agreeing reading on the four deflection meters at the crown of the arch showed that this point commenced to raise. This means that the loaded part of the arch tried to straighten, and corresponding to this a considerable rolling must have taken place in the crown hinge. This was also clearly visible by the levels. By this turning the pressure was moved downward, by which a new pressure line could be figured inside the undamaged concrete and which would explain the new

Table II.

Moduli of elasticity (E), stresses (ζ), and length alterations per unit (λ). E and ζ in lbs. per square inch, λ in 1/100,000 of the measure length.

A.—Measuring on the bridge.　　　　　　　　　B.—Measuring on the cubes.

A.—Measuring on the bridge.			Cube No. 1.			Cube No. 2.		
ζ	λ	E	ζ	λ	E	ζ	λ	E
Tension.								
330	65.0	5,050,000	.....	.....	....	.....	.....	....
231	52.0	4,440,000	.....	.....	....	.....	.....	....
168	34.0	4,900,000	.....	.....	....	.....	.....	....
70	18.0	3,920,000	.....	.....	....	.....	.....	....
14	0.5	2,800,000	.....	.....	....	.....	.....	....
Compression.								
24	6.0	3,910,000	.....	.....	....	.....	.....	....
70	18.0	3,910,000	.....	.....	....	.....	.....	....
129	21.0	5,600,000	.....	.....	....	.....	.....	....
154	28.0	5,450,000	.....	.....	....	.....	.....	....
256	67.0	3,920,000	.....	.....	....	.....	.....	....
...	....	....	270	47.0	5,740,000	.....	.....	....
...	....	....	....	.....	....	272	42.3	6,450,000
336	54.0	6,150,000	.....	.....	....	.....	.....	....
342	90.0	3,780,000	.....	.....	....	.....	.....	....
...	....	....	448	80.3	5,600,000	.....	.....	....
...	....	....	....	.....	....	445	82.9	5,480,000
484	113.0	4,340,000	.....	.....	....	.....	.....	....
532	107.0	4,900,000	.....	.....	....	.....	.....	....
...	....	....	630	116.0	5,430,000	.....	.....	....
...	....	....	....	.....	....	636	128.2	4,960,000
706	160.0	4,440,000	.....	.....	....	.....	.....	....
748	146.0	5,040,000	.....	.....	....	.....	.....	....
...	....	....	809	154.0	5,250,000	.....	.....	....
...	....	....	....	.....	....	817	170.2	4,800,000
...	....	....	990	189.0	5,230,000	.....	.....	....
...	....	....	....	.....	....	1,000	217.5	4,590,000
...	....	....	1,170	228.0	5,120,000	.....	.....	....
...	....	....	....	.....	....	1,180	254.1	4,640,000
...	....	....	1,350	263.0	5,120,000	.....	.....	....
...	....	....	....	.....	....	1,360	292.1	4,650,000
...	....	....	1,520	305.0	4,980,000	.....	.....	....
...	....	....	....	.....	....	1,540	334.0	4,600,000
...	....	....	1,710	342.0	4,980,000	.....	.....	....
...	....	....	....	.....	....	1,720	377.3	4,560,000
...	....	....	1,890	382.0	4,940,000	.....	.....	....
...	....	....	....	.....	....	1,900	419.3	4,540,000
...	....	....	2,070	423.0	4,900,000	.....	.....	....
...	....	....	....	.....	....	2,080	475.5	4,480,000

Table III.

The elongations λ measured on 3.28 feet = 1 meter one-quarter of the span from the springing line in 1/25,000 inch.
+ Means elongation.　— Means shortening.　e Means extrados.　i Means intrados.

	75 Tons.		150 Tons.		225 Tons.		300 Tons.	
	e	i	e	i	e	i	e	i
(a) Loaded part of arch	−54	+2	−107	+34	−146	+65	−213	+50
(b) Unloaded part of arch	−18	−67	−6	−90	+18	−113	+52	−160

Comparison of measured and calculated stresses (in lbs. per square inch) at the same point:—

	Dead load.		75 Tons.		150 Tons.		225 Tons.		300 Tons.	
	e	i	e	i	e	i	e	i	e	i
Loaded side measured	.....	.....	−335	+14	−532	+168	−750	+330	crack	acting
Loaded side calculated	−119	−154	−315	+8	−520	+153	−700	+194	crack	acting
Unloaded side measured	.....	.....	−70	−256	−24	−342	+70	−485	+231	−707
Unloaded side calculated	−119	−154	−87	−235	−8	−356	+54	−465	+265	−738