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LXIV. The contact difference of potential of distilled metals

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to the observations of Compton and Richardson, the relative magnitude of the two humps is determined by the amount of photoelectric fatigue which has occurred. The data of both pairs of observers can be harmonized on the following assumptions :—

(1) That Pohl and Pringsheim's typical curves correspond to a state of less advanced photoelectric fatigue. This involves the assumption of the attainment of better vacuum conditions in their experiments, which seems to be borne out by an examination of the general character of their results.

(2) That the first hump (the "resonance" hump (*a*)) is present from the beginning, or at least is formed very quickly, and does not suffer much alteration in the earlier stages of the photoelectric fatigue.

(3) That the second hump is small initially, and increases to a maximum value during the early stages of fatigue. According to Compton and Richardson's experiments, this initial increase is followed by a decay, which is slower than that of the first hump, as the fatigue progresses.

It is not claimed that this is the only possible explanation of the observed differences; it is put forward as a possible, and, on the whole, rather probable one.

LXIV. *The Contact Difference of Potential of Distilled Metals.* *By* Fernando Sanford*.

IT has seemed to the present writer that some of the results of the experiments published under the above caption in the September number of this Journal, may perhaps be accounted for in a manner not taken into consideration by Mr. Hughes. I refer especially to the observation that after a film of zinc or bismuth had been condensed from the metallic vapour upon a very thin film of platinum on a glass plate in a high vacuum, the condensed metallic film was at first much less electropositive to the platinum film than it became after standing for some time, and that the change to the more electropositive condition was hastened by admitting a very small quantity of air to the vacuum.

In some experiments which I have made for another purpose I have observed that when a section of a glass tube is heated to a temperature of 100 degrees, or even less, it becomes plainly electronegative to the colder parts of the same tube. The change is necessarily slow, since, on account of the low conductivity of glass, the electrons require considerable time to gather in the heated parts of the glass. It would seem that

* Communicated by the Author.

in Mr. Hughes' experiments the glass must have been considerably heated over the regions upon which the metallic films were condensed. If this heating process was kept up for some time the glass in these regions probably became negatively electrified, and accordingly lessened the electropositive inductive effect of the metallic films upon the plate connected to the electrometer. As the glass cooled off, its charge diffused slowly and the metallic films appeared to become more electropositive. The admission of a small amount of air, by lowering the insulation of the high vacuum, would then enable the negative charge on the glass to diffuse more rapidly.

Stanford University, Cal.
Dec. 26, 1914.

LXV. *Notices respecting New Books.*

Bulletin of the Bureau of Standards. Vol. X. (1914). Washington: Government Printing Office.

THIS volume of the Bulletin (Nos. 1, 2, 3 and 4) exhibits the great activity of the Bureau. It contains amongst other papers the following:—(i.) Constants of Spectral Radiation of a uniformly heated enclosure, by W. W. Coblentz, in which are described experiments with enclosures with white and with black walls, which yield as mean values of Planck's constants: $C = 14456 \pm 4$ micron deg.; $A = 2911$ micron deg. (results of 94 energy curves). (ii.) Melting-points of the refractory elements of atomic weight from 48 to 59, by G. K. Burgess and R. G. Waltenberg. The summary results for the probable melting-points of the pure elements are: nickel 1452 ± 3, cobalt 1478 ± 5, iron 1530 ± 5, manganese 1260 ± 20, chromium 1520 to > iron ?, vanadium 1720 ± 30, titanium 1795 ± 15. (iii.) Latent heat of fusion of ice, by H. N. Dickinson, D. R. Harper, and N. S. Osborne. Final result (mean of 21 determinations) 79·63 cal_{15} per gram. Mean of experiments by electrical method 79·65, by method of mixtures $79{\cdot}61 \pm {\cdot}02$; electrical method (second set, ice at $-3^{\circ}{\cdot}78$), 79·65. (iv.) Melting-points of some refractory oxides, by C. W. Kanolt. (v.) The pentane lamp as a working standard, by E. C. Crittenden and A. H. Taylor. (vi.) Comparison of the silver and iodine voltameters and the determination of the Faraday, by G. W. Vinal and St. J. Bates. Results: E. Ch. Eq. of iodine 1·31502; value of Faraday (iodine=126·92) 96515; (Ag=107·88) 96494. Recommended value for general use, 96500. (vii.) Production of temperature uniformity in an electric furnace, by A. W. Gray. (viii.) The silver voltameter, by E. B. Rosa, G. W. Vinal, and A. S. McDaniel. (ix.) Flame standards in Photometry, by E. B. Rosa and E. C. Crittenden.

The Bureau publishes these papers in separate form; also a set of technological papers. Amongst its recent circulars are one on the testing of barometers and a valuable one on Polarimetry (*i. e.* of sugars). It has also just published a decennial index to the Bulletin (Vols. 1–10).