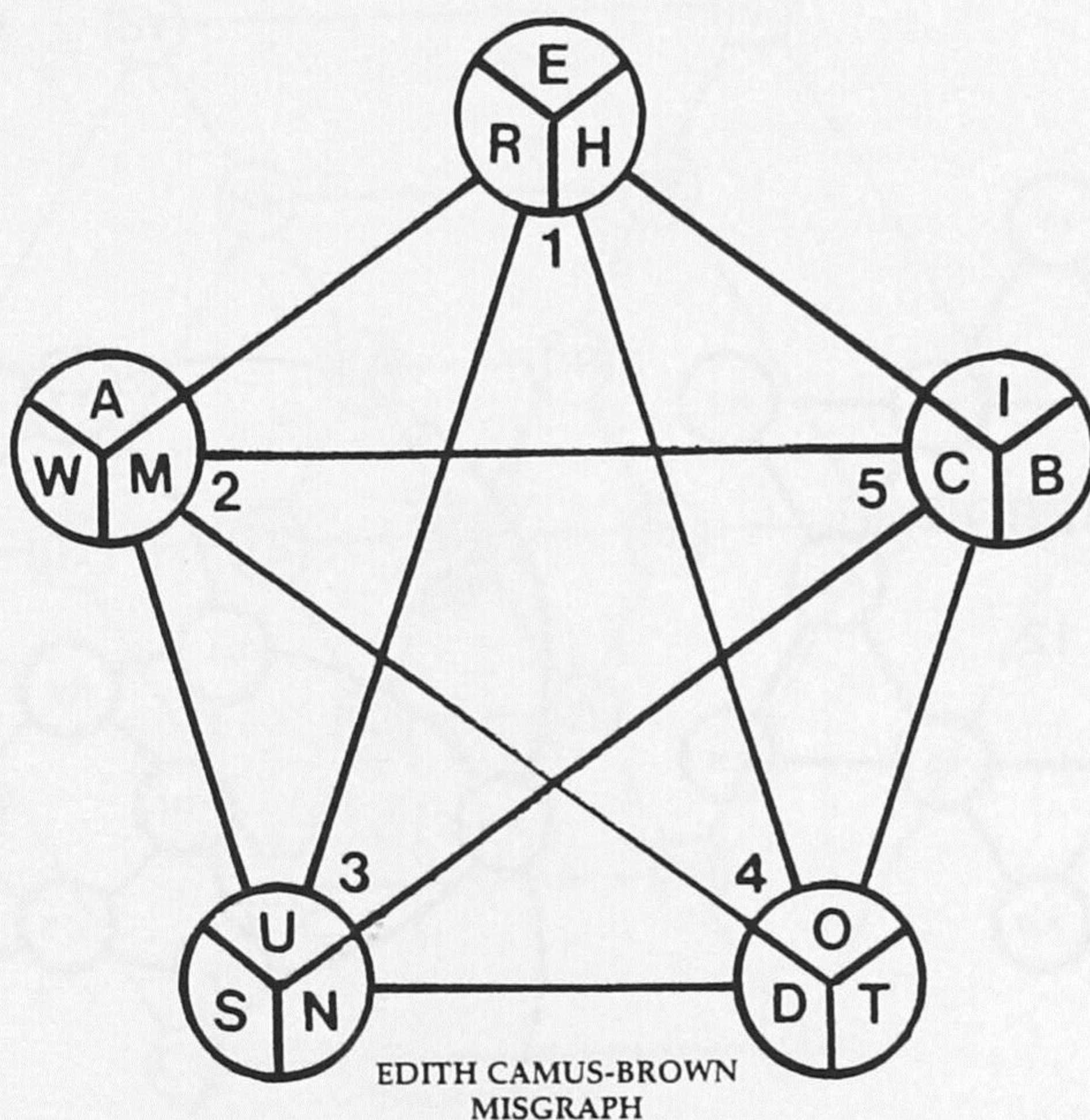
Suppose Mark gives Edith SOB-HOW-SHE-SIN from a stagger. The missing vowel comes from O-O-E-I-? and only ?=E preserves symmetry. Similarly, B-H-H-N-? yields ?=B or N, and the combination W-S-S-S-? can only mean ?=D. BED is the only word from the word list that works as the unknown.

The attentive reader may have noticed that each of our word squares is actually an instance of a set of Graeco-Latin squares. Briefly, an nxn Latin square is one where every one of n letters occurs exactly once in every row and every column. If we have two such squares, one in Latin and one in Greek, and if we can superpose the two so that every possible pair of Latin and Greek letters occurs exactly once, we have a Graeco-Latin square. Graeco-Latin squares are also called orthogonal or Euler squares.

In EDITH CAMUS-BROWN, we have three mutually orthogonal squares and could possibly have a fourth if we could add five new letters to take the places of the numbers 1,2,3,4 and 5 in the grid. It would then be possible to add quads to our prediction tricks. For example, if Mark keys the corner CON-WIT-HUD, Edith confuses MEW and BAW for the unknown corner. If the numbers are also present, she would know that MEW 3 could not be present in the same row as CON 3 or column as HUD 3. Therefore, the only answer is BAW 5. Perhaps some reader can find 25 four-letter words using 25 letters or the alphabet so that the ultimate word 5x5 can be constructed.

No pair of orthogonal squares exists for the 6x6 case, as was proven in 1900 by G. Terry, confirming a conjecture of L. Euler from 1782. However, nxn squares for n=7,8,9,10 and 11 do exist and could probably be constructed using letters.

And by no means are squares the only possible shapes. ASTEROID 12 and ASTEROID 16, on the next page, are examples of four-in-a-row on triangles, each with constant ASTEROID. The four circles all spell FLYING SAUCER along their circumferences.

ASTEROID 12

FLYING SAUCER

ASTEROID 16
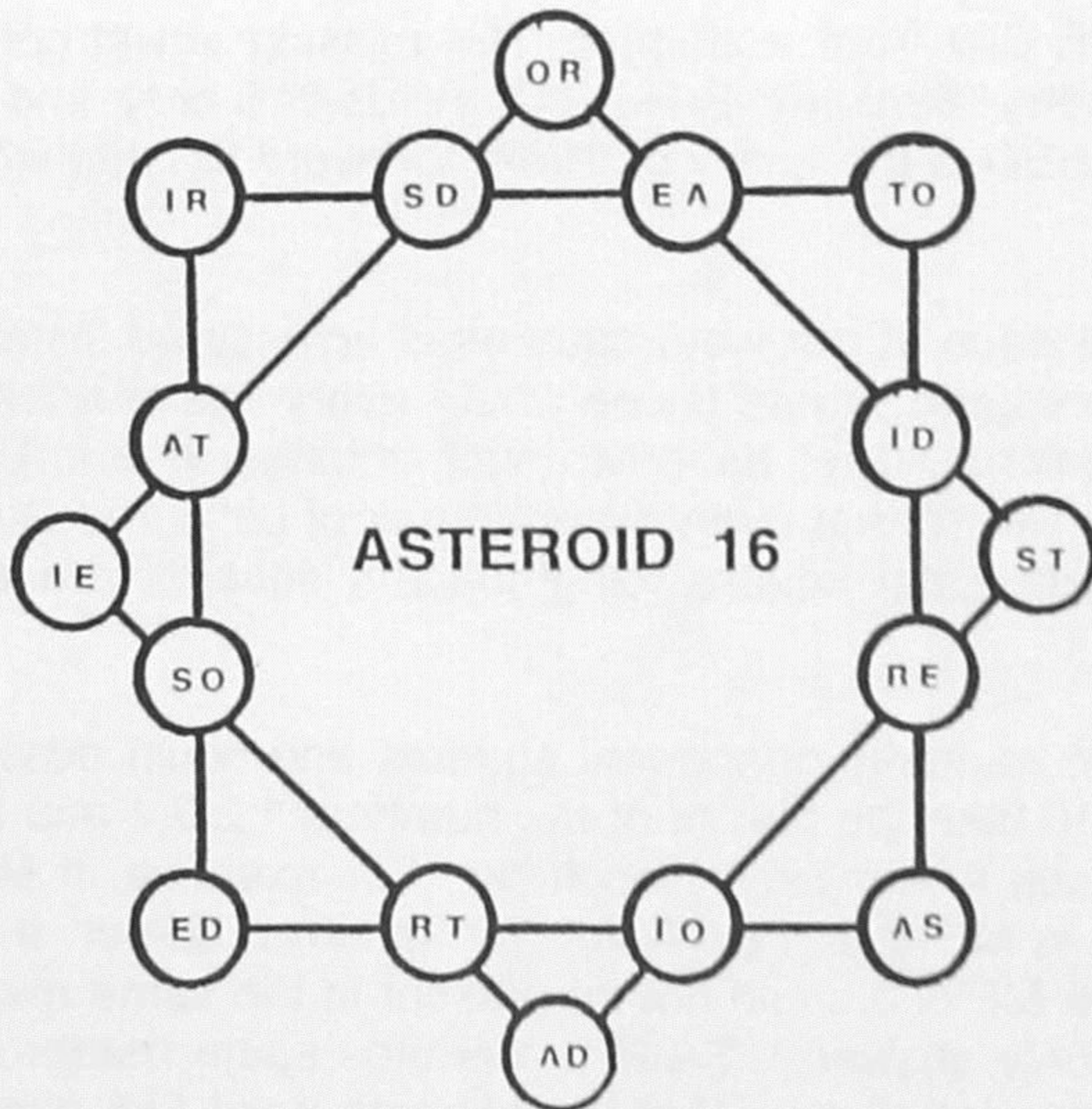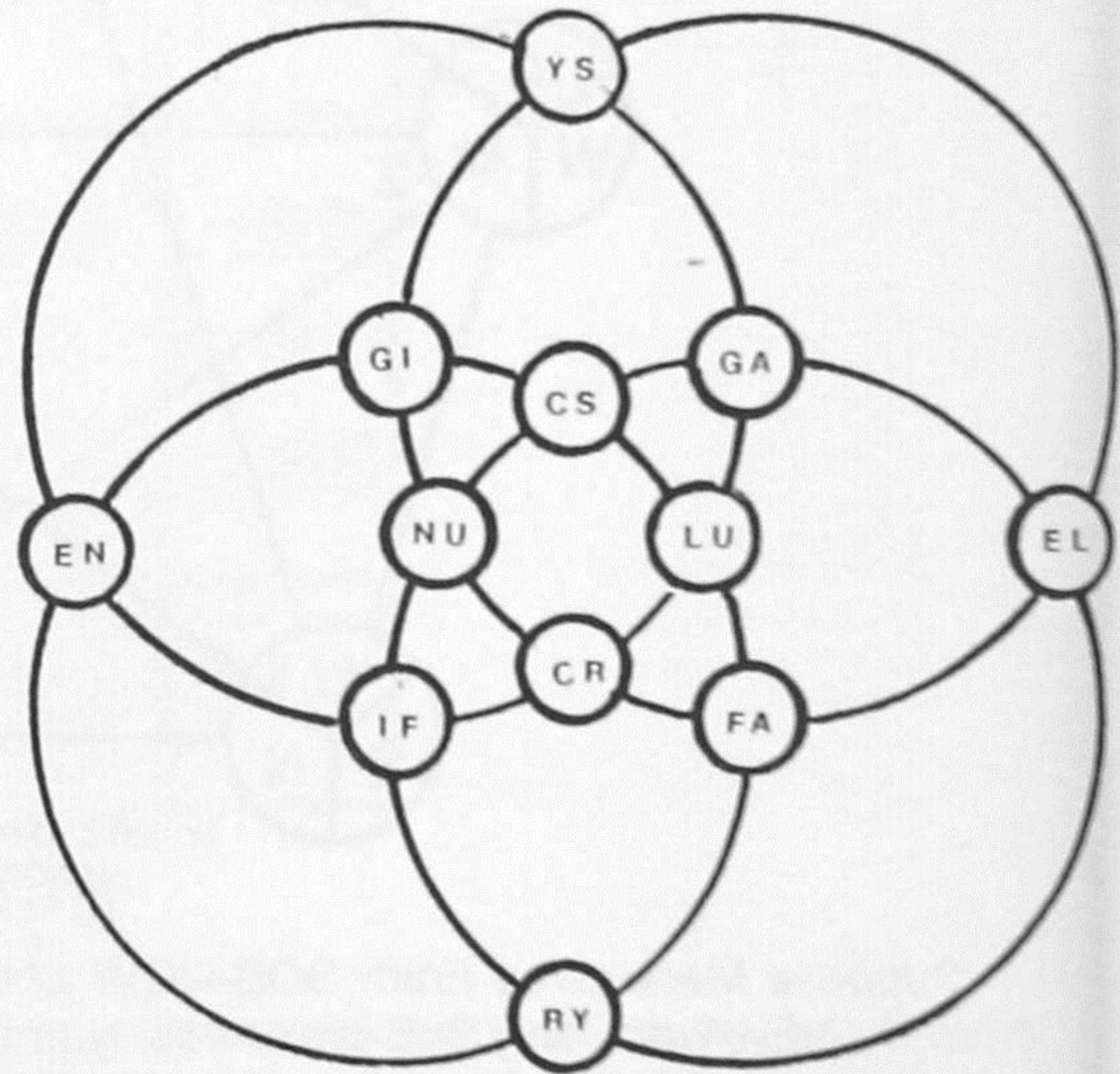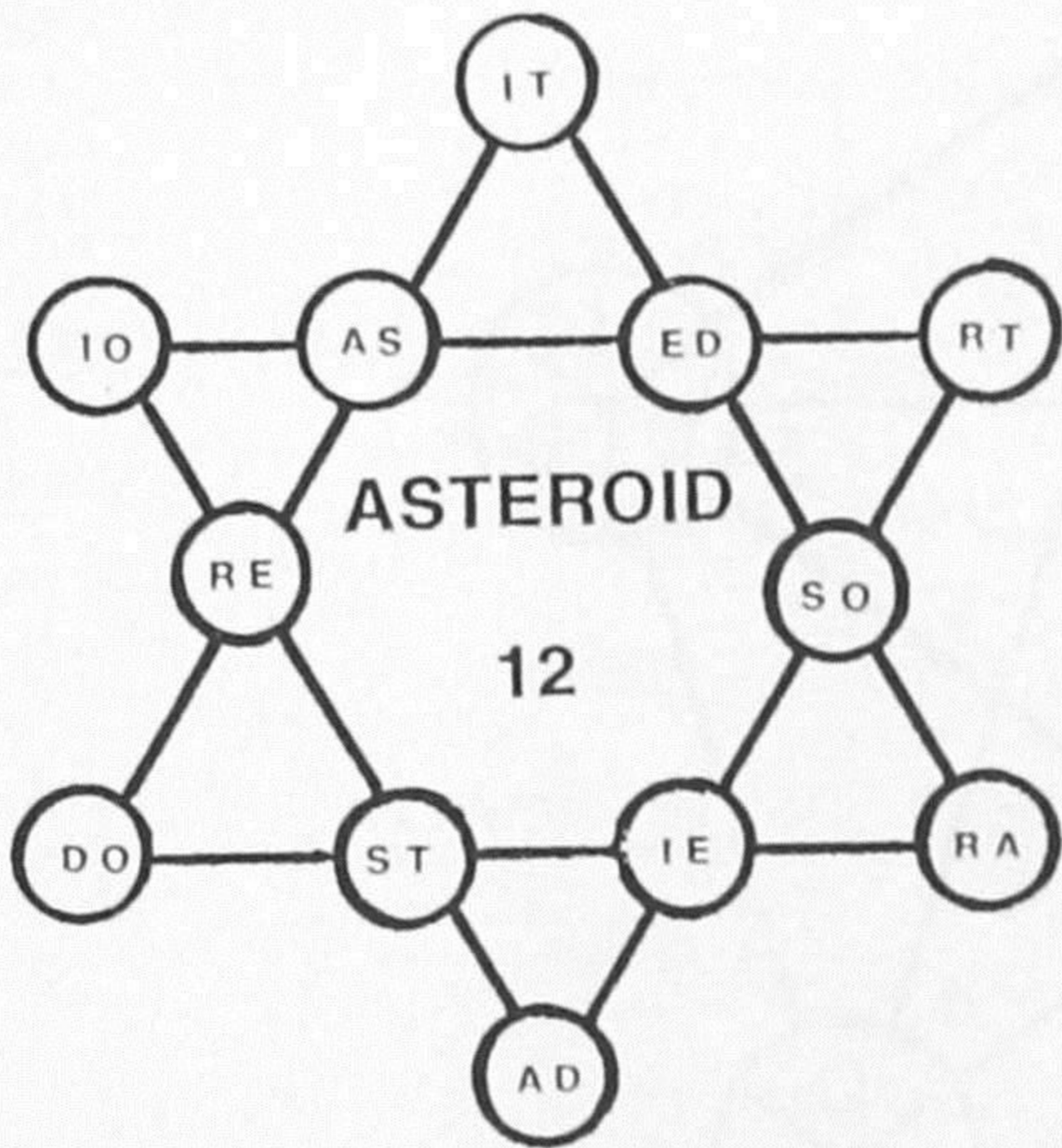
"BLACKY" SPIDER is a wonderful (i.e., hard) puzzle best played by printing the two-letter words on scrub tiles and trying to arrange them so that eachg of the three hexagons and each of the three ribs transpose into the constant BLACKY SPIDER (see diagram on next page). It is also possible to look carefully at the misgraph and choose numerical values so that the integers from 0 to 17 can be placed on the nodes to sum to a magic 51.

"Blacky" Spider
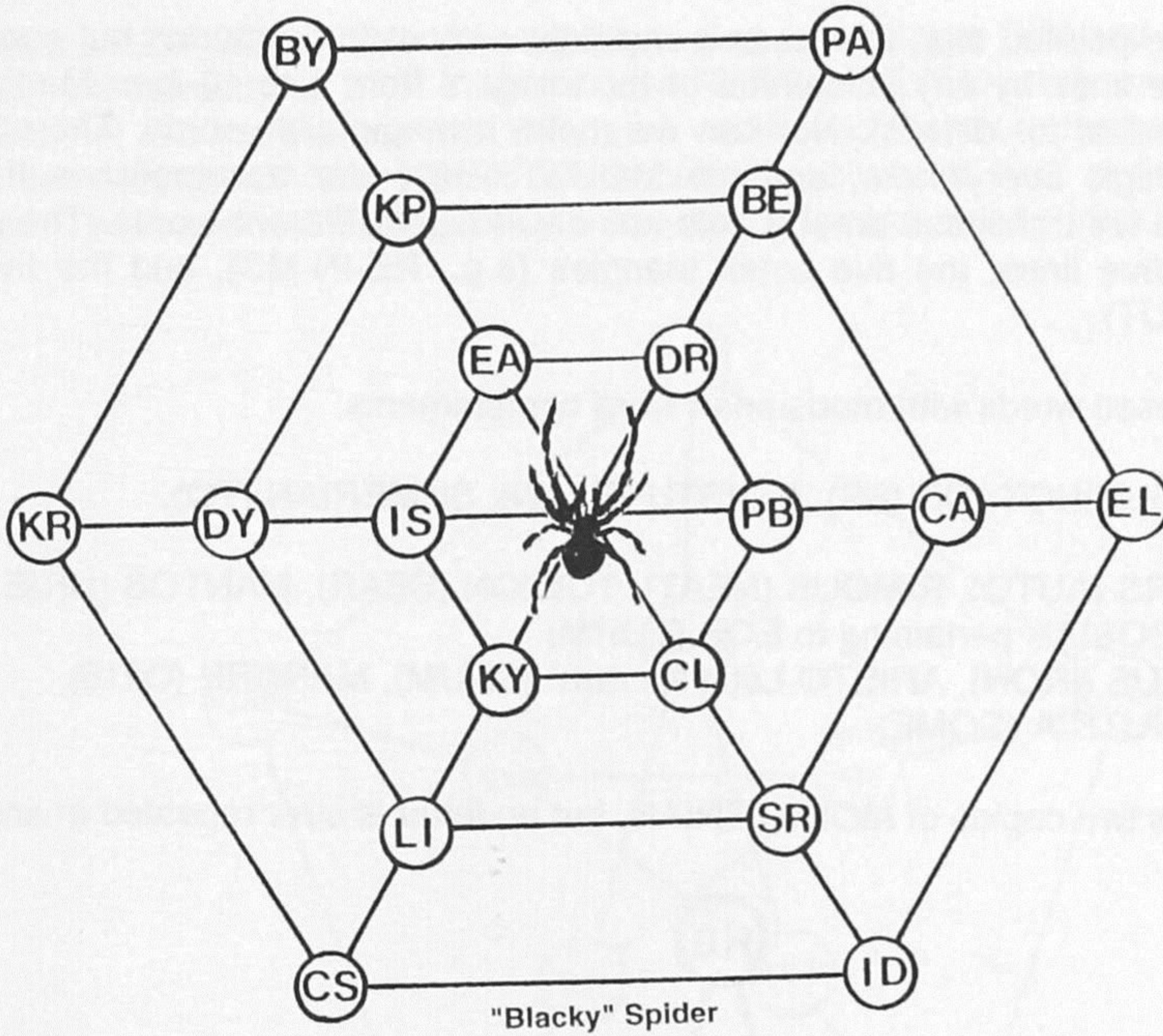
Even though 6x6 Euler squares do not exist, Edith's friend NORWICH BUMSTEAD has devised the next best possible square. No letter is repeated in any row, column or main diagonal, and any two letters appear together at most once in the grid. From the set A-E-I-O-U-S each letter appears six times while the remaining nine letters occur exactly four times each.

BA	ED	IT	OW	MU	CS
WE	OH	RA	SB	ID	NU
MI	SN	CU	TE	AH	OR
SD	UT	BO	IN	CE	AW
CO	MA	EN	UH	SR	BI
UR	WI	SH	AD	TO	ME

NORWICH BUMSTEAD

The pentacle, or five-pointed star, has been a mystical symbol for centuries but can not be made magic on the five lines by any placement of the integers from 1 to 10 (see Martin Gardner's *Mathematical Carnival* for details). Nor can we make it magic with words. Therefore, we seek to make it *antimagic* everywhere, and the MOUSTERIAN star accomplishes this feat. Antimagic means when we transpose among sets, we always get different words. The sets we have in mind are the five lines, the five small triangles (e.g., RE-IN-MS), and the five large triangles (e.g., RE-SO-UT).

Here are the transposed words with mousterian word complements:

Lines: SENORITA (MU), MINOTAUR (ES), MOISTURE (AN), SUMERIAN (TO),
    SEAMOUNT (IR)
Small Triangles: MINERS (AUTO), RIMOUS (NEAT), TUMION (SEAR), MANTOS (URIE, a
    town in Wyoming), EOSIAN pertaining to EOS (TURM)
Large Triangles: MEATUS (IRON), ARIETO Latin "to ram" (SNUM), MANURE (OTIS),
   ROUTES (MAIN), NUTRIA (SOME)

Of course, the star uses two copies of MOUSTERIAN, but no letter is ever repeated in any word.

MOUSTERIAN STAR
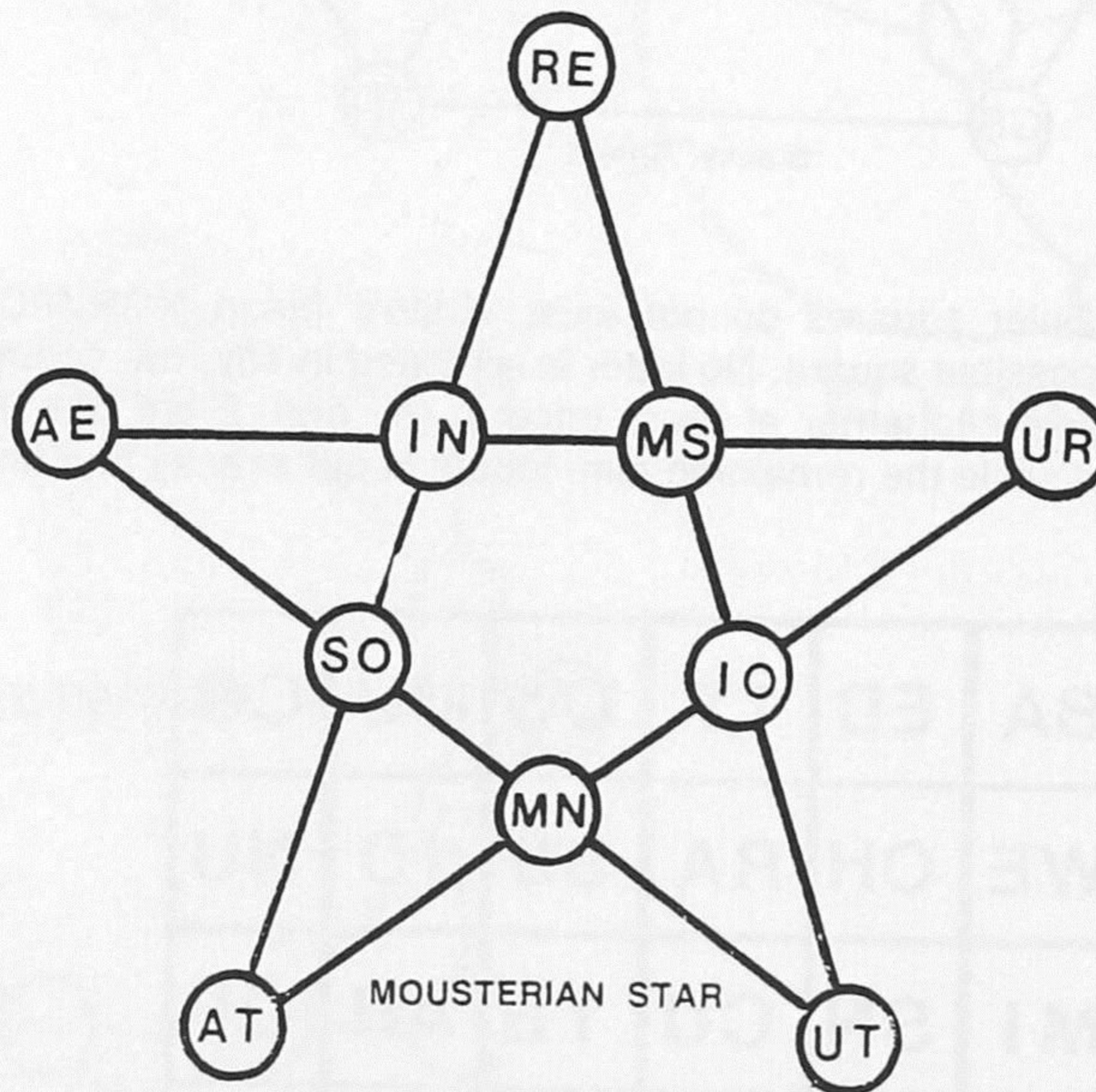
Edith has devised another kind of prediction trick based on the star ST. WORDBUCH, MAINE whose misgraph is the RUNE shown on the next page. Mark is asked to arrange scrub tiles of the words on the ten points so that no two words with a common letter abut. Since the rune is the graph of hits and is the famous Petersen graph, it would be quite impossible to place the scrubs to abut common letters, since the Petersen graph is non-Hamiltonian. Although there are 120 ways of placing them to non-abut that at least look different, it will still take some time for Mark to complete the puzzle. When he finally succeeds, he turns all the scrubs over. Edith knows that on the star a given word's three letters will be repeated on a triangle in the star. The triangle will lie on no common lines with the given word. For instance, the word RED is on no lines with the triangle CAR-HEN-DIM--we say that RED can not see the triangle. Similarly, HUT does not see the triangle HEN-CUB-WIT. Edith asks Mark to turn over any two scrubs. Suppose he exposes RED and MOB. From the rune, RED and MOB both connect DIM. Therefore, DIM does not see

the triangle RED-MOB-? This allows Edith to find and point to DIM and name it, and to point to ? and name it correctly as WIT. If Mark chose RED and HEN to uncover instead, Edith knows that RED can not see the triangle with HEN as a vertex and therefore the two unknown vertices must be, in some order, CAR and DIM. She simultaneously turns both over, naming the two as she does so. The reader will discover that with practice he can name virtually all of the nodes.

THE RUNE OF
ST. WORDBUCH, MAINE

ST. WORDBUCH, MAINE
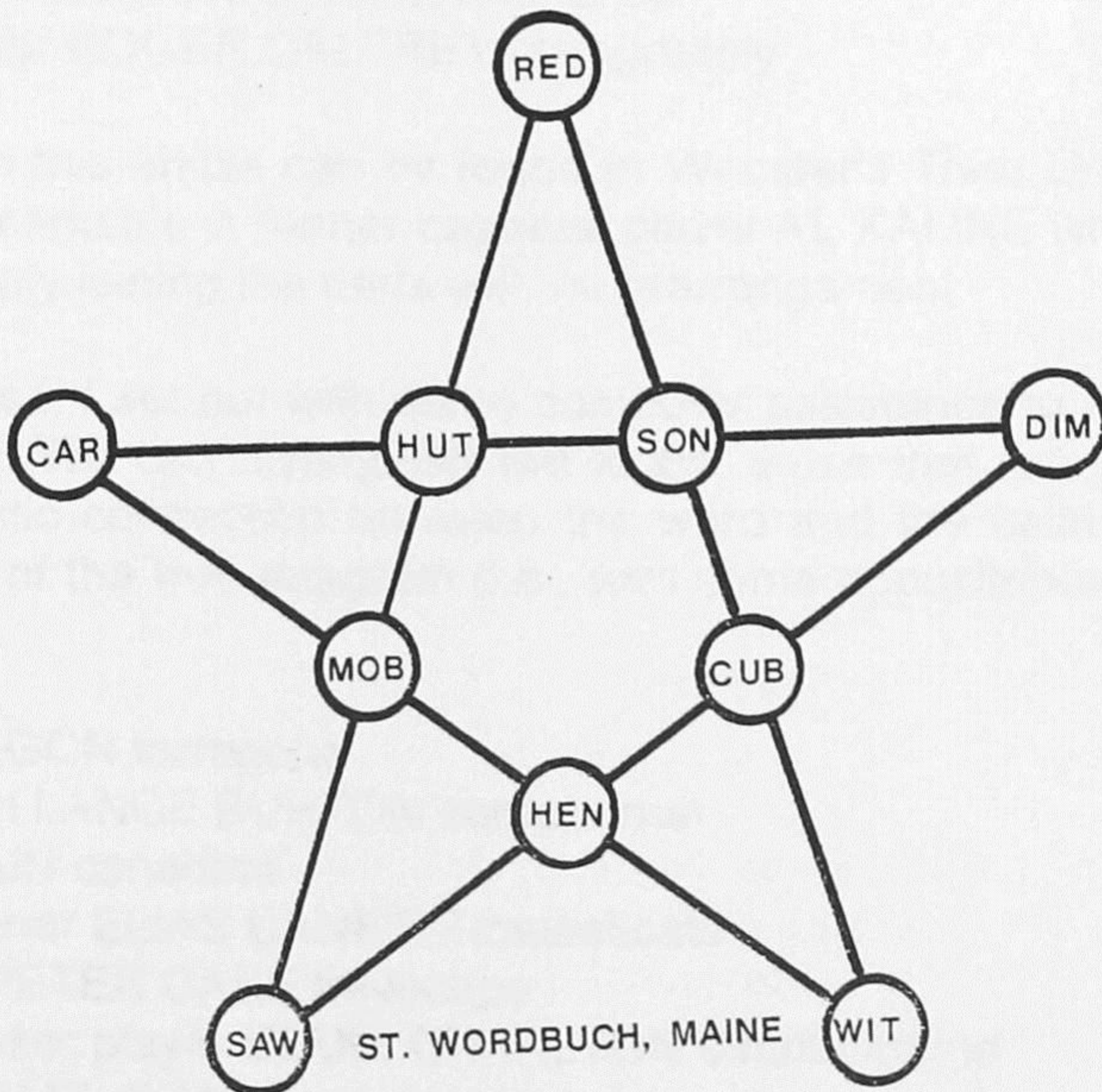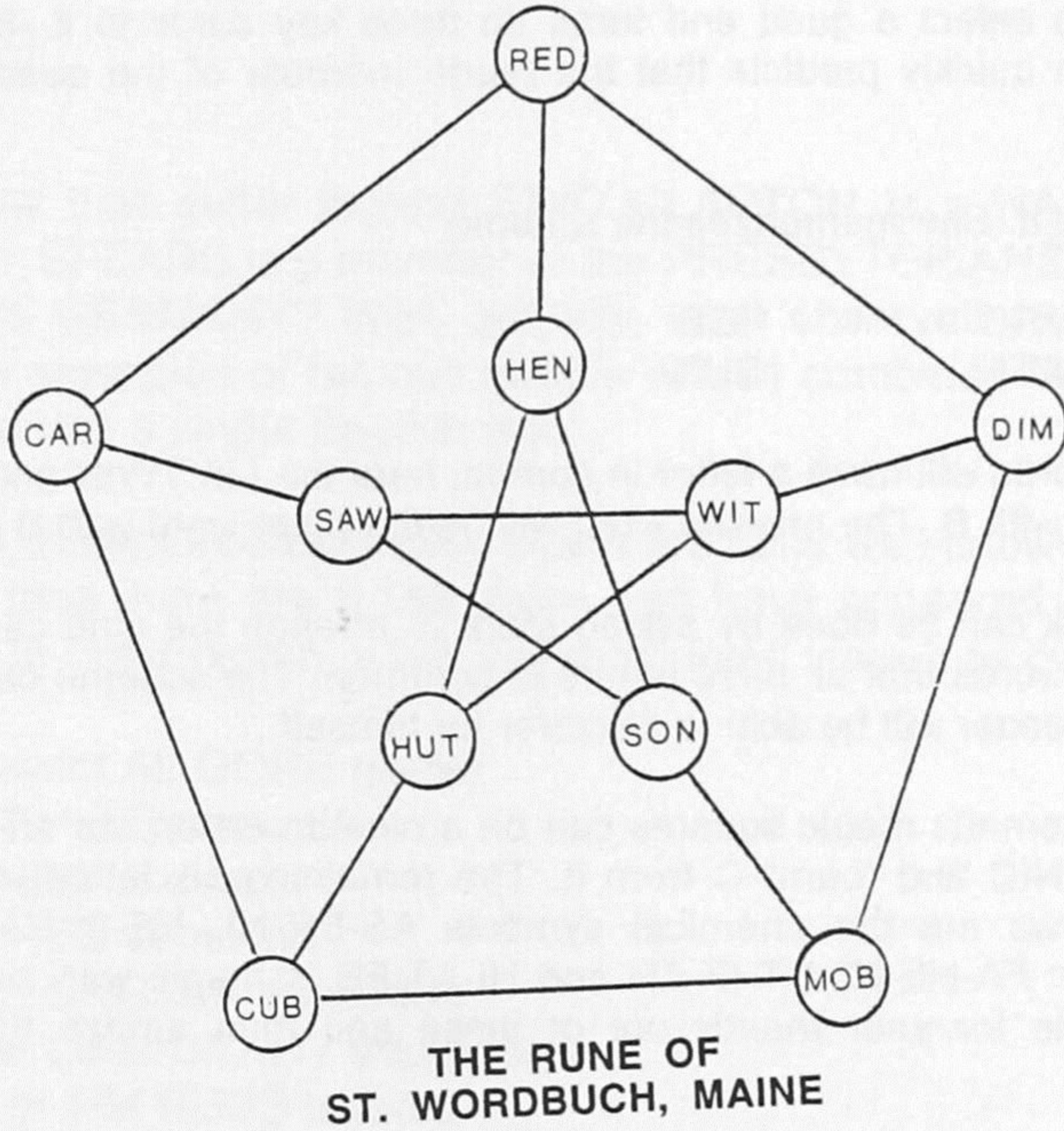
As a last prediction trick, we employ the services of Edith's friend, the village dowager INA CHOWBLY DUMPSTER. The nine words BODE, BUMP, CARD, CHEW, HYMN, LOUT, SAIL, SPRY and TWIN are written on cards. As a puzzle, Mark is to arrange these in a 3x3 grid so that no row or column contains duplicated letters. There are 72 different solutions to this puzzle and sooner or later Mark finds one. The cards are turned down and a further mix is performed, if desired, by interchanging any two rows or two columns. Edith, whose back has been turned all along, now asks Mark to select a quad and turns up three key cards in it. Suppose they are TWIN-BODE-SAIL. Edith quickly predicts that the fourth member of the quad is BUMP and it turns out to be so.

This is how Edith does it. She memorizes the scheme

PLY	MRS	ICD
WHO	ATE	BUN

Exactly two of the key words will have a letter in comon, here the I in TWIN and SAIL. The letter I is paired in the scheme with B. The missing word will be the other word with B (hence, BUMP).

A variation of this trick can be done by asking Mark to arrange the nine cards so that every row and column contain words that all have letters in common. The scheme can still be used to predict in a quad as the reader will be able to discover for himself.

The construction of thematic magic squares can be a nice diversion. As an example use the chemical element ARSENIC and "burn" C from it. The remaining six letters can form the 3x3 magic square whose rows are the chemical symbols AS-ER-NI, NE-SI-RA and IR-NA-SE. Another square with rows FA-HE-IT, ET-IF-AH and HI-AT-FE is magic with constant the name FAITH E. Make a puzzle for your friends out of these and then amaze them with a quad prediction trick!

DEDICATED TO MARTIN GARDNER

at the

GATHERING FOR GARDNER III

January 16-18, 1998   Atlanta, Georgia

MONTEY
A Word Game Hustle

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Three-card monte, or, "find the lady," is a scam sometimes perpetrated on the streets of our large cities where the sharper places a queen and two other cards face downward, shuffles them around, and then invites the bystanders to bet on which is the queen. Somehow, the bystanders are always wrong. In monte, as in thimblerig, the shell game, and other like hustles, the scam artist will use sleight of hand to perform his tricks. In our word game MONTEY (really derived form ETYMON) we will use abstract algebra instead to astound the audience.

MONTEY is played using the four words MEN, MOT, YET, and YON arranged in a 2 x 2 grid. The bystander will choose, unbeknown to us, one of the words and jot it down. We turn our back as he places a chess king on his word and moves it one square in any direction as often as he wishes. As he moves, he calls out "horizontal," "vertical," or "diagonal" as the case may be. When he is satisfied with his moves he tells us either the word he started with or the word he ended with. We are then able to quickly name the other word.

MEN	MOT
YET	YON

It can be somewhat difficult to follow the moves without enlisting the help of algebraic group theory. Call the moves H,V,D and add O for no move at all. The table gives the result of one move (the row heading) followed (+) by another (the column heading). Note that X + X is always 0, X, + 0 = X, and X + Y = Z whenever X, Y, and Z are all different and none is equal to 0. This table is essentially the same as a nim-sum table, but in this form, group theorists usually call it the Klein four group. As an example of its use suppose the bystander calls the sequence D,H,D,V,H,D,V. We mentally compute D + H = V, + D = H, + V = D, +H = V, +D = H, +V = D, and will know that the start and end words differ diagonally. Thus, if he started on MEN he would have ended on YON. If we had computed a final 0, we would know that the two words were the same.

+	0	H	V	D
0	0	H	V	D
H	H	0	D	V
V	V	D	0	H
D	D	V	H	0

A rather baffling extension of MONTEY is provided by using the letters of LEXICOGRAPHY. Prepare the alphabetical word list as in the diagram on the white page and also prepare eight cards with the words written separately on them. The bystander jots down his secret choice of one of the words on a sheet of paper. With our back turned, he covers his word with the card whose word matches it. He will now replace that card with a card whose word matches it in some one position, 1st, 2nd, or 3rd. He calls out the position of the match to us. He then repeats the procedure by replacing the current card (to be used again if he wishes) with a new card that matches the former card in some position, again calling out the position of the match. He does this as often as he cares to, and, upon stopping, names the last word showing. We can then name the written word below the card.

For example, suppose he writes HAG. A proper sequence could then be HEY (call 1), COY (call 3), LOX (call 2), REX (call 3), HEY (call 2), that is, he calls out 1,3,2,3,2 and reports the last word is HEY. We are able to name his written word as HAG.

We could construct an 8 x 8 addition table that works for LEXICOGRAPHY like the 4 x 4 does for MONTEY but choose instead to make a simple modification in the 4 x 4. Notice that the eight words can be paired into four sections based on their third letters G,Y,P or X. We think of the 8 x 8 as a 4 x 4 whose elements are the pairs of third letter "opposites." Each pair has a top and a bottom element. Now a 1 means a horizontal move, H; 2 means a vertical move, V; and 1 + 2 will be the diagonal move, D. The bystander will never call D, but we must still keep track of it. Tabulate the 3's separately noting only whether there is an even number or an odd number of them. A 3 flips the choice between top and bottom of a word pair. It is very easy to surreptitiously touch forefinger to thumb at the call of a 3 and untouch the fingers on the next 3 to keep tabs of the parity of 3's.

Using ' for an active 3 the former sequence 1,3,2,3,2 computes as 1 + 3 = 1', + 2 = D', +3 = D, +2 = 1. Hence we know the written word and the last word are directly horizontally placed from each other. As a final example, suppose the calls are 1,3,2,3,1,3,2,1,2. Notice that you may "cast out" pairs if you wish (3 + 3 = 0 also) and quickly get this to 1 + 3 + 2 or D', but in compute as you go, this is 1 + 3 = 1', + 2 = D', + 3 = D, + 1 = 2, + 3 = 2', + 2 = 0', + 1 = 1', + 2 = D'. If HAG were the start, then the last word would be LOX. I.e., diagonal to HAG and opposite.

MONTEY-like games can be constructed from other groups. There is exactly one other order four group, the integers mod 4, and we have an example on our display table at the Gathering that uses it in a 4-color wallpaper group. Also, it is easy to 4-color a standard checkerboard that one can play MONTEY on and predict the start or end color. In addition, we have constructed several simple electronic switching circuits that allow play of such games on cubes of dimension one, two, three or four. (See us for the details.)

For a final example we offer the five city map on the white page. Each city has highways #1,2,3, and 4 leading from it. (This is the USA, so stay on the right side of the road!) A little thought will convince you t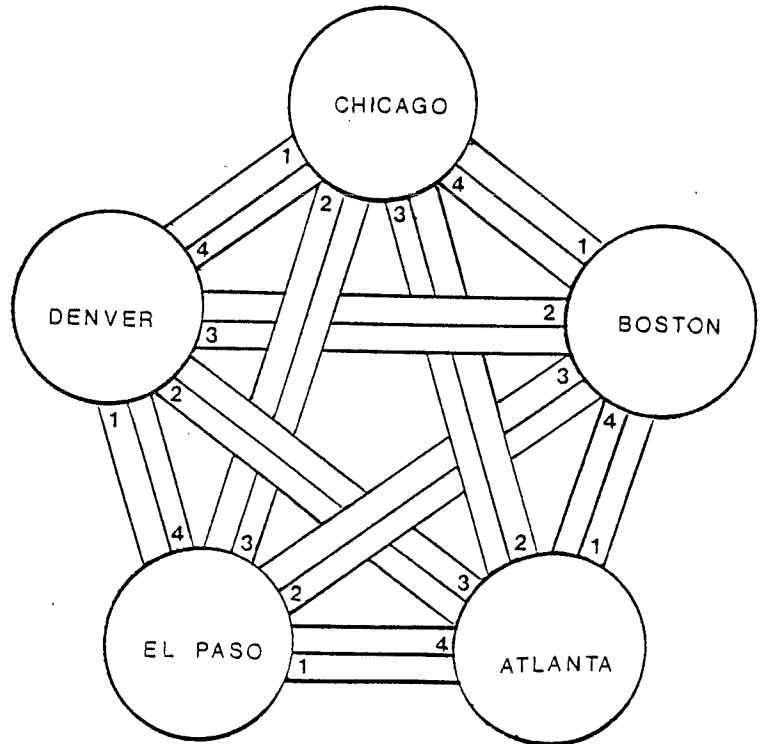hat the roads obey the mod 5 table shown. As usual, 0 means you didn't go anywhere. Have someone secretly pick out a city and call out the route numbers as he selects a tour. When he stops you can amaze him by immediately telling him which one road leads back to his start city. Or, if he tells you his start (or end) city you can quickly give him the end (or start). The details are left as an exercise.

+	0	1	2	3	4
0	0	1	2	3	4
1	1	2	3	4	0
2	2	3	4	0	1
3	3	4	0	1	2
4	4	0	1	2	3

CIG	COY
HAG	HEY
LIP	LOX
RAP	REX

LEXICOGRAPHY

MEN	MOT
YET	YON

MONTEY

ROAD MAP