No. 1. von Durango bis Chih. nach Rivera P. 1. u. 2. desselben nach Mascaro Pag. 7, von Zacatecas bis Chihuah.

Rancos Irrw. v. Z. bis Durango stets gribt Rivera Pag. 1.

No. 2. von Mexico bis Durango

a, nach Rivera von Mexico bis Fresnillo Pag. 1.
b, von Zacatecas bis Durango, Rivera Pag. 1 (b) 1/3
c, von Querelajo bis Zalate. u. Fresnillo nach Lafora Pag. 53
d, von Mexico bis Zacatecas, nach Mascaro Pag. 7

Resultate für No. 2.

a, Zacatec. 1° 58,5' westl. v. Mexico (Rivera) — 147' Diff.
*) b, Zacatec. 3° 45,5' westl. v. Mexico (Mascaro) —
b, ~~Zacatec.~~ Durango 1° 20' westl. v. Zacat. (Rivera)
c, ~~Querelaro~~ Zacatecas 1° 33,5' westl. v. Querelaro (Lafora)

Nach Pidero: Chibuchao 1° 10' westl. v. Pasaraqu

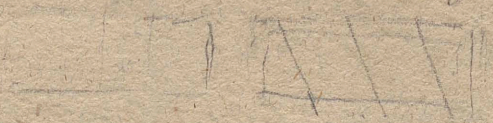
Pasaraqu 1° 20' westl. v. Zacatecas (20 v. Fluß

Also Chibuchao 2° 30' westl. v. Zacatecas

Nach Nascaro: Chibuchao 2° 3' westl. v. Zacatecas (Jos. Mendoza)

2° 57'

Differenz bei Argelt 0° 33' Nascaro mehr als Pidero



~~Mexico v. Zacat~~

Mexico v. Zacat 2° 30'
Pasaraqu v. Zacat 2° 5'
4° 35'

n. H. v. Humboldt gr. Geb.

Durch Rechnung gefunden nach Rivera, Santa Fe 53' westl. v. Chih.; nach Lafora 10' östlich; Diese Unterschied von 1° 3' rührt daher, Ojo Caliente folgt Lafora 35' weniger westl. von Chih. als Rivera; Paso u. Ojo Cal. folgen beide in einem Meridian.

Muerto folgt Lafora 16' östlicher v. Paso, Santa Fe 12' östlicher v. Muerto als Rivera. Demnach:

35'
0'
16'
12'
63' = 1° 3'

9 401
14 2
52 101

1° 58'
1° 20'
1° 10'
3
1° 31'
5° –

C1 901
87 5
52 101

Nach Antillon, Sonst Santa F. 101° (Madrid), Paso 102° 12', Chih. 101° 43', Mexico 96°

SFe v. Chihuahua

05 901
55 501

0° 53' westl. Rivera
0° 10' östl. Lafora
0° 45' Antillon
0° Constanzo
0° 15' v. Humboldt gr. Sonst

5 401
52 101
85 5

101 25
5 46
107 10

Durango

Chihuahua 1° 10' Durango
Dur. Florido 0° 52'

Mascaro
Chihuahua 2° 53' Zacatecas
Jiv. Florido 3° 22' Zacatecas
Durango 2° 12'

101 25
5 38
107 25

101 25
4 46
106 11

Zacatecas Jiv. 1° 58'
Durango 3° 45' Mascaro
Durango 2° 35' Otegza

Durango Zacatecas 1° 24' Jiv.
1° 57' Otegza
Mex. — Durango 1° 58' Jiv.
Mex. — Zac. 1° 20'
Zac. — Dur. 3° 18. — en lu de 4° 30. Otegza

Mex. — Zac. 3° 45' Mascaro
Zac. — Dur. 1 20 Jiv.
5° 5'

Zacatecas 1° 33'

Jiv.
Mex. — Durang. 3° 18'
Mex. — Chih. 1° 10
Dur. — S Fe 0 53
Chih. — S Fe 5° 21.

Querétaro — Zac. 3° 45' Mascaro
Mex. — Zac. 3° 45' Mascaro
Mex. — Chih. 2° 53 Mascaro
Mex. — Chih. 6° 48' Mascaro

4° 28 Jiv.

101 25
5
106 00

Es war zu spät in der Gelage um ein bemerkbares
vorzurücken, weshalb ich den Rest der Arbeit
170 für später natürlich und lieber noch einen genauen Gesch. Punkt
590 beider Reise-Routen (der Rivera und Mascaro) von
16 Zacatecas nach Chihuahua durchsetzte und in Vorrath, nämlich Rio Florido.

Die Haupt. Resultate der beiden Gelage sind:

| | Rivera | Oteiza Entfernung 37' von Zacat. | | | | | | H. v. Humboldt's gem. Ges. | |
|---|---|---|---|---|---|---|---|---|---|
| * Chihuahua | 1° 10' m. v. Durango | " | " | " | " | " | " | 0° 50' | |
| Durango | 1° 20' m. v. Zacat. | " | " | " | " | " | " | 2° 5' | |
| Chihuah. | 2° 30' m. v. Zacat. | " | " | 2° 53' | " | " | | 2° 55' | Die Unsicherheit |
| Rio Flor. | 2° 12' m. v. Zacat. | " | " | 3° 22' | " | " | | 3° 5' | |
| Rio Flor. | 0° 52 m. v. Durango | " | " | " | " | " | " | 0° 55 | |

105 55
10 25
4.00

9 / 114
101 12
12 41

Die Verfassung ist nur sehr angenehm
gewesen. Ich bin in der letzten Zeit
ganz ohne Fieber. Über die Ueberfahrung
über Zacatecas ist noch nur Conjectur
und hier nur sehr um 45' westl. od.
auf Fieber folgen würde Sie nach
Zacatecas ist nicht in der Hauptstadt
bei in Durango auf Chihuahua mehr

Ges. 10 10'
Ges. 94 – 5. 48'
Ges. 107. 10
Ges. 40

No. 1.

(A.) Von Zacatecas bis Durango nach Chihua Bag. 1.
(23°) — (24°25')

| Station | Rumb | Sinus | Cosinus | Leyna | Prod. d. Leynas = d. Sin. | Prod. d. Ley. in d. Cosin |
|---|---|---|---|---|---|---|
| Span. | Deutsch | | | | | |
| I. | NO¼N | N33°45'W | 0,555 | 0,831 | 13 | 7,215 | 10,803 |
| II. | NNO | N22°30'O | 0,382 | 0,923 | 5 | 1,910* | 4,615 |
| III. | ONO | N67°30'W | 0,923 | 0,382 | 8 | 7,384 | 3,056 |
| IV. | ONO. | N67°30'W | 0,923 | 0,382 | 10 | 9,230 | 3,820 |
| V. | NO¼O | N56°15'W | 0,548 | 0,836 | 8 | 4,384 | 6,688 |
| VI. | NO¼O | N56°15'W | 0,548 | 0,836 | 11 | 6,028 | 9,196 |
| VII. | NO | N45°W | 0,707 | 0,707 | 12 | 8,484 | 8,484 |
| | | | | | 67 | 44,635 | 46,662 |

No. 1 (A) α

Von Zacatecas bis Durango

| N. | O. |
|---|---|
| 7,215 | |
| 7,384 | |
| 9,230 | |
| 4,384 | 1,910 |
| 6,028 | |
| 8,484 | |
| 42,725 | 1,910 |
| 1,910 | 42,725 |
| 40,815 | 44,635 |
| Differ. | Summe |

Durango 24° 25'
Zacatecas 23
1° 25'
60
85'

24° 25'
23°
47° 25'
3 23° 42' 30"

24° — 1475,36
23° — 1410,27
64,09

46,662 . x = 85'

$x = \frac{85}{46,662}$

46,662 | 85000 | 1,8 bis 1,9
46662
39338
373329
24.2

40,815
1,9
367335
40815
77,5485 in Breite Grad

60 : 64 = 77,5 : x

$x = \frac{64 . 77,5}{60}$

77,5
6200
49600
48
16
12
40
36
40

88

82,60' — (liegt Durango westl. v. Zacatecas
= 1° 20,6')

28° 50
24° 26
4° 24
60
264

No. 1.

(B.) 164

(A.) Von Durango bis Chihuahua nach Rivera Pag. 1 u. —
(24° 26') — (28° 50')

| Station | Stamben Spurung | Stamben Distanz | Sinus | Cosinus | Legos | Prod. d. Sinus | Prod. d. Cosin | | |
|---|---|---|---|---|---|---|---|---|---|
| ~~I~~ | ~~NO~~ | ~~N45° W~~ | ~~0,707~~ | ~~0,707~~ | ~~12~~ | ~~8,484~~ | ~~8,484~~ | | |
| ~~II~~ | ~~NNE~~ | ~~N67°30' O~~ | ~~0,382~~ | ~~0,923~~ | | | | | |
| I. | N¼NE | N11°25' O | 0,195 | 0,980 | 0 | * | — | | |
| II. | NNE | N22°30' O | 0,382 | 0,923 | 6 | 2,292* | 5,538 | 5,065* | 12,238 |
| III. | NO | N45° O | 0,707 | 0,707 | 7 | 4,949* | 4,949 | 10,937* | 10,937 |
| IV. | ENE | N67°30' O | 0,923 | 0,382 | 8 | 7,384* | 3,056 | 16,318* | 6,753 |
| V. | NE¾N | N33°45' O | 0,556 | 0,831 | 7 | ~~3,846~~ | | | |
| VI. | NO | N45° W | 0,707 | 0,707 | 8 | 3,885* | 5,817 | 8,585* | 12,855 |
| VII. | ONO | N67°30' W | 0,923 | 0,382 | 7 | 6,461 | 2,674 | 14,278 | 5,909 |
| VIII. | NO | N45° W | 0,707 | 0,707 | 6 | 4,242 | 4,242 | 9,374 | 9,374 |
| * | | | | | | | | | |
| IX | NO | N45° W | 0,707 | 0,707 | 8 | 5,656 | 5,656 | 12,499 | 12,499 |
| XI | NO | N45° W | 0,707 | 0,707 | 5 | 3,535 | 3,535 | 7,812 | 7,812 |
| XII | ENE | N67°30' O | 0,923 | 0,382 | 10 | 9,230* | 3,820 | 20,398* | 8,442 |
| XIII | E¼NE | N78°45' O | ~~0,203~~ 0,979 | ~~0,979~~ 0,203 | 7 | ~~1,421~~ 6,853* | 1,421 | 15,145* | 3,140 |
| XIV | E¼NO | N78°45' W | ~~0,979~~ 0,979 | ~~0,203~~ 0,203 | 6 | 5,874 | 1,218 | 12,981 | 2,691 |
| XV | ONO | N67°30' W | 0,923 | 0,382 | 8 | 7,384 | 3,056 | 16,318 | 6,753 |
| XVI | O¼NO | N78°45' W | 0,979 | 0,203 | 10 | 9,790 | 2,030 | 21,635 | 4,486 |
| XVII | NO¼N | N33°45' W | 0,555 | 0,831 | 13 | 7,215 | 10,803 | 15,945 | 23,874 |
| XVIII | NO¼N | N33°45' W | 0,555 | 0,831 | 9 | 4,995 | 7,479 | 9,938 | 16,528 |
| XIX | O | W | 1,000 | — | 7 | 7,000 | — | 15,470 | — |
| XX | NO | N45° W | 0,707 | 0,707 | 9 | 6,363 | 6,363 | 14,062 | 14,062 |
| XXI | NNE | N22°30' O | 0,382 | 0,923 | 0 | * | — | | |
| XXII | NNE | N22°30' O | 0,382 | 0,923 | 10 | 3,820* | 9,230 | 8,442* | 20,398 |
| XXIII | NNE | N22°30' O | 0,382 | 0,923 | 10 | 3,820* | 9,230 | 8,442* | 20,398 |
| XXIV | NNE | N22°30' O | 0,382 | 0,923 | 8 | 3,056* | 7,384 | 6,753* | 16,318 |
| XXV | NNE | N22°30' O | 0,382 | 0,923 | 12 | 4,584* | 11,076 | 10,130* | 24,477 |
| XXVI | NO | N45° W | 0,707 | 0,707 | 8 | 5,656 | 5,656 | 12,499 | 12,499 |
| | | | | | 189 | 129,700 | 119,889 | 285,595 * | 264,942 |

119,889 . 221 = 264,954

129,7 . 221 = 286,637
*

No. 1 (A.) β.

Von Durango bis Chihahua

| Werth. | Ortg. |
|---|---|
| 5,636 | 2,292 |
| 6,461 | 4,949 |
| 4,242 | 7,384 |
| 5,636 | 3,885 |
| 3,535 | 9,230 |
| 5,874 | 6,853 |
| 7,384 | 3,820 |
| 9,790 | 3,820 |
| 7,215 | 3,056 |
| 4,995 | 4,584 |
| 7,000 | |
| 6,368 | |
| 5,656 | |
| 79,827 | 49,873 |
| 49,873 | 79,827 |
| 28,954 | 129,700 |
| Differ. | Summe |

Chihuah. — 28° 50'
Durango — 24° 25'
4° 25'
60
265

119,889 . x = 265'

$x = \frac{265}{119,889} = 2,21$ °/₀

119889) 265000 | 2,21 .. = 1 Legua
239778
252220
239778
124420
119889

28° 50'
24° 25'
53° 15'
3 26° 37' 30"

27° — 1673,81
26° — 1607,09
Mittl. Grad 66,72

28,954 Werth.
2,21
28954
57908
57908
63,98834

60 : 63,98834 = $\frac{63,98834 \cdot 66,72}{60}$ =

63,98834
66,72
127,97668
44791838
38393004
38393004
4269,3020448 | 70,115'...
42
69
60
93
60
330

Chihuahua liegt gegen Durango nach 70,115'
= 1° 10,115' oder 1° 10' 3"

63,988
77,548
41,536
125
2

2° 21,
2° 21' 30'

# No. 1.

(Pd.) Von Zacatecas (23°) bis Chihuahua (28°50') auf Mascaro Bog. 7.

| Station | Rumb | | Sinus | Cosinus | Bogen | Grad. d. Distanz in d. Sinus | Grad. d. Distanz in d. Cosin. | Die vorstehenden Grad. in Minuten d. Bogens 1 L = 2,15" | |
|---|---|---|---|---|---|---|---|---|---|
| | Strichen | Graden | | | | | | p. Sin. | p. Cos. |
| I. | N. | N. | — | 1,000 | 4 | — | 4,000 | — | 8,600 |
| II. | N. | N. | — | 1,000 | 6 | — | 6,000 | — | 12,900 |
| III. | NNO | N22°30'W | 0,382 | 0,923 | 5 | 1,910 | 4,615 | 4,106 | 9,922 |
| IV. | NO | N45°W | 0,707 | 0,707 | 5 | 3,535 | 3,535 | 7,600 | 7,600 |
| V. | N. | N. | — | 1,000 | 6 | — | 6,000 | — | 12,900 |
| VI. | NNO | N22°30'W | 0,382 | 0,923 | 8 | 3,056 | 7,384 | 6,570 | 15,875 |
| VII. | NO | N45°W | 0,707 | 0,707 | 12 | 8,484 | 8,484 | 18,240 | 18,240 |
| VIII. | ONO | N67°30'W | 0,923 | 0,382 | 14 | 12,922 | 5,348 | 27,782 | 11,498 |
| IX. | N | N. | — | 1,000 | 5 | — | 5,000 | — | 10,750 |
| X. | O | W | 1,000 | — | 10 | 10,000 | — | 21,500 | — |
| XI | ONO | N67°30'W | 0,923 | 0,382 | 14 | 12,922 | 5,348 | 27,782 | 11,498 |
| XII | NO | N45°W | 0,707 | 0,707 | 12 | 8,484 | 8,484 | 18,240 | 18,240 |
| XIII. | NNO | N22°30'W | 0,382 | 0,923 | 15 | 5,730 | 13,845 | 12,319 | 29,766 |
| XIV | NNO | N22°30'W | 0,382 | 0,923 | 12 | 4,584 | 11,076 | 9,855 | 23,813 |
| XV. | ONO | N67°30'W | 0,923 | 0,382 | 15 | 13,845 | 5,730 | 29,766 | 12,319 |
| XVI. | N. | N. | — | 1,000 | 16 | — | 16,000 | — | 34,400 |
| XVII. | NNE | N22°30'O | 0,382 | 0,923 | 6 | 2,292* | 5,538 | 4,927* | 11,906 |
| XVIII. | NNE | N22°30'O | 0,382 | 0,923 | 7 | 2,674* | 6,461 | 5,749* | 13,891 |
| XIX | NNE | N22°30'O | 0,382 | 0,923 | 19 | 7,258* | 17,537 | 15,664* | 37,704 |
| XX. | N. | N. | — | 1,000 | 28 | — | 28,000 | — | 60,200 |
| | | | | | 219 | 97,696 | ~~168,485~~ | ~~210,046~~ | |
| | | | | | | | 168,485 | 210,046 | 362,242* |

97,696 . 215 = 210,04640

168,485 . 215 = 362,242(*)

28° 50' hab 1797,69 Merid. Minuten von Aequator an.
23° — 1410,27
387,42

210,046 . 1,07 = 224,149

387,42 Meridian-Stich sind = 362,242 Minuten d. Breite-Grade

Mittel 1' der Breite = $\frac{387,42}{362,42}$ = 1,07' des Meridians; 1,07 ist also die Reduction-Zahl

Reductions-Tafel 1,07 P. Pontax.

| Werth d. Prod. in Meridian-Theile (Minuten) | | Summen z. Auftrag aus eig. Berg. | | |
|---|---|---|---|---|
| p. Jahr | p. Cosin | | | |
| — | 9,202 | — | 9,202 | |
| — | 13,803 | — | 23,005 | |
| 4,393 | 10,616 | 4,393 | 33,621 | xxx |
| 8,132 | 8,132 | 12,525 | 41,753 | xxx |
| — | 13,803 | — | 55,556 | xxx |
| 7,029 | 16,986 | 19,534 | 72,542 | xxx |
| 19,516 | 19,516 | 39,070 | 92,058 | xxx |
| 29,726 | 12,302 | 68,796 | 104,360 | xxx |
| — | 11,502 | — | 115,862 | xxx |
| | | | | xxx |
| 23,005 | — | 91,801 | — | xxx |
| 29,726 | 12,302 | 121,527 | 128,164 | xx |
| | | | | x |
| 20,506 | 20,506 | 142,033 | 148,670 | x |
| 13,181 | 31,849 | 155,214 | 180,519 | x |
| 10,544 | 25,485 | 165,758 | 206,004 | |
| 31,849 | 13,181 | 197,607 | 219,185 | |
| — | 36,808 | — | 255,993 | |
| 5,271* | 12,739 | 5,271* | 268,732 | |
| 6,151* | 14,863 | 11,422* | 283,595 | |
| 16,696* | 40,343 | 28,118* | 323,938 | |
| — | 64,414 | | 388,352 | |
| 225,725 | 388,852 | | | |
| | 3 | | | |

28,118* Ertr.
97,607 wirkl.

197,607 wirkl
28,118 Ertr
169,489 = 2° 49' wie 2° 53'

No. 1.

(Pd.) Von Zacatecas (23°) bis Chihuahua (28°50') nach Mascaro Pag. 7.

Reductions-Zahl 1,07 P. Pantex.

| Station | Name Frühere | Name Deutsche | Sinus | Cosinus | Lage | Prod. d. Distanz in d. Sinus | Prod. d. Distanz in d. Cosin | Hi vorstehend Prod. in Minuten d. Bd. Gr 1L = 2,15" p. Sin | p. Cosin | Werth d. Prod. in Meridian-Theile (Minuten) p. Sin | p. Cosin | Summen z. Auftrag aus einer Karte | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. | N. | N. | — | 1,000 | 4 | — | 4,000 | — | 8,600 | — | 9,202 | — | 9,202 |
| II. | N. | N. | — | 1,000 | 6 | — | 6,000 | — | 12,900 | — | 13,803 | — | 23,005 |
| III. | NNO | N22°30'W | 0,382 | 0,923 | 5 | 1,910 | 4,615 | 4,106 | 9,922 | 4,393 | 10,616 | 4,393 | 33,621 |
| IV. | NO | N45°W | 0,707 | 0,707 | 5 | 3,535 | 3,535 | 7,600 | 7,600 | 8,132 | 8,132 | 12,525 | 41,753 |
| V. | N. | N. | — | 1,000 | 6 | — | 6,000 | — | 12,900 | — | 13,803 | — | 55,556 |
| VI. | NNO | N22°30'W | 0,382 | 0,923 | 8 | 3,056 | 7,384 | 6,570 | 15,875 | 7,029 | 16,986 | 19,534 | 72,542 |
| VII. | NO | N45°W | 0,707 | 0,707 | 12 | 8,484 | 8,484 | 18,240 | 18,240 | 19,516 | 19,516 | 39,070 | 92,058 |
| VIII. | ONO | N67°30'W | 0,923 | 0,382 | 14 | 12,922 | 5,348 | 27,782 | 11,498 | 29,726 | 12,302 | 68,796 | 104,360 |
| IX. | N | N. | — | 1,000 | 5 | — | 5,000 | — | 10,750 | — | 11,502 | — | 115,862 |
| X. | O | W | 1,000 | — | 10 | 10,000 | — | 21,500 | — | 23,005 | — | 91,801 | — |
| XI | ONO | N67°30'W | 0,923 | 0,382 | 14 | 12,922 | 5,348 | 27,782 | 11,498 | 29,726 | 12,302 | 121,527 | 128,164 |
| XII | NO | N45°W | 0,707 | 0,707 | 12 | 8,484 | 8,484 | 18,240 | 18,240 | 20,506 | 20,506 | 142,033 | 148,670 |
| XIII. | NNO | N22°30'W | 0,382 | 0,923 | 15 | 5,730 | 13,845 | 12,319 | 29,766 | 13,181 | 31,849 | 155,214 | 180,519 |
| XIV | NNO | N22°30'W | 0,382 | 0,923 | 12 | 4,584 | 11,076 | 9,855 | 23,813 | 10,544 | 25,485 | 165,758 | 206,004 |
| XV. | ONO | N67°30'W | 0,923 | 0,382 | 15 | 13,845 | 5,730 | 29,766 | 12,319 | 31,849 | 13,181 | 197,607 | 219,185 |
| XVI. | N. | N. | — | 1,000 | 16 | — | 16,000 | — | 34,400 | — | 36,808 | — | 255,993 |
| XVII. | NNE | N22°30'O | 0,382 | 0,923 | 6 | 2,292* | 5,538 | 4,927* | 11,906 | 5,271* | 12,739 | 5,271* | 268,732 |
| XVIII. | NNE | N22°30'O | 0,382 | 0,923 | 7 | 2,674* | 6,461 | 5,749* | 13,891 | 6,151* | 14,863 | 11,422* | 283,595 |
| XIX | NNE | N22°30'O | 0,382 | 0,923 | 19 | 7,258* | 17,537 | 15,664* | 37,704 | 16,696* | 40,343 | 28,118* | 323,938 |
| XX. | N. | N. | — | 1,000 | 28 | — | 28,000 | — | 60,200 | — | 64,414 | | 388,352 |
| | | | | | | | | | | 225,725 | 388,852 | | |

zus 97,696 ~~168,485~~ ~~210,046~~ 36,242

168,485 210,046

97,696 . 215 = 210,04640

168,485 . 215 = 362,242 (*)

28° 50' hab 1797,69 Merid. Minuten von Chihuahua zu
23° — 1410,27
387,42

210,046 . 1,07 = 224,149

28,118* abz.
197,607 usw.

197,607 usw
28,118 abz
169,489 = 2° 49' inp 2°53'

387,42 Meridian-Theile sind = 362,242 Minuten d. Breiten-Grade

Mittel 1' der Breite = $\frac{387,42}{362,42}$ = 1,07 des Meridians; 1,07 ist also die Reductions-Zahl

Von Chihuahua nach Santa Fe (28° 50′; 36° 12′)

| Station | Namen Spricht | Namen Beatrek | Sinus | Cosinus | Distanz in Legnas | Prod. d. Dist. in d. Sinus | in d. Cosin | Rechte Prod. Inclination des zugehörigen Vor. Grades, die größte für d. Cos. | für d. Sin. |
|---|---|---|---|---|---|---|---|---|---|
| I. | | | | | | | | | |
| II. | O.NO | N67°30′W | 0,923 | 0,382 | 12 | 11,076 | 4,584 | 9,168 | 22,152 |
| III. | NE | N45 O | 0,707 | 0,707 | 7 | 4,949 | 4,949 | 9,898 | 9,898 |
| IV. | NO | N45 W | 0,707 | 0,707 | 8 | 5,656 | 5,656 | 11,312 | 11,312 |
| V. | NNO | N22°30′W | 0,382 | 0,923 | 8 | 3,056 | 7,384 | 14,768 | 6,112 |
| VI. | NNE | N22 30 O | 0,382 | 0,923 | 7 | 2,674 | 6,461 | 12,922 | 5,348 |
| VII. | NNO | N22 30′W | 0,382 | 0,923 | 12 | 4,584 | 11,076 | 22,152 | 9,168 |
| VIII. | NO | N45 W | 0,707 | 0,707 | 7 | 4,949 | 4,949 | 9,898 | 9,898 |
| IX. | NNO | N22°30′W | 0,382 | 0,923 | 8 | 3,056 | 7,384 | 14,768 | 6,112 |
| X. | N. | N. | — | ~~1,000~~ | 8 | — | 8,000 | 16,000 | — |
| XI. | NE | N45 O | 0,707 | 0,707 | 6 | 4,242 | 4,242 | 8,484 | 8,484 |
| XII. | N. | N. | — | 1,000 | 10 | — | 10,000 | 20,000 | — |
| XIII. | NO¼N | N33°45′W | 0,555 | 0,831 | 2 | 1,110 | 1,662 | 3,324 | 2,220 |
| XIV. | NO | N45 W | 0,707 | 0,707 | 5 | 3,535 | 3,535 | 7,070 | 7,070 |
| XV. | NO¼N | N33°45′W | 0,555 | 0,831 | 8 | 4,440 | 6,648 | 13,296 | 8,880 |
| XVI. | NO¼N | id. | id. | id. | id. | id. | id. | id | id |
| XVII. | NO | N45 W | 0,707 | 0,707 | 7 | 4,949 | 4,949 | 9,898 | 9,898 |
| XVIII. | NO¼O | N36°W | ~~0,836~~ 0,548 | ~~0,548~~ 0,836 | 6 | ~~5,016~~ 3,288 | ~~3,288~~ 5,016 | 10,032 | 6,576 |
| XIX | NNO | N22°30 O | 0,382 | 0,923 | 11 | 4,202 | 10,153 | 20,306 | 8,404 |
| XX. | id. | id. | id. | id. | 6 | 2,292 | 5,538 | 11,076 | 4,584 |
| XXI. | NNO | N22°30′W | 0,382 | 0,923 | 11 | 4,202 | 10,153 | 20,306 | 8,404 |
| XXII. | NNE | N22°30 O | id. | id | 8 | 3,056 | 7,384 | 14,768 | 6,112 |
| XXIII. | N¼O | N11°25′W | 0,195 | 0,980 | 12 | 2,340 | 11,760 | 23,520 | 4,680 |
| XXIV. | id | id. | id | id | id | id | id | id | id |
| XXV. | N¼NE | N11°25 O | 0,195 | 0,980 | 8 | 1,560 | 7,840 | 15,680 | 3,120 |
| XXVI. | N¼NO | id | id | id. | id. | id | id | id | id |
| XXVII. | NNE | N22°30 O | 0,382 | 0,923 | 10 | 3,820 | 9,230 | 18,460 | 7,640 |
| XXVIII. | N¼NE | N11°30 O | 0,195 | 0,980 | 11 | 2,145 | 10,780 | 21,560 | 4,290 |
| XXIX | ENE | N67°30 O | 0,923 | 0,382 | 9 | 8,307 | 3,438 | 6,876 | 16,614 |
| XXX. | E | O | — | 1,000 | 4 | — | 4,000 | 8,000 | — |

71,534
2,62
42
4 3308
12 3924
4 2308
55,72248 10
71,17

71 | 4,5
10 88
11 20
11 10

7040,18
7028,32
11,80
4,5

14,87
90
26 70
45

26

No. 1. (B)

Von Zacatecas bis Chihuahua

| Westl. | Ostl. |
|---|---|
| 1,910 | |
| 3,535 | |
| 3,056 | |
| 8,484 | |
| 12,922 | |
| 10,000 | |
| 12,922 | |
| 8,484 | |
| 5,730 | |
| 4,584 | |
| 13,845 | 2,292 |
| ~~4,076~~ | 2,674 |
| ~~4,770~~ | 7,258 |
| ~~16,000~~ | |
| 85472; | 12,224 |
| 12,224 | 85,472 |
| 73,248 | 97,696 |
| Differ. | Summe |

Chihuahua — 28° 50'
Zacatecas — 23°

50° 50'
60
350'

28° 50'
23°
51° 50'
3
25° 55'

162,385 : x = 350

$x = \frac{350}{162,385} = 2,15$

162,385 | 350 000 | 2,15
324 770
252 300
162 385
899 150

26° — 1607,09
25° — 1540,95
66,14

73,248
2,15
366240
73248
146496
157,48320

~~2° 37' 24"~~
~~2° 21' 30"~~
~~15' 30"~~

60 : 66,14 = 157,5 : x

$x = \frac{66,14 \cdot 157,5}{60} =$

66,14
157,5
33070
46298
33070
66,14
10417,0050 | 173,6' = 2° 53,6' liegt Chihuahua westl. von Zacatecas
60 | 6
44
42
21
18
37

Von Durango bis z. Rio Florido

| W. | O. |
|---|---|
| 5,636 | 2,292 |
| 6,461 | 4,949 |
| 4,242 | 7,384 |
| 5,556 | 3,885 |
| 3,535 | 9,230 |
| 5,874 | 6,853 |
| 7,384 | |
| 9,790 | 34,593 |
| 7,215 | |
| 55,813 | |
| 34,593 | |
| 21,220 Differ. | |

21,220
2,21
21220
42440
42440
46,89620

60 : 66,72 = 46,89 : x

x = 46,89 · 66,72

93 78
28 134
28 134
3104 114
28 134
3123,8 114

60) 300
12
12
08

* 52' Rio Florido westl. v. Durango

1° 20' Durango westl. v. Zacat.

* H. v. Humboldt 55'

Nay Rivera: 2° 12' Rio F. westl. v. Zacat.

Von Zacatecas bis z. Rio Florido.

| W. | O. |
|---|---|
| 1,910 | |
| 3,535 | |
| 3,056 | |
| 8,484 | |
| 12,922 | |
| 10,000 | |
| 12,922 | |
| 8,484 | |
| 8,730 | |
| 4,564 | |
| 10,845 | |
| 85,472 | |

85,472
2,15
427360
85472
170944
183,76480

60 : 66 = 183,7 : x

x = 66 · 183,7 / 60 =

183,7
66
11022
11022
12124,2

60) 12
12
012
12
04

202,0 — = 3° 22' Rio Florido westl. v. Zacatecas

18
22

Nay Marcado

lesen Sie dies lieber Herr
Friesen. alte
Quitaro 20° 36′ 39.″

Querotaro ist ein sehr gut bestimmter Punkt
und liegt unter 20° 36′ 39″ Nordlicher Breite und 101° 30′ 30″ *
(6h 30′ 2) der Länge. ganz so wie ich es schon in vorigen Sommer angegeben hatte

Ich verlasse da ich in meiner Corrections formel den Fehler zum Nenner gemacht hatte, vielleicht auch die Bestimmung des Polarkreises einsehen. Es ist ganz der Gegenstand
und mit $\Delta \varphi = \frac{\sin t}{\tang \delta - \cos t . \tang \varphi}$ so ist richtig
auch im meiner Entwicklung $\Delta \varphi = 0{,}029 \, \Delta t$. das ist 1″ Fehler in Stunden winkel bringt 0″,03 Änderung in Breite – 1 Stunde in Zeit machen 0,436 Änderung in Breite so daß wenn ich
Ihnen zwei Minuten in Zeit gefehlt hätte – die Breite dadurch
26″ unrichtig wäre.

So ist der nördliche Frachtweg Salamanca nach Querotaro zu beziehen
Querotaro ist von Salamanca fast 12 geographische Meilen entfernt, man kann also
von einem Punkte den andern nicht sehen und war vorzüglich da so genaue Richtung
erzielen.

So würde ich Salamanca vorläufig 20° 29′ setzen, dann sehen wir Querotaro
Salamanca geben würde und dann von der Entfernung einige Mittelpunkte
aus beyden zu Mittel nehmen. daß die Mexicaner bequeme Winde in der Richtung nicht
fehlen können – ergiebt sich daraus daß der Grenzalte Salamanca zu Maidcen
von Guanajuato gab, hatte daß erstere Ost. von letzteren liegen sollte 10° bis 12° fehler in der Richtung (Entfernung 8 Meilen 15 auf 1°)
konnte die Verwirrung.

Nach dieser Position klärt sich die Sache mit Tula, und auch der Umstand daß
von Salamanca bis Querotaro ~~liegen~~ 2/3 der Distanz von Mexico bis Salamanca
ungefähr auch. Salamanca scheint mir daß mit Querotaro auf ein Parallel
gesetzt werden zu müssen zu liegen. die Differenzen zwischen den Angaben der
Entfernung von Guan: nach Salam: gegen Querotaro mit 10′ bezogen
Mit jeder Minute zu berechnen. Otto

Pedro d. Rivera
Pag. 2.

Paso del Norte 32° 9'

171

# Von Chihuahua nach Santa Fe

(36° 12' − 28° 50' = 7° 22')

| Stationen | Rumbe Spanisch | Rumbe Deutsch | Sinus | Cosinus | Distanz in Leguas | Prod. d. Distanz in d. Sinus | Prod. d. Distanz in d. Cosin | Die vorstehenden Prod. in Minuten der Br.; 1 Leguas = 2° Prod. d. Sin. | Prod. d. Cos. |
|---|---|---|---|---|---|---|---|---|---|
| I. | | | | | | | | | |
| II. | ONO | N67°30'W | 0,923 | 0,382 | 12 | 11,076 | 4,584 | 22,152 | 9,168 |
| III. | NE | N45°O | 0,707 | 0,707 | 7 | 4,949* | 4,949* | 9,898* | 9,898 |
| IV. | NO | N45°W | id. | id. | 8 | 5,656 | 5,656 | 11,312 | 11,312 |
| V. | NNO | N22°30'W | 0,382 | 0,923 | 8 | 3,056 | 7,384 | 6,112 | 14,768 |
| VI. | NNE | N22°30'O | id. | id. | 7 | 2,674* | 6,461* | 5,348* | 12,922 |
| VII. | NNO | N22°30'W | 0,382 | 0,923 | 12 | 4,584 | 11,076 | 9,168 | 22,152 |
| VIII. | NO | N45°W | 0,707 | 0,707 | 7 | 4,949 | 4,949 | 9,898 | 9,898 |
| IX. | NNO | N22°30'W | 0,382 | 0,923 | 8 | 3,056 | 7,384 | 6,112 | 14,768 |
| X. | N. | N. | — | 1,000 | 8 | — | 8,000 | — | 16,000 |
| XI. | NE | N45°O | 0,707 | 0,707 | 6 | 4,242* | 4,242* | 8,484* | 8,484 |
| XII. | N. | N. | — | 1,000 | 10 | — | 10,000 | — | 20,000 |
| XIII. | NO¼N | N33°45'W | 0,555 | 0,831 | 2 | 1,110 | 1,662 | 2,220 | 3,324 |
| XIV. | NO | N45°W | 0,707 | 0,707 | 5 | 3,535 | 3,535 | 7,070 | 7,070 |
| XV. | NO¼N | N33°45'W | 0,555 | 0,831 | 8 | 4,440 | 6,648 | 8,880 | 13,296 |
| XVI. | id. | id. | id. | id. | 8 | id. | id. | id. | id. |
| XVII. | NO | N45°W | 0,707 | 0,707 | 7 | 4,949 | 4,949 | 9,898 | 9,898 |
| XVIII. | NO¼O | N36°15'W | 0,548 | 0,836 | 6 | 3,288 | 5,016 | 6,576 | 10,032 |
| XIX. | NNE | N22°30'O | 0,382 | 0,923 | 11 | 4,202* | 10,153* | 8,404* | 20,306 |
| XX. | id. | id. | id. | id. | 6 | 2,292* | 5,538* | 4,584* | 11,076 |
| XXI. | NNO | N22°30'W | 0,382 | 0,923 | 11 | 4,202 | 10,153 | 8,404 | 20,306 |
| XXII. | NNE | N22°30'O | id. | id. | 8 | 3,056* | 7,384* | 6,112* | 14,768 |
| XXIII. | N¼NO | N11°15'W | 0,195 | 0,980 | 12 | 2,340 | 11,760 | 4,680 | 23,520 |
| XXIV. | id. | id. | id. | id. | 12 | id. | id. | id. | id. |
| XXV. | N¼NE | N11°15'O | 0,195 | 0,980 | 8 | 1,560* | 7,840* | 3,120* | 15,680 |
| XXVI. | id. | id. | id. | id. | 8 | id.* | id.* | id.* | id. |
| XXVII. | NNE | N22°30'O | 0,382 | 0,923 | 10 | 3,820* | 9,230* | 7,640* | 18,460 |
| XXVIII. | N¼NE | N11°15'O | 0,195 | 0,980 | 11 | 2,145* | 10,780* | 4,290* | 21,560 |
| XXIX. | ENE | N67°30'O | 0,923 | 0,382 | 9 | 8,307* | 3,438* | 16,614* | 6,876 |
| XXX. | E | O | 1,000 | — | 4 | 4,000* | — | 8,000* | — |
| | | | | | 239 Leguas | 199,019 | | | |

Leguas

Σ 345,542
13,296
23,520
15,680
398,038
3 199,019
= der Summe v. d. Prod. in d. Cosinus.

Σ 345,542 < 7° 22' d. 442"
3 172,771

Seine Brod. in d. Distanzen

| Westl. | Ostl. |
|---|---|
| 1,076 | 4,949 |
| 6,656 | 2,674 |
| 3,056 | 4,242 |
| 4,584 | 4,202 |
| 4,949 | 2,292 |
| 3,056 | 3,056 |
| 1,110 | 1,560 |
| * 35,535 | 1,560 |
| 4,440 | 3,820 |
| 4,440 | 2,145 |
| 4,949 | 8,307 |
| 3,288 | 4,000 |
| 4,202 | |
| 2,340 | |
| 2,340 | |
| 66,021 | 42,807 |

66,021 W
42,807 O
23,214 Differ., mittlere Sonne F. westl. v. Chuts.

Multiplicirt man diese 23,214 durch 2,22 = den Werth Einer Leg. in Minuten der Br. Grade, so erhält man 51,535' für den Stand. westl. des S. F.

64,021
42,807
21,214
2,22
42428
42428
42428
47,095 08

23,214
2,22
46428
46428
46428
51,535 08

36° 12'
18° 50'
65° 2'
2 32° 31'

Der 32° 31' beträgt in Br. Kreis (Min) 70,42

32° 30' — 2052,35'
31° 30' — 1981,93
70,42

60 : 70,42 = 51,535 : x
x = 60,5' oder 1°

2292
5,655
6,363
3,870
18,131
218
146048
18131
3952558

10' [illegible]

10'

60 : 40 = 39,5 : x

27,65
24
36

46,1

39,5
395
27,65
24
36

46,1

60

35
16
51

51
19

50
51

35
16
51
60
12

Legnai

$199 \cdot x = 442'$

$x = \frac{442'}{199} = 2,221'\ldots$

$$\begin{array}{r|l} 199 & 442' \quad 2,221'\ldots \\ & 398 \\ \hline & 440 \\ & 398 \\ \hline & 420 \\ & 398 \\ \hline & 220 \end{array}$$

Die vorstehenden Brod. in Minuten d. Br. Grad; 1 Leg. = 2,221 Stb.

| Z. Fin. | Z. Ofin. |
|---|---|
| 24,598 | 10,176 |
| 10,986* | 10,986 |
| 12,556 | 12,556 |
| 6,784 | 16,492 |
| 5,936* | 14,948 |
| 10,176 | 24,588 |
| 10,986 | 10,986 |
| 6,784 | 16,392 |
| —— | 17,760 |
| 9,417* | 9,417 |
| —— | 22,000 |
| 2,464 | 3,089 |
| 7,847 | 7,847 |
| 9,756 | 14,758 |
| 9,756 | ~~9,756~~ 14,758 |
| 10,986 | 10,986 |
| 7,299 | 11,135 |
| 9,328* | 22,539 |
| 5,088* | 12,294 |
| 9,328 | 22,539 |
| 6,784* | 16,392 |
| 5,194 | 26,107 |
| 5,194 | 26,107 |
| 3,463* | 17,404 |
| 3,463* | 17,404 |
| 8,460* | 20,490 |
| 4,761* | 23,931 |
| 18,441* | 7,662 |
| 8,880* | —— |

174

175

## Lafora

Von Chih. bis zum Presidio del Paso

| W. | O. |
|---|---|
| 3,656 | 1,365 |
| 7,070 | 5,636 |
| 4,584 | 3,056 |
| 1,560 | 1,755 |
| 1,755 | |
| 20,625 | 11,832 |
| 11,832 | |
| 8,793 Spil. mah. | |

8,793
213
26379
8793
17586
18,72909

93,182 | 199,000 / 188364 | 2,13
125360
93182
371780
279546

$\frac{199}{93,182} = \frac{199}{93,182} = 2,13 \ldots$

8,793 . 2,13 = 18,729

Mittl. Grad
30° 30'
29° 30'

60 : = 18,729 : x

mah. $x = \frac{18,729}{60} =$

Von Presid. bis Santa Fe

| W. | O. |
|---|---|
| 2,292 | 7,070 |
| 5,656 | 8,484 |
| 6,363 | 9,191 |
| 3,820 | 5,480 |
| 18,131 | 30,225 |
| 38,756 | 42,037 |

30,225
18,131
12,094 mah. Spil.

$\frac{243}{116,892} = 2,08$

12,094 . 2,08 = 25,155

116,892 | 243,000 / 233784 | 2,08
921600
935136

12,094
2,08
96752
24188
25,15552

60 : = 25,155 : x

mah. $x = \frac{25,155}{60} =$

Mittl. Grad
34° 10'
33° 10'

Seins-Grade in d. Distanz

| Westl. | Östl. | |
|---|---|---|
| 5,636 | 1,365 | von Chihuahua |
| 7,070 | 3,636 | |
| 4,584 | 3,056 | |
| 1,360 | 1,755 | |
| 1,755 | | |
| 2,292 | 7,070 | bis z. Presid. del Paso |
| 5,636 | 8,484 | |
| 6,363 | 9,191 | |
| 3,820 | 5,480 | |
| 38,756 | 42,057 | bis Santa Fe |

42,057 O.
38,756 W.
3,301 Differ. Östl. also Santa Fe östl. von Chih., da nach der Riss des Dr. Pedro d. Rivera Santa Fe um 21,634 westl. v. Chih. liegt.

1° nach dieser Angabe —
oder 60,5°

| W. | O. |
|---|---|
| 5,636 | 1,365 |
| 7,070 | 3,636 |
| 4,384 | 3,036 |
| 1,360 | 1,755 |
| 1,755 | |
| 20,625 | 11,832 |
| 11,832 | |
| 8,793 | |

8,793
218
70344
8793
17586
191,6874

Cr: 70 = 19 :
70
1330
12
18
10
40

/ 22,16

| W. | O. |
|---|---|
| 5,636 | 1,365 |
| 7,070 | 3,636 |
| 4,384 | 3,036 |
| 1,360 | 1,755 |
| 1,755 | |
| 20,625 | 11,832 |
| 11,832 | |
| 8,793 | |
| 218 | |
| 70344 | |
| 8793 | |
| 17586 | |
| 191,6874 | |

Muestra 46 n. C.
Paso 22,16
Muestra nueva 23,34

~~Cr: 70~~

Cr: 70 = 19 : x
70
1334
1
4

/ 22,16

Nicolas d. Lafora

## Von Chihuahua bis zu Presidio del Paso del Norte.

(Leingt. Blatt)

| Stations | Rumber Points | Degrees | Sinus | Cosinus | Distance in Leagues | Prod. d. Distanz d. Sinus | Prod. d. Dist. d. Cosin | Die vorstehenden Prod. in eine der Vor. Gr. 1 Leagues = 2,18. zu Sin. | zu Cosin |
|---|---|---|---|---|---|---|---|---|---|
| I. | N¼NE | N11°15'O | 0,195 | 0,980 | 7 | 1,365* | 6,860 | | |
| II. | N | N | — | 1,000 | 8 | — | 8,000 | | |
| III. | NE | N45°O | 0,707 | 0,707 | 8 | 5,656* | 5,656 | | |
| IV. | NO | N45°W | 0,707 | 0,707 | 8 | 5,656 | 5,656 | | |
| V. | NO | N45°W | 0,707 | 0,707 | 10 | 7,070 | 7,070 | | |
| VI. | NNO | N22°30'W | 0,382 | 0,923 | 12 | 4,584 | 11,076 | | |
| VII. | N¼NO | N11°15'W | 0,195 | 0,980 | 8 | 1,560 | 7,840 | | |
| VIII. | N¼NO | N11°15'W | 0,195 | 0,980 | 9 | 1,755 | 8,820 | | |
| IX. | NNE | N22°30'O | 0,382 | 0,923 | 8 | 3,056* | 7,384 | | |
| X. | N¼NE | N11°15'O | 0,195 | 0,980 | 9 | 1,755* | 8,820 | | |
| XI. | N | N | — | 1,000 | 11 | — | 11,000 | | |
| XII. | N | N | — | 1,000 | 5 | — | 5,000 | | |
| | | | | | 103 | | 93,182 | | |

### Seg. 6. J. Presidio del Paso bis Santa Fe

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| I. | NNO | N22°30'W | 0,382 | 0,923 | 6 | 2,292 | 5,538 | | |
| II. | N | N | — | 1,000 | 6 | — | 6,000 | | |
| III. | NO | N45°W | 0,707 | 0,707 | 8 | 5,656 | 5,656 | | |
| IV. | NO | N45°W | 0,707 | 0,707 | 9 | 6,363 | 6,363 | | |
| V. | NNO | N22°30'W | 0,382 | 0,923 | 10 | 3,820 | 9,230 | | |
| VI. | N | N | — | 1,000 | 14 | — | 14,000 | | |
| VII. | NE | N45°O | 0,707 | 0,707 | 10 | 7,070* | 7,070 | | |
| VIII. | NE | N45°O | 0,707 | 0,707 | 12 | 8,484* | 8,484 | | |
| IX. | NE | N45°O | 0,707 | 0,707 | 13 | 9,191* | 9,191 | | |
| X. | N | N. | — | 1,000 | 14 | — | 14,000 | | |
| XI. | N. | N. | — | 1,000 | 10 | — | 10,000 | | |
| XII. | N. | N. | — | 1,000 | 5 | — | 5,000 | | |
| XIII | N. | N. | — | 1,000 | 8 | — | 8,000 | | |
| XIV. | SE. | S36°E | 0,548 | 0,836 | 10 | 5,480* | 8,360* | | |
| | | | | | 135 | | 116,892 | | |

201,714 . x = 442.'

$x = \frac{442}{201,714} = 2,18^{6} = 1$ Legua.

| | |
|---|---|
| 135 | 116,892 |
| 103 | 93,182 |
| 238 | 210,074 |
| | 8,360 |
| | 201,714 |

201,714 | 442000 / 2,18...
403428
385720
201714
184006,00

188