

## CHEMISTRY

# Solves Two-Year-Old Puzzle Of Surface Tension Behavior

## Peculiar Behavior of Solutions of Very Weak Concentration Has Led To Measurement Errors

FOR NEARLY two years now chemical circles have been puzzling over a curious surface tension effect first observed by Prof. Grinnell Jones and Wendell A. Ray of Harvard University.

Back in January, 1937, they reported to the *Journal of the American Chemical Society* that in certain solutions of very weak concentration a particular point could be reached where the surface tension became less than that of water, although in higher concentrations the surface tension was more than for water. This curious, and previously unexplained, phenomenon has become known as the Jones-Ray effect.

Dr. Irving Langmuir, General Electric's Nobel Prize winning chemist, however, has just reported (*Science*, Nov. 4) an explanation of the previously baffling phenomenon.

Although Prof. Jones and Mr. Ray took every precaution to measure the diameter of their tiny capillary tube exactly, they were in error for an unforeseen reason, explains Dr. Langmuir. The rise of the solution in the tube, it should be noted, can be used to determine surface tension forces.

At certain concentrations of the solutions, Dr. Langmuir proves in his complex mathematical report, the effective diameter of the capillary tube would be smaller than any measurement could ever show.

The reason, he adds, is that at these concentrations a tiny film of water is held against the inner surface of the tube and is bound by electric charges. Thus the effective diameter of the tube is less than its real diameter. While the difference is very small it can account for the curious decrease in surface tension observed by the Harvard scientists.

Surface tension is the force which exists on the surface of liquids due to the attractions of the molecules. The force makes water assume spherical shapes in falling, as in raindrops. And, when liquids rise in fine capillary tubes, surface tension makes the upper surface form a curved shape called a meniscus.

If the attractive forces between the

molecules of the liquid are greater than the attractive forces between the liquid and the capillary tube, then the meniscus is rounded at the top and convex. Mercury behaves in this fashion.

If the attractive forces of the molecules for the glass in capillary tube are greater than the inter-molecular attraction, then the top of the meniscus is curved upward, higher at the edges than in the center. Water behaves in this fashion.

Dr. Langmuir's new report goes a step further and shows why not only a meniscus is formed but that in special cases, a thin layer of liquid lines the walls of the capillary tube and cuts down the effective diameter of the tube.

*Science News Letter, December 24, 1938*

## ANTHROPOLOGY

## American Types Seen as Needing Science Study

IT IS TRADITIONAL for scientific expeditions to go visiting savage tribes to study their unusual ways and customs. Perhaps the savages sometimes wonder whether foreign white men ever stay home to study their own unusual ways and customs.

It's an idea. It is something anthropologists are just beginning to do. And the United States, trying to assimilate the most extraordinary assortment of peoples in history, may well do it to advantage.

In Chicago, the Institute of Juvenile Delinquency has sponsored a study of how Mexicans and Negroes come into conflict with law and society. With over three million of its people rated as criminals, the United States is not being "academic" when it looks into racial and cultural backgrounds of crime.

A pleasanter duty for anthropologists is advocated by Dr. Vincenzo Petruccio, anthropologist and explorer. And that is to study valuable culture traits of immigrant groups, so that natural pride in ancestry may be used for good.

Before the Conference of Social Work, Dr. Petruccio said:

"I believe that the various immigrant

groups should never be made to feel that they have to discard and forget their cultural backgrounds and heritages in order to become good American citizens."

For the first time, Indians are being encouraged by the Office of Indian Affairs to keep their cultural personalities, so far as these fit modern life. Dr. Petruccio advocates the same chance for immigrant groups, who are mainly European with no such striking differences of culture as Indians represent. Eventually, he predicts, the foreign traits will blend into American culture or vanish. Scientific study, especially now that the government is actively engaging in such projects, may prove useful to see that those traits preserved are desirable.

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## CHEMISTRY

## Vitamin C May Be Formed From Fatty Substance

VITAMIN C, the substance in fresh fruits and vegetables which prevents and cures scurvy, belongs to the sugar and starch group of chemicals, but some detective work on its origins now shows that it is probably formed by plants and lower animals from a fatty substance.

Details of the investigation which gives new information on how this vitamin that scientists can produce in the laboratory is formed in life and on the novel chemical idea of a fatty substance like a lipid playing a part in the building up of a sugar are reported by Drs. Rade R. Musulin, Robert H. Tully, III, Herbert E. Longenecker and Charles Glen King (*Science*, Dec. 9).

*Science News Letter, December 24, 1938*

## MEDICINE

## Duty of State

● "I consider that it is the duty of the State to make the lives of the poor, and particularly of the mothers and children of the poor, as safe and healthy as possible. This, to the mind of all thinking persons, ought to be at least as important as the expenditure on safety against attack from warlike peoples." —George Sava in *THE HEALING KNIFE* (*Harcourt, Brace*).

*Science News Letter, December 24, 1938*

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gold ore was made in the Cimarron mining district of Nevada.

Quantity production of manganese ore was started in the Philippines.

Iridium, valuable rare metal, was discovered in Alaska.