



12 Pages

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

[illegible]

(Gweler yr ochr arall am y fersiwn Cymraeg)

KIMBERLEY LOUISE.

(See the other side for English version)

12 Tudalen

 **Prifysgol Cymru**
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

CYFENW:

ENW(AU) CYNTAF:

①

Recent Prospecting techniques can include Drones for under water and intertidal zones taking photographs and videos of the sea bed

There are two basic principles in searching for ship wrecks as well as the above these are:

- A. Deploying divers either by themselves being towed by a vessel or not. Sometimes divers use a hand held sonar or metal detector. If the diver is towed it's important to use a Echo sounder on the vessel to look out for obstructions.
- B. Remote Sensing Surveys Deploying electronic equipment controlled from a boat or other craft. Whatever method is used it is always planned before the search.

Important Points

- Gyroscopes can track Divers
- you can not guarantee 100% results both methods can miss objects by mm.
- experience is essential
- Concentration is a must as conditions can be hazzadous, currents visibility
- busy shipping lanes, and other waterway users.
- Always use a dive flag on your vessel



- it is important to know where you are and where you have been.
- Dive logs are essential for both Divers and electronic Deployment
- communication with your team on surface such as tags on lines, (can be seen underwater in dive Manuals) or
- Hard line communication ~~is better than~~

Geophysical and Remote Sensing Surveys.

- fish or Torpedoes are not easy to track
- but can be towed behind a vessel.

Types.

- Side scan Sonar. Originally use by Navy.
- Sub bottom profiling (~~great for shallow water~~)
- Chirps (great for shallow water)
- AUV Autonomous operated vehical
- ROV Remote operated vehical.
- BATHYMETRY (old type of topography survey) (Pigs fat on line)
- Echo Sounders 50 KHZ - 500 KHZ, Or Just Pole.
- Swath or Multi beam bathymetry
- Magnetometers.

Side Scan Sonar

with

method used on Gresham ship. This method you can see the shipwreck projected from the side with the erosion around the shipwreck a bit around the wreck.

Sub bottom Profiling

Developed by oil and Gas companies these can scan a object 60ft below the surface. Lower frequency 1 KHZ - 7 KHZ.

Magnetrometry.

Measures Earth Magnetic field. Objects leave magnetic shapes. ~~on sea floor~~

Swath or bathymetry or Multi Beam

very expensive transister is fixed to bottom of vessel. Sweeping taken in beam and in a arc, initially designed to give topography of Sea Bed (Gresham ship)

ARIEAL Photography. Lots and Lots of Photos. These days digital make it easier

Historical Searches.

1. Wreck's officer Hydrographic Dept Military of defence.
2. Public records office
3. National museum Greenwich.
4. Lloyd's
5. India Office Library & Collection
6. National Library and Museum London.
7. Royal Commission

Historic evidence is the usually the starter on most site ~~search~~ searchers unless like the Newport boat and you come across it digging a hole for a Arts Centre.

Types of Survey.

- assessment Survey.
- Recording Survey
- Monitoring Survey.
- Topographical Survey.

Sketches of Site.

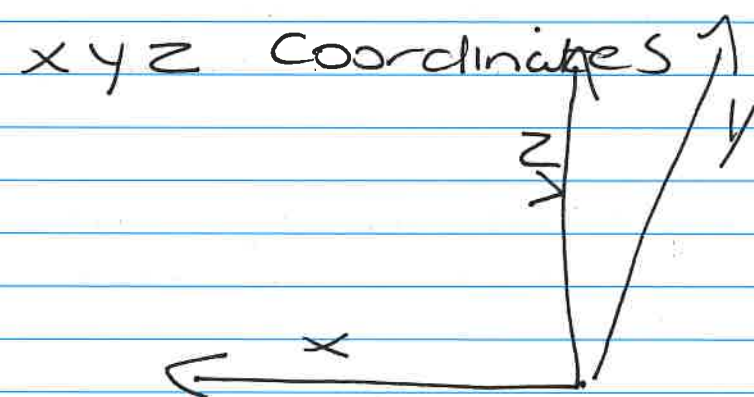
Planning

Setting up base line/control Points

main points taken

secondary.

Then detailed Points on Artefacts and features.



- all labeling is to be clear with water proof ink. measurements taken in between the labels position of labels eg. North - South
- every single position must be recorded of a base line or point which is anchored.

Distance Measurements are taken between station points.

Method of

Triangulation on the



Wreck and artifacts give it a 3D perspective.
mooring Sediment can cause a problem.

Case Studies

- 1/ Mary Rose. The late Alexandra McKee was responsible for excavations on the Mary Rose in 1971 May 5th the Diver who found her was Percy Ackland.

According to the Mary Rose Website the site was the first site in the UK to be found with subbottom profiling also the first site which was positioned by GPS. Using underwater acoustics

2. Another important site

was found in

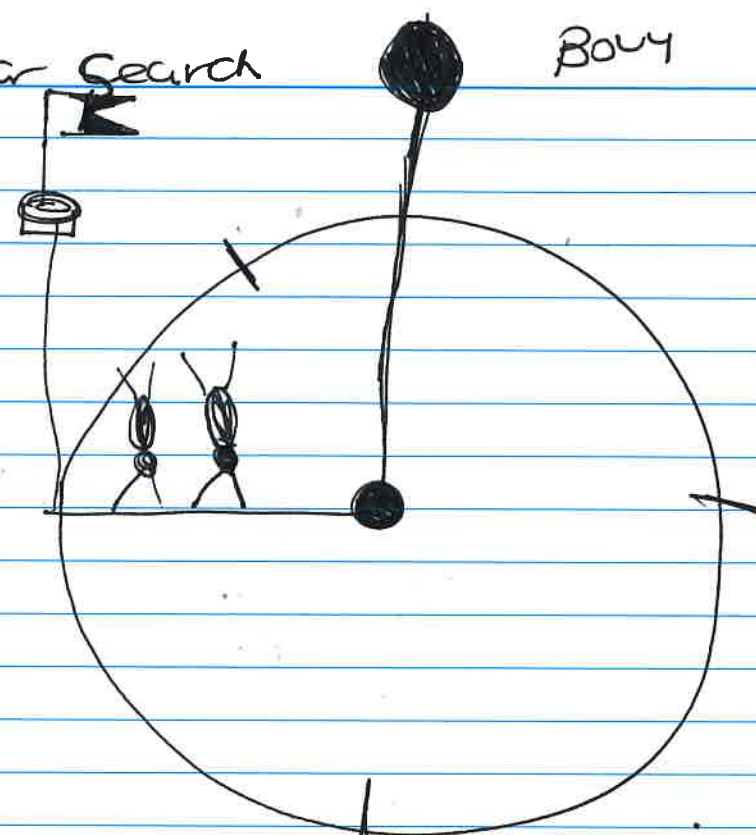
HMS INVINCIBLE 1979 by a fisherman trawling His name was Arthur Mack. She was a 74 Gun ship the style was made in France Charente at Rochefort. Its understood the style of this ship was used by European Navy. built in 1744 Sunk 1758.

Historically documented.

~~was~~ in 2010 Swath bathymetry was used on the wreck.

Types of Dives searches. P.T.O.

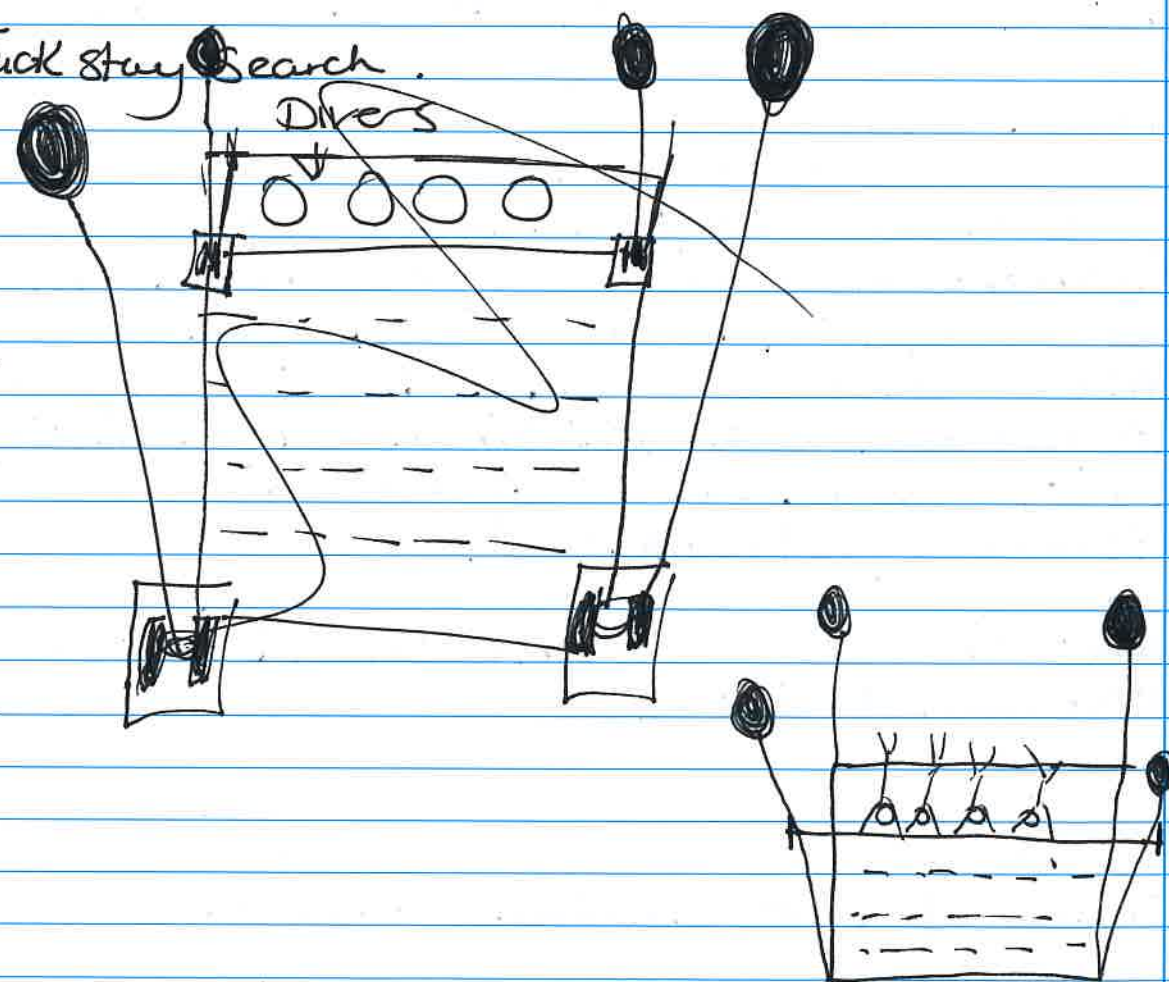
Circular Search

Divers
Flag.

Usually done on already discovered wrecks.

Jack stay Search.

Divers



⑤.

THE HISTORICAL HYPOTHESIS PROCESS.
The reason for Archaeologists to reconstruct or hypothetical reconstruct are

- Public Engagement.
- Cost effective.
- Marketing tool. A completed model is more attractive than flat wet planks of wood, which is what remains usually ^{or sometimes} consist of.
- To Duplicate ~~the~~ ^{surviving} planks and design which have survived to replace wood which is missing.
- To understanding of Methods and tools used to build the vessel experts and use wood markings on the artifact to distinguish which tools were used.
- To understand and educate about historical boat building.
- Knowing how to harvest that organic materials, i.e. trees have to be ^{sometimes} grown and harvest a special way trees need to be right shape.
- Lots of sketches and photographs have to be done to then build a model. Partial and complete line drawings are used materials.
- Card board
- 3D Printing (plastic)
- wood
- Computer Modeling (Orca) Computer Program. Specially adapted for this work.

The Historical Hypothesis Process is not the definite truth in terms of how the vessel originally looked or functioned but it is a picture which acts as a catalyst and a tool for a process which highlights new issues and correlations and allows us to see and interpret the source.

CASE STUDIES.

Skuldelev ships discovered in the Roskilde Fjord in Denmark were all clinker built. These were found by Ole Crumlin Petersen and Olaf in 50^s - 60^s all ships were built as models then to full scale replicas the reconstruction was not 100% as only portions of the hulls survived in these cases iconography can be used.

La Belle 1684 owned by Louis XIV 54ft has been digitally mastered on youtube.com on the internet to help show how this ship was constructed.

~~Newport~~

~~The Newport~~

The Newport ship found in Newport bay under construction in 2002 she was a merchant ship they rebuilt models of this ship every way possible including 3D printing all the small bits of timber could be twisted or manipulated into shape to gain the shape of the hull. also 3D graphical imaging was used (robotic still left buried).

Reconstruction and sea trials.

L Hermon, Constitution Project 32 Gun Concord Class Frigate Completed Rochefort in 2014 Assela organisation 65 meters long war ship.

Doric Boat. 1550 BC.

Bronze age boat.

Conserved Remains at Doric Boat Museum

Owain Roberts has hypothetically reconstructed the Doric Boat.

The Sea Factory of the Basque - Albasola they build replica ships and train people to build ship in the traditional way.

Mogana 4000 Old Bronze age boat 11 months to build

Ferriby boat made using yew withies to sew together oak trunks, sealed with moss and tallow.

Kyrenia Ship 4th Century BC Cyprus Michael L. Katzev cargos involved 400 Amphoras of 8 different types.

All Skuldelev ships were involved in sea trials