

$$X = Ne \left(\frac{1}{r^2} - \frac{r}{R^3} \right) \quad [\text{and}]^1$$

$$V = Ne \left(\frac{1}{r} - \frac{3}{2R} + \frac{r^2}{2R^3} \right).$$

$$X = Ne \left(\frac{1}{r^2} - \frac{r}{R^3} \right)$$

[and]²

$$V = Ne \left(\frac{1}{r} - \frac{3}{2R} + \frac{r^2}{2R^3} \right).$$

CLASSICAL THEORY
Space-Time Description [and] Causality

QUANTUM THEORY

<i>Either</i>	<i>Or</i>
Space-Time Description	Mathematical Model
<i>But</i>	Statistical Not in Space and Time
Indeterminacy Relations	<i>But</i> Causality

¹[To determine the electric potential we *integrate* the field strength X *over distance* (see Appendix II B, 269-71 below for a discussion of this), from $s = r$ to $s = R$ (it is not necessary to consider radii greater than R because, the atom as a whole being electrically neutral, there is no field beyond R). Thus Rutherford's expression for V is the result of having evaluated the integral $\int_r^R Ne(1/s^2 - s/R^3) ds$.]

²[To determine the electric potential we *integrate* the field strength X *over distance* (see Appendix II B, 269-71 below for a discussion of this), from $s = r$ to $s = R$ (it is not necessary to consider radii greater than R because, the atom as a whole being electrically neutral, there is no field beyond R). Thus Rutherford's expression for V is the result of having evaluated the integral $\int_r^R Ne(1/s^2 - s/R^3) ds$.]

TABLE VI^a

t_g Sec.	t_F Sec.	$\frac{1}{t_F}$	$\frac{1}{t'_F} - \frac{1}{t_F}$	n'	$\frac{1}{n'}(\frac{1}{t'_F} - \frac{1}{t_F})$	$\frac{1}{t_g} + \frac{1}{t_F}$	n	$\frac{1}{n}(\frac{1}{t_g} + \frac{1}{t_F})$
11.848	80.708	.01236	.03234	6	.005390	.09655	18	.005366
11.890	22.366	.04470				.005358	.09138	17
11.908	22.390		.03751	7	.005348			
11.904	22.368	.007192				.005348	.11289	21
11.882	140.565		.01254	.01616	3			
11.906	79.600	.02870				.026872	5	.09146
11.838	34.748		.03414	.021572	4			
11.816	34.762	.01623				.005410	.12926	24
11.776	34.846		.04507	.04307	8			
11.840	29.286	.002000				.04879	9	.13498
11.904	29.236		.05079	.03[79]4	7			
11.870	137.308	.01285				.01079	2	.10783
11.952	34.638		.02364	Means				
11.860	22.104							
11.846			22.268					
11.912	500.1							
11.910	19.704							
11.918	19.668							
11.870	77.630							
11.888	77.806							
11.894	42.302							
11.878								
11.880								

Duration of exp.	= 45 min.	Pressure	= 75.62 cm.
Plate distance	= 16 mm.	Oil density	= .9199
Fall distance	= 10.21 mm.	Air viscosity	= $1,824 \times 10^{-7}$ [poise]
Initial volts	= 5,088.8	Radius (a)	= .[0]000276 cm.
Final volts	= 5,081.2	$\frac{l}{a}$ [mean free path $\div a$]	= .034
Temperature	= 22.82°C.	Speed of fall	= .08584 cm./sec.

$$e_i = 4.991 \times 10^{-10} \text{ [statcoulomb]}^b$$

^a[The bracketed numbers are our corrections of errors in the original paper.]

^b[The value presently accepted is 4.802×10^{-10} statcoulombs.]