(b) It has been already mentioned that the photoionization experiments of negative ions in liquid helium of Northby and Sanders[27] are of considerable interest in determining the ground-state energy of the negative ion.

(c) The effective inertial mass of the negative ion in liquid helium can be obtained by microwave measurements of momentum relaxation times.[18] The inertial mass $M^*$ of a sphere oscillating at frequency $\omega$ due to viscous flow in the normal fluid just below the $\lambda$ point can be estimated as

$$M^*=\tfrac{2}{3}\pi\rho_0R^3(1+\tfrac{9}{2}(\rho_n\delta/\rho_0R)), \qquad (28)$$

where $\rho_n$ is the normal fluid density [so that at $T\lesssim T_\lambda$, $(\rho_n/\rho_0)\sim1$], $\eta$ is the normal fluid viscosity, and $\delta=(2\pi\eta/\omega\rho_n)^{1/2}$ is the penetration depth. Since $M^*$ is approximately proportional to $R^3$, our results imply that the internal effective mass should decrease by about a factor of 2 in the pressure range 0–20 atm.

(d) The vibration frequency for the symmetric stretching mode of the negative ion can be determined from Fig. 1 in the form $\nu=(1/2\pi)(f/M)^{1/2}$, where the force constant $f$ is given by $f=\frac{1}{2}(\partial^2E_t/\partial r^2)_{r=R}$. Taking the oscillator mass to be equal to the experimental inertial mass $M=M^*=(110+100,\ -30)M_{\mathrm{He}}$ the symmetric vibration frequency is found to be surprisingly low: $\nu=4\times10^{10}$ sec$^{-1}$ at $p=0$ and $\nu=10^{11}$ sec$^{-1}$ at $p=20$ atm. Because other (asymmetric) vibration modes of the negative ion should be characterized by comparable frequencies, microwave absorption measurements (in the frequency range of 10 GHz) on negative ions in liquid helium will determine these low-frequency modes. These low-vibration frequencies of the negative ion are probably not related to the periodic discontinuities in the mobilities of ions in liquid He II observed by Careri *et al.*,[30,31] since the same effect is also experimentally observed in the case of the positive ion.

## ACKNOWLEDGMENTS

This research was partially supported by the National Science Foundation and the U. S. Air Force Office of Scientific Research. It benefitted also from general support of research in Materials Science at the University of Chicago by the Advanced Research Projects Agency. The authors also acknowledge useful conversations with Dr. R. J. Donnelly concerning the experimental determination of the radius of the negative ion in liquid-He II.

[30] G. Careri, S. Cunsolo, and P. Mazzoldi, Phys. Rev. **A136**, 303 (1964).

[31] J. A. Cope and P. W. F. Gribbon, Phys. Letters **16**, 128 (1965); *Superfluid Helium*, edited by J. F. Allen (Academic Press Inc., New York, 1966), p. 83. These authors have come to the opposite conclusion.

# Errata

**Relativistic Self-Consistent-Field Theory for Closed-Shell Atoms,** YONG-KI KIM [Phys. Rev. **154**, 17 (1967)]. The right-hand side of Eq. (128) should be multiplied by $\frac{1}{2}$. The "experimental" energy of the He atom in the Concluding Remarks should be $E_{\mathrm{expt}}=-2.903387\ (\pm1.1\times10^{-6})$ atomic units. Also in the same section, the relativistic correction calculated by Pekeris (Ref. 36) corresponding to ours should be $-E_j-2\alpha^2$.

**Hyperfine Splittings and $g_F$ Values of Metastable $H_2$,** LUE YUNG-CHOW CHIU [Phys. Rev. **145**, 1 (1966)]. A phase factor $(-1)^{J+J'}$ has been neglected in evaluating the matrix element for the term $H_1$(hfs). The right-hand side of the first two equations in the right column of p. 3 should be multiplied by a factor $(-1)^{J+J'}$. So whenever $J'-J=\pm1$, a negative sign will appear before the coupling constant $a$. Consequently $a$ in Eqs. (2.8a), (2.8b), (3.4) (for both $P$ and $\bar{P}$), and (3.8) should be replaced by $-a$. $K_1$ and $K_2$ which are obtained through Eq. (3.8) should now read

$$K_1=1097.70\ \text{Mc/sec},\qquad K_2=1053.42\ \text{Mc/sec}. \qquad (4.2)$$

Owing to the same phase-factor error, the quantity $(g_S+g_N)$ in Eq. (3.6) should be replaced by $(g_S-g_N)$, and the right-hand sides of all of the six equations denoted by Eq. (3.9) should be multiplied by a factor $\frac{3}{5}$ [which is the ratio $(g_S-g_N)/(g_S+g_N)$]. The $g_F^{(1)}$'s (and consequently the $g_F$'s), which were obtained through Eq. (3.9) and which were listed in Table I should be replaced by a set of new values. The new values are given in the following Table I and they show better agreement with the experimental values.

TABLE I. Calculated $g_F^{(1)}$ and $g_F$ $(=g_F^{(0)}+g_F^{(1)})$ values for $N=1$ rotational level of the $c^3\pi_u$ state of ortho-$H_2$.

| $J$ | $F$ | $g_F^{(0)}$ | $g_F^{(1)}$ | $g_F$ |
|---|---|---|---|---|
| 0 | 1 | −0.003 | −0.211 | −0.214 |
| 1 | 0 | ··· | ··· | ··· |
| 1 | 1 | +0.624 | +0.257 | +0.881 |
| 1 | 2 | +0.624 | +0.028 | +0.652 |
| 2 | 1 | +1.878 | −0.046 | +1.832 |
| 2 | 2 | +1.042 | −0.028 | +1.014 |
| 2 | 3 | +0.833 | 0 | +0.833 |

The author wishes to thank Dr. A. N. Jette for calling her attention to a sign error which led to the above corrections.