232), viz., I wished to show that an accurate estimate of e could be made, which was *independent* of any direct estimate, but which confirmed Millikan's value.

(III) Birge's chief disagreement with my work is in his adopting as the value for e/m (1.761 ± 0.001) or $(1.759\pm0.001)\times10^7$ e.m.u., and consequently disagreeing with both Eddington's theoretical numbers 137 and 1847.6. This estimate of e/m is the *only* experimental evidence against *either* of Eddington's theories. I would point out that, though e/m has now been measured for 35 years, it is only during the last three years that any appreciable number of physicists have accepted the value Birge advocates. Moreover, I understand from Sir Arthur Eddington that the discovery of the neutron makes it seem likely that the equations used in deducing the spectroscopic estimates of e/m are in error.

(IV) In section 4 of Birge's letter he speaks of the probable error of an estimate of e that I had given as being much larger than the error he estimates. I believe Birge's estimate must be wrong, as it would make his estimate of e ten times more accurate than the data from which it is obtained.

W. N. Bond

Department of Physics,
University of Reading, England.
May 11, 1932.

The Relation of Relative Humidity to the Absorption of Supersonic Waves in Various Mixtures of CO_2.

A sputtered quartz crystal with a frequency of 4.096×10^5 vps was used as source for supersonic waves. The absorption of these waves by a column of air mixed with different percentages of CO_2 was measured with an acoustic radiometer of the torsion vane type. A constant relative humidity of 10 percent for one set of runs was maintained with P_2O_5, 15 percent relative humidity for another set was obtained using LiCl and 35 percent for the remaining runs was obtained using CrO_3 as a dryer.

Curves plotting log of deflection (log D_x) against height (x) of radiometer from crystal face were plotted from the data and values for the absorption constant (k) were obtained by taking the slope of the straight lines thus plotted.

The following values of k were taken from these curves:

	10% R.H.	15% R.H.	35% R.H.
5% CO_2	0.053	0.09	0.11
50% CO_2	0.51	0.64	0.69
95% CO_2	0.97	1.19	1.29

These values indicate that relative humidity has a very marked and important effect upon the absorption in CO_2 or in air containing large percentages of CO_2.

Henry H. Rogers

Pennsylvania State College,
May 26, 1932.

Constants of the N_2O Molecule

In a recent paper on N_2O [1] the vibration frequencies as indicated by infrared absorption bands were correlated, and the anharmonic coefficients determined, employing an equation developed by Dennison for linear triatomic molecules. It now appears that this relation is too limited in its application, and should have been written in the more general form

$$W_l = V_1\nu_1 + V_2\nu_2 + V_3\nu_3 + x_{11}V_1^2 + x_{22}V_2^2 + x_{LL}L^2 + x_{33}V_3^2 + x_{12}V_1V_2 + x_{13}V_1V_3 + x_{23}V_2V_3 + A$$

[1] Barker, Phys. Rev. **38**, 1827 (1931).

Table I.

ν observed	transition	anharmonic coef. symbol	value	ν^0	ν computed
1285.4	$(0\rightarrow1)V_1$	x_{11}	−3.3	1288.7	1285.4
2564.2	$(0\rightarrow2)V_1$				2564.2
589.0	$(0_0\rightarrow1_1)V_2$	x_{22}	−2.2	588.3	589.1
579.5	$(1_1\rightarrow2_0)V_2$	x_{LL}	+3.0		578.7
590.5	$(1_1\rightarrow2_2)V_2$				590.7
1167.3	$(0_0\rightarrow2_0)V_2$				1167.8
2224.1	$(0\rightarrow1)V_3$	x_{33}	−13.8	2237.9	2224.1
4420.7	$(0\rightarrow2)V_3$				4420.6