Hoaglands Mixture

We used:

$LiCl$	27.8 mg/L
$CuSO_4 \cdot 5H_2O$	55.6 mg/L
$ZnSO_4$	55.6 mg/L
H_3BO_3	611 mg/L
$Al_2(SO_4)_3 \cdot 18H_2O$	55.6 mg/L
$SnCl_2$	27.8 mg/L
$(NH_4)_6Mo_7O_{24} \cdot 4H_2O$	20 mg/L
$FeSO_4$	200 mg/L
$MnCl_2 \cdot 4H_2O$	389 mg/L
$NiSO_4 \cdot 6H_2O$	55.6 mg/L
$Co(NO_3)_2 \cdot 6H_2O$	55.6 mg/L
TiO_2	55.6 mg/L
KI	27.8 mg/L
KBr	27.8 mg/L

	Time	elapsed t	Vol collected	w	Σ	Pins
364 Vgt = 31	6:20 PM 8:17 a.m	13.95 hrs	53 ml	3.80	8.16	2
366 Vgt = 103	7:05 P.M. 9:41 a.m.	14.6 hrs	189	~~7.69~~ 12.94	~~13.4~~ 7.95	2
367 Vgt = 25.6	7:05 P.M. 9:39 a.m.	14.6 hrs	66 ml	4.52	5.67	3
363A Vgt ~~18.7~~	10:20 P.M. 11:20 a.m.	13	78	6.0	3.12	1

Tuesday

Exper. No.	1-28-52	time elapsed	Volume collected	W	t	Pins
364 Vgt = 31	1.1 P.M. to 9.60 M.	20.5	97.5	4.76	6.51	2
356 Vgt = 22.2	9.80 A.M. F to 10.40 A.M. M	72.6	220	3.03	7.33	6
359 Vgt = 42	3:50 P.M. to 2:50 P.M.	23.0	140	6.09	6.90	

Brandt

Fog Mineral Concentrate

$CaCl_2 \cdot 2H_2O$	✓	2.62 gm	2.62 ✓ .215 2.835
$FeSO_4 \cdot 7H_2O$	✓	1 gm	
H_3BO_3	✓	100 mg	
$MnCl_2 \cdot 4H_2O$	✓	60 mg	59.6
$Co(NO_3)_2 \cdot 6H_2O$	✓	3 mg	3.1 mg
H_2O	✓	200 ml	
HCl (conc)	✓	2 ml	

Anker Has:

l
- Lysine
- Histidine
- Tryptophan
- Leucine
- Aspartic
- Glutamic

l
- Asparagine
- Arginine
- Ornithine
- Tyrosine
- β alanine

He Lacks:

l
- Methionine
- Valine
- Isoleucine
- Proline
- OH proline
- Serine
- Threonine

~~$CaCl_2$ $10 mg/L \times 10^3$~~	10 gm / L	2 gm
$FeSO_4$	5 gm / L	1 gm
H_3BO_3	500 mg / L	100 mg
$MnCl_2 \cdot 4H_2O$	300 mg / L	60 mg
$Co(NO_3)_2 \cdot 6H_2O$	15 mg / L	3 mg
H_2O	1 Litre	200 ml
HCl (Conc	10 ml	2 ml

1/26/52

Trace Elements to be added to F medium

$CaCl_2$	10 mg/liter
$FeSO_4$	5 mg/liter
H_3BO_3	500 γ/liter
$MnCl_2 \cdot 4H_2O$	300 γ/liter
$Co(NO_3)_2 \cdot 6H_2O$	15 γ/liter

10 cc / liter tapwater from main in Washington faucet end of West Stands

Soln 1

500 mg ~~grams~~ $FeSO_4$

1 ml Conc HCl in 100 ml H_2O

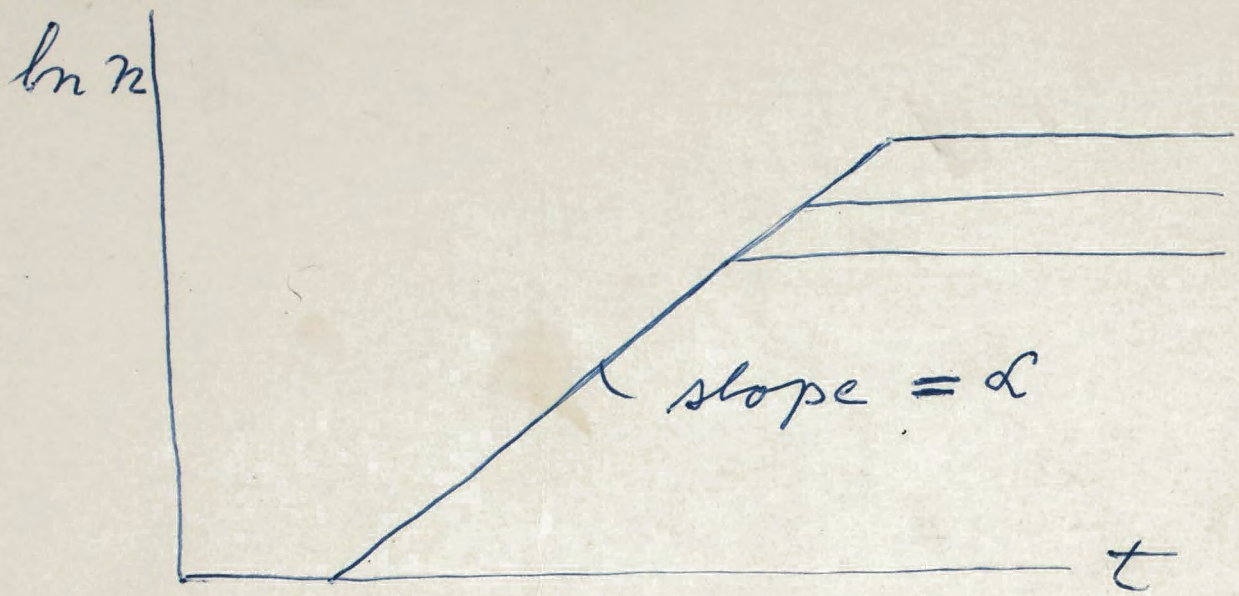
Soln 2.

50 mg H_3BO_3

30 mg $MnCl_2 \cdot 4H_2O$

in 100 ml H_2O

$$n = \text{Const}\, e^{\alpha t}$$



$$\tau = \frac{1}{\alpha} \; ; \quad \tau_m = 70\,\text{min}$$

1.) $\alpha(c) = \frac{W}{V}$ i

$a_1 \longrightarrow a_2$

$n_1 \longrightarrow n_2$

2.) $a = c + n Q$

$Q = 2\,10^{-15}$ gm

for $a \approx 1000\,\gamma/\ell$

$a \approx n Q$

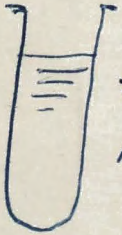
$n \approx \frac{a}{Q}$

$$\begin{cases} \tau = \frac{V}{W} > 70 \text{ min} \\ c < 10\,\gamma/\ell \end{cases}$$

$a = 1000\,\gamma/\ell$

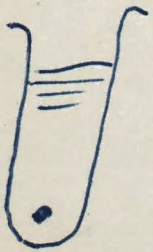
$n = 5 \times 10^{8}$/cc

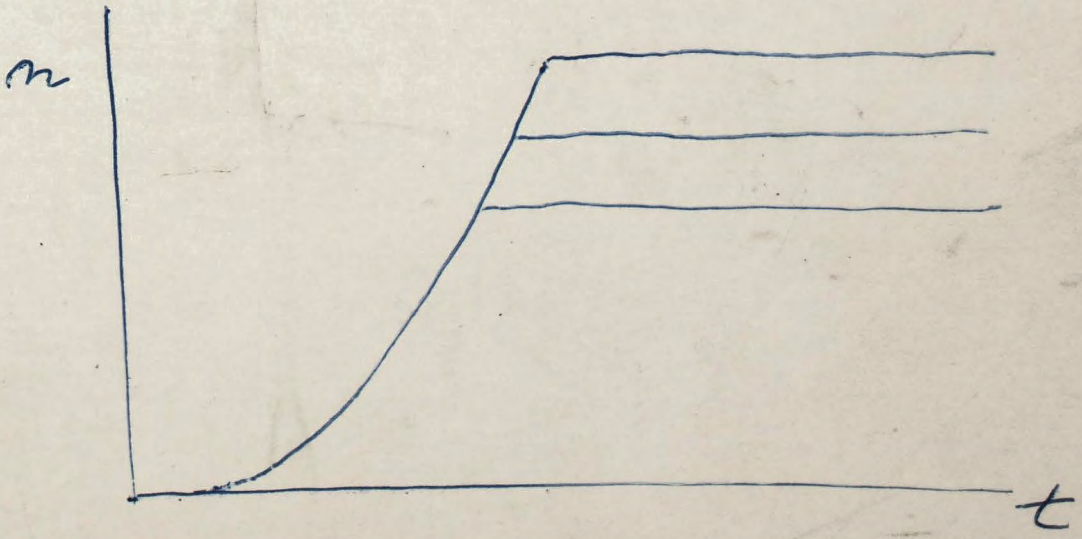
coli



lactate
tryptophane

$$n = \text{Const}\ e^{\alpha t}$$





$$k = A\, e^{-\frac{W}{RT}}$$

$$10^{5} < A < 10^{14}$$

we find drop in mutation rate of factor 2 for drop in temp of $10^{\circ}C$ or

$$A = 10^{-3}$$

10^{8} times less than min. value above.

12252
606

Energy considerations JB Britain 363B

with lactate medium + Fox salts

and low flow of oxygen density

refer: 1.61 { 0.29 (corr) this rises to
0.46 (corrected)

at τ = 93 to 94 min

with amino acid mixture NO2
50 cc to 1 Liter
100 µl/l Tryptophane

if τ is doubled (with amino acid mixture)

density rises from 0.461 to 0.716 (corrected)

1.55

acceleration reduced:

τ = 93 density 0.189
τ = 2 x 93 " 0.319

} refer 1.69

Fast Chemostat 349 C

running on amino acid mixture see 349 B
BQ strain E is used Beckmann at 350
observed for stationary state.

$\bar{v}$ = 82.5 Beckm 0.360 6 pins
54 min 0.220 9 pins
11 pins

Werkman & Wilson
Bacteriology Physiology
Academic Press 1951 NYC

0.075 / hrs 12

35
14
4

53

14

(0.8)

27 mg/l trypt.

14+35+4

14

14 gm 200 gm

~~200~~ / ~~14~~ | 14/200 × 27 = (2) mg/l N

(1 − 1/8) 7 mg/l ~~5~~ × 3/8 ≈ 3 mg/l NH4Cl

7 mgm/l (A)
NH4Cl

588
171
384

~~640~~ 497
145

55
2

22.5
14

638352
-188 1.7
450

3000
1200
2
400

0000
360
440
/1.7

262
508
254
=.121

7200
198
507/1.7

79
26.6
3.6

737
206
531/1.7

667
192
475

768
215
553/1.7

6.3 x .14
14
252
2
135

7000
21
569/1.7

263
886
1488
1.986

350 = 0.250
.280 = 1.98

252
173
425/10 =
226
142
368

173
252

257

.30

484
144
340 ÷ 0.200
17

30

200/14 = (14)

550
120
380

100
14

30
143

30

29 − 15

210/14

200/14

M Saunders

True Jan 15/15

		Elapsed	Collected
350a	5:35 Pm Sun to 9:30 am Tues	40.25 hrs	112.0
V_{gt} = 23.5		τ = 8.03	
349B	5:17 Pm to 8:22 am	15.1 hrs	225 56 281
V_{gt} = 41.0		τ = 2.20	
356	12:25 Pm to 8:25 am	20.0 hrs	124
V_{gt} = 22.2		τ = 3.58	
354	5:43 Pm to 10:05 am	16.4 hrs	211
V_{gt} = 103		τ = 8.00	

334

(2 pairs)

After 21 hrs (57) 7.9×10^7 $\tau = 5.16$

" 41 hrs (7) 1.2×10^7 $\tau = 4.93$

" 73 hrs (12) 1.78×10^7 $\tau = 5.16$

Changed τ (1 pair)

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after 113 hrs (30) 1.09×10^8 $\tau = 7.40$

after 168 hrs 1.05×10^8 $\tau = 7.51$

( ) = 75 resistants/ml

Water is Standard — Tube 10

Sample 0	0.763	.118	0
300 ppm	0.753	.123	.005
1000 ppm	0.728	.138	.020
3000 ppm	0.602	.219	.101

200 ppm ≃ .081

1000 ppm = .0405

T = 5 ....

T = 7.5

$C_1 + P_{пеленгов\,1} = C_2 + P_{пеленгов\,2}$

$0.25 C_1 = P_{пел\,2} - P_{пел\,1}$

0.25

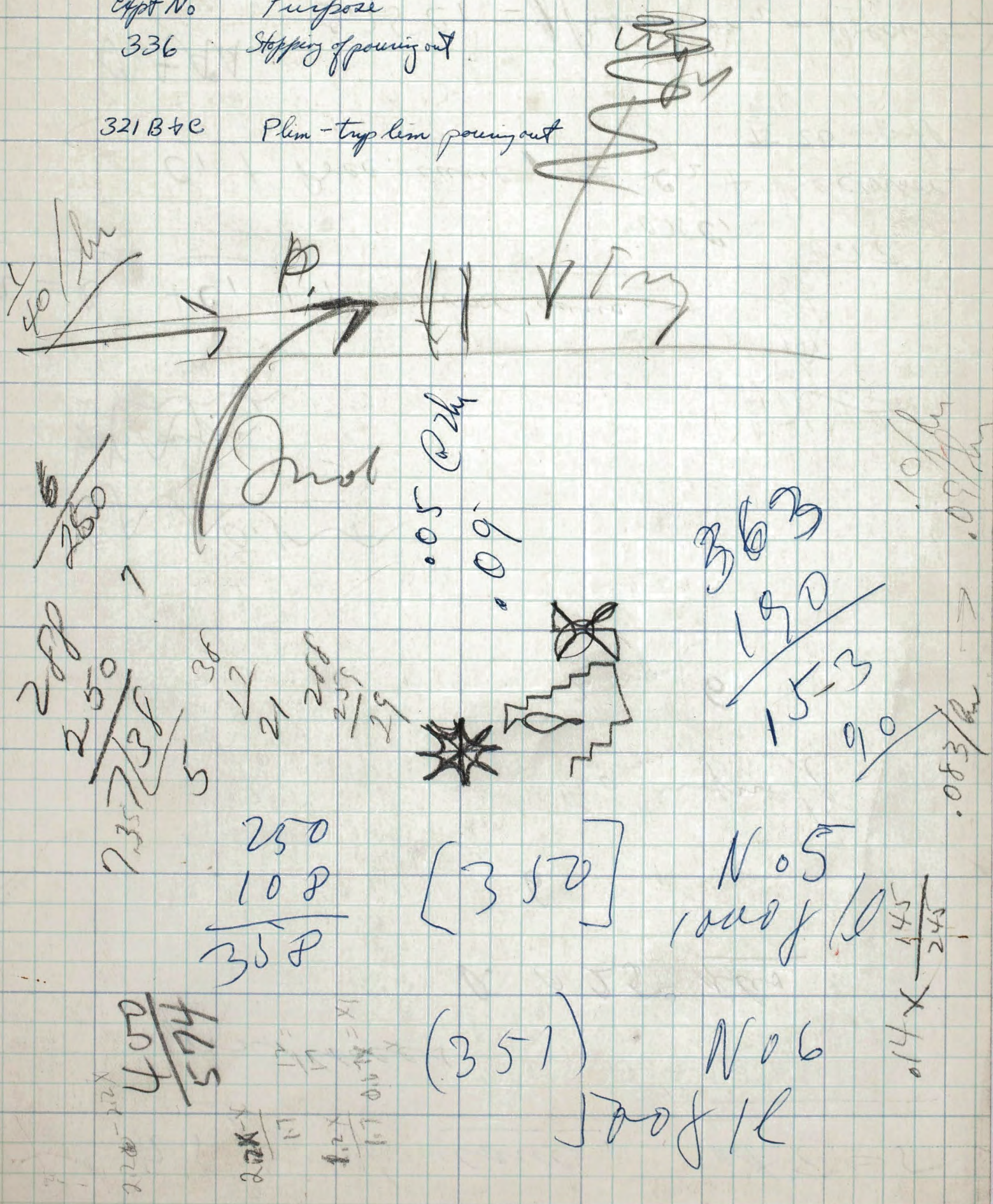
$\frac{C_1}{4} = \frac{6 \frac{25}{60}}{346}$ 20 миль

$C \approx$

$6 \frac{14.5}{20}$ мили 0.725

$1.2 - 0.78 \cdot 0.45$

Expt No	Purpose
336	Stopping of pouring out
321 B+C	Plim - trip lim pouring out



25% of conc. at $\bar{c} = 5$

produces

0.025 ales

6

20 mpn/l

2 mpn | 6

5A 0.1A

2/6 mpn

a = B + c_1 + Precursor conc.

0.75

0.75 c_1

c_1 + Prec. conc. = c_2 + Precursor$_2$

$\frac{75}{60}$ 20 mpn/l

0.25 c_1 = $\frac{1}{4}$ (Precursor$_2$ − Precursor$_1$)

$\frac{75}{60}$ 20 mpn − $\frac{50}{60}$ 20

+ $\frac{25}{4}$ 20 mpn

At 1000 g/l Temp.

3/11/ # Effect of Temp on precursor rate

Jan 10/52

[354] at 36.5°C $\tau = 4.2$

350: .245 280: .897 250: .418

$\frac{.907}{4.2} \frac{145}{245} = 0.130/hr$ +10

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at 25.3°C $\tau = 12.8$ hrs

350: 0.278 280: 1.404 250: .680

$\frac{1.404}{13} \frac{145}{265} = 0.060/hr$

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at 31.5 $\tau =$ 8 hrs

1 280: 1.464 250: .702

$\frac{1.464}{8} \frac{145}{265} = 0.100/hr$

36.5°C $\tau =$ 8

280: 1.788 250: 0.965

$\frac{1.800}{8} \frac{145}{265} = 0.123/hr$

43.5°C $\tau = 7.9$ hrs

350: .263 ; 280: 1.443 ; 250: 0.731

$\frac{1.443}{7.9} \frac{145}{265} = 0.100/hr$

3/11 To compare with 342 – 342A (500 g/l Temp)

at 25°C $\tau = 7.$ hrs

350: .135 280: .189 250: .117

$\frac{.189}{7} = 0.029 \approx 0.030/hr$

at $\tau = 13.7$ hrs

280: .590 ; 250: 302 $X_1 = .534/13.7 = 0.039/hr$

not long enough run

$\tau = 14.4$ hrs

350: 0.142 280: .600 ; 250: 315 $X_1 = .592/14.4 = 0.041$

342 - 342A

at 37°C $\bar{\tau} = 6.66$ hr

350: 0.137 ‖ 280: 668 − 17 = 651

250: 350 − 21 = 329 | X_1 = .649

$\frac{0.649}{6.66} = 0.0975$ /hr

corrected for infinite time 0.100 /hr

$\frac{[37]}{[25]} = \frac{100}{41} = 2.44$

to compare with [354]:

there $\frac{[37]}{[25]} = \frac{126.5}{60} = 2.1$