Stock-1

Wages Cash Book No. 1

Petty Book No. 1

In the firſt place, I take the liberty of aſſerting (and from experience) that the Eaſt-India Company's ſhips, as now conſtructed, are the firſt and ſafeſt ſhips in Europe. In ſupport of the aſſertion which I have made in favor of the conſtruction of thoſe ſhips, I beg leave to ſubmit, in the Appendix, a liſt of the number of ſhips built and repaired under my inſpection, from the year 1757 to 1794, making in all 989, of which (as will appear by the ſaid paper) there was only one, the Earl of Chatham, which was ſuppoſed to have foundered. If the improvements adopted in thoſe ſhips were extended to the Navy much labor and expence would be ſaved to the nation.

Appendix No. VII.

Upon that idea the following remarks are founded; but, before I proceed to enumerate the particular circumſtances which render the Company's ſhips ſuperior to our ſhips of war, I muſt be permitted to remark, with deference to the opinions of the perſons employed by Government in the department of ſhip-building, that radical errors appear to prevail reſpecting the article of timber.

In the firſt place, a much greater quantity of rough timber than can be neceſſary is kept in ſtore; for I muſt contend, that a ſtock ſufficient for one year's conſumption would equally ſerve the purpoſes to which it is at preſent applied in any of his Majeſty's dock yards.

No ſhip was ever yet built entirely with timber that had laid to ſeaſon three years, two years, or even one year; conſequently, that part of the ſhip which was formed of the moſt unſeaſoned wood muſt be expected to decay firſt, and thus a progreſſive decay in the ſeveral parts of the ſhip, ſubjects her to the neceſſity of continual repairs, at an immenſe expence, and to the great detriment of the ſervice.

A ſecond error is in the preparation of timber for ſervice; upon this and upon the other point above-mentioned, I cannot ſubmit better information than what is contained

contained in my anſwers to queſtions put to me by the Commiſſioners of the Land Revenue, in the year 1791, which are publiſhed in their eleventh report to the Houſe of Commons.

Appendix No. II.

I there recommended that Government ſhould always have twenty or thirty ſail of line-of-battle ſhips conſtantly on the ſtocks, to be built by contract, and to ſtand to ſeaſon under cover (as is deſcribed in my anſwer to the thirty-fifth queſtion) by which means the ſhips would laſt from eighteen to twenty years, inſtead of only eleven years and three quarters, which is ſaid by the Navy Board to be the average duration of ſhips of the preſent Navy.

Indeed, I hope I ſhall be forgiven in requeſting particular attention to thoſe anſwers, as containing, in my humble opinion, ſuggeſtions which, if carried into execution, would be the means of reducing, not only the conſumption of oak timber, but alſo the expence of building and repairing ſhips in the Navy, by at leaſt *one-half*. My opinions ſtill continue the ſame as thoſe which I then expreſſed.

No ſhip ſhould ever have what is called a thorough repair, or *any timbers* ſhifted; inſtead of this, their bottoms and upper works ſhould be doubled with three-inch oak plank, from keel to gunwale, and ſtrengthened with iron knees, ſtandards, and even with iron ryders, if neceſſary, all which might be done at a ſmall expence; and ſhips ſo repaired would be ſtronger and ſafer, and be able to keep the ſeas longer, in the worſt weather, than any new ſhips in his Majeſty's Navy.

This meaſure would be the means of ſaving great quantities of valuable ſtraight and crooked (commonly called compaſs) oak timber, which otherwiſe muſt be expended by giving ſhips thorough repairs; and it ſhould be more eſpecially adopted with reſpect to ſuch ſhips as have their top-ſides of the abſurd old faſhion of *tumbling in*, than which nothing

Appendix No. III.

nothing can poſſibly be more extravagant and ridiculous, as many of the timbers muſt be much weakened by being cut acroſs the grain; and ſuch ſhips as have had a ſecond thorough repair, muſt alſo be further weakened, as the timbers are always conſiderably reduced in the moulding way on each repair, and thoſe timbers are originally much too ſlight: on the contrary, great advantages would be derived from having little or no tumble-home to the ſides, as it gives more room upon deck, a greater ſpread to the ſhrouds, additional ſecurity to the maſts, makes the ſhip ſtiffer, a much better ſea boat, and, in every reſpect, ſafer, ſtronger, and better.

As all ſhips of the Navy are every way deficient of iron to ſtrengthen and connect the ſides and beams together, they ſhould be built with diagonal braces, as deſcribed by me in the aforeſaid eleventh report, and with the knees, ſtandards, breaſt-hooks, and crutches, of iron, it being obviouſly impoſſible, by any means, to make a ſhip equally ſtrong with wooden knees, &c. The iron may be made to any ſize, ſtrength, and length, ſo as to admit of as many additional bolts as may be judged neceſſary.

APPENDIX No. II.

It is upwards of twenty-four years ſince I firſt introduced in the Eaſt-India Company's ſhipping the mode of faſtening on the outſide and inſide plank with bolts, and leaving the tree-nail holes open for air until the ſhips were nearly finiſhed and ready for caulking, which has been, and is now univerſally acknowledged to be the beſt method of ſeaſoning the timbers and plank of any yet adopted. But although this is a matter of ſo much importance to the preſervation of the ſhips of the Navy, it has not been practiſed in his Majeſty's dock yards, nor have I ever heard of its being introduced into any contract for building ſhips of war in the Merchants' yards.

It is more than ſeventeen years ſince I brought into uſe, for the Eaſt-India ſhips, round-headed rudders, requiring no rudder-coats. Experience taught me how dangerous

gerous the old faſhioned rudder-coats were, particularly in ſmall ſhips of the Navy, many of which, I cannot doubt, were loſt from the ſea having carried away their rudder-coat.

The round-headed rudders are now univerſally acknowledged to be much ſuperior, in every reſpect, to the ſquare-headed rudders of the ſhips of the Navy; and I am very anxious that theſe ſhould be introduced into all ſhips to be built in the King's yards, and provided for in the contracts made, in future, for ſhips of war to be built in Merchants' yards.

About twenty-ſeven years ago I alſo introduced four-inch bottoms to ſhips for the Eaſt-India Company's ſervice, inſtead of three-inch bottoms; and there are ſhips of leſs than ſix hundred tons burthen, built for that ſervice, with four-inch bottoms, alſo with ſheathing of three-fourths of an inch thick, and coppered as uſual; whilſt, on the contrary, there have been frigates of a thouſand tons burthen, lately built for Government in Merchants' yards, with three-inch bottoms, and a ſhip of eight hundred tons with a fir bottom only three inches thick; and there are ſhips of ſeventy-four guns, now building in thoſe yards, of eighteen hundred tons burthen, with not more than four-inch bottoms, which ſhips, I preſume, are intended to go to ſea, as uſual, without any wood ſheathing.

It appears to me that continuing the practice of *thin* bottoms tends to riſk the loſs of the ſhips and the lives of his Majeſty's ſubjects, more eſpecially if fir be taken inſtead of Engliſh, Quebec, or Eaſt-country oak plank, which may always be procured. In my opinion, no ſhips of four hundred tons and upwards ſhould have leſs than a bottom of four-inch oak plank;—all ſhips of the Navy, of eight hundred tons and upwards, ſhould have not leſs than five-inch plank;—line-of-battle ſhips ſhould have bottoms at leaſt ſix inches thick;—and all ſhips ſhould have the addi-

tion of wood ſheathing. The thickneſs of the inſide plank of thoſe ſhips may then generally be reduced in proportion.

It is many years ſince the keels of all the East-India ſhips have been rabbitted in the middle, which is certainly ſafer and better than having the rabbit on the upper edge, as is the practice in the ſhips of his Majeſty's Navy at this time.

About twenty-ſix years ſince, I had the capſtands to the ſhips in the Company's ſervice fitted with an iron ſpindle, paul-head, and catch-pauls. This has ever ſince been allowed effectually to prevent the people from being thrown from the bars, which, is well known, has frequently happened on board of his Majeſty's ſhips, and whereby many lives have been loſt, and great numbers crippled.

Every old capſtand in the King's ſhips ſhould be fitted with an iron ſpindle and catch-pauls, which may be done in a ſhort time, and at a very moderate expence, compared with the great ſafety and other advantages that muſt attend this improvement.

I have made it a practice, for many years, to add iron knees under the beams to all old ſhips in the Company's ſervice; and, of late years, to ſuch ſhips as have made three voyages, I have frequently added an iron knee under every beam of the lower and middle decks, from the fore-maſt to the mizen-maſt, where there has not been a ſtandard. If his Majeſty's ſhip the Centaur (although French-built) and others that have foundered at ſea, had been fitted in this manner, it would have prevented their ſides from ſeparating from the ends of their beams, and conſequently might, in all probability, have prevented thoſe ſhips from foundering.

Indeed, I am perſuaded that the loſs of moſt of the ſhips of war, and even merchant ſhips that have foundered at

at ſea, has been occaſioned by their having been inſufficient in point of ſtrength.

After having ſtated, in my anſwers to the queſtions put to me by the Commiſſioners of the Land Revenue in the year 1791, every alteration I then thought neceſſary to be made in future, ſo as to prevent accidents of that kind, even in the worſt weather, I cannot but ſincerely regret that my remarks have not been attended to. I feel this the more when I conſider the frequent loſſes of the King's ſhips, particularly the very recent cataſtrophe of his Majeſty's ſhip Leda, when (as it is ſaid) only ſeven of the whole crew were ſaved.

Out of the great number of ſhips that have been loſt from getting on ſhore or ſtriking on the rocks, there can be no doubt many of them might have been ſaved if their bottoms had been thicker when originally built, and the old ſhips doubled with three-inch oak plank when they required conſiderable repairs.

Whenever a ſhip is loſt at ſea, a ſtrict inquiry ought always to be made of the ſurvivors as to every particular, in order that the *cauſe* of ſuch loſs may be aſcertained:—the reſult of ſuch inquiry ſhould be made as public as poſſible to the eye of obſervation.

The great number of King's ſhips, of all rates, which have foundered at ſea, and the number of lives that have been loſt in conſequence, are ſtriking proofs that thoſe ſhips were not conſtructed, in all reſpects, as they might have been, ſo as to encounter the moſt ſevere ſtorm. I am fully convinced that all ſhips may be ſo conſtructed, and I preſume I have pointed out, in the different parts of this publication, effectual means for the purpoſe.

I ſincerely hope that this will attract the attention of Government, and alſo induce profeſſional men to make ſuch further

further obſervations on building, conſtructing, and repairing ſhips for the Navy of Great Britain, as may prevent the like dreadful conſequences in future.

The principal cauſes of theſe misfortunes, in caſe of ſudden violent ſtorms, or the ſhips broaching too, appear to me as follows, *viz.*

In the firſt place, The deep waiſt in thoſe ſhips, and more eſpecially in the frigates and ſloops of war, which occaſions them to ſhip a great deal of water on the main-deck.

Secondly, The ballaſt, water, and every thing in the hold, ſhifting and falling to leeward, from want of ſhifting boards and the pillars not being properly ſecured to prevent the ſame, whereby the ſhips are liable to become water-logged, and thus, before the hatches are ſufficiently ſecured, they may *fill* and founder.

Captain Inglefield's narrative of the loſs of the Centaur of ſeventy-four guns, will clearly evince that not only ſmall ſhips, but all ſhips of war, however large, ſhould have ſhifting boards in the hold, and the pillars better ſecured; and as a farther ſecurity from the guns doing damage, in caſe of their breaking looſe, I recommend ſubſtantial comings to all the hatch-ways, at leaſt two feet above the decks, alſo thick pieces of oak in mid-ſhips, between the hatch-ways, let down upon the beams, equally well ſecured and of the ſame height above the deck as the comings, which muſt prevent the guns from going further to leeward.

The ſterns of ſhips of war ſhould have little or no rake, in order to give an opportunity of fighting a greater number of ſtern chaſe-guns, which cannot be done with ſafety where the ſterns have a great over-hanging, as is the caſe with the ſhips of his Majeſty's Navy. There ſhould be ſtrong dead-lights to their ſtern windows, and no quarter-

galleries, which are not only unneceſſary in thoſe ſhips, as when they are cloſe hauled, they very much impede their ſailing, but are alſo dangerous (particularly in ſmall ſhips) in caſe of the galleries being carried away; neither ſhould there be any ſcuttles through the ſides, or their tillars under the gun decks of any ſhip; there ſhould be whole ports inſtead of half ports between decks, and no line-of-battle ſhips ſhould work their cables on the lower deck.

I am confident if all ſhips had firm and fluſh upper decks, in place of deep waiſts (as I recommended in my anſwers in the year 1791, before-mentioned) they would be far ſuperior, not only as ſhips of war, but alſo in point of ſafety, as it would then be almoſt impoſſible (except through great neglect) for any ſhip to founder in deep water, even in the heavieſt ſeas or the moſt ſevere ſtorm. I feel myſelf ſo deeply intereſted in this ſubject, that I muſt take the liberty of referring to Steel's Liſt of Ships loſt or foundered at Sea, and I am perſuaded that I am rendering a ſervice to the community by pointing out what I am certain would prevent thoſe fatal conſequences in future. APPENDIX No. I.

In addition to the above ſuggeſtions, which come more particularly within the profeſſed object of this addreſs, allow me, Honorable Sirs, to ſubmit the following ideas to your conſideration.

As it is apprehended there may be a want of oak timber in this country, I preſume it is now time that Government ſhould give orders to plant and encloſe every part of the King's foreſts and waſte lands with oaks, as I recommended in a report to an Open Committee of the Houſe of Commons, printed in the year 1771. APPENDIX No. III.

I would further recommend that, whenever a peace ſhall take place, all thoſe ſhips that were contracted for, or built for the Eaſt-India Company's ſervice, and purchaſed by Government, ſhould be returned to be employed in that

 ſervice

APPENDIX.

LIST OF APPENDIX.

No. I. A Liſt of Britiſh Ships of War, loſt or foundered, from 1775 to 1784, extracted from a Book publiſhed by STEEL in the Year 1785.

No. II. Extracts from the Eleventh Report of the Commiſſioners of the Land Revenue, and of the Appendix to that Report.

No. III. Two Engravings, intended to exhibit the impropriety of Tumble-home Sides for Ships.

No. IV. Evidence given by Mr. Snodgraſs before a Committee of the Houſe of Commons, appointed in March 1771, to conſider how his Majeſty's Navy might be better ſupplied with Timber.

No. V. A Letter from Mr. Snodgraſs to the Admiralty Board.

No. VI. A Letter from Mr. Snodgraſs to the Society for the Improvement of Naval Architecture.

No. VII. A Liſt of Ships in the United Eaſt-India Company's Service, which have been loſt, burnt, or captured, from the Seaſon 1757 to the Seaſon 1794.

No. VIII. Letter from Captain Lowis to Mr. Snodgraſs reſpecting the Ship Woodcot.

APPENDIX, No. I.

A LIST of Britiſh Ships of War, loſt or foundered, from 1775 to 1784, extracted from a Book publiſhed by STEEL in the Year 1785.

Suppoſed No. of Men.	No. of Guns.	Ships' Names.	Where loſt, &c.
120	16	Falcon - - -	Foundered on the Coaſt of America, - - Crew periſhed.
120	18	Mentor } - -	Ditto near Bermudas, with the crew of the Cerberus on board, in addition to her own crew, All periſhed.
180	28	Cerberus }	
120	18	Pomona - - -	Loſt in the Weſt-Indies, Crew periſhed.
120	18	Ferret - - -	Ditto Ditto - - ditto
220	32	Repulſe - - -	Ditto in North America, - ditto
120	20	Veſtal - - -	Ditto on the Newfoundland Station, - - - ditto
120	16	Pegaſus - - -	Ditto on ditto, - - ditto
100	12	Sprightly - -	Ditto at Guernſey, - - ditto
120	16	Swallow - - -	Ditto coming from the Cape of Good Hope, - - ditto
110	14	Diſpatch - - -	Ditto in North America, - ditto
120	20	North - - -	Ditto near Halifax, - - ditto
600	74	Thunderer - -	Ditto in the Weſt-Indies, - ditto
250	42	La Blanche - -	Ditto Ditto, - - ditto
180	28	Laurel - - -	Ditto Ditto, - - ditto
180	28	Shark - - -	Ditto in North America, - ditto
120	18	Rover - - -	Ditto (don't mention where) - ditto
110	14	Barbadoes - -	Ditto in the Weſt-Indies, - ditto
110	14	Camelion - -	Ditto Ditto, - - ditto
60	10	Victor *(Brig)* -	Ditto Ditto, - - ditto
120	16	Delight - - -	Ditto on her paſſage to North America, - - - ditto
60	14	Pheaſant *(Cutter)*	Ditto going convoy to Guernſey, ditto
3360		*Carr. forward*	

3360 *Brought forward.*

Suppoſed No. of Men.	No. of Guns.	Ships' Names.	Where loſt, &c.
100	8	Thunderer *(Bomb)*	Loſt in the Britiſh Channel, Crew periſhed
500	64	Sterling Caſtle -	Ditto in the Weſt-Indies, - - - Crew chiefly periſhed.
180	28	Andromeda - -	Ditto - Ditto, - - ditto
120	16	Beaver's Prize -	Ditto - Ditto, - - ditto
600	74	Centaur - - -	Foundered coming from Jamaica, - - - - Only 12 ſaved.
4860		*Total*	

No mention of the Crew of the following ſhips, whether any were ſaved or not, but I preſume that may be aſcertained from the books at the Navy Office.

180	26	Earl of Bute -	Foundered in the Gulph of Florida.
120	16	Cupid - - -	Ditto off Newfoundland.
350	50	Leviathan - -	Ditto coming from Jamaica.
160	24	Penelope - -	Ditto in the Weſt-Indies.
850	104	Ville de Paris -	Suppoſed to have foundered coming from Jamaica.
600	74	Glorieux - - -	Ditto ditto ditto.
180	28	Hinchinbrook -	Foundered at Jamaica.
350	50	Cato - - - -	Suppoſed to be loſt on her paſſage to the Eaſt-Indies.
	8	Savage - - -	Loſt at the Iſland of Scaterie.
180	28	Liverpool - -	Ditto in Jamaica Bay.
120	20	Syren - - -	Ditto off Point Judith near Rhode Iſland.
220	32	Arethuſa - -	Ditto off Uſhant.
220	32	Grampus }	Ditto near Newfoundland.
220	32	Tortoiſe } - -	
120	16	Zebra - - -	Ditto near New York.
	12	Spy - - - -	Ditto at Newfoundland.

Otter

Suppoſed No. of Men.	No. of Guns.	Ships' Names.	Where loſt, &c.
	10	Otter - - - -	Loſt in Florida.
120	16	Viper - - -	Ditto in the Gulph of St. Lawrence.
280	44	Phœnix - - -	Ditto in the Weſt-Indies.
220	32	Sartine - - -	Ditto in the Eaſt-Indies.
160	24	Deal Caſtle - -	Ditto in the Weſt-Indies.
120	20	Scarborough - -	Ditto Ditto.
120	18	Bellona - - -	Ditto at the Mouth of the Elbe.
	14	Endeavor - -	Ditto at Jamaica.
	8	Incendiary *(Fire-ſhip)* }	Ditto near the Iſle of Wight.
180	28	Greyhound - -	Ditto near Deal.
160	24	Pelican - - -	Ditto at Jamaica.
160	24	Syren - - - -	Ditto upon the Coaſt of Suſſex.
120	16	Hope - - - -	Ditto off Savannah.
120	16	Duchefs Cumberland	Ditto off Newfoundland.
	14	Race-horſe - -	Ditto off Beachy Head.
	14	Rattle-ſnake - -	Ditto off the Iſland Trinidada.
250	36	Santa Monica -	Ditto off Tortola.
180	28	Solebay - - -	Ditto off Nevis.
	14	Repulſe *(Cutter)*	Ditto off Yarmouth.
	14	Placentia *(Brig)*	Ditto off Newfoundland.
160	24	Crocodile - - -	Ditto off the Start Point, coming from the Eaſt-Indies.
	14	Antelope }	Ditto in the Hurricane at Jamaica.
	10	Duke of Rutland }	

APPENDIX, No. II.

EXTRACTS from the Eleventh Report of the Commiſſioners of the Land Revenue, and of the Appendix to that Report.

(PAGE 26.) The Commiſſioners of the Navy, in anſwer to our enquiries concerning the duration of ſhips of war, give as their opinion, that ſhips built in the dock-yards laſt, on an average, about fifteen years, and thoſe built by contract, in the merchants' yards, about ten years. This difference they impute, among other cauſes, to the timber uſed in the dock-yards being better ſeaſoned, and the ſhips a longer time in building, which laſt circumſtance alone contributes greatly to their duration. The merchant builders being employed to build ſhips of war only in caſes of emergency, are often, from the urgency of the ſervice, preſſed by the Navy Board to compleat them in a ſhorter time than is ſpecified in the contract; and, not having a ſufficient ſtock of timber on hand, they are obliged, at a ſhort notice, to provide what is wanted, and to work it up before the juices are ſufficiently exhauſted to render it fit for uſe.

If this opinion of the Commiſſioners of the Navy be well founded (and no perſons can have better opportunities of judging of this matter) it follows, that as the tonnage of the ſhips built by contract, or purchaſed during the preſent reign, amounts to 256,656 tons, and of thoſe built in the dock-yards to only 131,852 tons, the medium duration of the ſhips which compoſe the preſent Navy, taken one with another, is only about eleven years and three quarters.

Every addition to the duration of ſhips being obviouſly a proportional ſaving of timber, if means could be deviſed

deviſed to make ſhips of war laſt eighteen years, one-third part of the preſent conſumption of timber for the Navy would be ſaved; and inſtead of 50,000 loads being neceſſary for the annual ſupply, 33,333 loads would be ſufficient.

(PAGE 33.) It appears, from the anſwers of Mr. Snodgraſs, that, in the ſhips built for the Eaſt-India Company, iron knees have, for many years, been uſed inſtead of oak, and are found to anſwer better than oak, being lighter, cheaper, and ſtronger. They have alſo been adopted in the conſtruction of ſhips of war in France, for a great while paſt; and it ſeems extraordinary that, notwithſtanding the apprehenſions of a ſcarcity of oak timber in this country, and though the difficulty of procuring knees has been ſuch as to induce the Navy Board to make trial of cheſnut and aſh, yet iron has been very little uſed in the conſtruction of ours. It would, undoubtedly, prove a great ſaving of timber, and of that kind which is already moſt difficult to procure, and in which, by grubbing of hedge rows, in conſequence of the extenſion of tillage and improvements in agriculture, a ſtill farther decreaſe is ſpeedily to be apprehended. This is, therefore, a very important ſuggeſtion; and, being founded on experience, well deſerves conſideration.

In the anſwers of Mr. Snodgraſs in particular, and in thoſe alſo of the merchant builders, whoſe opinions we have obtained on the means of preventing waſte, and increaſing the duration of ſhips, many alterations, beſides thoſe which we have mentioned, are ſuggeſted as improvements in the form and conſtruction of ſhips. Our view, in the enquiries we have made of perſons in that profeſſion, has been to diſcover whether any alteration in the preſent practice would be likely to contribute to the ſaving of timber, by rendering ſhips more laſting; and whatever appeared to us to have that tendency, being connected with the object of our appointment, is inſerted in this report. But we have not *here* detailed the other improvements which have been ſuggeſted in the form and mechaniſm of ſhips, not from

 thinking

thinking them of little importance, but becauſe they are matters which do not fall within the limits of our duty. They, however, appear to us to be ſo well deſerving of the conſideration of thoſe whoſe province it is to ſeek for improvements in naval architecture, that we have inſerted them at length in the appendix, and annexed a ſection, drawn by Mr. Snodgraſs, of a ſeventy-four gun ſhip and a frigate, as built in his Majeſty's dock-yards, and another upon a plan recommended by him, not thinking it right, in a matter of ſo much importance to this country, to keep back alterations ſuggeſted by very intelligent men, poſſeſſed of great profeſſional ſkill and long experience.

Eaſt-India Houſe, May 12th, 1791.

GENTLEMEN,

In conſequence of your application to the Court of Directors of the Eaſt-India Company to permit me, as their Surveyor of Shipping, to anſwer ſuch queſtions as you might think proper to put to me, I received their commands to communicate to you every information that you might deſire: I have accordingly conſidered the queſtions ſent to me from your Board with the utmoſt attention I am capable of, and have given the fulleſt anſwers thereto in my power, which are encloſed herewith.

If any thing that I have ſuggeſted may be of the leaſt ſervice to the Public, it will give me the higheſt ſatisfaction; and I ſhall at all times be happy to communicate any further information in my power.

I am,

GENTLEMEN,

Your moſt obedient humble ſervant,

(Signed) GABL. SNODGRASS.

The Commiſſioners of the Land Revenue.

QUESTIONS propoſed by the Commiſſioners of the Land Revenue to Mr. Gabriel Snodgraſs, with his anſwers thereto.

QUESTION 1. Does your opinion continue the ſame that you gave before the Committee of the Houſe of Commons in 1771, on all the points on which you were then examined; if not, be ſo good as to mention in what particular points it is altered?

ANSWER. My opinion continues the ſame, in all reſpects, as at that time; except on the following points, *viz.*

Reſpecting the building of ſhips in docks my opinion is altered. I now think the building of them on ſlips to be preferable; and, if they are to ſtand any time to ſeaſon before they are launched, a ſhed or roof ſhould be built over them. But I ſtill continue of the ſame opinion that the laying up old ſhips in docks, under proper cover, would be very proper, and that a few experiments of this kind ought to be made, in ſome of his Majeſty's yards, before it is generally adopted.

In the copy of my letter to John Purling, Eſq. printed with the report of the Committee in 1771, (page 35) it is ſaid that ſhips may go *eight* voyages to India in twelve or fourteen years. This muſt be a miſtake, as I never thought of ſhips going more than ſix voyages in that number of years.

In what is ſaid (page 36 of that report) reſpecting the not building ſhips for the Navy in the Merchants' yards, my opinion is alſo altered. I am now certain that it would be much for the intereſt of the Nation, and for the future good of the Navy, if Government were to contract for ſhips of war to be built in private yards in time of *peace*, or whenever there is but little work in thoſe yards, as proper time may then be allowed for the building and ſeaſoning of them, and

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proper attention paid to the materials, workmanſhip, &c. and this meaſure, for two good reaſons, *ought* to be adopted; firſt, That Government may always have a ſucceſſion of ſeaſoned and durable ſhips, at a moderate price, which would prevent the neceſſity that ariſes, in time of war, of building ſhips in great *haſte* and with *green* materials, which certainly is the principal cauſe of the rapid decay of ſhips built in this manner, and of the *bad* ſtate of many of the ſhips of the preſent Navy, and alſo of the extraordinary expence and conſumption of timber in building and repairing of them: and, ſecondly, That the ſhipwrights in the private yards may find conſtant employment, which would increaſe their numbers and continue them in this country, and be highly advantageous to the Nation in time of war. The contractors may alſo undertake building ſhips in the King's yards, by the ſhipwrights employed in thoſe yards, and ſlips may be ſeparated from the reſt of the yard by a fence put up for that purpoſe.

It has been ſuggeſted by ſome Gentlemen, that ſhips of war, built in the Merchant's yards, are not ſo durable as thoſe built in the King's yards. This, certainly, is a great miſtake, if the ſame time is allowed for building and ſeaſoning, as in the King's yards; or the *fault* muſt be with thoſe who form the contracts and ſhould ſee they are complied with, as it is well known and allowed, that the Merchants' builders buy ſounder and better timber, in general, than what is received into his Majeſty's yards for the uſe of the Navy; conſequently, if ſhips built in the Merchants' yards were allowed a ſufficient time for ſeaſoning, &c. and properly attended to while building, there is no doubt but they would be equal, if not ſuperior, to ſhips built in any of his Majeſty's yards, and at a much cheaper rate. For, if the prime coſt of a ſhip of war, built in Merchants' yards, was compared to the real expence of building one of the ſame dimenſions and ſcantlings in the King's yards, I much doubt whether the difference of the ſums would not be found nearly as *two* to *one*.

QUESTION 2. What is the number of Britiſh-built ſhips, at this time in the ſervice of the Eaſt-India Company, on the eſtabliſhment; and what is their tonnage?

ANSWER. There are now ninety-one Britiſh ſhips, built and building, on the Company's eſtabliſhment; and the amount of their tonnage is about 79,913 tons.

QUESTION 3. What other ſhips are conſtantly, or occaſionally employed in the Company's ſervice; and to what amount of tonnage?

ANSWER. Two ſhips, built at Bombay, are conſtantly employed in the Company's ſervice to and from India;—The amount of their tonnage is 1,727 tons. Very few ſhips have been *occaſionally* employed; except, lately, ſome few ſmall ſhips, returning from Botany Bay, have brought home teas from China.

QUESTION 4. Are there any ſhips now building for the ſame ſervice, and of what tonnage; and are ſuch ſhips intended to be employed in the room of ſhips of equal tonnage, to be forthwith broken up or ſold, or in addition to the preſent ſhipping?

ANSWER. Four ſhips are now building of ſomething more than twelve hundred tons each, in the room of four other ſhips of about eight hundred tons each, which are worn out and diſpoſed of by their owners.

QUESTION 5. At what time did the reſtriction, impoſed by the act of 12 Geo. III. againſt building more ſhips for the Eaſt-India Company, until their whole tonnage ſhould be reduced to 45,000 tons, expire; and how ſoon after that reſtriction ceaſed, did the Company begin to build and increaſe their ſhipping?

ANSWER. I cannot tell the preciſe time the reſtriction expired, but ſuppoſe it was ſome time in 1776, as in that year the Company began to build and increaſe their ſhipping.

QUESTION 6. Has the general conſumption of timber, for the building and repairing of ſhips, increaſed ſince the year 1771?

ANSWER. The conſumption of timber, for the Navy only, I ſuppoſe has been more than double, from 1771 to 1791, to what it was from 1751 to 1771; and the general tonnage of Eaſt-India ſhipping (Britiſh-built) has encreaſed, ſince the year 1776, from about 45,000 tons, to 79,913 tons, including the tonnage of the four ſhips now building.

QUESTION 7. Is oak, of any other country than Britain, uſed in the conſtruction of Eaſt-India ſhips; and if ſo, in what proportion?

ANSWER. About one-half of the plank of the bottoms of Eaſt-India ſhips is Dantzick oak plank. No large foreign oak is uſed in any part of thoſe ſhips.

QUESTION 8. From what part of Britain is the oak generally brought that is uſed for the conſtruction of Eaſt-India ſhips?

ANSWER. The merchant builders are not confined by their contracts to buy timber from any particular part of Britain, provided it is equal in goodneſs to that of the growth of Suſſex.

QUESTION 9. What do you ſuppoſe to be the difference between foreign oak timber imported into this country, and that of Britiſh growth, in point of duration?

ANSWER. All foreign oak, imported into this country, is very inferior to Engliſh oak; but I cannot aſcertain the exact difference in point of duration.

QUESTION 10. Has the price of ſhips, built for the Eaſt-India Company, riſen; and, if ſo, how much ſince 1771?

ANSWER. The price of ſhips, built for the Eaſt-India Company's ſervice, has riſen, ſince the year 1771, from twenty to forty ſhillings per ton, which has been occaſioned, partly from their increaſed tonnage, partly from their being more ſubſtantially built, from the contracts being made fuller, and by not admitting ſo large extra bills as formerly.

QUESTION 11. Has Government any competitor, beſides the Eaſt-India Company, in the purchaſe of large oak timber fit for the uſe of the Navy?

ANSWER. There are certainly many more competitors in the purchaſe of large oak timber, fit for the uſe of the Navy, than the Eaſt-India Company, ſuch as the Office of Ordnance, Brewers, Millwrights, &c. &c. and no Britiſh ſhips, of 300 tons and upwards, are built without having ſome principal oak timber and plank uſed in them, fit for the uſe of the Navy. But as the whole quantity of large oak timber uſed in the Eaſt-India Company's ſervice, and for all other marine purpoſes, is ſo ſmall compared to that uſed for the Royal Navy, the Navy Board have it much in their power, at all times, to regulate the price. I am of opinion, that Eaſt-India ſhips of 1,200 tons are built with timber of no larger meetings than is uſed for building and repairing the largeſt frigates in his Majeſty's yards.

QUESTION 12. How long may it take to build an Eaſt-India ſhip under the preſent regulations?

ANSWER. Eighteen months is the ſhorteſt time allowed at preſent.

QUESTION 13. How long, under former regulations?

ANSWER. I do not recollect any regulation for the time ſhips ſhould be in building formerly; ſome have been built in ſix months.

QUESTION