INTRODUCTION

Long-time *Puzzle Corner* participant Winslow Hartford reports that he has had a tough time recently with medical problems. He optimistically notes that being ''confined to quarters'' has given more time to work on mail, *Technology Review*, etc. Although I appreciate his increased efforts on TR, I am confient I join all of you in wishing him a speedy recovery, even if it means he must leave out a puzzle or two.

PROBLEMS

We begin with an unusual Bridge problem from Steve Shalom.

A/S 1.

```
            S  A7
            H  KJ985432
            D  K4
            C  7
            -----------
            |    N     |
            |          |
            |W        E|
            |          |
            |    S     |
            -----------
            S  Q83
            H  6
            D  J8653
            C  AKJ2
```

    Only a diamond lead defeats a double-dummy declarer playing in three no-trump. The club queen, heart queen, and diamond ace are offside. No two of East's spot cards (any card from two to ten) are of the same rank. The sum of West's spot cards is not evenly divisible by five.

    What are the precise East-West hands and what is the proper defense for beating three no-trump?

A/S 2. Some gremlin removed one of the 9 squares from problem M/J 3. Current theory has the gremlin associated with a fax transmission. However, I suspect it is human error, with the most likely suspect a "mature" NYU Professor currently sitting in Princeton. Anyway here is the corrected version of the problem.

    A "jigsaw" puzzle from Nob. Yoshigahara. Cut out the 9 squares below and arrange them into a 3x3 square so that all the (internal) edges match. There are six solutions.

Please place figure number 1 here.

A/S 3. We close with a surveying problem from Richard Mayor.

A surveyor is on a desert floor from which he can see three mountain peaks. The peaks form a triangle and are accurately located on a map?

The surveyor turns the angles between two pairs of peaks say (1,2) and (2,3)

How can he determine his location on the map.

SPEED DEPARTMENT

Joseph Keilin wants you to figure out the phrases represented by each of the following.

Please place figure number 2 here.

SOLUTIONS

APR 1. We begin with a Bridge problem from Tom Harriman.

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                    North
            S    Q 8 6 5
            H    10 3 2
            D    9
            C    A J 9 8 5

    West                         East
S    J 10 3                 S    9 2
H    A K 5 4                H    Q 9 7
D    K Q 10                 D    J 8 6 5 4 2
C    K 7 6                  C    4 3

                    South
            S    A K 7 4
            H    J 8 6
            D    A 7 3
            C    Q 10 2
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West	North	East	South
1D	P	P	DBL
P	2C	2D	2S
P	4S	P	P
P			

Opening Lead: HK

First, if you are East, what do you play on the first trick? Second, if you are West, what do you do next?

Oh my, a controversy. Most readers agree with the proposer that East should play the 9. Robert Bishop, however, by considering several possible East holdings, contends that the 9 will most likely mislead West. Bishop's comments follow. Note that his case (4) corresponds to the comments by the majority of responders.

If East encourages a continuation with the H9, West cannot know exactly what that card means or what is best to do next. East conventionally plays the H9 with any of these heart holdings: (1) 9, (2) J9 or 9x, (3) Q9, (4) Q9x, (5) Q9xx, or (6) Q9xxx (notice: no holding that includes both Q and J). Set cases (5) and (6) aside, because it then does not matter which heart West leads. Case 1 can also be ruled out because it is most unlikely that declarer could hold QJxxx.

Provided that East also holds the S9, case (4) is the only one in which West's lead of a low heart guarantees setting declarer in the first four tricks. East wins the HQ, returns his last heart to partner's HA, and forces a high trump from the opposition by ruffing West's lead of the last heart with the S9. That

promotes one of West's high trumps as the setting trick. (If East lacks the S9, however, there is no chance of setting the hand without increasing his honor count beyond its actual level.)

In case (2) it would be disastrous for West to lead a low heart at the second trick. Instead, the HA followed by a low heart for East to ruff guarantees at least three tricks (provided East is not void of trumps). Furthermore, lacking the HQ (and also, perhaps, the DJ), East might instead hold the CQ or even a high trump, either of which would set the hand.

In case (3), leading the HA and then a low heart is also the only way of guaranteeing the defenders at least three tricks -- with much the same chances of a setting trick as in case (2). West's alternative lead of a low heart limits the defenders to only two heart tricks -- and little or no chance of setting declarer.

In summary, a low heart is a possibly winning lead at the second trick only in case (4); but the HA is clearly the better lead in cases (2) and (3), which probably occur with greater aggregate frequency. In the actual hand, West's winning lead of a low heart is clearly justified only as a double-dummy solution.

Finally, if East's play of the H9 induces West to make the wrong response in the actual case (in accordance with my own analysis), should we not consider East's following with a somewhat more ambiguous H7, especially since the H6 is the only heart smaller than 7 that East might have, as compared with the 8, 9, J, and Q, which are as yet unaccounted for. Might this not have at least a somewhat better chance of inducing West to gamble that East's hand is as we know it to be? Maybe so.

APR 2. Here is one with a surprising result from the late Bob High. What is the the volume of an *n* dimensional ball of radius *R* and what is the limiting value of this volume as *n* goes to infinity.

The following analysis is from Jorgen Harmse.

Please place figure number 3 here.

Lijun Wang notes, in addition, that the volume (for a unit ball) "peaks at n=5, and is of very similar values at n=4 and 6. Then it takes a drastic downward move and approachs 0 very rapidly. For n=20 the folume is 0.026, and so on.

APR 3. Nob. Yoshigahara has sent us a problem that, presumably due to a distant Spanish heritage, he calls "El Puzzle". Nob. wants you to put all 9 little Ls into the big L. You may rotate the Ls but may not turn them upside down.

Faith, Please include figure from Apr

An "historic" solution from Charles Baker.

This solution was found using a computer program first written about 1955 for the JOHNNIAC computer at the RAND Corporation to find solutions to the classic Pentamino problem. JOHNNIAC (named after Princeton's John Von Neumann) was a two-floor room-sized vacuum tube computer, which was about as smart as your average toaster oven today, but which was used for many crucial problems in physics and mathematics, and which late in its life became the heart of one of the first On-Line computer systems, JOSS. We ran the Pentamino problem in JOHNNIAC's off-hours, and could find several solutions in an

overnight run.

I have used this program on nearly every computer and/or language I have subsequently programmed, mostly as a learning vehicle. In the mid-eighties, when I got my first desk-top 286, I used it to find a solution to the Pentamino triplication problem.

When the latest issue of Tech Review came I realized that I hadn't put the program on my current computer (Pentium 100) and did so in a couple of hours yesterday afternoon, adapting it to the nine shapes of El Puzzle. It took 1 minute 37 seconds to find the solution.

When the program was first written there was no thought of graphic output, and I haven't yet gotten around to doing that; hence the hand-drawn figure constructed from the numerical output array.

Please place figure number 4 here.

BETTER LATE THAN NEVER

Jan 1. When I published the solution in the May/June issue, I wrote ''I received a few letters saying that no solution was possible, but Alan Taylor found it. He writes''. This incorrectly suggests that Taylor was the only responder with the correct answer. I appologize for the poor wording.

OTHER RESPONDERS

Responses have also been received from H. Amster, T. Barrows, R. Bishop, H. Cejtin, A. Childs, A. Faller, S. Feldman, M. Fountain, R. Giovanniello, R. Hess, C. Inman, T. Maloney, S. McAdam, K. Rosato, D. Savage, J. Vanderpoel, and W. Yoshino.

PROPOSER'S SOLUTION TO SPEED PROBLEM

1) No two ways about it
2) A gross understatement
3) Triangle Inequality
4) Split second timing
5) Far to the right of center
6) Right in the middle of everything
7) John Underwood, Andover, Mass