The accompanying Pamphlet will shew Your Lordship how extensively and successfully it is used.

I have, &c.

(Signed) W. BURNETT,
Director General of the Medical Department of the Navy.

The Right Honorable Lord Stanley, &c. &c. &c.

(Copy) *Admiralty, 14th August*, 1845.

Sir,—In reply to your letter of the 9th instant, with its enclosure from Sir William Burnett, I am commanded by my Lords Commissioners of the Admiralty, to transmit to you, for the information of Lord Stanley, a copy of a Report from the Officers of Portsmouth Yard, upon the effects of his solution, applied to the purpose of preventing ignition in Timber, or rather to prevent it from breaking into flames. In consequence of that Report, my Lords have ordered the Bulkheads in the Holds and Magazines of Her Majesty's Ships to be fitted with Timber so saturated; and it is also applied largely to the various Buildings in Her Majesty's Dock Yards.

I send for Lord Stanley's information a copy of a statement of the price per load of preparing Timber for building purposes.

I am, &c.

(Signed) W. B. J. HAMILTON.

Geo. W. Hope, Esq. &c. &c. &c.

(Copy) *Portsmouth Yard, 13th March*, 1844.

Sir,—With reference to your directions of 1st ultimo, to make experiments as to the degree of prevention against ignition into flame which Timber saturated with Sir Wm. Burnett's solution affords, comparatively with Wood of the same and unprepared, we have the honor to state, that we have very carefully instituted a series of experiments on this subject, of which the following are the results.

Eleven different kinds of Timber were tried, each piece was 2 feet long, 5 inches wide, and 3 inches thick, each piece was cut into two equal parts one foot long, and one part was prepared with a strong solution of Chloride of Lime (in the proportion of 1lb. of chloride to four of water.) the other part was unprepared.

Care was taken after the preparation, to endeavour to bring both to the same degree of dryness.

One of the Furnaces at the Metal Mills, in which the cakes of Copper are heated previous to rolling, was selected for the experiments. The heat of this Furnace was very great.

Kind of Timber.	Result of Experiments.
African Oak.	The unprepared burst into a strong flame in 25 seconds. The prepared continued to resist flame for 2 minutes, and then a weak flame began to play gently over its surface.
English Oak.	Unprepared burst into flame in 5 seconds. Prepared burst into flame in 40 seconds, (a small flame.) At the end of 10 minutes the unprepared was rather more consumed than the other, but the difference was not considerable.
Italian Oak.	Unprepared ignited into a flame in 15 seconds. Prepared into a small flame in 35 do.
Dantzic Fir.	Both prepared and unprepared being thrust towards the hottest part of the Furnace, burst into flame immediately; but the heat was considered too great for such an experiment.
New Zealand Cowdie.	Placed not so far in the Furnace as the above, but both immediately ignited into flame; the prepared, however, burnt less fiercely than the other.
Riga Fir.	Placed near the mouth of the Furnace, the prepared was decidedly less inflammable than the other, it ignited into flame some time after the unprepared.
Pitch Pine.	Unprepared burst into flame in 5 seconds. Prepared resisted flame for 6½ seconds, and then gave out a feeble flame.
Red Pine, (Canada.)	Red hot iron placed over both. The unprepared burst into flame immediately. The prepared gave no symptoms of flame, and the iron became cold without its inflaming.
Elm, (Canada.)	Placed in the hot pots containing the copper cakes lately ladled out of the refining furnace, the unprepared ignited into flame in ½ minute; the prepared into a very much smaller flame in 2½ minutes.
Yellow Pine, (Canada.)	Placed in the cake pots similarly to the before mentioned, the unprepared burst into flame immediately; the prepared was watched for 12 minutes, but burst not into flame at all.—The heat was great. A second experiment was tried on this Timber by placing red hot iron on it. The unprepared ignited immediately into flame; the prepared not at all.

It appears from the above experiments that some of the prepared Woods (especially the Canada Yellow Pine) have resisted ignition into flame to an extraordinary degree.

We are of opinion, that Yellow Pine Timber prepared in this way, might be used most beneficially not only for Magazine and Light Room Bulkheads, but also for all the Bulkheads of a Ship. There appears to be nothing in the solution calculated to injuriously affect the health of the Crew; and if, by preparing Yellow Pine Timber in this way, it might be made as durable as the Timber generally used for Bulkheads, it would be found to possess the double advantage of preserving the Timber and of preventing its ignition into flame.

The solution used in the above experiments was about eight times the ordinary strength.

We remain, &c.

(Signed) R. Blake, J. Watts,
F. Sturdie, J. Owen.

(Copy) *Portsmouth Yard, 25th May*, 1844.

Sir,—With reference to your Memo. 20th March last, directing me to report whether we propose that Bulkheads should be prepared with Sir W. Burnett's solution of the same strength as that used in the experiments described in our Letter of the 16th March last, that is eight times the usual strength, and if so, what would be the expense of fitting a Line of Battle Ship in that manner, also the expense of solution even of the ordinary strength; we have the honor to state that we have instituted several experiments with the view to ascertain what strength of the solution would successfully resist ignition into flame; the following are the results:—

1st.—The Hard Woods, such as African, Dantzic, and English Oaks, are not much affected by the solution in respect of ignition into flame, whatever be the strength of the solution.

2nd.—In the case of the ordinary strength (1lb of the chloride to 4 gallons of water,) the prepared and unprepared Woods are very nearly alike.

3rd.—In solution of 1lb of chloride of lime, to 1½ gallons of water, and do. to 2 do., we found that certain Woods, when exposed to the immediate contact of iron, heated to a blood red heat, did not at all ignite into flames; whereas, unprepared Wood of the same kind, burst into flame immediately.

The following are the Woods:—

1 lb to 1½ gals. of Water.	1 lb to 2 gals. of Water.
Dantzic,	
Spruce,	Spruce Deal,
Polish Larch,	Polish Larch,
Scotch,	Riga Fir,
Yellow Pine,	Yellow Pine.

The same kind of Woods were boiled in solutions of 1lb chloride to 2 gallons of water, and do. to 3 do., and in both cases the prepared Woods successfully resisted ignition into flame, while the unprepared burst instantly into flame.

The following is the comparative expense of fitting the Bulkheads of the Hold of a Line of Battle Ship, with ordinary Timber unprepared, and with Yellow Pine and Riga Fir prepared with solution of 1lb to 2 gallons of water.

Bulkheads, &c. in Hold, of English Oak.						
3 inch thick, 2760 cubic feet, @ 7s. 6d. per foot,				£966	0	0
Do. Yellow Pine.						
3 inches, 2760 at 2s. 4d.	£322	0	0			
Solution,	243	0	0			
Labor,	12	18	0	577	18	0
Difference in favor of Yellow Pine,				£388	2	0
Bulkheads, &c. in Hold, of Riga Fir.						
3 inches, 2760 cubic feet, @ 3s.	£4140	0	0			
Solution,	220	0	0			
Labor,	12	18	0	£646	18	0
Difference in favor of Riga Fir,				£319	2	0

We are, &c.

(Signed) R. Blake,
J. Watts,
J. Owen.

(Copy) 53 *King William Street, London Bridge, 13th August*, 1845.

Sir,—In obedience to your desire, I beg to inform you that the cost of preparing Timber for building purposes, if it be desired to preserve it from dry rot only, will be from 9s. to 13s. 6d. per load, according to the greater or lesser absorbent properties of the wood.

But if the Timber is intended to be rendered uninflammable, the cost will vary from 25s. to 35s. per load; and it may be well to mention that unseasoned Timber is even more readily and effectually prepared than that which has been cut, the sap in green wood being firmly set by the process.

I am, &c.

(Signed) C. JACKSON, *Secretary.*