

Comments and Communications

Chemical Research in Israel

PROFESSOR LEOPOLD RUZICKA (*Science*, 112, 126 [1950]) has based the evaluation of the organic chemical research carried out in a given country, not on the total number of publications per annum in the field of organic chemistry (Boig. *Science*, 110, 107 [1949]), but on the ratio number of inhabitants: number of organic chemical papers published. I would like to be permitted to add to the interesting data so obtained the figures related to Israel, taking into account, of course, the great variation in the number of the Israeli population. The pertinent figures are:

For 1937: 36,000 (av. for the years 1935-39: 23,000)
For 1947: 33,000 (" " " " " 1947-49: 37,000)

inhabitants for each organic-chemical publication.

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The Bible and the Earth's Shape

IN THE September 8, 1950, issue of *SCIENCE* W. A. Rockie tells of a "strong religious leader" who believes the world is flat. He didn't state the nature of this man's religion. As a fundamentalist Presbyterian and also as a member of the American Chemical Society's Committee on Scientific Aids for Literature Searching, I am much interested in locating early statements of scientific fact and seeing that the original source receives the proper credit.

The Bible itself nowhere states that the earth is flat. It does, however, have a number of passages concerning the shapes and conditions of the world, past, present, and future. I shall name but a few, giving scriptural texts:

1. At one time in its early history, the earth had no definite shape at all, either flat or round (Gen. 1: 2—"And the earth was without form, and void . . .").

2. The earth is suspended in an ethereal vacuum and is part of a universe of immeasurable size. Furthermore, any attempt to detect the presence of a supporting medium, such as the Michelson-Morley ether-drift experiment, will give a null answer (Job 26: 7—"He stretcheth out the north over the empty place, and hangeth the earth upon nothing"; Jer. 31: 37—"Thus saith the Lord; if heaven above can be measured, and the foundations of the earth searched out beneath, I will cast off all the seed of Israel for all they have done, saith the Lord").

3. A particularly striking picture is given by Job concerning the rotation of the earth. To understand it, one must be aware of the type of seals used by ancient peoples such as the Babylonians, Phoenicians, etc. These seals, perforated longitudinally and rotating

upon a tiny axle of some hard material, were pressed against the face of the damp clay and rotated. As the seal was turned in the clay, it left its inscription. In like manner our earth is journeying on her annual orbital revolution. At the same time the planet is spinning on its axis, turning in the face of the sun like the seal in the face of the clay (Job 38: 14—"It is turned as clay to the seal; . . .").

4. The earth is round, not flat (Isaiah 40: 22—"It is he that sitteth upon the circle of the earth, . . ."). Note: The word "circle" is a translation of a Hebrew word that literally means "roundness." The modern Swedish version uses the word *rund* which is a literal rendition of the idea of Isaiah.

5. The earth will be destroyed, but some of the inhabitants will be saved (Matt. 24: 35—"Heaven and earth shall pass away, but my words shall not pass away"; John 3: 16—"For God so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life").

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Fern Prothallia under Cultivation for Twelve Years

THERE is considerable evidence that fern prothallia are like many other plants in that they will extend their life span if kept from reproducing. In 1927, Mottier reported that he had been able to keep prothallia alive for 4 years (1). In 1946 the author reported the continuous growing of adventitious prothallia at Marietta College for 7½ years (2). A few of these same prothallia were still alive in September 1950, 12 years after the spores were first sown in the flowerpot.

Because of competition of blue-green algae growing in the pot and lack of care during the author's absence, the surviving prothallia died sometime during October 1950. The dead tissue of the remaining prothallia was examined for reproductive organs, since these were reported in the older tissues in 1946 (2). Only occasional sporophytes developed after the first year after the spores were sown, and none appeared during the past 5 years. The prothallia maintained themselves by producing lateral proliferations. It is not the purpose of this paper to account for the lack of sporophyte production when reproductive organs were present, but the author believes it is largely due to the fact that there was never enough water around the prothallia for fertilization to take place. The pot was watered by subirrigation; thus, the culture received its water by capillarity from below. Very seldom was there enough moisture for