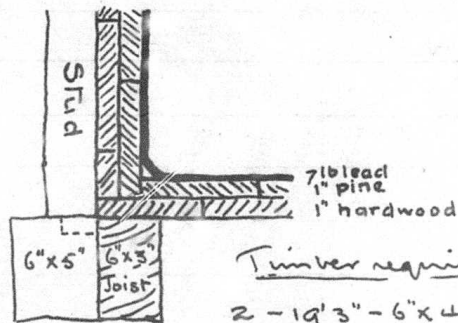


## Sulphuric Acid Tank

Inside dimensions 17'3" x 6'10" x 5'11"

Material - Hardwood frame with lining  
of 1" hardwood, 1" pine and 7 lb. lead.



### Timber required

2 - 19'3" - 6"x4"

2 - 8'10" - 6"x4"

1 - 8'8" - 4"x4"

2 - 19'3" - 6"x5"

4 - 8'10" - 6"x5"

9 - 9'0" - 6"x3"

3 - 19'3" - 9"x5"

26 - 5'7" - 4"x3"

410 ft. 1" hardwood

410 - 1" pine

Timber for Acid Tank

9" x 5" 3/19's

6" x 5" 2/19's 4/8'10"

6" x 4" 2/19's 2/8'10"

6" x 3" 9/9'

4" x 4" 1/8'8"

4" x 3" 2/5'7"

410 ft 1" hardwood

410 ft 1" pine

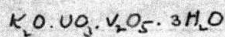


# Minerals

No.	Mineral	Locality	Ref. No.	Formula	Remarks
1	Pandermite	Chinar San, Asia Minor	704A	$4CaO \cdot 5B_2O_3 \cdot 7H_2O$	
2	Ulexite	Arequipa	708	$Na_2O \cdot 2CaO \cdot 5B_2O_3 \cdot 16H_2O$	
3	Colemanite	Daggett, Cal., U.S.A.	704	$2CaO \cdot 3B_2O_3 \cdot 5H_2O$	
4	Howlite	Daggett, Cal. U.S.A.	701	$4CaO \cdot 5B_2O_3 \cdot 2SiO_2 \cdot 5H_2O$	
5	Bakerite	Death Valley, Cal., U.S.A. Daggett,		$8CaO \cdot 5B_2O_3 \cdot 6SiO_2 \cdot 6H_2O$	
6	Pyrochlore	Miask, Russia	520	$5CaO \cdot 5Nb_2O_5 \cdot 4CaO \cdot 4(Ti, Th)_2O_3 + 4NaF$	
7	Samarskite	Mitchell Co., N. Car., U.S.A.	529	$3(Fe, Ca, UO_2)O_3 \cdot (Zr, Y)_2O_3 \cdot 3(Nb, Ta)_2O_5$	
8	Kilzhaite	Alve, Norway	511	$15Ca \cdot Si \cdot Ti \cdot O_5 \cdot (Al, Fe, Y)_2(Si, Ti)_2O_5$	
9.	Titanite	Natural Bridge, Lewis Co., NY. U.S.A.	570	$CaO \cdot TiO_2 \cdot SiO_2$	

10	Wiikike (Black)	Lokasaari, Impilaks, Finland		Silico-tungstate of iron, yttrium & vanadium (Manganese & scandium)
11	Wiikike (Brown)	Impilaks, Finland		
12	Cerite	Bastnäs, Sweden	425	$3\text{H}_2\text{O} \cdot 2(\text{Ca-Fe})\text{O} \cdot 3\text{Ce}_2\text{O}_3 \cdot 6\text{SiO}_2$
13	Thorite	Lövö Is, Brevig, Norway	395	$\text{ThO}_2 \cdot \text{SiO}_2$
14	Xenotime	Hitteroe, Norway	536	<del>Y</del> (Y, Er) $_2\text{O}_3 \cdot \text{P}_2\text{O}_5$
15	Pilbarite	Wodgina, W.A.		$\text{UO}_3 \cdot \text{PbO} \cdot \text{ThO}_2 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O} + 2\text{H}_2\text{O}$
16	Scorodite	Federal Downs, W.A.	607	$\text{Fe}_2\text{O}_3 \cdot \text{As}_2\text{O}_5 \cdot 4\text{H}_2\text{O}$
17	Calaverite & Coloradoite in Ankerite	Kalgoorlie, W.A.		$\text{AuTe}_2$ and $\text{HgTe}$
18	Calaverite i in Schist	Kalgoorlie, W.A.		$\text{AuTe}_2$
19	Gypsum Selenite	Halls Creek, W.A.		$\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

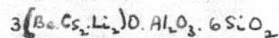
20	Carnotite	Radium Hill, S. Aus.
21	Davidite & Carnotite	Radium Hill, S. Aus. Olary
22	Manganixiolite	Wodgina, W.A.
23	Bismuth (Native)	Wolfram Camp, Q.
24	Monazite	California Crk, Mt. Garnet, Q
25	Fluorite	Petford, Q.
26	Beryl. var. Morganite	Mt. Bity, Madagascar.
27	Xenotime	Greenbushes
28	Stibiotantalite	Greenbushes
29	Euxenite	Shaw River



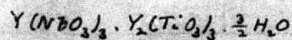
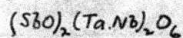
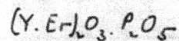
Bi



ThO<sub>2</sub>, 2.6%



See Amer. J. Sc. 1910  
 SiO<sub>2</sub> 62.71  
 Al<sub>2</sub>O<sub>3</sub> 17.73  
 H<sub>2</sub>O 16  
 BeO 11.43  
 Cs<sub>2</sub>O 1.70  
 Li<sub>2</sub>O 1.60  
 MgO 1.68  
 Loss 2.66 p 128  
 100





30	Turquoise	Keppel Rocks, Keppel Bay Qld.	642	$[Al(OH)_2.Cu(OH).H]_3 PO_4$
31	Molybdenite	Wolfram Camp Qld.	34	$MoS_2$
32	Halloysite var. Mineral Fat	Norseman W.A.	493	$Al_2O_3.2SiO_2.3H_2O+nH_2O$
33	Embolite	Broken Hill N.S.W.	170	$Ag(Cl,Br)$
34	Chabazite	Cunninghams Gap Qld.	447	$(Ca.Na_2)Al_2Si_4O_{12}+6H_2O$
35	Corundum var Emery	Mt. Warning, N.S.W.		$Al_2O_3+$
36	Amblygonite	Ubini W.A.		
37	Mesitite	Kanowna W.A.		
38	Mackintoshite in Albite Matrix	Wodgina W.A.		
39	Thorogummite in Albite Matrix	Wodgina W.A.		

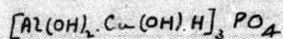
Al <sub>2</sub> O <sub>3</sub>	48.34
Fe <sub>2</sub> O <sub>3</sub>	45.68
FeO	2.42
TiO <sub>2</sub>	4.06
SiO <sub>2</sub>	67.
CaO	1.16
MgO	.60
H <sub>2</sub> O	100.26
	100.26
	J.C.H.M.

P <sub>2</sub> O <sub>5</sub>	49.01
Al <sub>2</sub> O <sub>3</sub>	34.71
Fe <sub>2</sub> O <sub>3</sub>	.07
Mn(OH) <sub>2</sub>	nil
Li <sub>2</sub> O	9.31
MnO	.78
K <sub>2</sub> O	nil
H <sub>2</sub> O	2.70
F <sub>2</sub>	6.95
SiO <sub>2</sub>	nil
	100.53
	3.32
	99.61
	99
	3.02

Crystals	
CaCO <sub>3</sub>	2.7
MgCO <sub>3</sub>	61.8
FeCO <sub>3</sub>	35.1
MnCO <sub>3</sub>	.4
	100.0



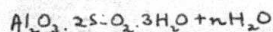
30 Turquoise Keppel Rocks, Keppel Bay Qld. 642



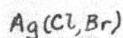
31 Molybdenite Wolfram Camp Qld. 34



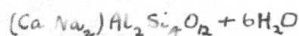
32 Halloysite var. Mineral Fat Norseman W.A. 493



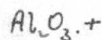
33 Embolite Broken Hill N.S.W. 170



34 Chabazite Cunninghams Gap Qld. 447



35 Corundum var. Emery Mt. Warning, N.S.W.



36 Amblygonite Ubini W.A.

Al<sub>2</sub>O<sub>3</sub> 48.34  
 FeO } 43.68  
 FeO }  
 TiO<sub>2</sub> 2.42  
 SiO<sub>2</sub> 4.06  
 CaO 6.  
 MgO 1.16  
 H<sub>2</sub>O .60  
 100.26  
 J.C.H.M.

37 Mesitite Kanowna W.A.

FeO 48.01  
 Al<sub>2</sub>O<sub>3</sub> 34.71  
 Fe<sub>2</sub>O<sub>3</sub> .07  
 Mn<sub>2</sub>O<sub>3</sub> nil  
 Li<sub>2</sub>O 9.31  
 MgO .78  
 K<sub>2</sub>O nil  
 H<sub>2</sub>O 2.70  
 F<sub>2</sub> 6.95  
 SiO<sub>2</sub> nil  
 100.53  
 2.92  
 94.61  
 3.023  
 9

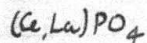
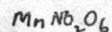
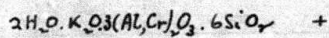
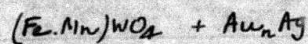
38 Mackintoshite in Albite Matrix Wodgina W.A.

Crystals  
 CaCO<sub>3</sub> 2.7  
 MgCO<sub>3</sub> 61.8  
 FeCO<sub>3</sub> 35.1  
 MnCO<sub>3</sub> .4  
 100.0

39 Thorogummite in Albite Matrix Wodgina W.A.



40	Wolfram with gold	Westonia <del>Essex</del>	W.A.
41	Fuchsite with pyrrhotite	Parkers Range	W.A.
42	Manganocolumbite	Coodardy	W.A.
43	Monazite	Cooglegong	WA
44	Ytrogummite	Garta	Norway
45	Fergusonite	Radium Ridge, Mt. Painter	S. Aus
46	Uraninite	Sr. Stephens Cornwall	Eng.
47	Titanite	Eganville, Ont.	Can
48	Titanite	Pemberton	W.A.
49	Pyrochlore	Table Cape	Tas.



Large fragments L 9278<sup>D</sup> 19

mu

46	46
12	12
48	48
<u>150</u>	<u>18</u>
286	124

Sand

1000011

186

0.000012

Wt. iron standards 0.000144 per ft  
 Coal iron - 0.000132 - -  
 Brass -

46  
12  
48  
10  
-  
28

46  
12  
48  
18  
-  
124

SANDS

100011

0.00012

W. Iron expands 0.000144 per ft for 1° C.

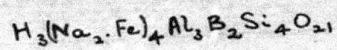
Cast Iron - 0.000132 - - - -

Brass -



Types of minerals  
found in sands.

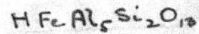
1. Journaline, Black (mass.), olive brown (micro)



From stream in concentrates, Smithfield W. Va.

M.

2. Staurolite, brown.



From alluvial concentrates, Green bushes.

M. 6260.

## Sphere

Sphere is the most perfect form of lines  
can. It alone (1) possesses infinite symmetry  
every portion of which is similar to the  
in perfection, (2) and is in equal connection  
center, (3) can measure with perfect accuracy  
point of its surface.

Symbolical of perfection, of idealism, of S.A.  
equilibrium, of balanced development.

Perpendicular, triangles can be said to be

Triangles, symbol of flame, is of aspiration.  
These aspects of the ego are material, intellectual  
heart is also applied in the three dimensions.

1	Mother bathing Brian	1906
2	" "	1906
3	Mother nursing Brian by lattice	1906
4	"Ryton" Rhoda & Perth	1905
5	" " "	1906
6	" " " 650 oak settle	1905
7	" " " table	1905
8	Christmas Eve Dinner at the "Roost"	1905
9	Es. den & Co. evening party	1905
10	" " "	1905
11	" " " "Wanatahi" at evening party	1905
12	Copies of early portraits of Muriel	
13	Set up first birthday	1907
14	Brian & Nurse here	1906
15	Muriel & Brian	25-3-06
16	" "	25-3-06
17	Mother, Laddie & head family	10-2-06
18	E.S.S. & Brian	15-7-06
19	Muriel & Brian	2-9-06
20	W.H.S., Muriel & Brian	18-11-06

421	W.H.S., E.S.S. & Brian	18-11-06
422	" " "	"
423	Muriel bathing Brian	06
424	" "	06
425	Muriel & Brian on cane lounge	06
426	" " " at lattice	26-4-06
427	Mellie Woon & Jack	06
428	" "	06
429	Brian with goats	18-12-06
430	Muriel, S, Brian, Betty, Linton Vera etc	08
431	" " "	08
432	Mother & Brian, Linton & Vera etc	08
433	Swinson family at Newlands	08
434	W.W.S., E.S.S., Brian & Betty	Xmas 08
435	W.W.S. & Brian	" 08
436	Brian having hose bath	- 08
437	" " "	- 08
438	Brian at Suddies Gardens	- 08
439	Muriel, S, Brian & Betty & Linton & Vera etc	08
440	" " "	08



41	E.S.S., Brian & Betty	30-V-08
42	Muriel, bathing Brian (kitchen)	9-VI-07
43	E.S.S. on Elephant Rock Susan View	65
44	Mother + Brian? Lynton	
45	Brian's first birthday party	23-2-07
46	"	"
47	"	"
48	"	"
49	Brian in bath in kitchen	
50	Brian & cat on table next Lynton	
51	"Illegionfontein" fabrics	07
52	Brian leaning to stand	3-2-07
53	Muriel &	
54	"	
55	Betty & house	3-VIII-07
56	"	"
57	Muriel & Betty	VIII-07
58	Brian leaning to stand	3-2-07
59	W.W.S. + Brian	08
60	?	

461	Muriel, Brian & Betty	30-V-08
462	"Sarabai" at Garsening Bay	
463	"Lynton" Rhoda to	05
464	Back over sideboard	05
465	Muriel against sideboard	05
466	Back over sideboard, "Lynton"	05
467	Muriel & E.S. Lynton	05
468	E.S. on granite rock, Susan View	05
469	Muriel under elephant rock	05
470	Gate settee	05
471	Muriel about 2 1/2	05
472	" - - - 3 1/2	05
473	E.S.S. at Jellie's gate	05
474	Back yard Lynton	05
475	" - - - Rennie & Madeline	05
476	P.ddie	05
477	E.S.S. under tree "Lynton"	27-7-05
478	Muriel - - -	-
479	Runt -	18-2-05
480	Muriel washing Brian	3-VI-05

- 481 Brian with chicks 18-XII-06
- 482 " " " "
- 483 In the edge, climbing
- 484 Whipped with goats, climbing
- 485 Mucil, Brian & Betty, "hint on" 15-9-07
- 486 " " " " " "
- 487 Mucil " " " "
- 488 Mucil & Betty " " 07
- 489 Betty " " 07
- 490 Brian & Betty " " 07
- 491 Albany Harbour from hot & balloon 10-3-08
- 492 " " " "
- 493 " " " "
- 494 " " " "
- 495 Brian on path, Casey Pass, Albany 08
- 496 " by gun " " 08
- 497 Brian eating bread, on top of Harbour 08
- 498 Brian as crossing suspension Albany 08
- 498 ← M. M. Mucil Brian Betty near long jetty Albany 27-2-08
- 499 ← " " " " "
- 500 ← " " " " "

## Lithia Water

In a	system of water put	gramme
		0.2 or 0.3
$\text{Li}_2\text{CO}_3$ or $\text{Li}_2\text{C}_2$		
$\text{NaHCO}_3$	1.5 - 2.5	1.5
$\text{NaCl}$	2 - 0.5	.2
$\text{K}_2\text{SO}_4$	0.2	.2
$\text{MgSO}_4$	0.2	.2

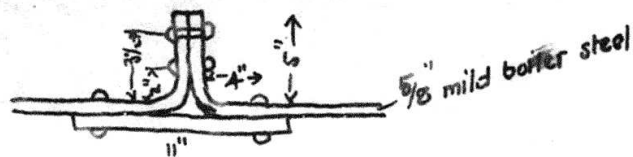
If water used has been boiled  
and

$\text{CaCO}_3$  0.1

Charge with  $\text{CO}_2$  from a  
sparklet bulb.

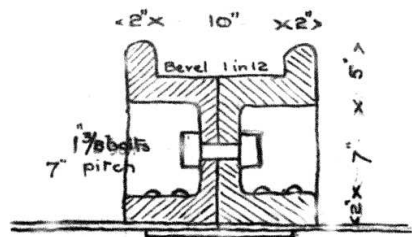
- 501 Meade + Brian paddling, Albany, N.Y. 5-3-08
- 502 SAs + Brian - - - - - "
- 503 Melville Point, Albany, N.Y. 26-2-08
- 504 SAs + Brian - paddling Grasmere 24-2-08
- 505 ditto " "
- 506 Mc Brian building sand castle Grasmere "
- 507 East end of Grasmere "
- 508 Grasmere from railway "
- 509 Brian, Betty + Thelma in boat of James, Mc. Kenny 23-3-13
- 510 Betty + Thelma " " " "
- 511 3 Bs. in boat, Canning R., Mc. Kenny "
- 512 " " " " "
513. Camp, Mc. Kenny 24-3-13
- 514 ditto " "
515. Mc + 3 Bs, Canning Bridge "
- 516 SAs + 3 Bs " " "





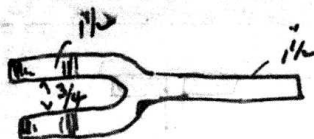
Revolving tunnel Vertical Joint  
 Fred H. M. S. Mt. Morgan

Fig 1

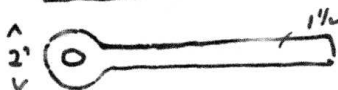


1/8 rivets spaced  
 7" centers

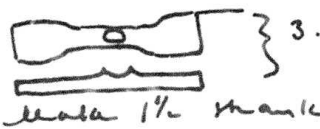
## Blacksmithing



Common joint  
Jaws 2"x1" wide

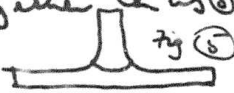



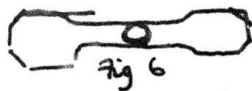
to be done at  
center as in fig 3.



Knock a hot  
punch in center

Make 1/2 mark size 4  Fig 4

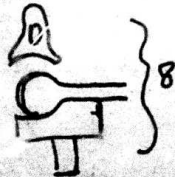
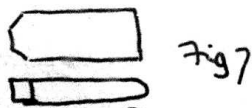
Get shank hot & flat bar set & weld  
them together  using files to  
finish  Fig 5 Cut shank  
& heat to blue & then cut across  
off head (b) & red-hot, using thickness

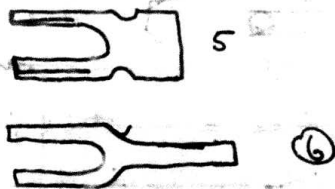
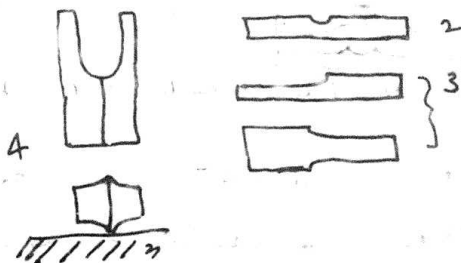


piece <sup>(p)</sup> to keep jaws  
apart. Have thick-

ness piece = width of jaw & 2" longer.  
Rest job on anvil pressing t.p. up  
against any bar in the hole of the  
anvil. Sweep up joint Fig 8.

Final hole drilled out punched.





### Common joint for smaller jobs.

As large but when welding on shank  
do it in bolster. (1)

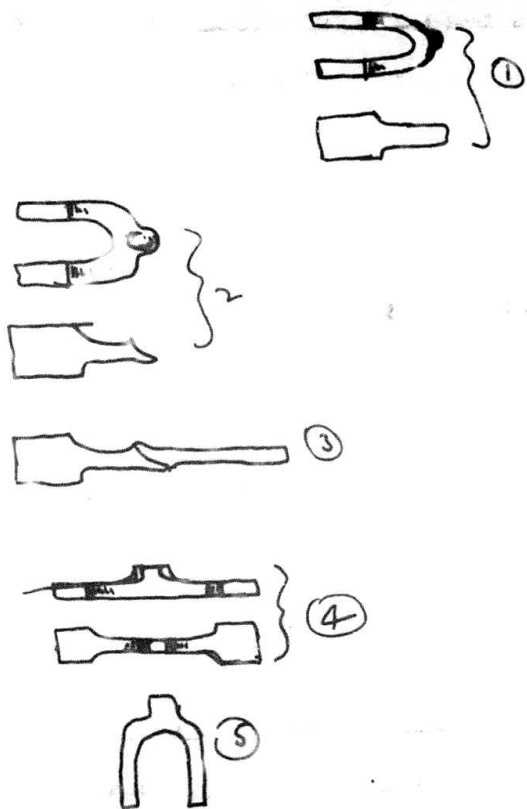
### Common joint 2<sup>nd</sup> Method.

If suitable size of iron not available:-  
Take 1 1/4 square. Drive filler in 2  
& then flatten it as in 3. Make 2<sup>nd</sup>  
piece same. Get welding heat &  
lay on sides on anvil 4. Tap together  
turn on flat & strike together well.  
Turn up on end & put filler in jaw  
to well inside of joint well.

Then take necessary pieces &  
filler in 5 then saw at shank.

6. Then put in thickness piece &  
round up junction of jaw & shank  
cut off jaw to exact length. Describe  
circle of correct size on head of  
jaw & set off on set-rod. Then  
round up as before.



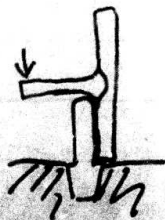
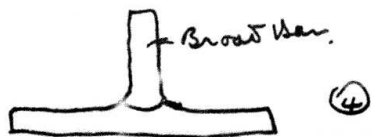
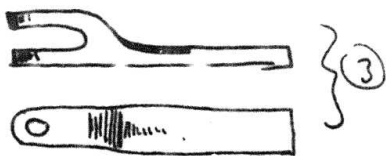
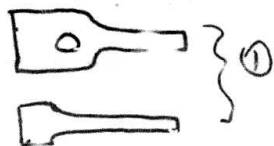


Common joint - 3<sup>rd</sup> method.

Take piece of flat iron for jaws & turn round ~~it~~ & knock in sideways  
 ①. Scarf with orb punch ②. Scarf up shank & round up slant to fit into heat scarf. ③. Finish up exactly as before.

Common joint - 4<sup>th</sup> method.

Take square iron filler & flatten at ends ④. Bend it as in ⑤. Scarf joint & ~~the~~ shank just as ordinary piece of iron. Weld & finish as before



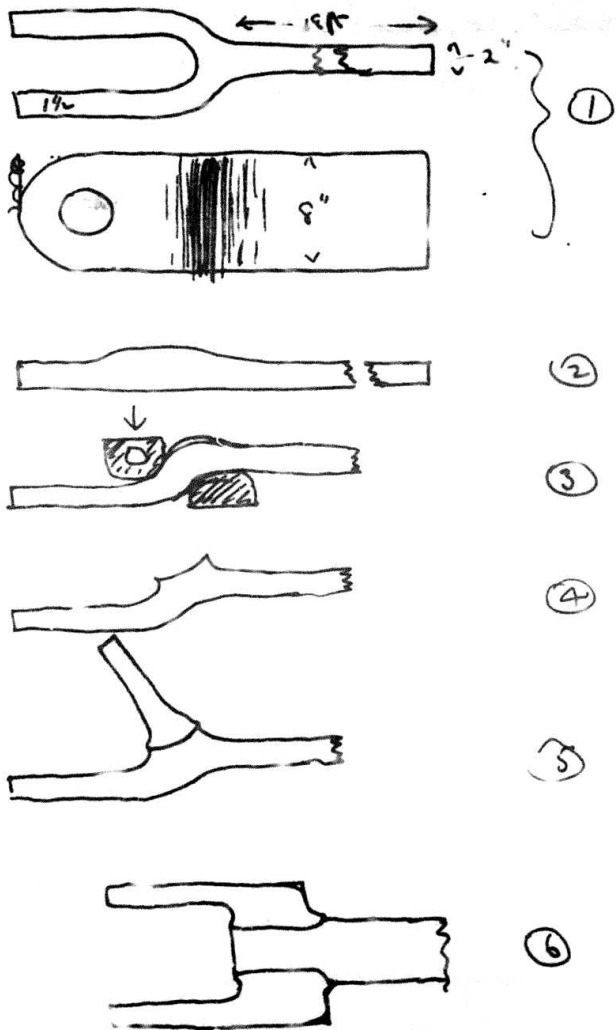
### Common Joints 5<sup>th</sup> Method

If joint is made out of solid only one  
 round or taper iron can be used.

Take iron file on side edge of ~~the~~ head  
 of joint. Pull in at end of head of  
 jaw. Draw handle out & punch  
 hole right through (1). With hot  
 set cut out piece & leave jaw (2).  
 Level up jaw on saddle. Finish  
 up as before.

### 2<sup>nd</sup> Joint (3)

Weld a handle as in fig (4). Pull  
 up joint & bend over piece as in (5)



Big joint. ①  
 $3/4$ " diam jumped up from  $2" \times 3"$  with a  
 beam. ②

Bend it as in ① with steam hammer  
 Scarf it with a file starting at  
 end farthest from handle

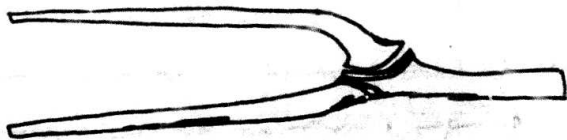
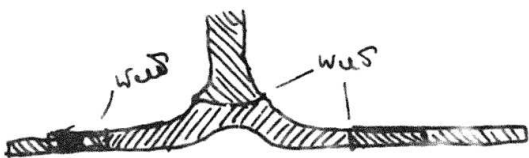
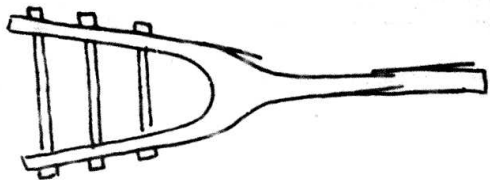
Get short piece for other joint, get  
 that heat on end, & put under  
 steam hammer to upset it.

Weld up as in ⑤.

Other method can be made by  
 method ② & scribed upon common  
 joint.

3<sup>rd</sup> method shown in ⑥ comes  
 from center of hollow of jaw cut out  
 with gouge & driven by chisels.



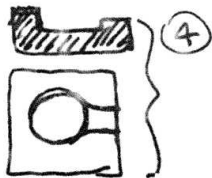
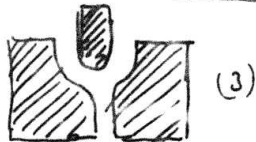
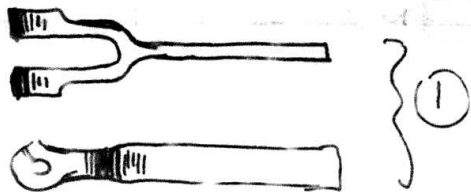


## Fork Strap for Mine Pumps. ①

4 pieces taken as shown in fig ②  
 Saw on handle on horn of anvil.  
 then scarf ends of jaws & scarf 2  
 pieces to rest on to them to give  
 necessary length to jaws.

2<sup>nd</sup> method. Make 2 half jaws like  
 ③. Put them together. Fuller  
 with beveling hammer & draw  
 out handle.

3<sup>rd</sup> method. Take 4<sup>th</sup> pieces of iron.  
 Jump up ends & bend them as in 4.  
~~the jaws~~ rest on a  
 line on the anvil.



Proc. Eccentric joint. ①

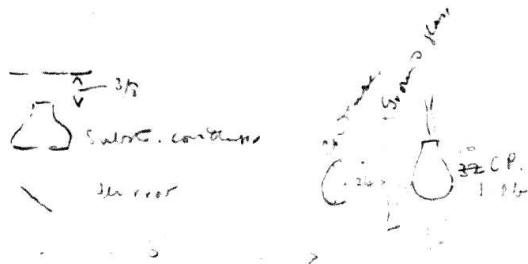
Stage 1 mem in fig ②

shaped up in special dies (3) & ④

□

Micro photo. 30/3/10

W. a. Saragan F. C. Wood x20



Specimen, 1" up in condenser with 5% solution  
20 diam. plate, Kp? otherwise. Time 2 min. 10 sec.  
1/2 min. thin section section

2nd AT Long 3-1/2 min. 10

1/2 min. 10 sec.

1/2 min. 10 sec.

NO CONDENSER



Exposure for thin section. 10 min. 0.1"

SWITCH CONTROLS  
MIRROR

See photo notes  
in Jan. 1959  
K. W.



Microphoto. of Lencikane.

Reflected light.

X 30      light 1/2 second 32 C.P. close above  
section.      Plate Super. ad special  
rapid      exposure 8 minutes.

Metazone PLATE.

Background white blotting. Inside fur. van door  
lighting. Plate, 24. ad. 16. Exp. 20 sec.  
Focus on a capital pin on smooth paper pressed  
against surface of metal.

catalogue of negatives.

- 1
- 2
- 3
- 4
- 5 Guildford, Upper Swan Bridge 1897
- 6
- 7
- 8
- 9 Perth G.S.W.A. Office, Pier St. 1897
- 10 " " " 1897
- 11
- 12
- 13 Perth, South Perth from Knip Park
- 14
- 15
- 16 Perth, Melville Water from Knip Park
- 17
- 18
- 19

- 21
- 22
- 23 <sup>at</sup> Knip Park
- 24
- 25
- 26
- 27 West Guildford, Old Bridge
- 28 Perth, South Perth from Knip Park
- 29 " " "
- 30
- 31
- 32 Perth, Black Swans, Monks Way Rd
- 33
- 34
- 35
- 36
- 37
- 38
- 39
- 40



81 Kalgosie, water condenser, K. Minto & banking Co.

82 " " Lake View South

83 " Condenser Brown Hill

84 " Islands in Kananara Lake

85

86

87

88

89

90 Swan R. Group on boat

91

92

93

94 Perth, G.S.W.A. Staff

95

96 Kalgosie Condenser

97

98

99

100

101

102

103

104 Darlington, Helena River

105 Zigzag - Granite rocks.

106 " Diabase Dyke

107 " Helena River

108

109

110

111

112

113

114

115

116

117

118

119

120



121 Perth, orchids

122 " "

123 " "

124 Perth, orchids

125 " "

126 " "

127 Perth orchids

128 Swan View, along any creek

129 " " " "

130 " " " "

131 " " " Small waterfall

132 " " " "

133 " " Granite Tor

134 Wandella, Grass trees

135 " Hill slope with Grass trees

136

137

138 Perth, G.S.W.A. office, St. Geo. Terrace, Front

139 " " " Back

140 Pinjarah Smoke gas

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160 - Boregowie, Water Condenser

161 Bowgardie, water condenser, boilers

162 " " " "

163 " " " "

164 " " " "

165 Perth Swan River, Perth Water

166 Perth, Swan River Narrows

167 " " " "

168 " " Perth Water

169 W.A. Bird House

170

171

172 Kalgardie Rpp Furnaces Assoc. S.M.

173 " " " "

174 " Condenser Kalgardie S.M.

175

176

177

178 " Condenser

179

180

181

182

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186

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188

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191

192

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195

196

197

198

199

200

201

202

203

204

6 Wooded hills

205

6 "

206

2 "

207

2 "

208

4 "

209

6 "

210

6 "

211

4 "

212

5 "

213

5 "

214

4 "

215

216

217 Margaret R. Osprey nest

218

219 Margaret R. miniature cliffs.

220

221

222

223

224 Margaret River, Lake Cove

1902

225

Karnis, Margaret River

226

near Wall of Pt

227

228

Granite on rocks

229 <

230

Mount

231 <

232

East end

233 <

234 <

235 yellow gum

Mount of cave

1902

236

Scene in valley

237

is unalton

Anglican church

238

Vase river

239

240 Bursallton

- |     |                           |                              |      |
|-----|---------------------------|------------------------------|------|
| 241 |                           |                              |      |
| 242 | Swan View - Mahogany cks. |                              |      |
| 243 | "                         | "                            |      |
| 244 | "                         | "                            |      |
| 245 | "                         | Main Fall                    |      |
| 246 | "                         | "                            |      |
| 247 | "                         | "                            |      |
| 248 | "                         | Falls                        |      |
| 249 | Wanleyton                 | Ruined convict camp          |      |
| 250 | "                         | "                            |      |
| 251 | West Guelph               | Ramp on West g               |      |
| 252 | "                         | "                            |      |
| 253 | "                         | View across river            |      |
| 254 | "                         | "                            |      |
| 255 | Kannans Lake,             | 8 boulders                   |      |
| 256 | "                         | , 6                          |      |
| 257 | "                         | , 6                          |      |
| 258 | M. H. G. copy             |                              |      |
| 259 | Smiths Hill,              | Bricks Pits (old)            |      |
| 260 | "                         | Ratite nest                  |      |
| 261 | Smiths Hill,              | Bauxite deposit.             |      |
| 262 | "                         | S. f., Gravel Pit.           |      |
| 263 | "                         | Fire clay Pit.               |      |
| 264 | Mahogany Creek,           | Ratite nest.                 |      |
| 265 | Wanley,                   | Keith ditch                  | 1902 |
| 266 | "                         | Bush house above pond        | 1902 |
| 267 | "                         | Cowan Creek                  | 1902 |
| 268 | Mustonville,              | "Jenita"                     |      |
| 269 | East End,                 | 13 Boulders to form<br>Paper |      |
| 270 | W. Bats?                  | 3 boulders                   |      |
| 271 |                           |                              |      |
| 272 | Patt                      | Bird flower                  |      |
| 273 |                           |                              |      |
| 274 | Patt,                     | Paper coal stamp             |      |
| 275 | "                         | trails                       |      |
| 276 |                           |                              |      |
| 277 | Wanley,                   | Bush house above pond        | 1900 |
| 278 | "                         | Riggs & Keith in Quarry      | 1900 |
| 279 | "                         | above pond                   | 1900 |
| 280 | "                         | Keith in Pram                | 1900 |



281 Waverley Keith in Pram 1900  
 282 " abscopd from front gate 1900  
 283 St. Springwood Wind - captured sandstone 1900  
 284 " " 1900  
 285 " Craigavad North side 1900  
 286 North Springwood, Trees in Gully 1900  
 287 " " Water holes 1900  
 288 " " Craigavad front 1900  
 289 " " Rocks, Boffins Bower 1900  
 290 " " Craigavad front S. side 1900  
 291 " " View from Boffins Bower 1900  
 292 " " Craigavad, front N. side 1900  
 293 " " " S. side 1900  
 294 BStany Wills market garden 1901  
 295 " " " 1901  
 296 Perth afternoon tea well in front lodge 1901  
 297 Cowan Creek 1902  
 298 Waverley Keith at Westford 1902  
 299 West Guildford, Orchard from North Rd. 1902  
 300 Waverley, St. Mary's 1902

301 West Guildford, "Kilvarna" 1901  
 302 Cowan Creek 1902  
 303 " " 1902  
 304 " " 1902  
 305 " " 1902  
 306 Perth, "Jatcara", May 10. West 1902  
 307 " " 1902  
 308 Perth, Aunt Nell, Ethel, Alan & Percy. 1901  
 309 " " 1901  
 310 Perth, Federal Hall 1900  
 311 " " 1901  
 312 Perth, Coal Arch, Duke of Yorks V.C. 1901  
 313 " Chinese Arch, " 1901  
 314 " St. George's Terr. " 1901  
 315 Margaret R., Entrance to M. mouth Cur 1901  
 316 Northampton, Row lastings 1901  
 317 " " 1901  
 318 Mangers Lake, W. side 1901  
 319 Kewmans Lake, Grantrees, N.W.S. + E.P.P. 1901  
 320 " " " " 1901

- |     |  |             |
|-----|--|-------------|
| 321 | Verdunans lake, water w. side                |             |
| 322 | Ellenbrook, coarse gravel range              |             |
| 323 | Friendly Creek Nugget                        |             |
| 324 | "  |             |
| 325 | "  |             |
| 326 | "  |             |
| 327 | Porter, Garden, Wellington Lodge             |             |
| 328 | Porter, Garden, Wellington Lodge             |             |
| 329 | Garden Isd, Wairarapa at Cassin Bay          | 1903        |
| 330 | "  | 1903        |
| 331 | " East side                                  | 1903        |
| 332 | " South side Roberts fishing                 | 1903        |
| 333 | " Rocky point                                | 1903        |
| 334 | "  | 1903        |
| 335 | Penguin Isd Young penguins                   | 1903        |
| 336 | "  | 1903        |
| 337 | " South coast                                | 1903        |
| 338 | " Jarvis Rock                                | 1903        |
| 339 | Robertson Isd. Salt deposit                  | 1903        |
| 340 | "  | 1903        |
| 341 | Robertson Island, Waterfront Point           | 1903        |
| 342 | " " Orchard on Lake Edge                     |             |
| 343 | " " Salt lakes from East                     |             |
| 344 | " " P. L. H. Bay                             |             |
| 345 | "  |             |
| 346 | Wainman, Lake Grange & Summit                |             |
| 347 | " " "  |             |
| 348 | "  |             |
| 349 | "  |             |
| 350 | Margaret River, "Burr side"                  | 1902        |
| 351 | " " Karris, Mammoth Cove                     | 1902        |
| 352 | " " Entrance to Lake Carey                   | 1902        |
| 353 | "  |             |
| 354 | Burke Bay Carbet Castle wreck from sand hill | 1903        |
| 355 | " " " " desk                                 | "           |
| 356 | " " " " "                                    | "           |
| 357 | " " Porton Rd. Hay carting                   | "           |
| 358 | " " higher on hill                           | "           |
| 359 | " " height on it                             | 27-XII-1903 |
| 360 | " " have fence                               | 1903        |



Item 5  
Book 1

Catalogue of Negatives



L. S. Simpson 1996

Chemical Apparatus & Chemicals  
Johnson & Mercer

↑  
Catalogue of negatives.

Point & Ballall } apparatus chemicals  
a. Johnson & Meece }

### Sulphur Solution (Reipur, Mt. Magan)

add 10 g. finely ground indigo to 4 lbs.

from 10 g.  $H_2SO_4$  stirring in a porcelain  
dish <sup>slant for 40 hours</sup> dilute slowly with  $\frac{7}{10}$  liter water.

filter through muslin & then through filter paper.

titrate with chlorine solution with  $\frac{10}{100}$   $AS_2O_3$ .

titrate the cl. solution with the indigo

until color becomes yellow the value

of the indigo solution is thus obtained.

Keep one of this solution as a standard

& make standard solution of potassium permanganate

ground  $MnO_2$  dissolved in 1 liter

with this solution titrate standard

indigo, the final value of indigo

is found & test all future

lots of indigo by the standard per-

manganate.

cl. solution + 80 grains ~~per~~ <sup>c. ft.</sup>

### Scale change

119 lbs. salt & manganate & acid  
when ~~used~~ <sup>used</sup> ~~for~~ <sup>for</sup> ~~all~~ <sup>all</sup> ~~the~~ <sup>the</sup> ~~uses~~ <sup>uses</sup>

Ironing Hand Paper (cont.)

N.B. Keep <sup>1<sup>st</sup></sup> wash water and ironing solution as cold as possible, with ice if necessary in the summer time. The temperature of the water should not be over 70° F.

After final washing press the prints between blotting paper to remove excess of water from the surface and then spread out on a cloth, face up - 20, to dry.



Printing on Platinotype Co's  
A.A. Platino-paper.

Stock Solutions.

N° 8 { Newk. Pot. oxalate 1000 grains.  
Water 8 oz

N° 9. Pure conc. Hydrochloric acid

N° 10 { Citric Acid. Make up into  
packets of 1 oz. each.

Solutions for use

Developer { N° 8 2 oz  
Water 4 oz

This is equivalent to KOx 250 gr., Water, 6 oz  
or a 10% solution of Kx

Clearer { N° 9 1/2 oz.  
Water 30 oz.

Fix { N° 100 1 pkt. = 1 oz.  
Water 30 oz.

Photographing Vesicularites Natural Size

Mounted on top of screws into metal  
gutter perch. White cardboard back ground.  
Camera, Raminator 1/4 plate - Lens, Prunus  
Combinator,  $\frac{14}{6}$ , focus 5. Plates, self  
Process  
~~light~~ light, 5' above & wall outside  
between 10 & 12 a.m. bright day in February.  
Aperture, 32. Time 90 secs. Yellow screen  
in lens.

Photographing Friendly Creek Froglet

1/2 Natural size

Back ground, white red set. Slight  
focus about 2 ft. Camera, own Kodak  
Lens, Prunus astronomical combination,  $\frac{20}{10}$ .  
Yellow screen Plates, self process ordinary.  
Light, <sup>inside</sup> ~~with~~ large south window at  
about 11, set. 1 & 12, bright day in December  
Aperture, nominal 11, true 16. Time  
15 secs. (Racket right out)

Primary lens.

Combs.	$\frac{20}{14}$	$\frac{20}{10}$	$\frac{14}{10}$	$\frac{20}{6}$	$\frac{14}{6}$	$\frac{10}{6}$
foci	9 1/2	7 1/2	6 1/2	5 1/2	5	4

Aperture.

Inch F	Reading with diff. combinations.					
	$\frac{20}{14}$	$\frac{20}{10}$	$\frac{14}{10}$	$\frac{20}{6}$	$\frac{14}{6}$	$\frac{10}{6}$
8		5		8		
16		11		16		
32		22		32		
64		44		64		

Hydroxide ions. Several of them.

Use equal quantities of each undiluted.

1. (1) Hydroxide ions	10 gram
(2) Sodium sulphite	55 "
(3) Citric acid	" "
(4) Potassium bromide	1.5 "
Water	500 c.c.

(2.)  
Sulphur

57 gms.	<del>Potassium carbonate anhyd.</del>	<del>55 gram</del>
30	<del>Sodium carbonate anhyd.</del>	<del>55 "</del>
500	<del>Water</del>	<del>500 c.c.</del>

Sod carb. crystals <sup>100% 10 H<sub>2</sub>O</sup> 100 gms \*  
Water 500 c.c.

26/6/21

\* = 37 gms anhyd  $\text{Na}_2\text{CO}_3$

## Microphotographs of Rock slices.

Slices must be thin and even.  
Light - 16 C.P. frosted & lit 7"  
from reflector.

Microscope - 2" <sup>2.1"</sup> objective, no eyepiece;

polariser and analyzer removed.  
Objective & object protected by mesh on lens.

Camera - Rasket set to full extent,

junction with microscope a

quarrel with rubber m'g &

black glazed paper.

Places 3 DeFord Process 1/4

1 mic <sup>me to ten</sup> ~~2~~ ~~to~~ ~~10~~ mic. according to  
ex-act of slide.

Focus - visual focus as fixed  
by quick movement of micros-  
cope.

Developer Hydrokione.

Stage trials, Process Royal. as above but  
4 1/2 min. 10 min.

1" back lens

Micro of 7 mm dia by repeated exposure

Close to 2/3 mm on ~~the~~ full working exposure

1" with 1" objective.



Notes

$\frac{1}{2}$

Gibson camera

16

in window room  
door

30 sec.

White blotting

14 and

Hydromine

## Photographing Jantelite Crystals.

Scale  $\frac{11}{10}$  to  $\frac{1}{2}$

Lens Prucius  $\frac{14}{6}$

Aperture 32

Light Open or under

Time 30 - 45 sec.

Background white or brown paper behind  
glass.

Plates Jantite Process (N.B. 24 1/2 tone)

Developer Hydromine.

Distance from front of lens to object for scale

$\frac{1}{1}$ ,  $\frac{1}{4}$ .

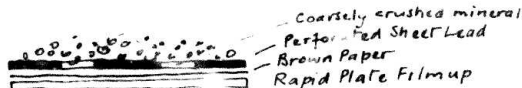
to clearing over developed negatives  
on lantern slides.

Wet plate with water & put in

Dist water	5 oz	150 cc
Kypt	1/2 oz	15 gm.
5% Ferricy sol	4 Acc.	4 cc

Roll gently until clear enough  
in water & dry.

Radiographs.



enclose whole in negative box, wrap well up

to exclude light and expose for time  $\equiv$

$$\frac{100}{\% \text{ of } \text{UO}_2} \text{ approx.}$$

Item 5  
Book 2

Index of Negatives

Negatives

1467

S. Perth for W. Giza



Take Becking on sandstone, 1897

From Becking shell collector, 1897

See also, L. G. G., 1897

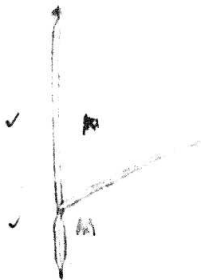
See also, Becking, 1897

See also, Becking, 1897

See also, Becking, 1897

See also, Becking, 1897

See also, Becking, 1897



See also, Becking, 1897

3. S. Point from Mt. Eliza, 1897  
13. ditto, Jan. 97  
4. Swan R. from Wellington Ridge 20. vi. 97  
15. Whiter Parade from W. Ridge 20. vi. 97  
16. Melville Water from Mt. Eliza, Jan 97 ✓ X  
17. Placks Camp, Mt. Eliza 97  
18. Twilight, Mungas Lake, Reedville 97  
19. Sun at clouds, Lower Swan, Jan 97  
20. ditto.  
→  
21. Snow, North Hill 2 Mt. Eliza, Jan 97  
22. Rocks, Cathedral Point 1897  
23. Cathedral Point, 1897  
24. ditto 1897



25. Forks, Granite Point, '97

26. Rosier Road Bridge, Guilford '97

27. ditto

28. ... Park, Guilford '97 ✓

X

29. ditto '97 ✓

X

30. ... Mounts Long Road, '97

31. ditto '97

32. ditto '97 ✓

33. G.P.O., ... Guilford '97

34. ... Guilford '97

35. Biological Survey Office Guilford '97

Redwood - 2 x 1/2

36. ... Guilford '97

X

- |     |                               |     |         |                        |
|-----|-------------------------------|-----|---------|------------------------|
| 37. | Panorama of Pentth (2)        |     |         | X                      |
| 38  |                               |     |         |                        |
| 38  | ditto                         | (3) |         | X                      |
| 39  | ditto                         | (4) |         | X                      |
| 40  | Sheep Gully 45                |     | Apr. 95 |                        |
| 41  | Flower slope's Base, Gully    |     | Nov. 95 | ✓ X                    |
| 42  | From the same                 |     | Nov. 95 |                        |
| 43  | ditto                         |     |         |                        |
| 44  | Kearney's Gully, near head    |     | Nov. 95 | X ✓                    |
| 45  | ditto                         |     |         | X ✓                    |
| →   |                               |     |         |                        |
| 46  | Station of Trees, Pentth Park | (4) |         | 46.56 ne $\frac{1}{4}$ |
| 47  | ditto                         |     |         |                        |
| 48  | ditto                         |     |         |                        |

- |      |   |     |     |
|------|---|-----|-----|
| 49   | Creek Bed, Gorseberry Hill                        | 197 | ✓   |
| 50   | Gap in Forest, Gorseberry Hill                    | 97  | x ✓ |
| 51   | Granite Jar, do.                                  | 97  | x   |
| 52   | Mountain Stream do.                               | 97  |     |
| 53   | Gravelly soil on slope of Jot                     | 97  |     |
| 54   | Woods edge, do.                                   | 97  |     |
| 55   | Bush home, do.                                    | 97  |     |
| 56   | Bush home, do.                                    | 97  |     |
| → 57 | Bush study, do.                                   | 97  | x ✓ |
| 58   | Railway Bridge, do.                               | 97  |     |
| 59   | Bush home, do.                                    | 97  |     |
| 60   | Railway construction camp,<br>Munstering. 18.3.98 |     | ✓   |

61. Gascogne Orchard, Montserrat, Jan 95
62. Mountain Scene, do. do. ✓
63. Colgan's N.S. Water Site, do. do. ✓
64. Granite Water Park, Bellabelling, Nov. 95
65. Kingsley Park, do. do., Colgan's, Apr. 95
66. Kingsley Park, Kingsley Park, do. do. ✓
- 67. ... ..
68. ... .. Aug. 97:
69. ... ..
70. ... ..
71. ... ..
72. ... .. Settling Vats, Apr. 95

73. Hol. Roke View Conits, Shime Vato Apr. 15

74 " Filter Presse " ✓

75 " " " " ✓

76 " Water Conter Aug. 17 ✓ →

77 Cassel. M. Carling Sept. " ✓

78 " Mail. Sept. 10. " ✓

79 " Water Conter " ✓

80 L.V. + B. J. & M. Water Conter " ✓

81 K.M. + I.K. & M. Cakes for W. Conter " ✓

→

~~82~~ ~~83~~ ~~84~~ ~~85~~ ~~86~~ ~~87~~ ~~88~~ ~~89~~ ~~90~~ ~~91~~ ~~92~~ ~~93~~ ~~94~~ ~~95~~ ~~96~~ ~~97~~ ~~98~~ ~~99~~ ~~100~~

82. L.V. Smith, Mail. Sept. 10. " ✓

83. K. Brown Hill, Conter " ✓



84. Islands, Harman's Lake Apr. 95 ✓
85. Harman's Lake
86. Serpentine Bay, Harman's Lake
87. The W + O. Co. Pumping St., Harman's  
Lake Apr. 95 ✓
88. Social Party at Harman's Lake Nov. 07
89. Beach Camp Dec. 07
90. The Lake Camp Apr. 95 ✓
91. Camp Office Camp Apr. 95
92. - - - - -
93. - Office Camp + High Camp -
94. - Office Camp, High + Hill -
95. - The corresponding bridge + other -
96. R.V. East, Harman's Lake

- |     |   |             |   |     |
|-----|---|-------------|---|-----|
| 97  | Copy. Plan of Harbor Mining Properties      | May '95     |   |     |
| 98  | Clonoo, Park.                               | May '95     |   |     |
| 99  | do  |             |   |     |
| 100 | do  |             |   |     |
| 101 | North Fremantle - Sea Beach                 | June '95    | ✓ |     |
| 102 | N. in Fremantle from the north side         | June '95    | ✓ |     |
| 103 | Ballast Quarry, Bigg's Bay Range            | 24 July '95 |   |     |
| 104 | The Bathing Boxes - Park<br>Dartmouth Range |             | ✓ | x   |
| 105 | Granite Working - Dartmouth Range           |             | ✓ | ✓   |
| 106 | Dioite Wyke Valley of the Kalamunda         |             | ✓ | x ✓ |
| 107 | Kalamunda River                             |             | ✓ |     |
| 108 | Cooling Run, Darling Range                  |             |   |     |

109. W.A.S. setting W.A.S. from ante  
→ General view July 95

110. W.A.S.

111. W.A.S. W.A.S. One of the Blowers

112. W.A.S.W. Upper Part of No 1 Blast  
Furnace being built

113. W.A.S.W. No 2 Furnace in process  
of being built.

114. Base of 165 ft. Stack

115. General view of the site, Collier Aug. 5/95

116. W.A.S. Clear view

117. Typical Bush scene, Collier Coalfield.

118. General view of the site, view from  
Collier Aug. 95

119. W.A.S. view of River  
from ground.

120. S.S.W. Pond at the Collier

Box 2

←

Box 3

121. W.A. Wilsons - Spider orchids, ~~sp.~~ ✓

122. do. White Caladenia. ✓

123. do. Pink Caladenia. " ✓ ✓

124. do. Spider orchids, Caladenias ✓  
not Swamp white.

125. do. Pink, white & yellow Caladenias, ✓  
and large Spider orchid

126. do. Spider orchids. " ✓ ✓

127. do. Dark Spider orchid. " ✓

128. Swan View, Malogony ✓  
Route 100, Rocky Creek. June 98 ✓

129. do. do. " ✓

130. do. do. " ✓

131. do. Malogony ✓  
Water fall, Rocky Creek. " ✓ X ✓

132. do. Malogony ✓  
Rocky Creek, Top View. " ✓ X





133. ~~Swan View~~  
Pinnacles, Summit St. June 98 ✓
134. Cranshaws, Mandella Sept. '98 ✓
135. Mountain Hope, Mandella Sept. '98 ✓
136. Picnic at J.W. on a slope 30. x. 98
137. do. do. 30. x. 98
138. Geol. Survey Office, St. George's Terrace. 26. x. 98 ✓
139. do. do. Rock View, 26. x. 98 ✓
140. Smoke Bush for Pinnacles 25. x. 98 ✓
141. do. do. 25. x. 98
142. The Causeway, Ocean Beach, Bunting 24. x. 98 ✓
143. Columnar Basalt, the Causeway, Bunting 25. x. 98 ✓
144. View of the "Carpet Castle", Bunting 26. x. 98

Box 3 (1923)

Box 4

- |      |  |                          |   |                  |
|------|--|--------------------------|---|------------------|
| 145. | W. A. Kamelhaus (active site)                        | Nov. 99                  | x | -                |
| 146  | do.  | Nov. 99                  | x | -                |
| →    |  |                          |   |                  |
| 147  | Granite outcrop, Soorak, Colgate July 99             |                          |   | o                |
| 148  | Excavation for W. A. Kamelhaus, Hudson River, Albany | Oct. 99                  |   | o                |
| 149  | At the "China" site & water to any.                  | Nov. 99                  | x | -                |
| 150  | At the "Mimosa" & "Mistral" Canning River, Nov. 99   |                          | ✓ | - <del>151</del> |
| 151  | Aspen River, Bowling                                 | 23 <sup>rd</sup> Dec 99  | x | -                |
| 152  | do   | "                        | ✓ | x -              |
| 153  | At Clarence, Albany                                  | 25 <sup>th</sup> Dec. 99 |   |                  |
| 154  | View looking N-E. from Mt. Melville, Albany.         |                          |   |                  |
| 155  | A quiet corner, Mt. Melville, Albany                 |                          | x | -                |
| 156  | Basal rock, Mt. Melville, Albany                     |                          |   |                  |

- |       |   |                          |     |         |
|-------|---|--------------------------|-----|---------|
| 145.  | W. A. Hammett House (Aust. 1880s)           | Nov. 99                  | x   | -       |
| 146   | do.   | Nov. 99                  | x   | -       |
| → 147 | Granite outcrop, Soorak, Corgies            | July 99                  |     | 0       |
| 148   | Excavation in W. an, Helen R. Albany        | Oct. 99                  |     | 0       |
| 149   | At the "China" 2 1/2 h. water to ang.       | Nov. 99                  | x   | 0 -     |
| 150   | The "Limosa" & "Mistral", Canning River.    | Nov. 99                  | ✓   | - 2/4 ✓ |
| 151.  | Avon River, Bunkerly                        | 23 <sup>rd</sup> Dec. 99 | x   | -       |
| 152.  | ∞   | "                        | ✓ x | -       |
| 153.  | Mt. Clarence, Albany?                       | 25 <sup>th</sup> Dec. 99 |     |         |
| 154   | View looking N-E from Mt. Melville, Albany. |                          |     |         |
| 155.  | A quiet corner, Mt. Melville, Albany        |                          | x   | -       |
| 156.  | Boat Rock, Mt. Melville, Albany.            |                          |     |         |

157. The Dog Rock, Albany 26. xii. 99 ✓

158. Natural Park, K. Co. Sound 24. xii. 99 ✓

159. Government Condenser, Montana, B. Co.  
General View from side. July 99 ✓

160. do.  
General View from End. " ✓

161. do.  
Boilers & Economisers. " ✓

162. do.  
Boilers, Economisers & Discharge " ✓

163. Turbine Condenser, Bortygardie 9. vii. 99 ✓

164. Paper Tank Condenser, & Cell 2 m. W.  
of Bortygardie 9. vii. 99 ✓

165. Yachting on the Swan Jan. 00 ✓

166. do. " ✓

167. do. " ✓

168. S.S. "Manx Fairy" & yachts, Perth  
Water, Swan River " ✓

← B of A (1923)  
B of S



- |      |  |                   |   |  |
|------|--|-------------------|---|--|
| 169. | W. A. Bird House   | June, 1900        | ✓ |  |
| 170  | Granite Water Rock,<br>Rondaverg, W. A.                    | near<br>June 1899 | ✓ |  |
| 171. | Richard shaft Furnace,<br>Breston Hill Reef G. M., Boulder | "                 | ✓ |  |
| 172. | Roff Furnaces, associated<br>G. M., Boulder                | "                 | ✓ |  |
| 173  | do. do.  | "                 | ✓ |  |
| 174  | Condenser, S. Kalgweil G. M.,<br>Boulder                   | " ✓               | ✓ |  |
| →    | 175 Bustran's Buttery G. M.<br>Bustran's                   | "                 | ✓ |  |
| 176  | Red Bluff, Lignite Mine,<br>Lodgepole                      | "                 |   |  |
| 177  | do.  | "                 |   |  |
| 178. | Condenser, Boulder   | " ✓               | ✓ |  |
| 179. | Seawannan Lake   | Aug. 1901         | ✓ |  |
| 180. | Outcrop of Siliceous Sinter<br>Seawannan Lake              | " ✓               | ✓ |  |

174



- |      |  |             |     |
|------|--|-------------|-----|
| 181. | Outcrop of Pisolite Sandstone<br>Near Hannans Lake               | Aug. 1900   | ✓   |
| 182. | Peridotite Spout, Hannans<br>Lake                                |             | ✓ ✓ |
| 183  | do.  |             | ✓ ✓ |
| 184  | Sandstone hills, N. of Kalbarrie                                 |             |     |
| 185  | Typical Bush Scene,<br>N. of Kalbarrie                           |             | ✓   |
| 186. | do.  |             |     |
| 187  | Scrubbing Ranges, S.W. of W.A.                                   | 1900        | ✓   |
| →    |  |             |     |
| 188. | Geochelone & Cicouren<br>Sundagai                                | 8. IV. 1900 | ✓   |
| 189  | Swain Peaks near Sundagai  | 5. IV. 1900 |     |
| 190  | Prince of Wales G. M., Reno.                                     | 7. IV. 00   |     |
| 191  | Near Sundagai.   | 5. IV. 00   |     |
| 192  | View from Asbestos Mine, looking<br>across from the Grants Reno. | 5. IV. 00   | ✓   |

Box 5  
← Box 6

- 193. Celestia Hill Gundersen 8.14.00 ✓
- 194. Gundersen to Reno 7.14.00
- 195. Chrona Hill, Gotland Long. 8.14.00 ✓
- 196. Gotland Long. Mountain + Mur- 8.14.00  
 rineridge R. from Chrona Hill. ✓
- 197. Murineridge R. at 8.14.00 ✓  
 Gotland Long. ✓
- 198. Creek at Stanwell Park 16.14.00 ✓
- 199. Palm Scrub, Stanwell Park. 16.14.00 ✓
- 200. Creek at Stanwell Park. 16.14.00 ✓
- 201. Toronora River (Panic Park) .00 ✓
- 202. " " .00 ✓
- 203. Car, Toronora River. .00 ✓

2x6

→

←

193. Oyster shell Gundayai 5.14.00 ✓

194. Gundayai from Reno 7.14.00

195. Oyster shell, Gohanalong. 8.14.00 ✓

196. Gohanalong Murrelets + Murre 8.14.00  
Murre ridge R. from Oyster shell. ✓

197. Murre ridge R. at 8.14.00 ✓  
Gohanalong ✓

198. Creek at Stanwell Park 16.14.00 ✓

199. Palm scrub, Stanwell Park. 16.14.00 ✓

200. Creek at Stanwell Park. 16.14.00 ✓

201. Warramona River (Picnic Party) .00 ✓

202. " " .00 ✓

203. Carr, Warramona River. .00 ✓

206

→

←

204. Obs. diatoms, W.A. Natural size.

1902

1  
2  
3  
4  
5  
6

Reg. Strong.

Pres. Plat.

205.

1902

Reg. Strong

Pres. Plat.

206.

1902

✓

Reg. Strong

Pres. Plat.

207.

1902

1

Kalgoolie, own coll.

Reg. Strong

Pres. Plat.

2

Rake Corran  
W.B.C. coll.

208.

1902

Kalgoolie,  
own coll.

Reg. Strong

Pres. Plat.

209.

1902

1

2 3

4

5 6

Reg. Strong

Pres. Plat.

210.

1902

Reg. Strong

Pres. Plat.

211.

1902

✓ 1

1. Colganville S.S.W.A  
coll.

Reg. Strong

2

3 4

2. Slacks Creek own  
coll.

Pres. Plat.

5

3. Kalgoolie

212.

1902

Reg. Strong

Pres. Plat.

213.

19

Reg. Strong

Pres. Plat.

214.

1902

✓ Kalgoolie

Reg. Strong

Pres.

← Box

7

Reg. Silen. mark.

215. Cape Henfield, W.A.

216. Gorges Falls, Cape Mentelle

1902

Fig. film, med.

217.

1902

Fig. film, med.

218. Rocks, Cape Mentelle

1902

Fig. film, weak

219.

1902

Fig. film, med

220. False-mooting, Cape Mentelle

1902

Fig. film, weak

221. Carpet snake,

1902

Fig. film, weak

222. Cape Mentelle

1902

Fig. film, weak

223.

1902

Fig. film, weak

→ 224. Fork side of Pt, entrance to Lake Cave, W.A. ✓

1. IV. 1902

Fig. strong

Pos. Sil. Plat.

225. Kari Tress, mouth of Mammoth Cave ✓

1902

Fig. strong

Pos. Sil. Plat

226. Waterfall, mouth of Margaret R. ✓

2. IV. 1902

Fig. med.

Pos. Sil.

227.

1902

Fig. med.

Pos. Sil.



228. Gneiss outcrop, mouth of Mary ant  
River, W. A. 1902

229. Junction of Gneiss & Limestone, Ocean  
Beach, Ellensbrook. 5. IV. 1902

230. Ditts. Mouth of Mary ant River.  
1902

231. " " " " " " " "  
2. IV. 1902

232. Sandstone, mouth of Mary ant R. ✓  
1902

233. Mollup Creek, bet. Busselton &  
Yallingup 28. III. 1902 ✓

234. " " " " " " " "  
28. III. 1902

235. Mouth of Yallingup Cave, W. A. ✓  
25. III. 1902

236. Yallingup Lake ✓  
25. III. 1902 ✓

237. C. of R., Busselton ✓  
1902 ✓

238. Vase River from Railway Bridge  
Busselton. 30. III. 1902

239. Vase River, Busselton ✓  
1902 ✓

Reg. weak  
P. Sil.

Reg. weak  
P. Sil.

Reg. med.  
P. Sil.

Reg. med.  
P. Sil.

Reg. strong.  
P. Sil. Pl.

Reg. strong.  
P. Sil. Pl.

Reg. strong.  
P. Sil.

Reg. strong.  
P. Sil. Plat

Reg. strong.  
P. Sil. Plat

Reg. strong  
P. Sil. Plat.

Reg. strong  
P. Sil.


Reg. strong  
P. Sil. Plat.



- |      |                                    |   |              |
|------|------------------------------------|---|--------------|
| 252. | The Hump, Hlagam, v. Gristed ✓     | ✓ | Reg. strong. |
|      | 1909                               |   | Pts. Peak.   |
| 253. | Rice at Hlagam, v. Gristed ✓       |   | Reg. strong. |
|      | 25. XII. 00                        |   |              |
| 254. | " " " ✓                            |   | Reg. strong. |
|      | 25. XII. 00                        |   |              |
| 255. | Obsidianite, Hannans Lake, v. A.   |   | Reg. weak    |
|      | Flat - as size. 1902               |   |              |
| 256. | Obsidianite, v. A. status " "      |   | Reg. weak    |
|      | 1902                               |   |              |
| 257. | " " " "                            |   | Reg. weak    |
|      | 1902                               |   |              |
| 258. | M.K.S. Copy of Portrait.           |   | Reg. strong  |
|      | 1902                               |   | Pts. Peak.   |
| 259. | Gravel Pit, Smiths Hill            |   | Reg. strong. |
|      | 1901                               |   |              |
| 260. | Gravel Pit, Smiths Hill.           |   | Reg. strong. |
|      | 1901                               |   |              |
| 261. | Bauxite, Gravel Pit, Smiths Hill ✓ | ✓ | Reg. strong. |
|      | 1901                               |   |              |
| 262. | Gravel underlying Granite, det.    |   | Reg. strong. |
|      | Smiths Hill & Mahogany Creek. 1901 |   |              |
| 263. | Stratans & Incey Pit               |   | Reg. strong. |
|      | 1901                               |   |              |

- |   |                        |              |
|---|------------------------|--------------|
| 264. Ratanite, Grand Pt., Maryland Creek<br>1901                        | ✓                      | Very strong. |
| 265. Keith, Hobotsford?<br>Jan. 1902                                    |                        | Very weak.   |
| 266. Bush house, Hobotsford?<br>Jan. 1902                               | ✓                      | Very weak.   |
| 267. Cowan Creek, N. S. W.<br>I. I. 02                                  | ✓                      | Very weak.   |
| 268. Jensen, Mustville<br>Apr 1902                                      |                        | Very weak?   |
| 269. Orestianito, East Indies, Copy of Plate<br>Krause's Paper.<br>1902 |                        | Very weak    |
| 270. C. bidia etc, W. A.<br>1902  | Photo - same<br>color? | Very weak?   |
| 271. Clover horsehairmap, W. A.   |                        | Very weak.   |
| →<br>272. Bird flower, W. A.  | ✓                      | Very weak?   |
| 273. Yellow Baronia, W. A.  |                        | Very weak    |
| 274. Paper horsehairmap, W. A.  |                        | Very weak?   |
| 275. Orchids (Pterostylis) W. A.  |                        | Very weak.   |



- |      |   |           |            |
|------|---|-----------|------------|
| 276. | Swamp-flower, W. A.   |           | Fig. 125.  |
| 277. | Greenhouse, <i>aberts</i> food:  | Jan 1902  | ✓<br>- 125 |
| 278. | Rizzie & Keith, <sup>many</sup> <i>aberts</i>   | Apr. 1900 | N.M.       |
| 279. | <i>aberts</i> from the Quarry   | Apr. 1900 |            |
| 280. | Keith   | Apr. 1900 |            |
| 281. | Keith   |           |            |
| 282. | <i>aberts</i> from the front garden   | Apr. 1900 | N.S.       |
| 283. | Cave in sandstone, <i>aberts</i> being<br>view  | Apr. 1900 | N.M.       |
| 284. | Do.   |           |            |
| 285. | Jugra at Craigavad  |           | N.S.       |
| →    |   |           |            |
| 286. | Jugra tree in gully at back<br>of Craigavad   | Apr. 1900 | ✓<br>N.S.  |
| 287. | Creek at Craigavad  |           | ✓<br>N.S.  |





300. S. Kings, Waverley

Jan. 02

301. Clearana, W. Guildford

15.12.01

302. Cowan Creek, N.S.W. from

Shanks Point

1.1.02

303. " " from the landing

at Corrona

1.1.02

304. E.S.S. Perth,

15.1X.01

305. Beance, Ethel & Ruby

15.1X.01

306. Jaciara, Kay & West, Perth

1899

307. Beance, Ethel & Ruby

15.1X.01

308. Aunt Flee, Beance, Ethel &

Perth

1901

309. E.S.S. Perth

1901

310. Federal Referendum Results

Perth

1.VIII.00

311

00.

1.VIII.00

N.S.

N.S.

N.S.

312. Coal Arch, Perth

June 1901

313. Chinese Arch, Perth

→

314. Scale Arch, Perth

315. Entrance of Mammoth Cave,  
Margaret River Apr. '02

316. White creosoting, Southampton  
28.VIII.02

317. Do. Do.  
25.VIII.02

318. West side of Mengers Lake  
19.X.02 N.S.

319. Bush scene N. side of Kerdmans Lake  
19.X.02

320. E.S.S. & W.W.S. north side of Kerdmans  
Lake near banks - 02 19.X.02 N.S.

321. Kerdmans Lake, West side  
19.X.02 N.S.

322. Granite gneiss, Ocean Beach near  
Selens brook 5.IV.02 N.S.

323. Friendly Creek Tugay, Scale T/16  
1902

324. Friendly Creek, Tugget Scale  $\frac{1}{10}$   
1902 ✓
325. Do Scale  $\frac{1}{5}$  ✓  
1000 ft 1902
326. Do Scale  $\frac{1}{5}$  ✓  
Recess 1902
327. Garden at Wheeling on loope ✓  
→ bet. 1902
328. Do. ✓  
bet 1902
329. S.S. Waratah, Carreenig Bay, Garden ✓  
\$2 and 2 bags 3.1.03
330. Do ✓  
3.1.03
331. Garden Island ✓  
3.1.03
332. Syd R. starts fishing at Garden ✓  
\$2 and 3.1.03
333. South coast of Garden Island ✓  
3.1.03
334. Do. ✓  
3.1.03
335. young Penguins caught at Penguin ✓  
Island 4.1.03

336. Young Penguins caught at  
Penguin Island 4.1.03
337. Ruin Stone Cliffs, south side of  
Penguin Island 4.1.03
338. Ruin Stone Cliffs, west side of  
Penguin Island 4.1.03.
339. Salt Deposit, Rottenest Island  
Rocking N. S. 26.1.03
340. ~~Pit~~  
Rocking S. 26.1.03
341. Bathurst Point, Rottenest Island  
→ 26.1.03
342. Old Orchard, Rottenest Island  
26.1.03
343. Salt Lakes from B side of Settle-  
ment, Rottenest 26.1.03
344. Pile Station & Monymile Refor-  
matory, Rottenest 26.1.03.
345. West end of Diatomite Deposit  
Lake Snangara 21.12.02
346. Diatomite Deposit north end of  
Lake Snangara 21.12.02
347. Diatomite Deposit, Lake Snangara,  
from West side 21.12.02

✓

✓

N.S.

✓

N.S.

✓

✓

✓

✓

✓

✓

✓

✓

✓



348. Sea + H. N. P., P. ✓  
16. 9. 02
349. Juff Hotel, Tana Tanna ✓  
23. VIII. 02
350. Bunsides Margaret R. sev. ✓  
5. IV. 02
351. Kani Forest at Mammoth Cave,  
Margaret River. 6. IV. 02 ✓
352. Do. 6. IV. 02 ✓
353. Entrance to Cave ✓  
Margaret River. 6. IV. 02
354. Bumbury, Carbet Castle woods  
from sandhills Dec. 03
355. " " decs
356. " " " "
357. " Preston Road, Kay carting "
358. " Lighthouse hill "
359. " Lighthouse 27-XII-02

- 360 Bunking lava flow 1903
- 361 Wet gullies well picked 1903
- 362 Blenheim "Curler" at line 4.XII.03
- 363 " " the line 4.XII.03
- 364 Seal 28, top of dirt at S. end 3.X.03
- 365 Uniquent, Rockier Riv. 28.VI.03
- 366 " " " "
- 367 19 on my work, far rock + Red gum 28.I.04
- 368 ma\_ 28, East side from water 9.XI.03
- 369 " " ma\_ workings, distant "
- 370 " " " close "
- 371 " " Silver gullies "

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381 *Stidians*

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384. *Stolidianites*

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410 Canning Key, Gausem Isd.

22-X-05

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W. H. S., Daniel & Brian

15-11-06

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Mat & Brian; Lynton & Sarah

'08

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444 Jester & Brian? Ruptor

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456. Betty & Duke

Aug. '67

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468

E.S.S. on granite rocks, Grand View

105

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- 480 Lunnie washing Brian 3-VI-66
- 481 Brian with chicks 18-XII-66
- 482 " " "
- 483 Water pipe, measuring
- 484 Wire fence on the grass, measuring
- 485 Lunnie, Brian & Betty, "know" 15-9-07
- 486 " " - water - "
- 487 Lunnie "
- 488 Lunnie + Betty " 07
- 489 Betty Rynston 07
- 490 Betty + Brian 07
- 491 Albany Narrows from lake  
balcony 10-3-08

492 Brian on a "conjure", Albany Harbour 5-3-08

493 K. George's sand from by the Harbour -08

494 Betty on seaweed, Melville Pt. S,  
Albany 5-3-08

495 Brian on Path, Rawley Park, Albany 08

496 Brian by Sun, " " 08

497 Brian eating bread, by the Harbour 08

498. Brian as Crossing Sweeper, Albany '08

499. Mr. Matis, Brian, Betty near Long Jetty  
Albany 27-2-08

500 ditto 27-2-08

501 Matis & Brian Paddling, Alb. Harb. 5-3-08

502. G.S.S. & Brian Paddling, " - 5-3-08

503. Melville Point, Alb. Harb. 26-2-08

504. E.S.S + Avian paddling Grassmere  
29-2-08

505. ~~Si 057~~

506. M + Avian building sand castles  
Grassmere 29-2-08

507. East end of Grassmere 29-2-08

508. Grassmere from railway 29-2-08

509 3 B's in box of Junt, Mc Henry 23-3-13

510 ~~Wetland~~ " " "

511 3 B's - boat, Gannings R, Mc Henry

512 " " "

513 Camp, Mc Henry 24-3-13

514 " " "

515 M. + 3 B's, Gannings bridge "

516 E.S.S. o 3 Ps. Lanning Av. Op 24-3-13

517.



516 E.S.S. & 3 Ps. Learning Br. Op 24-3-13

517.

T

all be open and a little ammonia  
solution which is formed. If  
the crevices are covered with  
their proper mud beds and  
set on a sand all over a char-  
coal fire 5 days and an ounce  
of gold.

Average Daily Number of Assays  
1896.

January	W. 17.2	M. 42.0	J. 59.2
February	19.6	40.6	50.2
March	20.9	43.6	64.5
April	20.2	49.1	9.5
May	21.0	54.8	75.8
June	20.5	57.9	78.4

Estimation of Gold in Lignors.

200 c.c. of the sample are taken and put in a 500 c.c. beaker. 5 c.c. of concentrated HCl are added, the beaker covered with a clock glass and the solution boiled gently until all free chlorine is removed. The solution is then cooled and H<sub>2</sub>S passed thro' it until it contains an excess of the gas. All gold, silver and copper is thus precipitated.

The residue is filtered and well washed with distilled water. A hole is pressed in the bottom of the filter and as much as possible of the residue washed into a 100 c.c. beaker. The filter is ignited and its ash dropped into the beaker also. 7-10 c.c. concentrated HNO<sub>3</sub> is then added and the solution boiled until all the

water is dissolved. The precipitate is allowed to settle when the solution is decanted off. The residue of gold containing a little  $HgCl_2$  and filter ash is washed by decantation first with water then with strong  $NH_4OH$  solution, after which it is washed down into a porcelain capsule. The water is poured off and the gold ignited. After cooling in a desiccator the gold is weighed on the scale pan and weighed.

The results obtained in April 1896, see the next page.

Date	Lower Works Grains per gallon	Upper Works	Date	Lower Works	Upper Works
1 <sup>st</sup>	0.140	0.375	16 <sup>th</sup>	0.455	0.910
2 <sup>nd</sup>	0.980	0.455	17 <sup>th</sup>	1.050	0.770
3 <sup>rd</sup>	"	"	18 <sup>th</sup>	1.330	0.280
4 <sup>th</sup>	0.980	0.840	19 <sup>th</sup>	"	"
5 <sup>th</sup>	"	"	20 <sup>th</sup>	0.630	0.070
6 <sup>th</sup>	1.225	0.210	21 <sup>st</sup>	0.630	0.630
7 <sup>th</sup>	0.210	1.085	22 <sup>nd</sup>	1.320	0.665
8 <sup>th</sup>	0.630	0.700	23 <sup>rd</sup>	0.630	1.050
9 <sup>th</sup>	1.610	0.700	24 <sup>th</sup>	0.805	0.735
10 <sup>th</sup>	0.490	0.595	25 <sup>th</sup>	0.630	0.805
11 <sup>th</sup>	0.770	0.875	26 <sup>th</sup>	"	"
12 <sup>th</sup>	"	"	27 <sup>th</sup>	0.175	1.260
13 <sup>th</sup>	Trace	0.735	28 <sup>th</sup>	2.100	1.050
14 <sup>th</sup>	0.770	0.525	29 <sup>th</sup>	1.190	0.945
15 <sup>th</sup>	0.455	1.050	30 <sup>th</sup>	1.855	0.210

Average R.W. 0.862 grains per gall.  
 U.W. 0.721 " " "



## Determination of $\text{KNO}_3$ in Manganese Ores.

The method followed is that numbered B in Sutton's Volumetric analysis.

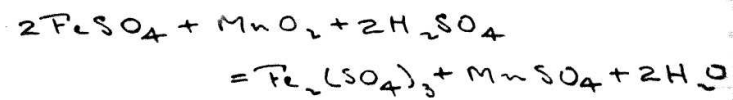
1.5 grams or less - according to the richness of the ore - of clean "flower wire" (99.9% Fe) is placed in a 500 c.c. flask with ~~100~~<sup>100</sup> c.c. of  $\text{H}_2\text{SO}_4$ . The flask is fitted with a rubber cork and a rubber non-return valve, and warmed until all the iron is dissolved.

1 gram of the finely powdered pyrolusite is then added and the stopper replaced. The flask is boiled gently until the whole of the manganese is dissolved which is known by the absence of black speck in the residue.

The solution is cooled and transferred to a 750 c.c. beaker, diluted to about 400 c.c. and titrated with

$\frac{N}{10}$ .  $K_2Cr_2O_7$  to ascertain the amount of iron unoxidized. Subtracting this from the total iron added, we obtain the amount of iron oxidized during the solution of the manganese. This amount multiplied by the factor 0.7768 gives the amount of  $MnO_2$  in the ore.

The equation for the oxidation of the iron is



so that 87 grams of  $MnO_2$  will oxidize 112 grams of Fe; or 1 gram of Fe  $\equiv$  0.7768 grams  $MnO_2$ .

Factors.

- 1 gram. Fe  $\equiv$  0.7768 grams  $MnO_2$
- 1.2873 gms. Fe  $\equiv$  1.0000 "  $MnO_2$
- 1.2886 " GunWire  $\equiv$  1.0000 "  $MnO_2$

When a 1 gram of ore is taken, then

- 1%  $MnO_2 \equiv$  0.0129 gms. Fe oxidized
- 5%  $MnO_2 \equiv$  0.0644 " " "

vide next page

Table for MnO<sub>2</sub> values

1%	TiO <sub>2</sub>	≡	0.0129	gr. Fe indicated
2		≡	0.0257	
3		≡	0.0386	
4		≡	0.0515	
5		≡	0.0644	
6		≡	0.0772	
7		≡	0.0901	
8		≡	0.1030	
9		≡	0.1159	
10		≡	0.1287	
20		≡	0.2575	
30		≡	0.3862	
40		≡	0.5149	
<del>40</del>		≡	0.6436	
60		≡	0.7724	
70		≡	0.9011	
80		≡	1.0298	
90		≡	1.1586	
100		≡	1.2873	

Sundry Analyses

Top Works Lignors - 9:3:96.

	Grains per gall.
Total Solids	430.8000
$\text{Au Cl}_3$	2.6448
$\text{Cu Cl}_2$	56.6900
$\text{Ag Cl}$	trace
$\text{Fe}_2 \text{Cl}_6$	18.7234
$\text{Al}_2 (\text{SO}_4)_3$	139.6310
$\text{Ca SO}_4$	38.2500
$\text{Mg SO}_4 \cdot 7 \text{H}_2 \text{O}$	107.6340
$\text{Si O}_2$	5.4840
$(\text{Na.K})_2 \text{SO}_4$	33.8970
$(\text{Na.K}) \text{Cl}$ (by difference)	27.8458
equal to	
$\text{Au}$	1.7143
$\text{Cu}$	26.7000

General Sample of Sulphide Ore

		Before Roasting.	After Roasting.
Jan. '96	Fe.	11.27%	12.50%
	S.	10.84	0.32
Feb.	Fe.	10.72	12.36
	S.	10.36	0.37
Mar.	Fe.	12.91	
	S.	11.17	

Water from Mendocino Creek - 17.7.95

Total Solids	S grains per gall. 76.40
NaCl	23.73
SiO <sub>2</sub>	2.44
CaSO <sub>4</sub>	25.67
MgSO <sub>4</sub>	6.64
MgCO <sub>3</sub>	<u>16.08</u>
	74.56



Filter Ash.

No. 1. Average Sample from Top Works  
for June 1894.

$\text{CaSO}_4$	2.244	} 5.444 Sol. in $\text{H}_2\text{O}$
$\text{MgSO}_4$	0.330	
$(\text{K. Na})_2\text{SO}_4$	2.870	
$\text{Fe}_2\text{O}_3$	38.620	} 44.295 Sol. in HCl + $\text{HNO}_3$ , exclusive of Au
$\text{Al}_2\text{O}_3$	4.615	
$\text{CaSO}_4$	0.624	
$\text{CaO}$	0.436	
Cu	trace	
$\text{MgO}$	trace	
$\text{SiO}_2$	10.800	
$\text{Fe}_2\text{O}_3$	1.669	} 14.170 Insol.
$\text{Al}_2\text{O}_3$	0.886	
$\text{CaO}$	0.815	
$\text{MgO}$	trace	
Au	35.690	35.690 Au
	99.869	99.869

22

Filter Ash

No. 2. Filter T, Lower Works, April '98  
Coloni. Light Brown.

$\text{CaSO}_4$	2.046	} 2.571
$\text{MgSO}_4$	0.090	
$(\text{K. Na})_2\text{SO}_4$	0.435	
$(\text{K. Na})\text{Cl}$	trace	} Soluble in $\text{H}_2\text{O}$ .
$\text{Fe}_2\text{O}_3$	12.226	}
$\text{Al}_2\text{O}_3$	2.124	
$\text{CaSO}_4$	1.412	
$\text{CaO}$	2.815	} 19.323
$\text{MgO}$	0.746	
$\text{SiO}_2$	33.380	} Soluble in $\text{HCl} +$ $\text{HNO}_3$ , incl. of $\text{Fe}$
$\text{Fe}_2\text{O}_3$	4.920	}
$\text{Al}_2\text{O}_3$	1.125	
$\text{CaO}$	1.535	
$\text{MgO}$	0.369	} Insoluble
$\text{Fe}$	34.710	34.710
	<u>70.433</u>	<u>90.433</u>

Filter Ash

No. 3. Upper Works 15-16. 20:5:95  
 No. 4. " " 54-57.  
 No. 5. Lower Works X.Y.Z.

	3.	4.	5.
$\text{SiO}_2$	26.99	21.26	24.47
$\text{Fe}_2\text{O}_3$	13.80	17.25	16.10
$\text{Al}_2\text{O}_3$	4.90	3.17	4.14
$\text{CaSO}_4^*$	12.72	10.06	9.06
$\text{MgO}$	1.21	0.77	0.69
$\text{Zn}$	36.49	46.20	44.62
Alkalis (by diff.)	3.39	1.29	0.92

\* all lime calculated as  $\text{CaSO}_4$

Smelting Furnace Slag

15:8:95

	1	2	3.
$\text{SiO}_2$	30.94	35.14	31.02
$\text{Fe}_2\text{O}_3$	23.10	27.24	25.33
$\text{FeO}$	6.91	8.42	5.51
$\text{Al}_2\text{O}_3$	8.25	6.25	6.70

English Stick Sulphur

S	77.909
O <sub>2</sub>	17.088
H <sub>2</sub> SO <sub>4</sub>	2.009
SO <sub>2</sub>	trace
Ash	0.408
Organic Matter	<u>2.585</u>
	99.999



ChargingStandard Flux.

Litharge	29 lb.
Soda	34 "
Flour	15 oz.

[1 gr. flour will reduce 10 grains litharge]

Charges

1. Oxidised Ores: Quartz, Sinter,  
Kalin, light ironstone.

Ore	400 grains
Std. Flux.	1000 "
Soda	300 "
Salt Cover	750 "

Pot. Batt. Rd. F.

- when  $\text{TiO}_2$  is present add

Borax	300 grains
-------	------------



2. Heavy Ironstone. Mine or less  
fine limonite.

Ore	400	grains
Sto. Flux	1000	"
Flour	5	"
Soda	300	"
Salt Cover	750	"

Pot. Batt. Rd. G.

3. Pyritic Ores.

	(1) Poor	(2) Rich
Ore	400 gr.	240 gr.
Soda	900 -	600 -
Recharge	300 -	300 -
Flour	35 -	35 -
Borax	500 -	350 -
Salt Cover	750 -	750 -
Shov	1. 6" iron dog-spike	

Pot. Batt. Rd. G.

## 4 Residues.

1 Ordinary ore residues; value about 1 dwt.

2. Sulphide-ore residues; value 3-5 dwts.

	<u>1</u>	<u>2</u>
Ore	1200 gr.	800 gr.
Std. Flux	1500 -	1250 -
Soda	600 "	600 "
Borax	500 -	500 -
Salt Cover	750 "	750 -

Pot. Batt. Rd. G

5. Smelting Room Products. 1 case of charcoal filters; 2 case of val timber and of fuel used in smelting; smelt w. Rag.

	<u>1</u>	<u>2</u>
Ore	100 gr.	400 gr.
Std. Flux	1000 -	1000 -
Soda	300 -	300 -
Borax	150 -	300 -
Salt Cover	500 -	750 -

P.M.S. D.R.F. B.R.G.



### Consumption of Material in Assay Office.

Consumption per month of 4 weeks when average no of assays is 70 daily.

Goke	60 bags =	
Charcoal	85 " =	
Cinnabars G	3 1/2 casks =	<del>1250</del> <sup>1500</sup> crux.
F	3/4 " =	600 -
C.I. Firebars		
Bone-ash	1 cask =	1 cwt.
Litharge	1 keg =	1 cwt.
Soda	3 " =	3 cwt.
Borax	1/3 box =	37 lb [1/3 of 1 cwt.]
Salt	2 bags =	400 lb
Flour		
Iron Spikes	1/2 cwt.	
Nitric Acid	2 wins. =	4 qts = 15 lb.
Ammonia (880)	1/2 " =	1 " = 2.2 "

\* The "separators" are vats, 4 ft. diam, with  
 layer of fine gravel at the bottom,  
 thro' which the acid liquor filter  
 before being run thro' the charcoal  
 filters, all suspended matter being  
 thus arrested. In the separators the  
 liquors are steam heated to drive  
 off excess of chlorine and make  
 them hot enough to be precipitated by  
 the charcoal in the filters.

## Sundry Assays

1896		hr
Mar. 19 <sup>th</sup>	Burning off shed ashes	8:13:02
- 23 <sup>rd</sup>	separator sand*	4:09:20
Apr. 7 <sup>th</sup>	Bring off shed "fine dust"	7:05%
8 <sup>th</sup>	- " - " Ashes	47:17:18
9 <sup>th</sup>	- " - " " Fine dust	4:2%
	- " - " Furnace Sweepings	34.7%
10 <sup>th</sup>	- " - " shed Ashes	37:11:06
17 <sup>th</sup>	Smelter Slag A.	73:11:15
	- " - " B.	8:13:02
	- " - " C.	3:14:07
20 <sup>th</sup>	separator sand	2:13:21
26 <sup>th</sup>	Smelter Slag	40:16:16
27 <sup>th</sup>	separator sand	1:07:18
30 <sup>th</sup>	Smelter Slag A.	25:17:18
	B.	16:06:16
	C.	12:01:17
	D.	3:08:14
May 1 <sup>st</sup>	Smelter Slag	7:08:15
4 <sup>th</sup>	separator sand	0:06:12
6 <sup>th</sup>	Bring off shed Ashes A.	16:09:22
	B.	6: - :20



\* 3 cub. of sediment, mostly char coal,  
taken from the bottom of a rain-water  
tank, holding water collected by  
roof of ~~smelting~~ and filter-burn-  
ing shed.

† 150. cc. reduced ash.

\*\* Ash resulting from burning of old  
siding and flooring timber taken  
from cherniation rats.

1896

30

AW

May 11 <sup>th</sup>	separator sand	-:06:12
14 <sup>th</sup>	bank sediment*	99:13:-
	ash <sup>†</sup>	2.55%
15 <sup>th</sup>	Bring-off furnace 5-sep <sup>9</sup>	31.3%
	Cherniation timber ash**	110:16:10



Cupel Bone-AshDegree of Fineness.

No. 1.

Best, fine. - Color, dead white

Left on 60 sieve N. e

" " 80 " 22.6 %

No. 2.

Bad quality, coarse - Color, pale ash

Left on 60 sieve 9.0 %

" " 80 " 28.5 % \*

\* N. B. This includes the % left on a 60 sieve.

No. 1. Bone-ash makes cupels of excellent quality, whilst those made from No. 2. are very liable to crack in the muffle. A mixture of the two in equal proportions makes very fair medium cupels, suitable for ordinary rough work.

Chlorination.Consumption of Solution  
Upper Works May '96

## Pyrites Ore

	tons	cwt.
Ore	976	: 11
Chlorine soln.	15,240	inches
" - per ton	15"	6

## Oxidised Ore

Ore	4,721	tons
Chlorine soln.	16,978	inches
" - per ton	3"	6

1" means 1" in depth of a qt.  
circular tank.



Chlorination.Consumption of Solution  
Upper Works May '96

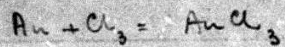
## Pyrites Ore

	tons	cwt.
Ore	976	: 11
Chlorine soln.	15,240	inches
" - per ton	15"	6

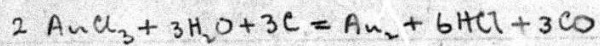
## Oxidised Ore

Ore	4,721	tons
Chlorine soln.	16,978	inches
" - per ton	3"	6

1" means 1" in depth of a qt.  
circular tank.



thermal eq.  $0 = x + 27.3$



R.F.  $54.6 + 2070 = x + \quad + 87$



Pantlast Crushers

Hand - M Kay	£ 5.0.0
Mill Power	£ 25.0.0

N. Smith & Co.  
 402 Collins St.  
 Melbourne

Fire Bricks (1897)

9" x 4 1/2" x 3"	per 1000	£ 5.0.0	f.o.b.
12" x 9" x 3"	each	1/-	

order of Smith  
 Sydney.



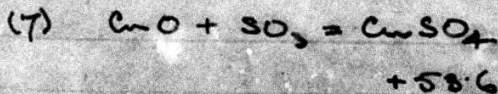
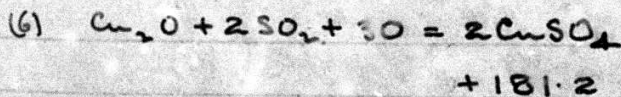
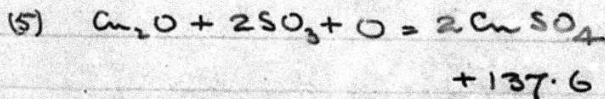
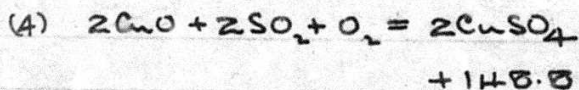
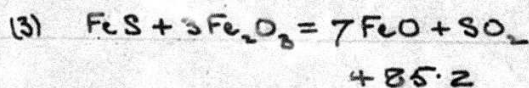
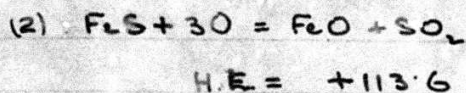
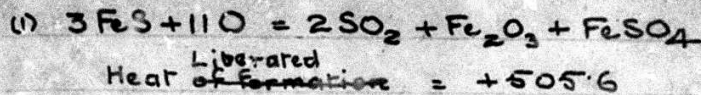
Roasting Pyritic Ore

Consumption of Fuel

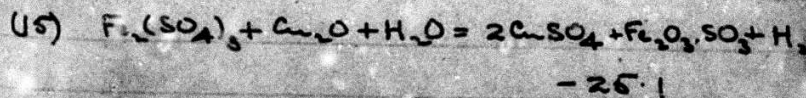
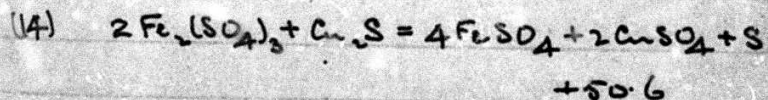
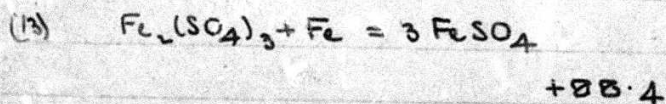
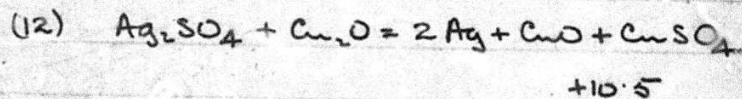
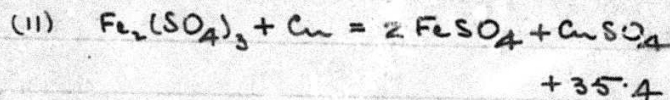
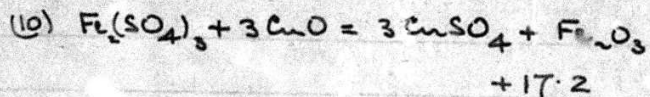
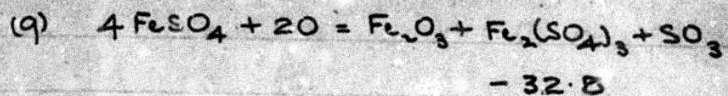
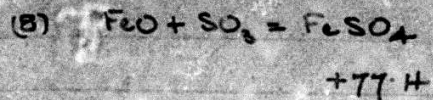
average for 6 months ending  
April 30<sup>th</sup> '96

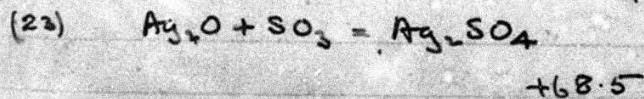
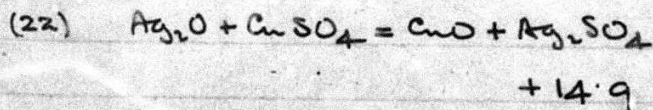
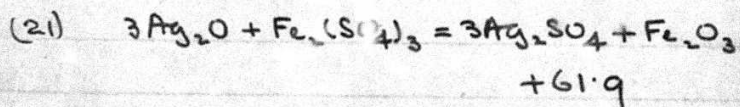
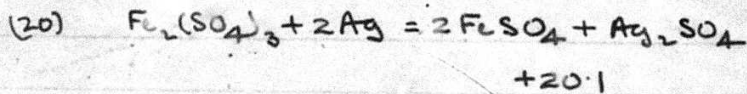
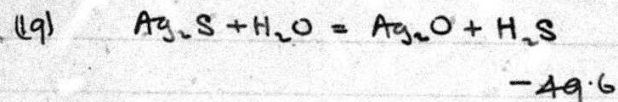
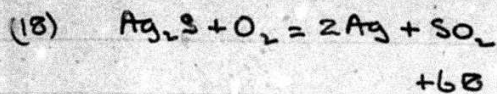
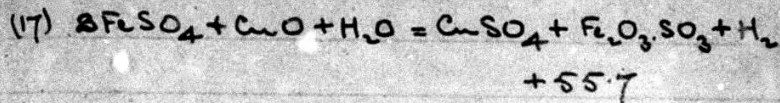
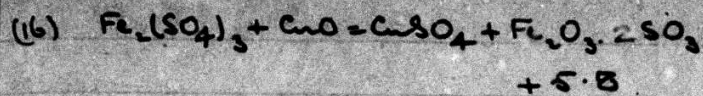
1 ton ore consumes 141 cu ft 21 lb. steam

## Roasting Chemical Reactions

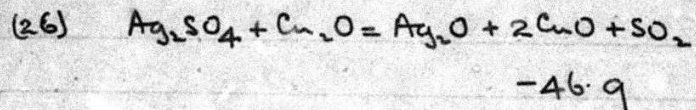
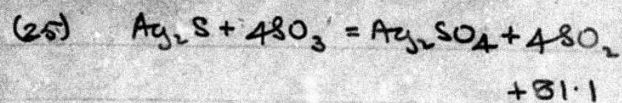
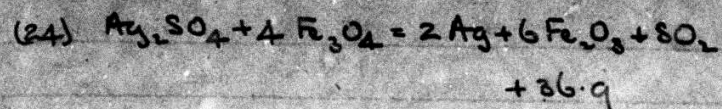










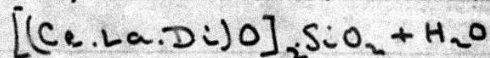




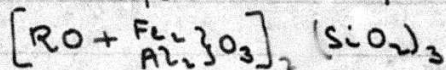
## Occurrence of Rare Earth Metals

Cerium (Ce), Lanthanum (La) and  
Dysprosium (Di) occur in

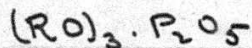
1. Cerite, H. 5.5 - 8p 4.91



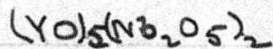
2. Allanite, H. 5.5 - 6.0 S. 4.30 - 4.2



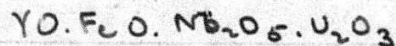
3. Monazite<sup>H</sup>, 5.0 - 5.5 S. 4.9 - 5.3



4. Fergusite, H. 5.5 - 6.0 S. 4.5 - 8

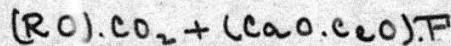


5. Samarskite, H. 5.5 - 6.0 S. 4.55 - 5.7



6. Dysomite

7. Parisite, H. 4.5 S. 4.3



8. Bastnasite.

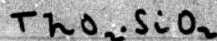
Yttrium Cerium (E.F.) occur  
principally in

1. Sodalite. H. 6.5-7.0 S.G. 4.0-4.5  
 $[(Y, Ce, Fe)_2O]_2 \cdot SiO_2$
2. Xenotime. H. 4-5 S.G. 4.45-4.55  
 $Y_2O_3 \cdot CeO_2 \cdot P_2O_5$
3. Yttrantinite. H. 5-5.5 S.G. 5.4-5.9  
 $(RO)_{10} \cdot (TaO_5)_3$
4. Xenite. H. 6.5 G 4.6  
 $(RO) \cdot [(Ta, Nb)_2O_5]_3$
5. Polycrase. H 5.5 G 5.1  
 $RO \cdot Nb_2O_5 \cdot U_2O_5$
6. Sipylite. H



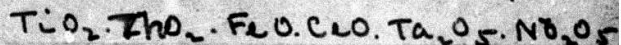
Thorium (Th) occurs principally in

1. Thinite H 4.5-5.0 G 4.3-5.4

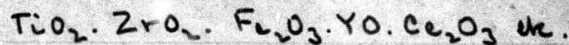


2. Monazite *vide supra*

3. Aeschynite H 5-6 G 4.9-5.1

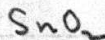


4. Pyrochlore H 6.5 G 4.7-4.9

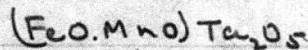


5. Thorogummite

Stibnite H 6-7 G 6.4-7.1

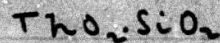


Tantalite - H 6-6.5 G 7-8



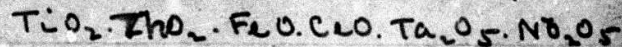
Thorium (Th) occurs principally in

1. Thinite H 4.5-5.0 G 4.3-5.4

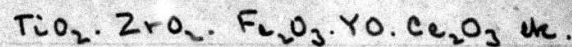


2. Monazite *vide supra*

3. Aeschynite H 5-6 G 4.9-5.1

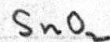


4. Polymignite H 6.5 G 4.7-4.9



5. Thorogummite

Stannite H 6-7 G 6.4-7.1



Santalite - H 6-6.5 G 7-8

