



KE 0019608

Barrel Fillers Ethyl

Age				
Age in years	f	x	fx	fx ²
20 - 24	1	0	0	0
25 - 29	2	1	2	2
30 - 34	6	2	12	24
35 - 39	2	3	6	18
40 - 44	7	4	28	112
45 - 49	2	5	10	50
50 - 54	0	6	0	0
55 - 59	1	7	7	49
60 -	<u>1</u>	8	<u>8</u>	<u>64</u>
	22		73	319

$$Nu_1 = \frac{73}{22} = 3.318142$$

$$Nu_2 = \frac{319}{22} = 14.499826$$

$$(Nu_1)^2 = 11.010066$$

$$Pi_2 = 3.489760$$

$$Sigma = 1.868090 \times 5 = 9.340450$$

$$P.E. sig. = \frac{.67449 \times 9.340450}{\sqrt{44}}$$

$$= \frac{6.300040}{6.633249}$$

$$= \pm .949767$$

$$mean = 3.318142 \times 5 + 22.5$$

$$= 39.090710 \text{ years}$$

$$P.E. m = \frac{.67449 \times 9.340450}{\sqrt{22}}$$

$$= \frac{6.300040}{4.690415}$$

$$= \pm 1.343173$$

$$mean = 39.091 \pm 1.343 \text{ years}$$

$$S.D. = 9.340 \pm .950 \text{ years}$$

Barrel Fillers Ethyl

Weight

Weight in lbs.	f	x	fx	fx ²
125 - 129	2	0	0	0
130 - 144	4	1	4	4
145 - 159	7	2	14	28
160 - 174	3	3	9	27
175 - 189	4	4	16	64
190 - 204	0	5	0	0
205 -	2	6	12	72
	<u>22</u>		<u>55</u>	<u>195</u>

$$Nu_1 = \frac{55}{22} = 2.500000$$

$$Nu_2 = \frac{195}{22} = 8.863636$$

$$(Nu_1)^2 = 6.250000$$

$$Pi_2 = 2.613636$$

$$\text{Sigma} = 1.616674 \times 15$$

$$= 24.250110 \text{ lbs.}$$

$$\text{P.E. sig.} = \frac{.67449 \times 24.250110}{\sqrt{44}}$$

$$= \frac{16.356457}{6.633249}$$

$$= \pm 2.465829$$

$$\text{mean} = 2.5 \times 15 + 122.5$$

$$= 160.000 \text{ lbs.}$$

$$\text{P.E.}_m = \frac{.67449 \times 24.250110}{\sqrt{22}}$$

$$= \frac{16.356457}{4.690415}$$

$$= \pm 3.487209$$

$$\text{mean} = 160.000 \pm 3.487 \text{ lbs.}$$

$$\text{S.D.} = 24.250 \pm 2.466$$

Barrel Fillers Ethyl

Height in inches	f	x	fx	fx ²
- 65	1	0	0	0
65 - 65.9	3	1	3	3
66 - 66.9	8	2	16	32
67 - 67.9	1	3	3	9
68 - 68.9	2	4	8	32
69 - 69.9	2	5	10	50
70 - 70.9	1	6	6	36
71 - 71.9	3	7	21	147
72 -	<u>1</u>	8	<u>8</u>	<u>64</u>
	22		75	373

$$Nu_1 = \frac{75}{22} = 3.409050$$

$$Nu_2 = \frac{373}{22} = 16.954342$$

$$(Nu_1)^2 = 11.621622$$

$$Pi_2 = 5.332720$$

$$\text{Sigma} = 2.309268 \times 1 = 2.30926 \text{ inches}$$

$$\text{P.E. sig.} = \frac{.67449 \times 2.309268}{\sqrt{44}}$$

$$= \frac{1.557578}{6.633249}$$

$$= \pm .234814$$

$$\text{mean} = 3.409050 \times 1 + 64.5$$

$$= 67.909050$$

$$\text{P.E.}_m = \frac{.67449 \times 2.309268}{\sqrt{22}}$$

$$= \frac{1.557578}{4.690415}$$

$$= \pm .332077$$

$$\text{mean} = 67.909 \pm .332 \text{ inches}$$

$$\text{S.D.} = 2.309 \pm .234 \text{ inches}$$

Barrel Fillers Ethyl

Pb in Urine mgs./ Liter

Mgs. Pb per liter urine	f	x	fx	fx ²
.0 - .039	8	0	0	0
.04 - .079	10	1	10	10
.08 - .119	2	2	4	8
.12 - .159	1	3	3	9
	<u>21</u>		<u>17</u>	<u>27</u>

No information 1

$$Nu_1 = \frac{17}{21} = .809524$$

$$Nu_2 = \frac{27}{21} = 1.285714$$

$$(Nu_1)^2 = .655329$$

$$Pi_2 = 1.285714 - .655329$$

$$= .630385$$

$$\text{Sigma} = .794 \times .04$$

$$= .03 \text{ mgs.}$$

This is interesting in that in spite of the frequency being low, the variability is low enough so that the mean is stable, being more than 12 times its own probable error.

$$\text{P.E. sig.} = \frac{.67449 \times .03}{\sqrt{42}}$$

$$= \frac{.020}{6.480740}$$

$$= \pm .003$$

Also note curious situation where Sigma fx is less than Sigma f.

$$\text{mean} = .809524 \times .04 + .02$$

$$= .052 \text{ mgs.}$$

$$\text{P.E.}_m = \frac{.67449 \times .03}{\sqrt{21}}$$

$$= \frac{.020}{4.582575}$$

$$= \pm .004$$

$$\text{mean} = .052 \pm .004 \text{ mgs. per liter urine}$$

$$\text{S.D.} = .030 \pm .003 \text{ mgs.}$$

Barrel Fillers Ethyl

Pb in Urine (Total)

Pb in urine mgs.	f	x	fx	fx ²
.04 - .079	6	0	0	0
.08 - .119	5	1	5	5
.12 - .159	4	2	8	16
.16 - .199	4	3	12	36
.20 - .239	1	4	4	16
.24 - .279	0	5	0	0
.28 - .319	0	6	0	0
.32 -	<u>1</u>	7	<u>7</u>	<u>49</u>
	21		36	122

No information 1

$$Nu_1 = \frac{36}{21} = 1.714286$$

$$Nu_2 = \frac{122}{21} = 5.809524$$

$$(Nu_1)^2 = 2.938776$$

$$Pi_2 = 2.870748$$

$$Sigma = 1.694328 \times .04 = .067773 \text{ mgs.}$$

$$P.E. sig. = \frac{.67449 \times .067773}{\sqrt{42}}$$

$$= \frac{.045712}{6.480740}$$

$$= \pm .007054$$

$$\text{mean} = 1.714286 \times .04 + .06$$

$$= .128571 \text{ mgs. Pb}$$

$$P.E. m = \frac{.67449 \times .067773}{\sqrt{21}}$$

$$= \frac{.045712}{4.582575}$$

$$= \pm .009975$$

$$\text{mean} = .129 \pm .010 \text{ mgs. Pb}$$

$$S.D. = .068 \pm .007 \text{ mgs.}$$

Barrel Fillers Ethyl

Pb in Faeces mg./gm. Ash

Mgs. Pb per gm. ash	f	x	fx	fx ²
.04 - .079	7	0	0	0
.08 - .119	8	1	8	8
.12 - .159	2	2	4	8
.16 - .199	3	3	9	27
.20 - .239	2	4	8	32
	<u>22</u>		<u>29</u>	<u>75</u>

$$Nu_1 = \frac{29}{22} = 1.318182$$

$$Nu_2 = \frac{75}{22} = 3.409090$$

$$(Nu_1)^2 = 1.737604$$

$$Pi_2 = 3.409090 - 1.737604$$

$$= 1.671486$$

$$Sigma = 1.292860 \times .04$$

$$= .052 \text{ mgs.}$$

$$P.E. \text{ sig.} = \frac{.67449 \times .052}{\sqrt{44}}$$

$$= \frac{.035}{6.633}$$

$$= \pm .005$$

Mean stable in spite
of small number in
total universe.

$$\text{mean} = 1.318182 \times .04 + .06$$

$$= .113$$

$$P.E. \text{ m} = \frac{.67449 \times .052}{\sqrt{22}}$$

$$= \frac{.035}{4.691}$$

$$= \pm .007$$

$$\text{mean} = .113 \pm .007 \text{ mgs. per gm. ash}$$

$$S.D. = .052 \pm .005 \text{ mgs.}$$

Barrel Fillers Ethyl

Pb in Faeces (Total)

Pb in faeces (total) mgs.	f	x	fx	fx ²
.08 - .159	2	0	0	0
.16 - .239	9	1	9	9
.24 - .319	5	2	10	20
.32 - .399	1	3	3	9
.40 - .479	2	4	8	32
.48 - .559	1	5	5	25
.56 - .639	0	6	0	0
.64 - .719	0	7	0	0
.72 - .799	0	8	0	0
.80 - .879	1	9	9	81
.88 - .959	0	10	0	0
.96 - 1.039	0	11	0	0
1.04 - 1.119	0	12	0	0
1.12 -	<u>1</u>	13	<u>13</u>	<u>169</u>
	22		57	345

$$Nu_1 = \frac{57}{22} = 2.590878$$

$$Nu_2 = \frac{345}{22} = 15.681630$$

$$(Nu_1)^2 = 6.712649$$

$$Pi_2 = 8.968981$$

$$\text{Sigma} = 2.994826 \times .08 = .239586 \text{ mgs.}$$

$$\text{P.E. sig.} = \frac{.67449 \times .239586}{\sqrt{44}}$$

$$= \frac{.161598}{6.633249}$$

$$= \pm .024362$$

$$\text{mean} = 2.590878 \times .08 + .12$$

$$= .327270 \text{ mgs. Pb}$$

$$\text{P.E.}_m = \frac{.67449 \times .239586}{\sqrt{22}}$$

$$= \frac{.161598}{4.690415}$$

$$= \pm .034453$$

$$\text{mean} = .327 \pm .034 \text{ mgs. Pb}$$

$$\text{S.D.} = .240 \pm .024 \text{ mgs. Pb}$$

Barrel Fillers Ethyl

Haemoglobin

DARE haemoglobin
reading

	f	x	fx	fx ²
62 - 65	1	0	0	0
66 - 69	0	1	0	0
70 - 73	0	2	0	0
74 - 77	2	3	6	18
78 - 81	6	4	24	96
82 - 85	5	5	25	125
86 - 89	5	6	30	180
90 -	<u>3</u>	7	<u>21</u>	<u>147</u>
	22		106	566

$$Nu_1 = \frac{106}{22} = 4.818124$$

$$Nu_2 = \frac{566}{22} = 25.726964$$

$$(Nu_1)^2 = 23.214319$$

$$Pi_2 = 2.512645$$

$$Sigma = 1.585133 \times 4 = 6.340532\% \text{ Haem.}$$

$$P.E. \text{ sig.} = \frac{.67449 \times 6.340532}{\sqrt{44}}$$

$$= \frac{4.276625}{6.633249}$$

$$= \pm .644726$$

$$\text{mean} = 4.818124 \times 4 + 64$$

$$= 83.272496\% \text{ Haem.}$$

$$P.E. \text{ m} = \frac{.67449 \times 6.340532}{\sqrt{22}}$$

$$= \frac{4.276625}{4.690415}$$

$$= \pm .911780$$

$$\text{mean} = 83.272 \pm .912\% \text{ Haem.}$$

$$S.D. = 6.341 \pm .645\% \text{ Haem.}$$

Barrel Fillers Ethyl

Dynamometer Left

Dynamometer reading	f	x	fx	fx ²
60 - 69	2	0	0	0
70 - 79	3	1	3	3
80 - 89	2	2	4	8
90 - 99	7	3	21	63
100 - 109	3	4	12	48
110 - 119	4	5	20	100
120 -	<u>1</u>	<u>6</u>	<u>6</u>	<u>36</u>
	22		66	258

$$Nu_1 = \frac{66}{22} = 3.000000$$

$$Nu_2 = \frac{258}{22} = 11.727132$$

$$(Nu_1)^2 = 9.000000$$

$$Pi_2 = 2.727132$$

$$Sigma = 1.651403 \times 10 = 16.514030$$

$$\begin{aligned} P.E. sig. &= \frac{.67449 \times 16.514030}{\sqrt{44}} \\ &= \frac{11.138548}{6.633249} \\ &= \pm 1.679199 \end{aligned}$$

$$mean = 3.000000 \times 10 + 65$$

$$= 95.000000 \text{ dynamometer degrees}$$

$$\begin{aligned} P.E. m &= \frac{.67449 \times 16.514030}{\sqrt{22}} \\ &= \frac{11.138548}{4.690415} \\ &= \pm 2.3747497 \end{aligned}$$

$$mean = 95.000 \pm 2.375 \text{ dynamometer degrees}$$

$$S.D. = 16.514 \pm 1.679 \quad " \quad "$$

Barrel Fillers Ethyl

Dynamometer Right

Dynamometer reading	f	x	fx	fx ²
60 - 69	1	0	0	0
70 - 79	0	1	0	0
80 - 89	7	2	14	28
90 - 99	2	3	6	18
100 - 109	2	4	8	32
110 - 119	4	5	20	100
120 - 129	3	6	18	108
130 - 139	2	7	14	98
140 -	<u>1</u>	8	<u>8</u>	<u>64</u>
	22		88	448

$$Nu_1 = \frac{88}{22} = 4.000000$$

$$Nu_2 = \frac{448}{22} = 20.363392$$

$$(Nu_1)^2 = 16.000000$$

$$Pi_2 = 4.363392$$

$$Sigma = 2.088873 \times 10 = 20.888730$$

$$P.E. sig. = \frac{.67449 \times 20.888730}{\sqrt{44}}$$

$$= \frac{14.089239}{6.633249}$$

$$= \pm 2.124032$$

$$mean = 4.000000 \times 10 = 65$$

$$= 105.000000 \text{ dynam. degrees}$$

$$P.E. m = \frac{.67449 \times 20.888730}{\sqrt{22}}$$

$$= \frac{14.089239}{4.690415}$$

$$= \pm 3.003836$$

$$mean = 105.000 \pm 3.004 \text{ dynamometer degrees}$$

$$S.D. = 20.889 \pm 2.124 \quad " \quad "$$

Barrel Fillers Ethyl

Pulse Pressure

Pulse pressure mm. Hg	f	x	fx	fx ²
30 - 34	2	0	0	0
35 - 39	2	1	2	2
40 - 44	5	2	10	20
45 - 49	1	3	3	9
50 - 54	6	4	24	96
55 - 59	1	5	5	25
60 - 64	4	6	24	144
65 - 69	0	7	0	0
70 - 74	0	8	0	0
75 - 79	0	9	0	0
80 -	<u>1</u>	10	<u>10</u>	<u>100</u>
	22		78	396

$$Nu_1 = \frac{78}{22} = 3.545412$$

$$Nu_2 = \frac{396}{22} = 17.999784$$

$$(Nu_1)^2 = 12.569946$$

$$Pi_2 = 5.429838$$

$$\text{Sigma} = 2.330201 \times 5 = 11.651005 \text{ mm. Hg.}$$

$$\begin{aligned} \text{P.E. sig.} &= \frac{.67449 \times 11.651005}{\sqrt{44}} \\ &= \frac{7.858486}{6.633249} \\ &= \pm 1.184711 \end{aligned}$$

$$\text{mean} = 3.545412 \times 5 + 32.5$$

$$= 44.151005 \text{ mm. Hg}$$

$$\begin{aligned} \text{P.E.}_m &= \frac{.67449 \times 11.651005}{\sqrt{22}} \\ &= \frac{7.858486}{4.690415} \\ &= \pm 1.675435 \end{aligned}$$

$$\text{mean} = 44.151 \pm 1.675 \text{ mm. Hg}$$

$$\text{S.D.} = 11.651 \pm 1.185 \text{ mm. Hg}$$

Barrel Fillers Ethyl

Systolic Pressure

Systolic pressure mm. Hg	f	x	fx	fx ²
90 - 99	1	0	0	0
100 - 109	0	1	0	0
110 - 119	5	2	10	20
120 - 129	7	3	21	63
130 - 139	4	4	16	64
140 - 149	4	5	20	100
150 - 159	0	6	0	0
160 - 169	0	7	0	0
170 -	1	8	8	64
	<u>22</u>		<u>75</u>	<u>311</u>

$$Nu_1 = \frac{75}{22} = 3.409050$$

$$Nu_2 = \frac{311}{22} = 14.136194$$

$$(Nu_1)^2 = 11.621622$$

$$Pi_2 = 2.514572$$

$$\text{Sigma} = 1.585740 \times 10 = 15.857400 \text{ mm. Hg}$$

$$\text{P.E.}_{\text{sig.}} = \frac{.67449 \times 15.857400}{\sqrt{44}}$$

$$= \frac{10.695658}{6.633249}$$

$$= \pm 1.612431$$

$$\text{mean} = 3.409050 \times 10 + 95$$

$$= 129.090500$$

$$\text{P.E.}_m = \frac{.67449 \times 129.090500}{4.690415}$$

$$= \frac{87.070251}{4.690415}$$

$$= \pm 18.911254$$

$$\text{mean} = 129.091 \pm 18.911$$

$$\text{S.D.} = 15.857 \pm 1.612$$

Barrel Fillers Ethyl

Pulse

Pulse in beats
per minute

	f	x	fx	fx ²
60 - 69	4	0	0	0
70 - 79	8	1	8	8
80 - 89	7	2	14	28
90 - 99	2	3	6	18
100 - 109	<u>1</u>	<u>4</u>	<u>4</u>	<u>16</u>
	22		32	70

$$Nu_1 = \frac{32}{22} = 1.454528$$

$$Nu_2 = \frac{70}{22} = 3.181780$$

$$(Nu_1)^2 = 2.115652$$

$$Pi_2 = 1.066128$$

$$\text{Sigma} = 1.032535 \times 10 = 10.325350$$

$$\text{P.E. sig.} = \frac{.67449 \times 10.325350}{\sqrt{44}}$$

$$= \frac{6.964345}{6.633249}$$

$$= \pm 1.049915$$

$$\text{mean} = 1.454528 \times 10 + 65$$

$$= 79.545280$$

$$\text{P.E.}_m = \frac{6.964345}{4.690415}$$

$$= \pm 1.484804$$

$$\text{mean} = 79.545 \pm 1.485$$

$$\text{S.D.} = 10.325 \pm 1.050$$

Barrel Fillers Ethyl

Temperature

Temperature in °F.	f	x	fx	fx ²
97 - 97.4	3	0	0	0
97.5 - 97.9	2	1	2	2
98 - 98.4	7	2	14	28
98.5 - 98.9	5	3	15	45
99 - 99.4	4	4	16	64
99.5 - 99.9	0	5	0	0
100 -	1	6	6	36
	<u>22</u>		<u>53</u>	<u>175</u>

$$Nu_1 = \frac{53}{22} = 2.409062$$

$$Nu_2 = \frac{175}{22} = 7.954450$$

$$(Nu_1)^2 = 5.803580$$

$$Pi_2 = 2.150870$$

$$Sigma = 1.466584 \times .5 = .733292^\circ \text{ F.}$$

$$\begin{aligned} \text{P.E. sig.} &= \frac{.67448 \times .733292}{\sqrt{44}} \\ &= \frac{.494598}{6.633249} \\ &= \pm .07456345 \end{aligned}$$

$$\begin{aligned} \text{mean} &= 2.409062 \times .5 + 97.25 \\ &= 98.454531^\circ \text{ F.} \end{aligned}$$

$$\begin{aligned} \text{P.E.}_m &= \frac{.494598}{4.690415} \\ &= \pm .105449 \end{aligned}$$

$$\text{mean} = 98.454 \pm .105^\circ \text{ F.}$$

$$\text{S.D.} = .733 \pm .075^\circ \text{ F.}$$