My family moved over the summer and of course buying, selling, and moving, are all painful and black holes for time. I am just now, at the end of September, getting back to normal. There is one silver lining. Before we moved, it was made clear to me that we had to have the house we were selling in good shape—meaning I had to clean up. With a heavy heart I packed a great deal of material that was more or less loose around my office into a few boxes that were then placed in the garage. My intention was that 30 minutes after signed a contract, the boxes would be opened and the material restored. Instead, I never open the boxes until after we moved a few months later.The moral is that the collected junk is not as crucial as one might think. Of course your mileage may vary.

PROBLEMS

DEC 1. We begin with a bridge problem from Larry Kells who wonders if it is always to make 6NT with S-AKQ, H-AKQ, D-AKQ, and C-AKJx for different values of x? You are to assume perfect double-dummy play.

DEC 2. Richard Hess wants us to solve "the chain problem" due to Bob Wainwright. I have modified it slightly. Consider a chain of length $d = \frac{n(n+1)}{2}$ with integer length links in order 1, 2, 3,..., n. For what n can you wrap the chain in a tight loop around two posts d/2 apart so that the posts occur exactly at the break between two links? For example if n = 4, one post is between 3 and 4 and the other post is between 1 and 2. But when n = 5, d = 15 and integers will not sum to 7.5. What if we have three posts and want the lengths to all be d/3?

DEC 3. Avi Ornstein SD(n) to be "the sum of the digits in n reduced to a single digit," where n is a positive integer. For example:
SD(25) —>2+5=7 and SD(2598) —>2+5+9+8=24 —>2+4=6.
For some n, e.g., 81, n/SD(n) is an integer. For other n, e.g., 83, it is not. What is the longest consecutive sequence of integers for which n/SD(n) is an integer? What are the numbers in the first such longest sequence?

SPEED DEPARTMENT

Nob Yoshigahara needs the expansion of the 26 factors (x-a)(x-b)(x-c)...(x-z).

SOLUTIONS

J/A 1. There were a number of different solutions. I have chosen Michael Flaster's in part because his wording seems to fit the spirit of the problem. It's funny Larry should mention that—I was actually at the table, sitting North. Here were the four hands:

	North	
	♠ 8 7 6 4 3 2 ♥ 9 8 5 3 2 ♦ 7 ♣ Q	
West		**East**
♠ A ♥ K Q J T 4 ♦ J 8 4 ♣ T 9 5 2		♠ K Q J T 9 5 ♥ A ♦ A T 3 ♣ A 8 4
	South	
	♠ – ♥ 7 6 ♦ K Q 9 6 5 2 ♣ K J 7 6 3	

The auction went:

E	S	W	N
1S	2N(1)	3H	–
4N	–	5S(2)	–
5N	–	6H(3)	–
7S	–	–	Dbl
all pass			

(1) Unusual for the minors
(2) RKC, with hearts as the trump suit, showing two key cards and the queen of hearts
(3) Explained by East as "two kings outside of hearts"

It's hard to be more confident of a double then when you have six trumps and you're defending a grand slam. But for this hand, it got even better. After the auction ended, West announced that the 6H bid was explained incorrectly—West was actually bidding his *lowest* king. So these clowns were missing two unexpected kings as well!

Unfortunately, my glee at the auction was replaced by my horror at the play. Partner treated my double as Lightner, and so led a heart, but it really didn't matter. Only a trump lead, to take out dummy's entry, could have stopped the contract. After clearing out the A of hearts, declarer crossed to the A of trumps, and cashed heart winner after heart winner,pitching all of his minor suit losers. I had to follow suit each and every time, squirming in my chair. He crossed back to a minor ace, drew my trumps, and the hand was over.

"How could you double with only two HCP!" my partner said. "You really have to stop overvaluing your singleton queens..."

J/A 2. Note that the problem does not require you to determine if the oddball is light or heavy. Several readers sent us solutions that extend the problem given: Frank Lyness sent a solution in which the weighings are oblivious, i.e., the outcome of one weighing is not used to decide what to weigh next. Richard Hess sent us a solution (first published by Steinhaus in *Mathematical Snapshots*) that works for 13 coins, but is not oblivious. Lyness's solution follows:

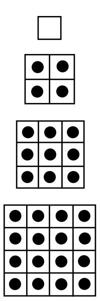
"A pleasing solution is to write down the numbers 1 to 26 in base 3. (1 is 001, 3 is 010, 9 is 100 and so on; 26 is 222). Then pick 12 of these numbers in such a way that 0 appears in the first position four times, as does 1 as does 2. And the same applies for the second position, and for the third position. It is also necessary that the 'complement' of any number picked is not also picked. Consider the two sets of 12 numbers below (the second column are the 'complements' of the first column):

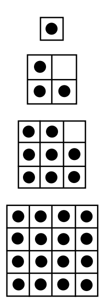
001	002
020	010
012	021
011	022
122	211
112	221
100	200
121	212
201	102
202	101
210	120
220	110

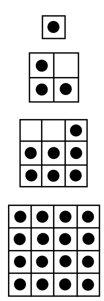
Take any 12 of the 13 coins and label them with the numbers from one of these columns, it doesn't matter which. First weighing; coins with one in first position v. coins with two in first position. Second weighing: ditto, one in second position v.2 in second position Third weighing: ditto, one in third position v.2 in third position. After each weighing write down zero if the scales balance, one if the ones are heavier, and two if the twos are heavier.

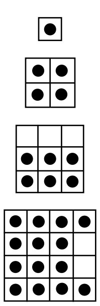
You then have a label. If it is 120 then either the coin labelled 120 is heavy (or if there is no such label) the coin labelled 210 is light. One and only one of these labels will be present so you know which is the odd coin and whether it is heavy or light. If you get 000, i.e. all three weighings balance, then you know that the 13th coin is the odd one out (but not whether it is heavy or light). Note that with this labelling it is not possible to get 111 or 222.

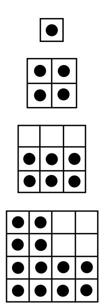
J/A 3. The proposer sent the following pictorial solution, which appears in its entirety on the Web at allan.ultra.nyu.edu/~gottlieb/tr. A large portion of the solution appears below:

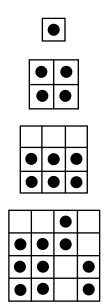
1. 

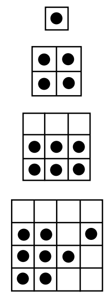
2. 

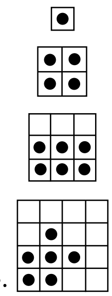
3. 

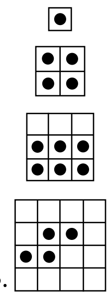
5. 

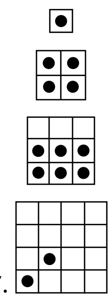
7. 

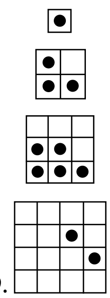
9. 

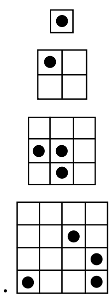
11. 

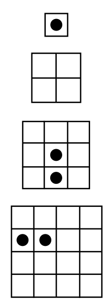
13. 

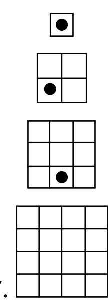
15. 

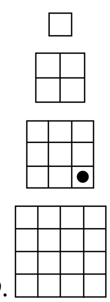
17. 

19. 

21. 

25. 

27. 

29. 

BETTER LATE THAN NEVER

MAR 2. Eugene Sard notes that it is not surprising that nine is not weighed since, if one through eight are known, nine is also. In addition he provides the correspondence of weighing results with particular heavier and lighter coins.

OTHER RESPONDENTS

Responses have also been received from P. Balise, R. L. Bishop, M. Bolotin, J. Chandler, J. Chang, D. Church, G. Coram, S. Deriel, G. L. Drescher, J. E. Hardis, D. Hester, T. C. Kelly, L. Iori, S. Lense, V. Luchangco, M. Mashaal, H. McIlvried, H. Milstein, E. Nelson-Melby, J. Rauen, S. Seifert, T. Terwilliger, and D. Wellington.

PROPOSER'S SOLUTION TO SPEED PROBLEM

Zero. The third factor from the right is (x-x).

Send problems, solutions, and comments to Allan Gottlieb, New York University, 715 Broadway, 7th Floor, New York NY 10003, or to gottlieb@nyu.edu.