gold $R_{T=20.3} > R_{T=290}$, but for alloys with more than 2 % of silver by volume $R_{T=20.3} < R_{T=290}$.

The curve that represents the relation between the HALL coefficient $R_{T=20.3}$ and the percentages of silver is of a shape analogous to that representing the conductibility or the temperature coefficient of the resistance as a function of percentages of silver. The curve for $R_{T=20.3}$ at first descends very rapidly for small admixtures of Ag; at higher concentrations it becomes flatter.

The HALL coefficient $R_{T=20.3}$ is approximately a linear function of the quantity $\frac{w_{T=20.3}}{w_{T=273}}$ for alloys with less than about 8 % by volume of Ag.

The HALL coefficient $R_{T=290}$ diminishes too, though much more slowly than $R_{T=20.3}$, when the percentage of Ag increases.

Physics. — "*On the triple point of methane*". By C. A. CROMMELIN. Comm. N°. 131*b* from the physical Laboratory at Leiden. (Communicated by Prof. H. KAMERLINGH ONNES).

The measurements made by Prof. MATHIAS, Prof. KAMERLINGH ONNES and myself on the diameter for argon [1]) afforded an opportunity of determining the pressure and temperature of methane at its triple-point. For, when the cryostat was filled with liquid methane, and the pressure was reduced so as to give a temperature of about $-183°$ C. the methane was covered with a solid crust. A slight increase of the pressure caused the solid methane to spread itself in small pieces throughout the liquid. While these pieces were kept in constant motion through the liquid by means of the stirrer, the following triple point constants were observed:

$$t = -183.15 \text{ K.} \qquad p = 7.0 \text{ cm.}$$

On account of the manner in which these figures have been determined they must be considered to be very accurate.

As far as I am aware there has hitherto been only one other determination of these data — that of OLSZEWSKI [2]) — who found

$$t = -185.°8 \text{ and } p = 8.0 \text{ cm.}$$

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[1]) Comm. No. 131*a*.

[2]) K. OLSZEWSKI, C. R. 100, page 940, 1885.

Physics. — "*On the rectilinear diameter for argon.* By E. MATHIAS, H. KAMERLINGH ONNES and C. A. CROMMELIN. Comm. N°. 131*a* from the phys. Lab. at Leiden.

§ 1. *Introduction.* The present paper forms a continuation of the investigation of the diameter for substances of low critical temperature with which a beginning was made with oxygen. [1]) The importance of this and of similar investigations was indicated in the introduction to the Communication referred to, so that we need not discuss the point further here.

We chose argon for the present investigation since the isotherms for that gas had already been determined to within the neighbourhood of the critical point, while the critical pont itself, the vapour pressures and even preliminary values of the densities of the coexisting vapour and liquid phases were already known [2]) the monatomic nature of the gas, moreover, will undoubtedly enhance the value of the results.

§ 2. *Apparatus.* The apparatus was essentially the same as that employed in the investigation of oxygen. The arrangement for compressing the argon and also the volumenometer have, however, undergone some modification since that time, so that it seemed desirable to take this opportunity of publishing a new diagram of the whole apparatus (Fig. 1).

The modifications of the volumenometer and of the auxiliary apparatus belonging to it have already been described in full detail [3]).

The use of such a costly gas as pure argon necessitated, however, a completely new arrangement of the pressure connections. The copper tubes of which all the connections were made were chosen as narrow as possible so as to reduce the quantity of gas in the dead space to a minimum. The argon was contained in the steel cylinder A which was completely immersed in oil; so too were all the taps and coupling pieces which contained compressed gas. [4])

Through the taps C_{16} and C_{15}, the gas passes to the spiral Sp;

[1]) Proc. Febr. 1911. Comm. No. 117. C. R. 151, 213 and 477, 1910.

[2]) Proc. May 1910. Comm. No. 115, Proc. Dec. 1910, Comm. No. 118, C. A. CROMMELIN, Thesis for the doctorate, Leiden. 1910.

[3]) Proc. May 1911 Comm. No. 121*a*, Proc. Sept. 1912 Comm. No. 127*c* and W. J. DE HAAS, Thesis for the Doctorate, Leiden 1912, in which diagrams of the modified volumenometer are also given. Certain small errors in these diagrams make it desirable to publish a diagram here in which these errors are corrected.

[4]) Proc. June 1905 Comm. No. 94*b*. The value of this device for the detection of leaks has already been repeatedly emphasized