

CURTIS'S & HARVEY, LIMITED

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*Papers & Sketches*

*relating to the*

*Manufacture of Gunpowder*

*at the*

*Royal Gunpowder Factory  
Faversham*

*in*

*last Century.*

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AGH

✓ C Godfrey

23/10/78



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# Regulations —

$\frac{1}{3}$  of the Proportion to consist of Powder, made at the Kings Mills. At Faversham. & Wallham Abby  
 $\frac{1}{3}$  of Powder made by Merchants auster & Resolved  
& the remaining  $\frac{1}{3}$  of Powder made by Merchants, such as was used during the last War 1783) Such of His Majesty's Ships as ordered upon foreign Stations, are to be supplied with  $\frac{2}{3}$  of their Proportion of the Powder made at the Kings Mills, & the other third of Merchant Powder auster and Resolved —

It is recommended to the Capt<sup>ns</sup> of His Maj<sup>ty</sup>'s Navy. to use in general the Powder made by the Merchants first, & economise the Powder made at the Kings Mills, as much as they can —

## The three sorts of Kings Powder —

L. G. in Red denotes a very strong Powder

L. G. in Blue on that is uniform a very durable

L. G. in White. on that in general is stronger than

The Blue, but more liable to grow dusty —



## Regulations

1/3 of the Proportion to consist of Powder made at the Kings Mills At Faversham. & Waltham Abby  
1/3 of Powder made by Merchants dusted & Resolved & the remaining 1/3 of Powder made by Merchants, such as was used during the last War 1783 / Such of His Majestys Ships as ordered upon foreign Stations, are to be supplied with 2/3 of their Proportion of the Powder made at the Kings Mills, & the other third of Merchant Powder dusted and Resolved.

It is recommended to the Capt's of His Maj's Navy to use in general the Powder made by the Merchants first, economise the Powder made at the Kings Mills as much as they can

The three sorts of Kings Powder

L.G. in Red denotes a very strong Powder  
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Process for charring Wood in Iron Cylinders  
for making Gunpowder at Waverstame 1798

The wood is Alder and Willow,  
the latter preferable if to be obtained. The  
the best Coal is made from Dogwood  
which is scarce and grown to a small size.

The Cylinders are of cast Iron  
about 2 feet in diameter and 8 feet long  
laid horizontally, the under end is closed  
except four holes at right angles to each  
other, two of which are used at a time.  
The reason for having four, is that when  
the fire passing over the Cylinders shall  
have injured that part they may be  
turned, two fresh holes taken, and a new  
surface exposed to the heat. The fire is  
in a Brick flue underneath, and made to  
pass under and over, three Cylinders placed  
together in the manner of a reverberatory  
furnace, when the Smoke is carried out of  
the Buildings by a flue over on Side.

An arched plate of Iron called the  
Shoe, made sometimes of Newcastle Brick  
earth which is placed on the upper part of  
each.



## Process for charring Wood in Iron Cylinder for making Gunpowder at Faversham 1798

The wood is Alder and Willow  
the latter preferable if to be obtained the  
best Coal is made from Dogwood  
which is scarce and grown to a small size.

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about 2 feet in diameter and 8 feet long &  
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the fire passing over the Cylinders shall  
have injured that part they may be  
turned, two fresh holes taken, and a new  
surface exposed to the heat. The fire is  
in a Brick flue underneath, and made to  
pass under and over, three cylinders placed  
together in the manner of a reverberatory  
furnace, when the Smoke is carried out of  
the Building by a flue over on side.

An arched plate of Iron called the  
Shoe, made sometimes of Newcastle Brick  
earth which is placed on the upper part of  
each



each Cylinder to guard it from the immediate effect of the flame, which might otherwise melt it. The whole is enclosed in Brick work in depth the Length of the Cylinder. The front or open end is then filled with Wood cut into lengths of 6 or 8 Inches to the Ring, which is about two thirds the Cylinder, at the Ring, the space before the Ring is filled with earth. The Cover filled on and filled also with sand and Ashes and luted with Clay, after which the fire is made on.

In the back part which is a distinct Room appear the closed ends of the Cylinders in which are the four holes or short pipes, the two horizontal ones are fitted up to the others two are luted Copper pipes of about 8 feet in length thro the upper one passes, and in the front of vapors which is made to pass thro a Barrel into a Wooden receiver by a syph or pipe immersed in Water. When the vapors begin to bubble the Water, the Wood is sufficiently charred which takes 6 Hours or 8. The lower Pipe conveys the Gas into a Barrel placed



each Cylinder to guard it from the immediate effect of the flame, which might otherwise melt it. The whole is enclosed in Brickwork in depth the length of the Cylinders. The front or open end is then filled with Wood cut into length of 6 or 8 inches to the Ring, which is about two thirds the Cylinder at the Ring, the space before the Ring is filled with earth. the Cover fitted on and filled also with sand and Ashes and luted with Clay, after which the fire is made on -

In the back part which is a distinct Room appear the closed ends of the Cylinders in which are the four holes or short pipes, the two horizontal ones are fitted up to the others two are luteal Copper pipes of about 8 feet in length thro the upper one passes, and in the front of vaper which is made to pass thro a Bank into a Wooden receiver by a syph or pipe immersed in Water. When the vapors esay to bubble the Water, the Wood is sufficently charred which takes 6 hours or 5 1/2 . the lower pipe conveys the Tar into a barrel placed



3  
placed on the ground. 150 lbs of Coal is  
made in each Cylinder at one charge -  
The quantity of acid and Tar is not regularly  
ascertained sometimes more being produced  
than at others. The smell and appearance  
of this Tar resembles that made from Sea  
Coal and the acid is used for some  
purposes by Dyers - "

When the Coal is taken from the  
Cylinders, it is put into Copper pans covered  
up, set to cool till wanted. It is ground  
by a Mill similar to that for Sulphur then  
passed thro a Sieve like the Powder sieve  
thus reducing it to a very fine Powder in which  
state it becomes part of the Composition of  
Gunpowder -

---



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When the Coal is taken from the Cylinders, it is put into Copper pans covered up, set to cool till wanted. It is ground by a Mill similar to that for Sulphur then passed thro a Seiver like the Powder siever this reduces it to a very fine Powder in which state it becomes part of the Composition of Gunpowder.



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Proceſs of Making Gunpowder at Faverſhame  
the Proportion of 100 lb of Powder is.

Saltpetre — 75

Sulphur — 15

Charcoal — 10

to allow for the Water in mixing, 76 lb of  
Petre is put in —

The whole is placed in a Tub,  
having a kind of Rack which is turned  
round to mix the Ingredients, it is then  
put into a Box or Hopper nearly like  
that used for Saltpetre, and in which is  
a Machine for stirring it about, from the  
Box it is taken to the Mill Room and  
there paſſed thro another mixing Tub, 30 lb  
are then put under each pair of Stones with  
a little Water, which is alſo added from  
time to time as it works any. 3 Hours are  
requer'd at Faverſhame, and at Malham  
Tobey to work faſt owing to the greater  
force and height of Water, at the latter  
place, and as the goodneſs of Powder is  
increas'd by the quietneſs of Working. Malham  
Tobey



Process of Making Gunpowder at Faversham

The Proportion of 100 lb of Powder is.

Saltpetre - 75 "

Sulphur - 15

Charcoal - 10

To allow for the Water in mixing, 76 lb of  
Petre is put in –

The whole is placed in a Tub  
having a kind of Rack which is turned  
round to mix the Ingredient, it is then  
put into a Box or hopper nearly like  
that used for Saltpetre, and in which is  
a Machine for stirring it about, from that  
Box it is taken to the Mill Room and  
there passed thro another mixing Tub, 30lb  
are then put under each pair of Stones with  
a little Water, which is also added from  
time to time as it works dry. 5 Hours are  
requiered at Faversham, and at Waltham  
Abby to work paste owing to the greater  
Body and height of Water at the latter  
place, and as the goodness of Powder is  
increased by the quickness of Working. Walt  
ham



Waltham abby Powder exceeded that of  
Faverham as 190 to 169. The miller  
works constantly Day and Night. The men  
are relieved every 6 hours and samples  
of each Mans produce of Powder are  
granulated and proved in the state by  
an experiment raising a weight of 25 lbs  
Perpendicularly in

Height it ought to rise with  
The Mass is then put under a Screw  
press and reduced to a solid Lump  
thence it is broke with Wooden Mallets into  
small Pieces and put into sieves with  
Round holes of the size of the largest  
grains. Two pieces ofignumitis of about  
6 Inches diameter, are put into each  
Sieve to break the Lump and force  
them thro the holes 30 or 40 of these sieves  
are placed on a frame, which is moved  
by a Crank on a perpendicular axle  
passing thro the middle of it, on the  
upper end of the axle is a trundle  
which is worked by a large Cogged  
Wheel. communicating with the Wheels



Waltham Abby Powder exceeded that of Faversham as 190 to 169. The Mills work constantly Day and Night. The men are relieved every 6 hours and Samples of each Mans produce of Powder are granulated and proved in the state by an eprov with raising a weight of 25 lbs Perpendicularly.

Height it ought to rise with The Mass is then put under a Screw press and Reduced to a solid Lump. thence it is broke with Wooden Mallets into small Pieces and put into [possible missing word] peirced with Round holes of the size of the largest grains, two pieces of Legnumvitie of about 6 Inches diameter, are put into each Seiver to break the Lumps and force them thro the holes 30 or 40 of these seives are placed on a frame, which is moved by a Crank on a perpendicular Exle passing thro the Middle of it, on the upper end of the Exle is a trundle which is worked by a large Cogged Wheel. communicating with the Wheels of



of the Water Works or a Horse Mill  
which will also in an adjoining Room  
turn the Screens.

The Powder being thus  
granulated is put into the Screening which  
are Cylinders of Brass, more work placed  
horizontally in the wooden caps & turned  
by the Coog of the Water Wheel. The  
above mentioned will communicate with  
a Wheel on each of the sides of the  
Cylinders. The small grains fall thro  
between the Wires, and the large grains  
after a certain time of Work are made  
to pass out of the Screen. by lowering  
one end and opening a segment of  
it, which suffers it to pass on each  
Revolution. There are Screens for  
several degrees of fineness. If the difference  
between small and large grained powder  
consists merely in the size of the grains  
they being exactly the same Powder  
made perhaps at the same time.

The Powder is taken to the Room  
which are Buildings having on the center



of the Water Work or a Horse Mill  
which mill also in an adjoining Room  
turn the Screws.

The Powder being thus  
granulated is put into the Screins which  
are Cylinders of Brass, wire work placed  
Horizontally in the wooden casses & turned  
by the Cogs of the Waters Wheel. The  
above mentioned will communicate with  
a Wheel on each of the exles of the  
Cylinder. The small grains fall thro  
between the Wires, and the large grains  
after a certain time of Work are made  
to pass out of the Screen. by lowering  
one end and opening a segment of  
it, which suffers it to pass on each  
Revolution. There are Screwes for  
several degrees of fineness. & the difference  
between small and large grained powder  
consists merely in the size of the grains  
they being exactly the same Powder  
made perhaps at the same time.

The Powder is taken to the Room  
which are Buildings having in the center



Center, a flat place separated from  
the drying Room by a Brick wall  
an Iron pot is set on edge in the  
Wall so that its Bottom appears in the  
Drying Room, against the Pot the  
fire is made of in course, the Powder is  
dried by the heat thrown from the  
Bottom of the Iron pot, over the  
Pot is a projecting sheet of Copper of  
in filling the Room with Powder and  
also in taking it away after drying, a Copper  
cover is placed over the part of the Pot  
shown in the Room and a Canvas  
hung over the whole to the Ground to  
prevent the possibility of dust flying out  
The Room is at those times, also covered  
with a painted Canvas, the form of  
the Room is semicircular with Racks  
from the floor to the Ceiling, to re-  
ceive frames stretched with Canvas,  
on which the Powder is laid about  
two inches thick, the frames are about  
3 feet long, and about half as wide - the



Center a [fuel] place separated from the drying Room by a Brick wall an Iron pot is set on edge in the Wall so that its Bottom appears in the Drying Room, against the Pot the fire is made of in course, the Powder is dried by the heat thrown from the Bottom of the Iron Pot, over the Pot is a projecting sheet of Copper of in filling the Room with Powder and also in taking it away after drying, a Copper cover is placed over the part of the Pot shown in the Room and a Canvass hung over the whole to the Ground to prevent the possibility of dust flying too it The Room is at all those times, also covered with a painted Canvass, the form of the Room is semicircular with Racks from the floor to the Ceiling to receive framers stretched with Canvass, on which the Powder is laid about two inches thick, The frames are about 3 feet long, and about half as wide - the



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The largest Stove containing about <sup>Brands</sup>  
the fire is made so, and the heat  
given is 132 of Fahrenheit within the Stove  
and 100 outside the door by a thermometer  
place in the door. There are valves in  
the Roof to give vent to the flues  
arising from the Powder in drying as  
well as to cool the Room when too  
hot, and which are opened by a string  
brought out near the fire place. When  
the fire has continued hours it is re-  
moved and the Stove suffered to cool  
The Powder is removed before cold  
the not into the open air, it is passed  
thru a Screen in the same <sup>Brands</sup>  
made angularly in a portable case so  
as to pass about 14 feet over Wire work  
to get out the dust, the rest is then weighed  
and headed up in Brands, and let  
Remain in that manner, till quite cold  
it is then carried to the Stone House,  
every precaution is therefore taken to pre-



the largest Stove contains about [ believed missing number] Banded  
the fire is made on, and the heat  
given is 132 of Farenheit within the stove  
and 100 outside the door by a thermometer  
place on the door. there are valves in  
the Roof to give vent to the ifluvia  
arising from the Powder in drying as  
well as to Cool, the Room when too  
hot and which are opened by a String  
brought out near the fire place. When  
the fire has continued { believed missing number] hours it is Re-  
moved and the Stove suffered to cool  
the Powder is removed before Cold  
tho not into the open air, it is passed  
thro a Screen in the same Building  
made angularly in a portable case so  
as to pass about 14 feet over Wire work  
to get out the dust, the rest is then weighed  
and headed up in Barrels, and let  
Remain in that manner till quite cold  
it is the carried to the Store House  
every precaution is therefore taken to  
pre



prevent the attraction of moisture from  
 the the there is also a cham  
 Stone piece up, but which has not been  
 used at Faversham, two of them have  
 been said to have blown up in some  
 other Powder works. It consists of a large  
 plate of Copper under which the steam  
 pipe of a great Copper is conveyed, which  
 Boilers and its furnace is in another room  
 separated by a Brick wall.

The Powder is proved by  
 the experiment already mentioned. 2 Drams  
 Cylinders powder gave eight in height  
 the weight was raised

As all the Charcoal is not  
 made in Cylinders the Powder in ge-  
 neral use is a mixture of Cylinders powder  
 with that made from Coal charred in pits

There are also Proofs made by an eight  
 Inch Mortar, and a Shot of 67 lb weight  
 the general use is Cylinders powder

Omer	---	"	208	fat Range
Pic Powder	---	"	160	
Half Cylinders half Pic	---	"	182	Sometimes

a foot or two of Variation. The charge is 20 in each case







Copy of daily Proof of the Mill charges  
and Powers drawn from the Stove in the  
vertical sponnetts. J. G. Severham Sep. 3. 1790

Names of the Mills & N <sup>o</sup> of pairs of Run- ners employed at each	Distinguishing Sort of Sponnetts	Names of Millmen & N <sup>o</sup> of charges proved	Height in Vertical Sponnetts	Appearance on the Copper Plate
Oshing Mills 4		John Robby " 1	15.2	
Horse & Cart mill 4		Wm. Cooper 1	14.7	
King's Mill 4		J <sup>m</sup> Nelson " 1	14.2	
		Wm. White " 1	14.4	
		Tho. Bennett " 2	15.3 14.3	
Lower water mill 4	Men 6	Robt. Wraib " 1	14 "	
	Alder 4	J <sup>m</sup> Goodrich " 1	15.1	Clear fine
	Cylinders	Wm. Silver " 1	14.7	a few
Bunnels Mill 4		Geo. Bourne 1	15.1	Small Beans
Loro Horse Mill 2		Wm. Claxton 1	13.8	
New Horse Mill 2		Wm. Webb " 1	13	
Single Horse Mill 1		J <sup>m</sup> Wilder " 1	14.3	
		Henry Page 1	15.6	
		Geo. Spence 1	15.1	
		Wm. Corbitt 1	13.2	
		Rich. Pearce 1	14.7	
Store Proof	Glasses	N <sup>o</sup> 2 " " 1/2	6.6	L
	Alders 4	N <sup>o</sup> 3 " " 1/2	6.4	L
	Cylinders	E. G " " 1/2	10.8 10.3	D.
	Glasses	E. G " " 1/2	11.2 11 "	
Store Proof	Alder 4	E. G " " 1/2	6.8	Do
	Cylinders	S. G " " 1/2	6.8	Many higher
Wm. Sumpter Esq.	Returned Powers recollected	N <sup>o</sup> 2 " " 1/2 Sign. J <sup>m</sup> T. King Master Work	2.4 2.4	Large Beans



Copy of daily Proof of the Mill Charges  
and Powders drawn from the Stove in the  
vertical [epro] mill & Co Faversham Sep 3 1756

Names of the Mills & No of pairs of runners employed at each	Distinguishing & Sort of Gunpowder	Names of Millmen & No charges proved	Height in Vetical [Exprouette]	Appearance on the Copper Rate
Ospring Mills 4		John Hobbs 1	15.2	
Horse & Cart Mill 4		Willm Copper 1	14.7	
Kings Mill 4		Jn Kelson 1	14.2	
		Willm White 1	14.4	
		Thos Bennet 1	15.3	
		2	14.3	
Lower Water Mill 4		Robt Wrail 1	14	
	M C	Jn Goodchiter 1	15.1	Clean fine
	Alder 4	Willm Silver 1	14.7	a few
	Cylinders	Geo Bourne 1	15.1	Small Beads
Bennets Mill 4		Wm Claggil 1	13.8	
Loro Horse Mill 2		Wm Webb 1	13	
		Jn Wilday 1	14.3	
New Horse Mill 2		Henry Page 1	15.6	
		Geo [Ipendes] 1	15.1	
Single Horse Mill 1		Wm Cornlue 1	13.2	
		Richd Pearce 1	14.7	
		No 1/2 1	6.6	
	Glassed	2	6.4	Do
	Alder 4	No 3 1	10.8	
Store Proof	Cylinders	2	10.5	
		F. G. 1	11.2	Do
	Glassed	2	11	
Store Proof	1 Alder 4	F. G. 1	6.8	Do
	1 Cylinder	S. G. 2	6.8	
	Returned	No 1/2 1	2.4	
		2	2.4	Many [Light ]
Willm Sumpter Esq.	Powder and resolved	Sign Jn Yiking Alcester	Master Work	Large Beads



Copy of Monthly Proof of Gunpowders by Mortar Carbine & Vertical  
 Royal Powders Mill Faversham 31 Aug<sup>r</sup> 1796

When Stove	Weight of lb when proving	Distinguishing mark	Ranges in the 8 inch Mortars fired with 2 Oz of Powders and a Ball of 67 lbs 10 <sup>1</sup> / <sub>2</sub> Round 2 R <sup>d</sup> Med <sup>m</sup>	N <sup>o</sup> of Boards penetrated By a steel Ball fired from a Carbine. Weight 4 <sup>lb</sup> of Powders 1 Round 2 <sup>d</sup> Round Med <sup>m</sup>	Height of the Vertical I. Round 2 R <sup>d</sup> Med <sup>m</sup>	Remarks on the Plates
17 Aug <sup>r</sup> 1796	70 to 71	No 1 <sup>2</sup> Glazed L. S. Alder I S. S. Cylinder No. 3 E. S.	207 " 200 " 203 <sup>1</sup> / <sub>2</sub> 212 " 207 " 209 <sup>1</sup> / <sub>2</sub> " " " " " " " " " "	" " " " " " " " " " 17 " 16 " 16 <sup>1</sup> / <sub>2</sub> 16 " 17 " 16 <sup>1</sup> / <sub>2</sub>	" " " " " " " " " " 103 " 107 " 103 111 " 112 " 111 <sup>1</sup> / <sub>2</sub>	
No. I. S. in the Square means Cylinders with Iron shoes instead of earthen now discontinued		Glazed 1 <sup>2</sup> Alder I L. S. I. S. S. S. Cylinders No. 3 E. S.	194 " 189 " 191 <sup>1</sup> / <sub>2</sub> 198 " 197 " 197 <sup>1</sup> / <sub>2</sub> " " " " " " " " " "	" " " " " " " " " " 16 " 16 " 16 15 " 16 " 15 <sup>1</sup> / <sub>2</sub>	" " " " " " " " " " 8:1 " 8:6 " 8:3 <sup>1</sup> / <sub>2</sub> 8:7 " 8:3 " 8:5	Clear fire & a few small Beads " " "
Winch Co. Clouely Col. Congreve			Sign. W. M.	Sumpter	Jr. Clouely	173. 10 front Inside stove for drying Powder



Copy of Monthly Proof of Gunpowder by Mortar Carbine and Vertical Royle Powder Mill Faversham 17 Aug 1796							
When Stove Dried	Weight of B when proving	Distinguishing mark		Ranges in the 8 inch Mortar fired with 2 oz of Powder and a Ball of [C ales] 1oz 1st Round 2 Rd Medm	No of Boards penetrated By a steel Ball fired from a Carbine. Weight 4 dm of Powder 1 Round 2d Round Medm	Height of the Vertical 1st Round 2d Rd Mechm	Remarks on the Plates
17 Augt 1796	70 to 71	Glazed	No 1	207 200 203 1/2			
			2	L.G. 212 207 209 1/2			
		Alder II	No 3	17 16 16 1/2			
No I. S in the square means Cylinders with Iron shoes instead of earthen now discontinued		Cylinder	F.G.	16 17 16 1/2			Clear fire [ ] few small beads
			1	194 189 191 1/2			
		2	L.G. 198 197 197 1/2				
		S.G.					
Wind E Cloudy Col. Congreve		Cylinders	No 3	16 16 16			[MB] to front Inside store for drying Powder
			E G	15 16 15 1/2			
				Signd Wm.	Sumpster	Jn	Cloudsly



Method of proving Powders at Purfleet 1796.

The lots of Powder received either from the Kings Mills at Faversham or Wallham Abbey, or from the different Powder makers, are when in a sufficient quantity proved as follows. Samples of each sort taken from the middle of the Barrels, are tryed by pressing between the fingers to find the texture and hardness of the Grain, and that they are no lumps in it. It is then taken to the flashing house, and three parcels of each sort weighing 2 Dr. each parcel, Beginning with some approved already in store, are put upon small Copper Plates and fired by a heated Iron with round noded Head. on the smartness of the explosion, the clearness of the Fire, the freedom from Grains in firing, and many large Breads left on the Plates, which evince the foulness of the Materials and want of care in the Manufacture, the powder is Rejected. The second proof of the grain or common Powder is by firing two 8 inch mortars with each a Charge of 2 Oz of every Sample, beginning as before with a charge of the Comparative Powders to each sort, — " — " The storeroom



## Method of proving Powders at Purfleet 1796

The lots of Powders received either from the Kings Mills at Faversham or Waltham Abby or from the different powder makers are when in a sufficient quantity proved as follows. Samples of each sort taken from the middle of the Barrles, are tryed by pressing between the figures to find the texture and hardness of the Grain, and that they are no lumps in it. It is then taken to the flashing house, and three parcels of each sort weighing 2 Drs each parcel. Begining with some approved already in Store, are put upon small Copper Plates and fired by a heated Iron with round [nabed] Head. on the smartness of the explosion, the clearness of the Fire, the freeness from Sparks in firing, and many large Beads left on the Plates, which eveness the foulness of the Materials and want of care in the Manufactor. the powder is Rejected . The second proof of the grained or common Powder is by fireing two 8 inch mortars with each a charge of 2 Oz of every Sample, beginning as before with a charge of the Comparative Powder to each sort.

The Mordars



The Mortars are laid at 45 Deg: of elevation and carefully washed and wiped clean and dry after each Round. The Ball thrown is of iron Weighing 65 lbs, which is also made very clean and dry each time of firing. The Powders made at the Kings mills with pure materials and the Charcoal distilled in Iron Cylinders gives a Range of 180 feet Sometimes more 2 or 3 feet. That made Charcoal from the Pit gives from 150 to 160 and approved accordingly to the sort of Wood used. The Merchants powder gives in general from 140 to 150 and upward and the Reserved powder (which is such as has been on Service or at Sea and returned and has been sifted and reared in the Stoves) usually gives from 107 to 117 or thereabout —

The Second proof for the first grain or Musquet Powder is (which as remarked in the description of the Manufactory is only that which passes thro the Wires in screening) by firing two charges of 4 Dr: each from every parcel (beginning with the Comparative as before from a Musquet barrel fixed in frame) this throws a steel Ball thro wet Elm Boards of 1/2 Inch in thickness and 3/4 in asunders fixed in another frame at 39 feet 10 1/2 the distance, the Numbers of Boards the strength of the Powder. The Kings powder usually



The Mortdars are laid at 45 Deg.e of elevation and carefully washed and wiped clean and dry after each Round. The Ball thrown is of iron Weighing 64 [drs], which is also made very clean and dry each time of fireing. The Powder made at the Kings Mills with pure materials and the Charcoal distilled in Iron Cylinders gives a Range of 180 foot Sometimes more 2 or 3 foot. That made Charcoal from the Pit gives 150 to 160 and approved accordingly to the sort of Wood used. The Merchant powder gives in general from 140 to 150 and upward and the Resolved powder (which is such as has been on Service or at Sea and returned and has been sifted and Redryed in the Stoves) usually gives from 107 to 117 or thereabout.

The second proof for the fuse grain or Musquet Powder is (which as Remarked in the discription of the Manufactory is only that which passes thro the Wires in screenings) by fireing two charges of 4 Drs each from every parcel (begining with the Comparative as before from a Musquet Barrel fixed in frame) this throws a Lead Ball thro wet Elm Boards of 1/2 Inch in the [Kness] and 3/4 in asunder fixed in another frame at 39 feet 10 ins distance, the Numbers of Boards [believed missing word - possibly " determines"] the the strength of the Powder. The King powder uswall



usual pieces 15 or 16 <sup>14</sup> Sometimes the whole and  
lodges in the frame, The Merchant powder

from 12 to 14. The Resolved powder from 16 to 12.  
The numbers of Banks are 17 in

The Powder having undergone this Proof,  
Parcels of lbs of each sort, accurately weighed,  
are placed in Lute Balls of about 1 foot diameter  
made on purpose, and properly marked, The  
Powder is spread over the whole Ball so as  
that each exposes an equal surface, they  
are then placed in a Chest perforated on all  
sides, and allowed to remain 17 or 18 days to  
try the purity of the materials by the  
of moisture from the Atmosphere as is then  
again weighed and the difference marked  
down. When these remarks were taken Oct. 6<sup>th</sup> 1746

The parcels weighed, which had been exposed 17  
Days, had not in any instance gained more  
than  $\frac{1}{2}$  a Grain in weight, many Parcels had  
no sensible difference. The same Proof  
as before are then again gone thro, & the Powder  
received and paid for accordingly to its compara-  
tive strength. This appears to be the whole  
Process of proving Powder.

All Powder for Service is  
mixed in proportion according to its Strength so  
as



usuwall peirces 15 or 16 Sometimes the whole and lodges in the frame, The Merchant powder from 12 to 14. The Resolved powder from 16 to 12 The numbers of Ranks are 17 The Powder having undergone this Proof, Parcels of 1 lbs of each sort, accurately weighed, are placed in Seive Bottoms of about 1 foot diamet made on purpose, and properly marked, The Powder is spread over the whole Bottom so as that each [experes] an equal surface, they are then placed in a Chest perforated on all Sides, and allowed to remain 17 or 18 days to try the purity of the Materials by the [possible word missing] of moisture from the Atmosphere it is then again Weighed and the difference marked down, When these remarks were taken Oct'r 6th 1796 the parcels weighed, which had been exposed 17 Days, had not in any instance gained more than 1/2 a Grain in weight, many Parcels had no sensible difference. The same Proof as before are than again gone thro, & the Powder received and paid for accordingly to its compara tive Strength. This appears to be the whole Process of proving Powder. The Powder for Service is mixed in proportion according to its Strength so as



15

as to bring it to a mean or uniform force  
as much as possible, for this purpose a mixing  
House is erected in one Room, of which is  
a machine of the kind devised at Top  
into seven parts as happen, into each of which  
a Barrel of Powder is put a proportion of the  
No of Barrels according to its strength is by London  
Powder, mostly 3/7 by using a handle a valve  
is opened, which suffers the Powder to run thro  
the nine bottoms of the 7 hoppers into a  
Globe, having a semicircular Bottom of wire  
& thro thence into seven wooden spouts each  
of which conveys it, to a Barrel placed  
underneath, This Powder is again returned  
to the hoppers at the top of machine, and  
received as before in the Barrels underneath  
being now thoroughly mixed, it is headed  
up, and is that sort of Powder marked  
with a Blue E G & the figures 2 or with F G & the  
figures 3 whose mean force is from 150 to  
160, this is the Powder used for practice &  
and experiments. and for service

The Powder marked E G... S G is generally  
awhile E. G & is the second sort of Powder of the  
above Quality, which is put under the Press &  
made



as to bring it to a mean or uniform force  
as much as possible, for this purpose a mixing  
House is irrected in one Room, of which is  
a Machine of the [ believed missing word ] kind divided at Top  
into seven parts as happen, into each of which  
a Barrel of Powder is put a proportion of the  
No of Barrels according to its strength is Cylinder  
Powder (mostly 3/7) By lifting a handle a [valvan]  
is opened, which suffers the Powder to run thro  
the Wire Bottoms of the 7 hoppers into a  
Globe, having a semicurclar Bottom of wire  
& thro thence into Seven wooden spouts each  
of which conveys it, to a Barrel placed  
underneath, This Powder is again returned  
to the hoppers at the top of Machine, and  
Received as before in the Barrels underneath  
Being now thoroughly mixed, it is headed  
up, and is that sort of Powder marked  
with a Blue E G & the figures 1/2 or with F G & the  
figure 3 whose mean force is from 150 to  
160, this is the Powder used for practice &  
and experiment and for service.

The Powder marked E G S G is generally  
a white E G & is the second sort of Powder of the  
above Quallity, which is put under the Press &  
made



made into a Solid Lump, thence bratt. correct  
 and screened afresh, only however taking the  
 dust away, which dust is entirely remanufactured  
 this sort of Powder, as noticed in the Re-  
 gulations for the supply of the Navy. is  
 sometimes stronger, than not so uniform in  
 its effects than the Blue. E. S. it is used for  
 filling shells & such things as do not require  
 great accuracy.

The red E & S is Powder entirely  
 made at the Kings mill with cylindrical coals  
 and is used at present only in particular  
 cases, in comparision to mix with the  
 other sorts to bring it to mean force.

The figures 1, 2, & 3 denot that the  
 Powder is made with Saltpetre obtained from  
 damaged Gunpowder 4, 5, & 6 from Saltpetre  
 refined from the ground

Regulations for the supply of His  
 Majesty's Navy with Gunpowder



made into a Solid Lump, thence brok, corned  
and Screened afresh, only however taking the  
dust away, which dust is entirely Remanufactored

This sort of Powder, as noticed in the Re-  
gulations for the supply of the Navy, is  
sometimes stronger, But not so uniform in  
its effects than the Blue E.G. it is used for  
filling shells & such things as do not require  
great accuracy

The red E & EG is Powders entirely  
made at the Kings Mill with Cylinder Coals  
and is used at present only in particular  
cases, in comparision & to mix with the  
other sorts to bring it to mean force.

The figures 1, 2 & 3 denot that the  
Powder is made with Saltpetre obtained from  
damaged Gunpowder 4, 5 & 6 from Saltpetre  
Refined from the grough.

Regulations for the supply of His  
Majesty Navy with Gunpowder.



17

This for Repository Papers " — "

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In the Works at Faversham the quantity of Saltpetre required is so great that the common Mode of Pulverizing, as used in the Laboratory would not be sufficient the whole is therefore ground in a Horse Mill — having two stone Rollers of about 3 feet diameter standing at right angles to each other, and in the open part of the stroke a wooden Ractl to separate the Saltpetre and give new surfaces for the Stone to pass over. When ground it is pressed in small quantities thro a Wire sieve placed on cross Wires in a hopper the bed is closed and with a Square stick having a notch to catch the edge of the Sieve. A Man passes it backward and forward. The finer particles are collected in a Tub under the hopper, and the residue ground again in the Mill, — By using a covered hopper a great deal of the finest parts which would fly off are retained — "

Similar Mills are used for Sulphur and Charcoal with this difference, there is an additional handle, perpendicular, to the which turns a large Wheel in an adjoining Room, and by it working the screens thro which the Sulphur and Coal are made to pass and which are similar to the Screens for Powder

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This for Repository Papers

In the Works at Faversham the quantity of Saltpetre Required is so great that the common Mode of Pulverizing as used in the Laboratory would not be sufficient. The whole is therefore ground in a Horse Mill having two stone Rollers of about 3 feet diameter standing at Right angles to each other, and in the open part of the Angle a wooden Rack to separate the Saltpetre and give new surfaces for the Stone to pass over, when ground [missing word] it is pressed in small quantities thro a Wire sieve placed on cross Wires in a hopper the bed is closed and with a Square stick having a notch to catch the edge of the Scieve. A Man passes it backward and forward. The finner particles are collected in a Tub under the hopper, and the resedue pound again in the Mills. By using a covered hopper a great deal of the finial parts which would fly off are retained

Similar Mills are used for Sulpher and Charcoal with this difference, there is an additional handle, perpendicular Axle which turns a large Wheel in an adjoining Room, and by it works the screens thro which the Sulphur and Coal are made to pass and which are similar to the Screens for Powder.



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# Method of Refining Sulphur at Faversham 1790

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The Sulphur recd. from Sicily being very pure  
is laid in the stone floor and broken small  
then put into Caldrons and Boiled, taking  
the Sum off as it rises, and which is again  
mixed with the next quantity to be boiled  
After boiling till the Sum ceases to rise,  
it is Boiled out into earthen Pans and set  
to Cool, when a great sediment will be  
formed called Sulphur visum. The clear parts  
are Separated from the Sediment, broken  
and Boiled in another Copper as at first  
and the Process repeated the third time,  
when the clear Sulphur from this Process  
is fit for making Powder, but the refining  
it, and for obtaining the Sulphur, as  
cannot be got by the common Mode the  
Subliming and Retort are used —

The Sulphur to be sublimed is put  
into the Iron retort with the Iron cover fixed  
on having a hole to Receive a Bott or  
Stopper intended to admit Air on any violent



## Method of Treating Sulphur at Faversham 1796

The Sulphur recd from Scicly [should probably be " Sicily"] being very [ ]  
is it laid in the Stone floor and broken small  
then put into Caldrons and Boiled, taking  
the Sum [probably Scum] off as it rises, and which is again  
mixed with the next quantity to be boiled  
After boiling till the Sum ceases to rise,  
it is Boiled out into earthen Pans and set  
to Cool, when a great sediment will be  
formed called Sulphur [viosim]. the clear parts  
are Separated from the Sediment, broken  
and Boiled in another Copper as at first  
and the Process repeated the third time,  
when the clear Sulphur from this Process  
is fit for making Powder, but the refining  
it, and obtaining the Sulphur, as  
cannot be got by the common Mode the  
Subleming [possible missing word] and Retort are used  
The Sulphur to be sublimed is put  
into the Iron retort with the Iron cover fixed  
on having a hole to Receive a Bolt or  
stopper intended to admit Air on any violent



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violent effort of the matter, in the retort  
the Sulphur rising in Sublimation pass into  
the Receiver or Room and adhere to the Roof  
a part of the Arsenic still pass over with  
the Sulphur which is separated by melting  
the Sulphur again and casting it in moulds  
of the form of Roll Brimstone as sometimes  
the covers of the Retorts will be blown off and  
the Sulphur there in takes fire, a wide piece  
of Sheet Iron is made to cover the flame and  
vapor out of the Building, an a cover wrap-  
ped round with flannel is set near, at hand  
in the passage between two doors, a man  
enters the Windward door and places this  
Cover on the Mouth of the Retort which  
extinguishes the flame gives time to reach just  
the proper one -- "

The Sulphur for Gun Powder  
from the Refining house is grounded in a roll-  
ing Mill similar to that used for Saltpetre  
and afterwards passed thro the Screen turned  
by the same Mill, it is then fine enough  
for mixing with the other ingredients.  
Col<sup>d</sup>. Congreve. Seems to think  
the effence might be so Reduced, as that  
all the Sulphur used for Gunpowder might



violent effort of the matter, in the retort the Sulphur using in Sublimation passes into the Receiver or Room and adhere to the Roof a part of the Arsenic still passes over with the Sulphur which is separated by melting the Sulphur again and casting it in moulds of the form of Roll Brimstone as sometimes the cover of the Retort will be blown off and the Sulphur there in takes fire, a wide [flice] of Sheet Iron is made to cover the flame and vapor out of the Building and a cover wrapped round with flannel is set near at hand in the passage between two doors, a Man enters the Windward door and places the Cover on the Mouth of the Retort which extinguishes the flame gives time to read just the proper one

The Sulphur for Gun Powder

from the Refining house is grounded in a rolling Mill similar to that used for Saltpetre and afterwards passed thro the Screen turned by the same Mill, it is then fine enough for mixing with the other ingredients.

Col. Congreve Seems to think

the expence might be so Reduced, as that all the Sulphur used for Gunpowder might



might be sublimed in which case it would  
be considerably more pure than by the pre-  
sented Process it is possible to make it,

There is lately Sulphur sent  
up from the upper Works at the Isle of  
Anglesa which is considerably cheaper but  
is found to contain a very great quantity of  
Arsenic, which has not yet been able to  
be separated owing to the Arsenic sub-  
liming with the same heat necessary to  
pass over the Sulphur it may be easily  
distinguished in Lumps by its being full  
of small Red spots which is the Arsenic

According to some trials made  
by Mr Cruickshank in the Royal Laboratory  
the comparative results were as follows  
4 Oz of Sicily Brimstone as imported  
yielded by slow Combustion

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might be sublimed in which case it would be Considerably more pure than by the present Process it is possible to make it.

There is lately Sulphur sent up from the upper Works at the Isle of Anglesa which is considerably cheaper but is found to contain a very great quantity of Arsenic which has not yet been able to be separated owing to the Arsenic subliming with the same heat necessary to pass over the Sulphur it may be easily distinguished in Lumps by its being full of small Red spots which is the Arsenic.

According to some trials made by Mr. Cruickshanks in the Royal Laboratory the Comparative results were as follows  
4 oz of Sicily Brimstone as imported yielded by slow Combustion.