now introduce the *semi-character* operator $\xi_n[2]$, defined as the average of those elements of the class of interchanges in π_n *not* contained in π_{n-2}, which will be diagonal in (n, k) with but three distinct elements easily calculable from the Dirac vector model. One can show that $P_{n-2,n-1}$ commutes with $(2n-3)\xi_n+(2n-7)\xi_{n-2}$ which gives the conditions for the non-vanishing elements. These are then determined from the fact that $P_{n-2,n-1}$ commutes with all elements of π_{n-3}, the unitary condition, and $P^2_{n-2,n-1}=1$.

In contrast to the inductive procedure from π_{n-1} to π_n, this method[1] diagonalizes P_{12}, P_{34}, $\cdots$ which is very desirable; since it facilitates factorization of the secular equation in problems which afford additional (space) symmetry elements. Further details will be presented in a future publication.

[1] T. Yamanouchi, Proc. Phys. Math. Soc. Japan **18**, 623 (1936).

Erratum: Disintegration of Be^8

[Phys. Rev. **73**, 806 (1948)]

ARTHUR HEMMENDINGER
Los Alamos Scientific Laboratory, Los Alamos, New Mexico

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THE disintegration energy of 116 kev of Be^8 is in error because the momentum imparted to the excited Be^9 nucleus by the 2.62 Mev photon was neglected. The maximum energy of the Be^8 nucleus due both to the absorption of the photon and to the photodisintegration is 117 kev; subtraction of this energy from the observed end point of the alpha-particle distribution of 220 kev gives 103 ± 10 kev for the disintegration energy of Be^8, in better agreement with the value 84.5 ± 10 kev quoted by Tollestrup, Lauritsen, and Fowler.[1]

[1] Tollestrup, Lauritsen, and Fowler, Bull. Am. Phys. Soc. 24, No. 2, E6 (1949).

Recent Changes and Additions in the Consistency Diagram of the Natural Atomic Constants

JESSE W. M. DUMOND
California Institute of Technology, Pasadena, California

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ABOUT one year ago E. R. Cohen and the author published a review[1] of the state of our knowledge regarding the values of the atomic constants F, N_0, m and h[2] incorporating the results of some 10 different types of experimental determination[3] each determining a different function of one or more of the four unknowns and exhibiting the interconsistency of the data on a graphic chart.[4] A least squares adjustment of these overdetermined data was made, yielding a set of compromise values for the constants and for various important functions thereof.[5] One indication from this study was that the value of F, the Faraday constant, might be somewhat higher than that directly obtained with the silver voltameter,[6] —closer to the iodine voltameter result.[7] These determinations were made before the existence of isotopes was known. Also the emphasis was then more on reproducibility than on absolute significance. The author is informed that a redetermination of F is now under way at the Bureau of Standards.

Since the aforementioned paper[1] appeared, the following three important and interesting experimental determinations have added new information. (1) H. A. Bethe and C. Longmire[8] report the results of Taub and Kush on the ratio of magnetic moments of electron and proton which they combine with the recent hyperfine structure work of Nafe and Nelson to yield a very accurate value for $\alpha^{-1}=(e^2/\hbar c)^{-1}=137.041 \pm0.005$. (2) Schwarz and Bearden have new information[9] on h/e determined by means of the continuous x-ray spectrum taken in the 8000 volt region which seems, like the work of Panofsky, Green, and DuMond,[10] (but with even smaller probable error) to give values too low to agree with the consistency chart. (3) DuMond, Lind and Watson have made a precision determination[11] of the wave-length $\lambda_c=h/(m_0c)$ of the annihilation radiation coming from recombination of positrons and electrons in a block of neutron activated copper (Cu^{64}) using the 2-meter curved crystal spectrometer.

The results (1) on α combined with the accurately known Rydberg constant give a value which plots on the above mentioned consistency chart so as to be directly comparable with the results (3) on $\lambda_c=h/(m_0c)$. On Fig. 1 these are

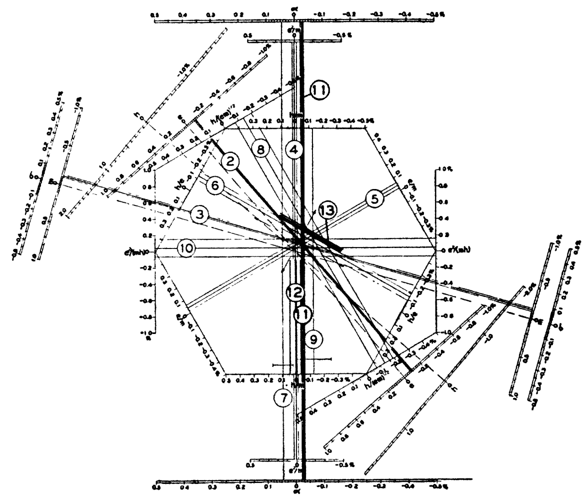

FIG. 1. Isometric consistency chart similar in all respects to Fig. 9 of reference 1 save that three new determinations have been added. These are: (11) The new precision value of α (Taub and Kush + Nafe and Nelson), (12) The new precision value of $h/(m_0c)$ (DuMond, Lind, and Watson), (13) The new x-ray determination of h/e (Bearden). The DuMond-Cohen least squares "best values" of 1947 correspond to the center of the small black ellipse of probable error which can be identified by the four oblique arrows radiating out along the major and minor axial directions of the ellipse (not to be confused with the *origin* of the chart at the intersection of the three oblique dot-and-dashed axes).

shown numbered (11) and (12) respectively. The probable error ranges are essentially in contact so that the disagreement is not serious. The Schwarz and Bearden h/e result is numbered (13). Bethe and Longmire[8] have pointed out that a very small correction to the determination of e^2/m (numbered (4), x-ray refractive index of diamond) for nuclear scattering has been overlooked. If this correction were made in Fig. 1 the center line of determination (4) would be moved to the present position of its right-hand error line.

The h/e discrepancy remains unexplained. The important new result on α tends to reestablish confidence in the silver Faraday. On the other hand, the λ_c results point toward the higher Faraday. We believe any reevaluation of the entire atomic constants picture should be postponed at least until the new N.B.S. Faraday results are available.

[1] J. W. M. DuMond and E. R. Cohen, Rev. Mod. Phys. **20**, 82 (1948).
[2] The all important constant, e, is here implied since $e=F/N_0$.
[3] See Table VII, page 102 of reference 1, for these input data.
[4] See Fig. 9 of reference 1.
[5] See Table VIII, pages 106 and 107 of reference 1, for these values.
[6] G. W. Vinal, Comptes Rendus 3, 95 (1932).
[7] G. W. Vinal and S. J. Bates, Bull. Bur. Stands. **10**, 425 (1914). In a private communication, G. W. Vinal and L. H. Brickwedde give 96 480 abs. coulombs (N.B.S.) per equivalent for the silver result and 96 493 abs. coulombs (N.B.S.) per equivalent for the iodine result. Both are on the chemical scale of atomic weights.
[8] H. A. Bethe and C. Longmire, Phys. Rev. **75**, 306 (1949).
[9] G. Schwarz and J. A. Bearden, Bull. Am. Phys. Soc. **24**, No. 1 (1949).
[10] W. K. H. Panofsky, A. Green and J. W. M. DuMond, Phys. Rev. **62**, 214 (1942).
[11] J. W. M. DuMond, D. A. Lind and B. B. Watson, Phys. Rev. **75**, 1226 (1949).