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

him, inevitably and improperly, on the ostensible ground that the matter is not yet proved and therefore should not be supported. If it had been proved, we should have been asking for money for some other purpose.

A few medical men have been interested in our point of view. We thank them for this and we hope that we may retain their sympathy in the stormy days that are to come.

The medical profession, as a whole, is hostile to us, due to the attitude of those who should be the leaders. So far as we know, not a single medical school or hospital has shown any active, intelligent interest in our work. Two deans of medical schools have been good enough to make clear to us what the attitude of the medical profession is. We have confirmed the following views independently:

(1) Nothing good along lines of research involving living tissue can come from chemists.

(2) Our line of reasoning is foreign to the medical mind and the authorities in the medical profession consequently consider our work and conclusions so unsound that it would be a waste of time to check either.

(3) Since our experimental work is bad by hypothesis, one hundred or even five hundred cases would not be convincing, because one hundred or five hundred experiments done badly have no cumulative value.

(4) Since our conclusions are unsound by definition, any doctor confirming our findings proves thereby that he is incompetent to do that type of research.

At Beaufort, N. C., Miss Koehring has shown that treating a starfish with ether or chloroform causes a reversible agglomeration of some of the proteins in the walls of the stomach. Though this experiment can presumably be confirmed by anybody who is interested, the experimental results carry no weight in medical science against an *obiter dictum*. The theory of Claude Bernard on anesthesia is to be considered wrong; not because it is wrong but because we have shown it to be a first-class working hypothesis.

Pauli's work along similar lines to ours has stood uncriticized for about thirty years, but is now automatically and officially worthless because it confirms our results.

Our answer to the medical profession is simple. It is up to them to clean house. From now on it is a fight to the finish between the medical profession and ourselves. There can be only one outcome to this contest. The medical profession will lose. The medical profession—or their unwise leaders—can and probably will retard progress; but they can not prevent progress completely.

We challenge the medical profession to run fair tests of our treatment, with all experimental details released, on certain forms of alcoholism, insomnia and sciatica. These are selected because even a medical man should get good results the first time. The medical profession does not dare make these tests, because the results would show that we are right. The medical profession can not admit that they do not dare to make these tests, because that would prove that the medical leaders are wrong. The medical profession can not treat us with dignified contempt, because that is confession in view of the fact that this is not a commercial venture.

If all data are released of any tests that are run, we can and will expose the faulty technique or the misunderstanding, which will probably occur in the future as it has in the past. Individual medical men have said that it would take twenty years to test our views properly. That is nonsense so far as we are concerned. If sufficient material is available, tests satisfactory to us can be made in a few months. There will come a time when the intelligent medical men—and there are such—will resent the false position into which they have been led by following the priests of Baal.

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A PASTEURELLA-LIKE MICROORGANISM IN THE BRAINS OF HORSES SUFFERING FROM SO-CALLED CORNSTALK DISEASE

STUDIES at the Laboratory of Animal Pathology and Hygiene of the Illinois Agricultural Experiment Station on the etiology of an acute encephalitic disease of horses, referred to as cornstalk disease, cerebro-spinal meningitis, staggers, blind staggers, meningitis, forage poisoning, etc., which occurred in Illinois during the fall of 1934, have given consideration to the presence of filterable agents, pathogenic molds and bacteria, as well as toxic chemical substances. For the reason that such investigations require long periods of time for their completion, preliminary observations on the bacterial flora of the brains of affected horses are being reported, in part, at this time.

Animal inoculations of the brain tissue suspensions in saline of two horses, together with the inoculation of five mixed cultures made from the brains of horses, yielded pure cultures of a pathogen possessing the characters of the pasteurella group. The seven horses supplying material for these studies originated on seven different farms in three counties. In six of the seven brains, visible areas of degeneration were encountered in the cerebrum. Pasteurellosis infection has long been recognized as an etiologic factor in so-called cornstalk disease of cattle, but so far as the