

The Effect of Temperature and Salinity on the Spermatozoa, Ova, and Development
to the First Swimming Stage of *Ostrea virginica*.

The results of experiments show that such variations in temperature and salinity as are found in nature do not exceed the vital limits of spermatozoa or ova of *Ostrea virginica*. Low temperatures delay the development to the first swimming stages.

Variations in Numbers of Oyster Larvae in Correlation with Temperature and Salinity.

From the study of plankton collections in correlation with temperature and salinity, it was found that the temperature has a marked effect on the number of oyster larvae, while salinity has little or no effect.

M. Sc.

GEOLOGY

FRANK THEOPHILE DENIS

AN INVESTIGATION OF THE MINERAL COMPOSITION
OF THE ORES OF NORANDA MINES LIMITED.

In treating the ore at the Noranda mill, a copper concentration is effected by floating chalcopyrite and depressing the pyrite and pyrrhotite. Gold is associated with both pyrite and pyrrhotite, but mainly with the former. An effort is then made to separate the pyrite and the pyrrhotite for cyaniding purposes, since the treating of the pyrrhotite is unprofitable, due to the enormous cyanide consumption involved. The ratio of pyrite to pyrrhotite in a mill product can only be roughly estimated due to the lack of knowledge of the composition of the pyrrhotite.

This paper outlines the methods used in arriving at the formula of the pyrrhotite and the composition of the ore by chemical analysis; and further suggests a mathematical formula which will give the respective quantities of pyrite and pyrrhotite in any product by a simple determination of the iron and sulphur.

M. Sc.

PHYSICS

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THE INFLUENCE OF TEMPERATURE GRADIENTS ON
THERMOELECTRIC EFFECTS IN METALS.

As the first step in an attempt to systematize many so-called "spurious" effects which have been observed in the study of thermoelectric phenomena, and perhaps to verify some predictions of the new Fermi Statistics, various temperature gradients have been applied to cylindrical rods of aluminium, lead, iron and copper. These were 42 cm. long by 0.9 cm. diameter. The ends were maintained in a circulating cold water bath and the heat applied electrically with alternating current.

After corrections for various stray effects have been applied, it appears that there is an e.m.f. associated with a temperature gradient, which changes sign and magnitude with the direction and magnitude of the gradient. For the aluminium and copper specimens examined, the effect is of the order of -1.66 and $+2.70 \times 10^{-8} \times (\text{°C per cm.})^2$ volts respectively. Results for lead and iron were erratic but showed similar tendencies.

M. Sc.

CHEMISTRY

EUGENE MITCHELL ELKIN

THE KINETICS OF HETEROGENEOUS GASEOUS REACTIONS.
CATALYTIC DECOMPOSITION OF METHANOL OVER
SOLID AND LIQUID ZINC.

The effect of variation in temperature on the rate of decomposition of gaseous methanol over solid and liquid zinc has been investigated between 360° and 440°C. With constant surface the catalytic activity of zinc is directly dependent on the temperature, there being no discontinuity in the relationship on liquefaction of the metal. Thus the presence of "active patches" on the catalyst is refuted. This is explained by the method of preparation of the catalyst, the procedure consisting of purification of zinc by distillation in vacuo followed by melting the condensate into a single "button".

Continuous use of the catalyst at constant temperature resulted in increase in activity. This is explained by modification of the surface of the contact agent with probable formation of active patches.

It is concluded that the presence of "active patches" is not necessary for this particular reaction to proceed under the conditions described and this is discussed in the light of existing theories of the nature of catalytic surfaces.