

**The use of Continuous Plankton
Recorder for zooplankton
monitoring: its applicability in the
Baltic Sea**

Inga Lips
LPM SOOP Activities

Sir Alister Hardy developed the Continuous Plankton Recorder after realising the temporal and spatial restrictions of traditional net sampling

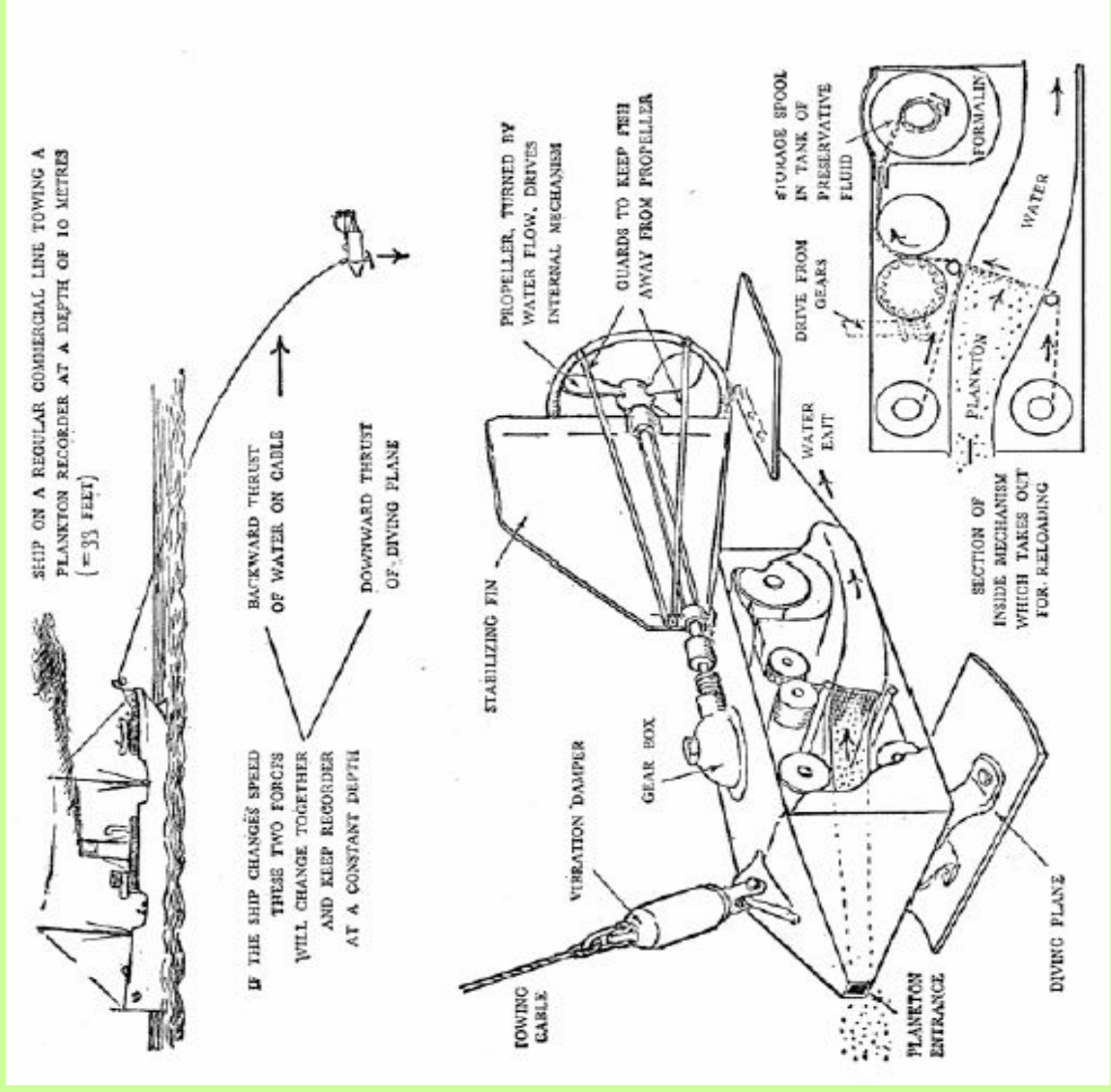


First tow of the Continuous Plankton Recorder - September 1931

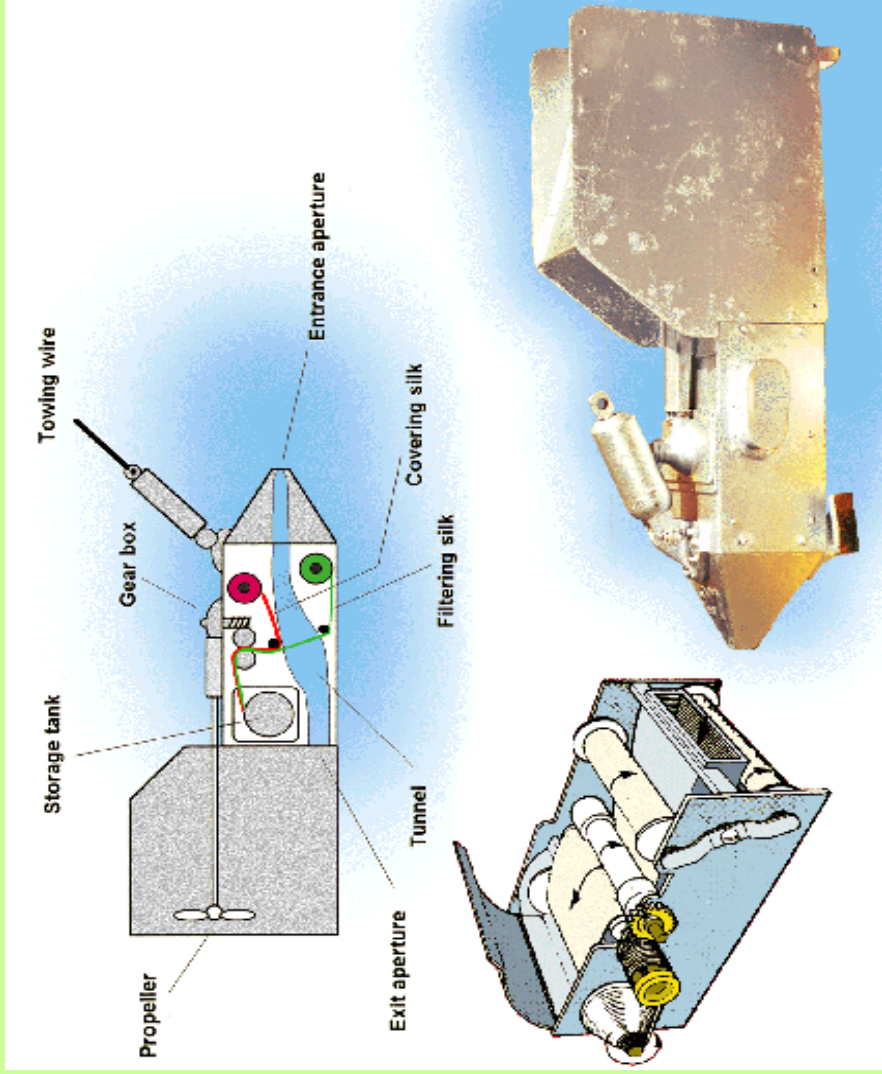
• Robust design

• Filtering mechanism propeller driven

• Mesh size 260/280 μm



- about one meter long
- body is made of gunmetal, (phosphor bronze), or stainless steel in later versions from 1997
- nose cone is filled with lead
- tail section is made of rust proofed mild steel



CPR has been operated successfully at speeds of up to 25 knots, and its robust design allows deployment in rough seas without fear of excessive damage.

The CPR is a plankton sampling instrument designed to be towed from merchant ships on their normal sailings.

- **The internal mechanism is a self-contained cartridge that is loaded with the filtering silk at the laboratory and placed inside the CPR prior to deployment**
- **Each CPR sample represents 10 nautical miles (approximately 3 cubic meters of water filtered).**
- **On return to the laboratory, the silk is removed from the mechanism and divided into samples representing 10 nautical miles of towing. The plankton on these samples are then analysed according to standard procedures – on the silk.**

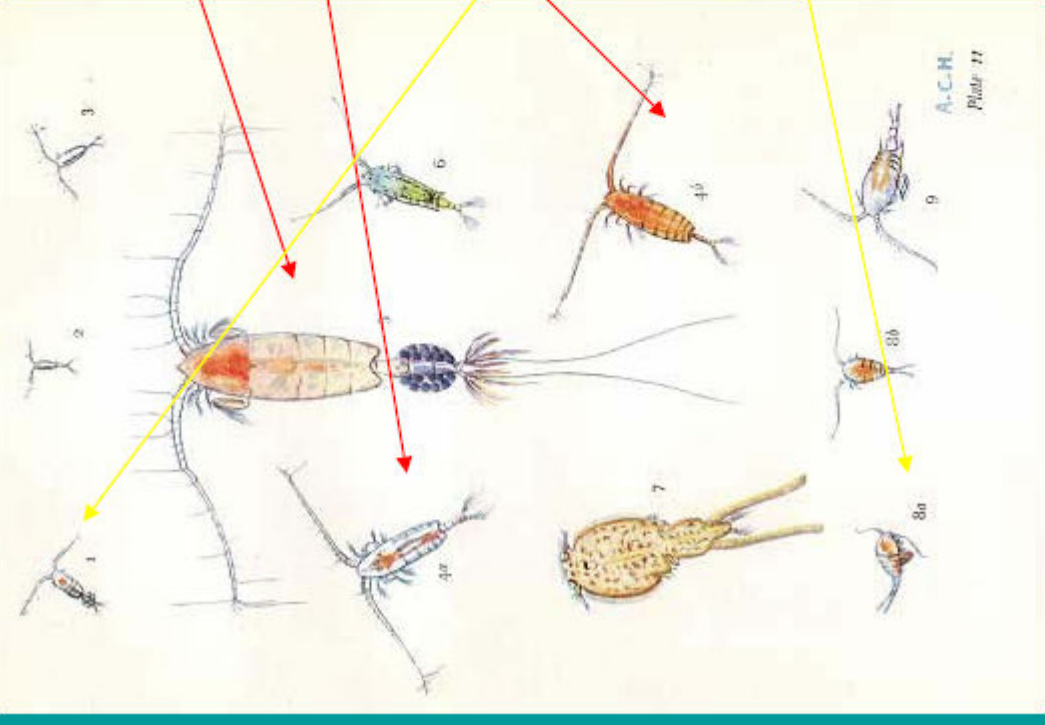
The aims of the CPR Survey are to monitor the near-surface plankton of the North Atlantic and North Sea on a monthly basis.

CPR database contains details of the plankton found on over 17000 samples taken since 1946 in the North Sea and North Atlantic Ocean.

In the Baltic Sea *Alg@line* has expanded their plankton monitoring also to zooplankton

In 1998-1999 the CPR experiment was carried out on a transect between Lübeck and Hanko, towed by Transfennica containerships

Comparison studies carried out by scientists from FIMR and SAHFOS showed that CPR loaded with standard 280 μm mesh significantly undersamples Baltic plankton



large oceanic copepods:

Euchaeta norvegica

Calanus finmarchicus

large Baltic copepods:

Pseudocalanus elongatus

Temora longiremis

..and the rest of our stuff is even smaller!

Juha Flinkman, FIMR

**HELCOM guidelines recommend to use
100 µm mesh in WP-2 nets in the
Baltic Sea**

Standard CPR has also other features that are a disadvantage at the

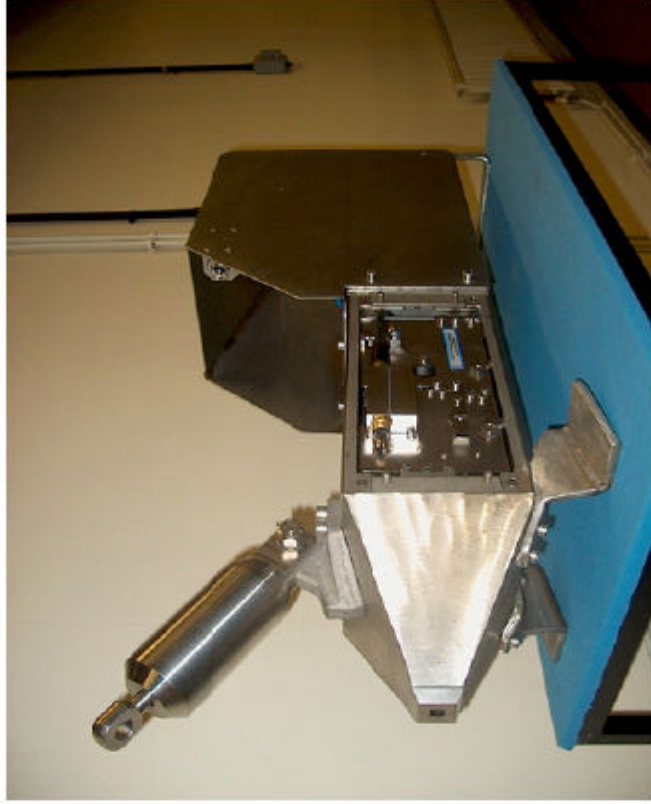
Baltic Sea:

- **silk advance is continuous, subsequent sample overlap – problems with georeference applications**
- **silk is sticky – difficult to wash off plankters for off-silk analyses**
- **on-silk analysis differs from HELCOM methods – requirement of other instruments and skills**

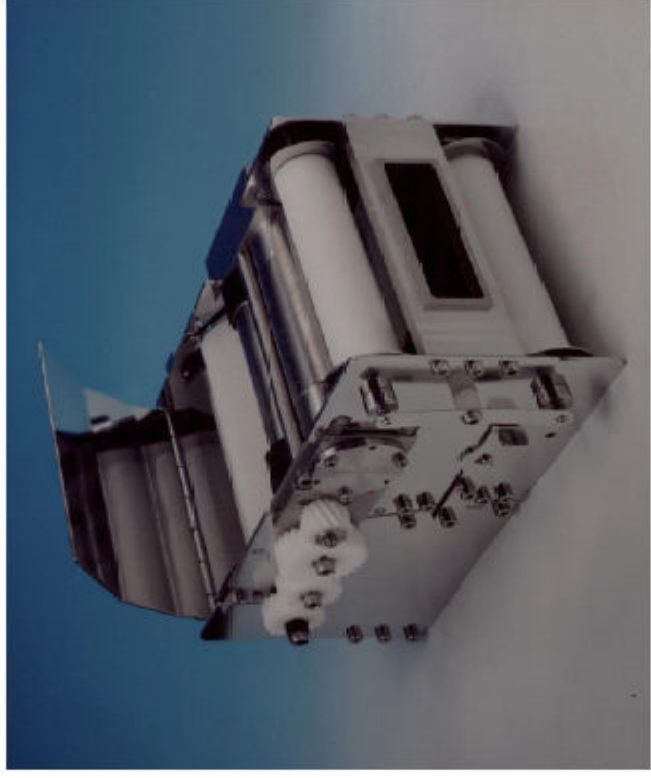
Solution for the Baltic Sea:

**Autonomous plankton sampler manufactured by
Chelsea Technology Group fits to the CPR body
and looks like original, but:**

- **is less complicated to service and load**
- **can use any size standard nylon mesh**
- **does not advance the silk continuously, but takes predefined snapshot samples**
- **logs start and end of each sample, facilitating exact georeference**
- **electrically operated: makes CPR body cleaner and less vulnerable as propeller and gear mechanisms are omitted**



CPR body complete with APS.



APS Unit.

Juha Flinkman, FIMR

Experiments with "new" CPR equipped with CTG mechanism onboard r/v Aranda



- instrumentation simple and convenient to use, works reliably

- vehicle has excellent hydrodynamic characteristics

- using 100um mesh, we get same order of magnitude abundances as with WP-2

- sample processing easy: identification, packing, washing plankters off the silk

- due to easy loading and sample retrieval, short deck turnaround time

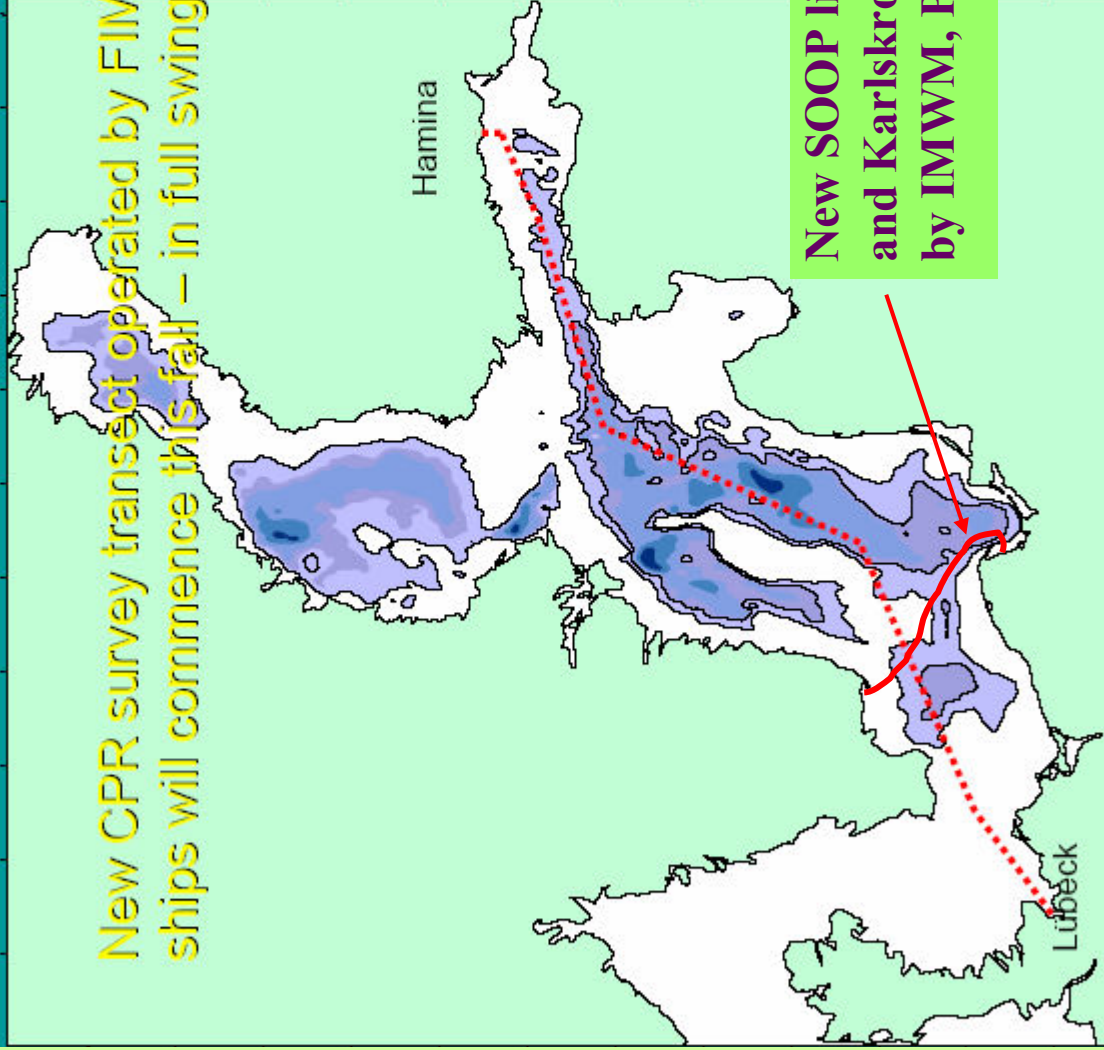
Juha Flinkman, FIMR

The CPR will collect valuable material for the estimation of variability of zooplankton communities in the Baltic Sea.

The information may be used to understand the natural and man-made changes in the environment (eutrophication, new species etc.).

Zooplankton is also a crucial link in the food web as it feeds on phytoplankton (algae) and it is in turn food for pelagic fish, most importantly Baltic herring.

New CPR survey transect operated by FIMR on Transfennica ships will commence this fall – in full swing in 2005



New SOOP line between Gdynia and Karlskrona will be operated by IMWM, Poland