

DISCUSSION

A WIDE-SPREAD ERROR RELATING TO
EGYPTIAN MATHEMATICS

IN a recent book entitled "Vorlesungen über Geschichte der Antiken Mathematischen Wissenschaften" (Vol. 1, p. 122, 1934), its author, O. Neugebauer, directs attention to a popular mathematical legend which seems to have been started by the late Moritz Cantor (1829-1920) who has sometimes been called the prince of mathematical historians. According to this legend, the ancient Egyptians constructed right angles by means of a cord with three knots separated by distances in the proportion of 3, 4, 5. This legend appears, among many other places, in the most commonly used American textbooks on the general history of mathematics as well as in those of various other countries, but it is not supported by the mathematical writings of the ancient Egyptians which have been deciphered up to the present time.

It seems to have been due originally to a misinterpretation, but the high standing of the work in which it first appeared and its elementary character naturally led to its wide adoption by other writers. Since right angles can be constructed in the given manner it is obviously impossible to prove now that the ancient Egyptians did not use this method for this purpose, but the definite statement that they used it naturally implies that it appears in their deciphered writings and this is incorrect. These writings contain sets each composed of three numbers which are in the proportion of 3, 4, 5 and were known at least as early as 2000 B.C. to satisfy the condition that the sum of the squares of the two smaller ones is equal to the square of the largest, but such examples of numerical relations are far removed from proving that the ancient Egyptians were familiar with the corresponding geometrical properties. The deciphered writings exhibit no definite evidence to the effect that they recognized the correspondence between these arithmetical and geometrical relations.

The crowning mathematical achievement of the ancient Egyptians is the so-called formula for the volume of the frustum of a square pyramid. In a strict sense of the term neither the pre-Grecian mathematicians nor the ancient Greeks themselves developed a mathematical formula. The pre-Grecian mathematicians had neither rules nor formulas but gave merely numerical examples which correspond to formulas. The ancient Greeks had rules but no formulas, since the mathematical language was not then sufficiently developed to express results in modern formulas. This could not be done until the people of western Europe had created the needed mathematical language at about the close of the middle ages. Such questions belong to explicit mathematical history and

hence they are not controversial. It is only the implicit mathematical history that has given rise to controversies.

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ONE ASPECT OF THE LONGEVITY PROBLEM

PRELIMINARY experiments on the giving of dilute sodium rhodanate solutions continuously to rabbits and chickens instead of water were reported on at the Cleveland meeting of the National Academy of Sciences, November 20, 1934. The work was financed in part by a grant from the Heckscher Foundation for the Advancement of Research, established by August Heckscher at Cornell University. These preliminary results indicate that sodium rhodanate improves the general health and lessens the nervous irritability of rabbits and chickens, thereby increasing their resistance to coccidiosis, respiratory infections and infectious leukemia. There is reason to believe that a number of other diseases should not be so acute and fatal in animals treated with sodium rhodanate. Of even more interest to us are the general conclusions which we believe that we are justified in drawing from these experiments and from our preceding work, a great deal of which is still unpublished.

In the last twenty-five years the probable length of human life has increased materially, thanks to medical science; but the change has been due very largely to a decrease in mortality among infants and children. The probable length of life of a man of forty-five has not been increased appreciably in the last quarter-century. Medical science has failed so far as such men are concerned.

The colloid chemist comes in where the medical man drops out. Sodium rhodanate and drugs of that type will minimize the physical effects of worry and will decrease the tendency to nervous breakdowns not caused by definite pathological conditions. Sodium rhodanate increases the resistance of the living organism to infection by inducing better health. Drugs of this type will not cure progressive lesions and sclerotic conditions; but they will retard the aging of the colloids of the body and will thereby delay the onset of such pathological conditions. If every human being of forty-five or over, for whom sodium rhodanate is not contra-indicated, would take sodium rhodanate regularly for the rest of his life, we predict an average increase in the probable length of life of at least two years, provided the medical men will cooperate.

We can not prove this prolongation of life now because every application to a foundation for money for research is referred, inevitably and properly, at some stage to a medical man and turned down by