comparing the values of "*n second approx*" in Table VI with those calculated from the equation:[1]

$$n\ calc. = \frac{log(2K_1C + K_2Cr) - log(K_1C + K_2Cr)}{log\ 2} + 1 \qquad (5)$$

Temperature Coefficient

In order to find the temperature coefficients of the rates involved, I repeated the experiments of Table IV at zero. (See Table VII.)

Table VII

Cr	*n*, 2d appx.	*n* calc.	Cr	*n*, 2d appx.	*n* calc.
0	2.00	2.00	20	1.28	1.26
2	1.73	1.75	30	1.22	1.19
4	1.58	1.62	40	1.13	1.12
6	1.53	1.53	50	1.12	1.11
8	1.49	1.47	60	1.07	1.10
10	1.44	1.41	70	1.05	1.09
12	1.37	1.37	80	1.01	1.07
14	1.36	1.34	90	1.01	1.06
16	1.32	1.30	100	0.96	1.04
18	1.30	1.28			

Under "coeff" is entered the temperature coefficient, that is the cube root of the ratio of the two rates R_0 at 30° and at 0°. The coefficient varies with the amount of bichromate present, as is shown graphically in Fig. 3; the similarity between this curve and that of Fig. 2 furnishes another argument in support of the assumption of two simultaneous reactions. The coefficient falls off gradually as the quantity of bichromate increases until $Cr = 60$, when it becomes constant at 1.19; this may be taken as the temperature coeffi-

[1] In Table VI the concentration of the acid was twice that in Table III; hence, comparing values of R_0 from experiments in which the concentration of bichromate was the same,

by Equation (1) $\frac{R_0\ (Table\ VI)}{R_0\ (Table\ III)} = 2^n$

by Equation (4) $\frac{R_0\ (Table\ VI)}{R_0\ (Table\ III)} = \frac{2(2K_1C + K_2Cr)}{K_1C + K_2Cr}$

Equation 5 is obtained by equating these two expressions and taking the logarithms; C refers to the acid of Table III.