

TOPIC -

“ DETAILS -

SALVAGE OPERATION

SCUTTLED WW I

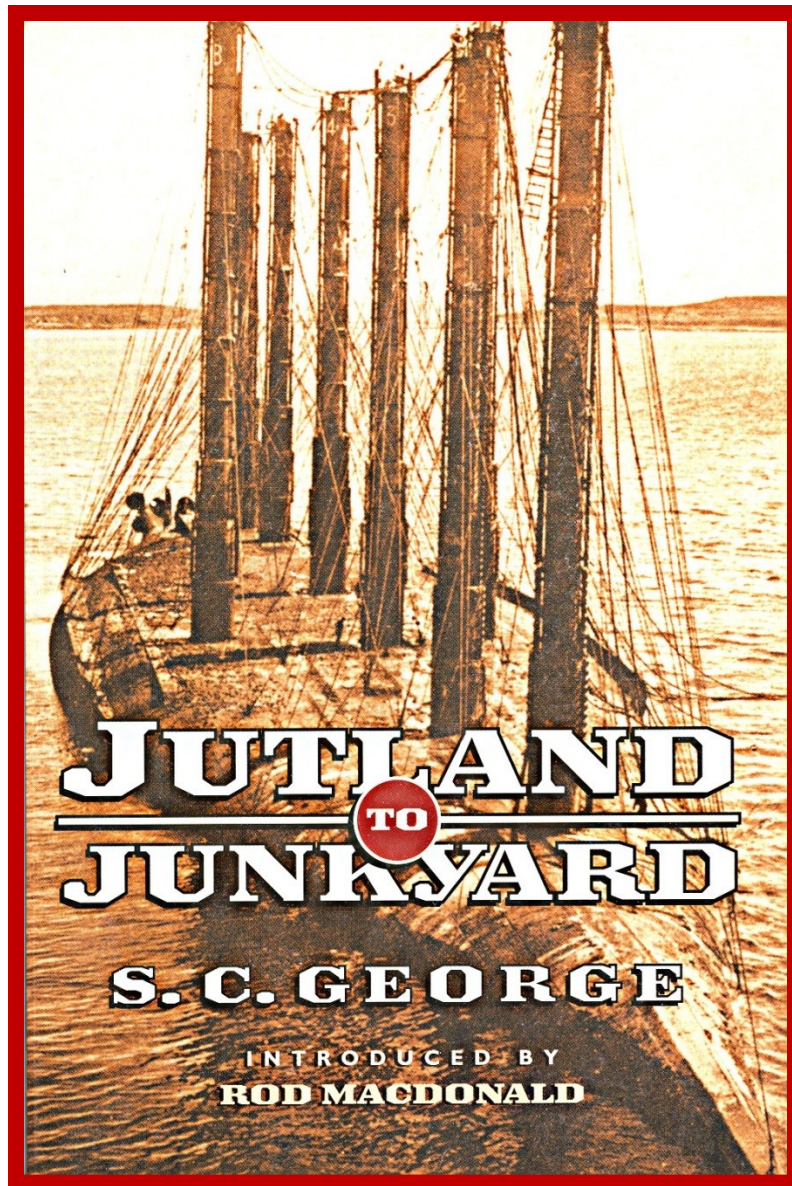
GERMAN NAVY_“

SCIENCE, TECHNOLOGY & SOCIETY

{ “STS” }

BY

FRANK J. GADEK, PH.D.



JUTLAND TO
JUNKYARD

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02/14/2005

SALVAGED:

ALL BATTLECRUISERS

ALL DESTROYERS

8 OF 10 BATTLESHIPS

4 OF 8 LIGHT CRUISERS

**UNSALVAGED AND NOT
SALVAGABLE EXCEPT PIECEMEAL**

3 BATTLESHIPS

4 LIGHT CRUISERS

SUNK NOT SALVAGED = 7

% SUNK NOT SALVAGED = 14

INITIALLY, NO THOUGHT OF SALVAGING THEM

AT END OF WAR, NO SHORTAGE OF SCRAP METAL, SO NO INCENTIVE FOR SALVAGE

ALSO, SALVAGE WOULD BE VERY FORMIDABLE & EXPENSIVE

**BUT IN 1922 LOCAL INITIATIVE SALVAGED 1 DESTROYER SUNK
IN SHALLOW WATER**

**SO JUNE 1923 ADMIRALTY CONTRACT TO RAISE 4
DESTROYERS TO J. W. ROBERTSON**

ADMIRALTY ONLY CHARGED 250 BRITISH POUNDS £ / SCUTTLED
DESTROYER AND BATTLESHIPS FOR 1000 – 2000 BRITISH
POUNDS £ [ESTIMATE IN TODAY'S US DOLLARS, \$10,000
**AND \$40,000 - \$80,000 - NOT UNREASONABLE IN THOSE
TIMES!**

[VAN DER VAT, P#199-200]

**JANUARY 1924 ERNEST COX BOUGHT 2 BATTLECRUISERS
AND 24 SMALLER SHIPS**

COX CALLED “THE MAN WHO BOUGHT A NAVY”

- **A CLASSIC SELF-MADE MAN**
- **“WHERE THERE IS MUCK, THERE IS MONEY”**
- **LOVED PERSONAL PUBLICITY**
- **BUT NOT A BUSINESS MAN – HIS DOWNFALL**
- **MCKENZIE HIS CHIEF SALVAGE OFFICER**

**CALLED “AN UNDERWATER STEEL-MINE” SINCE
SCRAP METAL MARKET PICKED-UP**

**HOWEVER, OTHERS [“PIRATE DIVERS”] REGARDED
WRECKS AS FAIR GAME AND HAD STARTED
TO STRIP SOME**

ROBERTSON ONLY RAISED 4 DESTROYERS

[VAN DER VAT, P#200-1, 207; GEORGE, P#53]]

GERMAN NAVY SHIPS SCUTTLED AT SCAPA FLOW 06/21/1919

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CLASS / SHIP	TONS	SPEED KNOTS	LENGTH FEET	BEAM FEET	DRAUGHT FEET	MAIN	LAUNCHED	SALVAGED	COMMENTS
						ARMOUR THICKNESS INCHES			
BATTLESHIPS									
KAISER	24380	23	564	95	27	13.75 10-12"	1911	1929	BEST KEPT LARGE SHIP
PRINZREGENT LUITPOLD	24380	23	564	95	27	13.75 10-12"	1912	1931	
KAISERINE	24380	23	564	95	27	13.75 10-12"	1909	1936	
KONIG ALBERT	24380	23	564	95	27	13.75 10-12"	1912	1935	
FRIEDRICH DER GROSSE	24380	23	564	95	27	13.75 10-12"	1911	1937	REUTER/SHEER FLAGSHIP
KONIG ALBERT	24380	23	564	95	27	13.75 10-12"	1912	1935	
KONIG	25390	23	580	97	29	14 10-12"	1913	NOT	
GROSSER KURFURST	25390	23	580	97	29	14 10-12"	1913	1933	
KRONPRINZ WILHELM	25390	23	580	97	29	14 10-12"	1914	NOT	
MARKGRAF	25390	23	580	97	29	14 10-12"	1913	NOT	
BADEN	28075	22	623	99	28	13.75 8-15"	1915	BEACHED	HEAVIEST / MIGHTIEST
BAYERN	28075	22	623	99	28	13.75 8-15"	1915	1933	HEAVIEST / MIGHTIEST
BATTLECRUISERS									
SEYDLITZ	24610	27	606	94	27	11 10-11"	1912	1929	LED FLEET TO INTERNMENT
MOLKE	22640	28	610	97	27	11 10-11"	1910	1927	FIRST SALVAGED
VAN DER TANN	19400	28	563	87	28	9.5 8-11"	1909	1930	
DERFFLINGER	26180	28	689	95	28	12 8-12"	1913	1939	LAST SALVAGED/DEEPEST
HINDENBURG	26180	28	689+	95	28	12 8-12"	1915	1930	LARGEST/ NOT HEAVIEST
LIGHT CRUISERS									
BREMISE	4400	28	461	44	20	1.5 4-5.9"	1916	1929	
BRUMMER	4400	28	461	44	20	1.5 4-5.9"	1915	NOT	
DRESDEN	5600	29	512	47	21	2.5 8-5.9"	1917	NOT	NEWEST
COLN	5600	29	512	47	21	2.5 8-5.9"	1916	NOT	
KARLSRUHE	5440	28	496	47	21	2.5 8-5.9"	1916	NOT	
NURNBERG	5440	28	496	47	21	2.5 8-5.9"	1916		DRIFT TO SHORE
EMDEN	5440	28	496	47	21	2.5 8-5.9"	1916	BEACHED	REUTER 2ND FLAGSHIP
FRANKFURT	5200	28	477	46	20	2.5 8-5.9"	1915	BEACHED	
TORPEDOBOAT-DESTROYERS = 50									
LARGEST	1350	37	325	30.5	12.5	3-4.1"			& MINES / TORPEDOS
[REF =VAN DER VAT, P#220-5]									
TOTALS =	464520								
[BUT NOT TORPEDOBOAT-DESTROYERS]									

GERMAN NAVY SHIPS SCUTTLED AT SCAPA FLOW 06/21/1919

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CLASS / SHIP	TONS	SPEED KNOTS	LENGTH FEET	BEAM FEET	DRAUGHT FEET	MAIN ARMOUR THICKNESS INCHES	MAIN ARMAMENT
BATTLESHIPS							
KAISER	24380	23	564	95	27	13.75	10-12"
PRINZREGENT LUITPOLD	24380	23	564	95	27	13.75	10-12"
KAISERINE	24380	23	564	95	27	13.75	10-12"
KONIG ALBERT	24380	23	564	95	27	13.75	10-12"
FRIEDRICH DER GROSSE	24380	23	564	95	27	13.75	10-12"
KONIG ALBERT	24380	23	564	95	27	13.75	10-12"
KONIG	25390	23	580	97	29	14	10-12"
GROSSER KURFURST	25390	23	580	97	29	14	10-12"
KRONPRINZ WILHELM	25390	23	580	97	29	14	10-12"
MARKGRAF	25390	23	580	97	29	14	10-12"
BADEN	28075	22	623	99	28	13.75	8-15"
BAYERN	28075	22	623	99	28	13.75	8-15"
BATTLECRUISERS							
SEYDILITZ	24610	27	606	94	27	11	10-11"
MOLKE	22640	28	610	97	27	11	10-11"
VAN DER TANN	19400	28	563	87	28	9.5	8-11"
DERFFLINGER	26180	28	689	95	28	12	8-12"
HINDENBURG	26180	28	689+	95	28	12	8-12"
LIGHT CRUISERS							
BREMISE	4400	28	461	44	20	1.5	4-5.9"
BRUMMER	4400	28	461	44	20	1.5	4-5.9"
DRESDEN	5600	29	512	47	21	2.5	8-5.9"
COLN	5600	29	512	47	21	2.5	8-5.9"
KARLSRUHE	5440	28	496	47	21	2.5	8-5.9"
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EMDEN	5440	28	496	47	21	2.5	8-5.9"
FRANKFURT	5200	28	477	46	20	2.5	8-5.9"
TORPEDOBOAT-DESTROYERS = 50							
LARGEST	1350	37	325	30.5	12.5		3-4.1"
[REF =VAN DER VAT, P#220-5]							

GERMAN NAVY SHIPS SCUTTLED AT SCAPA FLOW 06/21/1919

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	TONS	KNOTS	LENGTH FEET	BEAM FEET	DRAUGHT FEET		FUEL	
BATTLESHIPS						CREW	COAL	OIL
KAISER	24380	23	564	95	27	1088	X	X
PRINZREGENT LUITPOLD	24380	23	564	95	27			
KAISERINE	24380	23	564	95	27			
KONIG ALBERT	24380	23	564	95	27			
FRIEDRICH DER GROSSE	24380	23	564	95	27			
KONIG ALBERT	24380	23	564	95	27			
KONIG	25390	23	580	97	29			
GROSSER KURFURST	25390	23	580	97	29			
KRONPRINZ WILHELM	25390	23	580	97	29			
MARKGRAF	25390	23	580	97	29			
BADEN	28075	22	623	99	28	1200	X	X
BAYERN	28075	22	623	99	28			
BATTLECRUISERS								
SEYDILITZ	24610	27	606	94	27	1108	X	
MOLKE	22640	28	610	97	27	1107	X	
VAN DER TANN	19400	28	563	87	28	910	X	
DERFFLINGER	26180	28	689	95	28	1215	X	X
HINDENBURG	26180	28	689+	95	28			
LIGHT CRUISERS								
BREMISE	4400	28	461	44	20	309	X	X
BRUMMER	4400	28	461	44	20			
DRESDEN	5600	29	512	47	21	559	X	X
COLN	5600	29	512	47	21			
KARLSRUHE	5440	28	496	47	21			
NURNBERG	5440	28	496	47	21			
EMDEN	5440	28	496	47	21			
FRANKFURT	5200	28	477	46	20	474	X	X
TORPEDOBOAT-DESTROYERS = 50								
LARGEST	1350	37	325	30.5	12.5	114		X
TOTALS =	464520							
[BUT NOT TORPEDOBOAT-DESTROYERS]								
NOTE:								
[1] VAN DER VAT, P#219-225; GEORGE, P#139,141]								

**DURING SALVAGE OPERATIONS, COX'S CREW
FOUND THAT THE GERMANS HAD DONE THEIR
WORK OF SCUTTLING THOROUGHLY**

INSPECTION OF 4 DESTROYERS FOUND:

**CONDENSER DOORS REMOVED
ALL AUXILIARY VALVES, SEA
CONNECTIONS, IN BOILER ROOMS
& MAGAZINE VALVES OPENED
HATCHES & WATER TIGHT DOORS RAISED
EVEN LEFT UNFASTENED PORTS &
LAVATORY CONNECTIONS
REMOVED ALL PLATES INDICATING
POSITIONS OF VARIOUS VALVES
THEY OPENED**

[GEORGE, P#57-]

COX'S BASIC PROCESS:

HACK WAY THRU "6 FOOT" COATING MARINE VEGETATION

**PLUG ALL HOLES IN HULL INCLUDING SEACOCKS
WITH SPECIAL INSTANT CEMENT BY DIVERS**

**PUMP OUT WATER AND RAISE BY CABLES FROM
FLOATING DOCKS**

ALSO PUMPED IN COMPRESSED AIR

**USED AIR LOCKS SHAPED LIKE FACTORY CHIMNEYS
TO ACCESS INSIDE OF SHIPS BY WORKERS
AND NOT LOOSE COMPRESSED AIR
PRESSURE PUMPED IN SHIP**

**DIFFICULT TO WORK INSIDE SHIP – UPSIDE DOWN,
WET, DARK, ETC.**

**EVENTUALLY MORE COMPRESSED AIR WOULD BE
PUMPED IN AND SHIP WOULD SHOOT TO
THE SURFACE**

**THE UPSIDE DOWN FLOATING SHIP WOULD BE
TOWED TO PORT FOR STRIPPING**

[VAN DER VAT, p#202-5]

PORT WAS **ROSYTH** IN THE **FIRTH OF FORTH**
ON THE EAST COAST OF SCOTLAND
275 MILES AWAY THRU SOME OF **MOST**
TREACHEROUS WATER IN THE WORLD

IRONIC – TOWING OPERATIONS AWARDED TO
A **GERMAN** COMPANY!

NATURALLY, MANY “ADVENTURES” AND
PERSONALTIES IN THESE
OPERATIONS – THEY MAKE GOOD
READING ON THE SPECIFIC DETAILS!

COX’S WORK WAS MARKED BY **INSTANT AND**
BRILLIANT IMPROVISATION AND “SAVVY”

[VAN DER VAT, P#205-X; GEORGE, P#131]

METHODS TO BREAK UP SCRAP METAL

DROPPING BALL – USED FOR 75 YEARS
MAINLY FOR BRITTLE **CAST IRON**

ELECTRIC MOTORS USED TO CUT PLATES
OF **HARD STEEL UP TO 2” THICK**

LARGE SHEERS USED TO CUT PLATES OF
UP TO **8 FEET LONG AND 1” THICK**

12” THICK PLATES COULD BE CUT
8-10 FEET PER HOUR

THIN PLATES COULD BE CUT
50 FEET PER HOUR

3” OF TEAK WOOD BETWEEN HULL AND
PLATES – LITTLE DEMAND, SO
USED FOR LOCAL CONSTRUCTION
AND WAS A LONG LASTING WOOD

[GEORGE, P#114]

TEAK WOOD

CAN GROW TO **100 FEET**

NATIVE OF INDIA AND MALAY
ARCHIPELAGO

CULTIVATED IN PHILIPINES
AND JAVA

**DURABLE AND STRONG, SO
USED IN SHIPBUILDING**

**FURNITURE IN TROPICS RESIST
ATTACK BY INSECTS
AND WEATHER CORROSION
FOR HUNDRED OF YEARS!**

[MICROSOFT ENCARTA]

**SALVAGED SHIPS IN DRY DOCK TO
BE BROKENUP:**

OVERPOWERING **STENCH FROM
ROTTEN WEEDS & DEAD FISH**

**GULLS SWOOPED DOWN FOR
MUSSELS SCRAPED OFF HULL**

[GEORGE, P#97]

HINDENBURG LARGEST SHIP EVER SALVAGED
689+ FEET LONG, NOT HEAVIEST AT 26,180 TONS

COX SPENT 30,000 BRITISH POUNDS £ TO DO IT
[\$1,200,000 US DOLLARS ESTIMATED IN
TODAY'S CURRENCY]

BUT COX WAS NOW OVER-EXTENDED FINANCIALLY

HE WAS A VERY STUBBORN PERSON, BLUNT SPOKEN,
QUICK TEMPER AND PREPARED TO RISK ALL
FOR HIS EGO

[VAN DER VAT, P#200, 208-10]

**HE GAVE UP WHEN HIS LOSSES OVER
INVESTMENT REACHED ABOUT**

10,000 BRITISH POUNDS £

**[ABOUT \$400,000 US DOLLARS
ESTIMATED IN TODAY'S
CURRENCY]**

**BUT HIS BUSINESS, AS SUCH,
REMAINED SOLVENT**

[VAN DER VAT, P#200, 208-10]

**ERNEST FRANK GUELPH COX DIED IN 1959 AT
AGE 76 WITHOUT THE KNIGHTHOOD
HE BELIEVED HE DESERVED**

**HE WAS NOT A GOOD BUSINESS PERSON,
BUT HE WAS ALSO UNLUCKY, THE
PRICE OF SCRAP REACHED A NEW LOW
AND HIS EQUIPMENT WAS WORN OUT.**

BUT OVERALL HE LIFTED:

26 DESTROYERS

1 LIGHT CRUISER

6 CAPITAL SHIPS

[VAN DER VAT, P#210]

**ROBERT MCCRONE, COX'S PRINCIPLE CUSTOMER NOW
TOOK OVER**

**MCCRONE BORN IN 1893 HAD COX'S NECESSARY DRIVE
AND DETERMINATION, BUT WAS VERY DIFFERENT!**

**HE HAD A GOOD TECHNICAL EDUCATION TO COLLEGE
LEVEL AND PRACTICAL EXPERIENCE IN SHIP
DESIGN, ONE OF HIS CHIEF ASSETS WAS
A HIGHLY DEVELOPED BUSINESS ABILITY!**

**HIS AVERAGE PROFIT ON EACH CAPITAL SHIP SALVAGED
WAS 50,000 BRITISH POUNDS £
[\$2,000,000 US DOLLARS ESTIMATED IN
TODAY'S CURRENCY]**

LUCKILY, PRICE OF SCRAP DOUBLED WHEN HE TOOK OVER

[VAN DER VAT, P#210,]

HE EVEN HIRED FULL TIME A QUALIFIED VERY ASTUTE
60 YEAR OLD CHEMIST, CALLED C. COWAN, TO
MONITOR AIR INSIDE SHIPS BEING WORKED ON
FOR EXPLOSIVE METHANE GAS DUE TO
DECOMPOSITION OF VEGETABLE MATERIALS IN
THE SHIPS WHEN AIR WAS PUMPED IN

COWAN ALSO EDUCATED THE WORKERS ON THE NEED
FOR DECOMPRESSION DUE TO NITROGEN
GAS BUILDUP IN THEIR BODIES WHEN THEY
WORKED IN THE SHIPS UNDER HIGH AIR
PRESSURE [“THE BENDS”]

>120 FEET DEPTH NEEDED DECOMPRESSION FOR “BENDS”

[VAN DER VAT, P#211, 214; GEORGE, P#102, 106-8,130]

MCCRONE HAD HIS SETBACKS

BUT ULTIMATELY, HE

**“WAS EXTRACTING THE TEETH OF THE GERMAN
FLEET FROM THE MUD OF SCAPA FLOW WITH
A PRECISION ALMOST WORTHY OF A DENTIST”**

**ACTUAL AVERAGE PROFIT / SHIP SALVAGED =
50,000 BRITISH POUNDS £**

ESTIMATE \$2,000,000 IN TODAY'S US DOLLARS

[VAN DER VAT, P#211, 214; GEORGE, P#102, 106-8,130]

A TREMENDOUS EFFORT “ON / OFF” FROM 1924 - 1939

EVENTUALLY SHUTDOWN IN 1947

1956 ARTHUR NUNDY, A VETERAN DIVER FOR COX AND MCCRONE, BEGAN 14 YEARS OF BREAKING UP THE WRECKS ON THE BOTTOM

1970 DAVID NICOL AND DOUGLAS CAMPBELL ALSO USED EXPLOSIVES TO BREAK UP THE WRECKS ON THE BOTTOM AND ENDED IN 1979 DUE TO FINANCIAL REASONS

1981 CLARK’S DIVING SERVICES BOUGHT 4 WRECKS AND LEASED 3 OTHERS FOR SALVAGE WORK

[VAN DER VAT, P#214-5]

**MANY ORCADIANs STILL HAVE SALVAGED
OBJECTS IN THEIR HOMES:**

SHAVING MUGS

VASES

ASH TRAYS

PLATES

DECANTERS

CUPS / SAUCERS

MUSICAL INSTRUMENTS

TELESCOPES

**LITTLE OF A PERSONAL NATURE HAD ANY
GREAT VALUE, SINCE GERMAN
MAINTENANCE CREW DID NOT
EXPECT TO BE ON BOARD FOR LONG &
IN HOSTILE TERRITORY**

[GEORGE, P#90]

SOME
INTERESTING
/ ODD
DETAILS OF
SALVAGE
OPERATIONS

FAMOUS ARMS OF KRUPP 1587-1968 OF ESSEN, GERMANY
WHICH HAD MADE MOST OF THE ARMOUR,
GUNS AND SHIPS FOR WW I, BOUGHT BACK SOME OF
THEIR HANDIWORK IN THE FORM OF SCRAP METAL TO
HELP BUILD **HITLER'S NEW NAVY FOR **WW II** !!!**

THIS “UNIQUE PIECE OF RECYCLING” A MAJOR
APPLICATION OF THE RECOVERED METAL

SO SOME METAL MAY HAVE BEEN “SUNK TWICE!**”**

IRONICALLY, AT THE SAME TIME, THE ROYAL NAVY WAS
SUFFERING FROM A **SHORTAGE OF ARMOUR**
PLATE!!!

NAZIS EVEN ORDERED GERMAN SHIPS TO **STOP TOWING**
THE SALVAGED HULKS TO THE BREAKER'S
YARDS

[VAN DER VAT, P#212]

SOME INTERESTING “LOOSE ENDS” REGARDING THE HIGH SEAS FLEET – SCUTTLING & SALVAGE

EXPLOSION OF HOROSHIMA **ATOMIC BOMB**
POLLUTED THE EARTH’S ATMOSPHERE
WITH UNNATURALLY HIGH QUANTITY
OF NUCLEAR RADIATION

A LOT OF AIR USED IN MAKING STEEL, SO
STEEL MADE **AFTER 1945** CONTAINS
SIGNIFICANT TRACES OF RADIATION

RADIATION UNTAINTED PROTECTIVE SHIELDING IS
NECESSARY FOR DELICATE SCIENTIFIC
INSTRUMENTS TO MEASURE RADIATION
LIKE IN THE MEDICAL FIELD

SCAPA FLOW **LARGEST ACCESSIBLE SOURCE**
OF SUCH UNCONTAMINATED STEEL

[VAN DER VAT, P#214]

**SOME OF SCRAP NOT CONTAMINATED BY RADIATION
MAY HAVE BEEN USED IN THE SPACE PROGRAM
AND SPECIAL DEFENSE PURPOSES, BUT THIS
IS UNDERSTANABLY DIFFICULT TO VERIFY DUE
TO SECURITY CONSIDERATIONS**

SCAPA FLOW HAS BECOME A **POPULAR TOURIST
ATTRACTION, ESPECIALLY FOR
SCUBA / SKIN- DIVERS TO EXPLORE THE
REMAINING WRECKS AND THERE ARE EVEN
SEVERAL EXCELLENT **WEB SITES** THAT
PROVIDE MUCH ADDITIONAL AND CURRENT
INFORMATION**

[VAN DER VAT, P#215]

SOME

REFLECTIONS

SOME OF MY REFLECTIONS:

WAS THE SUCCESS OF THIS SALVAGE OPERATION
WHY SOME THOUGHT THAT THE **TITANIC**
COULD ALSO BE RAISED?????

BUT IT WAS **2.5 MILES** DEEP IN THE OCEAN

SCAPA FLOW WRECKS WERE ONLY ABOUT
135 FEET DEEP IN THE OCEAN

BEFORE WW I THERE WAS **NOT** MUCH OF A GERMAN
NAVY & IT IS AMOST A LANDLOCKED NATION,
THAT IS WHY IT IS **SO DRAMATIC**
THAT THE NAVY COULD BE **SO QUICKLY**
EXPANDED AND TO SUCH HIGH LEVELS

**SO STORY OF GERMAN IMPERIAL
HIGH SEAS FLEET REMAINS**

UNFINISHED

CONCEIVED BY TIRPITZ

RAISED BY THE KAISER

BUILT BY KRUPP

SCUTTLED BY REUTER

SALVAGED BY MANY

IN GREATEST RECOVERY

OPERATION EVER

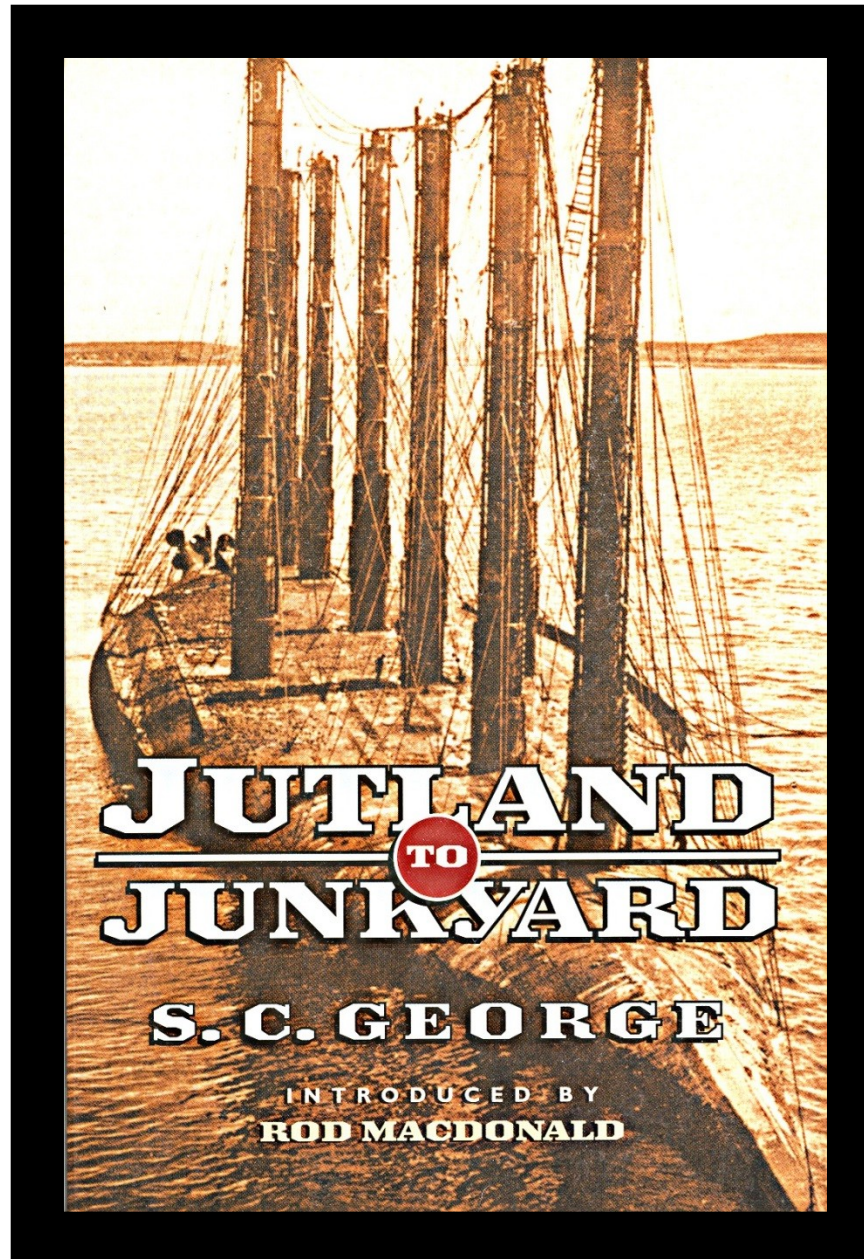
MOUNTED

THE FUTURE????????????????

[VAN DER VAT, P#216]

***IRONIC TRAGEDY THAT WITH ALL
THIS EFFORT, SUFFERING &
RESOURCES, IT WOULD END LIKE
THIS***

**A REASON WHY A BETTER
UNDERSTANDING AND
APPRECIATION OF “STS” –
SCIENCE, TECHNOLOGY & SOCIETY
- IS SO IMPORTANT, ESPECIALLY
TODAY!**



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