COLLECTOR'S CORNER, Round 5

An Occasional Item of Interest to Gardner Collectors

Scientific American Magazine Revisited
Suggested by Jeremiah Farrell

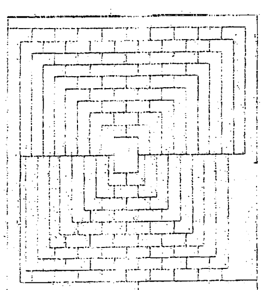
Martin Gardner's 300th article for *Scientific American* appeared in their August, 1998 issue (Cover: New Thinking about Back Pain). It's title "A Quarter-Century of Recreational Mathematics," highlights Gardner's 297 "Mathematical Games" columns and his 1956 article on "Hexaflexagons" (he does not mention the 1952 article on "Logic – see Collector's Corner – Round 4).

Gardner's good friend Solomon W. Golomb of the University of Southern California was one of the first to supply grist for "Mathematical Games". The May, 1957 issue (Cover: Birds In The Museum) introduced Golomb's studies of the immensely popular polyominoes, i.e. shapes formed by joining identical squares along their edges. The 2-square domino can take only one shape but the tromino, tetromino, and pentomino can assume a variety of forms. "The study of polyominoes soon evolved into a flourishing branch of recreational mathematics," said Gardner. "Arthur C. Clarke, the science-fiction author, confessed he had become a 'pentomino addict' after he started playing with the deceptively simple figures." Golomb would contribute many more times, over the years.

A simple tetromino problem for the reader. Can you prove that the five different tetrominos cannot cover exactly a 4x5 checker board?

Gardner mentions several other multiple contributors including Denmark's Piet Hein and John H. Conway of Princeton. Conway's game of Life and Hein's game Hex are both still popular.

One of Gardner's favorite columns was April 1975 (Cover: Dinosaur Renaissance) "Six sensational discoveries that somehow or another have escaped public attention." The article was an April Fool's Day hoax! It told readers that Leonardo da Vinci had invented the flush toilet, that opening pawn to King's rook 4 was a certain chess winner, and supplied a complicated map purporting to require five colors to ensure that no two neighboring regions were colored the same. "Hundreds of readers sent me copies of the map colored with only four colors," reported Gardner. "Many said the task had taken days.



The four-color-map theorem is exploded

Every year or so Gardner would devote a column to the numerologist Dr. Irving Joshua Matrix (note the "666" provided by the number of letters in the first, middle and last names). There were 22 in all, starting in January, 1960 (Cover: *not seen*) and ending with Matrix' untimely "death" in the September, 1980 issue (Cover: Economic Development). However, Gardner, in *Penrose Tiles to Trapdoor Ciphers*, 1989, Freeman, discovered that the reported "death" of Matrix was premature when he found the mysterious doctor in Casablanca.

For a flavor of Matrix and his numerology we offer the following from the 1980 issue. An emirp is a prime that yields a different prime when it's digits are reversed (like 13 and 31). Leslie E. Card discovered these order 4 and order 5 emirp squares:

9	1	3	3
1	5	8	3
2	5	2	9
3	9	1	1

and

1	3	9	3	3
1	3	4	5	7
7	6	4	0	3
7	4	8	9	7
7	1	3	9	9

The order 4 square is unique save for rotations and reflections.

Surprisingly often so-called recreational mathematics can lead to serious, applied mathematics. Gardner was first to report, in his August, 1977 (Cover: Kangaroos) column, "A new kind of cipher that would take millions of years to break," about an "unbreakable" code discovered by Ronald L. Rivest, Adi Shamir, and Leonard Adleman, computer scientists at the Massachusetts Institute of Technology. Gardner notes that "It was the first of a series of ciphers that revolutionized the field of cryptology."

We would be remiss if we did not mention the work of the remarkable Scott Kim that Gardner so much admired. Kim was first featured in the June, 1981 issue (Cover: Accretion of Planets) where his "Inversions" were displayed.

Gardner cites Kim's "magical ability to take just about any word or short phrase and letter it in such a way that it exhibits some kind of striking geometrical symmetry." A recent example: