

a carbonyl bridge in a six membered ring was unstable and that the phenyl and hydrogen on the junction of the two rings shifted on pyrolysis.

The mode of polymerization of cyclopentadienones has been established.

PH. D.

CHEMISTRY

WILLIAM WESLEY STEWART

THE VISCOSITY OF GASES AND ITS RELATIONSHIP
TO THE GAS LAWS.

Measurements of high accuracy have been made on the viscosity and density of sulphur dioxide. The oscillation disk method has been used for the viscosity measurements and results have been obtained over the temperature range between -78.5° and 30°C . An equation representing the variation of viscosity with temperature of sulphur dioxide has been derived.

Density measurements have been made in a 50 litre bulb at 25° and 0°C . and at pressures of 1 atmosphere and less. The molecular weight—pressure isothermal at 25°C . for sulphur dioxide is found to be a curve. An estimation is made of the molecular weight of sulphur dioxide by extrapolation of this curve to zero pressure. A value is also submitted for the atomic weight of sulphur.

The data for the viscosity and density of sulphur dioxide were used to calculate the constants occurring in the equation of state developed by Cooper and Maass.

PH. D.

CHEMISTRY

JAMES STEWART TAPP

AN INVESTIGATION OF THE DENSITY OF A VAPOR IN EQUILIBRIUM
WITH A LIQUID NEAR THE CRITICAL TEMPERATURE.

An apparatus has been designed and constructed for measuring the density at any position within a sealed bomb containing a substance at, or above the critical temperature. The device has operated successfully and has supplied much interesting and heretofore undetermined data. A machine has been built for mechanically winding compact and sensitive quartz spirals used in the above mentioned apparatus. A method of preparing, purifying and storing methyl ether has been developed which permits of handling considerable quantities with the greatest ease.

The density determinations at the critical temperature have been confined to one substance, methyl ether. The results point to a definite continuance of a density difference between the medium above the point of disappearance of the meniscus and the medium below. Peculiar hysteresis effects have been noted, and great influence of temperature gradients throughout the length of the bomb have been studied. In general, the results obtained point to a discontinuity between the liquid and gaseous states of aggregation.

PH. D.

AGRICULTURAL BACTERIOLOGY

ROBERT REDVERS THOMPSON

A STUDY OF THE DISTRIBUTION OF BRUCELLA ABORTUS (BANG) IN
REACTING COWS AND ITS ISOLATION FROM SEX ORGANS AND FROM GLANDS.

A historical outline relating to infectious abortion in cattle (Bang's disease), the isolation of the etiological factor from milk and other body fluids, and the relationship of infectious abortion in cattle to undulant fever in the human has been given. A review of the literature relating to methods of cultivation and isolation of *Brucella abortus* has been made. A medium showing special growth promoting properties for *Brucella abortus* has been prepared by using a pressure-extract of liver as the growth stimulant.

The author has shown that *Brucella abortus* is constantly eliminated with the milk of cows reacting to the agglutination test, for infectious abortion, in dilutions of 1 to 200 or over, providing that recurrent infections do not excite a visible pathological condition in the udder. Experiments carried out have shown that, when *Brucella abortus* is eliminated with the milk, the supra-mammary glands are infected and there is a predisposition to mastitis. The experimental findings reveal that *Brucella abortus* in naturally infected milk may be transmitted to butter, buttermilk, cheese, ice cream and whey, and is viable in these for periods long enough to justify the assumption that the use of such products constitutes a mode of transmission from the cow to the human or to the domestic animals.

Brucella abortus has been isolated from "Special" milk being sold in the City of Montreal.

It has been shown by experiments that eggs from hens fed on or inoculated with milk infected with *Brucella abortus*, do not harbour the organism.