A NUMBER GAME

J. WLODARSKI
Porz Westhoven, West Germany

Preliminary condition for participation in the game: elementary knowledge of arithmetic.

1. First of all, give all participants of the game the same task, as follows:

Build up a sequence of numbers with nine terms in which the first and the second term may be any arbitrary cipher and their sum should build up the third term of the sequence. Every following term of the sequence is the sum of the two preceding terms (for instance; starting with the numbers of 3 and 4 we have the sequence 3, 4, 7, 11, 18, $\cdots$).

2. Now put the individual task for every participant of the game:

Divide the eighth or the ninth term of the sequence by the ninth or the eighth term, respectively (limit the result to two decimals behind the point!). Then multiply the received quotient by a small integer, for instance: by 2, 3, or 5, etc.

The final result of the computation can immediately be told to every participant of the game as soon as he has finished his computation. The participant is required only to state what ratio, i.e.,

$$\frac{\text{8th term}}{\text{9th term}} \text{ or } \frac{\text{9th term}}{\text{8th term}}$$

was used and by what integer it was multiplied. Since for any figures of the first two terms of the sequence the ratio

$$\frac{\text{8th term}}{\text{9th term}}$$

equals 0.62 (roundly) and

$$\frac{\text{9th term}}{\text{8th term}}$$

equals 1.62 (both quotients are an approximation to the "golden ratio"-value), it follows that the final result of the computation can easily be guessed. Thus for instance in the case

$$\frac{\text{8th term x 3}}{\text{9th term}}$$

the answer should be 0.62 x 3 = 1.86 and in the case

$$\frac{\text{9th term x 2}}{\text{8th term}}$$

the answer is 1.62 x 2 = 3.24.

If the properties of the recurrent sequences are unknown or too little known to the participants of the game, the guessing of the final results of their computations will have a startling effect.

[Continued from page 300.]

FIBONACCI NUMBERS AND WATER POLLUTION CONTROL

Upon generating the number of solutions for varying n the similarity of the series to the Fibonacci number series was noted.

n	1	2	3	4	5	6
A(n)	1	3	8	21	55	144

And thus we concluded that the total number of economical solutions for n cities is

$$A(n) = F_{2n},$$

where F_k stands for the k^{th} Fibonacci number. This still does not indicate which of the F_{2n} solutions is the most economical one, but places an upper bound on the total number of economical solutions to be investigated.