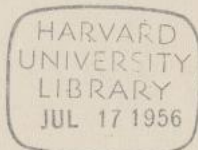


KG
11365
931

Computation Book No. 2. ^{ESK}
Beginning at page 65
The earlier pages relate
to Jaramidophenol work.

KG 11365,931

KQ 113.65, 937



Friday Feb. 11, 1916

I went to the Dorchester Pottery Works and obtained from them two porous pots (flanged) at 50¢ apiece. One is more porous than the other. The more porous pot holds about 1100 cc.; the less porous pot holds about 1200 cc.

Monday Feb. 21, 1916

The two porous cups were cleaned and then were partly filled with concentrated H_2SO_4 so that the pores would be filled with the free acid rather than ^{with} the nitrobenzene mixture.

The porous cups were set into battery jars which were filled with about 1500 cc 60% H_2SO_4 each.

(The H_2SO_4 had Sp. Gr. of 1.500) Inside the cups was a mixture of 500 cc. 85% H_2SO_4 (Sp. Gr. 1.790) and 60 cc nitrobenzene, each. Into each porous cup was put a carbon electrode of $2\frac{1}{2}$ inch diameter.

The resistance of the two cells together in series was 72 ohms.

Tuesday Feb. 22, 1916

Experiment 1.

With solutions as before but using
Eimer & Amant $4\frac{1}{2} \times 11$ in. porous cup. Carbon
cathode $2\frac{1}{2} \times 5$ in. Lead anode.

Started 11.30

Kilowatt Hour Reading II 5232

" " " I 5228.

" " Used 4

Amperes

Resistance in series

Voltage

Resistance of cell

Resistance for set on 7th

8.2
~~11.5~~
17.5 ohms

1.5 ohms

Time	Amps	Remarks.
11.30	8.2	
12.00	8.5	
1.50	---	Resistance started to smoke. ∴ shut off. Liquid inside porous cup taken out and put into a bottle. It was dark in color (grayish blue) and contained some solid matter. The porous cup was washed with water and put in a pail of water.

The result was very dark so as to make the hope
of purifying useless.

Thursday March 30, 1916

The larger glass jars hold 7.5 l liquid
when electrodes & porous cell are in it.

Thursday April 13, 1916

Experiment 2.

Large glass jar filled with $7\frac{1}{2}$ liters H_2SO_4
(Sp. gr. 1.5). Porous cup filled with 750 cc.
 H_2SO_4 (Sp. gr. 1.740) + 90 cc. nitrobenzene
Carbon electrode from National Carbon Co.

Started 10.45 Amp. 8.50

Stopped 6.00 P.M.

Time of run $19\frac{1}{4}$ hours.

or 173 amp. hours.

Product deep blue in color.

Monday April 17, 1916

Experiment 3

The solutions the same as before as to concentrations. The liquid in the outer jar identical in both cases.

Started 1 o'clock P.M. Amp. $12 \pm$

Color light blue
after 5 hours.

Stopped 6 P.M. 4/18/16 Amp 13

Solution emptied out of porous cell and the cell left to wash out under water. The solution light gray in color containing small crystalline flakes and larger lumps of gray material. Very little dye stuff. The carbon electrode was coated with a heavy light gray or white mass of crystals which I scraped off.

Time of run 29 hours
or 562.5 amp. hours

Thursday April 20.

Filtered the pasty p-aminophenylsulphate & clay-platted. Product while still slightly damp with H_2SO_4 = 53.5 gms. Very light gray in color.

Do

April 26, 1916 Wednesday.

Dissolved in 250 cc water & filtered.

April 29, 1917 Saturday

Solution had turned blue. Cooled with ice and saturated with HCl gas. After standing 2 hours filtered. Prod. light gray. Clay platted. 5 + gms product

Wednesday April 19, 1916

I filtered off the *p*-aminophenol sulphate from Experiment 3.

Experiment 4.

Mixed solution as before except used only 80 cc nitrobenzene.

Reduction was started 10.30 P.M. Amp. 12

Reduction stopped 4.30 P.M.

Time of run 18 hours

or 216 amp. hours.

Little dye but many chunks of heavy material

Experiment No. 5.

April 20, 1916. Thursday.

Inner cup filled to within $1\frac{1}{2}$ inch of top with mixture of sulphuric acid conc. and 400 cc nitrobenzene. Platinum electrode in inner cup. Rest as in preceding experiments.

Started 10.45

Amp. 5.5

Experiment no. 6.

Wednesday April 26, 1916

Inner solution

340 cc. H_2SO_4 sp. gr. 1.84
 80 cc $\leftrightarrow NO_2$
 10 cc H_2O

Outer Sol. Commercial conc. H_2SO_4 mixed with a little water.

Anode Lead

Cathode Carbon

 $I_A = I_C = 6$ amp per 100 sq. cm. about.

Amp. 14.4.

Voltage ~~70.4~~ 74.0

Start Kilowatt Hours 5656.5

End " " 5692 Total 35.5 kilowatt hours

Start 5.36 P.M.

End 2.40 P.M. Thursday April 27, 1916

Solution contained much white solid. No dye.

Time of run 21 hours

Saturday April 29, 1916

The solution contained some yellowish heavy solid and much large crystals of p-aminophenyl sulfate.

The top was completely covered. Filtered and clay plated. Product yellowish gray. Wt. crude product 37 gms.

Sunday April 30, 1916

Dissolved product in 225 cc water. Tried to ppt with HCl gas but no ppt.

Experiment No. 7.

Monday May 1, 1916

Made up solutions as in Experiment No. 6.

Started 11 o'clock PM

Stopped 6 o'clock PM.

Turned out to cool + no crystals formed.

Experiment No. 8

May 8, 1916 Monday

Anode liquor: Conc. commercial H_2SO_4 Cathode liquor: 60 cc. conc HNO_3 + 105 cc C.P. H_2SO_4

Water until slight emulsion then a few drops alcohol.

Porous pot saturated with conc. acid.

Anode = Cathode = 50 sq. cm. platinum foil.

 $I_A = I_C = 3.5$ amperes.

Voltage 24

Voltage across cell = 6 volts

Started 12 P.M.

Wires smoked slightly.

3 P.M.

Top of cathode liquor solid.

Stopped 6 P.M.

Whole mass thick & very dark

Turned out into a beaker to cool.

Time of run 18 hours.

May 10, 1916. Wednesday

Filtered sol & clay plated twice. Much of dye gotten rid of.

May 13, 1916 Saturday

Weighed yield after clay plating = 29.5 gms.

Dissolved 14.75 gm in alcohol boiling hot and filtered off the p-aminosulphonic acid. Cooled filtrate & filtered. A good deal redissolved but on clay plating got $3\frac{1}{2}$ gms product. Rest will go over with next experiment.

A. success.

Experiment No. 9.May 10, 1916 Wednesday

Mixed up the cathode liquor with 100 cc
 $\text{OM}_2 + 100 \text{ cc } \text{H}_2\text{SO}_4$. Added a few drops^{a.c.} of water.
 Put 180 cc in cell.

Anode liquor the same - (have saved it)

Rest of the apparatus the same.

Started 9 P.M. 3.4 amps (24 volts on switch board)

Kilowatt hour reading 5777

Stopped 10 P.M. May 11, 1916 Thursday

Time of run 25 hours.

Poured the solution into a beaker. Dark blue

May 13, 1916 Saturday.

Solution had solidified to a mass thick enough
 to turn up side down without falling out.

Nitrobenzene had collected on the surface which
 measured 25 cc. So that only ⁶⁵25 cc nitrobenzene
 used.

May 15. Monday

The clay plate with the pumice phenol was deliquescent
 & I put it on a second set of plates. Turned light gray.

Experiment 10Monday May 15, 1916

Anode liquor same as before but a little more dilute
Cathode liquor 65 cc KMnO_4 in 100 cc H_2SO_4 conc.

Anode 2 carbon bars

Cathode 50 sq. cm. surface of Pb.

Amp. 3.

Started 8.30 P.M.

Kilowatt read 5805 at start

Stopped 7.00 A.M.

Because carbons were eaten entirely off.

Tuesday May 16, 1916

Experiment 11.

Cathode solution 60 cc KMnO_4 , 350 cc H_2SO_4
+ 20 cc H_2O

Anode lead Cathode carbon. (well brushed)

Anode solution Equal parts of H_2SO_4 + H_2O

Amperage 9.

Started with 5.00 PM.

Stopped 4.00 A.M.

No p-aminophenol separated out

Wednesday, May 17, 1916

Experiment 12

Anode liquor = commercial H_2SO_4

Cathode " = 65 cc $\hookrightarrow NO_2$ + 105 cc H_2SO_4
+ water + alcohol

Platinum cathodes + anode

Started 8.45 Amp. 2.5
9.00 Amp 3.0

Stopped 11.3 P.M. May 18, 1916 26.45 hours

Solution so thick that electrode was hard to get out for it had to be loosened for the bottom
Friday May 19, 1916

Pounded off 3 cc. $\hookrightarrow NO_2$ from the top of the solidified mass.

Thursday May 18, 1916

Experiment 13

Solutions etc. same as in Experiment 12.
Amp. 3.

Started 11.30 P.M.

At 4 P.M. the mass began to solidify.

Stopped 9.30 P.M.

Monday May 22, 1916

Experiment 14.

Same as in Experiment 13.

Started 8.15 A.M.

Wednesday June 21, 1916

Experiment 15.

Cathode Sol. 300 cc NO_2 , 600 cc H_2SO_4
75 cc H_2O

Anode Sol. $\text{H}_2\text{SO}_4 : \text{H}_2\text{O} = 1:1$

Elect. Platinum.

Amp. 10-11

Start Thurs. June 22, 1916 - 7:45 A.M.

Stopped ^{Friday} Wed. June 23, 1916 - 7:45 A.M.

Recovered 150 cc NO_2 so only 150 cc. need
be counted.

Filtered through glass wool and dissolved
in alcohol at boiling temperature and filtered
hot. Cooled and filtered again. Clay. ~~to~~
Plated the crystals.

Friday June 23, 1916

Experiment 16

Everything the same as in experiment 15

Started 8.00 A.M.

Stopped 7.30 AM Sat. June 24, 1916

Recovered 105 gms. of $\text{C}_2\text{H}_2\text{NO}_2$

Purified as in Experiment 15

Wednesday June 28, 1916

Experiment 17

Everything the same as in exp. 15 except used new cells. They disintegrated so experiment spoiled.

Experiment 18.

Everything the same as in Exp. 16 using original cell.

Started 9.00 P.M.

Stopped 6.30 A.M. Friday

Friday June 30, 1916

Experiment 18

Same as in Experiment 17 except used only
250 cc. CO_2

Started 7.30 P.M.

Stopped 7.00 A.M. Sunday

Wednesday July 5, 1916

Experiment 19.

Same as before

Started @ 9.30 A.M., Amp 12

9.10 A.M. July 6 Amp 6

Thursday July 13, 1916

Experiment 20

Same as before

Started 4.30 P.M. Amp. 11.

Stopped 12.00 P.M. July 14.

Monday July 24, 1916

Experiment 21

Same as before

Started 1.45 PM

Amf 11

Stopped 9.00 PM. July 25

Thursday July 27, 1916
Experiment 22

Same as before
Started 12.45 P.M. Amp 12
Stopped 10.45 P.M. July 28

Tuesday August 15, 1916

Experiment 23

Solution. Anode con. H_2SO_4 diluted $\frac{1}{2}$ with H_2O

Cathode 225 cc OMe & rest of cup

filled with con. H_2SO_4

Porous jars 2 of Alundum ware. 6×4

Electrode of platinum

Amps. 10, Volts at cells 9 each, Volts of whole 50.

Start 10.45 \pm A.M.

Stopped 9.15 A.M. Thursday Aug 17, 1916

Wednesday August 23, 1916

Experiment 24

Solutions as before

Small cylindrical cathodes washed in HNO_3
E + A cup.

Hwp. 9 to 10

Started 12.30 P.M.

Stopped 7. P.M. Aug 24, 1916

Monday Sept. 18, 1916

Experiment 25

Anode Sol. C.P. H_2SO_4 : H_2O = 1:1

Cathode Sol. 750 cc. H_2SO_4 C.P. 125 cc. $\text{C}_2\text{H}_5\text{NO}_2$
10 cc. alcohol 50 cc H_2O

Amp. 9

Started 10.00 P.M.

I 40400

Book 4

Pg. 77.

P = 2.79 22 = 80

-10

<i>Zeus</i>	+0.38	+0.48	10.34	1.63 [✓]	1.62	1.52
"	+0.83	+1.04	10.32	1.61 [✓]	1.59	1.49
<i>Jupiter</i>	-0.53	-0.66	6.97	-1.74 [✓]	-1.73	-1.83
"	-0.09	-0.11	6.99	-1.72 [✓]	-1.71	-1.82
"	+0.24	+0.30	6.89	(-1.82)	-1.82	(-1.82)
"	+0.25	+0.31	6.90	-1.81 [✓]	-1.81	-1.91
"	+0.66	+0.82	6.89	-1.82 [✓]	-1.82	-1.92
<i>Saturn</i>	+0.11	+0.14	9.98	+1.27 [✓]	+1.28	1.18
"	+0.58	+0.72	9.98	(+1.27)	+1.28	1.18
"	+0.50	+0.62	9.86	+1.15 [✓]	+1.15	1.05
"	+0.95	+1.19	9.94	+1.23 [✓]	+1.23	1.13

440
-1.88
37
-2.45

}

I 40453

Book 4

Pg. 78

P = 2.98 22 = .67

-9

<i>Jupiter</i>	-0.79	-1.18	7.52	-1.19 [✓]	-1.30	-1.39
"	-0.62	-0.93	7.23	-1.48 [✓]	-1.61	-1.70
"	-0.29	-0.43	7.20	-1.51 [✓]	-1.64	-1.73
"	+0.09	+0.13	7.23	-1.48 [✓]	-1.62	-1.71
"	+0.37	+0.55	7.14	-1.57 [✓]	-1.71	-1.80
"	+0.75	+1.12	7.19	-1.52 [✓]	-1.68	-1.77
<i>Saturn</i>	-0.36	-0.54	9.86	+1.15 [✓]	+1.04	0.95
"	+0.17	+0.25	10.09	+1.38 [✓]	+1.25	1.16
"	+0.57	+0.85 [✓]	10.15 ²	+1.44 ¹	+1.31 ²⁸	1.19
"	+0.93	+1.39	10.09	+1.38 [✓]	+1.24	1.15
<i>Faint</i>	—	—	—	—	—	—

6/410
-1.68
70
-2.38
-1.63
-1.70
-2.33

66

I 39655 Book 3 Pg. 191 $\beta = 3.34$ $2\alpha = .68$

					-18
Venus	-0.65 -0.96	4.05	-2.31 [✓]	-2.99	-3.17
"	-0.24 -0.35	4.16	-2.20 [✓]	-2.88	-3.06
"	+0.07 +0.10	4.11	-2.25 [✓]	-2.99	-3.17
"	+0.40 +0.59	4.10	-2.26 [✓]	-3.00	-3.18
"	too faint	—	—	—	—
Jupiter	+0.27 +0.40	6.41	+0.05 [✓]	-0.76	-0.94
"	+0.61 +0.90	6.41	+0.05 [✓]	-0.84	-1.02
					mem -0.98 76 -1.74

I 39933 Book 3 Pg. 210. $\beta = 3.18$ $2\alpha = .62$

					plan -3
Arcturus ⁽⁷⁾	+0.27 [✓] +0.44	7.45	1.20 [✓]	1.36	1.33
" ⁽⁶⁾	-0.05 [✓] -0.08	7.43	1.18 [✓]	1.34	1.31
" ⁽³⁾	-0.31 [✓] -0.50	7.51	1.26 [✓]	1.42	1.39
Mars	+0.68 +1.10	6.61	+0.36	+0.21	0.18
"	+0.07 +0.11	6.62	+0.37	+0.22	0.19

I 39902 Book 3 Pg. 214 $\beta = 2.99$ $2\alpha = .74$

					-5
Jupiter	-0.56 -0.76 [✓]	4.25 [✓]	-1.42	-1.25	-1.30
"	-0.23 -0.31 [✓]	4.20 [✓]	-1.47	-1.30	-1.35
					-1.32 -20 -1.52

I 39935

Book 3

Pg 217

P = 3.23

22 = .62

					Pd	-3
Mars	-0.84 [✓] -1.35 [✓]	6.16 [✓]	-0.13	-0.25	-0.28	
"	-0.47 [✓] -0.76 [✓]	6.25 [✓]	-0.04	-0.16	-0.19	
"	-0.19 [✓] -0.31 [✓]	6.20 [✓]	-0.09	-0.21	-0.24	
Antares	-0.34 [✓] -0.55 [✓]	7.46 [✓]	1.17 [✓]	1.35	1.32	
"	-0.02 [✓] -0.03 [✓]	7.48 [✓]	1.19 [✓]	1.37	1.34 [✓]	29.07
"	+0.24 [✓] +0.39 [✓]	7.40 [✓]	1.11 [✓]	1.29	1.26	

I 39938

Book 3

Pg. 219

P = 3.01

22 = .70

						-14
Mars	-1.23 -1.76	5.75	-0.38 [✓]	-0.53 [✓]	-0.67	
"	-0.85 -1.21	5.80	-0.33 [✓]	-0.48 [✓]	-0.62	
"	-0.51 -0.73	5.78	-0.35 [✓]	-0.50 [✓]	-0.64	

I 39943

Book 4

Pg. 2.

P = 3.58

22 = .62

						+14
Jupiter	-0.16 -0.26	4.75	-1.30 [✓]	-1.26	-1.22	} -1.36 54 -1.90
"	-0.02 -0.03	4.48	-1.57 [✓]	-1.53	-1.49	
Saturn	-0.61 -0.98	7.49	+1.44 [✓]	+1.55	+1.59	
"	-0.31 -0.50	7.51	+1.46 [✓]	+1.57	+1.61	
Antares	-0.93 -1.50	6.96	+0.91 [✓]	+1.04	1.08	
"	-0.56 -0.90	7.11	1.06 [✓]	+1.19	1.23	
"	-0.35 -0.56	6.95	0.90 [✓]	+1.03	1.07	
Mars	-0.45 -0.73	5.78	-0.27 [✓]	-0.16		
"	-0.10 -0.16	5.85	-0.20 [✓]	-0.09		
"	+0.19 +0.31	5.82	-0.23 [✓]	-0.12		

68

I 39948

Book 4, Pg 3.

 $P = 3.32$ $2a = .55$

-4

Jupiter	+0.07	+0.13	5.14	-0.89	-0.86 ^L	-0.90	$\left. \begin{array}{l} -0.92 \\ -0.95 \\ \hline -1.50 \end{array} \right\}$
"	+0.32	+0.58	5.09	-0.94	-0.91 ^L	-0.95	
Saturn	-0.02	-0.04	7.90	1.87	1.97 ^L	1.93	
"	+0.25	+0.45	7.96	1.93	2.03 ^L	1.99	
Mars	-0.35	-0.64	5.87	-0.16	-0.26 ^L	-0.30	
"	+0.06	+0.11	6.12	+0.09	0.01 ^L	-0.05	
Arcturus	-0.32	-0.58	7.36	1.33	1.48 ^L	1.44	
"	-0.11	-0.20	7.31	1.28	1.43 ^L	1.39	
"	+0.15	+0.27	7.28	1.25	1.40 ^L	1.36	

I 39951

Book 4, Pg. 6

 $P = 3.32$ $2a = .55$

-4

Jupiter	+0.05	+0.07	5.08	-0.98	-0.93 ^L	-0.97	$\left. \begin{array}{l} -0.94 \\ -0.92 \\ \hline -1.52 \end{array} \right\}$
"	+0.44	+0.62	5.13	-0.93	-0.88 ^L	-0.92	
Saturn	-0.08	-0.11	7.90	+1.84	+1.96 ^L	1.92	
"	+0.28	+0.39	7.90	+1.84	+1.96 ^L	1.92	
Arcturus	-0.52	-0.73	7.28	+1.22	+1.38 ^L	1.29	
"	-0.22	-0.31	7.20	+1.14	+1.25 ^L	1.21	
"	+0.10	+0.14	7.15	+1.09	+1.20 ^L	1.16	
Mars	-0.35	-0.49	6.02	-0.04	-0.16 ^L	-0.20	
"	0.00	0.00	6.01	-0.05	-0.17 ^L	-0.21	

I 39955

Book 4 Pg. 7

 $P = 3.36$ $2A = .65$

-18

Marz.	+0.17	+0.26	6.77	+0.64 [✓]	+0.59	0.41
	+0.49	+0.75	6.76	+0.63 [✓]	+0.58	0.40

I 39959

Book 4 Pg. 10.

 $P = 3.40$ $2A = .62$

Marz	-0.32	-0.52	6.98	+0.89 [✓]	+0.84	0.66
"	-0.07	-0.11	6.88	+0.79 [✓]	+0.74	0.56
	+0.30	+0.48	6.97	+0.88 [✓]	+0.83	0.65

I 39965

Book 4 Pg. 12

 $P = 3.48$ $2A = .84$

-18

Marz	-0.03	-0.04	7.45	1.35	1.28	
	+0.39	+0.46	7.45	1.35	1.28	1.10
Too faint.	-0.07	-0.08	7.40	1.30	1.23	1.08

I 39968

Book 4 Pg. 13

 $P = 3.42$ $2A = .66$

-15

Marz	-0.55	-0.83	7.71	1.59 [✓]	1.37	1.22
"	-0.19	-0.29	7.71	1.59 [✓]	1.37	1.22
"	+0.08	+0.12	7.62	1.50 [✓]	1.28	1.13

70

I 39972

Book 4

Pg. 16

 $P = 2.90$ $2a = .65$

Mars -0.51 -0.78

8.24

1.63[✓]

1.07 1.01

" -0.10 -0.15

8.38

1.77[✓]1.21 1.15⁻

I 39975

Book 4

Pg. 18

 $P = 2.77$ $2a = .66$

Mars -0.15 -0.23

8.79

1.93

(1.31)

Spiral

+0.18 +0.27

8.76

1.90[✓]

1.22 1.16

-0.12 -0.18

8.80

1.94[✓]

1.26 1.20

I 39987

Book 4

Pg. 19

 $P = 2.94$ $2a = .75$

Mars -0.75 -1.00

8.52

1.92[✓]1.54 1.45⁻

" -0.38 -0.51

8.47

1.87[✓]

1.49 1.40

I 39989

Book 4

Pg. 21

 $P = 3.05$ $2a = .75$

Mars -0.63 -0.84

8.68

2.06[✓]

1.55 1.50

" -0.25 -0.33

8.67

2.05[✓]

1.54 1.49

I 40203

Book 4 Pg. 29

 $\sigma = 3.80$ $2\sigma = .58$

					-3
Venus	-0.97 -1.67	1.84	-2.46	-3.14	-3.17
"	-0.65 -1.12	1.89	-2.41	-3.09	-3.12
"	-0.38 -0.66	1.85	-2.45	-3.13	-3.16
Mars	-6.36 -0.62	7.89	+3.59 [✓]	+2.85	+2.82
"	+0.01 +0.02	7.96	+3.66	+2.92	+2.89
"	+0.20 +0.34 0.00 0.00	7.78 7.44	+3.48 +3.44	+2.74 +2.40	+2.71

I 40223

Book 4 Pg. 31

 $\sigma = 3.64$ $2\sigma = .52$

					-9
Mars	0.00 0.00	8.50	3.71 [✓]	2.82	2.73
"	+0.21 +0.40	8.41	3.62 [✓]	2.65	2.56
Venus	-0.54 -1.04	2.47	-2.32 [✓]	-3.38	-3.47
"	-0.21 -0.40	2.61	-2.18 [✓]	-3.24	-3.33

I 40253

Book 4 Pg. 36

 $\sigma = 3.12$ $2\sigma = .48$

					+15
Venus	-0.48 -1.00	2.51	-3.37 [✓]	-3.71	-3.56
"	-0.24 -0.50	2.51	-3.37 [✓]	-3.71	-3.56
"	+0.07 +0.15	2.66	-3.22 [✓]	-3.60	-3.45

I 40255

Book 4 Pg. 38

 $\sigma = 2.92$ $2\sigma = .77$

					+15
Mars	+0.09 +0.13 ²	9.08 ⁷	3.20 ¹⁹	+2.58 ⁷	2.72
Venus	-0.09 -0.12	2.39 [✓]	-3.49 [✓]	-3.91 [✓]	-3.76
"	-0.04 ⁴⁹ -0.05 ⁶⁴	2.96 ³⁷	-2.92 ²² -3.51	-3.38 ⁹⁷	-3.82

72

I 40329

Book 4 Pg. 39.

 $B = 2.56$ $22 = .46$

Saturn	+0.62	+1.35	9.27	2.14 ^v	2.04	1.93	-11
"	+0.91	+1.98	9.49	2.36 ^v	2.26	2.15 ^v	
Jupiter	+0.08	+0.17 ⁶	5.68 ⁹	-1.45 ⁴	-1.43 ²	-1.53	
"	+0.18	+0.39 ^v	5.40 ^v	-1.67 ²³	-1.65 ²¹	-1.82	3 4 247 59 -1.62 -20 -1.82 79
"	+0.51	+1.11	5.62	-1.51 ^v	-1.49	-1.60	
"	+0.82	+1.78	5.79	-1.34 ^v	-1.31	-1.42	

I 40352

Book 4 Pg. 41

 $B = 2.34$ $22 = .67$

Jupiter	+0.68	+1.01 ^v	5.52 ^v	-1.44 ^v	-1.41	-1.55 ^v	216
"	+0.33	+0.49 ^v	5.50 ^v	-1.46 ^v	-1.43	-1.57	-1.55 20 -1.75
"	+0.01	+0.01 ^v	5.57 ¹	-1.45 ⁴	-1.41 ⁰	-1.54	
Saturn	+0.21	+0.31 ^v	9.16 ^v	+2.20 ^v	2.19	2.05 ^v	
"	+0.54	+0.81 ^v	9.24 ^v	+2.28 ^v	2.27	2.13	
"	+0.86	+1.19 ²⁸	9.11 ^{20v}	+2.15 ²⁴	2.14 ²³	2.05	

I 40353

Book 4 Pg. 42

 $B = 3.28$ $22 = .92$

Venus	-1.14	-1.24	2.27	-3.61 ^v	-3.99	-3.82	+17
"	-0.85	-0.92	2.09 2.09	-3.79 ^v	-4.17	-4.00	
"	-0.40	-0.43	2.08	-3.80 ^v	-4.18	-4.01	

I 40362

Book 4 Pg. 61.

 $P = 3.17$ $2a = .52$

Venus	-0.72 -1.38	2.13	-3.75 [✓]	-4.26 [✓] -3.24	+24 -4.02 -3.0
"	-0.52 -1.00	2.01	-3.87 [✓]	-4.38 [✓] -3.36	-4.14
"	-0.22 -0.42 [✓]	2.01 2.09	-3.81 ⁷⁹	-4.358 [✓] -3.28	-4.11

I 40387

Book 4 Pg. 71

 $P = 2.84$ $2a = .58$

Saturn	-0.64 -1.10	7.88	1.87	1.98	8.1 +4 7.4
"	-0.62 [✓] -1.07 [✓]	7.85	1.84	1.95 [✓]	1.99
"	-0.41 [✓] -0.71 [✓]	7.75	1.74	1.85 [✓]	1.89
Jupiter	-0.31 [✓] -0.53 [✓]	4.48	-1.53	-1.47 [✓]	-1.43
"	-0.15 [✓] -0.26 [✓]	4.25	-1.76	-1.71 [✓]	-1.66
"	+0.26 [✓] +0.45 [✓]	4.46	-1.55	-1.50 [✓]	-1.46

2/11'5"
-1.52
38
-1.90

(Sat. May 6/22)

I 41108

Book 4 Pg. 106.

 $P = 2.57$ $2a = .83$

Saturn	-0.17 -0.20	9.55	+0.92	+0.92	+0.92 [✓]
"	+0.24 +0.29	9.52	+0.89	+0.89	+0.88 [✓]
"	+0.66 +0.80	9.47	+0.84	+0.84	+0.83 [✓]
Arcturus	-0.47 -0.57	8.58	-0.05	-0.05	-0.06
"	-0.01 -0.01	8.66	+0.03	+0.04	+0.03
"	+0.49 +0.59	8.67	+0.04	+0.05	+0.04

74

I 41109. Book 4 Pg 107.

 $B = 2.30$ $22 = .46$

Saturn	-0.26	-0.57	8.27	1.76	1.77	1.78 [✓]
"	-0.09	-0.20	8.19	1.68	1.70	1.71 [✓]
"	+0.19	+0.41	8.30	1.79	1.81	1.82 [✓]
Arcturus	-0.01	-0.02	7.85	1.34	1.32	1.33
"	+0.24	+0.52	7.93	1.42	1.41	1.42
"	-0.22	-0.48	7.92	1.41	1.40	1.40
"	-0.49	-1.07	7.80	1.29	1.30	1.31

I 41147

Book 4

Pg. 108

 $B = 3.19$ $22 = .84$

HR. 2286	-0.28	-0.33	10.11	3.29	3.16	3.18 [✓] -
2943	-0.14	-0.17	7.37	0.55	0.44	0.46 [✓] -
2845	-0.26	-0.31	9.99	3.17	3.04	3.06 [✓] -
2095	-0.52	-0.62	9.72	2.90	2.77	2.79 [✓] -
4662	-0.48	-0.57	9.69	2.87	2.74	2.76 [✓] -
4757	-0.22	-0.26	10.03	3.21	3.08	3.10 [✓] -
424	-0.19	-0.23	8.98	2.16		
424	+0.19	+0.23	8.91	2.09		
5056	-0.09	-0.11	8.01	1.19	1.11	1.13 [✓] -
5056	+0.36	+0.43	7.95	1.13	1.05	1.07 [✓] -
—	—	—				
3873	-0.29	-0.35	9.95	3.13	3.19	3.21 [✓] -
3569	-0.16	-0.19	10.10	3.28	3.34	3.36 [✓] -
4357	-0.72	-0.86	9.40	2.58	2.67	2.69 -
4357	-0.18	-0.21	9.54	2.72	2.81	2.83 [✓] -
4932	-0.41	-0.49	9.79	2.97	3.05	3.07 [✓] -
4914-5	-0.43	-0.51	9.79	2.97	3.09	3.11 [✓] -

F 41165

Book 4

Pg. 109.

 $B = 3.20$ $22 = .79$

W09.

2845	-0.18	-0.23	^{10.05} 9.73	3.26 -11-5	3.10 [✓]
2095	-0.41	-0.52	9.73	2.94	2.83 [✓] 2.78 [✓] -
3873	-0.39	-0.49	9.80	3.01	3.09 [✓] 3.04 [✓] -
3569	-0.22	-0.28	9.97	3.18	3.27 [✓] 3.22 [✓] -
424	-0.17	-0.22	8.95	2.16	
424	+0.18	+0.23	8.88	2.09	
2890-1	³ -0.17 ⁶	-0.22	⁵⁰ 8.44	⁷¹ 1.65	⁸ 1.62 ⁶³ 1.57 [✓] -
2890-1	+0.37	+0.47	8.56	1.77	1.73 [✓] 1.68 [✓] -
2990	-0.43	-0.54	8.13	1.34	1.29 [✓] 1.24 [✓] -
2990	+0.02	+0.03	8.11	1.32	1.26 [✓] 1.21 [✓] -
462	-0.61	-0.77	9.53	2.74	2.63 [✓] 2.58 [✓] -
4757	-0.19	-0.24	10.06	3.27	3.16 [✓] 3.11 [✓] -
5056	-0.07	-0.09	7.99	1.20	1.15 [✓] 1.10 [✓] -
5056	+0.34	+0.43	8.02	1.23	1.18 [✓] 1.13 [✓] -
3982	-0.29	-0.37	8.29	1.50	1.51 [✓] 1.46 [✓] -
4057-8	-0.75	-0.95	8.75	1.96	2.00 [✓] 1.95 [✓] -
4357	-0.22	-0.28	9.44	2.65	2.73 [✓] 2.68 [✓] -
4534	-0.41	-0.52	9.19	2.40	2.48 [✓] 2.43 [✓] -

76

J 41174

Book 4

Pg. 110

P = 3.28 $2\alpha = .93$

HR.

2286	-0.20	-0.22	10.17	3.37	3.23 ²	3.26 [✓] -
"	+0.02	+0.02	10.43	3.63	3.47	3.50 [✓] -
2095	-0.49	-0.53	9.84	3.04	2.91	2.94 [✓] -
2088	-0.12	-0.13	9.06	2.26	2.16	2.19 [✓] -
3748	-0.08	-0.09	9.11	2.31	2.20 ¹	2.22 ^{4✓} -
424	-0.26	-0.28	8.89	2.09	2.05	
"	+0.25	+0.27	8.95	2.15	2.09	
2890-1	+0.08 ⁺	+0.09	8.59 ⁷⁵	1.77 ⁹⁵	1.73 ⁹¹	1.76 ^{94✓} -
2990	-0.38	-0.41	8.23	1.43	1.37	1.40 [✓] -
4662	-0.38	-0.41	9.92	3.12	3.01	3.04 [✓] -
4757	-0.12	-0.13	10.23	3.43	3.33	3.36 ^{6✓} -
3982	2801	—	—	—	—	—
"	^{narrow} +0.17	+0.18	6.34 [✓]	1.54 [✓]	1.56	1.59 [✓] -
			10.56	3.76	3.78	3.81 [✓] -
			10.11	3.31	3.34	3.37 [✓] -
3873	-0.25	-0.27	9.48	2.68	2.71	2.74 [✓] -
4057-5	-0.51	-0.55	9.73 ²⁰	2.73 ⁴⁰	2.77 ⁴⁴	2.77 ^{47✓} -
3569	+0.01	+0.01	10.29	3.49	3.52	3.55 ^{5✓} -
5056	+0.03	+0.03	8.11	1.31	1.27	1.30 [✓] -
"	+0.46	+0.49	8.09	1.29	1.25	1.28 [✓] -
5340	-0.65	-0.70	6.87	0.07	0.16	0.19 [✓] -
"	-0.14	-0.15	6.93	0.13	0.22	0.25 [✓] -

F 41090

Book 4, Pg. 113

 $B = 3.22$ $22 = .93$

H.R.

3873	-0.57 -0.61	9.77	2.92	3.02	3.07 [✓] —
424	-0.25 -0.27	8.97	2.12	2.12 [?]	2.17
"	+0.25 +0.27	8.97	2.12	2.12 [?]	2.17 —
4554	-0.49 -0.53	9.24	2.39	2.50	2.55 [✓] —
4357	-0.29 -0.31	9.46	2.61	2.71	2.76 [✓]
Saturn	+0.02 +0.02	7.60	0.75	0.77	0.82 [✓]
" too faint	—	—	—	—	—
Jupiter	-0.03 -0.03	4.51	-2.34	-2.38	-2.33 [✓]
"	+0.37 +0.40	4.44	-2.41	-2.44	-2.39 [✓]
" too faint	—	—	—	—	—
5340	-0.77 -0.83	6.76	-0.09	-0.05	0.00 [✓] —
"	-0.28 -0.30	6.76	-0.09	-0.05	0.00 [✓] —
5056	-0.62 -0.67	7.77	1.12	1.03	1.08 [✓] —
"	-0.04 -0.04	8.06	1.21	1.12	1.17 [✓] —
4662	-0.56 -0.60	9.71	2.86	2.73	2.78 [✓] —
4757	-0.17 -0.18	10.18	3.33	3.22	3.27 [✓] —

F 41095

Book 4

Pg. 114

 $B = 2.95$ $22 = .94$

Saturn	-0.44 -0.47	9.29	+0.62	0.60	0.60 [✓]
"	+0.26 +0.28	9.53	+0.86	0.84	0.84 [✓]
"	+0.54 +0.57	9.28	+0.61	0.59	0.59 [✓]
Arcturus too faint	—	—	—	—	—
"	} not to be reduced	—	—	—	—
"		—	—	—	—
"		—	—	—	—
Jupiter	-0.10 -0.11	6.48	-2.19	-2.23	-2.23 [✓]

78

I 41096

Book 4

Page 115

 $B = 2.44$ $2\alpha = .51$

Saturn	+0.06	+0.12	8.60	1.68	1.6 ⁶	1.71 [✓]
"	-0.22	-0.43	8.45	1.53	1.5 ⁷	1.56 [✓]
"	-0.39	-0.76	8.52	1.60	1.58	1.63 [✓]
Arcturus	nd to re. reduced					
"						
"						
"						
Jupiter	-0.40	-0.78	5.73	-1.19	-1.27	1.22 [✓]

I 41291

Book 4

Pg. 123

 $B = 2.32$ $2\alpha = 0.13$
on frame
+27

Saturn	-0.35	-0.38	9.93 10.69	1.13	1.10	1.34
"	+0.22	+0.24	9.99	1.19	1.16	1.40
"	+0.71	+0.76	9.99	1.19	1.15	1.39
"	+1.0 ⁰⁹	+1.18 ⁷	9.88 ⁷	1.08 ⁷	1.04 ³	1.27
Arcturus	-0.83	-0.89	8.77	-0.03	-0.27	
"	-0.42	-0.45	8.73	-0.07	-0.31	
"	+0.52	+0.56	8.79	-0.01	-0.25	
"	+0.72	+0.77	8.87	+0.09	-0.15	
Jupiter	+0.25	+0.27	6.81	-1.99	-1.96	-1.72
"	+0.73	+0.78	6.82	-1.98	-1.95	-1.71
"	+1.19	+1.28	6.80	-2.00	-0.97	-1.73
"	+1.59	+1.71	(6.76)?	-2.04	-2.01	-1.76

	I 41292		Book 4	B _g 124	B = 2.28 22 = 0.59 comp are = +35	
Saturn	-0.41	-0.69	8.65	2.11	2.10	2.48
"	-0.11	-0.19	8.70	2.16	2.15	2.63
"	+0.09	+0.15	8.61	2.07	2.06	2.44
"	+0.52	+0.88	8.81	2.27	2.28	2.64 ⁶
Antares	-0.41	-0.69	8.21	1.67	1.29	
"	-0.25	-0.42	7.95	1.41	1.03	
"	+0.01	+0.02	7.93	1.39	1.01	
"	+0.10	+0.17	7.63	1.09 (1.09)	0.67	
"	+0.54	+0.92	7.90	1.36	0.94	
Jupiter	-0.25	-0.42	5.51	-1.03	-0.97	-0.59
"	+0.03	+0.05	5.52	-1.02	-0.96	-0.68
"	+0.37	+0.63	(5.64)	-0.90	-0.83	-0.45
"	(+0.65) (+0.65)	+1.10	5.61	-0.93	-0.86	-0.48

	I 41336		Book 4	B _g 125	B = 2.52 22 = 0.94 ³ Comp are +24	
Saturn	-0.02	-0.02	9.77	1.08	1.08	1.32
"	+0.66	+0.70 ¹	9.89	1.20	1.20 ¹	1.45
"	+1.04	+1.11 ²	9.83	1.14	1.14 ⁵	1.39
Antares	-0.58	-0.62	8.61	-0.08	-0.30	
"	+0.02	+0.02	8.72	+0.03	-0.21	
"	+0.55	+0.59	8.72	+0.03	-0.21	
Jupiter	+0.22	+0.23 ⁴	+6.79	-1.90	-1.87 ⁶	-1.62
"	+0.61	+0.65 ⁶	6.69	-2.00	-1.97 ⁶	-1.72
"	+1.02	+1.09 ¹⁰	6.62	-2.07	-2.04 ³	-1.99

80

I 41337

Book 4

Pg. 126

 $P = 2.43$ $22 = 0.65$
 compare with

Saturn	-0.08 ¹	-0.12 ³	8.33	2.25	2.26 ⁷	2.69
"	+0.24 [✓]	+0.37 ³	8.31	2.23	2.24 ⁰	2.62
"	+0.59 [✓]	+0.91 ⁶²	8.36	2.28	2.29 ⁰	2.62
Arcturus	-0.35	-0.54	7.39	1.31	0.89	
"	-0.07	-0.11	7.35	1.27	0.85	
"	+0.41	+0.63	7.63	1.55	1.13	
Jupiter	+0.08 [✓]	+0.12 ¹	5.12	-0.96	-0.91 ²	-0.50
"	+0.49 [✓]	+0.75 ⁶⁴	5.26	-0.82	-0.96 ⁸³	-0.41
"	+0.76 [✓]	+1.17 ⁶	5.18	-0.90	-0.84 ⁹⁵	-0.53

46

I 41358

Book 4

Pg. 130

 $P = 2.99$ $22 = 1.11$
 compare with

Saturn	-0.44	-0.40	9.36	1.24	1.20 [✓]	+1.17
"	+0.08	+0.07	9.28	1.16	1.12 [✓]	+1.09
"	+0.61	+0.55	9.24	1.12	1.08 [✓]	+1.05
Spica	-0.42	-0.38	9.35	1.23	1.13 [✓]	+1.04
"	+0.20	+0.18	9.40	1.28	1.16 [✓]	+1.09
"	+0.72	+0.65	9.28	1.16	1.05 [✓]	+0.94
Jupiter	-0.44	-0.40	6.19	-1.93	-2.02 [✓]	+1.10
"	+0.22	+0.20	6.27	-1.85	-1.94 [✓]	+1.02
"	+0.71	+0.64	6.20	-1.92	-2.02 [✓]	+1.11
Arcturus	-0.63	-0.57	8.09	-0.03	+0.05	+0.13
"	+0.04	+0.04	8.14	+0.02	+0.10	+0.17
"	+0.59	+0.53	8.12	0.00	+0.08	+0.15
Antares	-0.44	-0.40	9.34	1.22	0.89 [✓]	+0.60
"	+0.30	+0.27	9.49	1.37	1.04 [✓]	+0.75
"	+0.85	+0.77	9.46	1.34	1.31 [✓]	+0.72
Mars	-0.45	-0.41	6.18	-1.94	-2.30 [✓]	+2.62
"	+0.12	+0.11	6.18	-1.94	-2.30 [✓]	+2.62
"	+0.78	+0.70	6.26	-1.86	-2.22 [✓]	+2.54

I 41359

Book 4

Pg. 131

 $B = 2.75$ $2\alpha = 0.85$

Conf ab. acc. = .16

Saturn	-0.04	-0.05	7.87	2.27	2.19 [✓]
"	+0.35	+0.41	7.92	2.32	2.24 [✓]
"	+0.81	+0.95	7.96	2.36	2.26 [✓]
Spica	-0.01	-0.01	6.50	0.90	0.73 [✓]
"	+0.37	+0.44	6.45	0.85	0.68 [✓]
"	+0.81	+0.95	6.46	0.86	0.69 [✓]
Jupiter	-0.12	-0.14	4.87	-0.73	-0.92 [✓]
"	+0.20	+0.24	4.75	-0.85	-1.07 [✓]
"	+0.79	+0.93	4.94	-0.66	-0.88 [✓]
Arcturus	-0.40	-0.47	6.96	1.36	1.52 ⁵
"	-0.02	-0.02	6.99	1.39	1.55
"	+0.41	+0.48	6.99	1.39	1.55
Antares	-0.02	-0.02	8.90	3.30	2.68 [✓]
"	+0.30	+0.35	8.82	3.22	2.60 [✓]
"	+0.72	+0.85	8.77	3.17	2.55 [✓]
Mars	-0.47	-0.55	5.46	-0.14	-0.82 [✓]
"	-0.13	-0.15	5.36	-0.24	-0.92 [✓]
"	+0.38	+0.45	5.46	-0.14	-0.82 [✓]

I 41379

Book 4

Pg 134.

 $B = 3.33$ $22 = .73$

Jupiter	-0.04	-0.05	6.51	-1.62	-1.98	-1.65 [✓]
"	+0.37	+0.51	6.55	-1.58	-1.94	-1.61 [✓]
"	+0.81	+1.11	6.67	-1.46	-1.86	-1.53 [✓]
Antares	-0.35	-0.48	9.26	+1.13	+0.80	+1.13
"	+0.02	+0.03	9.29	+1.16	+0.83	+1.16 ^{1.11}
"	+0.33	+0.45	9.16	+1.03	+0.70	+1.03
Mars	-0.24	-0.33	6.22	-1.91	-2.24 [✓] -1.58	-1.91 [✓]
"	+0.13	+0.18	6.24	-1.89	-2.22	-1.89 [✓]
"	+0.47	+0.64	6.15	-1.98	-2.31	-1.98 [✓]

I 41380

Book 4

Pg 137

 $B = 3.35$ $22 = .77$

Saturn	-0.52	-0.68	9.74	+1.00	+0.80	+1.13 [✓]
"	+0.17	+0.22	10.05	+1.31	+1.09	+1.42 [✓]
"	+0.56	+0.73	10.00	+1.26	+1.08 ⁴	+1.35 ⁷
Jupiter	-0.11	-0.14	6.96	-1.78	-1.98	-1.65 [✓]
"	+0.32	+0.42	7.01	-1.73	-1.93	-1.60 [✓]
"	+0.55	+0.71	6.78	-1.96	-2.16	-1.83 [✓]
Spica	-0.08	-0.10	9.70	+0.96	+0.72	+1.05 [✓]
"	+0.45	+0.58	9.81	+1.07	+0.80	+1.13 [✓]
"	Too faint.	—	—	—	—	—
Antares	-0.47	-0.61	9.83	+1.09	+0.76	+1.09
"	+0.02	+0.03	9.84	+1.10	+0.77	+1.10
"	+0.46	+0.60	9.89	+1.15	+0.82	+1.15
"	Too faint.	—	—	—	—	—
Mars	-0.07	-0.09	7.01	-1.73	-2.06	-1.73 [✓]
"	+0.35	+0.45	7.04	-1.70	-2.03	-1.70 [✓]
"	+0.52	+0.68	6.75	-1.99	-2.32	-1.99 [✓]

47

83

I 41382

Book 4

Pg 135

 $\theta = 2.90$ $2\alpha = .99$

Saturn	-0.63	-0.64	9.78	+1.19	+0.92	+0.97✓
"	+0.28	+0.28	+10.08	+1.49	+1.22	+1.27✓
"	+0.72	+0.73	9.95	+1.36	+1.06	+1.11✓
Jupiter	-0.70	-0.71	8.89	+0.30	+0.03	+0.08 $\times 2.00 = -1.92$ ✓
"	-0.16	-0.16	6.92	-1.67	-1.94	-1.89✓
"	+0.42	+0.42	6.98	-1.61	-1.88	-1.83✓
"	+0.74	+0.75	6.79	-1.80	-2.10	-2.05✓
<hr/>						
Spica	-0.55	-0.56	9.82	+1.23	+0.93	+0.98✓
"	+0.22	+0.22	9.98	+1.39	+1.09	+1.14✓
"	+0.72	+0.73	9.97	+1.38	+1.05	+1.10✓
Antares	-0.86	-0.87	9.51	+0.92	+0.59	+0.64✓
"	+0.16	+0.16	9.44	+0.85	+0.52	+0.57 $+50 = 1.07$ ✓
"	+0.57	+0.58	9.86	1.27	+0.94	+0.99✓
Mars	-0.08	-0.08	7.02	-1.57	-1.90	-1.85✓
"	+0.48	+0.48	7.04	-1.55	-1.88	-1.83✓
"	+0.76	+0.77	6.83	-1.76	-2.09	-2.04✓
Polaris	-0.30	-0.30	10.70	2.11	2.11	2.16
"	+0.30	+0.30	10.72	2.13	2.13	2.18
Arcturus	-0.15	-0.15	8.53	-0.06	-0.04	+0.01✓
"	+0.47	+0.47	8.60	+0.01	+0.03	+0.08✓
"	+0.78	+0.79	8.41	-0.18	-0.16	-0.11✓
Vega	-0.16	-0.16	8.56	-0.03	+0.08	+0.13✓
"	+0.42	+0.42	8.57	-0.02	+0.09	+0.14✓
"	+0.91	+0.92	8.52	-0.07	+0.04	+0.09✓

I 41383

Book 4

Pg. 136

 $P = 2.79$ $2a = 1.35$

Antares	-0.60	-0.44	9.35	+0.98	+0.65	+0.98
"	-0.62	-0.46	9.34	+0.97	+0.64	+0.97
"	+0.32	+0.24	9.50	1.13	+0.80	+1.13
Mars	-0.09	-0.07	6.51	-1.86	-2.19	-1.86 ✓
"	+0.49	+0.36	6.42	-1.95	-2.28	-1.95 ✓
Antares	+0.34	+0.25	9.55	+1.18	+0.85	+1.18
Mars	+0.11	+0.08	6.65	-1.72	-2.05	-1.72 ✓
"	+0.74	+0.55	6.59	-1.78	-2.11	-1.78 ✓
Antares	+0.58	+0.43	9.70	+1.33	+1.00	+1.33

see elsewhere
for other filesI 41389⁴²⁰

Book 4

Pg. 140

 $P = 3.36$ $2a = .61$

Antares (omit)	—	—	—	—	—	—
"	-0.17	-0.28	9.58	+1.12	+0.79	+1.12
"	+0.17	+0.28	9.56	+1.10	+0.77	+1.10
Mars	-0.11	-0.18	6.96	-1.50	-1.83	-1.50 ✓
"	+0.31	+0.51	7.10	-1.36	-1.69	-1.36 ✓
"	+0.55	+0.90	6.97	-1.49	-1.82	-1.49 ✓

48

85

I 41389

Book 4

Pg. 139

 $\sigma = 3.73$ $2\sigma = .74$

HR. 4932	+0.03	+0.04	10.38	+2.86	+2.75	+2.84 [✓]	Do not use
"	+0.07	+0.09	10.51	+2.99	+2.86	+2.95 [✓]	✓
6134	+0.08	+0.11	8.81	+1.29	+0.96	+1.05 [✓]	✓
5685	—	—	—	—	—	—	
"	—	—	—	—	—	—	
4295	+0.19	+0.26	9.98	+2.46	+2.38	+2.47 [✓]	✓
6378	+0.25	+0.34	10.17	+2.65	2.55	+2.64 [✓]	✓
"	-0.24	-0.32	10.14	+2.62	2.52	+2.61 [✓]	✓
424	Too faint	—	—	—	—	—	
"	"	—	—	—	—	—	
4301	-0.24	-0.32	9.49	+1.97	+1.88	+1.97	—
"	+0.24	+0.32	9.55	+2.03	+1.94	+2.03	—
4554	-0.08	+0.11	^{3.1} 10.53	^{2.79} +3.01	⁷³ +2.95	^{2.82} +3.04 [✓]	✓
"	+0.26	+0.35	10.13	+2.61	+2.55	+2.64 [✓]	✓
5235	Too faint	—	—	—	—	—	
"	+0.05	+0.07	10.49	+2.97	+2.92	+3.01 [✓]	✓
4914.5	+0.09	+0.12	10.52	+3.00	+2.95	+3.04 [✓]	✓
6175	0.00	+0.00	10.39	+2.87	+2.79	+2.88 [✓]	✓
6056	-0.10	-0.14	10.36	+2.84	+2.80	+2.89 [✓]	✓
5854	-0.19	-0.26	10.30	+2.78	+2.78	+2.87 [✓]	✓
5505.6	-0.40	-0.54	9.88	+2.36	+2.38	+2.47 [✓]	✓
"	+0.18	+0.24	9.97	+2.45	+2.47	+2.56 [✓]	✓
5191	-0.27	-0.36	9.42	+1.90	+1.90	+1.99 [✓]	✓

86

49

I 41656

Book 4

Pg 141.

 $\beta = 3.80$ $z_2 = .75$

HR. 6148	-0.64	-0.85	9.61	+2.81	+2.79	+2.75 [✓]	✓
6603	-0.63	-0.84	9.6 ¹ 2	+2.81	+2.79	+2.75 [✓]	✓
6212	-0.63	-0.84	9.6 ¹ 2	+2.81	+2.83	+2.79 [✓]	✓
6410	-0.33	-0.44	9.99	+3.19	+3.22	+3.18 [✓]	✓
6132	-0.63	-0.84	9.61	+2.81	+2.85	+2.81 [✓]	✓
7557	-0.87	-1.16	7.52	+0.72	+0.78	+0.74 [✓]	✓
"	-0.45	-0.60	7.52	+0.72	+0.78	+0.74 [✓]	✓
7528	-0.55	-0.73	9.67	+2.87	+2.98	+2.94 [✓]	✓
424	-0.21	-0.28	8.96	+2.16	—	—	
"	+0.20	+0.27	8.97	+2.17	—	—	

50

I 41657

Book 4

Pg 142

 $\beta = 3.82$ $z_2 = .73$

HR. 424	+0.16	+0.22	8.97	+2.12	—	—	
"	-0.17	-0.23	9.01	+2.16	—	—	
7525	-0.69	-0.95	9.43	+2.58	+2.61	+2.57 [✓]	✓
6536	-0.58	-0.79	9.58	+2.73	+2.75	+2.71 [✓]	✓
6705	-0.54	-0.74	9.01	+2.16	+2.19	+2.15 [✓]	✓
7001	-0.29	-0.40	6.70	-0.85	-0.11	-0.15 [✓]	✓
"	+0.16	+0.22	6.81	-0.04	0.00	-0.04 [✓]	✓
7996	-0.58	-0.79	8.99	+2.14	+2.23	+2.19 [✓]	✓
7924	-0.46	-0.63	8.67	+1.22	+1.32	+1.28 [✓]	✓
"	-0.08	-0.11	8.05	+1.20	+1.29	+1.25 [✓]	✓
7949	-0.32	-0.44	9.30	+2.45	+2.53	+2.49 [✓]	✓
8162	-0.30	-0.41	9.31	+2.46	+2.55	+2.51 [✓]	✓

51

I 41665

Book 4

Pg. 143

 $P = 3.81$ $22 = .68$

HR. 6148	-0.30	-0.44	9.96	+3.11	+3.09	+3.05 [✓]	✓
6663	-0.35	-0.51	9.86	+3.01	+2.96	+2.92 [✓]	✓
6556	-0.40	-0.59	9.21	+2.36	+2.36	+2.32 [✓]	✓
6212	-0.35	-0.51	9.91	+3.06	+3.07	+3.03 [✓]	✓
6410	-0.14	-0.21	10.08	+3.33	+3.34	+3.30 [✓]	✓
424	-0.19	-0.28	8.86	+2.11	—	—	
"	+0.19	+0.28	8.98	+2.13	—	—	
7557	-0.77	-1.13	7.57	+0.72	+0.78	+0.74 [✓]	✓
"	-0.32	-0.47	7.67	+0.84	+0.89	+0.85 [✓]	✓
7235	-0.20	-0.29	10.03	+3.18	+3.21	+3.17 [✓]	✓
6132	-0.38	-0.56	9.76	+2.91	+2.91	+2.87 [✓]	✓
7525	-0.23	-0.34	10.06	+3.21	+3.25	+3.21 [✓]	← do not use
7528	-0.35	-0.51	9.85	+3.00	+3.10	+3.06 [✓]	✓
6536	-0.34	-0.50	9.87	+3.02	+3.04	+3.00 [✓]	
7001	-0.34	-0.50	7.13	+0.28	+0.33	+0.29 [✓]	
"	-0.08	-0.12	6.98	+0.13	+0.17	+0.13 [✓]	

52

I 41666

Book 4

Pg. 144 $P = 3.85$ $22 = .53$

HR. 7924	-0.85	-1.60	7.59	+0.77	+0.87	+0.84 [✓]	✓
"	-0.51	-0.96	7.69	+0.87	+0.97	+0.94 [✓]	✓
424	+0.10	+0.19	8.89	+2.07	—	—	
"	-0.10	-0.19	8.99	+2.17	—	—	
21	-0.45	-0.85	8.90	+2.08	+2.19	+2.16 [✓]	✓
39	-0.43	-0.81	9.52	2.70	+2.78	+2.75 [✓]	✓

88

53

I 41681

Book 4

Pg. 145

R=3.61

 $2\alpha = .70$

H.R. 5854	-0.43	-0.61	9.76	2.92	2.72	2.75 [✓]
5505,6	-0.55	-0.79	9.51	2.67	2.49	2.52 [✓]
"	-0.08	-0.11	9.61	2.77	2.57	2.60 [✓]
5435	-0.06	-0.09	10.30	3.46	3.32	3.35 [✓]
"	+0.39	+0.56	10.37	3.53	3.37	3.40 [✓]
5854	-0.16	-0.23	10.09	3.25	2.85	2.88 [✓]
Polaris	-0.14	-0.20	9.03	2.19	—	—
"	+0.14	+0.20	8.88	2.04	—	—

54

I 41691

Book 4

Pg. 146

P=3.74

 $2\alpha = 0.62$

Polaris	-0.10	-0.16	9.08	2.22	—	—
"	+0.11	+0.18	8.90	2.04	—	—
H.R. 8232	-0.42	-0.68	9.76	2.90	2.88	2.91 [✓]
6705	-0.45	-0.73	9.03	2.17	2.18	2.21 [✓]
8308	-0.46	-0.74	8.98	2.12	2.19	2.22 [✓]
"	-0.94	-1.52	8.85	1.99	2.06	2.09 [✓]
8414	-0.50	-0.81	9.64	2.78	2.80	2.83 [✓]
7949	-0.84	-1.35	8.98	2.12	2.21	2.24 [✓]
"	-0.41	-0.66	9.10	2.24	2.33	2.36 [✓]
8728	-0.21	-0.34	8.34	1.48	1.70 ⁰¹	1.08 [✓]
8162	-0.35	-0.56	9.19	2.33	2.42	2.45 [✓]
"	-0.06	-0.10	9.10	2.24	2.33	2.36 [✓]
8775	-0.32	-0.52	9.20	2.34	2.45	2.48 [✓]
21	-0.52	-0.84	8.87	2.01	2.12	2.15 [✓]
403	-0.77	-1.24	9.16	2.30	2.40	2.43 [✓]
39	-0.58	-0.94	9.44	2.55	2.64	2.67 [✓]

55

I 41702

Book 4

Pg. 147.

 $P = 3.60$ $2\alpha = 0.79$

X.R.

5854	-0.41	-0.52	9.90	3.10	2.83	2.78 [✓]
5435	-0.13	-0.16	10.18	3.38	3.22	3.17 [✓]
5505,6	-0.08	-0.10	9.72	2.92	2.62	2.67 [✓]
Mane	+0.37	+0.47	(7.06)	0.26	-0.01	-0.06 [✓]
6148	-0.35	-0.44	9.92	3.12	3.07	3.02 [✓]
6603	-0.41	-0.52	9.87	3.07	3.02	2.97 [✓]
6212	-0.39	-0.49	9.89	3.09	3.08	3.03 [✓]
6410	-0.16	-0.20	10.14	3.34	3.34	3.29 [✓]
8322	-0.22	-0.28	10.04	3.24	3.11	3.06 [✓]
424	-0.17	-0.22	8.97	2.17	—	—
"	+0.18	+0.23	8.87	2.07	—	—
7235	-0.51	-0.65	9.65	2.85	2.89	—
7525	-0.37	-0.47	9.85	3.05	3.10	See below for correction.
7528	-0.62	-0.78	9.54	2.74	2.84	—
7949	-0.13	-0.16	(10.23)	3.43	3.54	—
"	-0.23	-0.29	9.45	2.65	2.76	—
8162	+0.29	+0.37	10.15	3.35	3.4	—
"	+0.29					—

H.R.

7235	-0.27	-0.34	9.96	3.16	3.20	3.15 [✓]
7525	-0.51	-0.65	9.67	2.87	2.92	2.87 [✓]
7528	-0.37	-0.47	9.85 10.79	3.05 3.99	3.15 4.09	3.10 4.04 [✓]
7949	-0.62	-0.78	9.61	2.81	2.92	2.87 [✓]
"	-0.13	-0.16	9.58	2.78	2.89	2.84 [✓]
8162	-0.23	-0.29	9.49	2.69	2.79	2.74 [✓]
"	+0.29	+0.37	9.63	2.83	2.93	2.88 [✓]

90

56

I 4713

Book 4

Pg 148

 $P = 3.66$ $22 = 0.81$

H.R.

5854	-0.36	-0.44	9.93	3.12	3.02	2.99 [✓]
5435	-0.21	-0.26	10.19	3.38	3.20	3.17 [✓]
5505,6	-0.66	-0.81	9.57	2.76	2.46	2.43 [✓]
5505,6	0.00	0.00	9.75	2.94	2.61	2.58 [✓]
Mars	-0.39	-0.48	7.12	0.31	0.04	0.01 [✓]
Mars	+0.04	+0.05	7.12	0.31	0.01	-0.02 [✓]
Mars	Faint.	— 9?	6.56?	?	?	?
424	-0.17	-0.21	8.99	2.18	—	—
424	+0.17	+0.21	8.87	2.06	—	—
7557	-0.76	-0.94	7.70	0.89	0.93	0.90 [✓]
7557	+0.04	+0.05	7.63	0.82	0.86	0.83 [✓]
7557	-0.27	-0.33	7.74	0.93	0.97	0.94 [✓]
7528	-0.37	-0.46	9.87	3.06	3.16	3.13 [✓]
7949	-0.25	-0.31	9.48	2.67	2.78	2.75 [✓]
8162	-0.32	-0.40	9.36	2.55	2.65	2.62 [✓]
8232	-0.30	-0.37	9.95	3.14	3.13	3.10 [✓]

57
I 41714 Book 4 Pg 149 $P = 3.70$ $2a = 0.71$

H.R						
5854	-0.34	-0.48	9.89	3.07	2.74	2.79 [✓]
5793	-0.82	-1.15	9.19	2.37	2.27	2.32 [✓]
5505,6	-0.50	-0.70	9.70	2.88	2.58	2.63 [✓]
5505,6	-0.03	-0.04	9.70	2.88	2.55	2.60 [✓]
Mar2	-0.38	-0.54	7.06	0.24	-0.03	+0.02 [✓]
Mar2	-0.02	-0.03	7.04	0.22	-0.08	-0.03 [✓]
Mar2	—	—	—	—	—	—
424	-0.21	-0.30	8.91	2.09	—	—
424	+0.20	+0.28	8.95	2.13	—	—
7557	-0.73	-1.03	7.60	0.78	0.74	0.79 [✓]
7557	-0.19	-0.27	7.75	0.93	0.89	0.94 [✓]
8232	—	—	—	—	—	—
8232	-0.31	-0.44	9.87 [✓]	3.07 [✓]	3.01 ⁰	3.06 ^{5✓}
8414	-0.31	-0.44	9.86	3.04	3.04	3.09 [✓]
8728	-0.10	-0.14	8.48	1.66	1.19	1.24 [✓]
8308	-0.34	-0.48	9.27	2.45	2.48	2.53 [✓]

92

I 41800

Book 4

Pg 152

 $P = 2.85$ $z_2 = .73$

Mars	-0.10	-0.14	9.07	0.44	+0.08	+0.08 [✓]	H.R.
Mars	+0.45	+0.62	9.26	0.63	+0.27	+0.27 [✓]	
Mars	+0.62	+0.85	8.93	0.30	-0.10	-0.10 [✓]	
Altair	-0.67	-0.92	9.36	0.73	+0.73	+0.73	
Altair	+0.04	+0.05	9.75	1.12	+1.12	+1.12	H.R.
Altair	+0.64	+0.88	9.50	0.87	+0.86	+0.86	

I 41811

Book 4

Pg 154

 $P = 3.04$ $z_2 = .74$

Mars	-0.26	-0.35	8.85	+0.61	+0.39	+0.33 [✓]	
Mars	+0.06	+0.08	8.74	+0.50	+0.28	+0.22 [✓]	
Mars	+0.45	+0.61	8.68	+0.44	+0.22	+0.16 [✓]	
Altair	-0.37	-0.50	9.06	+0.82	+0.88	+0.82	
Altair	-0.05	-0.07	9.11	+0.87	+0.93	+0.87	
Altair	+0.41	+0.55	9.23	+0.99	+1.04	+0.98	

I 41814

Book 4

Pg 156.

 $B = 3.36$ $22 = .75$

H.R. 6603	-0.49	-0.65	9.73	9.73	9.59
8322	-0.39	-0.52	9.80	9.80	9.69
Mare	-0.72	-0.96	7.14	7.14	6.96
Mare	-0.35	-0.47	7.16	7.16	6.98
H.R. 424	-0.12	not tabulated	—	—	—
424	-0.18	-0.24	8.94	8.94	8.94
424	+0.18	+0.24	8.89	8.89	8.89
7235	-0.26	-0.35	10.02	10.02	9.97
6536	-0.33	-0.44	9.86	9.86	9.83
6705	-0.39	-0.52	9.78	9.19	9.18
7001	-0.54	-0.72	6.82	6.82	6.82
7001	-0.15	-0.20	6.84	6.84	6.83
8414	-0.40	-0.53	9.79	9.79	9.80
8308	-0.31	-0.41	9.33	9.33	9.38
8775	-0.37	-0.49	9.23	9.23	9.34
21	-0.64	-0.85	8.87	8.85	8.96
168	-0.48	-0.64	9.08	9.08	9.19
403	-0.49	-0.65	9.60	9.60	9.70

Next Page

94

56

I 41814

Book 4

Bg 156.

$B = 3.36$ $22 = .75$

#R							
6603	-0.49	-0.65	9.73	+ 2.93	+ 2.79	+2.84 [✓]	H.R.
8322	-0.39	-0.52	9.80	+ 3.00	+ 2.98 [✓]	+2.95 [✓]	81
Manz	-0.72	-0.96	7.14	+ 0.34	+ 0.16	+0.21 [✓]	424
Manz H.R.	-0.35	-0.47	(7.16)	+ 0.36	+ 0.18	+0.23 [✓]	424
424	-0.12	not 2B used	—	—	—	—	403
424	-0.18	-0.24	8.94	+ 2.14	+ 2.14 [?]		168
424.	+0.18	+0.24	8.89	+ 2.09	+ 2.09 [?]		
7235	-0.26	-0.35	10.02	+ 3.22	+ 3.17	3.22 [✓]	
6536	-0.33	-0.44	9.86	+ 3.06	+ 3.03	3.08 [✓]	
6705	-0.39	-0.52	9.19	+ 2.39	+ 2.38	2.43 [✓]	
7001	-0.54	-0.72	6.82	+ 0.02	+ 0.02	+0.07 [✓]	
7001	-0.15	-0.20	6.84	+ 0.04	+ 0.03	+0.08 [✓]	H.R.
8414	-0.40	-0.53 ⁵	9.79	+ 2.99	+ 3.00	+3.05 [✓]	188
8368	-0.31	-0.41	9.33	+ 2.53	+ 2.58	+2.63 [✓]	188
8775	-0.37	-0.49	9.23	+ 2.43	+ 2.54	+2.59 [✓]	424
21	-0.64	-0.85	8.85	+ 2.05	+ 2.16	+2.21 [✓]	424
168	-0.48	-0.64	9.08 ⁸	+ 2.28	+ 2.39	+2.44 [✓]	39
403	-0.49	-0.65	9.60	+ 2.80	+ 2.90	+2.95 [✓]	1122

59

95

I 41890

Book 4

Page 157

 $P = 3.47$ $2_2 = .69$

H.R.

21	-0.47	-0.68	9.04	2.26	2.37	2.38 [✓]
424	-0.19 ⁹	-0.28	8.90	2.12		
424	+0.19	+0.28	8.91	2.13		
403	-0.52	-0.75	9.49	2.71	2.81	2.82 [✓]
168	-0.40	-0.58	9.12	2.34	2.45	2.46 [✓]

60

I 41897

Book 4

Page 158

 $P = 3.42$ $2_2 = .70$

H.R.

188	-0.42	-0.60	9.14	2.34	2.20	2.20 [✓]
188	-0.45	-0.64	9.08	2.28	2.14	2.14 [✓]
424	-0.19	-0.27	8.91	2.11	2.14	2.11
424	+0.18	+0.26	8.91	2.11	2.20	2.11
39	-0.44	-0.63	9.63	2.83	2.44 ⁹¹	2.44 ⁹¹ ✓
1122	-0.26	-0.37	9.92	3.12	2.20 ^{3 1}	2.20 ^{3 1} ✓
1203	-0.38	-0.54	9.75	2.95	3.01	3.01 [✓]
911	-0.66	-0.94	9.40	2.60	2.63	2.63 [✓]
1165	-0.38	-0.54	9.75	2.95	3.03	3.03 [✓]
(30a)	+0.23	+0.33	10.65	2.85 ³	3.93	3.93 [✓]

96

61

I 41916

Book 4

Page 159

 $\beta = 3.34$ $2k = .57$

HR.

39	⁰ -1.33	-2.33	8.06	^{1.} 2.27	1.29	1.24 + 1.75 = 2.99 ✓
553	-0.48	-0.84	9.54	2.75	2.84	2.79 ✓
911	-0.62	-1.09	9.25	2.46	2.51	2.46 ✓
622	-0.27	-0.47	9.85	3.06	3.17	3.12 ✓
424	-0.15	-0.26	8.92	2.13	—	—
424	+0.16	+0.28	8.92	2.13	—	—
424	+0.15	+0.26	8.88	2.09	—	—

1916bae proj. 932x

62

97

I 41917 Book 4 Page 160 $\bar{P} = 3.37$ $22 = .81$

Mar 1	-0.68	-0.84	7.82	1.04	0.77	0.78 [✓]
Mar 2	-0.64	-0.79	7.87	1.09	0.79	0.80 [✓]
Mar 22	-0.42	-0.52	9.13	2.35	2.21	2.22 [✓]
188	-0.17	-0.21	8.95	2.17		
424	+0.17	+0.21	8.86	2.08		
424	-0.40	-0.49	9.19	2.41	2.52	2.53 ^{5✓}
168	-0.42	-0.52	9.76	2.98	3.09	3.10 [✓]
403	-0.46	-0.57	9.71	2.93	3.03	3.04 [✓]
553	-0.15	-0.19	10.06	3.28	3.40	3.41 [✓]
622						
911	-0.49	-0.60	9.64	2.86	2.90	2.91 [✓]
915	-0.20	-0.25	10.02	3.24	3.35	3.36 [✓]
1017	-0.25	-0.31	8.83	2.05	2.17	2.18 [✓]
1122	-0.18	-0.22	10.24	3.26	3.37	3.38 [✓]
1708	-0.87	-1.07	6.99	0.21	0.30	0.31 [✓]
1708	-0.38	-0.47	7.08	0.30	0.39	0.40 [✓]
1220	-0.30	-0.37	9.86	3.08	3.20	3.21 [✓]
1165	-0.23	-0.29	9.95	3.17	3.27	3.28 [✓]
(386)	(+0.27)	(+0.33)	(10.57)	(3.79)	(3.89)	(3.90)
1203	-0.31	-0.38	9.86	3.08	3.20	3.21 [✓]
1577	-0.50	-0.62	9.66	2.88	2.99	3.00 [✓]
1666	-0.32	-0.40	9.88	3.10	3.08	3.09 [✓]
1790	-0.05	-0.06	8.56	1.78	1.82	1.83 [✓]
1851-2	-0.32	-0.40	9.28	2.50	2.51	2.52

98

63

I 41918

Book 4

Page 161

 $\bar{x} = 3.44$ $2\sigma = .80$

Marz.	-1.39	-1.74	7.92	1.14	0.94	0.93 [✓]
Marz.	-0.58	-0.72	7.92	1.14	0.94	0.93 [✓]
HR 188	-0.37	-0.46	9.27	2.49	2.35	2.34 [✓]
" 424	-0.23	-0.29	8.87	2.09		
424	+0.23	+0.29	8.93	2.15	2.25	
553	-0.55	-0.69	9.53	2.75	2.8 ⁵	2.84 [✓]
622	-0.28	-0.35	9.91	3.13	3.25	3.24 [✓]
911	-0.53	-0.66	9.58	2.80	2.83	2.82 [✓]
915	-0.33	-0.41	9.83	3.05	3.16	3.15 [✓]
1017	-0.41	-0.51	8.63	1.85	1.96	1.95 [✓]
1122	-0.26	-0.32	9.92	3.14	3.24	3.23 [✓]
1165	-0.35	-0.44	9.83	3.05	3.13	3.12 [✓]
(346)	+0.21	+0.26	10.53	3.75	(3.8 ⁵)	(3.8 ⁵) [✓]
1203	-0.40	-0.50	9.74	2.96	3.06	3.05 [✓]
1220	-0.32	-0.40	9.91	3.13	3.24	3.23 [✓]
1457	-0.56	-0.70	7.94	1.16	1.21	1.20 [✓]
1457	-0.11	-0.14	7.94	1.16	1.21	1.20 [✓]
1577	-0.55	-0.69	9.60	2.82	2.90	2.89 [✓]
1910	-0.19	-0.24	10.04	3.26	3.32	3.31 [✓]
2095	-0.49	-0.61	9.64	2.86	2.94	2.93 [✓]
2286	-0.20	-0.25	10.06	3.28	3.32	3.31 [✓]
2061	-0.14	-0.18	7.90	1.12	1.13	1.12 [✓]
2061	+0.22	+0.28	7.85	1.07	1.09	1.08 [✓]
1666	+0.15	+0.19	10.47	3.69	3.67	3.66 [✓]
1790	+0.01	+0.01	8.63	1.85	1.90	1.89 [✓]
2421	-0.12	-0.15	9.03	2.25	2.30	2.29 [✓]
1851-2	-0.15	-0.19	9.45	2.67	2.69	2.68 [✓]
3569	+0.02	+0.02	10.22	3.44	3.46	3.45 [✓]
1903	-0.29	-0.36	8.78	2.00	2.02	2.01 [✓]
2491	+0.20	+0.25	5.81	x -0.97	-1.19	-1.18 ^{2.0⁵✓}

64

99

I 41942

Book

Page 162 $P=3.42$ $22=.65$

Mars	-1.32	^{2 03} -2.18	⁶³ 7.48	⁸⁹ 0.74	⁸⁶ 0.71	⁸³ 0.68 [✓]
Jupiter	-1.53	³⁵ -2.51	⁷² 7.56	⁹⁸ 0.82	⁹⁴ 0.78	⁹¹ 0.75 [✓]
HR 424	-0.13	-0.20	8.90	2.16	()	
Same	+0.15	+0.23	8.85	2.11	()	
Same	+0.18	+0.28	8.88	2.14	()	
Same	-0.18	-0.28	8.84	2.10	()	
HR 168	-0.36	-0.55	9.09	2.35	2.43	2.40 [✓]
15	-0.42	-0.65	8.98	2.24	2.26	2.23 [✓]
264	-0.88	-1.35	8.82	⁸ 2.04	⁶ 2.12	¹³ 2.09 [✓]
403	-0.44	-0.68	9.52	2.78	2.86	2.83 [✓]
553	-0.39	-0.60	9.55	2.81	2.88	2.85 [✓]
622	-0.16	-0.25	9.93	3.19	3.28	3.25 [✓]
911	-0.49	-0.75	9.42	2.68	2.71	2.68 [✓]
915	-0.21	-0.32	9.86	3.12	3.23	3.20 [✓]
1122	-0.14	-0.22	10.02	3.28	3.40	3.37 [✓]
1165	-0.25	-0.38	9.83	3.09	3.19	3.16 [✓]
(21a)	+0.30	+0.46	10.72	3.98	4.08	4.05 [✓]
1203	-0.23	-0.35	9.89	3.15	3.26	3.23 [✓]
1220	-0.20	-0.31	9.89	3.15	3.26	3.23 [✓]
1666	-0.37	-0.57	9.80	3.06	3.06	3.03 [✓]
1865	-0.43	-0.66	9.56	2.82	2.69	2.66 [✓]
Same	+0.08	+0.12	9.76	3.02	2.89	2.86 [✓]
2294	+0.01	+0.02	9.16	2.42	2.28	2.25 [✓]
1577	-0.46	-0.71	9.59	2.85	2.96	2.93 [✓]
2491	+0.01	+0.02	5.53	^{-1.21} -1.79	-1.34	-1.37 [✓]
Same	-0.25	-0.38	5.65	-1.09	-1.22	-1.25 [✓]

100

I 41945

Book 4

Page 163

 $\beta = 3.58$ $2\alpha = .71$

HR 1017	-0.81	-1.14	8.52	1.78	1.90	1.87 ^v
Same	-0.43	-0.61	8.54	1.80	1.92	1.89 ^v
HR 424	-0.17	-0.24	8.89	2.15	—	—
Same	+0.17	+0.24	8.84	2.10	—	—
HR 1122	-0.31	-0.44	9.78	3.04	3.16	3.13 ^v
1165	-0.38	-0.54	9.70	2.96	3.07	3.04 ^v
(27b)	+0.19	+0.27	10.51	3.77	3.88	3.85 ^v
HR 1203	-0.43	-0.61	9.65	2.91	3.03	3.00 ^v
1220	-0.48	-0.68	9.55	2.81	2.93	2.90 ^v
1577	-0.56	-0.79	9.51	2.77	2.89	2.86 ^v
1708	-1.00	-1.41	6.63	-0.11 -0.01	+0.01	-0.02 ^v
Same	-0.62	-0.87	6.67	-0.07	+0.05	+0.02 ^v
1666	-0.33	-0.46	9.80	3.06	3.06	3.03 ^v
1910	-0.30	-0.42	9.82	3.08	3.18	3.15 ^v
2286	-0.31	-0.44	9.82	3.08	3.18	3.15 ^v
1790	+0.02	+0.03	8.65	1.91	1.97	1.94 ^v
1851-2	-0.27	-0.38	9.28	2.54	2.57	2.54 ^v
1903	-0.32	-0.45	8.65	1.91	1.93	1.90 ^v
1948-9	-0.10	-0.14	8.96	2.22	2.24	2.21 ^v
2004	-0.10	-0.14	8.99	2.25	2.21	2.18 ^v
2088	-0.23	-0.32	8.80	2.06	2.18	2.15 ^v
1865	+0.15	+0.21	9.89	3.15	3.01	2.98 ^v
2061	-0.11	-0.15	7.92	1.18	1.24	1.21 ^v
2095	-0.45	-0.63	9.57	2.83	2.95	2.92 ^v
Blank 2226	-0.04	—				
2294	-0.04	-0.06	9.06	2.32	2.18	2.15 ^v
2491	-0.36	-0.51	5.51	-1.23	-1.34	-1.37 ^v

I 41947

Book 4

Page 164

 $\sigma = 3.44$ $2\sigma = .77$

HR 1122	-0.37 -0.48	9.83	3.05	3.17	3.21 [✓]
1203	-0.49 -0.64	9.67	2.89	3.01	3.05 [✓]
1220	-0.42 -0.55	9.79	3.01	3.13	3.17 [✓]
1666	-0.49 -0.64	9.65	2.87	2.86	2.90 [✓]
424	-0.21 -0.27	8.90	2.12	—	—
"	+0.20 +0.26	8.90	2.12	—	— [✓]
1577	+0.49 ⁺ -0.64	9.30 8.02	2.42 ² 1.24	2.64 1.36	2.68 1.40 [✓]
1851,2	-0.45 -0.58	9.10	2.32	2.35	2.39 [✓]
1865	+0.03 +0.04	9.72	2.94	2.81	2.85 [✓]
1910	-0.37 -0.48	9.76	2.98	3.08	3.12 [✓]
1948-9	-0.44 -0.57	8.05	1.27	1.29	1.33 [✓]
2004 (out)	—	—	—	—	—
2061	-0.63 -0.82	7.82	1.04	1.11	1.15 [✓]
"	-0.26 -0.34	7.74	0.96	1.03	1.07 [✓]
2286	-0.29 -0.38	9.92	3.14	3.24	3.28 [✓]
2294	+0.02 +0.03	9.21	2.43	2.30	2.34 [✓]
2421	-0.21 -0.27	8.90	2.12	2.21	2.25 [✓]
2491	-0.64 -0.83	5.70	-1.08	-1.19	-1.15 [✓]
"	-0.20 -0.26	5.78	-1.00	-1.11	-1.07 [✓]

102

73

I 42080

Book 4

Bg. 174

 $P = 3.33$ $22 = .75$

H.R. 424 -0.15 -0.20

8.96

2.20

2.20

H.R. 424 +0.15 +0.20

8.82

2.06

2.06

Saturns -0.86 -1.15

7.45

0.69

0.67[✓]

Saturns -1.34 -1.59

7.51

0.75

0.73[✓]

H.R. 5685 -0.55 -0.73

9.47

2.71

2.67[✓]

6378 -0.49 -0.65

9.55

2.79

2.59[✓]

6378 -0.09 -0.12

9.54

2.78

2.60[✓]

74

I 42083

Book 4

Bg. 175

 $P = 3.38$ $22 = .76$

H.R. 424 -0.17 -0.22

8.90

2.19

2.19

H.R. 424 +0.17 +0.22

8.87

2.16

2.16

Saturns -0.92 -1.16

7.44

0.73

0.73[✓]

Saturns -0.47 -0.62

7.44

0.73

0.73[✓]

H.R. 4554 -0.32 -0.42

9.23

2.52

2.61[✓]

4554 -0.70 -0.92

9.26

2.55

2.64[✓]

4932 -0.37 -0.49

9.73

3.02

3.07[✓]

4914,5 -0.40 -0.53

9.66

2.95

3.05[✓]

5235 -0.48 -0.63

9.55

2.84

2.92[✓]

5685 -0.54 -0.71

9.45

2.74

2.71[✓]

6056 -0.42 -0.55

9.61

2.90

2.90[✓]

6175 - -

-

-

-

6175 -0.51 -0.67

9.51

2.80

2.74[✓]

6378 - -

-

-

-

6378 - -

-

-

-

7# 75-

I 42088

Book 4

Pg. 176

 $\beta = 3.54 \ 222.74$

HR 424	-0.24	-0.32	8.82	2.20	2.20
424	+0.23	+0.31	8.61	1.99	1.99
Saturn	-0.83	-1.12	7.16	0.54	0.54 [✓]
Saturn	-0.60	-0.81	7.25	0.63	0.62 [✓]
HR 4554	-0.34	-0.46	9.20	2.58	2.67 [✓]
4554	-0.87	-1.18	9.04	2.42	2.50 [✓]
4932	-0.50	-0.68	9.58	2.96	3.01 [✓]
4914.5	-0.48	-0.65	9.58	2.96	3.05 [✓]
5235	-0.61	-0.82	9.40	2.78	2.86 [✓]
5685	-0.61	-0.82	9.45	2.83	2.79 [✓]
6056	-0.57	-0.77	9.47	2.85	2.86 [✓]
6175	-0.59	-0.80	9.48	2.86	2.81 [✓]
6378	-0.61	-0.82	9.42	2.80	2.67 [✓]
6378	-0.22	-0.30	9.38	2.76	2.63 [✓]

104

76

I 42092

Book 4

Page 177

 $P = 3.38$ $2a = .81$

H.R 424	-0.20	-0.25	8.93	2.12	2.12
424	+0.19	+0.23	8.88	2.07	2.07
Saturn	-0.95	-1.17	7.45	0.64	0.63 [✓]
Saturn	-0.48	-0.59	7.48	0.67	0.66 [✓]
4554	-0.27	-0.33	9.35	2.54	2.62 [✓]
4554	-0.70	-0.86	9.37	2.56	2.64 [✓]
4932	-0.34	-0.42	9.85	3.04	3.09 [✓]
4914.5	-0.34	-0.42	9.84	3.03	3.13 [✓]
5235	-0.53	-0.65	9.59	2.78	2.87 [✓]
5685	-0.47	-0.58	9.68	2.87	2.84 [✓]
6056	-0.44	-0.54	9.73	2.92	2.92 [✓]
6175	-0.48	-0.59	9.68	2.87	2.81 [✓]
6378	-0.53	-0.65	9.59	2.78	2.62 [✓]
6378	-0.04	-0.05	9.63	2.82	2.68 [✓]

77

105

I 42093

Back 4

Page 178

 $\sigma = 3.38$ $2\sigma = .76$

4.9 424	-0.19 -0.25	8.91 [✓] 678	2.14	2.14
424	+0.20 +0.26	8.87	2.12	2.12
Saturn	-0.85 -1.12	7.47	0.70	0.70 [✓]
Saturn	-0.46 -0.61	7.45	0.68	0.68 [✓]
4554	— —	—	—	—
4554	-0.65 -0.86	9.33	2.56	2.65 [✓]
4932	-0.31 -0.41	9.85	3.08	3.14 [✓]
4914.5	-0.32 -0.42	9.84	3.07	3.17 [✓]
5235	-0.35 -0.46	9.78	3.01	3.10 [✓]
5685	-0.30 -0.39	9.84	3.07	3.04 [✓]
6056	-0.27 -0.36	9.92	3.15	3.15 [✓]
6175	-0.35 -0.46	9.80	3.03	2.97 [✓]
6378	-0.44 -0.58	9.65	2.88	2.82 [✓]
6378	+0.03 +0.04	9.68	2.91	2.77 [✓]

$$\begin{array}{r} 591 \\ 678 \\ \hline 2.18 \end{array}$$

$$\begin{array}{r} 889 \\ 678 \\ \hline 1.1 \end{array}$$

106

X 14850

do?

Hypothetical value for P of 3.00

2S = 75

HR		$\div 25$	Conf. from	Conf. 2. D	HR values.	diff.	value =		
2326	+66	+80 ¹	0.89 ⁹⁰	0.91 ⁹²	-0.86	-1.71 ^{1.16}	-0.76 ^{1.16}	-0.75	
F0	+95	+1.33 ²⁷	0.91 ⁶⁵	0.93 ⁶⁷	-0.86	-1.71 ^{1.16}	-0.74 ^{1.16}	-0.78	
2421	+75	+1.00	3.64	3.64 ²⁰⁷	1.93	-1.71	1.91 ^{1.57}	1.91 ^{1.57}	
- A0	-	-	-	-	-	-	-	-	
2491	50	+67	0.25	0.31 ^{1.42}	-1.58	-1.89 ^{1.71}	-1.37 ^{1.71}	-1.34 ^{1.71}	-1.36
A0	93	+1.24	0.32	0.37	-1.58	-1.91 ^{1.71}	-1.30 ^{1.71}	-1.30 ^{1.71}	
-	-	-	-	-	-	-	-	-	
2618	46	+61	3.25 ^{2.03}	3.28	1.63	-1.65	1.61 ^{1.60}	1.60 ^{1.60}	1.45
B1	84	+1.12	3.24	3.27	1.63	-1.64	1.60 ^{1.59}	1.60 ^{1.59}	
2693	53	+71	3.35	3.37	1.98	-1.39	1.70 ^{1.69}	1.75 ^{1.71}	1.85
F8V	95	+1.33 ^{1.27}	3.45 ^{3.9}	3.47 ^{3.41}	1.98	-1.49 ^{1.39}	1.50 ^{1.73}	1.50 ^{1.73}	
2890.1	72	+96 ^{2.4}	3.80 ^{3.6}	3.83 ^{3.6}	1.58	-1.45 ^{1.39}	1.36 ^{1.65}	1.36 ^{1.65}	1.55
A0	-	-	-	-	-	-	-	-	
2943	46	+61 ^{1.1}	2.22	2.00 ^{1.40}	0.48	-1.52 ^{1.60}	0.33 ^{1.60}	0.38 ^{1.60}	0.37 ^{1.60}
F5	94	+1.25	2.35	2.11	0.48	-1.63 ^{1.71}	0.44 ^{1.71}	0.44 ^{1.71}	
3307	80	+1.07	3.71	3.58	1.74	-1.84	1.91 ^{1.84}	1.83 ^{1.84}	1.82
K0p	1.07	+1.43	3.55	3.42	1.74	-1.68	1.73 ^{1.74}	1.73 ^{1.74}	
3485 ^{A0}	84	+1.12	3.76	3.66	2.01	-1.65	1.99 ^{1.98}	1.99 ^{1.98}	2.05
3685 ^{A0}	71	+95	3.59	3.43	1.80	-1.63	1.76 ^{1.65}	1.76 ^{1.65}	1.69
-	-	-	-	-	-	-	-	-	
3748 ^{K2}	103	+137 ^{2.4}	4.01	3.93 ^{2.00}	2.16	-1.77 ^{1.87}	2.26 ^{2.25}	2.26 ^{2.25}	2.07
3983 ^{B8}	73	+97	3.09	3.00 ^{1.40}	1.34	-1.66 ^{1.60}	1.33 ^{1.60}	1.33 ^{1.60}	1.48
-	-	-	-	-	-	-	-	-	
6527	58	+77 ^{2.4}	3.41	3.37	1.71	-1.66	1.90 ^{1.69}	1.72 ^{1.69}	1.79
B2	98	+131	3.43	3.40	1.71	-1.69	1.73 ^{1.72}	1.73 ^{1.72}	

$$20 \overline{) 1344} \begin{array}{r} 66 \\ -1344 \\ \hline 0 \end{array}$$

$$8 \overline{) 524} \begin{array}{r} 65 \\ -524 \\ \hline 0 \end{array}$$

$$41 \overline{) 48} \begin{array}{r} 1 \\ -48 \\ \hline 0 \end{array}$$

X 14 865

P = 3.00

#R		$\div 28$	Cor for f ₂₁	Cor for f ₂₀	#R	Diff	margin f ₈₅₋₃	Diff	Value = 7 - .82 - .83
2491	-21	-29	-0.31	-0.68	-1.58	-0.90	-1.42	-0.74	-1.50
Av	+26	+36 ¹²	-0.56	-0.54	-1.58	-1.04	-1.42	-0.88	-1.36
	+77	+1.05 ^{1.43}	-0.38	-0.36	-1.58	-1.22	-1.42	-1.06	-1.18
2618	-34	-47 ²⁴	+2.17	2.18	1.63	-0.55			1.36
B1	+18	+25	+2.37	2.37	1.63	-0.74			1.55
2693	-1	-1	+2.63	2.62	1.98	-0.64			1.80
F8h	+46	+63	2.75	2.73	1.98	-0.75			1.91
2820.1	+7	+10	2.74	2.41	1.58	-0.83	1.64	-0.77	1.59
Av	+44	+60	2.72	2.36	1.58	-0.78	1.64	-0.72	1.54
2910	+19	+26	2.38	2.05	1.21	-0.84	1.18	-0.87	1.23
K0	+47	+64 ¹⁶¹	2.35	1.99	1.21	-0.88	1.18	-0.81	1.17
2943	+31	+42	1.52	1.25	0.48	-0.77	0.40	-0.85	0.43
F5	+57	+78 ⁵⁹	1.37	1.17	0.48	-0.69	0.40	-0.77	0.35
3206.7	+17	+23 ²⁶⁴	2.47	2.77	1.85	-0.92			1.95
B3.0-5	+50	+68	2.80	2.69	1.85	-0.84			1.87
3307	+15	+21	2.85	2.69	1.74	-0.95			1.87
Kor	+49	+67	2.79	2.61	1.74	-0.87			1.79
3485 Av	+28	+38 ²⁶⁴	3.07	2.87	2.01	-0.86			2.05
3685	+3	+4	2.68	2.50	1.80	-0.70			1.68
Av	+45	+62	2.74	2.54	1.80	-0.74			1.72
3748 K2	+31	+42 ²⁶⁴	3.00	2.90	2.16	-0.84	2.06	-0.44	1.68
3982 B	+33	+45	2.57	2.37	1.34	-1.03	1.40	-0.97	1.55
B8	+63	+86 ¹⁶¹	2.47	2.25	1.34	-0.91	1.40	-0.85	1.43
6527	-4	-5	2.59	2.61	1.71	-0.90			1.79
B2	+36	+49	2.61	2.63	1.71	-0.92			1.81

25 | 2041 | -82
 2041 | 200 |
 40 | 41
 25 | 2051 | -83
 200 |

12 | 973 | -81
 973 | 40 |
 12 | 973 | 1013 | 154
 26 | 3

108

X14869

Chi-Square Plot

#R			Conf found	Hypothetical corr for 2.5	value for 76-6	diff	Corr χ^2 +4.12	2.5 =
2491	+14	+27	-1.73	-1.70	-1.36	+0.34	-1.39	-3
A ₀	+31	+60	-1.90	-1.87	+1.36	+0.44	-1.38	-2
	+60	+1.15	-1.85	-1.83				
2618	-3	-6	0.94	0.97	1.36	+0.32	1.45	+10
B1	+31	+60	1.10	1.12				
2693	+60	+1.15	2.25	2.28	2.65	+0.53	2.58	-11
F8V	+85	+1.44	1.94	1.96				
2820.1	+33	+63	1.63	1.23	1.68	+0.39	1.70	+3
A ₀	+65	+1.25	1.75	1.35				
2920	+77	+1.48	1.98	1.65	2.36	+0.66	2.18	-25
K ₀	+1.08	+2.08	2.08	1.75				-20
2943	+27	+52	0.52	0.35	0.85	+0.50	0.78	-8
F5	+52	+1.00	0.50	0.33				-7
	+80	+1.54	0.54	0.37				
3206.7	+24	+46	1.46	1.40	1.47	+0.10	1.78	+32
B3 IV	+47	+90	1.40	1.34				
3307	+1.06	+2.04	3.04	2.91	3.29	+0.38	3.38	+3 +4
3485	+33	+63	1.63	1.54	2.05	+0.51	1.95	+10 -9
3685	+31	+60	1.60	1.39	1.76	+0.44	1.78	-3 -2
A ₀	+50	+96	1.46	1.25				
3748	+1.04	+2.00	3.00	3.01	3.62	+0.61	3.48	-20 -19
3982	+2.9	+56	1.06	1.04	1.30	+0.33	1.389	+8 +9
B2	+48	+92	0.92	0.98				
6527	+10	+19	1.19	1.22	1.49	+0.25	1.65	+16 +17
	+39	+75	1.25	1.40				
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div> 13 / 588 52 78 25 </div> <div> +42 +64 +75 -40 -74 13 / 149 13 17 </div> </div>								

108

X14869 Chi-Square P

Conf. Interval

#R				
2491	+14	+27	-1.73	-1.70
A ₀	+31	+60	-1.90	-1.87
	+60	+1.15	-1.85	-1.82
2618	-3	-6	0.94	0.97
B1	+31	+60	1.10	1.12
2693	+60	+1.15	2.25	2.28
F8V	+85	+1.44	1.94	1.96
2520.1	+33	+63	1.63	1.23
A ₀	+65	+1.25	1.75	1.35
2590	+77	+1.48	1.98	1.65
K ₀	+1.08	+2.08	2.08	1.75
2943	+27	+52	0.52	0.35
F5	+52	+1.00	0.50	0.33
	+80	+1.54	0.54	0.37
3206.7	+24	+46	1.46	1.40
B3Ve	+47	+90	1.40	1.34
3307	+1.06	+2.04	3.04	2.91
3485	+33	+63	1.63	1.54
3685	+31	+60	1.60	1.39
A ₀	+50	+96	1.46	1.25
3748	+1.04	+2.00	3.00	3.01
3922	+29	+56	1.06	1.04
B2	+48	+92	0.92	0.98
6527	+10	+19	1.19	1.22
	+39	+75	1.25	1.40

H_R value

probably the value
is not so.
Recorded on this sheet
but

-1.58 -23

1.63 -59

1.98 +14

1.58 -29

1.21 +49

0.48 -12

1.85 -48

1.74 +17

2.01 -47

1.80 -48

2.16 +83

1.34 -37

1.71 -47

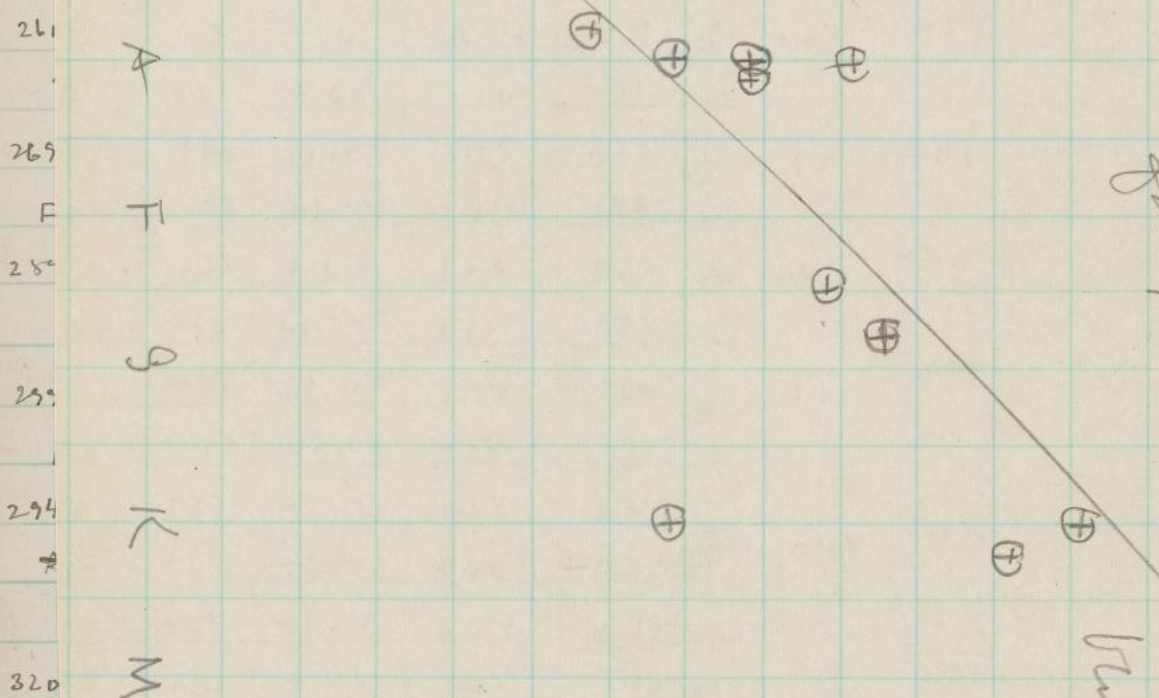
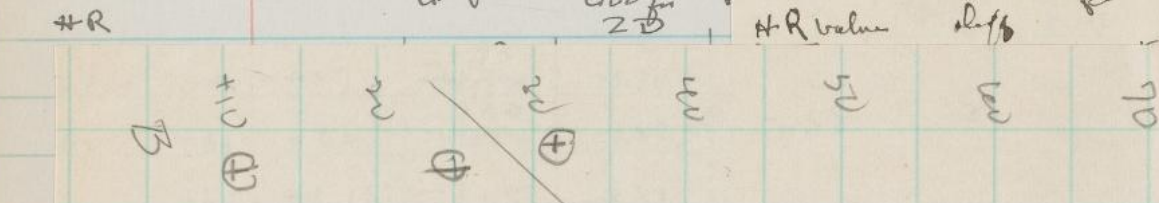
Hi - Good P

can for ~~70000~~.

Chy for
con for
ZD

H R value

evidently the plates
 is not so.
 Recreated on the Street
 shop



Plot 7 with configuration BOM II 6.108
for 7.14.82

Although reversed
the plot is off

Although recommended
I have kept it. I affirm
is not.

from the 1 of June,
Surfaced at the State Agency
have been normally
recorded as the "Spicy"
Not from out as seen of
about 1000

con and fustep

$$a +1.00$$

$$1 +.50$$

$$2 0.00$$

$$3 -.50$$

$$4 -1.00$$

$$5 -1.50$$

$$6 -2.00$$

$$7 -2.50$$

$$8 -3.00$$

Chemicals.

H_2SO_4 85% 6 liters
Nitrobenzene 10 lbs.

