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OCCASIONAL PAPER NO.2.

PROPOSALS FOR CANADIAN NAVAL EXPANSION.

NOTE: Prepared in accordance with the desire of the Minister of the Naval Service, and approved generally by the Director of the Naval Service.

Naval War Staff,
Ottawa,
3rd July 1919.

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COMPARATIVE STATEMENTS.

1910 Programme (6 years).

- 4 Light Cruisers (Improved Bristol class).
- 6 Destroyers (Improved Acorn Class).
- 1 Light Cruiser (Boadicea class) or NIOBE.
RAINBOW.

Construction.....	\$11,690,000.
33% for building in Canada.	3,897,000.
Works.....	<u>715,000.</u>
Total.....	
	\$16,302,000.
Annual Upkeep.....	
	3,680,000.

1912 Programme (Mr. Borden).

Proposed construction of 3 Battle Cruisers.. \$35,000,000.

1912 Programme (Sir Wilfred Laurier),

2 Fleet Units.....

Construction.....	\$53,548,000.
Annual Upkeep.....	5,616,000.

1920-1926 (7 years).

Construction.....	\$25,630,000.
Works.....	<u>1,281,500.</u>
Total,.....	
	\$26,911,500.
Annual Upkeep.....	
	7,476,900.

S U M M A R Y.

CONSTRUCTION.

1910	1912		1920	
(6 years). \$16,302,000.	Mr. Borden. \$35,000,000.	Sir W. Laurier. \$53,548,000.	(7 years) \$26,911,500.	(14 years) \$60,522,000
3,680,000%	-	ANNUAL UPKEEP. 5,616,000.†	7,476,900.	15,939,500

† At then existing prices of wages and material.

CANADIAN NAVAL POLICY.

At the Imperial War Conference 1917, it was resolved that the Admiralty be requested to work out immediately after the conclusion of the war, what they considered the most effective scheme of naval defence of the Empire, for the consideration of the several Governments.

The following remarks are an attempt to formulate the principles leading to a decision on any recommendations put forward by the Admiralty.

It is assumed that no policy which does not provide for the building up of a Canadian Navy will be acceptable.

Alternative Schemes.

The first and most important decision to be made, is as to the form which the Canadian Navy is to take. There are four (4) alternatives -

1. To provide docking and repair bases for Imperial Ships only.
2. To provide, in addition, local defence forces.
3. To maintain, in addition, a small service such as is contemplated in the Fleet Unit Scheme.
4. To maintain a fleet complete in all its different types of ships, with the necessary repairing and shipbuilding bases.

The first alternative was practically the extent of the naval effort of Canada at the outbreak of war: in spite of nearly all her efforts being concentrated on the military side, it was found absolutely necessary to make provision for local naval defence forces. The naval effort, therefore, cannot be less than the second alternative. These local forces will provide for the defence of the coasts and for the protection of trade in Canadian waters against raids, but they could not afford any protection for trade overseas. As Canadian interests extend to all quarters of the globe, it would appear necessary that some additional form of naval defence should be provided.

The principal difficulty which is now met is to find a suitable basis on which to calculate the scale of naval forces which should be provided. The principle here adopted is to ascertain what the minimum effort should be, and also to estimate what the maximum effort could be, the actual effort then lying between the two alternatives and depending upon the amount of money available. The minimum effort is found by taking into consideration the probable scale of attack on Canadian coasts. This matter was dealt with by the Overseas Defence Committee in 1911. The Committee considered the probable scale of attack against Halifax as "one or two cruisers", and against Esquimalt (or rather Prince Rupert) as "one or two unarmoured cruisers". The war served to confirm the accuracy of this forecast and there is no reason to suppose it to be any different now. A reasonable scale of defence against this force would be one of 50% greater strength, that is to say, three cruisers. It is not intended to suggest, however, that these cruisers should be tied to Canadian waters, but rather that they should in time of war (especially) be attached to the Imperial Fleet and disposed as the Admiralty considers best.

The minimum naval effort, therefore, is the maintenance of a small service as contemplated in the Fleet Unit Scheme of three cruisers and local defence forces, together with repair and docking bases for Imperial ships. The maximum effort which Canada could make is reached by a different process of reasoning.

British naval estimates are based primarily on the naval forces likely to be arrayed against the navy in war. At the same time they bear, or can be made to bear, some sort of relation to the trade which they seek to protect. Having by other processes arrived at the minimum effort Canada can make the maximum effort might be regulated by fixing it at an amount similar in proportion to Canadian trade as the Imperial Navy estimates bear on the trade of the United Kingdom.

In the year previous to the war (1913-14) the value

of United Kingdom Foreign trade amounted to £1,294,000,000, whilst the navy estimates for that year were £46,319,000 that is 3½% of the value of the trade.

In the same year the value of Canadian imports and exports was \$1,130,000,000. Three and one half per cent of this amount is \$39,500,000 and would represent the cost of the maximum naval effort of Canada. The expenditure of such a large amount per annum would provide Canada with a fleet of some size. The proper policy therefore to follow appears to be to establish a small service (Alternative 3) but to keep in mind the possible eventual construction of a complete fleet (Alternative 4).

Battle
Cruisers
no.
recommended.

In 1909 and again in 1912 the Admiralty urged the construction of battle cruisers on the Canadian Government. It is well understood that this policy was advocated because the number of capital ships in the Royal Navy was considered dangerously low. The same pressing need for capital ships does not exist today owing to the elimination of the German navy. But for the urgent need, it is not to be supposed that the Admiralty would have recommended the construction of battle cruisers, as they are very expensive to build and maintain and each requires in the neighbourhood of 1000 officers and men to man, a large number of whom must be highly skilled. The same remarks apply to battleships. It does not, therefore, appear at all advisable at the present time that Canada should undertake the construction of capital ships, but should confine herself to cruisers and small craft, the actual number to be provided over and above an irreducible minimum depending upon the amount of money available.

Another argument against capital ships is the lack of experienced Canadian officers for these ships. We have at present about 60 young Canadian officers afloat with more to follow each year. We have very few senior Canadian officers. The most advantageous policy from this point of view is, therefore, to build at first numbers of small craft which, whilst not requiring senior officers, give junior officers most valuable training in

command and prepare the way for appointments in larger ships, which could be built at a later date.

A further objection to building capital ships is to be found in the fact that it is probable no private firm would establish or extend a shipyard in Canada for building capital ships, unless it were guaranteed a sufficiency of orders to justify the preparatory expense. As battleships are now costing from \$25,000,000 to \$30,000,000 each to build, any guarantee for a number of ships of this nature would be a very heavy obligation on the country. On the other hand, it is probable that more than one firm would be willing to tender for ships comprised in a programme which included nothing larger than light cruisers.

Permanent
policy
necessary.

At the same time, it is most necessary that a definite policy extending over a period of years should be inaugurated. By this is meant that a certain sized Naval Service should be aimed at in say 15 or 20 years, the whole scheme being sealed by a special Act of Parliament. The effect of such a policy would greatly tend to economy in the prevention of hurried and ill-considered annual programmes, and it would give stability to the whole service, as those joining (especially officers, who make the navy their life's career) would fully understand what prospects were before them. It is unnecessary to dilate here on

the enormous advantage which would accrue if it were possible to find a policy on which all political parties could agree. It is not too much to say that a navy founded on the above principles, even though of very small size, would be far more efficient than a numerically larger navy constructed on some haphazard principle.

Local Defence Forces.

It remains to consider of what the local defence forces should consist. The duties which they will be required to perform are:-

- (a) Local harbour defence operations.
- (b) Patrol of the coast against minor enemy operations.

Both these duties would be largely carried out by auxiliary vessels to be taken up and commissioned on the outbreak of war. An organization should be prepared in peace time to permit of this being done. These auxiliary craft will, however, require supporting by heavier naval vessels. The latter should be fast craft, able to keep the sea in all weathers, and would most conveniently consist of flotillas of P.C. boats. It is not easy to lay down the exact number

of P.C. boats required, as their duties are so varied and the scale of attack is less easily presupposed than that of heavier ships. It seems reasonable, however, that there should be provided 2 divisions of 8 boats each which, together with 2 reserve boats, would be 18 boats. 1 parent ship would be required for their use. They should be supported by a few destroyers for special purposes.

With regard to (b), the most suitable form of support to the surface patrol probably would be an Air Service.

Ty. of
AS P.

Every ship built should be constructed with a definite object in view, the most pressing requirements in case of war being dealt with first.

P.C. Boats.

On the principle that self defence is the first law of nature, it is reasonable to consider first the strictly local defences required. Leaving on one side such auxiliaries as mine-sweepers, etc. which would be taken up on the outbreak of war, the vessels supporting these auxiliaries should be capable of dealing with enemy submarines and small raiding surface craft. They should be of good sea-going capabilities, able to escort fast merchant ships and able to overhaul the ordinary merchant vessel or submarine. Owing to the distance of the Canadian coast from probable enemy bases, it does not seem necessary that these vessels should be fit to oppose modern destroyers. These conditions seem to be best met by the P.C. (Patrol-boat Converted) boats built by the Admiralty in the later stages of the war.

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They compare with destroyers as follows:-

	<u>P.C.Boat.</u>	<u>Destroyer.</u>
Length.	247'	312'
Breadth.	27'	30'
Draught.	8'	13'
Displacement.700 tons	1296 tons
Complement.	60	105
Speed.	20 knots	34 to 36 knots
H.P.	3500	27000
Armament.	1-4" ; 2-12pdr	4-4" ; 1-3"A.A., 4-21" torp.
Oil.	165 tons	322 tons.

It will be seen, therefore, that the cost of a P.C.boat would be but half that of a destroyer both to construct and to maintain. They are particularly good sea boats and have done excellent service during the war.

Destroyers.

It has been pointed out already that the P.C. boat is generally sufficient and perhaps superior to the destroyer for the purposes required by Canada. Nevertheless for escorting fast merchant ships or cruisers, for supporting a flotilla of vessels, hunting submarines and other special purposes a certain number of destroyers are necessary. They should be of the highest speed and have good sea keeping qualities. Other factors in their construction are of minor importance.

Cruisers.

The type of cruiser selected is of great importance. Cruisers which at the critical moment are out-matched by the enemy are useless. It is, therefore, prudent to construct ships with a view to probable enemies they will have to engage, and to give them somewhat greater speed and heavier armament.

Taking Japan as the most probable enemy of the future, she at present possesses six battle cruisers and a number of light cruisers. The details of the latest projected class of the latter are not known. But those building are of 3500 tons, 31 knots speed and armed with 4-5.5" guns; those built just before the war were 4950 tons, 26 knots and armed with 8-6" guns.

It will be seen from the table given below that the British C. and D. classes are inferior to the Japanese ships in one respect or another. Any new vessels built should, therefore, be not less heavily armed than the D class and of greater speed.

In addition to considering foreign vessels, thought must also be given to the conditions under which our ships may have to operate. These conditions are not at all the same as, for instance, are prevalent in the North Sea. In that locality distances are comparatively short, bases are close at hand, and the heavy weather of the ocean is frequently absent, and, therefore, a comparatively small class of cruiser may be suitable.

But on our coasts, especially the Pacific, distances are great and weather conditions make habitability and good sea keeping qualities essential. It is, therefore, considered that cruisers of the type of the Frobisher class now completing are more suitable for Canada than either C or D classes. It is understood that the Frobisher class of cruiser has been designed with a view to service in distant seas, to act against fast commerce destroyers such as the EMDEN during the war.

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COMPARATIVE TABLE OF LIGHT CRUISERS.

	<u>Displacement</u> Tons.	<u>Speed</u> Knots.	<u>Armament.</u>	<u>Torpedo</u> <u>Tubes.</u>
Japan (HIRADO)	4950	26	8-6"	3
(TATSUTA)	3500	31	4-5.5"	6
C class	3750 to 4150	28 to 29	5-6"	4 double.
D class	4650	29	6-6"	4 triple.
Frobisher	9750	31	7-7.5"	6

Submarines.

It has already been mentioned that Japan has a number of battle cruisers, whilst it has also been recommended that Canada should not build this type of vessel. Nevertheless, some form of defence is desirable, especially on the Pacific, in case battle cruisers were despatched to Canadian waters. The most suitable defence under the circumstances would seem to be submarines, which could not but exercise great moral effect on an enemy operating so far from his bases.

The type considered most suitable is some form of coastal boat, not unlike the H class, but rather larger.

It would be unnecessary to have large sea-going craft.

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Depot Ships.

Three depot ships are provided for in the proposed programme. They are intended as parent ships for P.C. boats, destroyers and submarines, respectively. There are many disused cruisers suitable for the purpose if fitted up, which could no doubt be obtained from the Admiralty at small cost.

Aircraft.

Aircraft have hardly been touched upon owing to the uncertainty as to the future air policy of the Dominion. Either a naval air service or air forces attached to the navy are a necessity of modern war. Some arrangement regarding the provision of aircraft should certainly be included in the programme.

In conformity with the foregoing a 15 years naval programme, divided into two parts of 7 years each, is proposed on the lines given below. On the completion of this programme in 1934, it would be for the Government to decide whether the time had arrived to extend the scheme by including battleships in the new programme of construction.

SHIPBUILDING PROGRAMME.

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First 7 years' programme - 1920-26.

	P.C. Boat.	Destroyer.	Cruiser.	Submarine.	Parent Ship.
1920-21	6	-	-	-	1
22	-	-	1	-	-
23	4	1	-	-	-
24	-	-	1	-	-
25	4	1	-	-	-
26	-	-	1	-	-
27	4	1	-	-	1
	<u>18</u>	<u>3</u>	<u>3</u>	<u>-</u>	<u>1</u>

Complete fleet - 1926.

- 3 Cruisers
- 3 Destroyers
- 18 P.C. Boats
- 1 Parent Ship

Requiring 3500 officers and men in addition to the 500 already authorised.

Total 4000

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SHIPBUILDING PROGRAMME.

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Second-7 years' programme - 1927-34.

	P.C. Boat	Destroyer	Cruiser	Submarine	Parent Ship
1927-28:	-	-	1	-	-
29.	-	3	-	-	1
30.	-	-	1	-	-
31.	-	-	-	6	1
32	-	-	1	-	-
33	-	6	-	-	-
34	-	-	1	-	-
	<u>-</u>	<u>9</u>	<u>4</u>	<u>6</u>	<u>2</u>

Complete fleet. 1934.

7 Cruisers
12 Destroyers
6 Submarines
18 P.C. Boats
3 Parent Ships)

Requiring 8,000 officers and men
in addition to the 500 already
authorised.

Total: 8,500

WORKS.

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It is important that all parts of the service i.e. shipbuilding, personnel and works, should develop together and in the proportions requisite to the approved programme of shipbuilding.

The principal works necessary would be, the provision of suitable bases both on the Atlantic and Pacific, if not already provided. These bases being situated in accordance with the strategic needs of the country.

Dockyards.

Halifax.

It is generally agreed that on the Atlantic coast, Halifax is the most convenient port for a naval base. The dockyard, however, cannot be said to come up to the requirements of a modern fleet, and requires additions and alterations.

Esquimalt.

Esquimalt is generally recognized as being unsuitable for a naval base under modern conditions. Proposals have been put forward for the construction of a new base elsewhere. A large sum of money must be spent on the development of the place if it is to continue to serve as a naval base, but this would be an expenditure which could not be recommended from the naval point of view.

Barracks.

Barrack accommodation is required at Halifax for at least 150 men in the first two years which can be provided no doubt in existing buildings. But in 1923 barrack

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accommodation for 750 officers and men in addition would be required.

Small barrack accommodation should be provided on the Pacific Coast for say 250 men during the first 7 years. During the second 7 years, accommodation for the crew of a cruiser should be provided i.e., 750 officers and men.

Hospitals.

The naval hospital at Halifax is probably sufficient for some years to come. The old naval hospital at Esquimalt should revert to the navy as soon as the convalescent home now occupying it is closed.

Detention Barracks.

Small detention barracks would be required at both Halifax and Esquimalt unless the Militia can continue to accommodate our men.

Establishments.

In order to provide for the training of officers and men it will be necessary to provide barracks and gunnery and torpedo schools and the necessary staff. The gunnery and torpedo staff and plant would be small in the early stages.

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Estimate.

It is impossible to give any reliable estimate of the cost of the above works, nevertheless, an amount equal to 5% of the cost of the shipbuilding programme has been allowed. More detailed proposals for the barracks and training establishments are being put forward in a separate paper.

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COMPLEMENT S.

First 7 years' programme 1920-26.

		<u>Basis.</u>	
1920-21	6 P.C.Boats 300 1 Parent Ship 200	P.C.Boats 50. Destroyer 100 Cruiser 740 Submarine 25 parent Ship 200	
	500		
22	1 Cruiser 740		
	1240		
23	4 P.C.Boats 200 1 Destroyer 100		
	300		
	1540		
24	1 Cruiser 740		
	2280		
25	4 P.C.boats 200 1 Destroyer 100		
	300		
	2580		
26	1 Cruiser 740		
	3320		
27	4 P.C.boats 200 1 Destroyer 100		
	300		
	<u>3620</u>		

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C O M P L E M E N T S.

Second 7 Years' programme. 1927 - 34.

1927-28	1 Cruiser		740	
29	3 Destroyers	300		
	1 Parent ship	<u>200</u>		
			500	
				1240
30	1 Cruiser		740	
				1980
31	6 Submarines	150		
	1 Parent ship	<u>200</u>		
			350	
				2330
32	1 Cruiser		740	
				3070
33	6 Destroyers		600	
				3670
34	1 Cruiser		740	
				<u>4410</u>
	First 7 years		3620.	
	Second 7 "		<u>4410.</u>	
	Total		8030.	
			<u><u> </u></u>	

ESTIMATES.

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SHIPBUILDING - - FINANCE.

First 7 years' programme... 1920-26.

Supposed date of completion.

1920-21	6 P.C.Boats.....	\$2,970,000			
	1 Parent Ship...	400,000	\$3,370,000		Jan. 1921 (July 1920)
21-22	1 Cruiser.....		4,450,000		April 1923
22-23	4 P.C.Boats.....	1,980,000			Jan. 1923
	1 Destroyer.....	990,000	2,970,000		April 1923
23-24	1 Cruiser.....		4,450,000		April 1925
24-25	4 P.C.Boats.....	1,980,000			Jan. 1925
	1 Destroyer.....	990,000	2,970,000		April 1925
25-26	1 Cruiser.....		4,450,000		April 1927
26-27	4 P.C.Boats.....	1,980,000			Jan. 1927
	1 Destroyer.....	990,000	2,970,000		April 1927.
			<u>\$25,630,000</u>		

BASIS OF COST.

P.C. Boat	- 1/2/cost of Destroyer.	\$495,000.
Destroyer	- Admiralty pre-war price + 50% increased cost + 25% for building in Canada.	990,000.
Cruiser	- Cost of 'Hawkins' + 1/6 + 25% for building in Canada..... <i>see note attached.</i>	4,445,000.
Parent Ship	- Purchase old cruiser from Admiralty.	400,000.
Submarine	- Admiralty pre-war price +50% increased cost + 25% building in Canada.	750,000.

BASIS OF CONSTRUCTION.

P.C.Boat.	9 months.
Destroyer.	12 months.
Cruiser.	2 years.
Submarine.	6 months.

SHIPBUILDING - FINANCE.

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Second 7 years' programme - 1927-34

Supposed date of completion.

1927-28	1 Cruiser	(see note attached)	\$4,450,000	April 1929
28-29	3 Destroyers	\$2,970,000		April 1929
	1 Parent ship	<u>400,000</u>	3,370,000	October 1928
29-30	1 Cruiser		4,450,000	April 1931
30-31	6 Submarines	\$4,500,000		October 1930
	1 Parent ship	<u>400,000</u>	4,490,000	April 1930
31-32	1 Cruiser		4,450,000	April 1933
32-33	6 Destroyers		5,940,000	April 1933
33-34	1 Cruiser		4,450,000	April 1935
			<u>\$32,010,000</u>	

First 7 years	\$25,630,000
Second 7 years	<u>32,010,000</u>
Total 15 years -	\$57,640,000

Average per year for shipbuilding	-	First 7 years	\$3,661,428
		Second 7 years	4,572,857

MAINTENANCE, STORES, etc.

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First 7 years.

Basis -

1920-21	6 P.C. boats	\$ 180,000	
	1 Parent ship	<u>100,000</u>	
			\$280,000
22	1 Cruiser		<u>225,000</u>
			505,000
23	4 P.C. boats	120,000	
	1 Destroyer	<u>82,500</u>	
			<u>202,500</u>
			707,500
24	1 Cruiser		<u>225,000</u>
			932,500
25	4 P.C. boats	120,000	
	1 Destroyer	<u>82,500</u>	
			<u>202,500</u>
			1,135,000
26	1 Cruiser		<u>225,000</u>
			1,360,000
27	4 P.C. boats	120,000	
	1 Destroyer	<u>82,500</u>	
			<u>202,500</u>
	<u>First 7 years' total</u>		<u>\$ 1,562,500</u>

{ Cruiser	\$225,000
{ Destroyer	82,500
{ P.C. boat	30,000
{ Submarine	37,500
{ Parent Ship	100,000

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COST OF PERSONNEL - PAY.

First 7 years

Basis - \$3.00 per day
per man.

	Nos.	Pay.	
1920-21	500	\$547,500	
22	740	810,300	\$1,357,800
23	300	328,500	1,686,300
24	740	810,300	2,496,600
25	300	328,500	2,825,100
26	740	810,300	3,635,400
27	300	328,500	3,963,900

Second 7 years.

1927-28	740	\$810,300		\$4,774,200
29	500	537,500	\$1,347,800	5,311,700
30	740	810,300	2,158,100	6,122,000
31	350	382,750	2,540,850	6,504,750
32	740	810,300	3,351,150	7,315,050
33	600	657,000	4,008,150	7,972,050
34	740	810,300	4,818,450	8,782,350

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COST OF PERSONNEL - CLOTHING.

First 7 years.

	<u>Nos.</u>	<u>Outfit.</u>	<u>Upkeep.</u>	<u>Annual Total.</u>	<u>Basis.</u>
1920-21	500	\$50,000	-	\$50,000	\$25 per year per man. \$100 per man outfit.
22	740	74,000	12,500	86,500	
23	300	30,000	31,000	61,000	
24	740	74,000	38,500	112,500	
25	300	30,000	49,500	79,500	
26	740	74,000	57,000	131,000	
27	300	30,000	75,500	105,500	

Total upkeep 75,500.

Second 7 years.

					<u>Total annual cost.</u>
1927-28	740	74,000	7,500	81,500	157,000
29	500	48,000	26,000	74,000	149,500
30	740	74,000	38,500	112,500	188,000
31	350	35,000	57,000	92,000	167,500
32	740	74,000	63,750	137,750	213,250
33	600	60,000	84,250	144,250	219,750
34	740	74,000	99,250	173,250	248,750

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COST OF PERSONNEL - VICTUALLING.

First 7 years.

Basis.

55 cts. per head
per day,
i.e. \$200 per
head per year.

1920-21	500	100,000	Total
22	740	148,000	248,000
23	300	60,000	308,000
24	740	148,000	456,000
25	300	60,000	516,000
26	740	148,000	664,000
27	300	260,000	\$ 924,000

Second 7 years.

1927-28	740	148,000		\$ 872,000
29	500	108,000	256,000	980,000
30	740	148,000	404,000	1,128,000
31	350	72,000	476,000	1,200,000
32	740	148,000	624,000	1,348,000
33	600	120,000	744,000	1,468,000
34	740	148,000	892,000	1,616,000

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MAINTENANCE, STORES, ETC.

Total.

Second 7 years.

1927-28	1 Cruiser	\$225,000	\$ 1,787,500.
29	3 Destroyers 247,500 1 Parent ship 100,000	<u>347,500</u>	
		572,500	2,135,000.
30	1 Cruiser	<u>225,000</u>	
		797,500	2,360,000.
31	6 Submarines 225,000 1 Parent ship 100,000	<u>325,000</u>	
		1,122,500	2,685,000.
32	1 Cruiser	<u>225,000</u>	
		1,347,500	2,910,000.
33	6 Destroyers	<u>495,000</u>	
		1,842,500	3,405,000.
34	1 Cruiser	<u>225,000</u>	
		2,067,500	<u>3,630,000.</u>

First 7 years	\$1,562,500
Second " "	<u>2,067,500</u>
	<u>\$3,630,000</u>

SUMMARY FINANCIAL COST.

YEAR	SHIP-BUILDING.	WORKS.	TOTAL CAPITAL CHARGE.	MAINTENANCE.	PAY.	VICTUAL-LING & CLOTHING.	PRESENT SERVICES ADAPTED.	BARRACKS, SCHOOLS, DOCKYARDS, ETC. (1/6 OF WORKS).	TOTAL RUNNING EXPENSES.
1920-21	3,370,000	168,500	3,538,500	230,000	547,500	150,000	750,000	18,350	1,745,350
22	4,450,000	222,500	4,672,500	505,000	1,357,800	334,500	800,000	49,500	3,046,800
23	2,970,000	148,500	3,118,500	707,500	1,686,300	369,000	850,000	51,100	3,663,900
24	4,450,000	222,500	4,672,500	932,500	2,496,600	568,500	900,000	83,600	4,979,600
25	2,970,000	148,500	3,118,500	1,135,000	2,825,100	595,500	1,000,000	99,600	5,655,200
26	4,450,000	222,500	4,672,500	1,360,000	3,635,400	795,000	1,050,000	132,100	6,972,500
27	2,970,000	148,500	3,118,500	1,562,500	3,963,900	829,500	1,100,000	148,000	7,603,900
1st 7 years.	25,630,000	1,281,500	26,911,500						
28	4,450,000	222,500	4,672,500	1,787,500	4,774,200	1,029,000	1,150,000	180,500	8,921,200
29	3,370,000	168,500	3,538,500	2,135,000	5,311,700	1,129,500	1,200,000	196,100	9,971,300
30	4,450,000	222,500	4,672,500	2,360,000	6,122,000	1,316,000	1,250,000	228,600	11,276,600
31	4,900,000	245,000	5,145,000	2,685,000	6,504,750	1,367,500	1,300,000	256,900	12,114,150
32	4,450,000	222,500	4,672,500	2,910,000	7,315,050	1,561,250	1,350,000	289,400	13,425,700
33	5,940,000	297,000	6,237,000	3,405,000	7,972,050	1,687,750	1,400,000	314,400	14,779,200
34	4,450,000	222,500	4,672,500	3,630,000	8,782,350	1,864,750	1,450,000	346,900	16,074,000
2nd 7 years.	32,010,000	1,600,500	33,610,500						
Total	57,640,000	2,882,000	60,522,000						

Handwritten initials/signature

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NOTE TO OCCASIONAL PAPER NO. 2

Owing to a clerical error in the copy of an Admiralty telegram the cost of Cruiser HAWKINS has been taken as £600,000, whereas it was really £1,600,000.

This would make the cost of such a ship in Canada over \$7,000,000 a prohibitive price, and as much as a battle cruiser in pre-war days.

It will, therefore, be necessary to revise these estimates on the basis of constructing D class cruisers, for which the estimate of construction given in this paper would be approximately correct.

The total annual cost of maintenance and operations should, however, be reduced by about one-third of the cost for the cruisers, i.e. -

<u>Year</u>	<u>Total</u>
1921-22	\$418,000
1922-23	418,000
1923-24	836,000
1924-25	836,000
1925-26	1,054,000
1926-27	1,054,000

Naval War Staff,

Ottawa,

3rd July 1919.