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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1988 RESEARCH CRUISE PROGRAMME

REPORT: RV Corystes 3b

(PROVISIONAL: not to be quoted without prior reference to the author)

STAFF:
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Mrs W A Dawson
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P R Witthames
S M Stevens
B F Riches

DURATION:
Left Barry (Glamorgan) 0800 h 16 June 1988
Arrived Lowestoft 0900 28 June 1988
(All times are Greenwich mean time)

LOCATION:
Celtic Sea. Western Channel

AIMS:

1. To estimate the contribution that 1, 2 and 3 year old mackerel make to total egg production in the western mackerel stock.

2. To estimate levels of atresia in mackerel ovaries during spawning.

3. To assess the contribution of mackerel spawning in the western channel to the western spawning stock.

NARRATIVE:

Staff left Lowestoft on 15 June and proceeded to Barry by road. RV Corystes sailed at 0800 h 16 June and arrived at the first tin tow net station at 1900 h (Figure 1). Eleven such stations were subsequently worked along latitude 50°15' westwards to the central mackerel spawning area. The centre of this area is ICES statistical square M.19. Between 18 and 21 June mackerel of various ages, lengths and maturity stages were collected using the Portuguese high headline trawl (7 stations) and rod and line (12 stations). On 20 June as the weather was fine the opportunity was taken to use the Engels 800 mid water trawl. Three hauls were made and although few mackerel were caught useful experience was gained in the operation of this gear. RV Corystes left the central spawning area on 21 June and steamed overnight to the channel plankton grid (107E), work commenced at 0800 h 22 June. This grid was interspersed on the northern edge with rod and line and trawl stations. Stations close to the Lizard (N8, N9) and Start Point (P5) yielded useful catches of mackerel. On 23 June repair work on the odometer and benthic

sledge permitted trials of this equipment. The plankton grid was interrupted (at N7) and Corystes steamed overnight to the recommended trials position between the Lizard Point and the Eddystone light. Following successful trials and a rod and line station the grid was resumed at 1730 h 24 June. The Channel plankton grid was completed at 2230 h 25 June. The last working day was spent in the Start Point area (P5 & P6) where further mackerel samples comprising larger fish were collected, and a radar transponder was tested for RSG2. Corystes left the working area at 1700 h 26 June and reached Lowestoft at 0900 h 28 June.

RESULTS:

1. Two collections of mackerel ovaries were made and preserved in formalin. One from the central spawning area (107J) and one from the western channel (107E). 233 mackerel were sampled covering the length range and comprising age groups 1, 2 and 3. These two collections are summarised by length age and maturity stage in Figure 2. In addition age, length, sex and maturity were recorded from a larger sample in each area to supplement the stock assessment work. The samples of 1, 2 and 3 year old fish will also be used to estimate oocyte recruitment and maturation on a monthly basis throughout the year and to this end 7 fish/cm were collected above a length of 35 cms. All the one year old fish caught in 107J were immature (maturity stages 1 & 2) in 107E however a proportion were classified as spent (maturity stage 7) but probably had not spawned. Histological analysis will show whether these fish have indeed spawned or whether they are resorbing their eggs. The majority of 2 year old fish from 107J were spawning but channel fish (107E) again showed a proportion which were classified as spent fish. Three year old fish were either spawning or spent in the central spawning area (107J) but in the channel (107E) there were very few fish of this age caught, those that were showed a mixture of maturity stages.

2. A total of 41 plankton samples were collected from the western channel. The 5 within the central spawning area will be used to ensure comparability with previous surveys. The number of eggs in the jars was graded by casual inspection and the results are shown in Figure 4.

MISCELLANEOUS

1. Blood was collected from 61 sexually mature mackerel to test for Oestradiol 17B which initiates yolk production in the liver. The purpose of this assay is to identify with certainty the termination of spawning.

2. The benthic sledge with on board TV was deployed on 24 June. The sledge was launched in 71 m of water and travelled 1.3 nautical miles in a period of 50 mins. The odometer counts were compared with the ships EM log over 5 x 10 min periods. The camera was angled to show the wheel in operation and visual counts of wheel revolutions were also made. The mechanical and electronic components of the odometer performed satisfactorily. The relationship between the distance travelled and the number of revolutions is shown in Figure 3.

3. A prototype continuous sea water monitoring system measuring temperature and salinity was tested satisfactorily.

4. Various species of fish were frozen for the fisheries identification course.

5. Ovaries were collected from 33 mature spawning and spent mackerel and fixed in Carnoy's fixative. This fixative enables mitotic divisions in the

developing eggs to be more clearly seen and mitotic counts are proportional to the rate of egg production.

6. During sojourn in the central spawning area contact was made with the Kings Cross which was on charter to DAFS. An interchange of samples was arranged and it was noted that the much larger mid water trawl samples collected by the Kings Cross showed the same length frequency distributions and stages of maturity as our smaller samples caught mainly by rod and line.

7. A pilot fish (Naucrates ductor L.), a rare vagrant, took up residence under the vessel on 26 June. It was clearly seen by several of the ship's company during forays away from the vessel.

8. A portable radar transponder (racon beacon) was tested for RSG2 using the ships rubber boat. The transponder gave a satisfactory signal in optimum conditions out to a maximum range of about 3 nautical miles.

M Greer Walker
21 July 1988

SEEN IN DRAFT: G Sinclair
J Harper

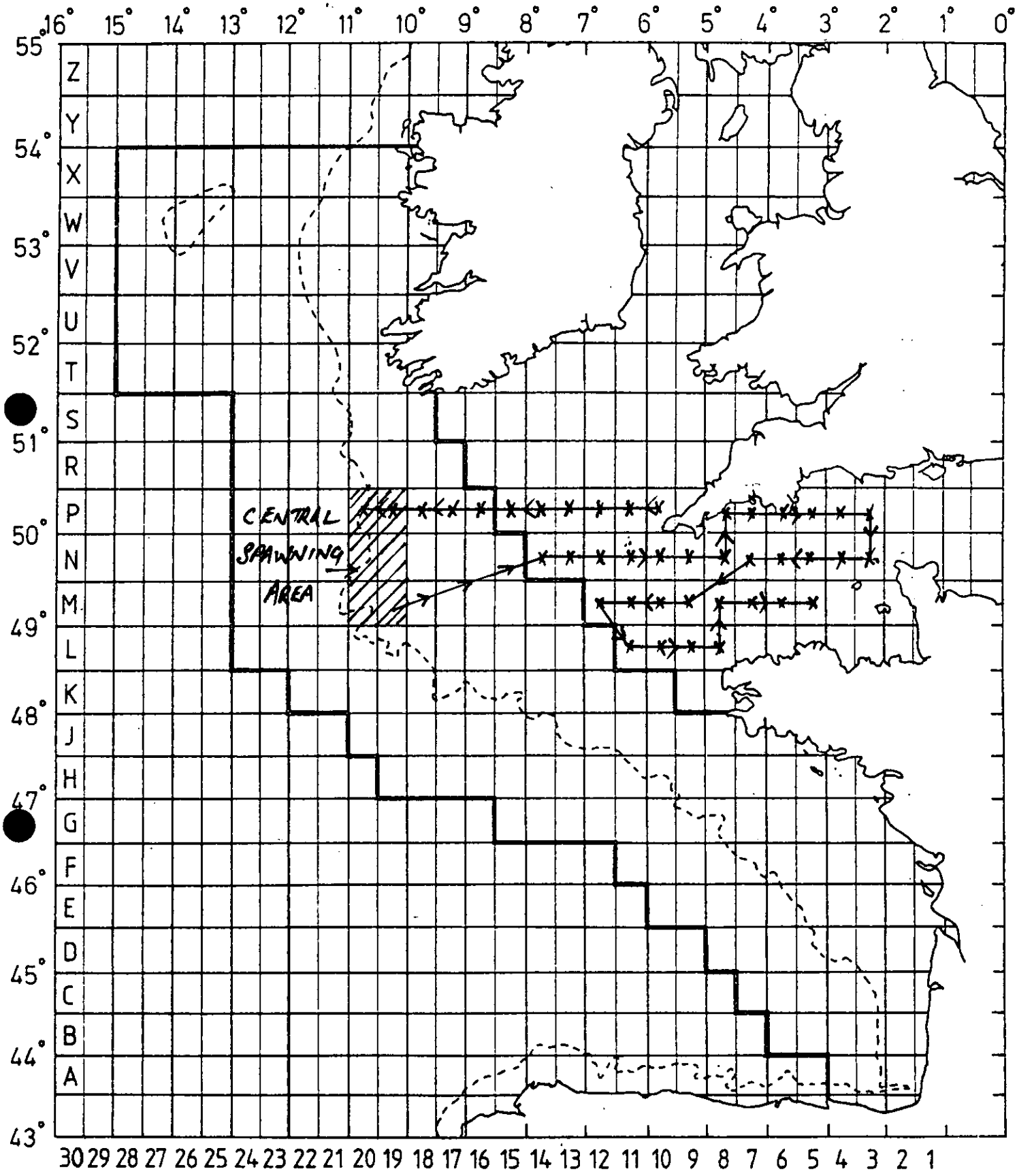
INITIALLED: D J G

DISTRIBUTION:

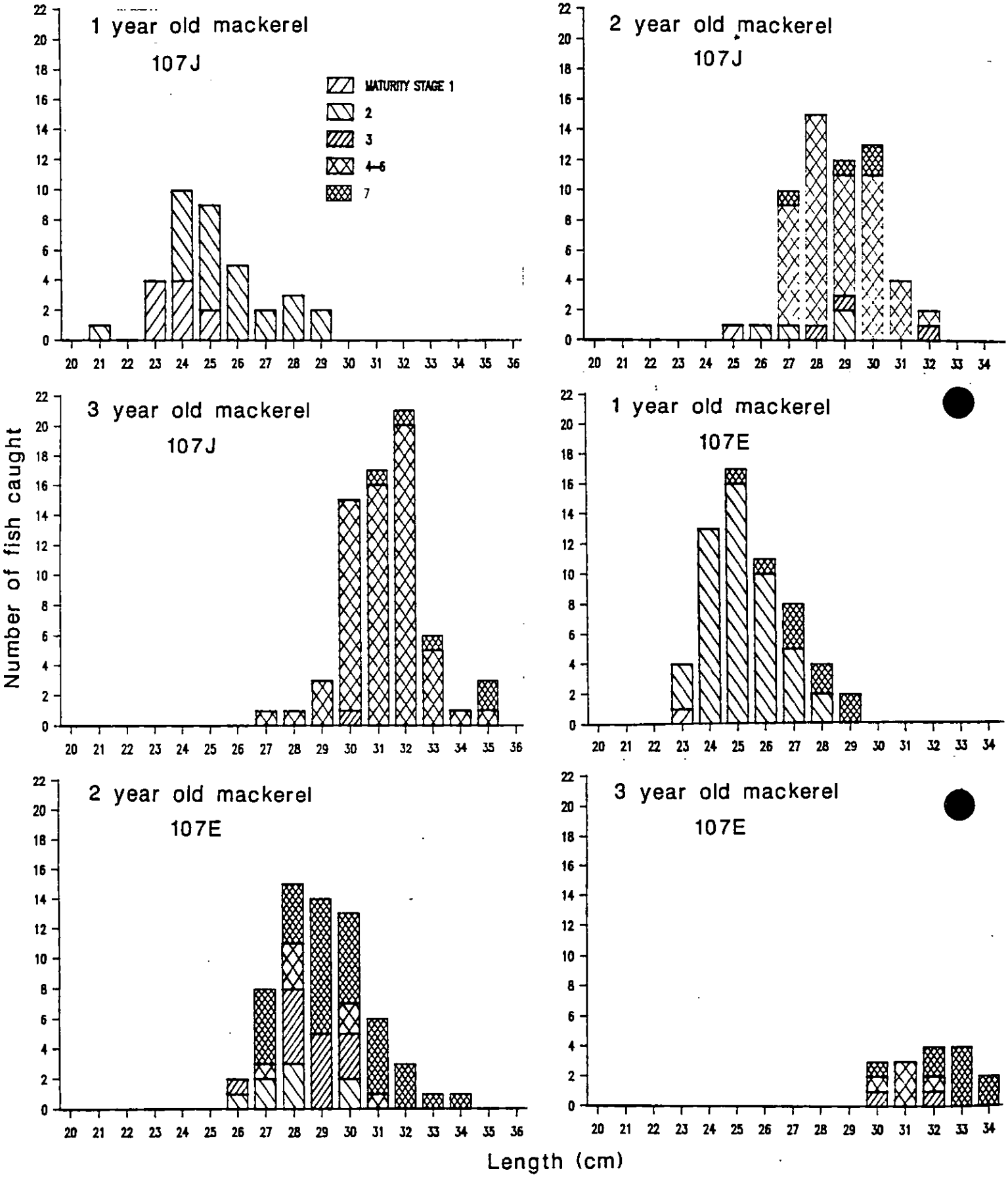
Basic List +

M Greer Walker
W Dawson
C Whiting
P Witthames
S Stevens
B Riches
R Mitson
P Dare
J Nichols
S Milligan
B Jones
A P Scott

FIGURE 1.



R.V. CORYSTES CRUISE 3b 1988


1 year old mackerel
107J
MATURITY STAGE 1
2
3
4–6
7
2 year old mackerel
107J
3 year old mackerel
107J
1 year old mackerel
107E
2 year old mackerel
107E
3 year old mackerel
107E
Number of fish caught
Length (cm)

ODOMETER V EM LOG AND LAT LONG CALC

UWTV SLEDGE CORYSTES 3B/88

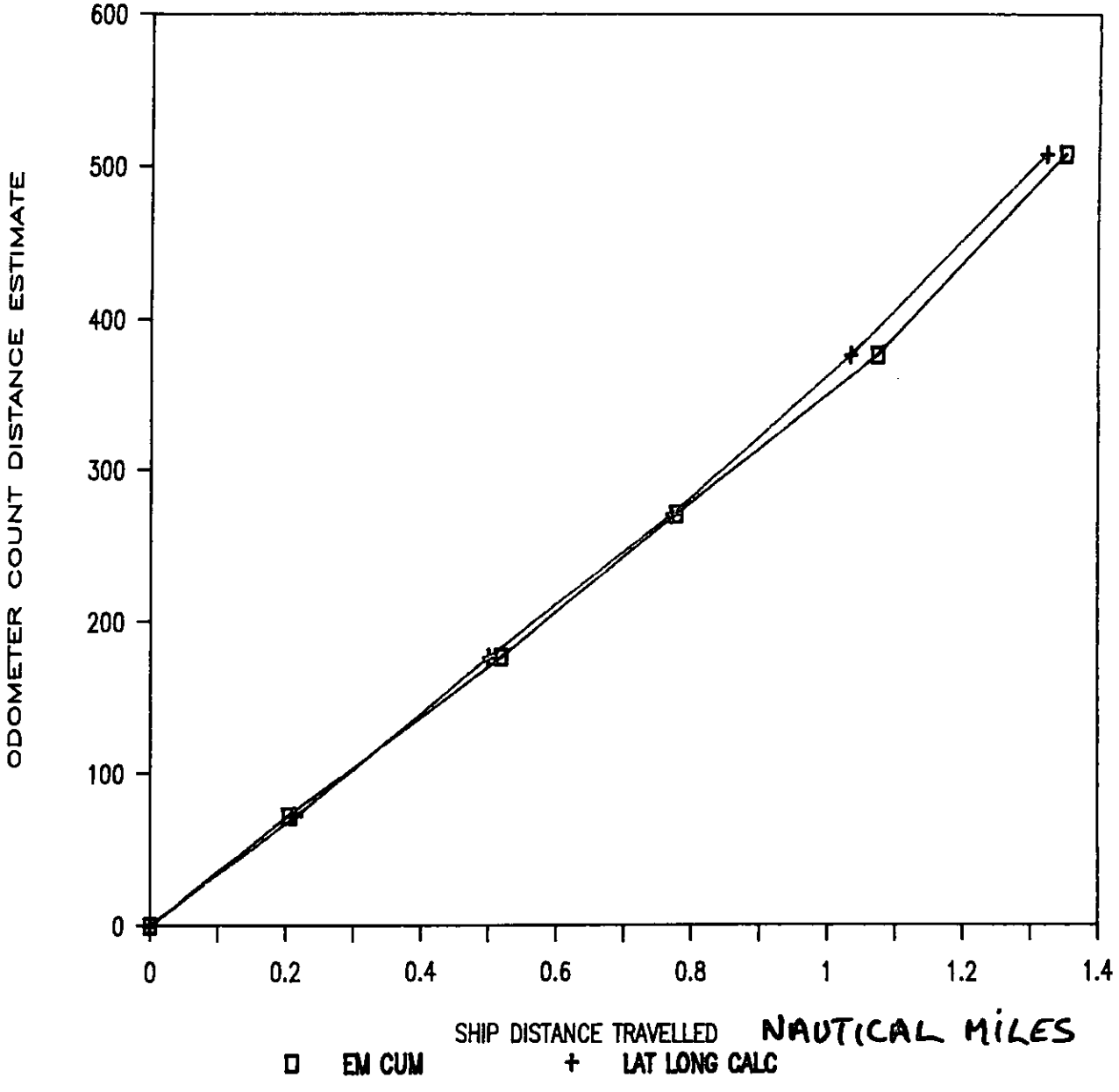


FIGURE 84 NUMBERS OF EGGS