

gration of goals, some federal funding, administered possibly through the National Academy of Sciences, will be required to provide lists of cooperating industries and to circulate grant proposals to relevant industries. Also, the possibility of cost-sharing (say, one-third federal funding) should be considered.

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La Porte Precipitation Fallacy

I was pleased to note that Landsberg in his admirable survey "Man-made climatic changes" (18 Dec, p. 1265) recognized the controversial nature of the La Porte precipitation anomaly which too many meteorologists, without close scrutiny of the record, have accepted as a proven case of man-made climatic change. The La Porte rainfall record is a celebrated but specious example of man's inadvertent modification of climate.

During the years 1928-1963 the precipitation for La Porte, Indiana, located some 30 miles east of the Chicago industrial complex, was higher than that recorded at surrounding stations. Meteorologists have been puzzled by this precipitation anomaly. Changnon suggested that the increased precipitation might be due to inadvertent man-made cloud modification resulting from nucleation debris ejected by the industrial activities to the west (1). Air pollution in any form is bad, but to blame the Chicago industrial complex for the change of climate at La Porte is most unfair.

The precipitation record at La Porte can be shown (2) to be spurious, statistically invalid, and physically unacceptable. (A most ludicrous outgrowth of the belief that the La Porte anomaly is true was the award of a government research contract to a fine university to study the presumed ecological changes in the environs of La Porte because of fictitious excesses of rainfall.)

The rainfall anomaly began in 1927 when a new cooperative climatic observer was appointed and ended in 1964 when an automatic rain gauge installed at La Porte replaced him. Prior to 1927 many of the surrounding stations reported more annual rainfall than La Porte and after 1964 many of the nearby stations also reported more

rain than La Porte. However, in the intervening 37 years except for one instance, La Porte always reported the highest rainfall amounts. . . .

A study was also made of many synoptic weather situations, especially in those years which had unusually high rainfall amounts. Trajectory analyses demonstrated that when a west-northwest flow brings effluent nucleation debris to La Porte, either of two events occurs: (i) if it is raining at La Porte, the rain stops, and (ii), if it is cloudy at La Porte, the weather clears. These easily explainable occurrences are hardly conducive to causing excess precipitation. . . .

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References

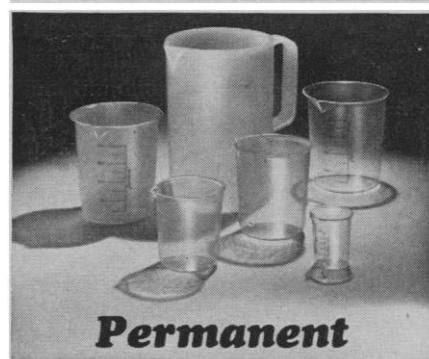
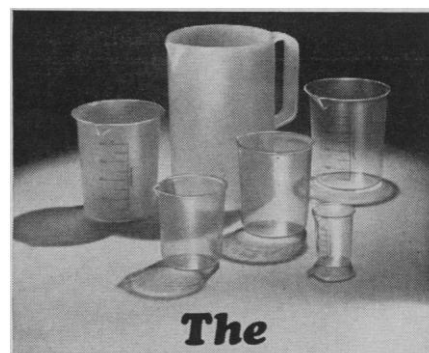
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Last Word on Yogurt-Making

Being an Armenian by ethnic origin and also a microbiologist, I should perhaps be in a more advantageous position to comment on the making of yogurt than the previous letter writers (Segal, 31 July; Goodman, 9 Oct.; and Bagdikian, 6 Nov.).

Yogurt (*yoghurt* in Turkish; *mādzun* in Armenian; *leben* in Arabic) is curdled or coagulated milk resulting from the fermentation of sugars in the milk by two microorganisms, *Lactobacillus bulgaris* and *Streptococcus thermophilus* (1). Both these microorganisms are capable of multiplying at temperatures between 20° and 50°C (2) and, with acid formation, ferment a number of sugars including lactose which is the main sugar present in milk. As a result of acid formation the proteins in the milk are curdled or coagulated and the milk attains the yogurt consistency.

Any kind of milk can be used to make yogurt but whole fresh cow's milk often gives the best results. The optimum temperature for the growth of yogurt-forming microorganisms lies within the range of 40° to 50°C. At this temperature range growth is rapid and yogurt formation takes only a few hours. If the temperature falls below 40°C the growth continues but at a slower rate and consequently yogurt formation delays. Multiplication of



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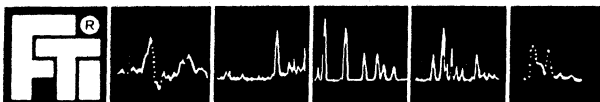
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yogurt-forming microorganisms is minimal or stops below 20°C. If growth is rapid and acid coagulation is extensive, souring of yogurt results. Thus, as soon as yogurt is formed it should be refrigerated to prevent further souring of the product. All this is learned by experience.

In brief, to make yogurt the milk is brought to its boiling point to kill in-born and other microorganisms present in the milk and allowed to cool down to a temperature slightly above the body temperature. This can be determined by the touch of the little finger. Dipping the elbow into the milk is unnecessary. It is then inoculated with yogurt and mixed. Two tablespoonfuls of yogurt per liter of milk should be adequate as starter. Next, it is covered with a dish and wrapped in a woolen material to minimize heat loss until yogurt consistency is obtained. This will commonly take 5 to 10 hours depending upon the temperature of the room. It is advisable to use crockery or glass bowls for processing yogurt as metal containers may get eroded by the acidity contained in the yogurt.

When equal parts of yogurt and ice-cold water are mixed together and the mixture is homogenized by means of a fork or an electric mixer, it forms a delicious and refreshing beverage known as *tān* in Armenian or *āyrān* in Turkish. Some salt may be added to it. It goes well with any kind of steak, hamburger, or *shish-kebab*. Yogurt also can be emptied into a bag made of cheesecloth and hung overnight from a faucet over a sink to drain the excess fluid. The part that remains in the bag has a pasty consistency and is known as *lebneh* in Arabic. In Lebanon it is eaten with bread. The addition of olive oil and some spices makes it more palatable. It is a Lebanese national food product and is sold in any grocery store. Incidentally, the yogurt and cucumber salad described by Segal is known as *jājek* by the Armenians and the Turks. In my opinion and in the opinion of many others this salad does not necessarily require pepper as one of its ingredients.

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