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

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

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

$$[\text{and}]^2$$

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

CLASSICAL THEORY Space-Time Description [and] Causality

QUANTUM THEORY

EitherOrSpace-Time Description Mathematical Model Statistical Not in Space and Time ButCorrelations ButCausality

Indeterminacy Relations

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 $\int_r^R Ne(1/s^2-s/R^3) \, ds$.]

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TABLE VI^a

t_g Sec.	t_F Sec.	$rac{1}{t_F}$	$\frac{1}{t_F'} - \frac{1}{t_F}$	n'	$\frac{1}{n'} \left(\frac{1}{t_F'} - \frac{1}{t_F} \right)$	$\frac{1}{t_g} + \frac{1}{t_F}$	n	$\frac{1}{n}(\frac{1}{t_g} + \frac{1}{t_F})$
11.848	80.708	.01236				.09655	18	.005366
11.890	22.366	}	.03234	6	.005390			
11.908	22.390	.04470 {				.12887	24	.005371
11.904	22.368	}	.03751	7	.005358			
11.882	140.565	.007192				.09138	17	.005375
		}	.005348	1	.005348			
11.906	79.600	.01254 {				.09673	18	.005374
11.838	34.748	}	.01616	3	.005387			
11.816	34.762	.02870				.11289	21	.005376
11.776	34.846							
11.840	29.286							
	}	.03414				.11833	22	.005379
11.904	29.236	}	.026872	5	.005375			
11.870	137.308	.007268	001550		005000	.09146	17	.005380
11.050	0.4.600	00004	.021572	4	.005393	11000	0.1	005000
11.952	34.638	.02884 {	01.000	9	005410	.11303	21	.005382
11.860	00 104		.01623	3	.005410			
11.846	22.104	.04507				.12926	24	.005386
11.912	$_{22.268}$.04507	.04307	8	.005384	.12920	24	.005560
11.912	500.1	$ _{.002000}$.04507	0	.005564	.08619	16	.005387
11.918	19.704	.0020007	.04879	9	.005421	.00013	10	.005567
11.510	3.704	.05079	.04019	9	.005421	.13498	25	.005399
11.870	19.668	.00013				.10450	20	.000000
11.010	10.000	}	.03[79]4	7	.0054[20]			
11.888	77.630		.50[10]1		.0001[20]			
11.000		.01285				.09704	18	.005390
11.894	77.806	}	.01079	2	.005395			
11.878	42.302	.02364				.10783	20	.005392
11.880			Means		.005386			.005384

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

 $[^]a[{\rm The~bracketed~numbers~are~our~corrections~of~errors~in~the~original~paper.}]$ $^b[{\rm The~value~presently~accepted~is~4.802\times10^{-10}~statcoulombs.}]$