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Government's 7 X 50 Binoculars

You Assemble them! Complete Optics! Complete Metal Parts! Save More Than 1/2 Regular Cost! METAL PARTS—All Metal Parts—completely finished—for assembly of 7 X 50 Binoculars. No machining required. Sturdy Binoocular Carrying Case optional with each set of Metal Parts.
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(These are standard American-made parts... not Japanese, French or German.) Include 20% Federal Excise Tax if you buy both Optics and Metal Parts. Other items of interest: 6 X 30 Gov't Binooculars, Drift Meters, Gun Sights.

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PHYSICISTS

During the coming year the Armour Research Foundation is planning to expand considerably its research activities in the following fields: nuclear physics, electricity and magnetism, acoustics and vibrations, optics, spectroscopy, and high-pressure phenomena. Unusual opportunities are available for fundamental and applied research and for professional advancement. The Foundation will welcome applications from persons with several years of research and/or administrative experience.

Write:

**Chairman, Physics Research
 Armour Research Foundation
 35 West 33rd Street
 Chicago 16, Illinois**

In a series of three articles of which the present one is the last, Richard C. Tolman has presented a quasi-thermodynamic analysis of the structure of the transition zone between a liquid and its vapor which leads to the important conclusion that the superficial density is generally positive. Hence the surface tension of small drops is less than that when the liquid has a plane surface and decreases with decreasing droplet size. The effect is small but it is not negligible for embryo droplets in the borderline between the macroscopic and the microscopic. For drop radii of the order of magnitude of several hundred Angstrom units, decreases in surface tension of a few percent are to be expected in representative cases.

Tolman's analysis is based upon the hypothesis, which he recognized to be only approximately valid, that macroscopic thermodynamics can be applied to each layer of the transition zone between liquid and vapor. The thermodynamic functions are thus supposed to have values identical with those of the fluid in bulk appropriate to the given temperature and the local density of the layer.

JOHN G. KIRKWOOD

The Effect of Droplet Size on Surface Tension. By Richard C. Tolman. *J. Chem. Phys.* 17: 334, March, 1949.

Polymer Chains

The thousands of atoms in long chain polymer molecules are connected to one another by valance bonds about which they may rotate. The configuration of these molecules has customarily been studied by an analogy to the diffusion of a particle which moves about in successive displacements of equal length but in random directions. The diffusion problem and the polymer configuration problem differ, however, in one important respect not ordinarily taken into account. Whereas a diffusing particle may cross its previous path with impunity, there obviously cannot be a configuration in which two elements of the polymer chain occupy the same space. The modification of the configurational dimensions resulting from this stipulation has been investigated by an approximate statistical method and the results confirmed by numerous experiments.

P.J.F.

The Configuration of Real Polymer Chains. By Paul J. Flory. *J. Chem. Phys.* 17: 303, March, 1949.

Visual Ultrasonics

The problem of detecting and measuring the wavelength, intensity, and absorption of ultrasonic vibrations has been solved in a number of ingenious ways. Mechanical methods, involving the use of dust figures, the condensation of alcohol mist at the loops of stationary waves, and the measurement of sound radiation pressure by radiometers have been used frequently. Electrical and visual methods, however, are more versatile and have proved considerably more successful. The technique described in the present paper employs a visual method which appears capable of rather widespread application.