AN ECOLOGICAL INTERPRETATION OF MESOLITHIC SHELLFISH REMAINS ON THE ISLAND OF ORONSAY, INNER HEBRIDES

VOLUME 2 OF 2 VOLUMES

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the University of Sheffield,
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FIGURE 1 : THE LOCATION OF ORONSAY AND COLONSAY.

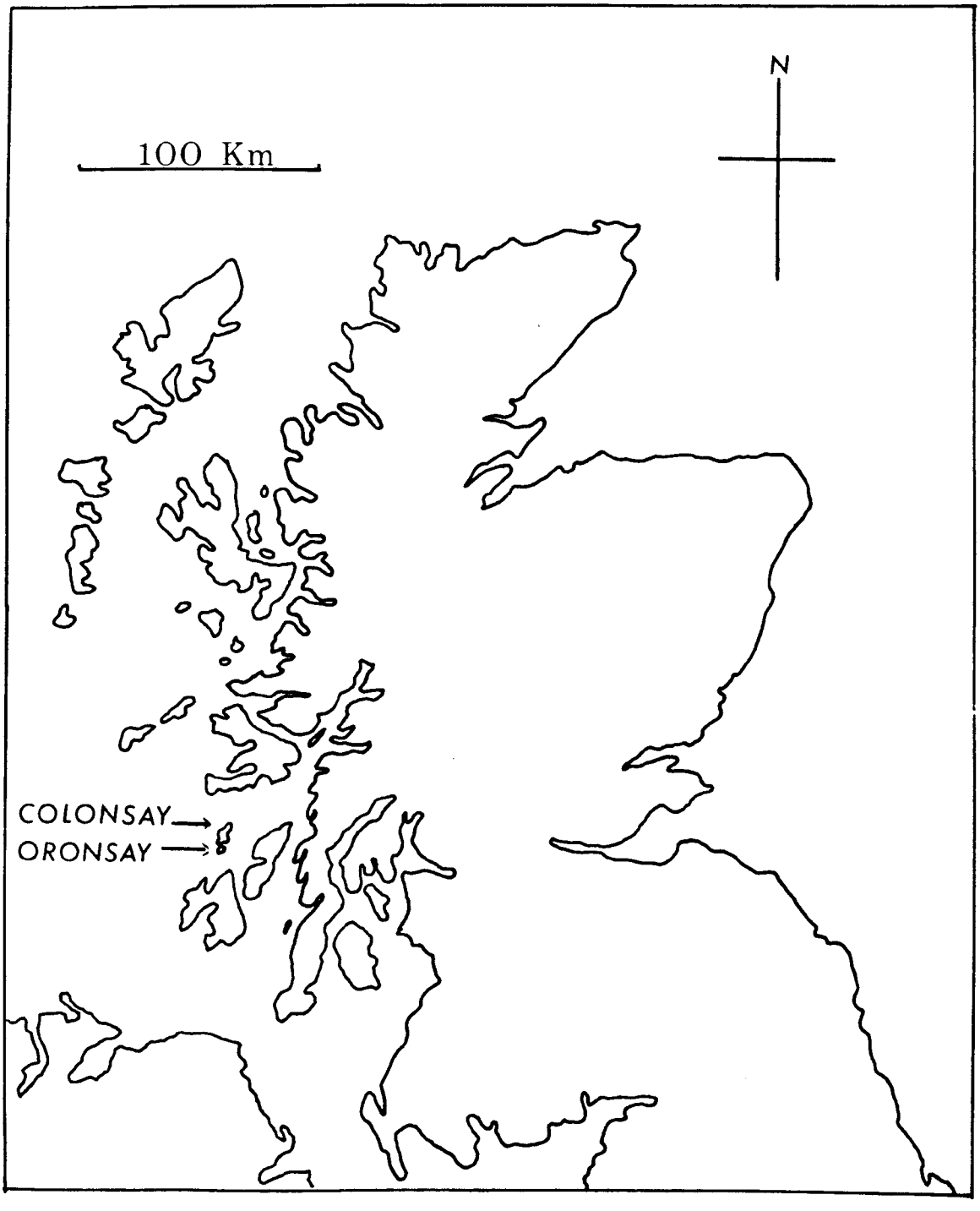


FIGURE 2 : ORONSAY AND THE SOUTHERN PART OF COLONSAY.

Former shoreline after Jardine 1977.

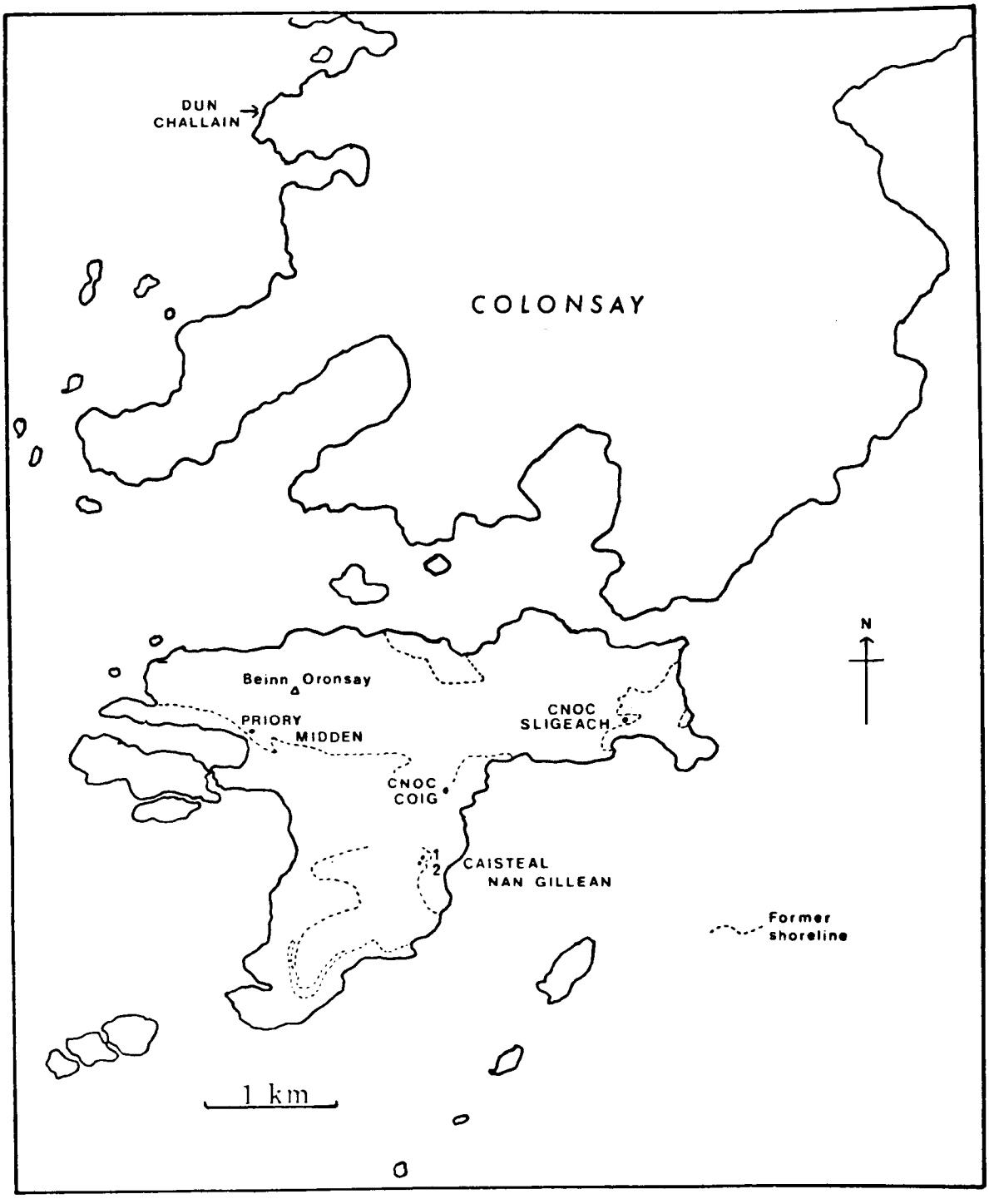


FIGURE 3 : MEAN GROWTH RATES OF PATELLA VULGATA OF VARYING SIZES AT BOULOGNE. After Choquet 1968.

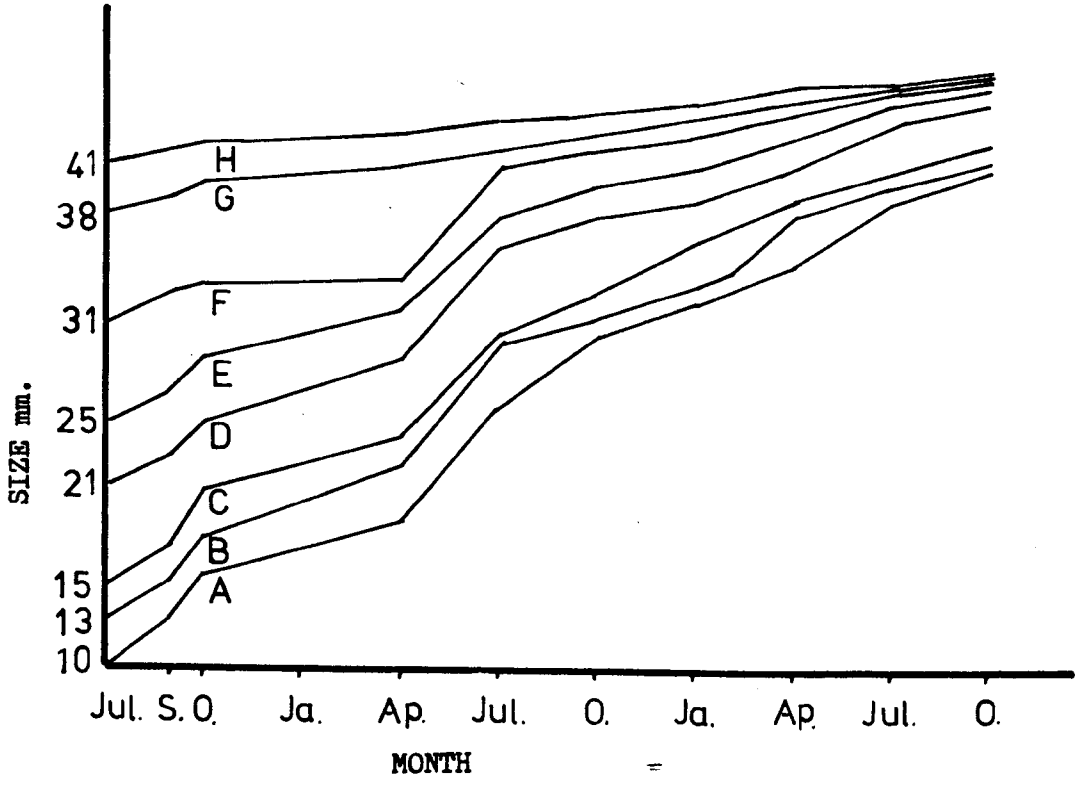


FIGURE 4 : MEAN GROWTH RATES OF PATELLA VULGATA IN DIFFERENT HABITATS AT ROBIN HOOD'S BAY. After Lewis and Bowman 1975.

Level	Habitat
a-low	bare
b-low	bare/fucus
c-mid	bare/fucus
d-low	bare
e-high	bare
f-mid	mussels/barnacles
g-mid	barnacles
h-mid	barnacles
i-high	barnacles/mussels
j-high	barnacles

Dotted line = less than 10 individuals.

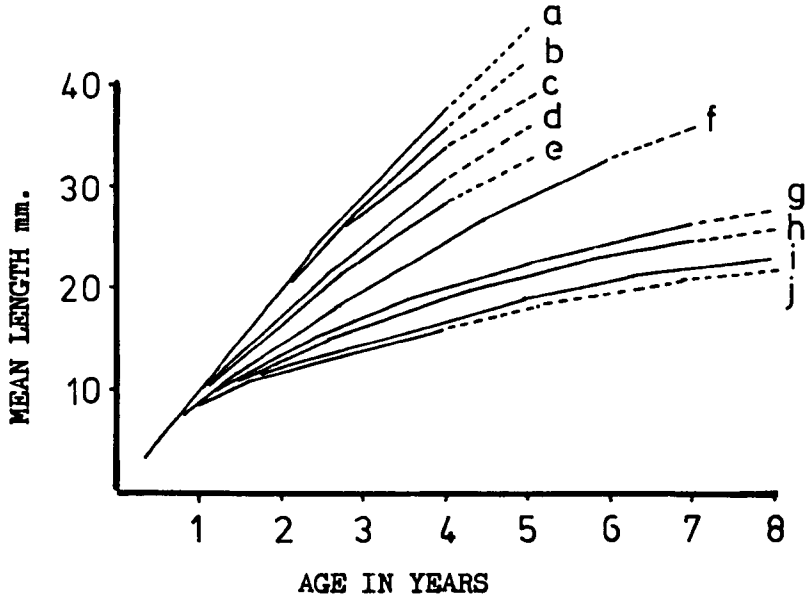


FIGURE 5 : MEAN GROWTH RATES OF PATELLA VULGATA IN DIFFERENT HABITATS AT BOULOGNE. After Choquet 1968.

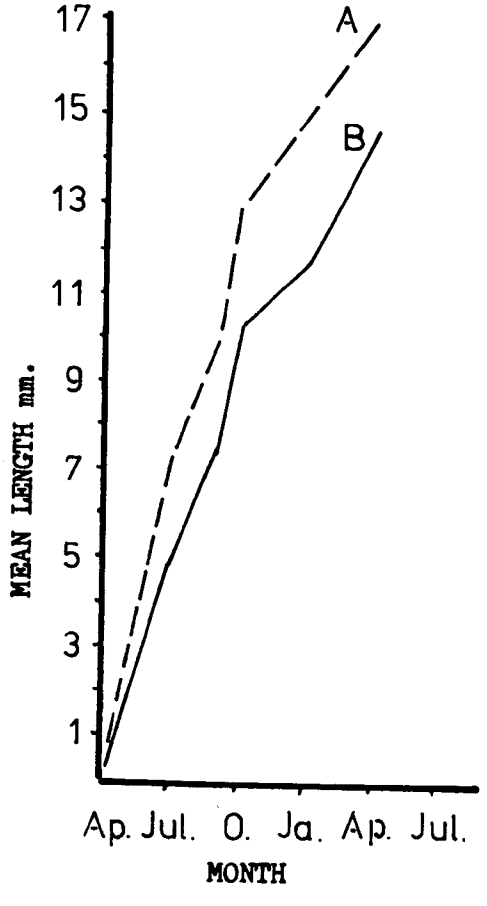


FIGURE 6 : MEAN GROWTH RATES OF PATELLA VULGATA AND PATELLA ASPERA AT BANTRY BAY. After Thompson 1980.

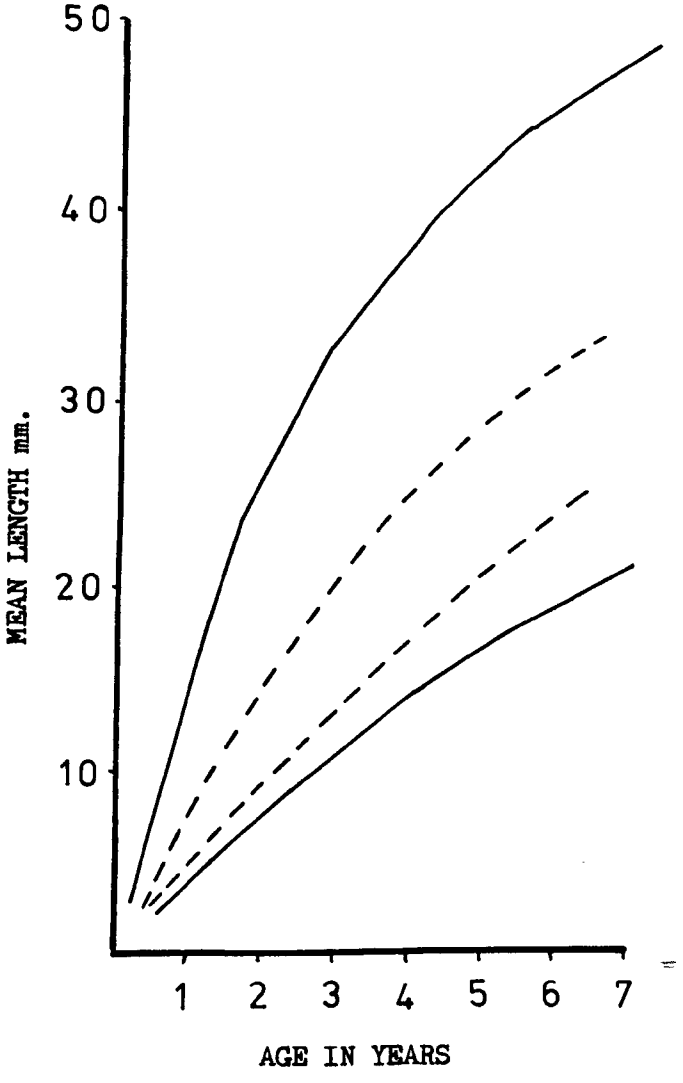


FIGURE 7 : THE SUGGESTED PROBABLE LENGTH-FREQUENCY STRUCTURE OF PATELLA VULGATA POPULATIONS FROM DIFFERENT TIDAL LEVELS AND DIFFERENT BIOLOGICAL HABITATS AT ROBIN HOOD'S BAY.

After Lewis and Bowman 1975.

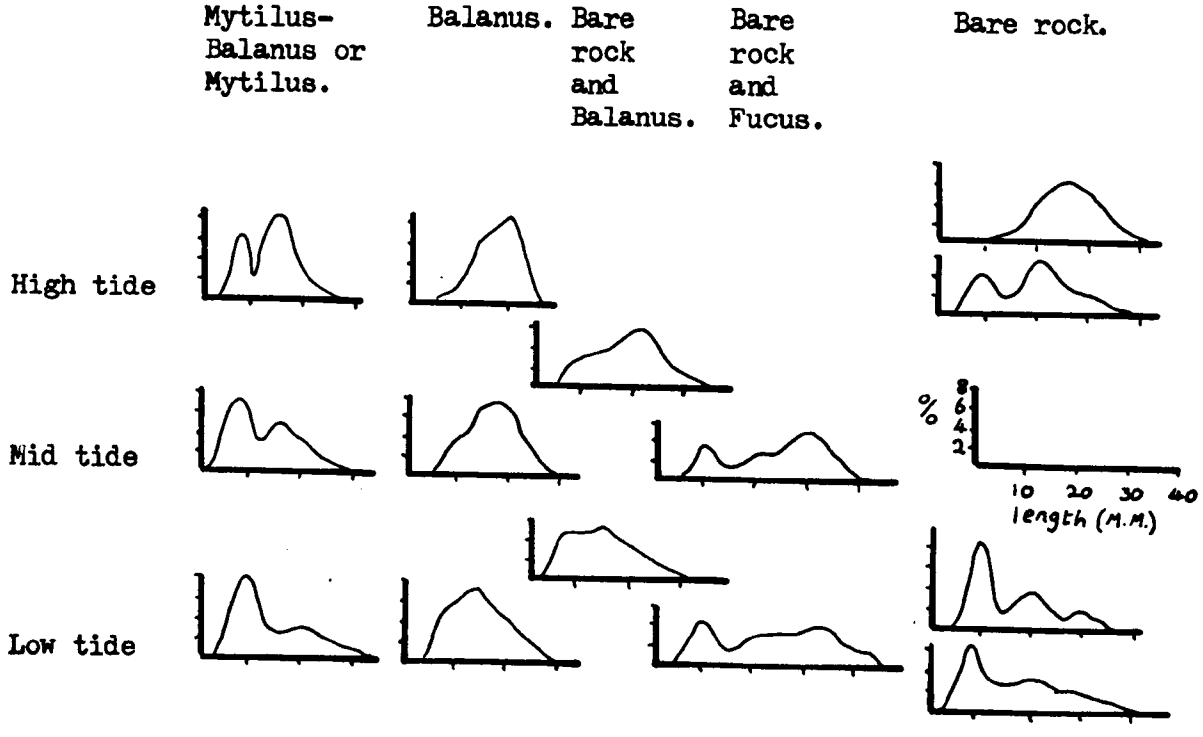


FIGURE 8 : MEAN GROWTH RATES OF PERIWINKLES OF VARYING SIZES AT CRAIG-YR-WYLFA. After Williams 1964.

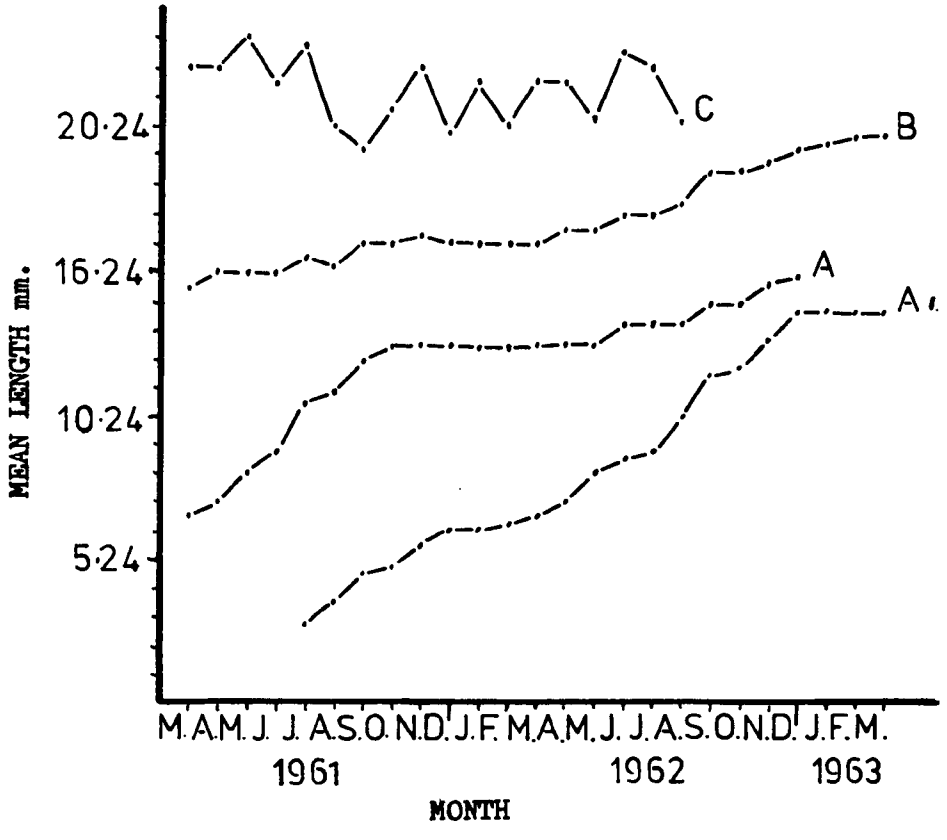


FIGURE 9 : THE ORONSAY SHELLFISH COLLECTION AREA, SHOWING LOWER AND UPPER SHORE ROCK SKERRIES.

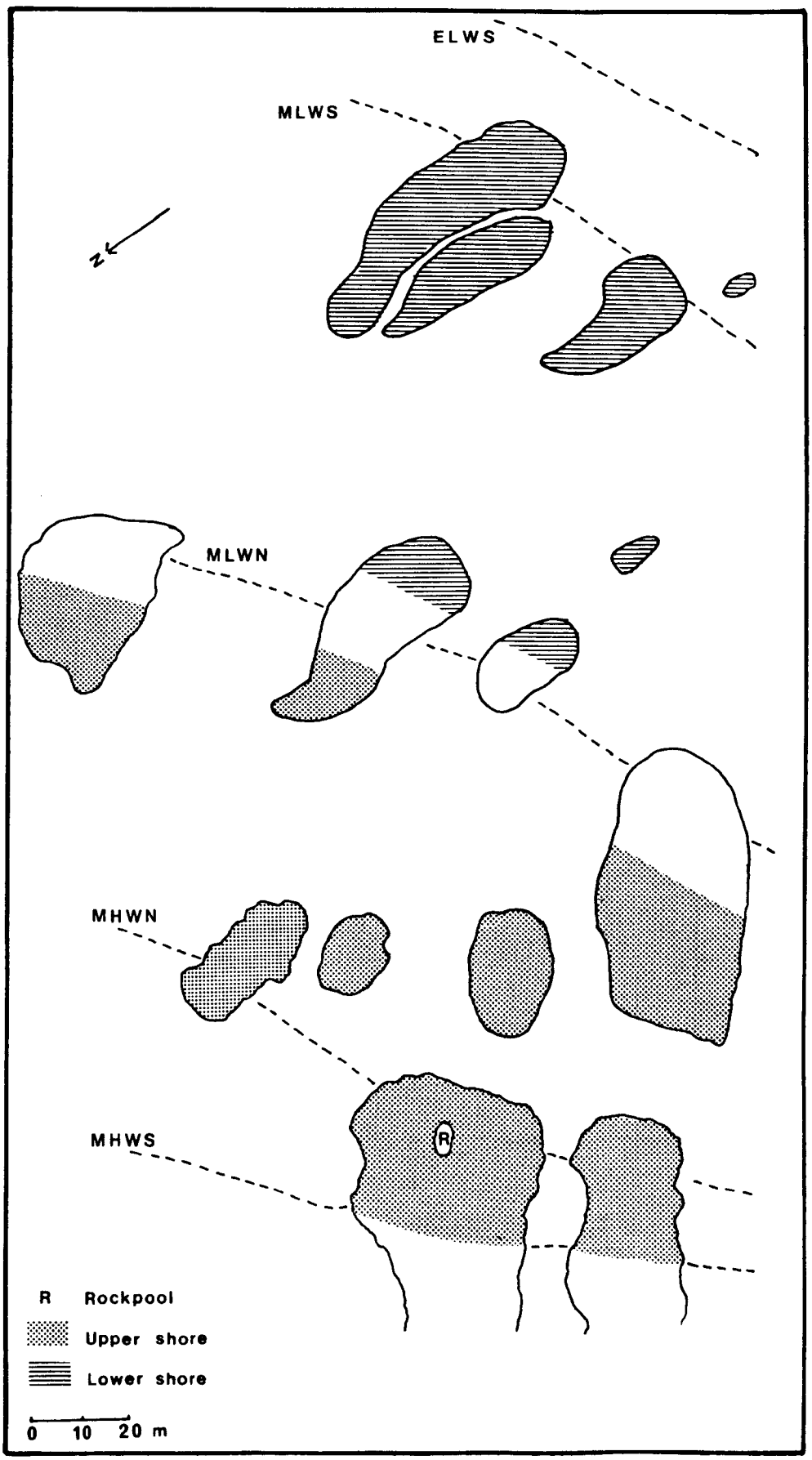


FIGURE 10 : THE RELATIONSHIP BETWEEN DRY MEAT WEIGHT AND SHELL WEIGHT FOR ORONSAY LOW SHORE LIMPETS IN NOVEMBER.

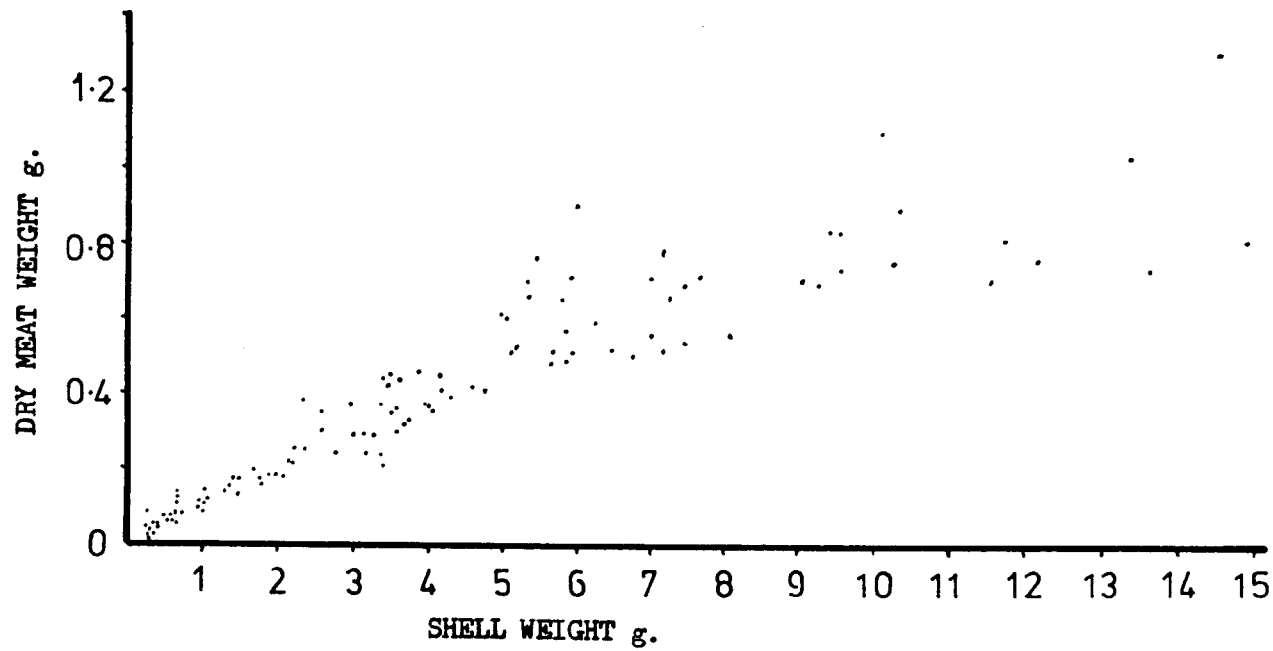


FIGURE 11 : THE RELATIONSHIP BETWEEN DRY MEAT WEIGHT AND SHELL WEIGHT FOR COLONSAY HIGH SHORE LIMPETS IN SEPTEMBER.

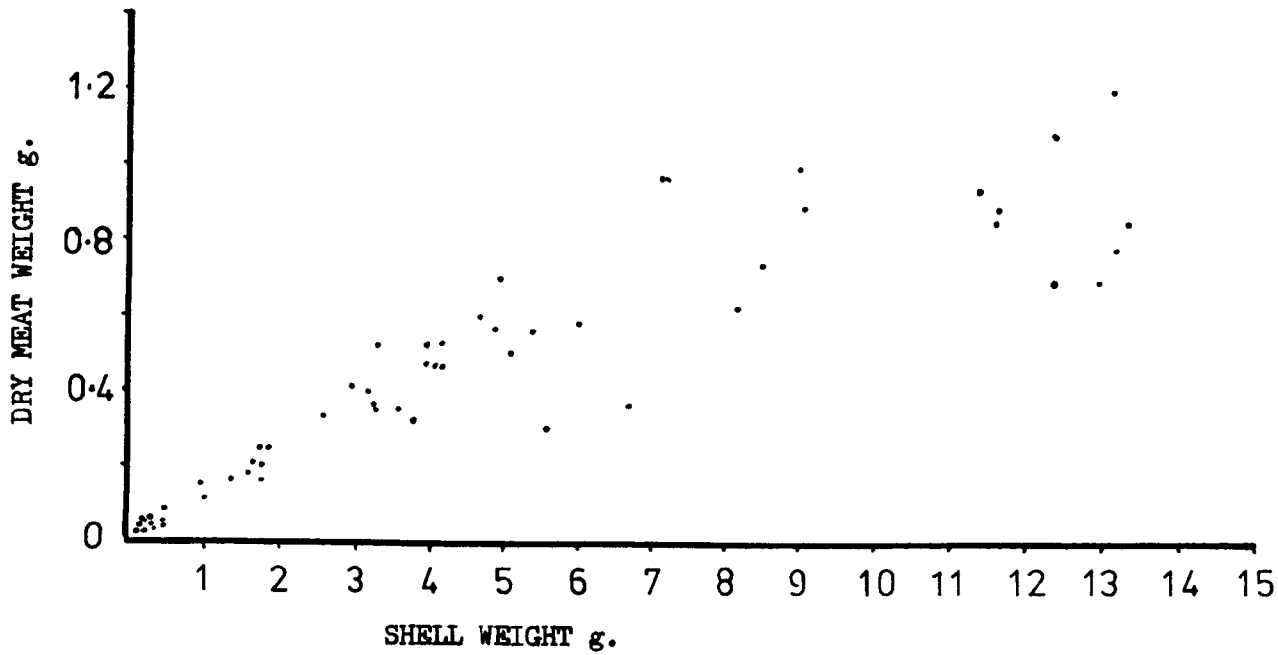


FIGURE 12 : THE RELATIONSHIP BETWEEN DRY MEAT WEIGHT AND SHELL WEIGHT FOR ORONSAY LOW SHORE DOGWHELKS IN MARCH.

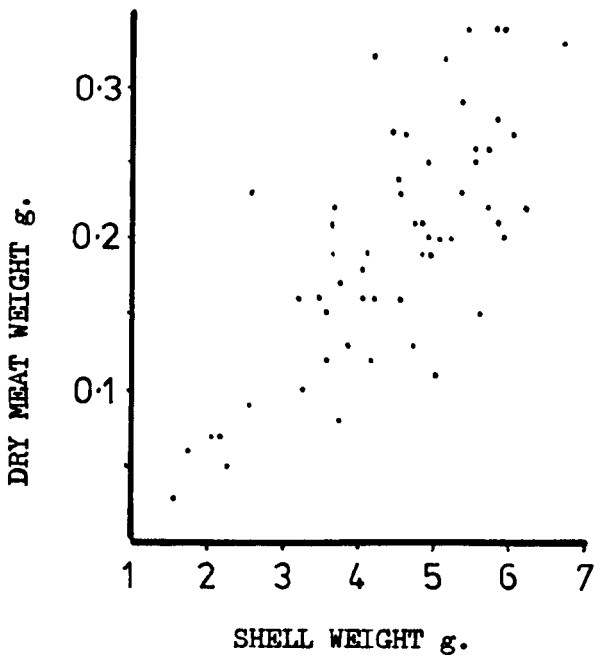


FIGURE 13 : THE RELATIONSHIP BETWEEN DRY MEAT WEIGHT AND SHELL WEIGHT FOR ORONSAY LOW SHORE PERIWINKLES IN MAY-JUNE.

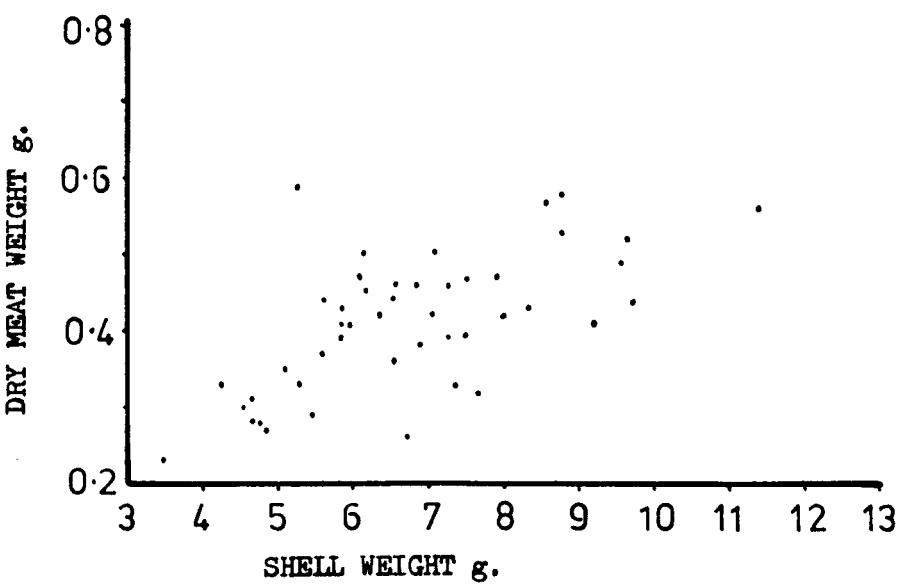


FIGURE 14 : MEAN RATIO SHELL/MEAT WEIGHT (RATIO S/M) PER MONTH IN ORONSAY LOW SHORE LIMPETS.

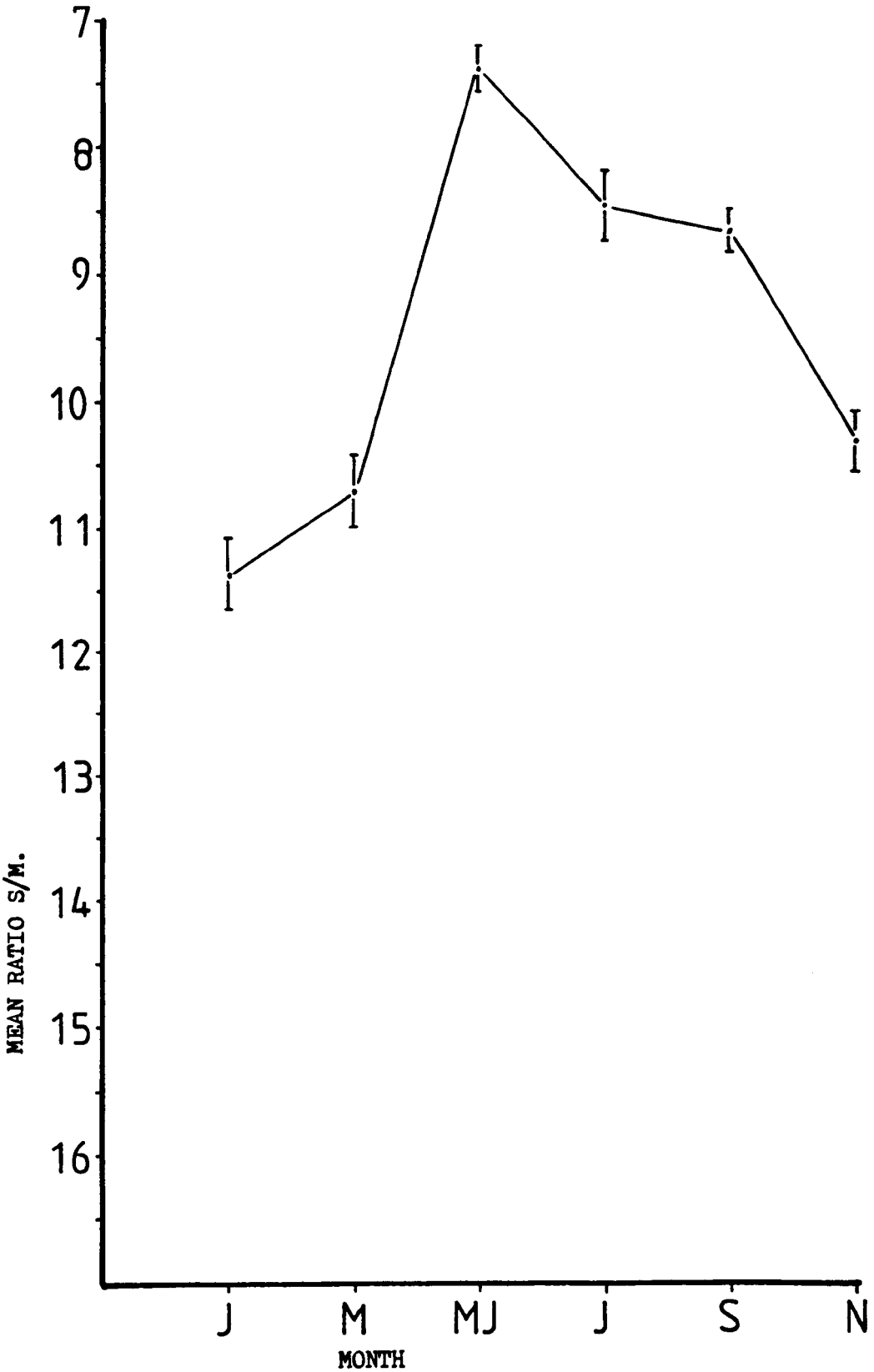


FIGURE 15 : MEAN RATIO S/M PER MONTH IN ORONSAY HIGH SHORE LIMPETS.

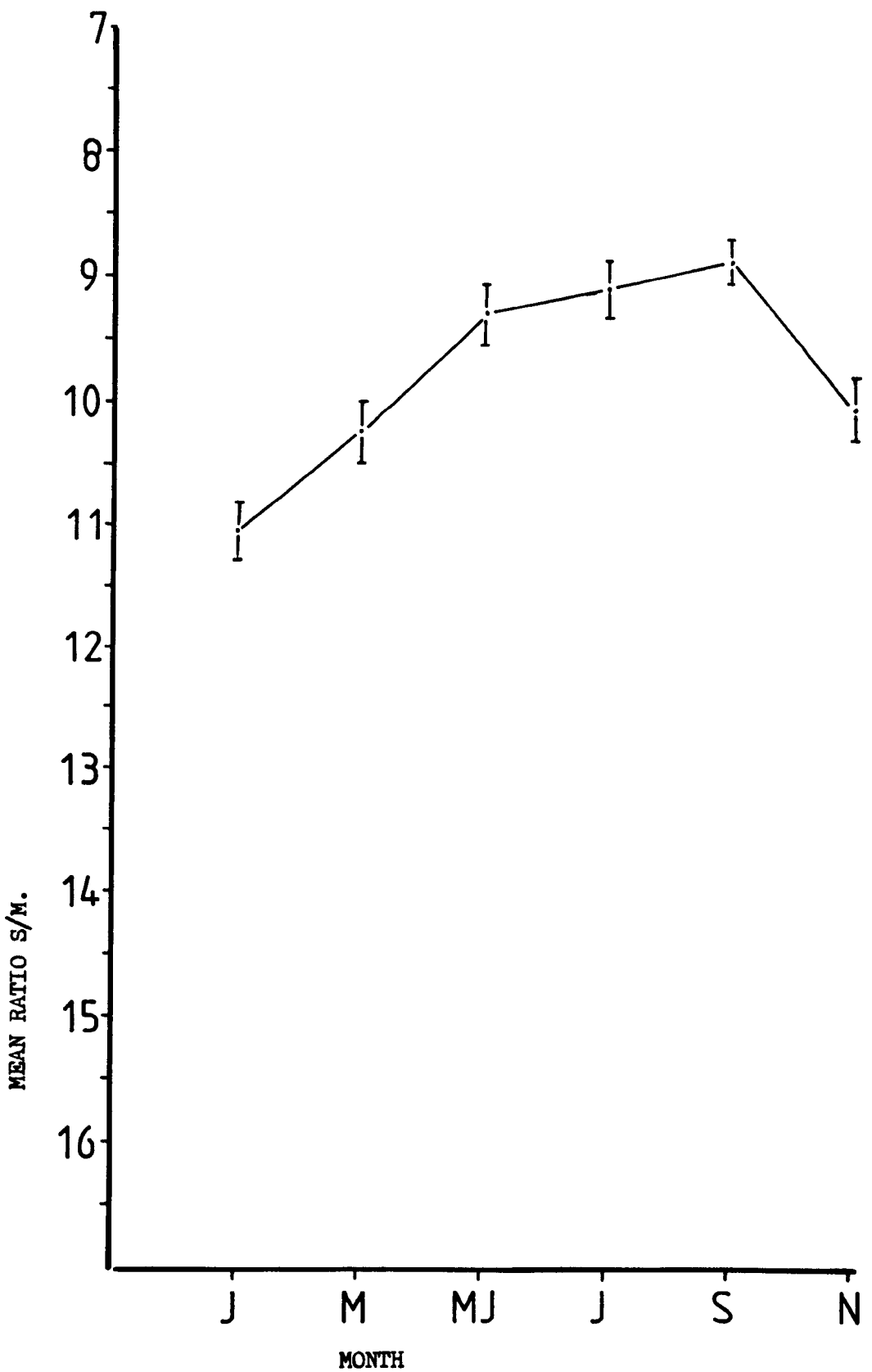


FIGURE 16 : MEAN RATIO S/M PER MONTH IN COLONSAY LOW SHORE LIMPETS.

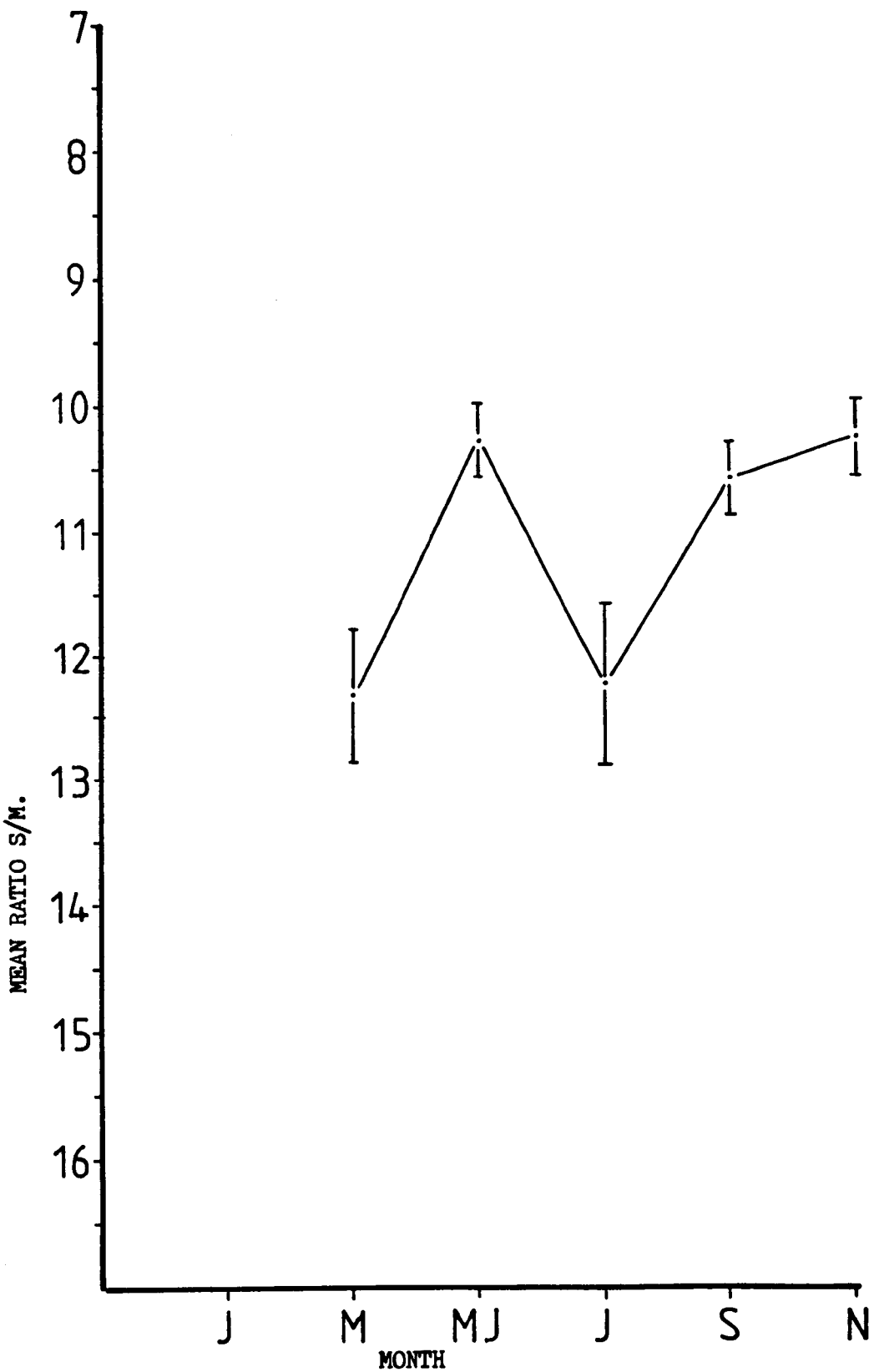
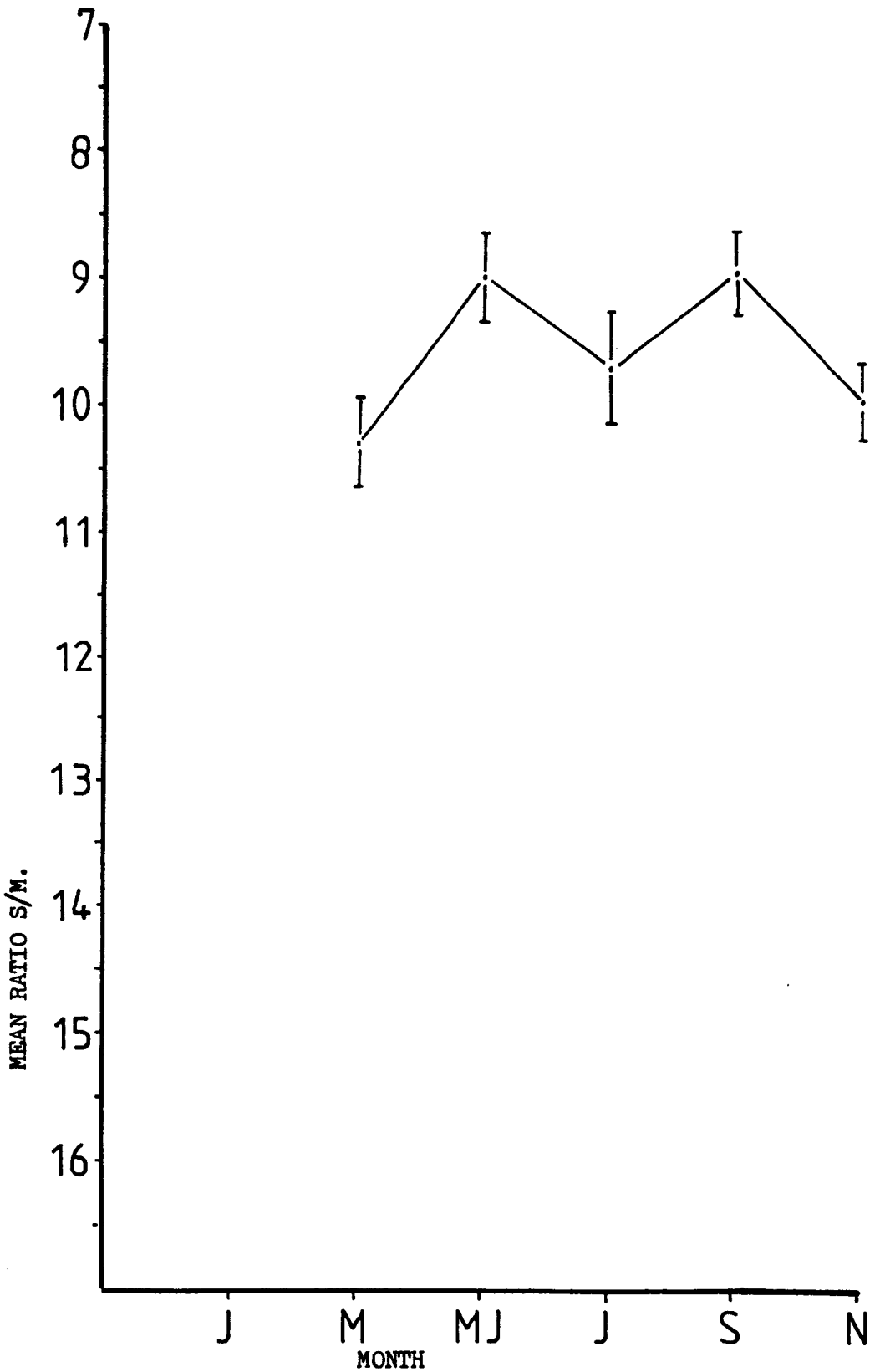


FIGURE 17 : MEAN RATIO S/M PER MONTH IN COLONSAY HIGH SHORE LIMPETS.



KEY TO FIGURES 18, 19, 20, and 21.

SMALL ANIMALS

MEDIUM ANIMALS

LARGE ANIMALS

KEY TO FIGURES 27, 28, 29, 35, 36, and 37.

SMALL ANIMALS

LARGE ANIMALS

FIGURE 18 : MEAN RATIO S/M PER MONTH FOR SMALL, MEDIUM AND LARGE ORONSAY HIGH SHORE LIMPETS.

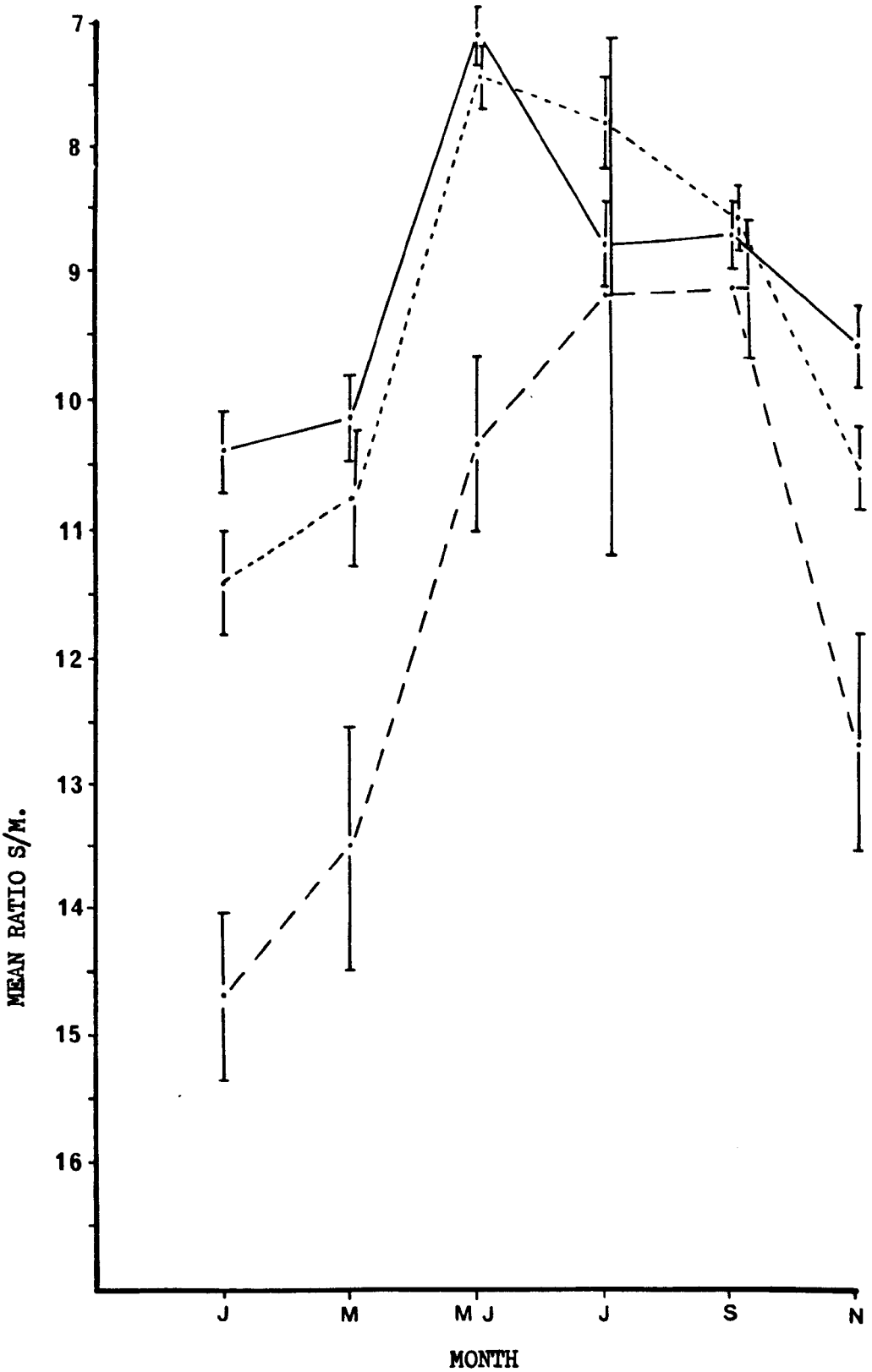


FIGURE 19 : MEAN RATIO S/M PER MONTH FOR SMALL, MEDIUM AND LARGE ORONSAY HIGH SHORE LIMPETS.

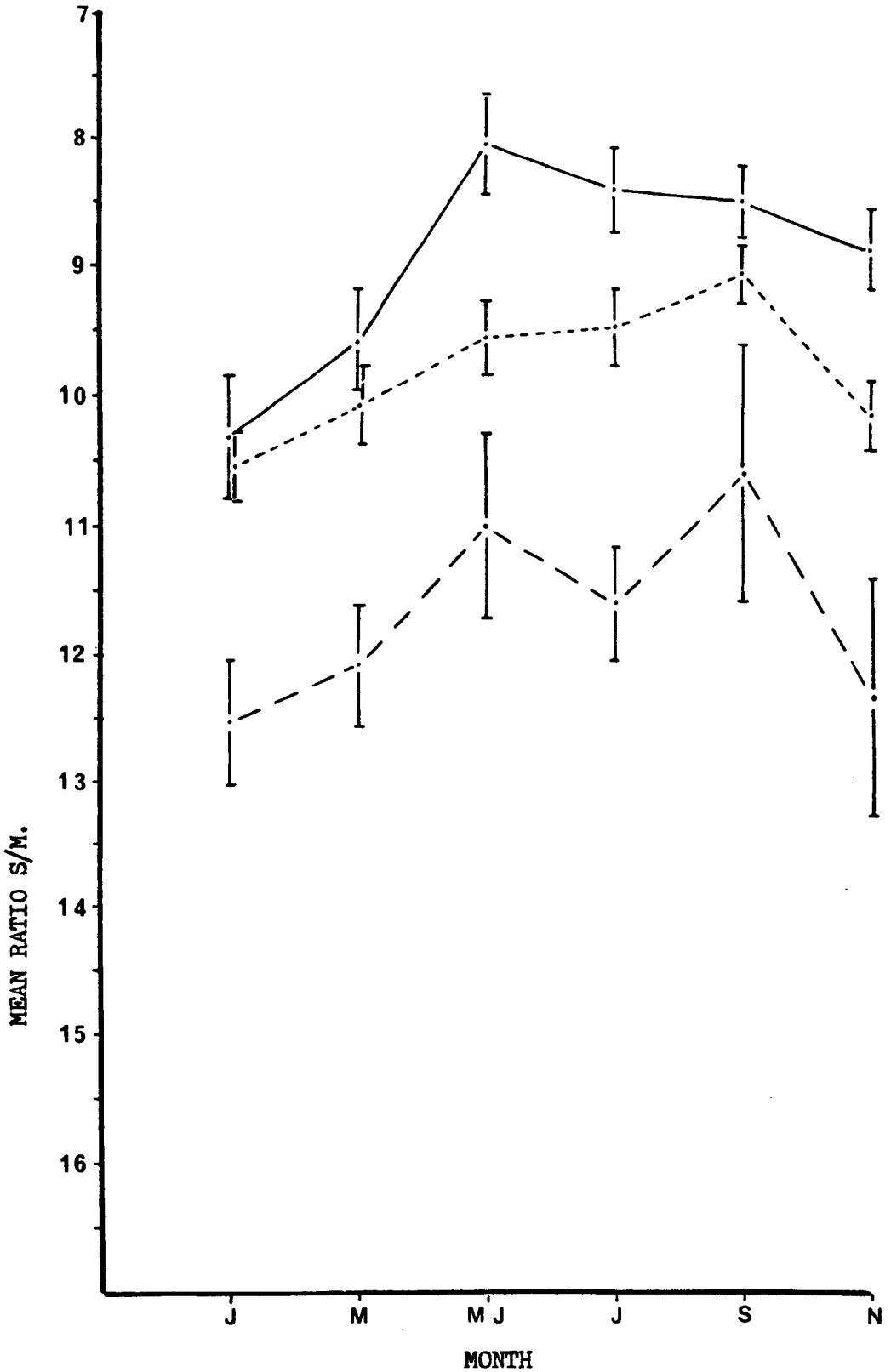


FIGURE 20 : MEAN RATIO S/M PER MONTH FOR SMALL, MEDIUM AND LARGE COLONSAY LOW SHORE LIMPETS.

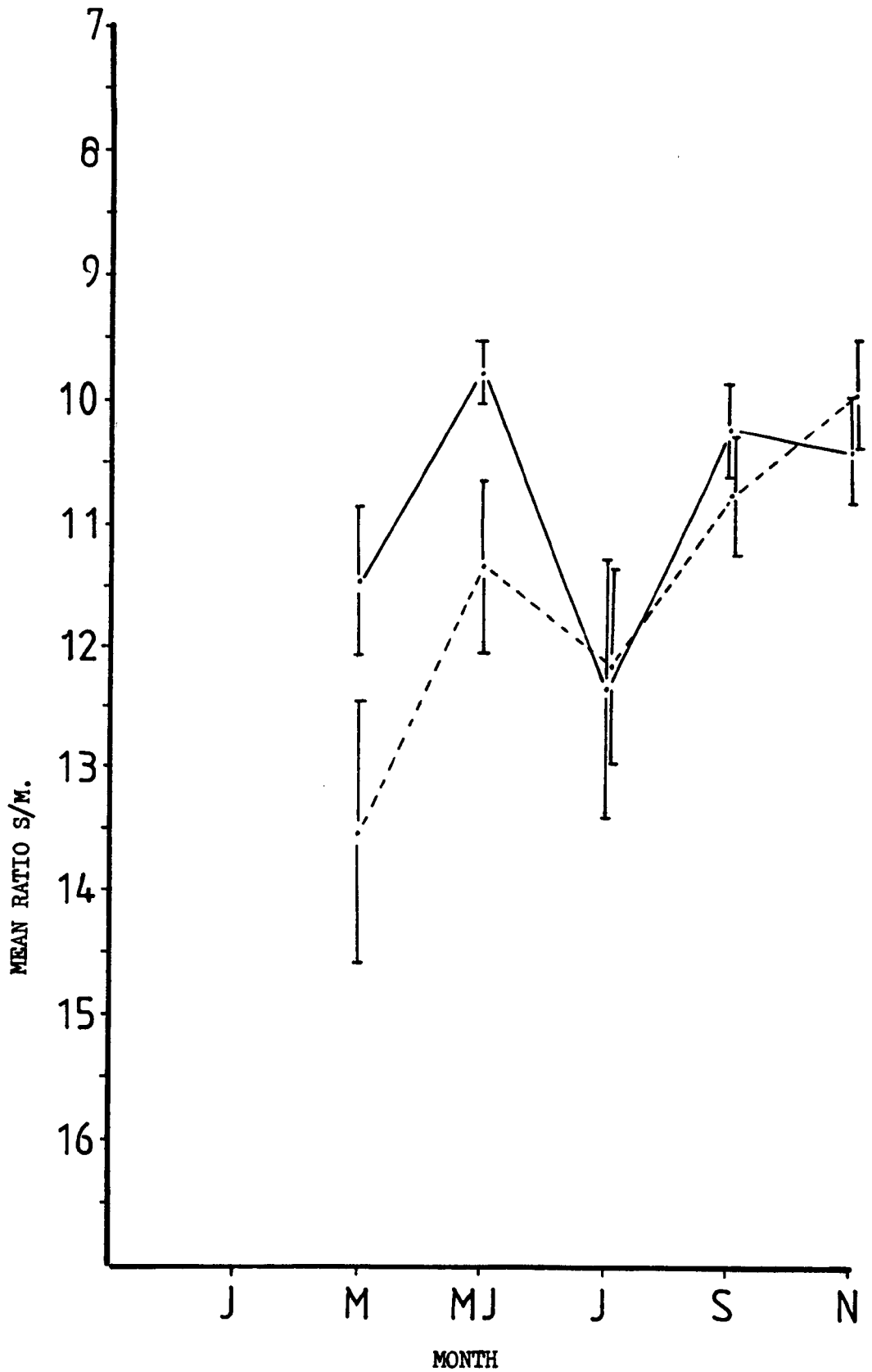


FIGURE 21 : MEAN RATIO S/M PER MONTH FOR SMALL, MEDIUM AND LARGE COLONSAY HIGH SHORE LIMPETS.

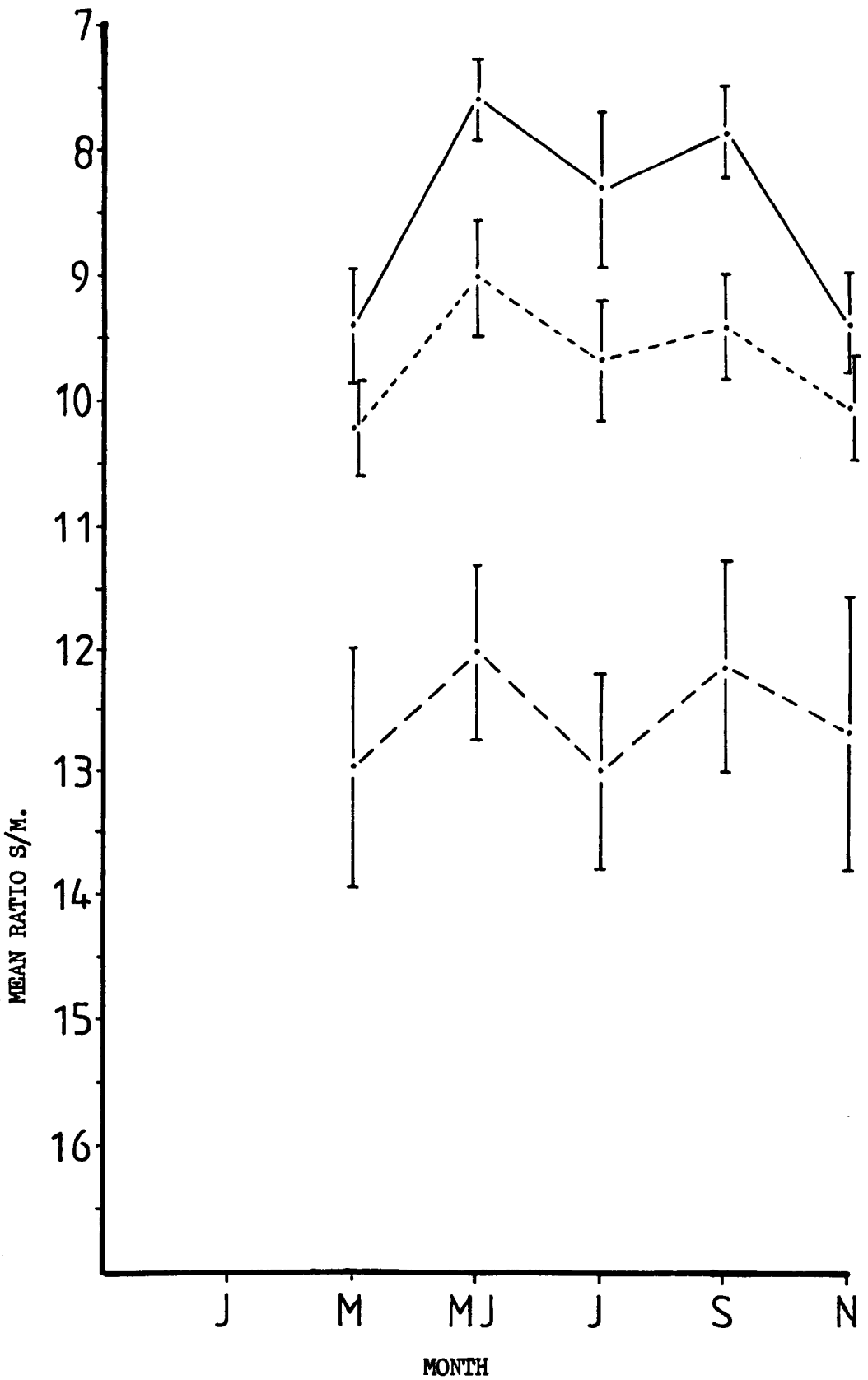


FIGURE 22 : VARIATION IN ASH- FREE DRY WEIGHT OF A STANDARD LIMPET (36mm SHELL LENGTH) FROM LOW WATER DURING 1966 AT ROBIN HOOD'S BAY.

After Blackmore 1969b.

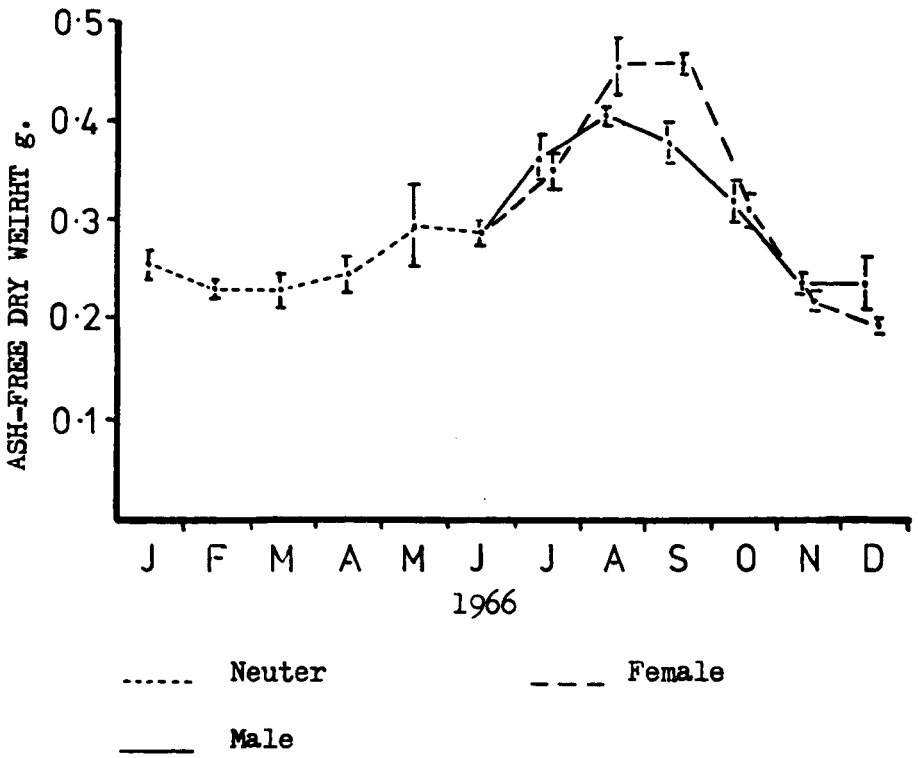
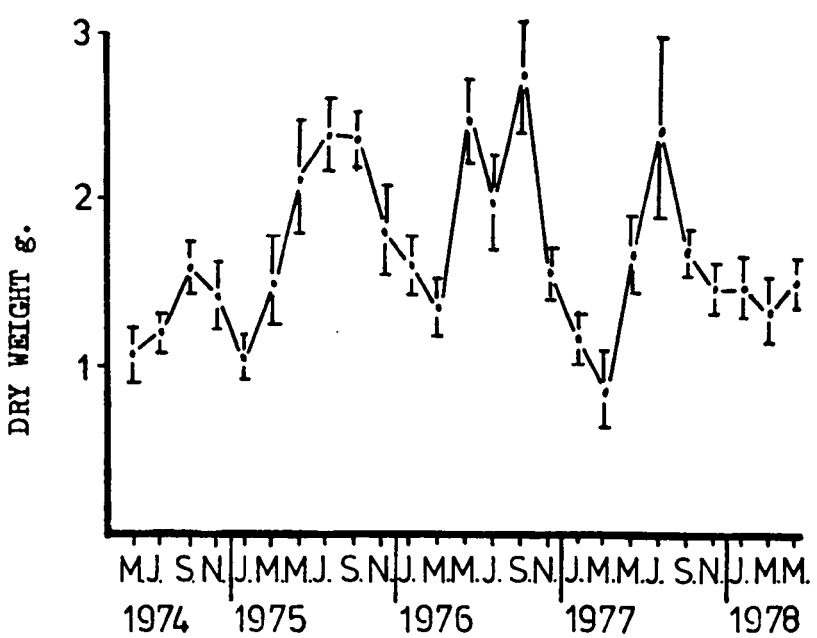


FIGURE 23 : VARIATION IN DRY MEAT WEIGHT OF A STANDARD LIMPET (50 mm SHELL LENGTH) FROM LOW WATER DURING 1974 TO 1975 AT EASTHAVEN, TAYSIDE.

After Jones et al 1979.



(In both figures vertical bars represent standard error.)

FIGURE 24 : MEAN RATIO S/M PER MONTH IN ORONSAY LOW SHORE PERIWINKLES.

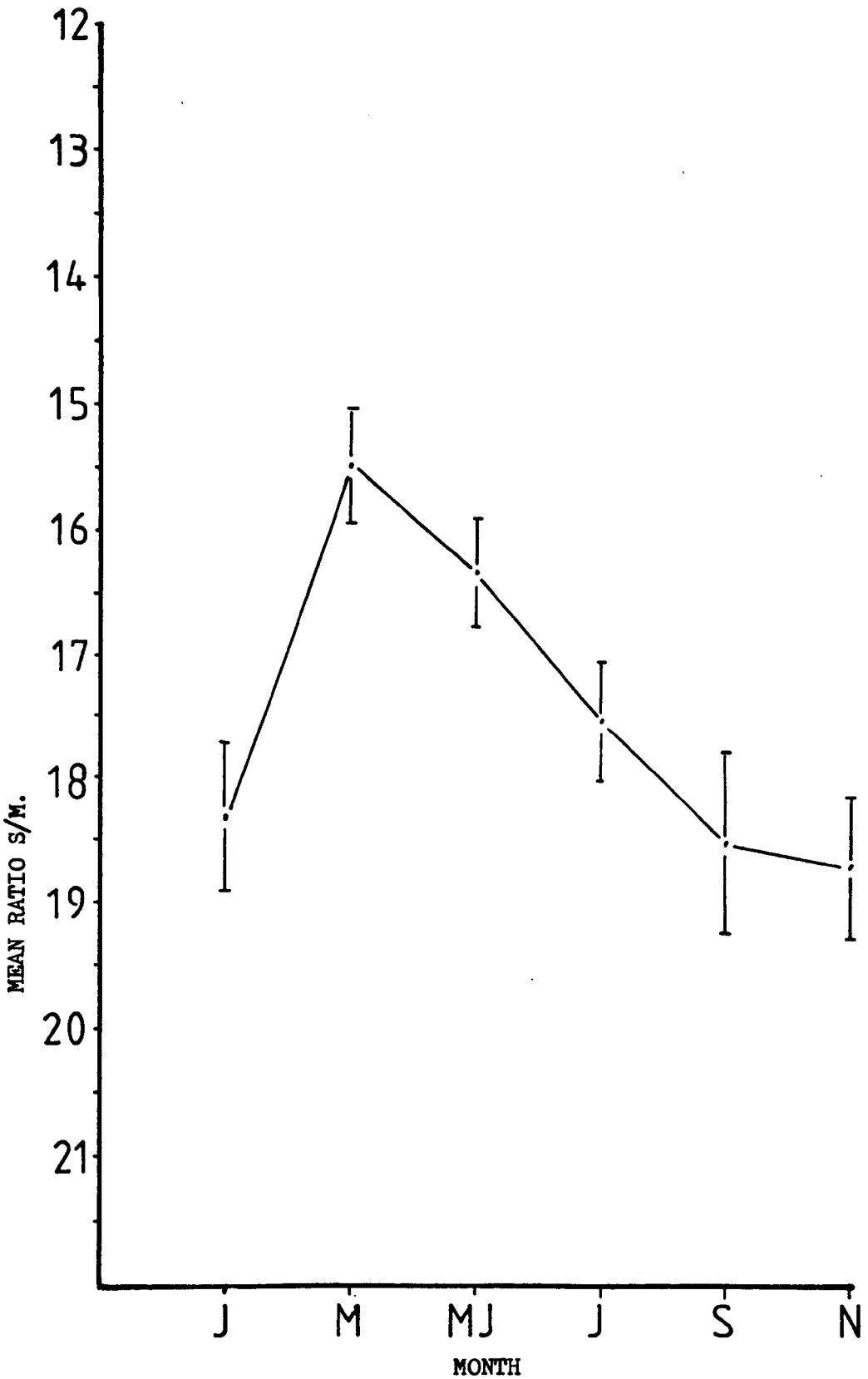


FIGURE 25 : MEAN RATIO S/M PER MONTH IN ORONSAY HIGH SHORE PERIWINKLES.

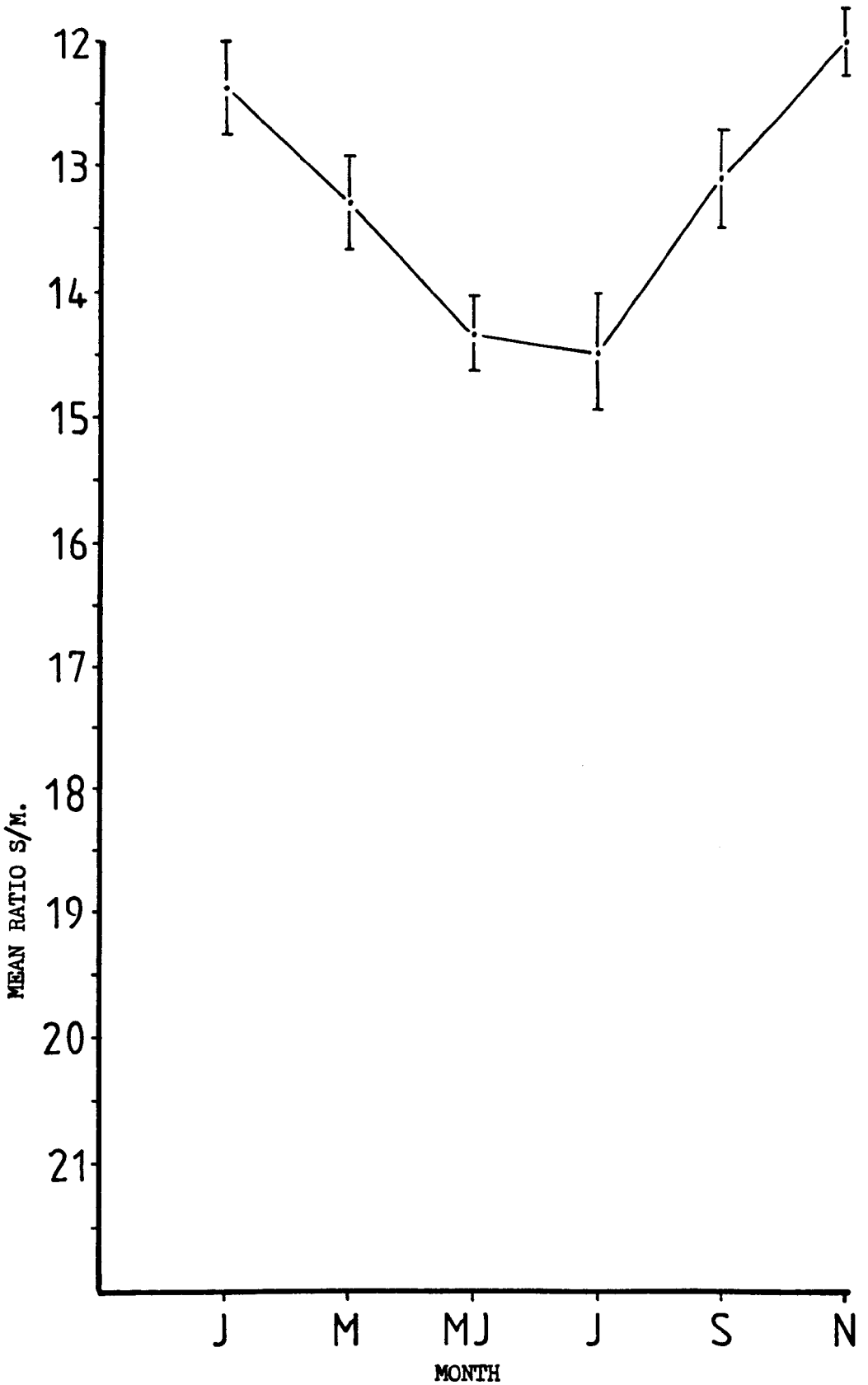


FIGURE 26 : MEAN RATIO S/M PER MONTH IN COLONSAY PERIWINKLES.

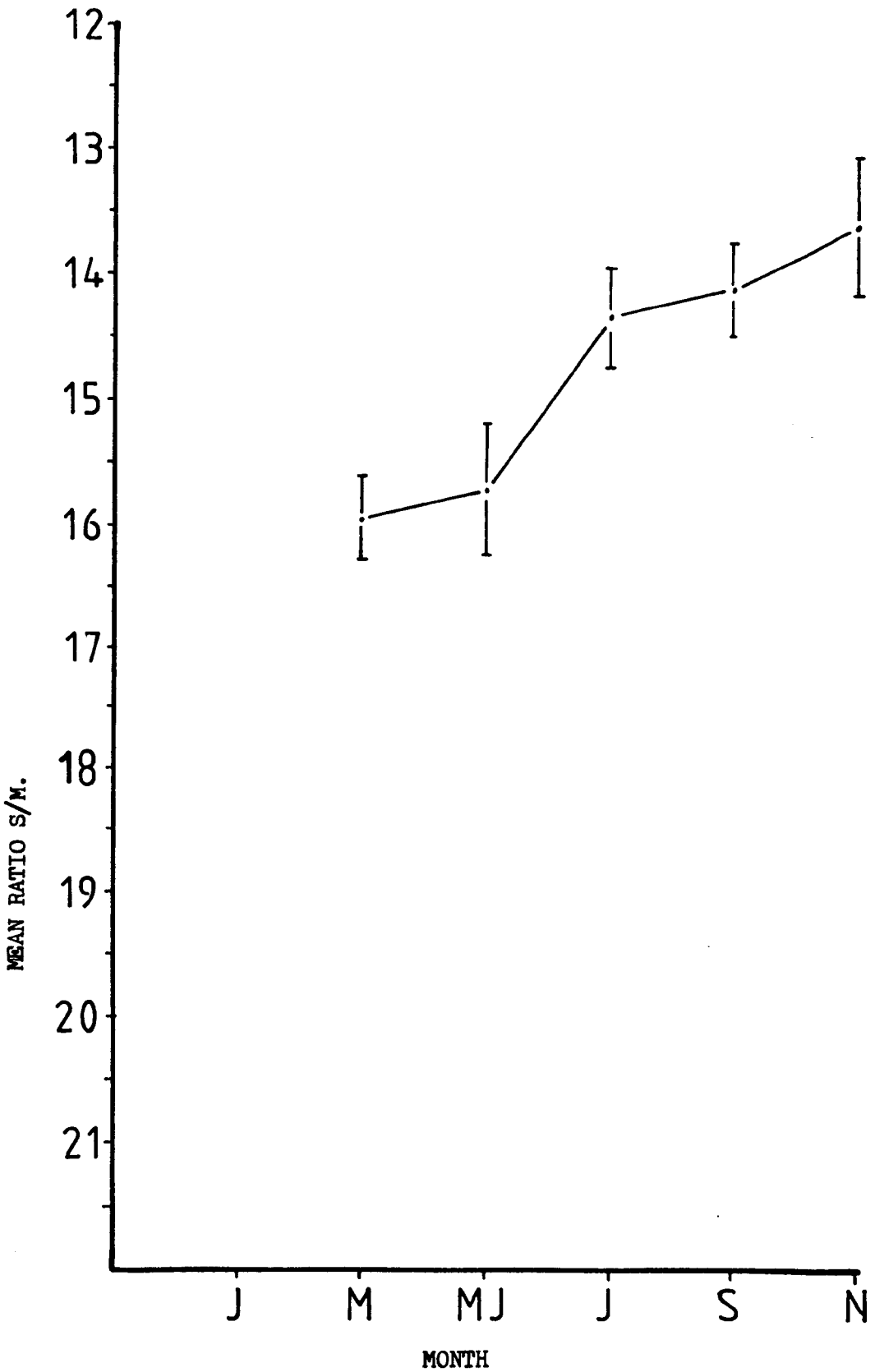


FIGURE 27 : MEAN RATIO S/M PER MONTH FOR SMALL AND LARGE ORONSAY LOW SHORE PERIWINKLES.

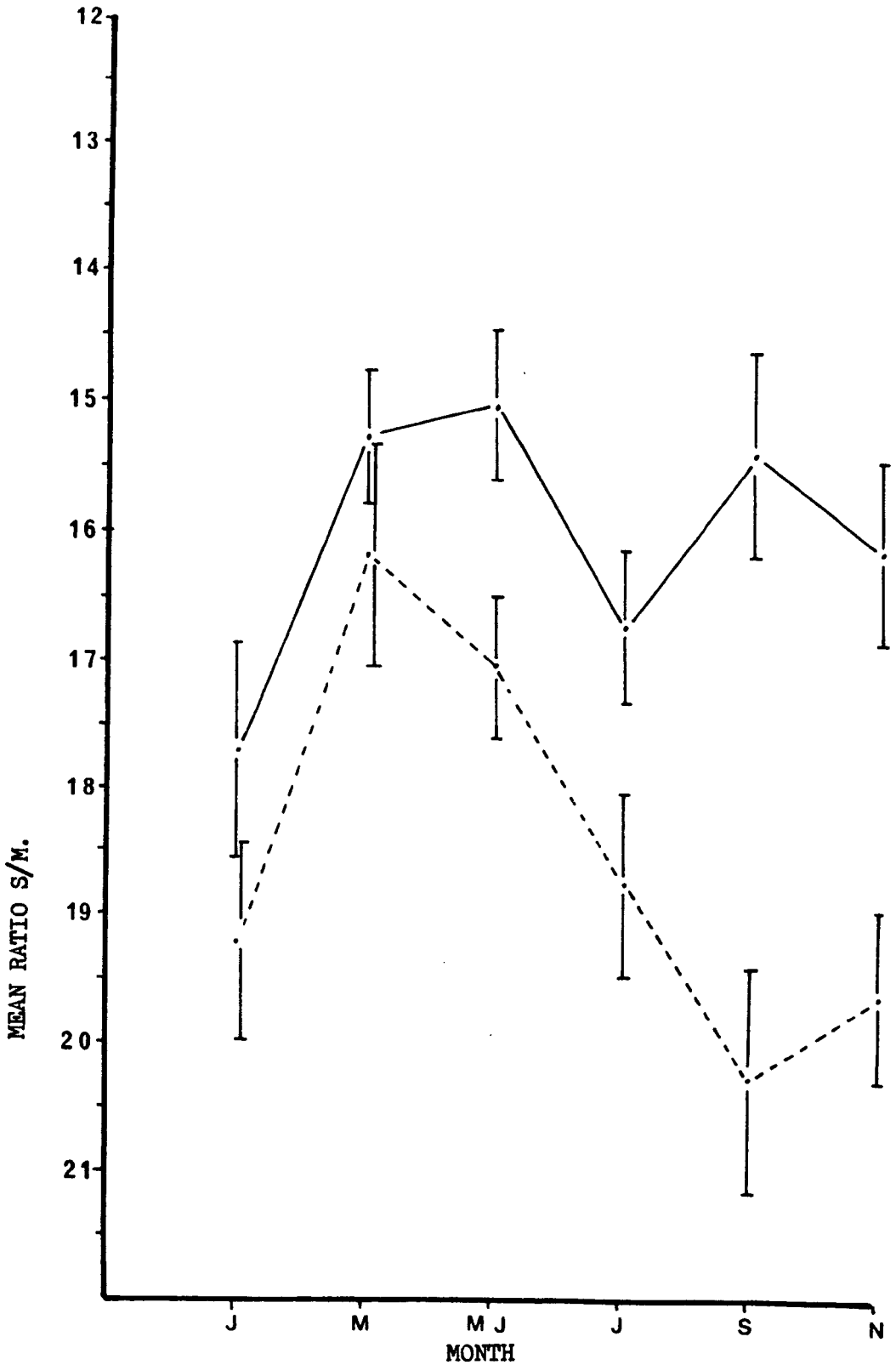


FIGURE 28 : MEAN RATIO S/M PER MONTH FOR SMALL AND LARGE ORONSAY HIGH SHORE PERIWINKLES.

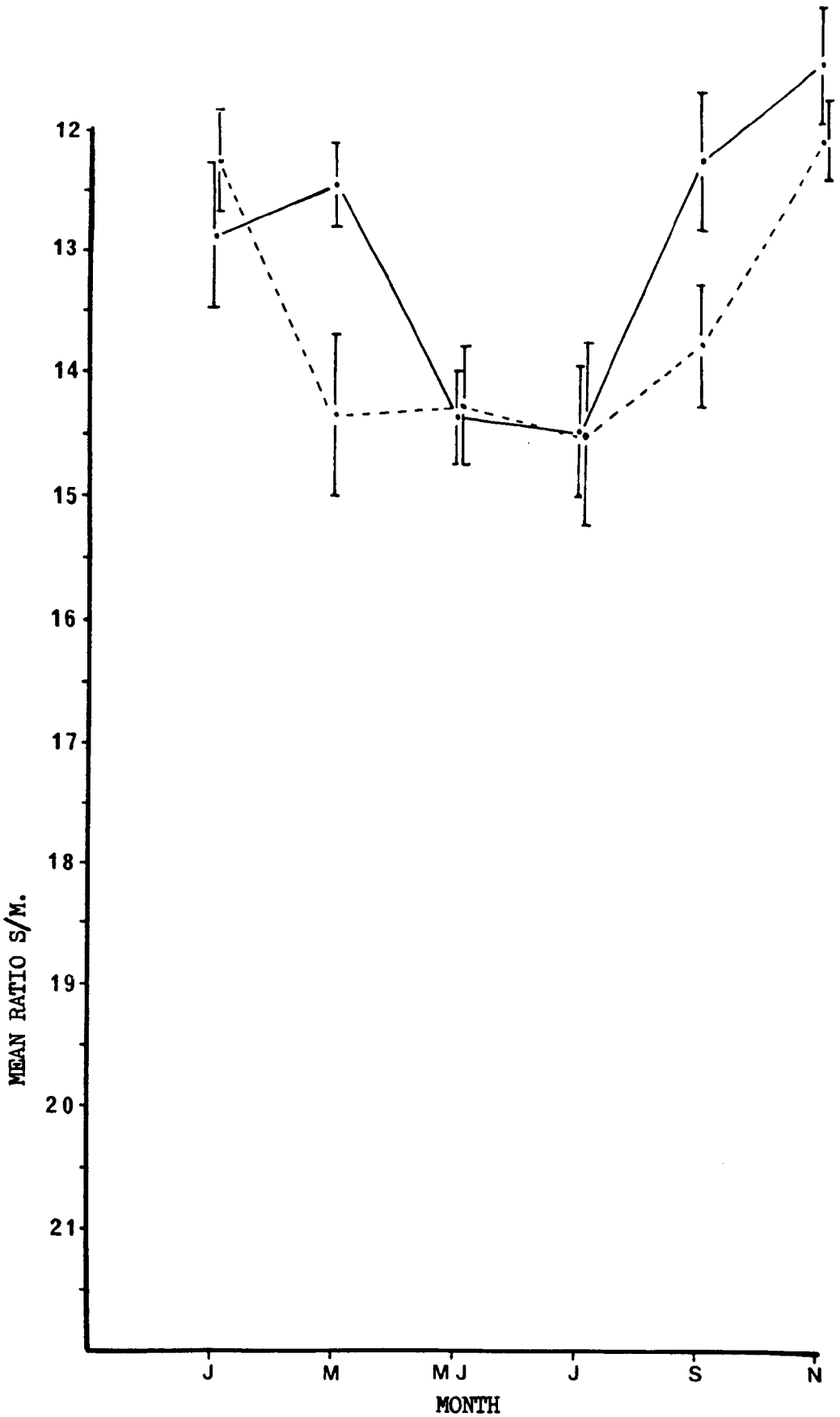


FIGURE 29 : MEAN RATIO S/M PER MONTH FOR SMALL AND LARGE COLONSAY PERIWINKLES.

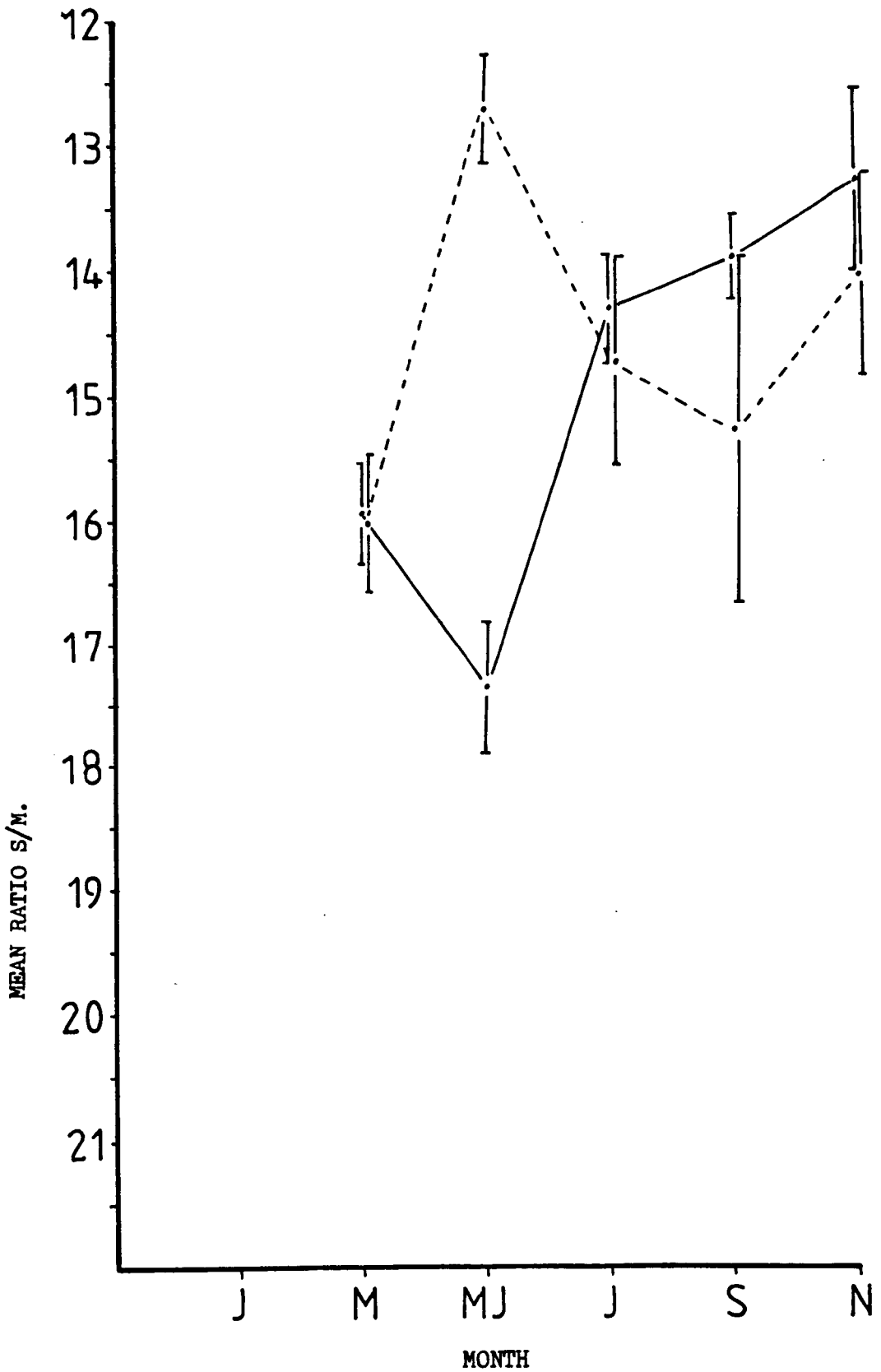
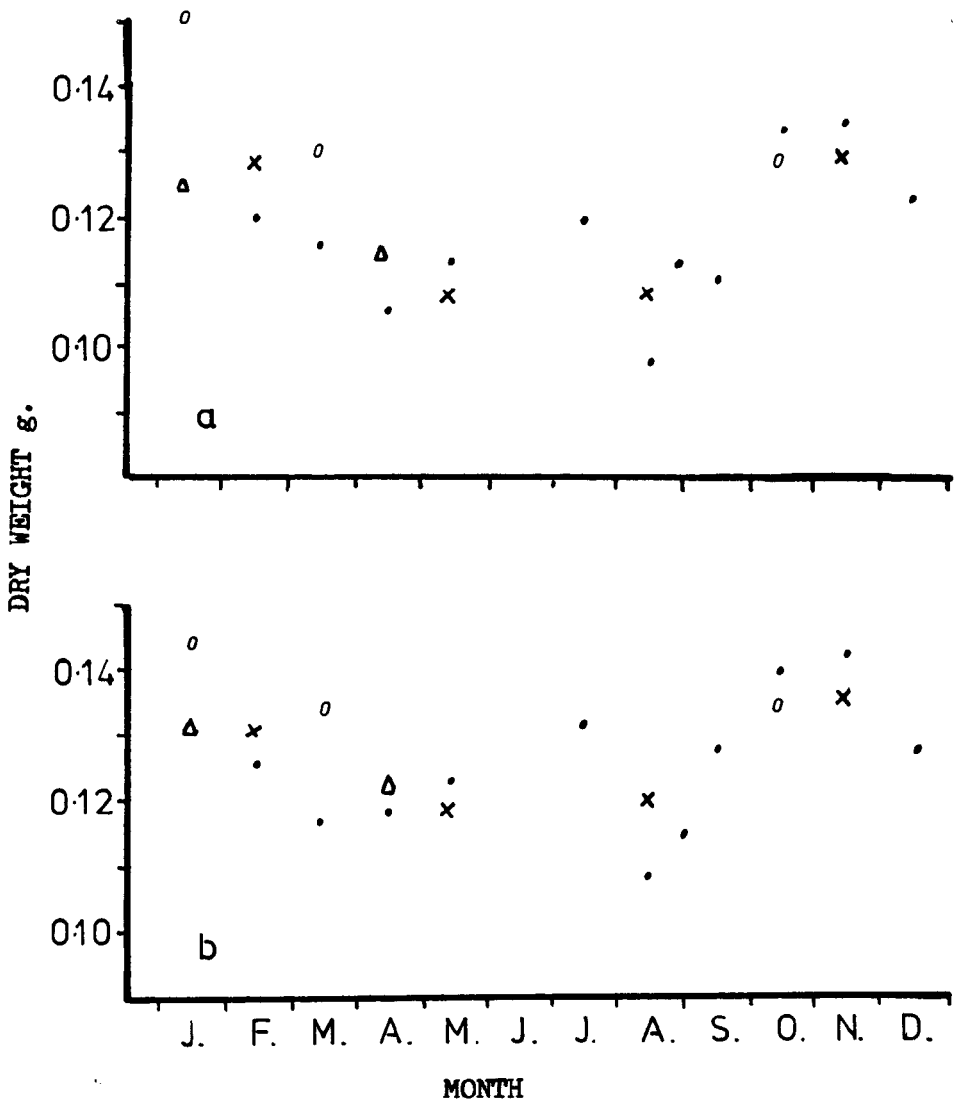


FIGURE 30 : SEASONAL VARIATION IN DRY BODY WEIGHT OF A STANDARD PERIWINKLE (20mm SHELL LENGTH) FROM ANGLESEY.

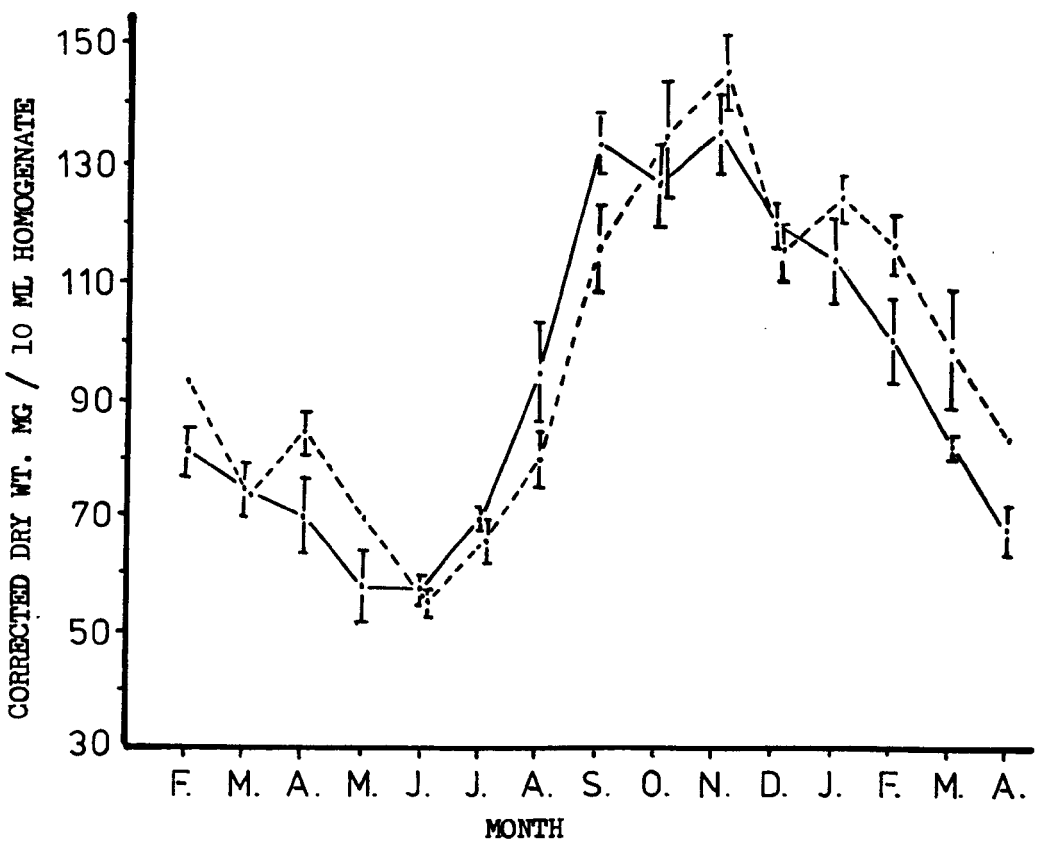
After Grahame 1973.



o 1967
• 1968
▲ 1969
x Seasonal mean

FIGURE 31 : MEAN DRY MEAT WEIGHT VALUES OF PERIWINKLES FROM ROBIN HOOD'S BAY (SIZE 20-25mm SHELL LENGTH).

After Williams 1970.



____ Males

\- - - - Females

Vertacal bars represent standard error. Corrected dry weight = dry weight less ash weight.

FIGURE 32 : MEAN RATIO S/M PER MONTH IN ORONSAY LOW SHORE DOGWHELKS.

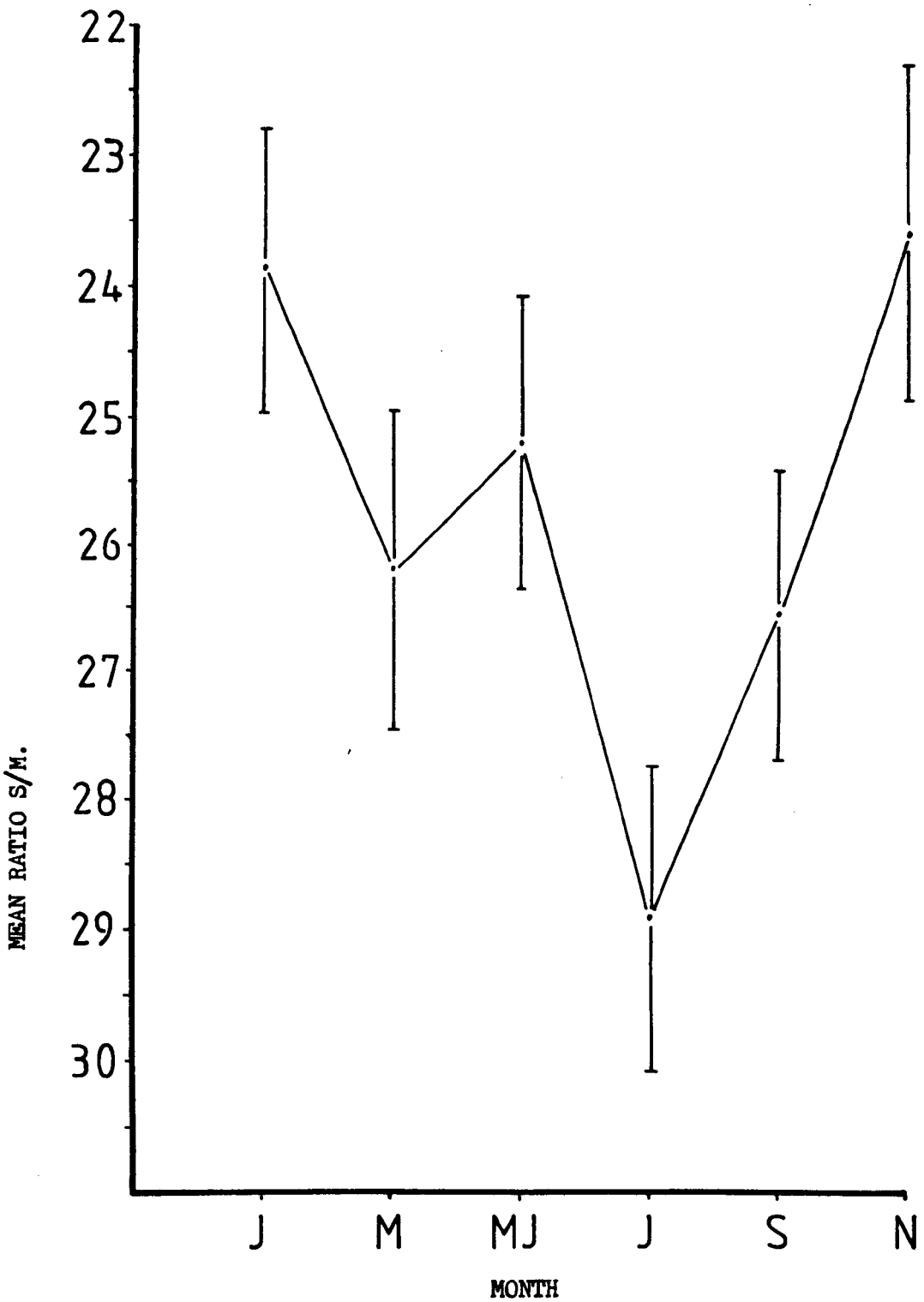


FIGURE 33 : MEAN RATIO S/M PER MONTH IN ORONSAY HIGH SHORE DOGWHELKS.

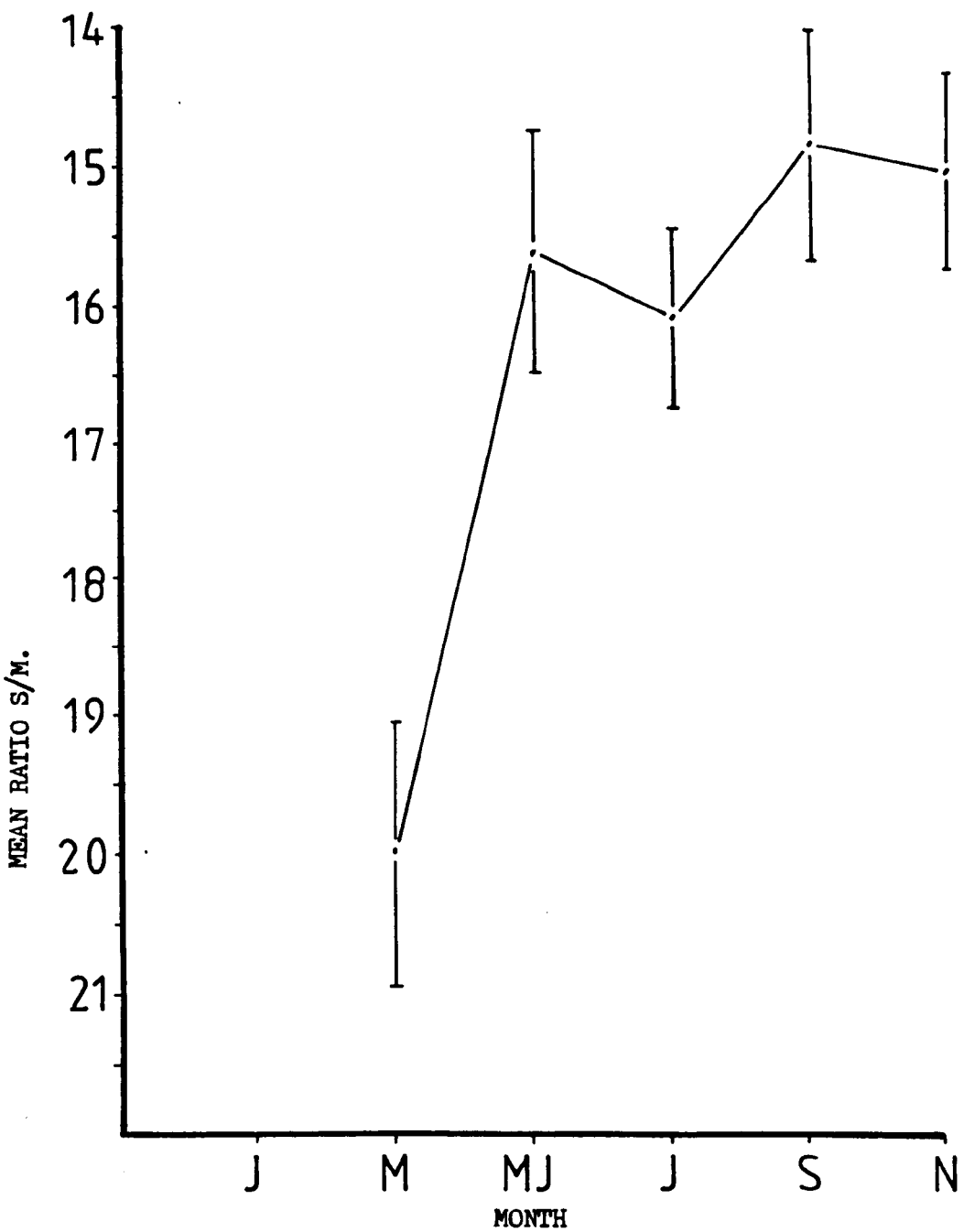


FIGURE 34 : MEAN RATIO S/M PER MONTH IN COLONSAY LOW SHORE DOGWHELKS.

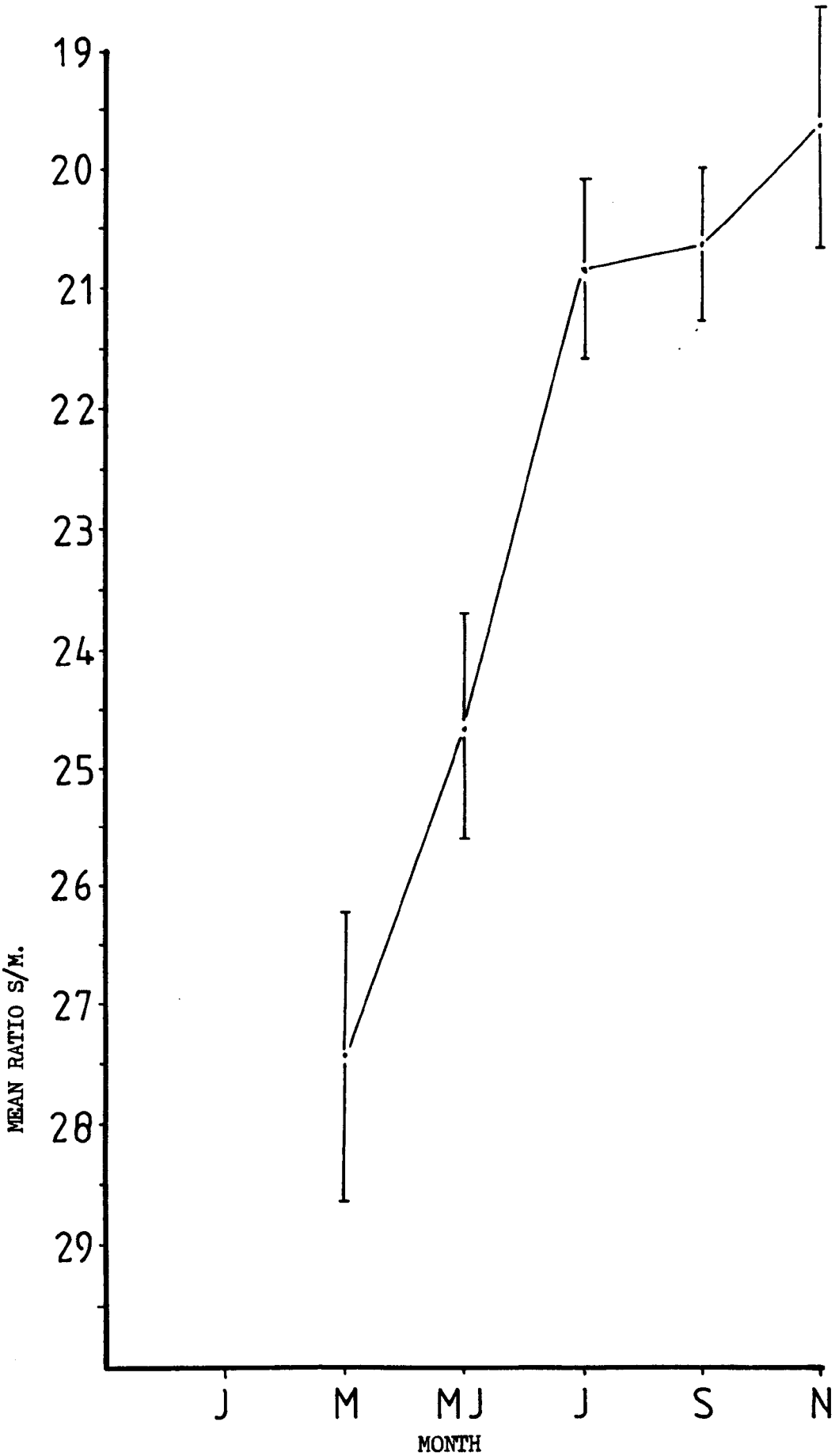


FIGURE 35 : MEAN RATIO S/M PER MONTH FOR SMALL AND LARGE ORONSAY LOW SHORE DOGWHELKS.

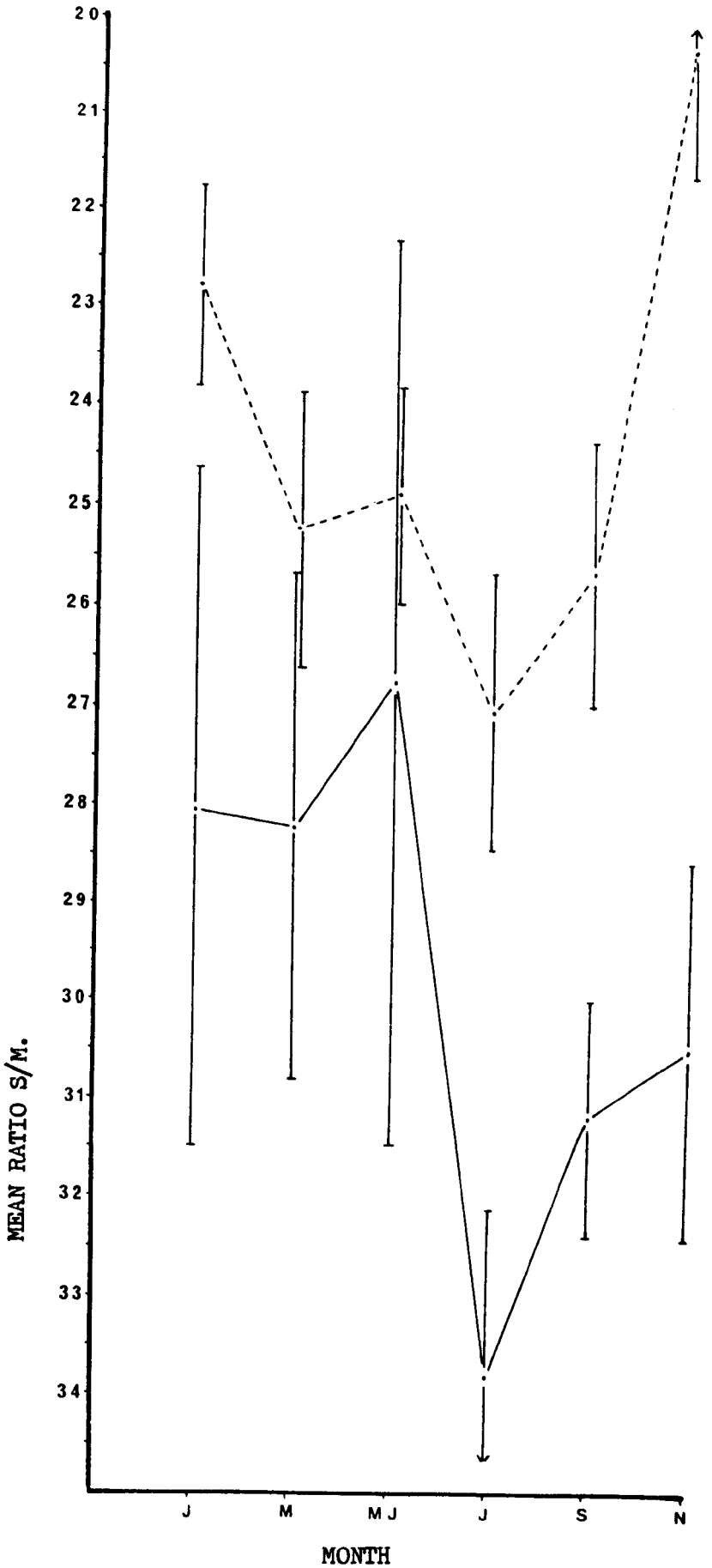


FIGURE 36 : MEAN RATIO S/M PER MONTH FOR SMALL AND LARGE ORONSAY HIGH SHORE DOGWHELKS.

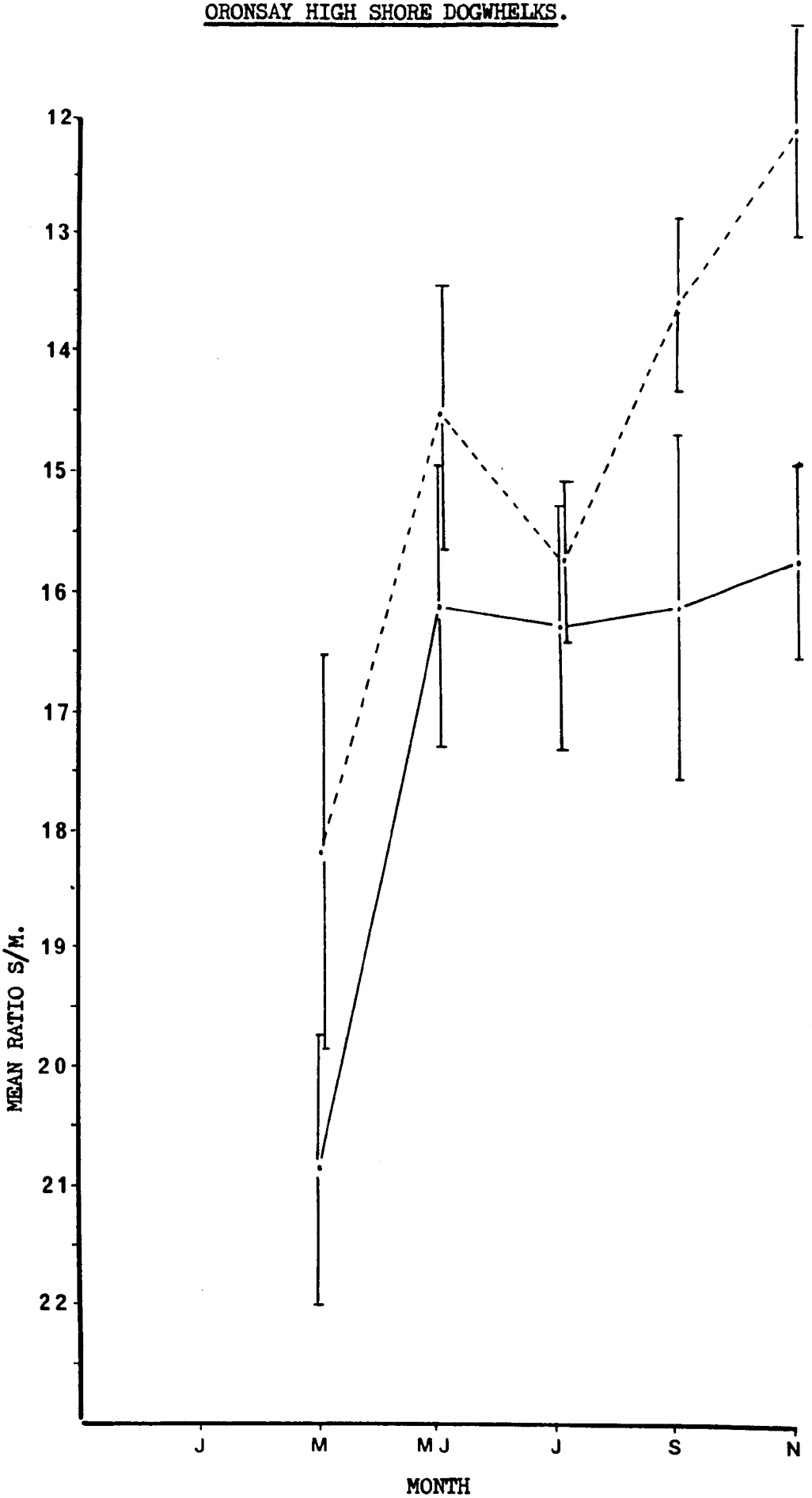


FIGURE 37 : MEAN RATIO S/M PER MONTH FOR SMALL AND LARGE COLONSAY LOW SHORE DOGWHELKS.

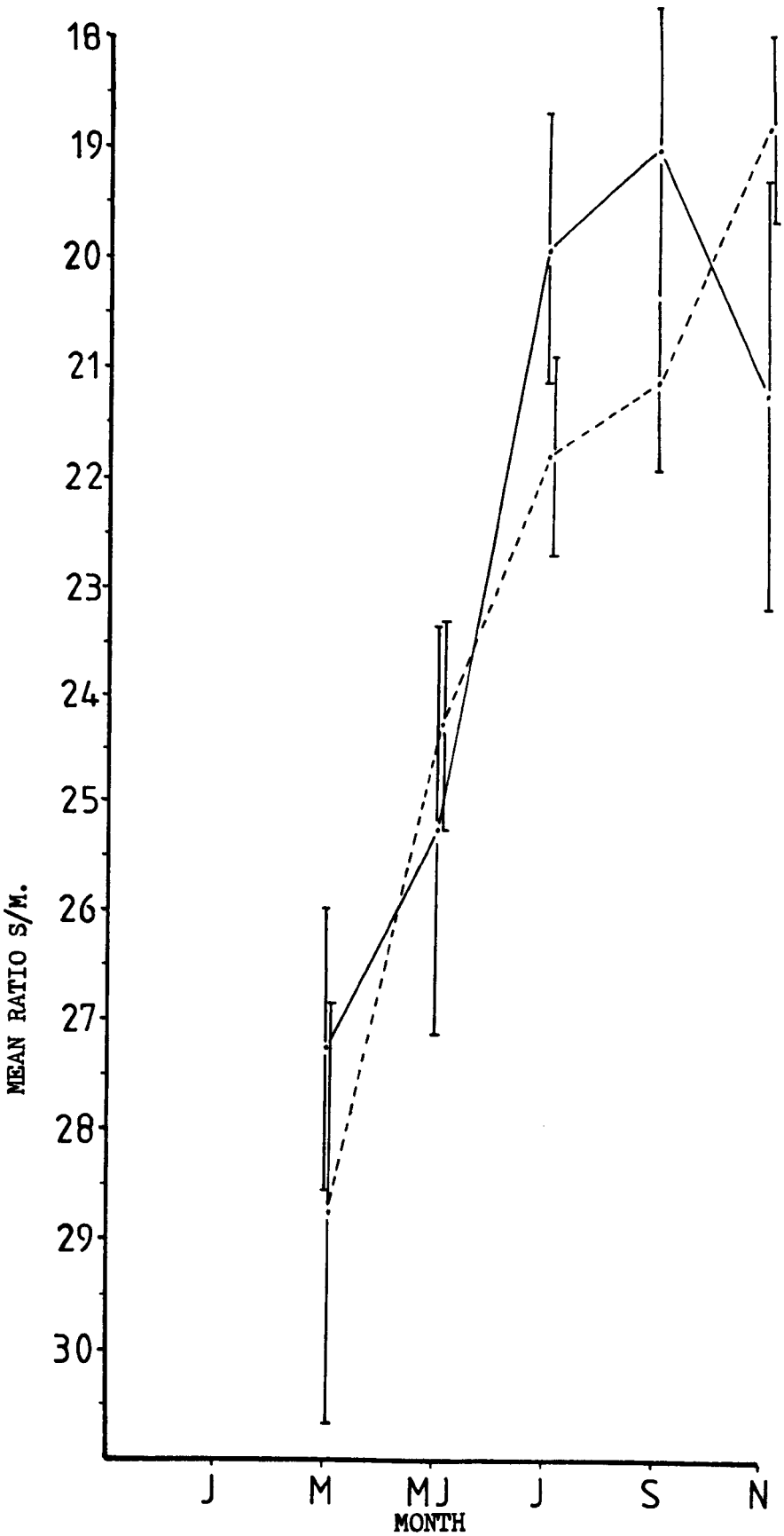


FIGURE 38 : MEAN DRY MEAT WEIGHT PER MONTH FOR ORONSAY LOW SHORE DOGWHELKS.

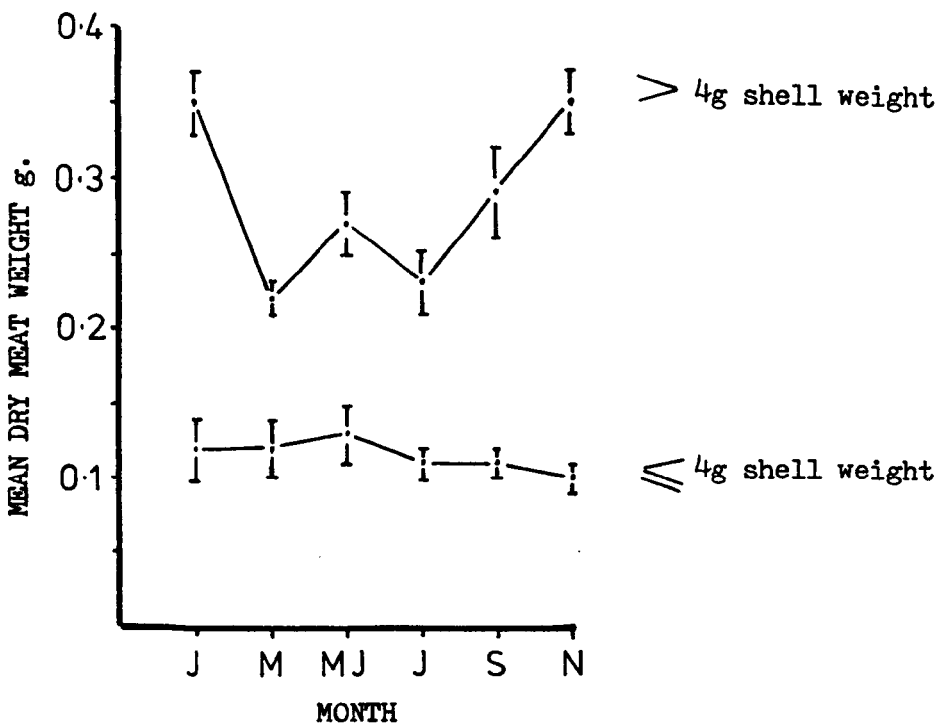


FIGURE 39 : MEAN DRY MEAT WEIGHT PER MONTH FOR ORONSAY HIGH SHORE DOGWHELKS.

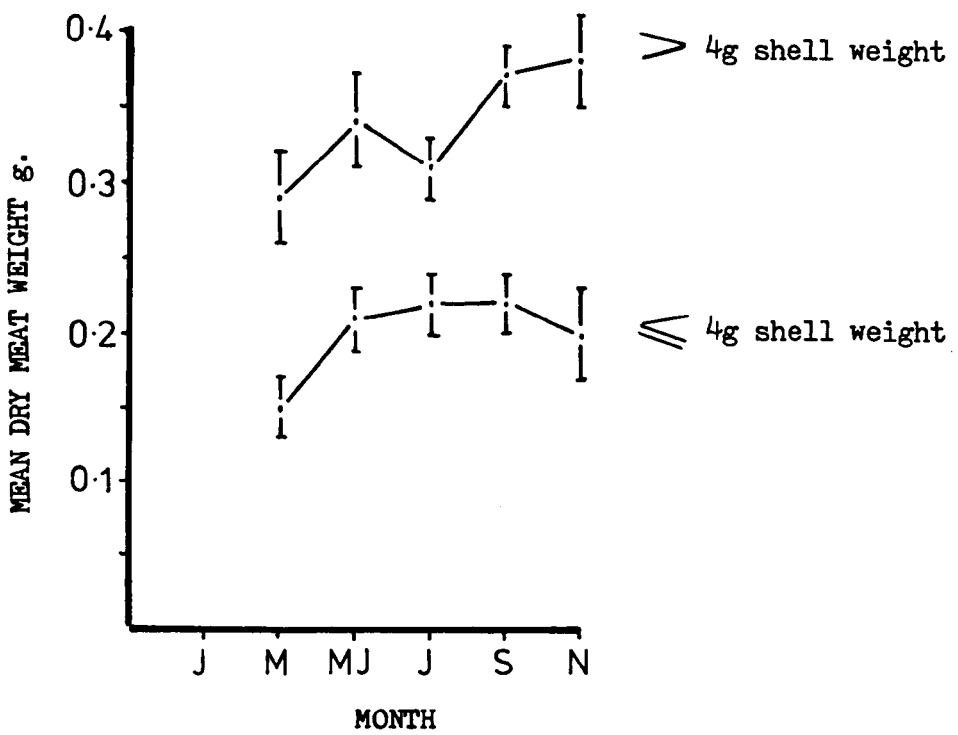


FIGURE 40 : MEAN DRY MEAT WEIGHT PER MONTH FOR COLONSAY LOW SHORE DOGWHELKS.

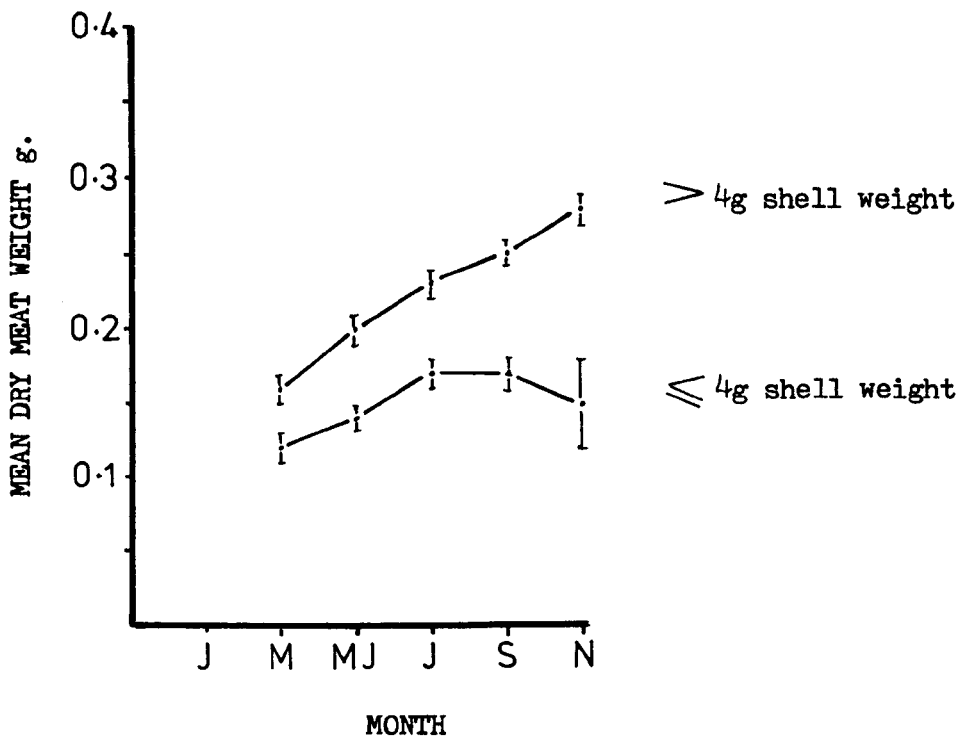


FIGURE 41 : SEASONAL VARIATION IN DRY MEAT WEIGHT OF A STANDARD DOGWHELK (25.5mm shell length) FROM YEALM.

After Moore 1938a.

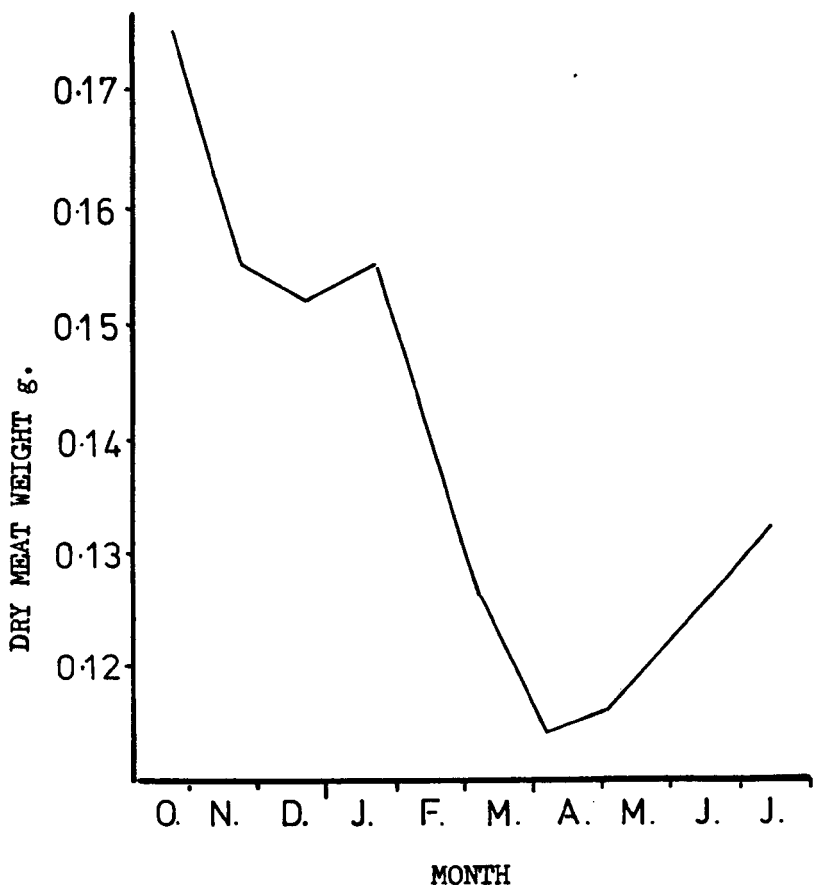


FIGURE 42 : SEASONAL VARIATION IN POLYSACCHARIDE, LIPID AND PROTEIN NITROGEN CONTENT OF LIMPETS IN ROBIN HOOD'S BAY.(All refer to standard animals of 36mm shell length). After Blackmore 1969b.

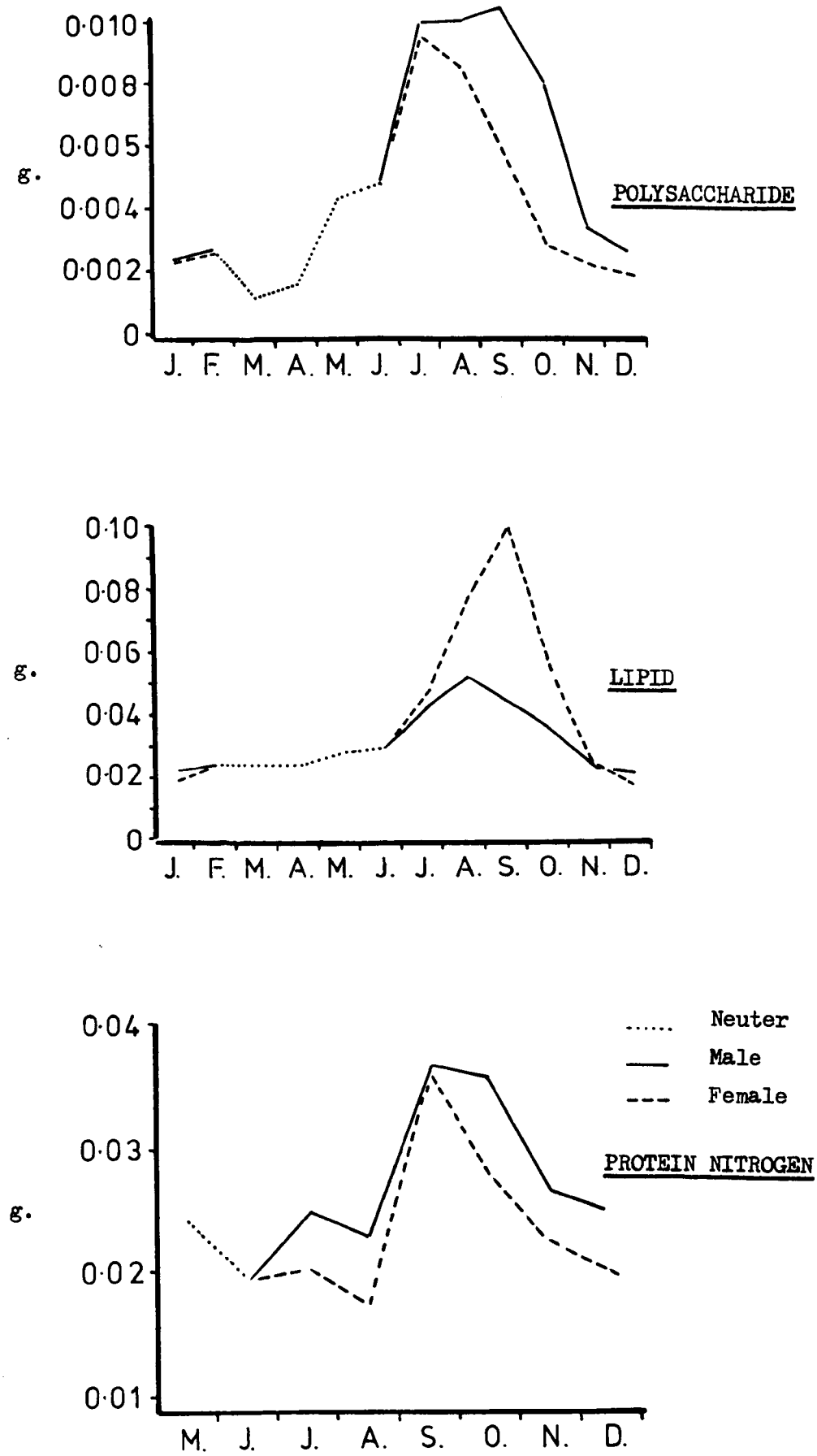
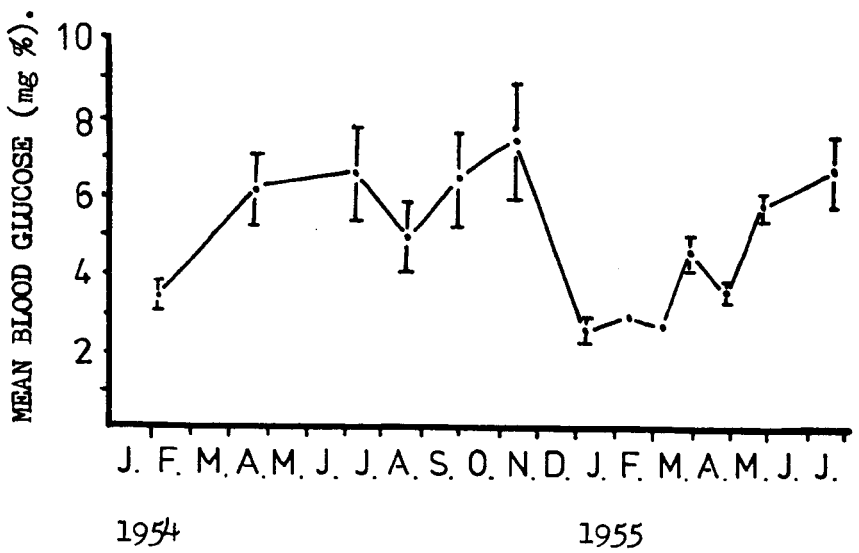


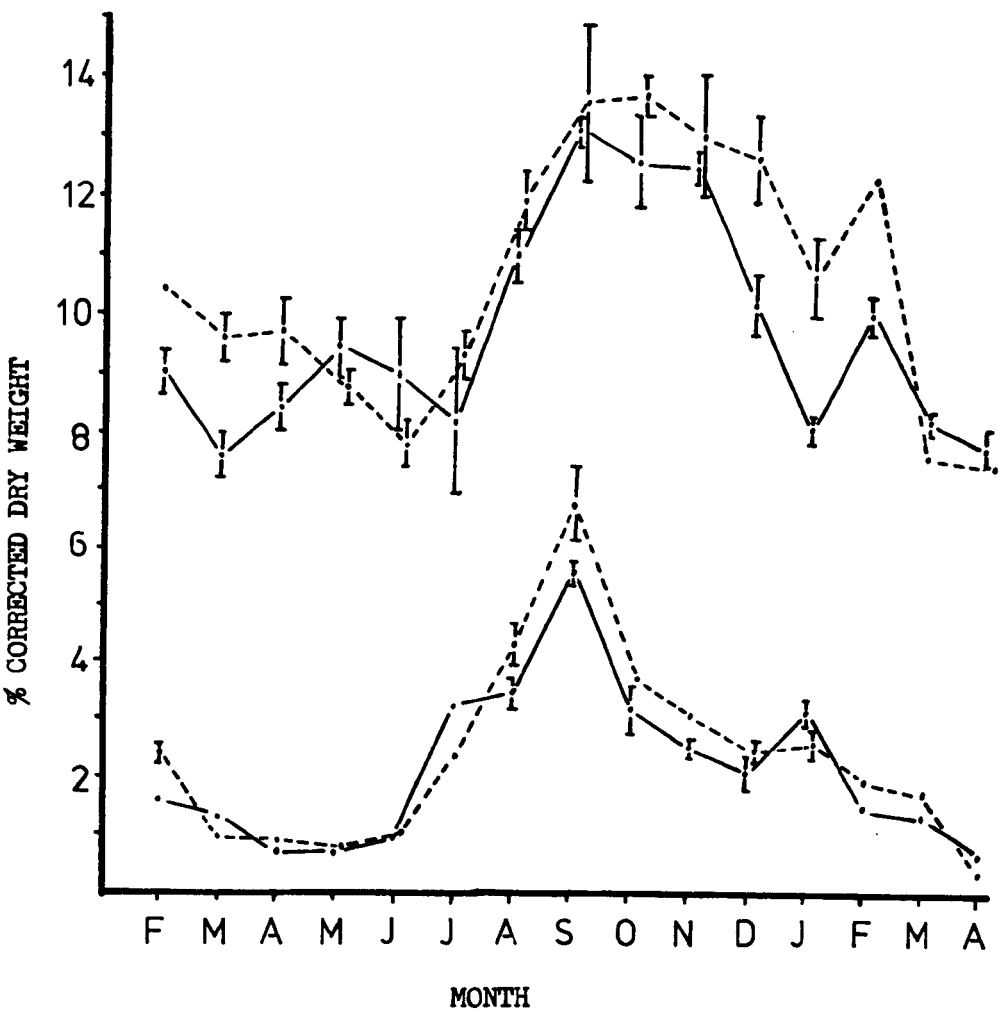
FIGURE 43 : SEASONAL VARIATION IN MEAN BLOOD GLUCOSE CONCENTRATION OF LIMPETS FROM SWANAGE.
After Barry and Munday 1959.



Vertical bars represent standard error.

FIGURE 44 : SEASONAL VARIATION IN MEAN LIPID AND CARBOHYDRATE LEVELS OF LOW TIDE PERIWINKLES OF BETWEEN 20 AND 25mm SHELL LENGTH FROM ROBIN HOOD'S BAY.

After Williams 1970.



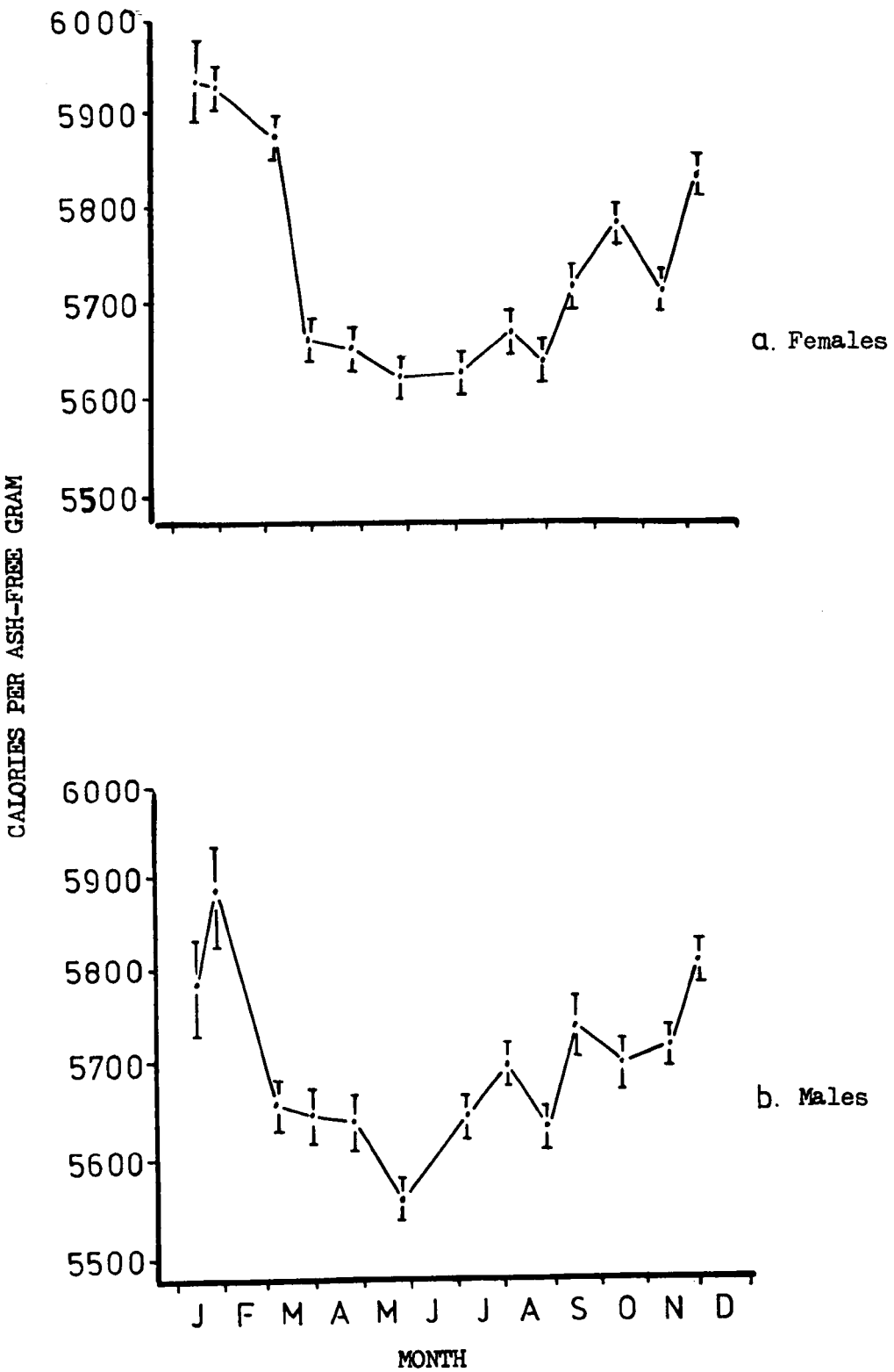
____ Males

\- - - - - Females

Vertical bars represent standard error. All results expressed as a % of dry weight less ash weight.

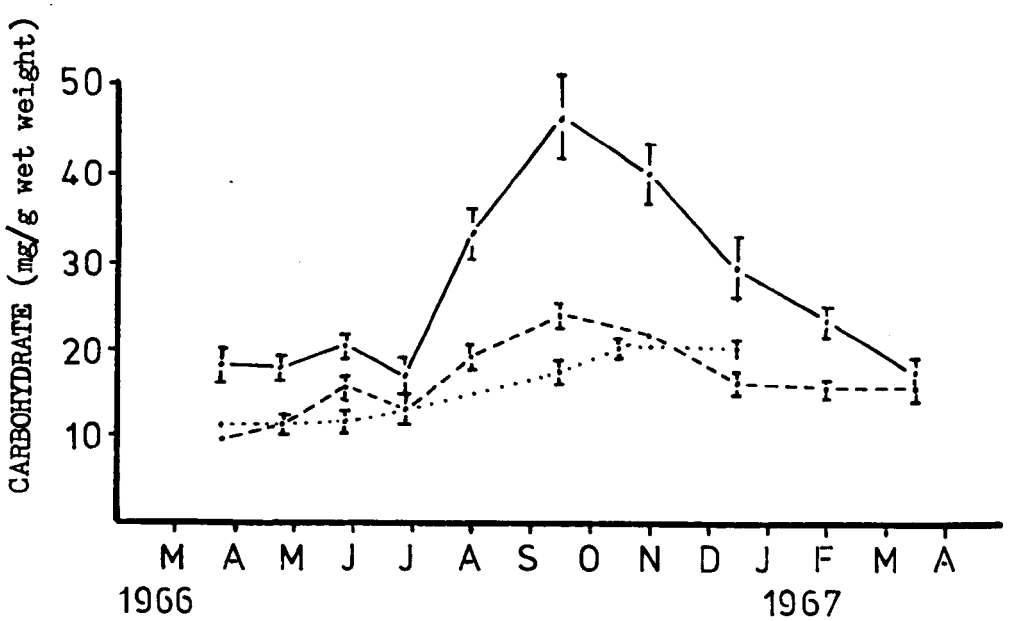
FIGURE 45 : SEASONAL VARIATION IN CALORIES PER ASH-FREE GRAM OF PERIWINKLE TISSUE FROM ANGLESEY.

After Grahame 1973.



Vertical bars represent standard error.

FIGURE 46 : THE MEAN LEVEL OF TOTAL CARBOHYDRATE STORED IN THE DIGESTIVE GLAND OF DOGWHELKS FROM THREE FEEDING LOCALITIES IN THE HUMBER ESTUARY. After Morgan 1971.



_____ Cockle feeders

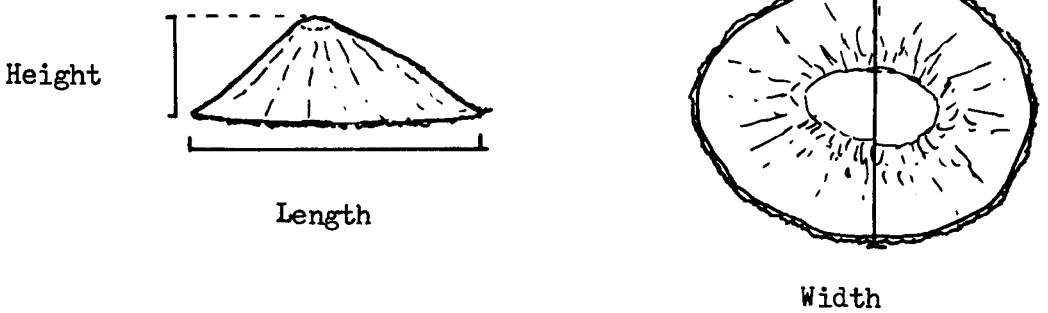
..... Barnacle feeders

_ _ _ Barnacle feeders

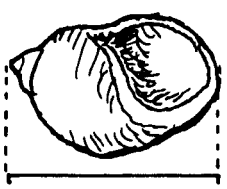
Vertical bars represent standard error

FIGURE 47 : MEASUREMENTS TAKEN ON LIMPETS, PERIWINKLES AND DOGWHELKS.

LIMPETS



PERIWINKLES



DOGWHELKS

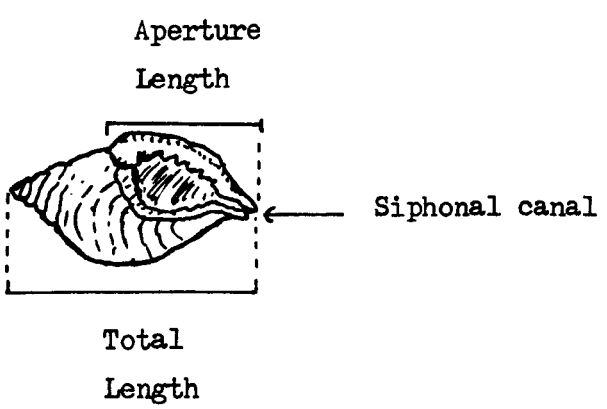
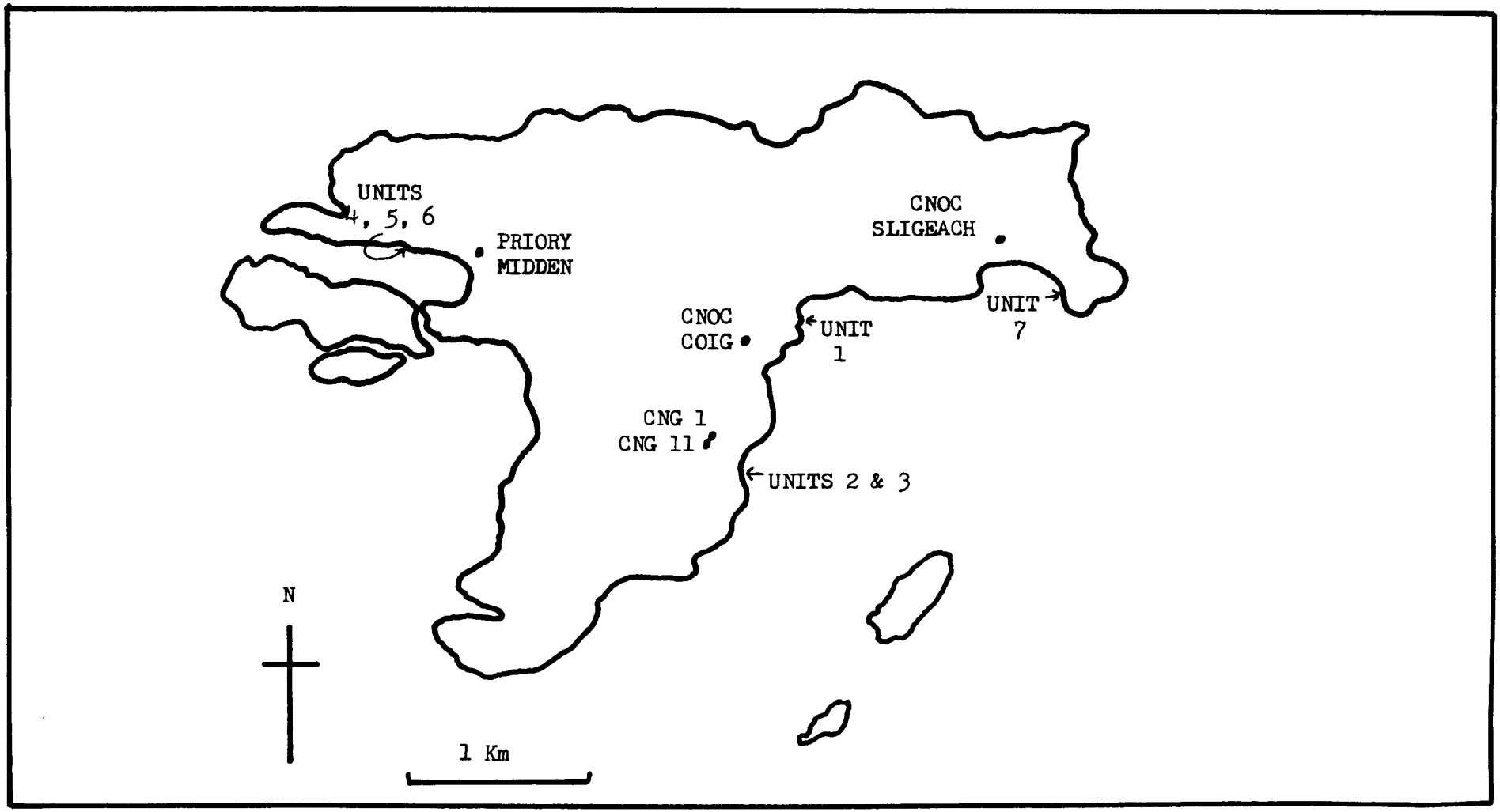


FIGURE 48 : MAP OF ORONSAY SHOWING SHELLFISH COLLECTION AREAS.



KEY TO FIGURES 49 TO 60

	SHELL LENGTH (mm)
1	19.0 - 21.9
2	22.0 - 24.9
3	25.0 - 27.9
4	28.0 - 30.9
5	31.0 - 33.9
6	34.0 - 36.9
7	37.0 - 39.9
8	40.0 - 42.9
9	43.0 - 45.9
10	46.0 - 48.9
11	above 49.0

FIGURE 49 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 1A

n = 190

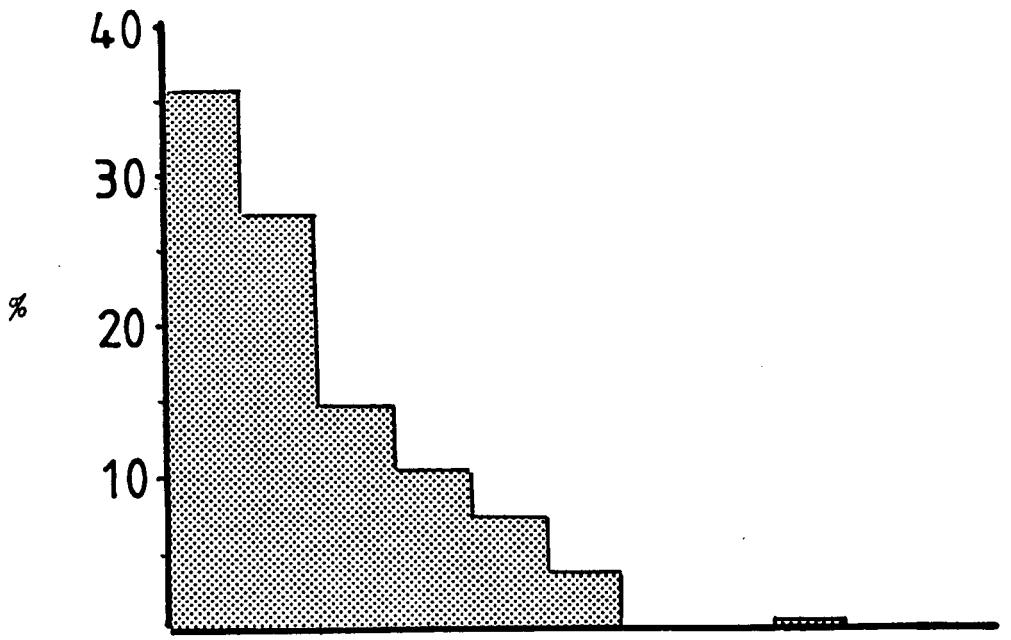


FIGURE 50 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 1B

n = 161

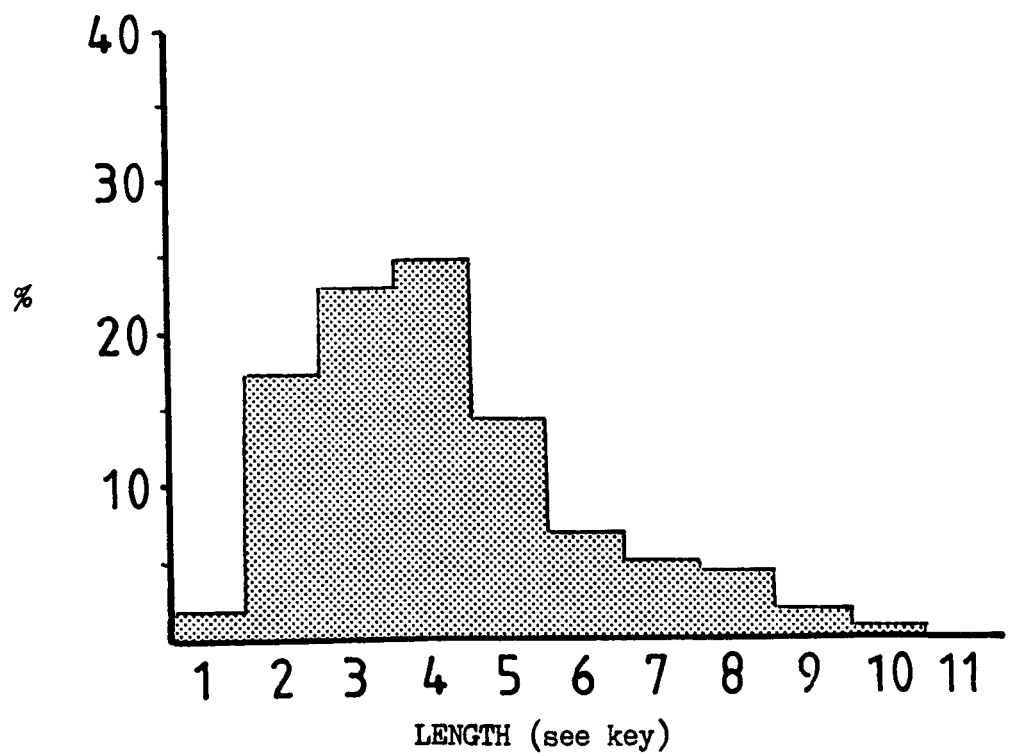


FIGURE 51 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 1B-C

n = 164

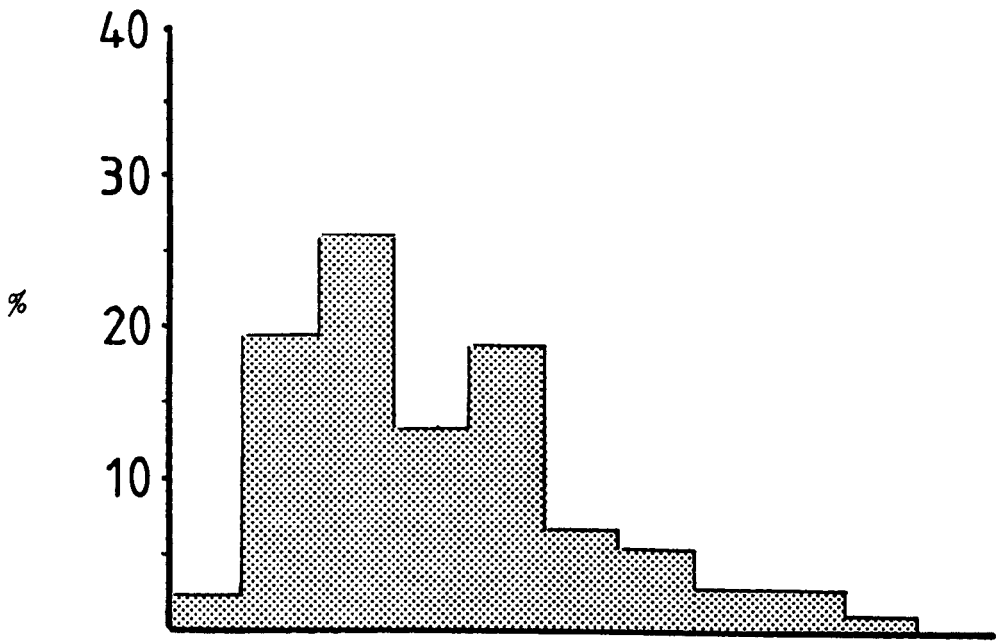


FIGURE 52 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 1C

n = 455

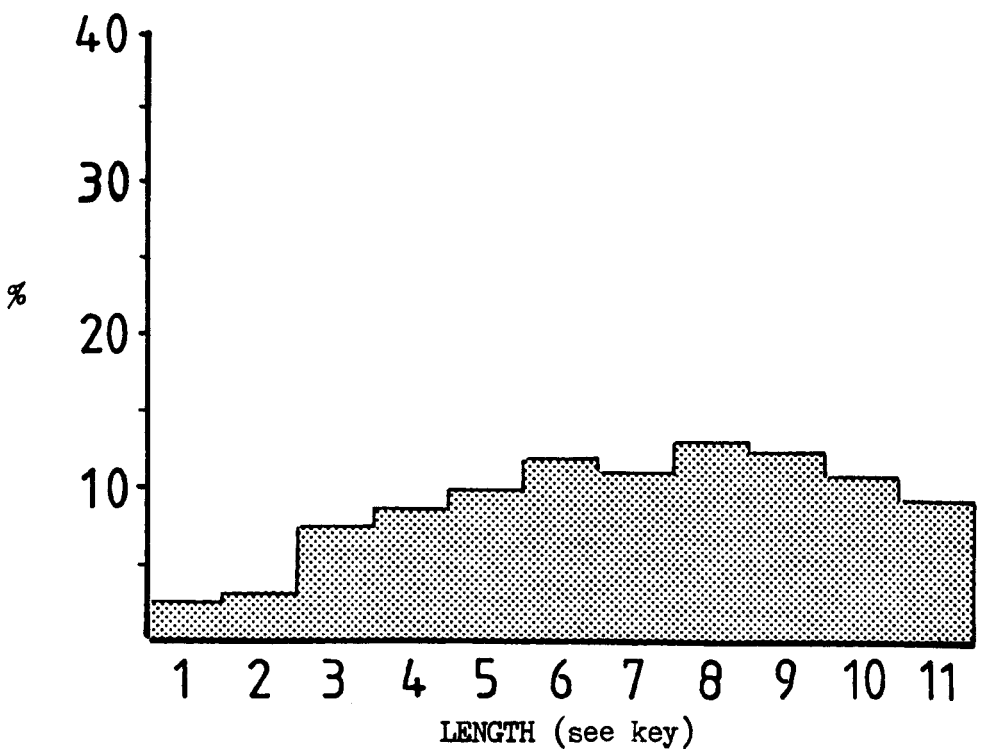


FIGURE 53 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 1C-1

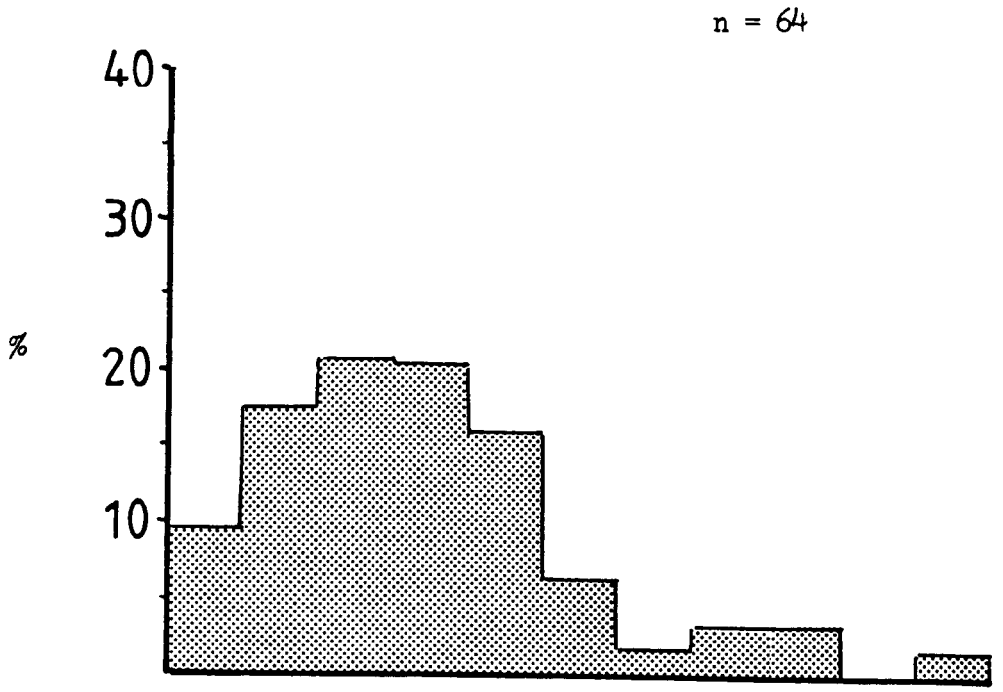


FIGURE 54 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 2

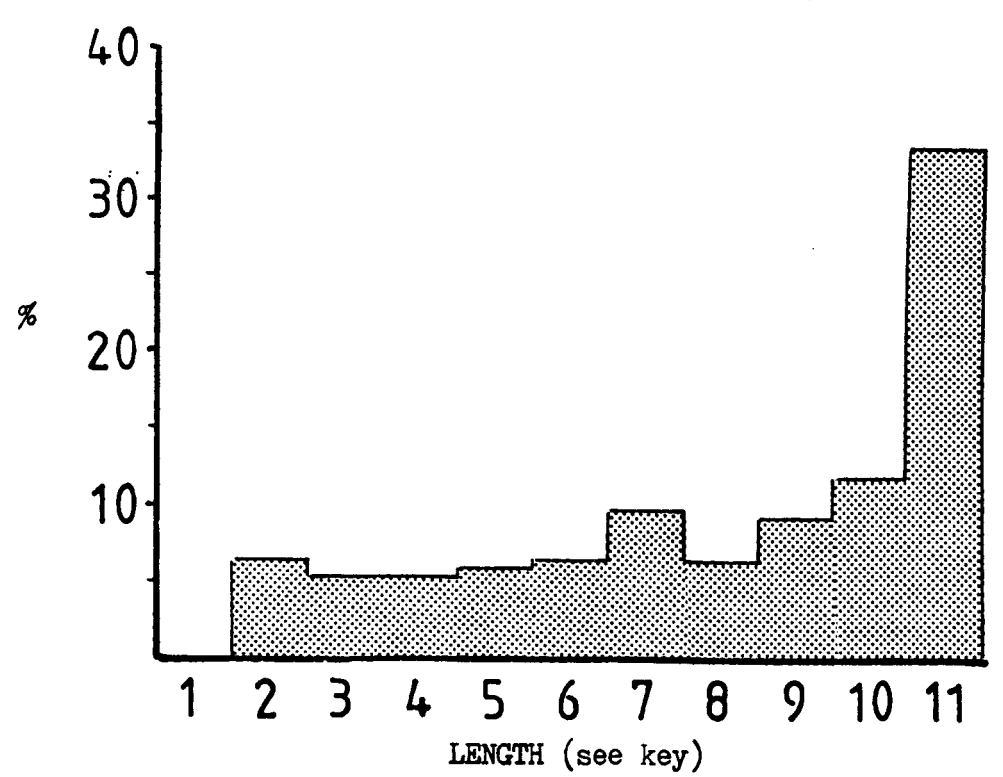


FIGURE 55 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 3

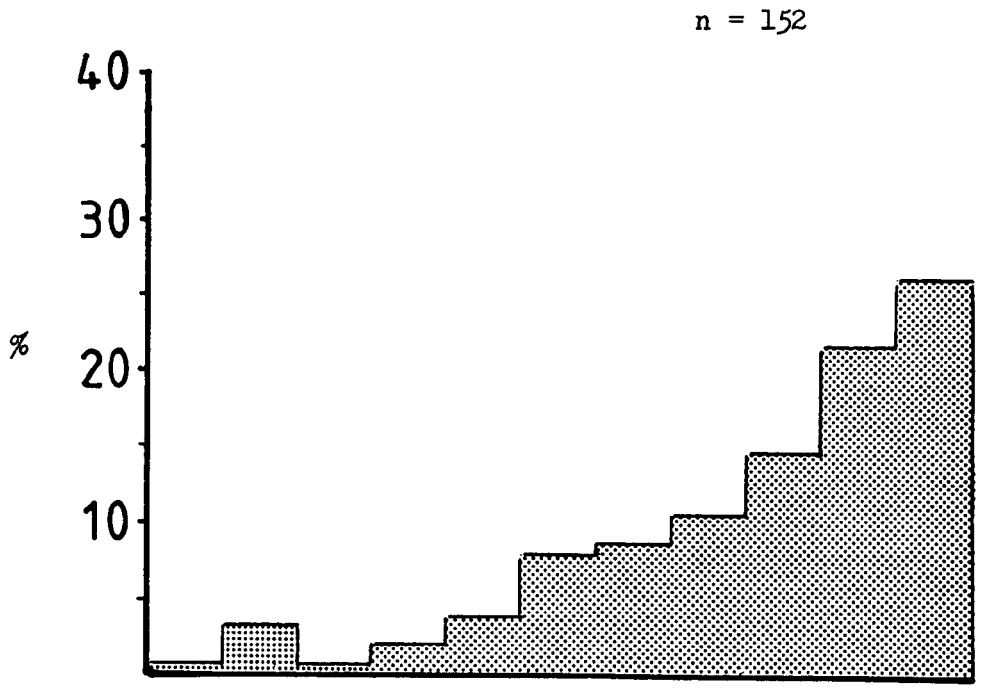


FIGURE 56 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 4

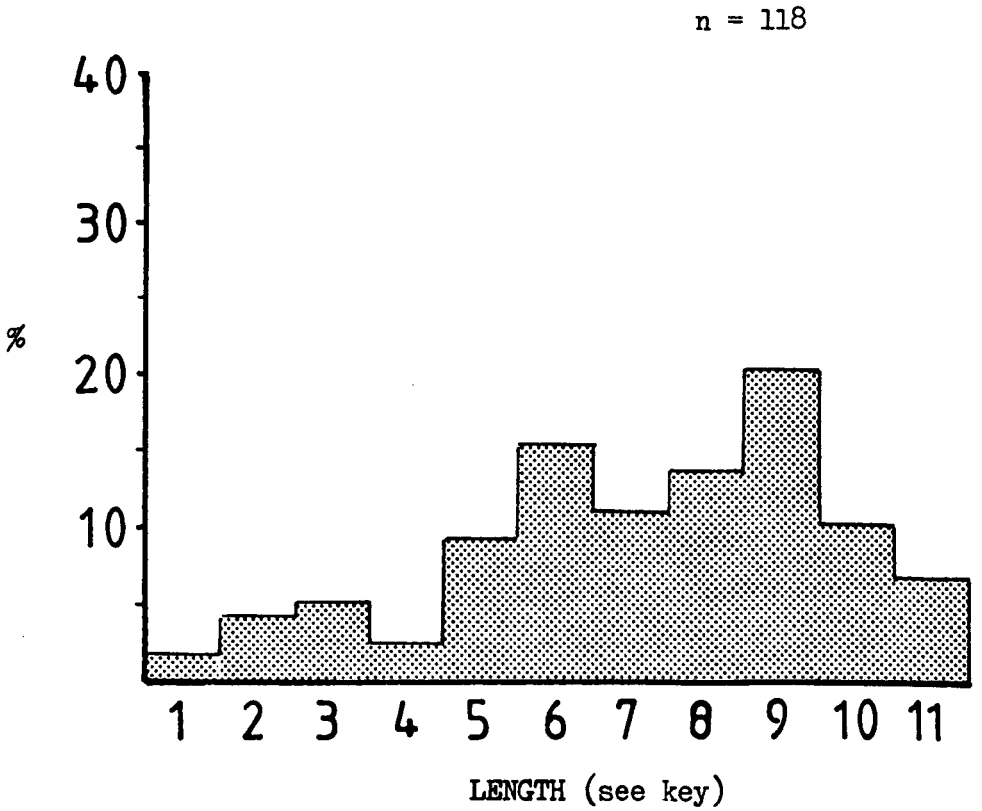


FIGURE 57 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 5

n = 137

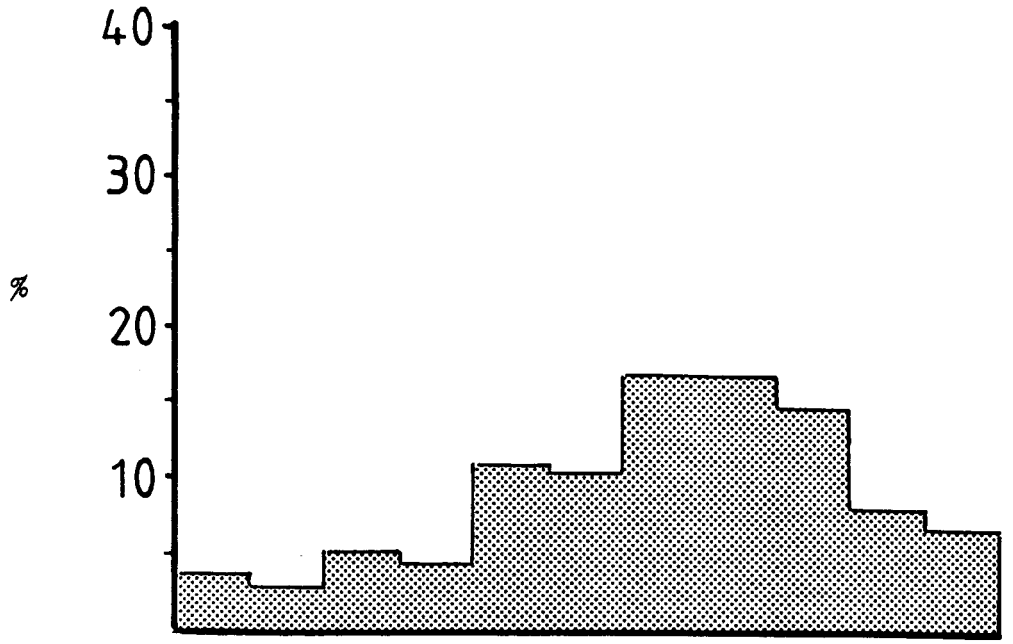


FIGURE 58 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 6

n = 163

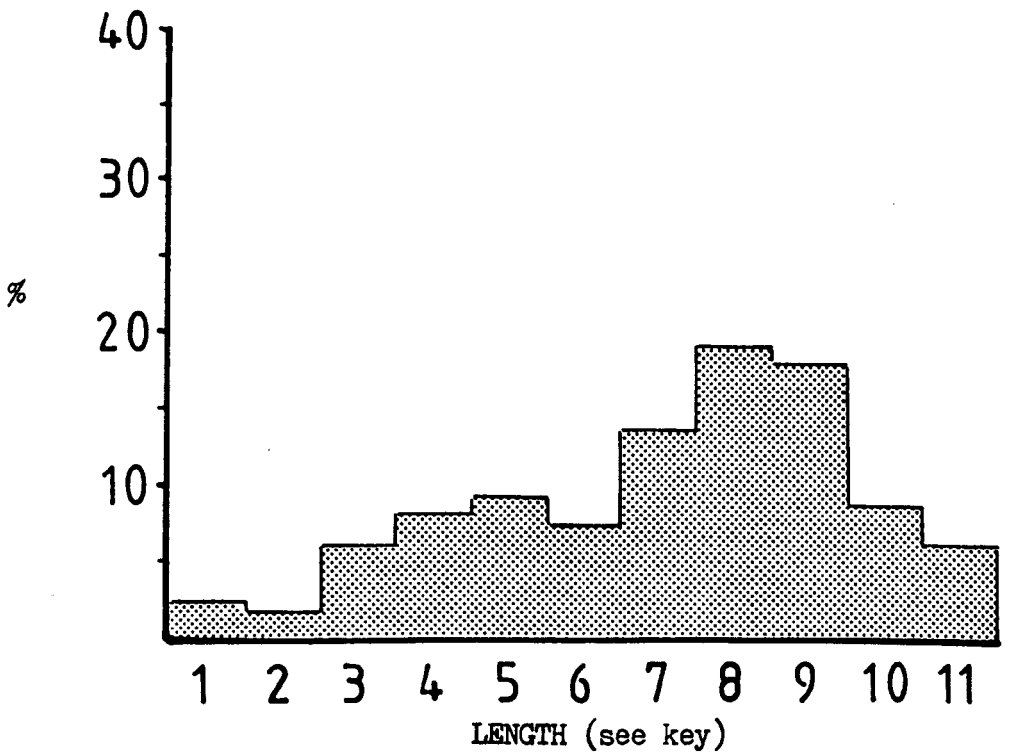


FIGURE 59 : LIMPET LENGTH DISTRIBUTIONS IN UNIT 7

n = 157

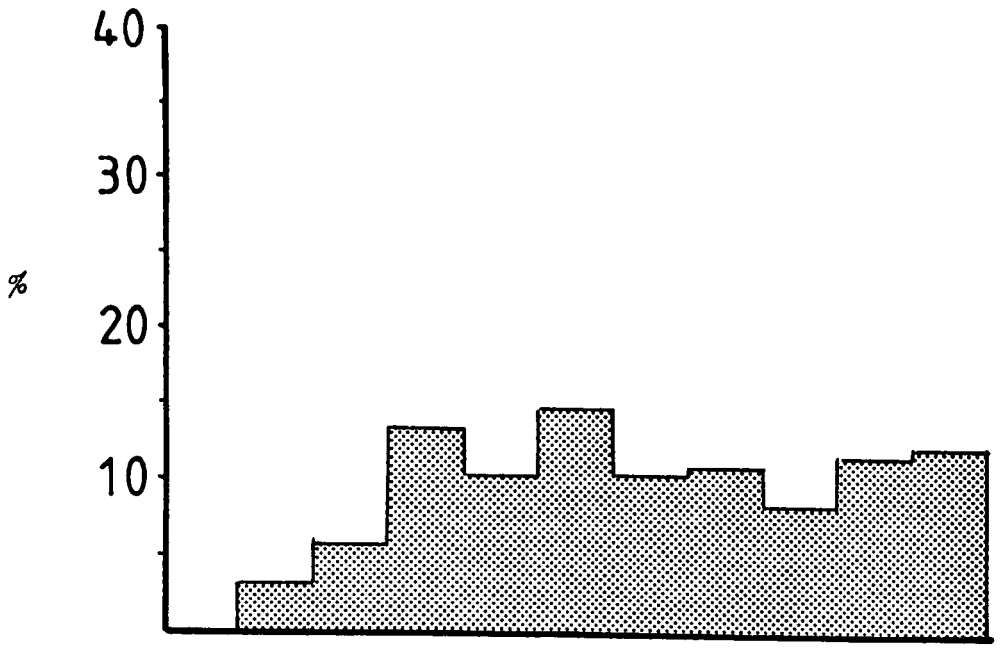
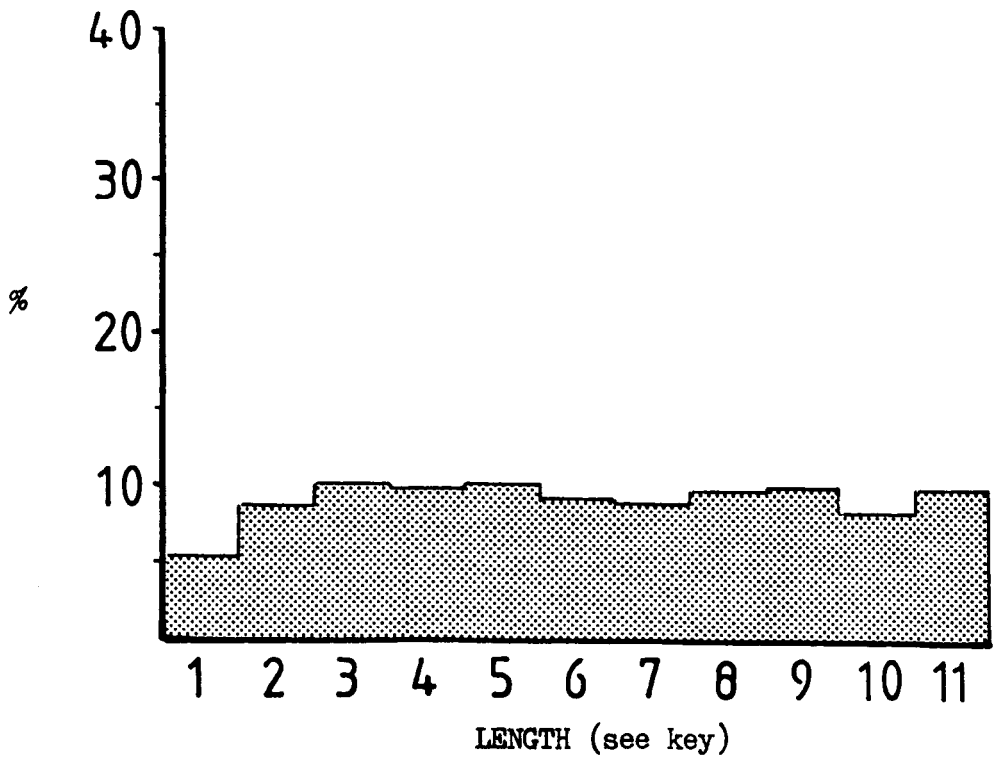


FIGURE 60 : LIMPET LENGTH DISTRIBUTIONS IN A COMBINATION OF ALL UNITS.

n = 1948



KEY TO FIGURES 61 TO 66

	SHELL LENGTH (mm)
1	18.0 - 19.9
2	20.0 - 21.9
3	22.0 - 23.9
4	24.0 - 25.9
5	26.0 - 27.9
6	28.0 - 29.9
7	30.0 - 31.9
8	32.0 - 33.9
9	above 34.0

FIGURE 61 : PERIWINKLE LENGTH DISTRIBUTIONS IN UNIT 1A

n = 146

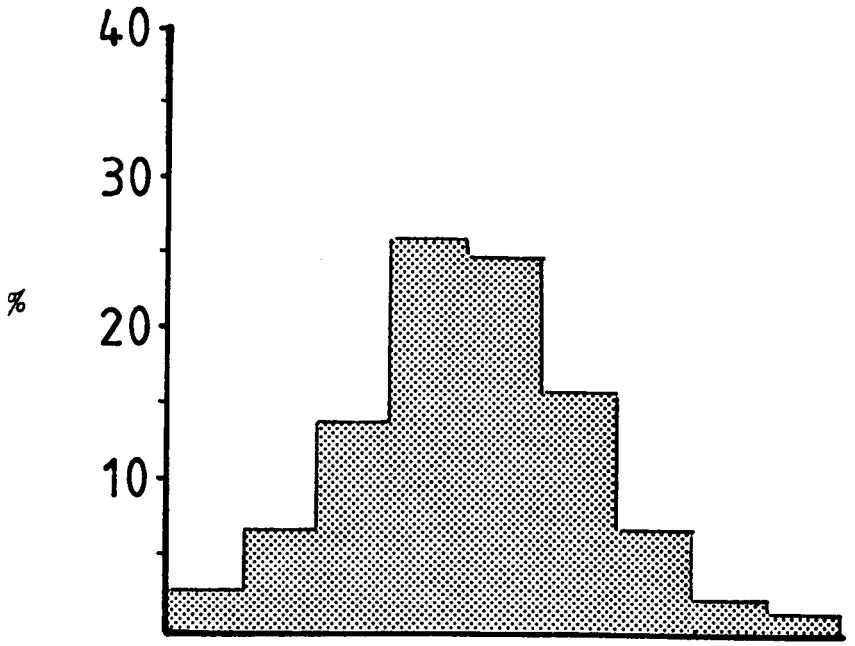


FIGURE 62 : PERIWINKLE LENGTH DISTRIBUTIONS IN UNIT 1C

n = 149

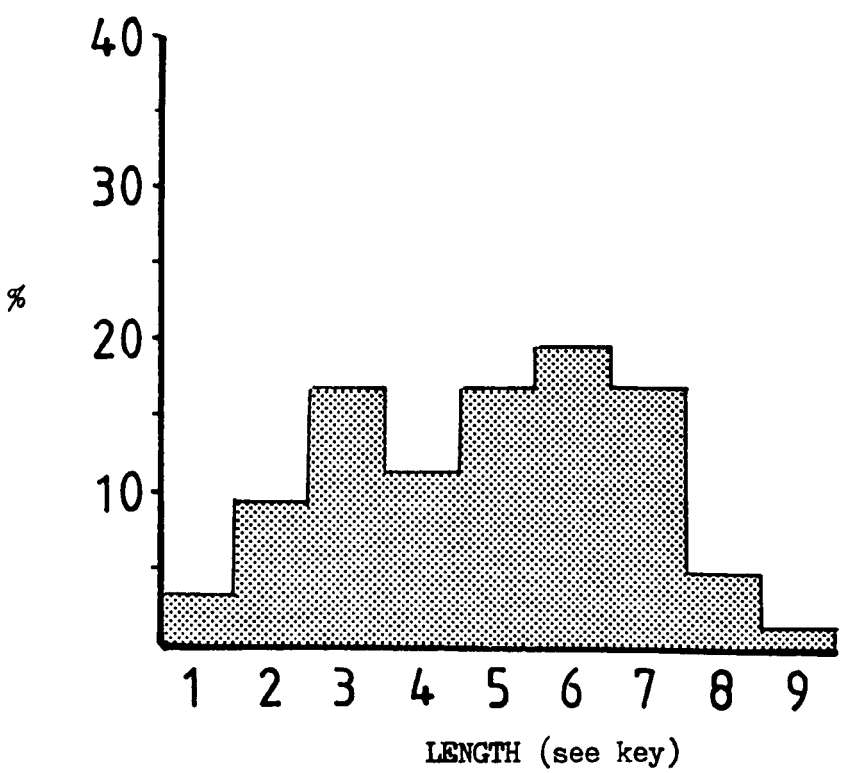


FIGURE 63 : PERIWINKLE LENGTH DISTRIBUTIONS IN UNIT 2

n = 300

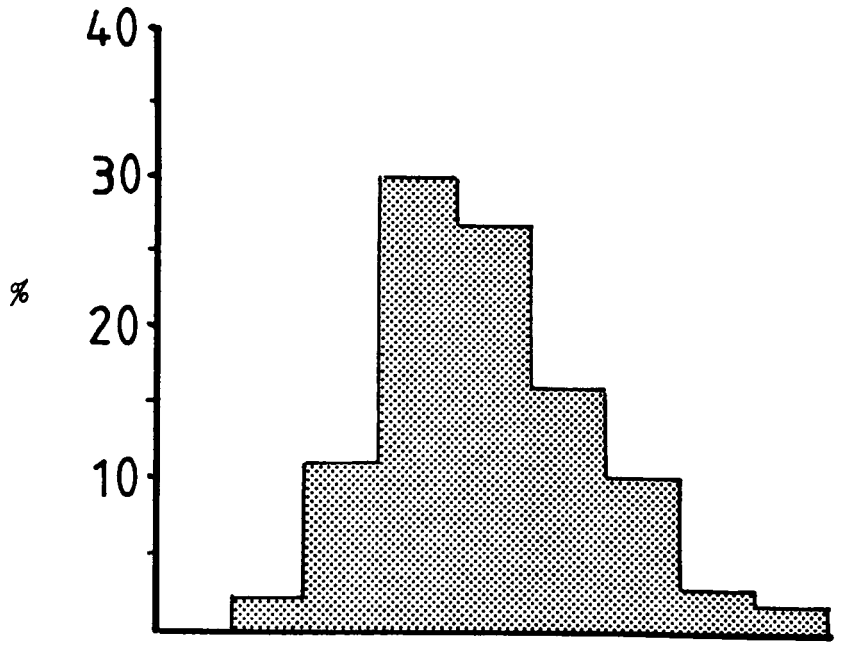


FIGURE 64 : PERIWINKLE LENGTH DISTRIBUTIONS IN UNIT 3

n = 83

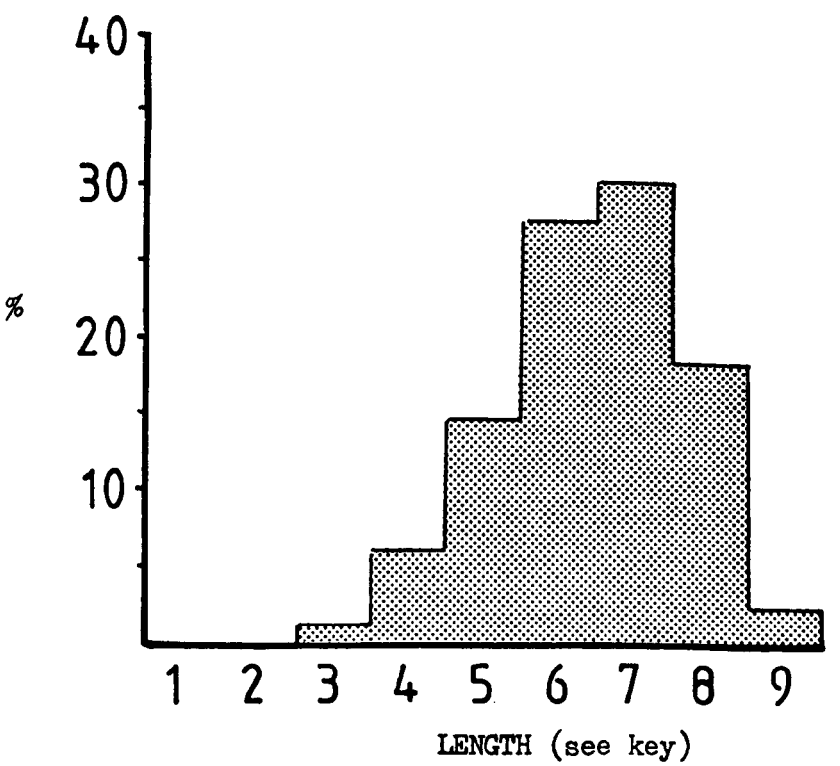


FIGURE 65 : PERIWINKLE LENGTH DISTRIBUTIONS IN UNIT 4

n = 30

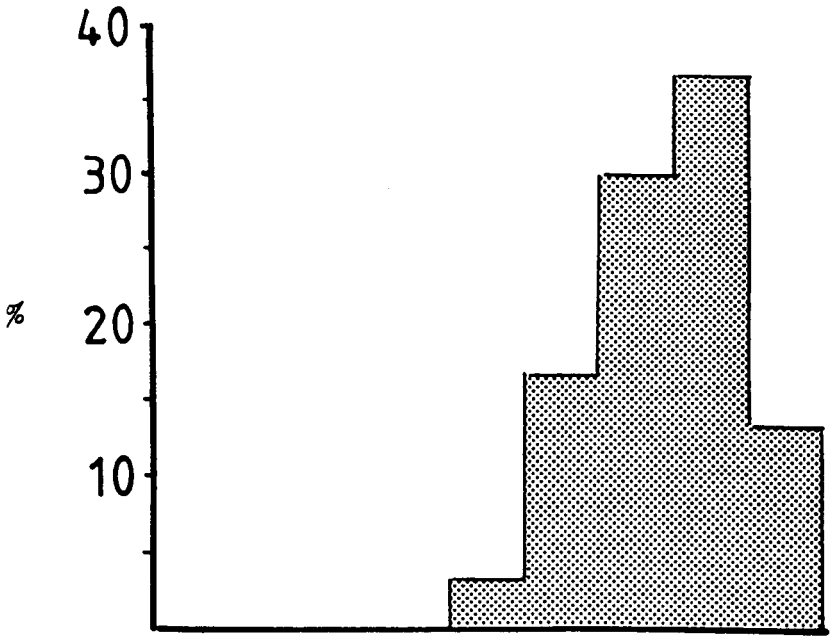
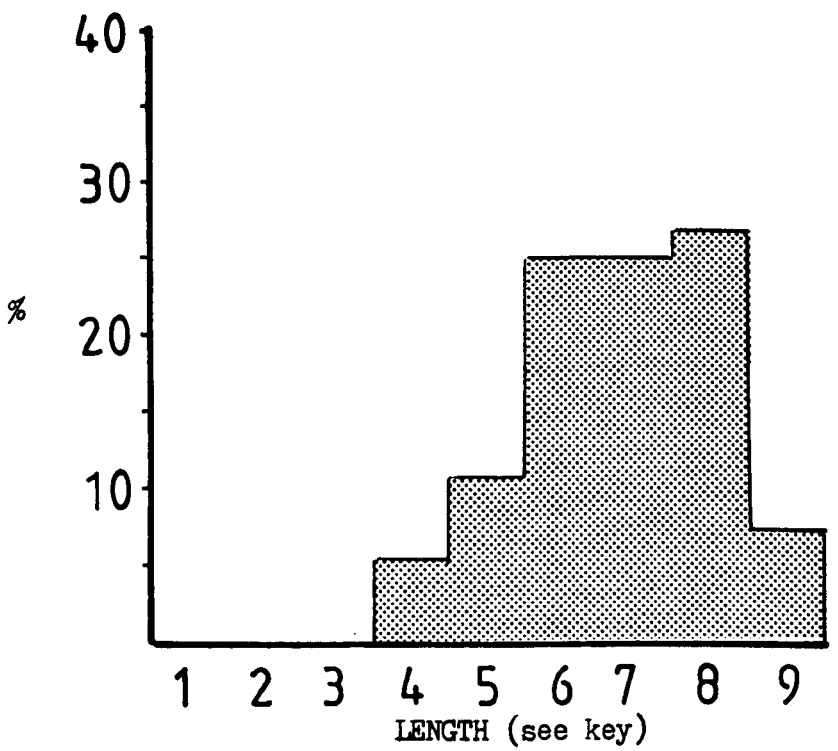


FIGURE 66 : PERIWINKLE LENGTH DISTRIBUTIONS IN UNIT 7

n = 56



KEY TO FIGURES 67 TO 74

	SHELL LENGTH (mm)
1	under 21.9
2	22.0 - 23.9
3	24.0 - 25.9
4	26.0 - 27.9
5	28.0 - 29.9
6	30.0 - 31.9
7	32.0 - 33.9
8	34.0 - 35.9
9	36.0 - 37.9
10	38.0 - 39.9
11	above 40.0

FIGURE 67 : DOGWHELK LENGTH DISTRIBUTIONS IN A COMBINATION OF ALL UNITS. n = 1,349

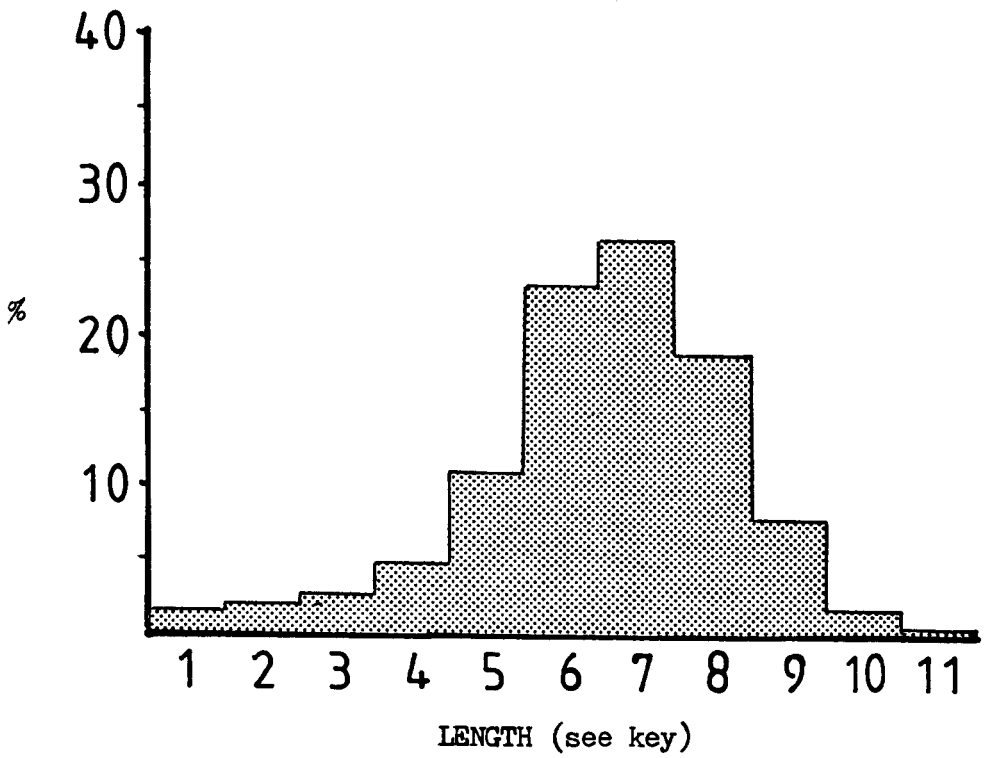


FIGURE 68 : DOGWHELK LENGTH DISTRIBUTIONS IN UNIT 1A

n = 123

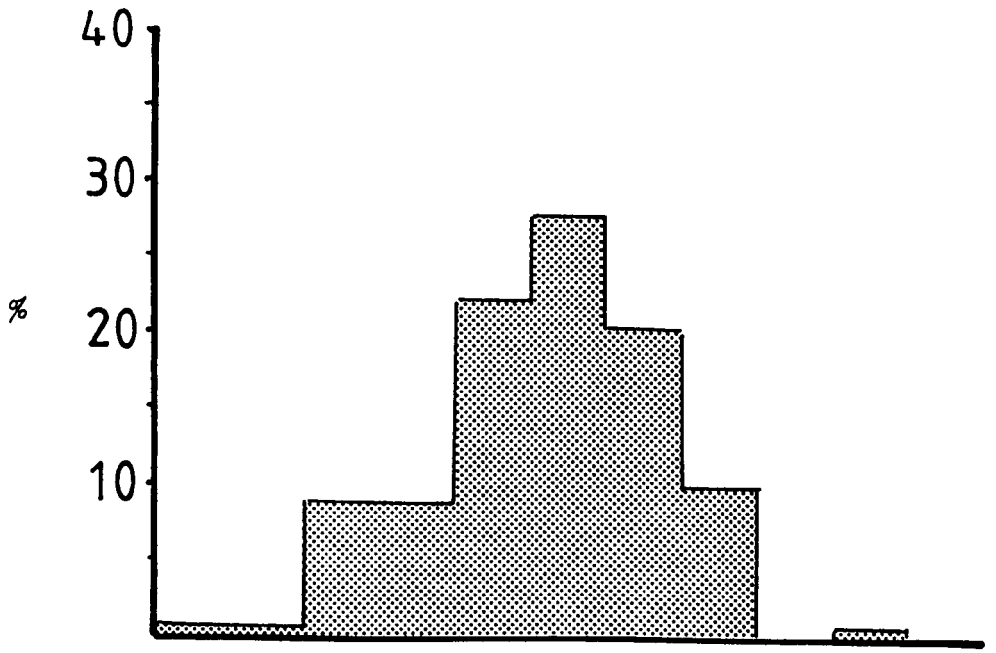


FIGURE 69 : DOGWHELK LENGTH DISTRIBUTIONS IN UNITS 1B & 1B-C

n = 320

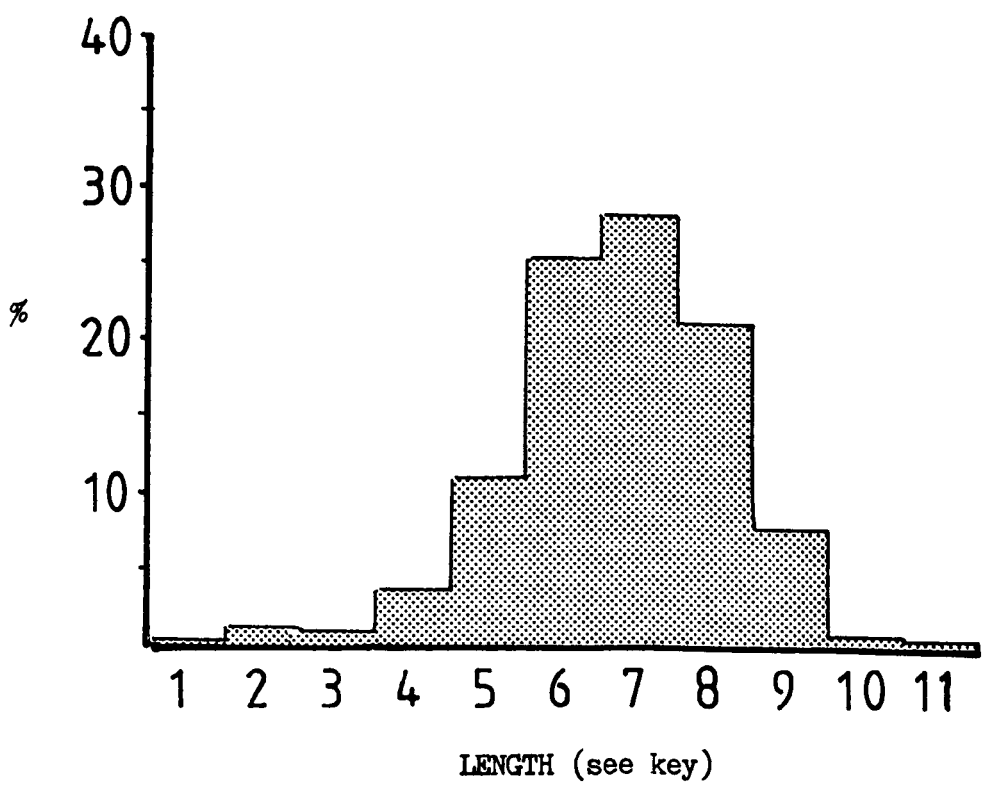


FIGURE 70 : DOGWHELK LENGTH DISTRIBUTIONS IN UNIT 1C

n = 431

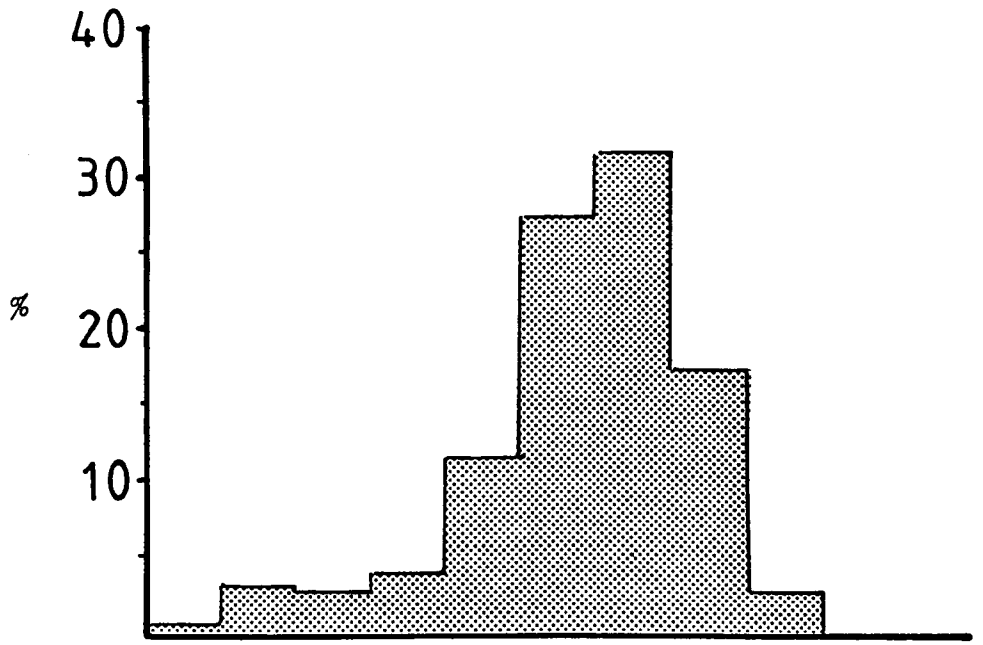


FIGURE 71 : DOGWHELK LENGTH DISTRIBUTIONS IN UNIT 2

n = 181

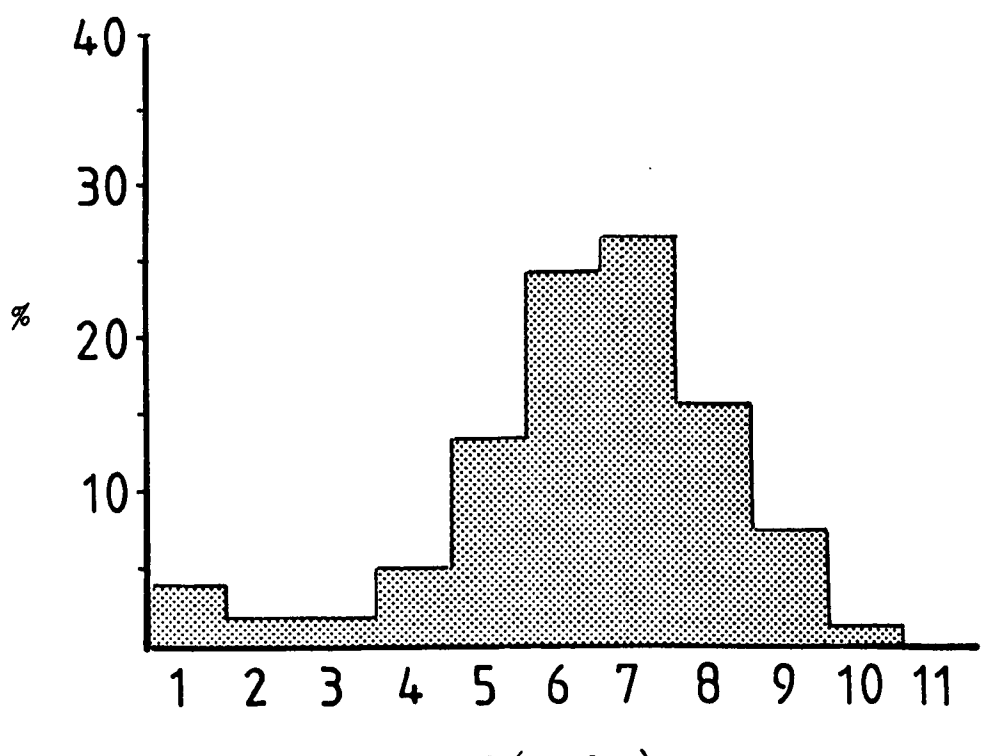


FIGURE 72 : DOGWHELK LENGTH DISTRIBUTIONS IN UNIT 3

n = 174

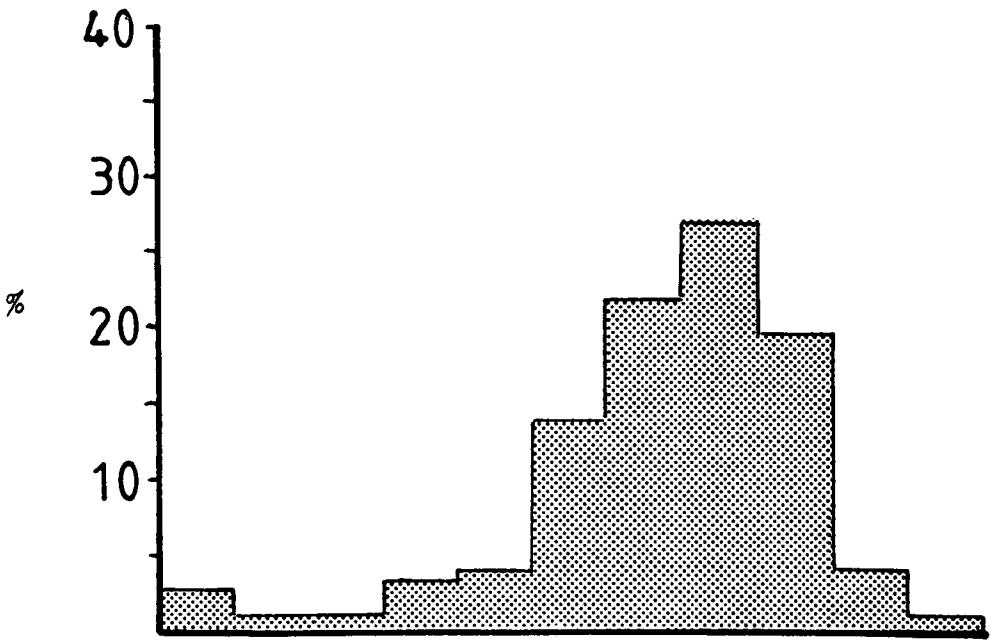


FIGURE 73 : DOGWHELK LENGTH DISTRIBUTIONS IN UNITS 4, 5 and 6

n = 25

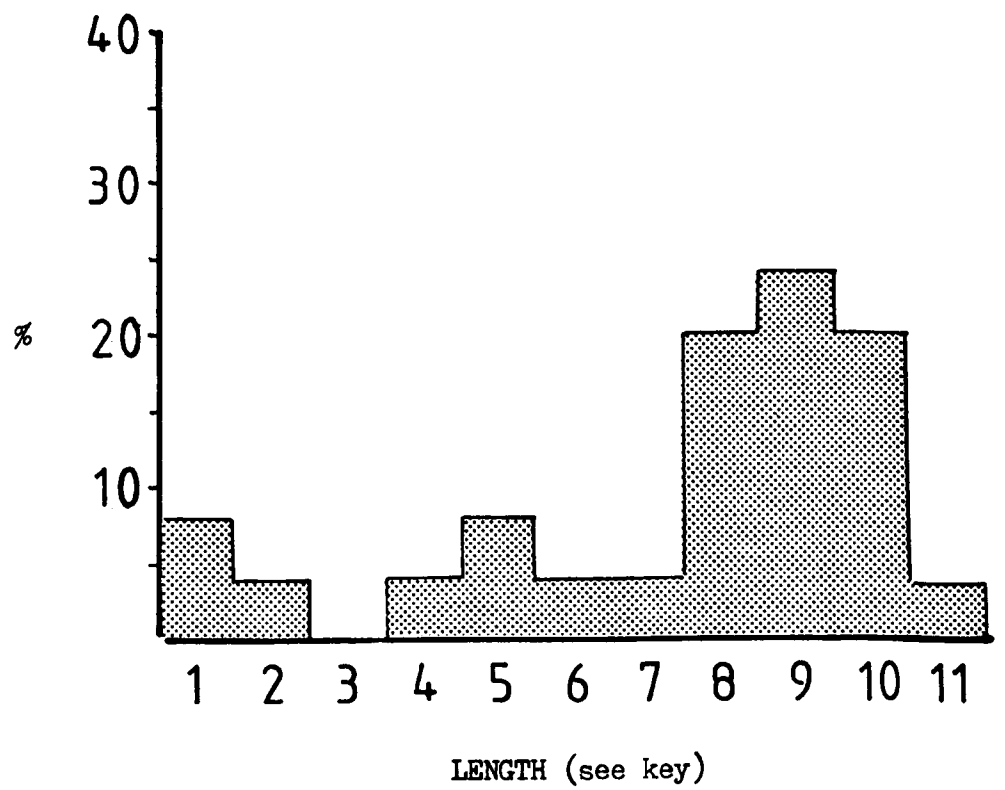
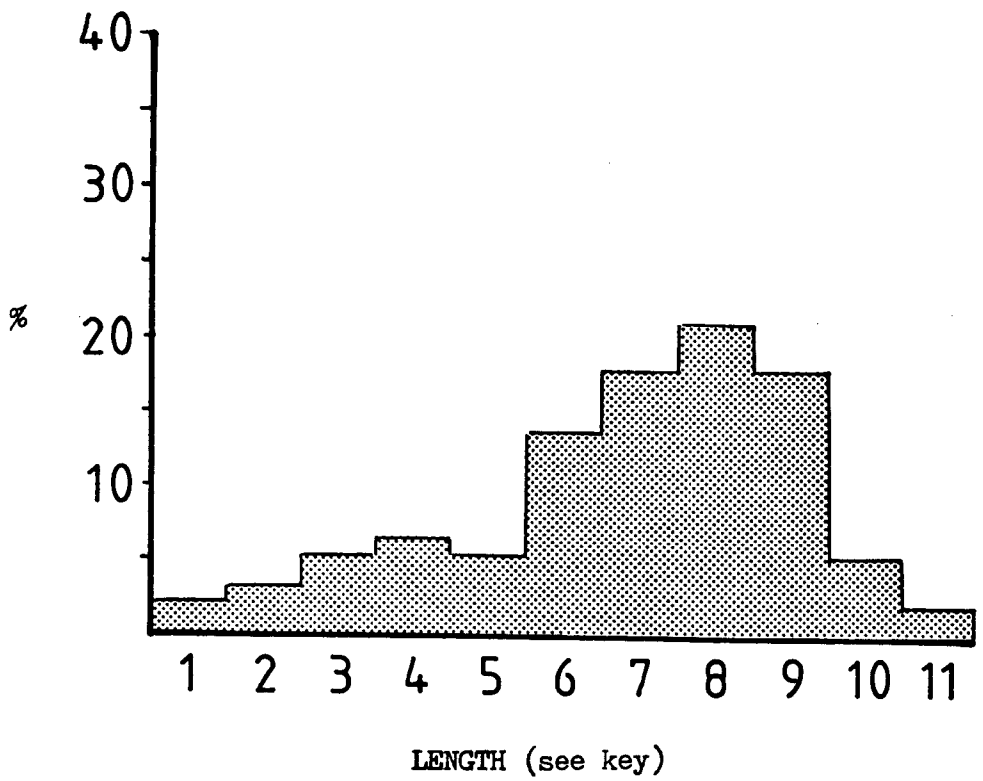


FIGURE 74 : DOGWHELK LENGTH DISTRIBUTIONS IN UNIT 7

n = 95



KEY TO FIGURES 75 TO 82

APERTURE LENGTH (mm)

1	under 14.9
2	15.0 - 16.9
3	17.0 - 18.9
4	19.0 - 20.9
5	21.0 - 22.9
6	23.0 - 24.9
7	25.0 - 26.9
8	above 27.0

FIGURE 75 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN A COMBINATION OF ALL UNITS. n = 1,349

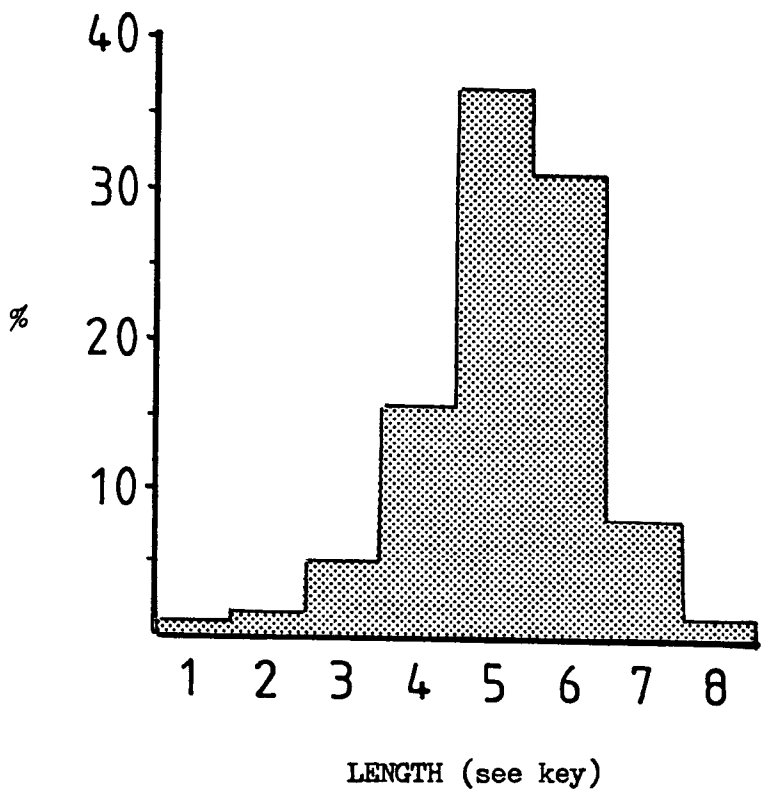


FIGURE 76 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN UNIT 1A

n = 123

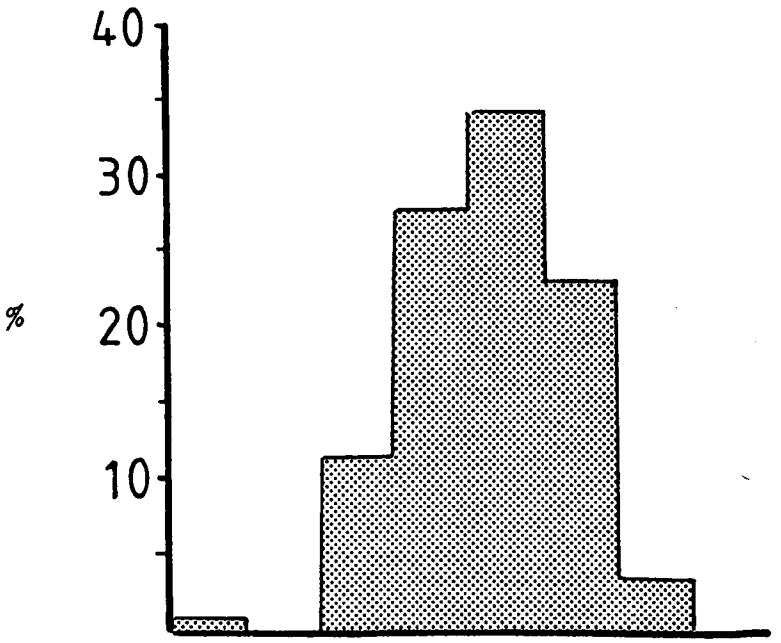


FIGURE 77 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN UNITS 1B & 1B-C

n = 320

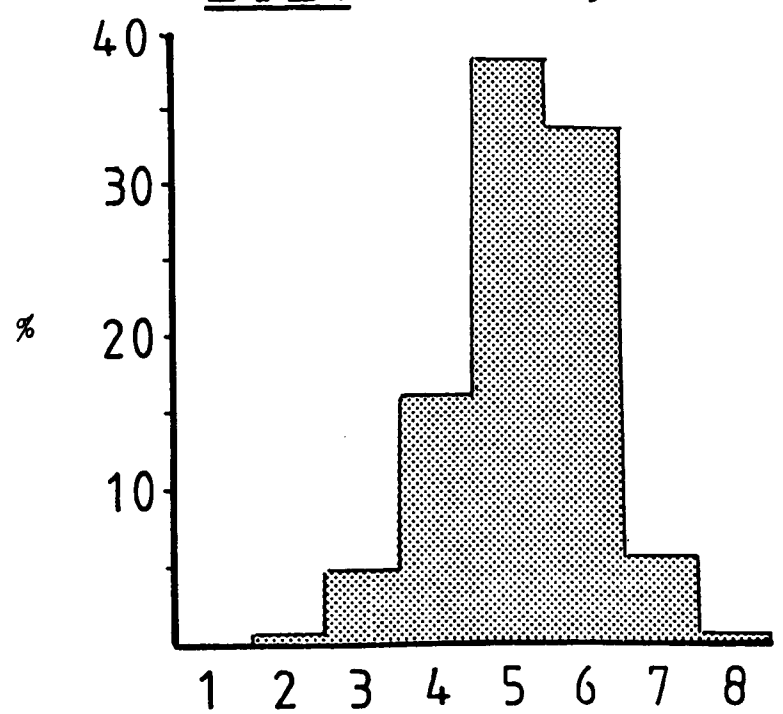


FIGURE 78 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN UNIT 1C

n = 431

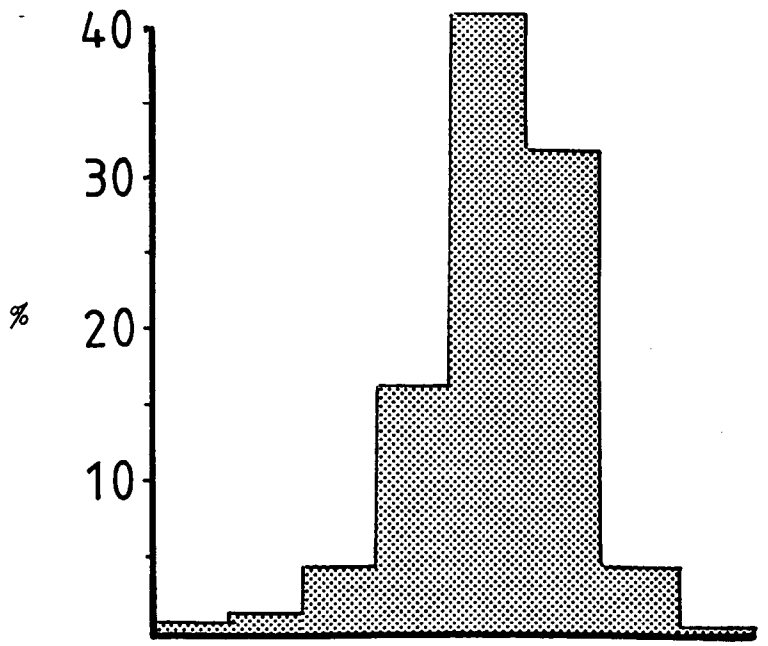


FIGURE 79 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN UNIT 2

n = 181

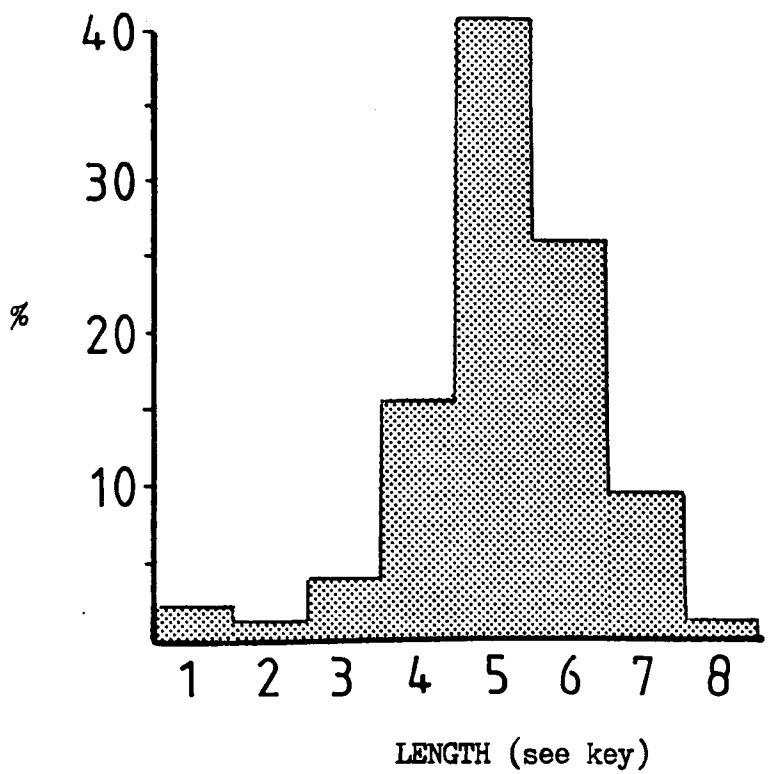


FIGURE 80 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN UNIT 3

n = 134

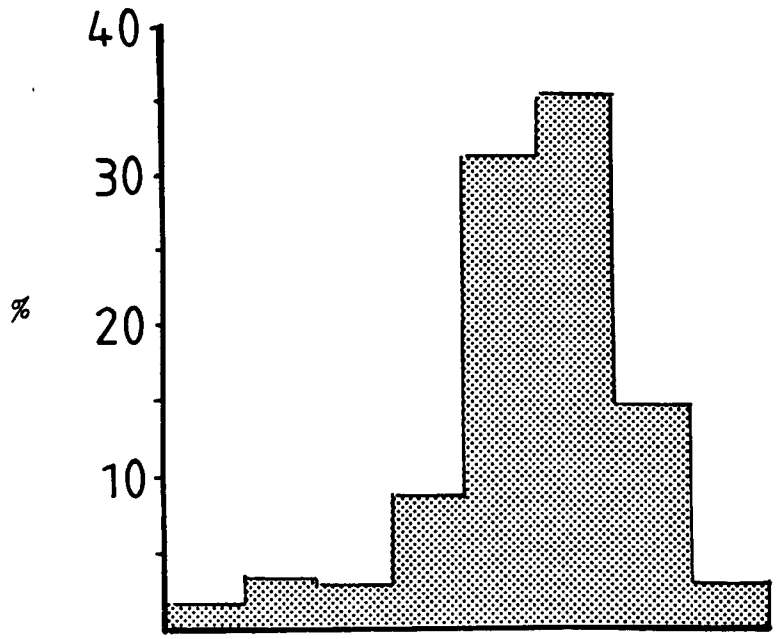


FIGURE 81 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN UNITS 4, 5 and 6

n = 25

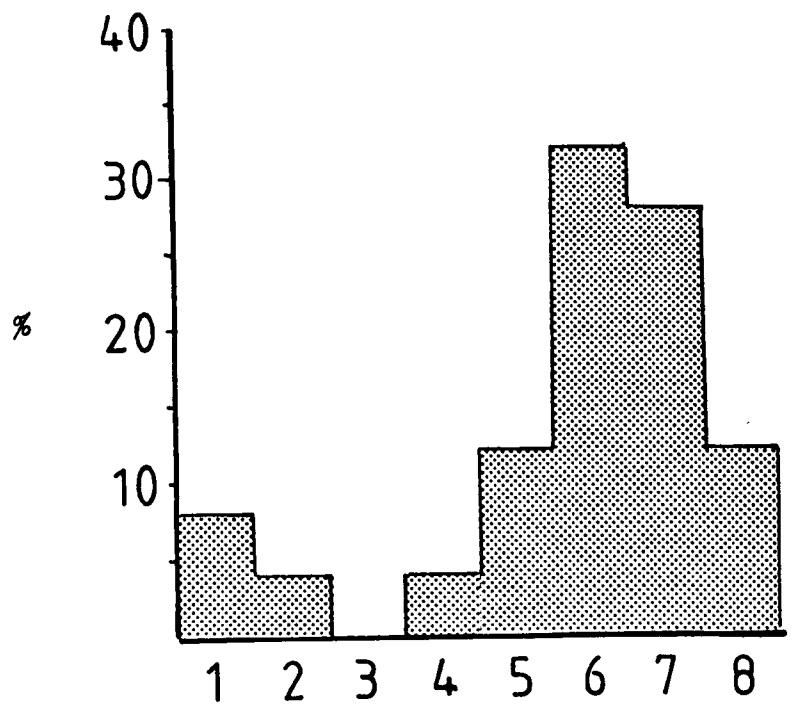


FIGURE 82 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN UNIT 7

n = 95

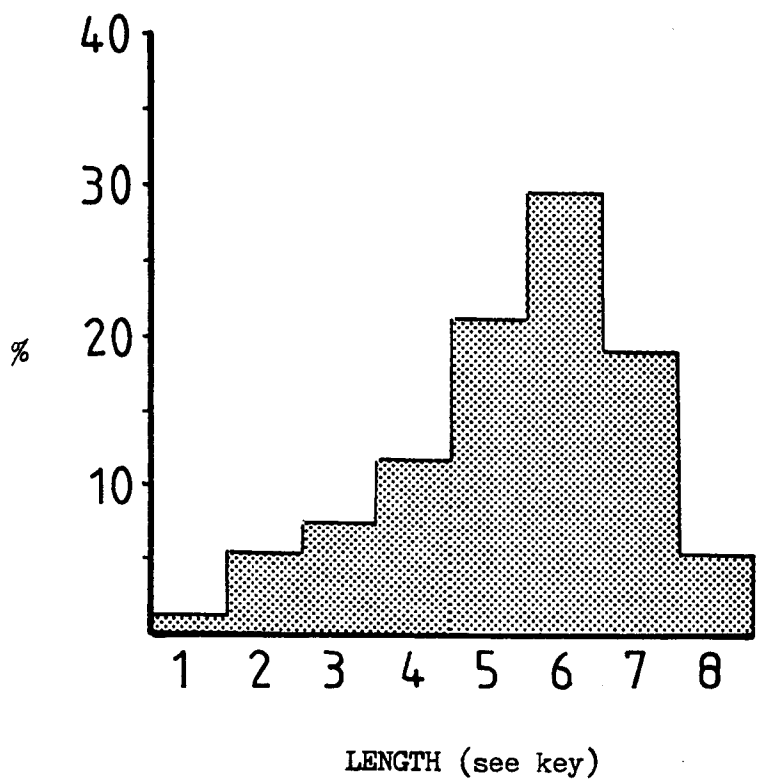


FIGURE 83 : LENGTH DISTRIBUTIONS OF OPEN COAST AND ESTUARINE PERIWINKLES AT DIFFERENT TIDAL LEVELS FROM WEST WALES. After Fish 1972.

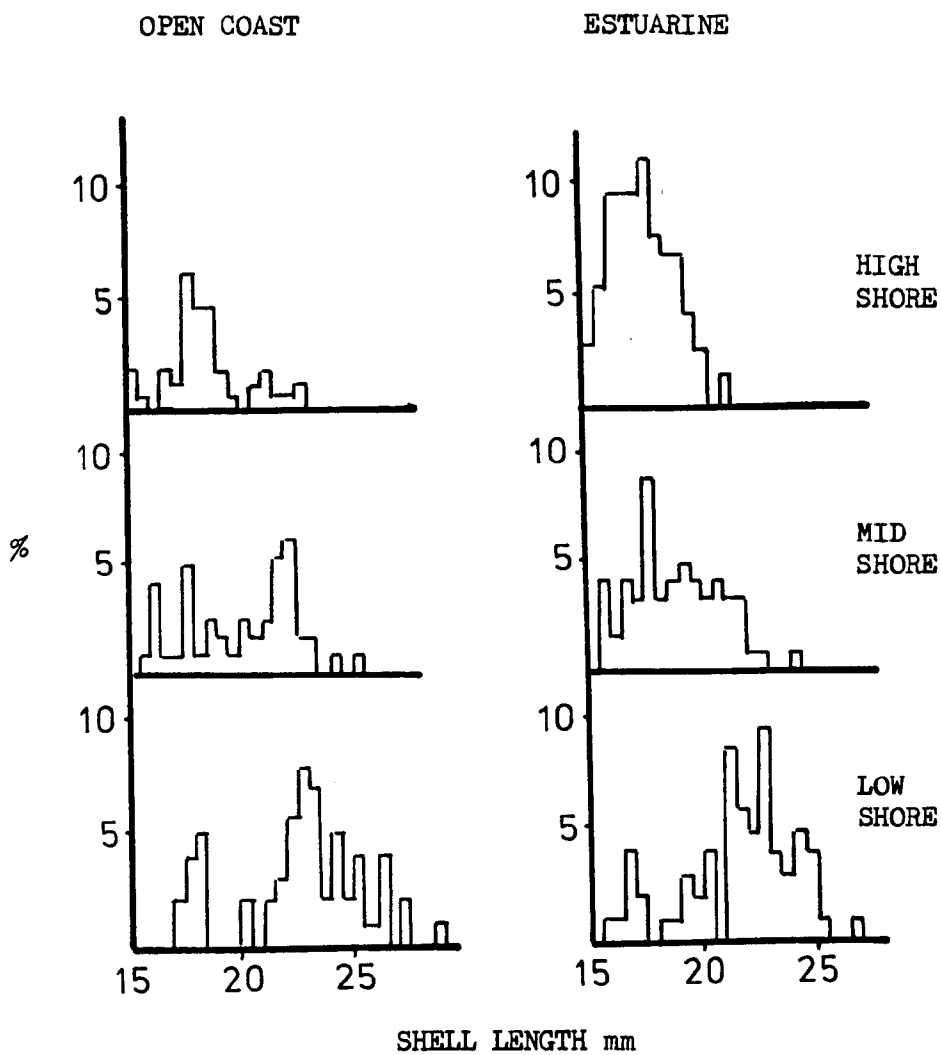
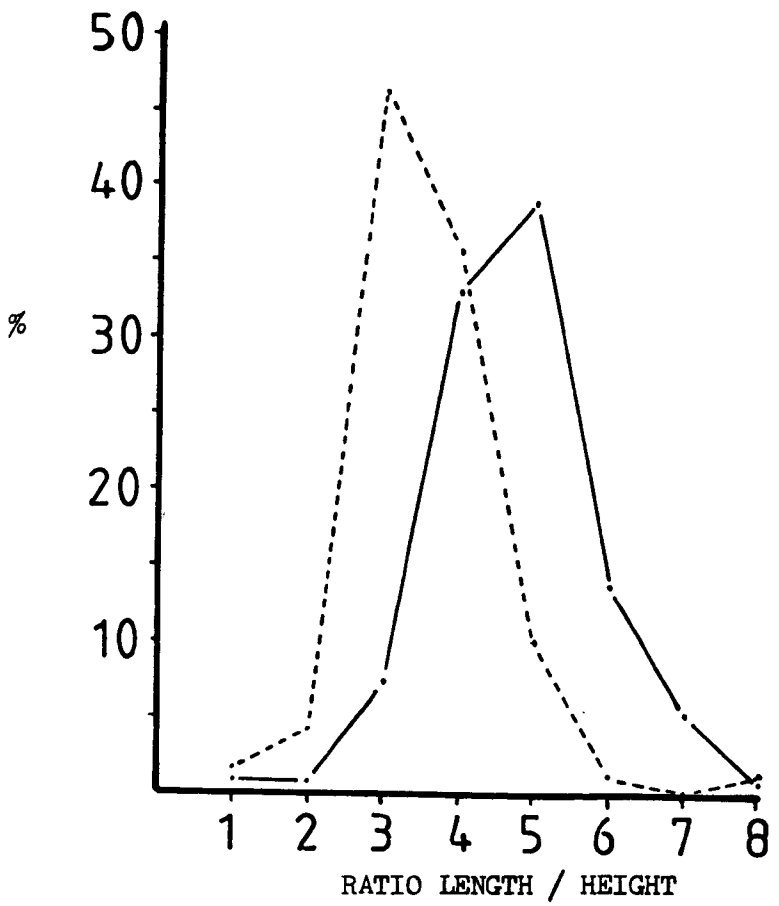


FIGURE 84 : THE PERCENTAGE OF DIFFERENT SHAPED LIMPETS ON THE UPPER AND LOWER ORONSAY SHORE.



---- HIGH SHORE

—— LOW SHORE

RATIO LENGTH / HEIGHT

1 = Below 1.49
2 = 1.50 - 1.99
3 = 2.00 - 2.49
4 = 2.50 - 2.99
5 = 3.00 - 3.49
6 = 3.50 - 3.99
7 = 4.00 - 4.49
8 = Above 4.50

KEY TO FIGURES 85 TO 122

SHELL LENGTH (mm)

0	under 18.9
1	19.0 - 21.9
2	22.0 - 24.9
3	25.0 - 27.9
4	28.0 - 30.9
5	31.0 - 33.9
6	34.0 - 36.9
7	37.0 - 39.9
8	40.0 - 42.9
9	43.0 - 45.9
10	46.0 - 48.9
11	above 49.0

FIGURE 85 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10

n = 500

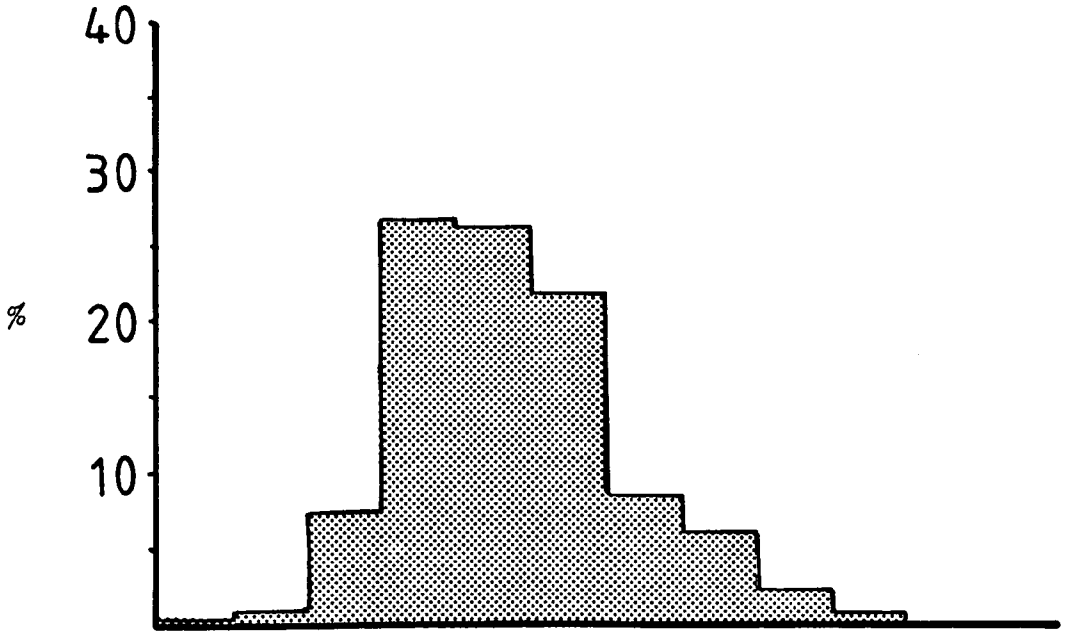


FIGURE 86 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6

n = 423

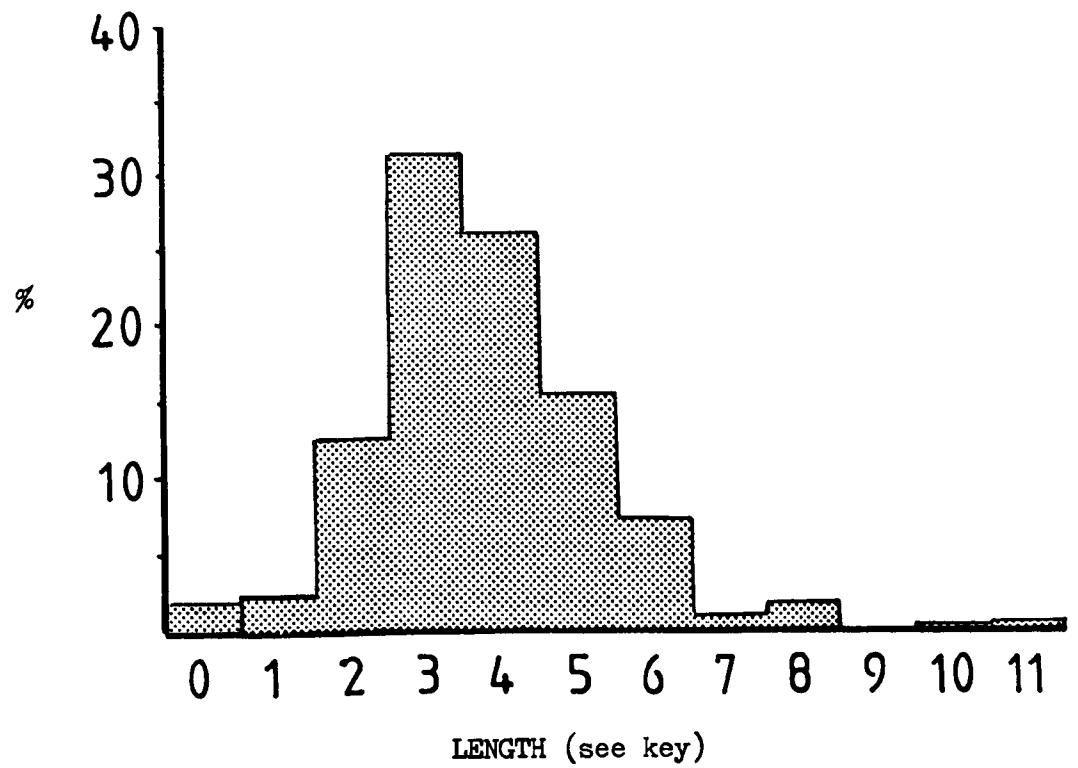


FIGURE 87 : LIMPET LENGTH DISTRIBUTIONS IN BOTH COLUMNS FROM CNOC COIG. n = 923

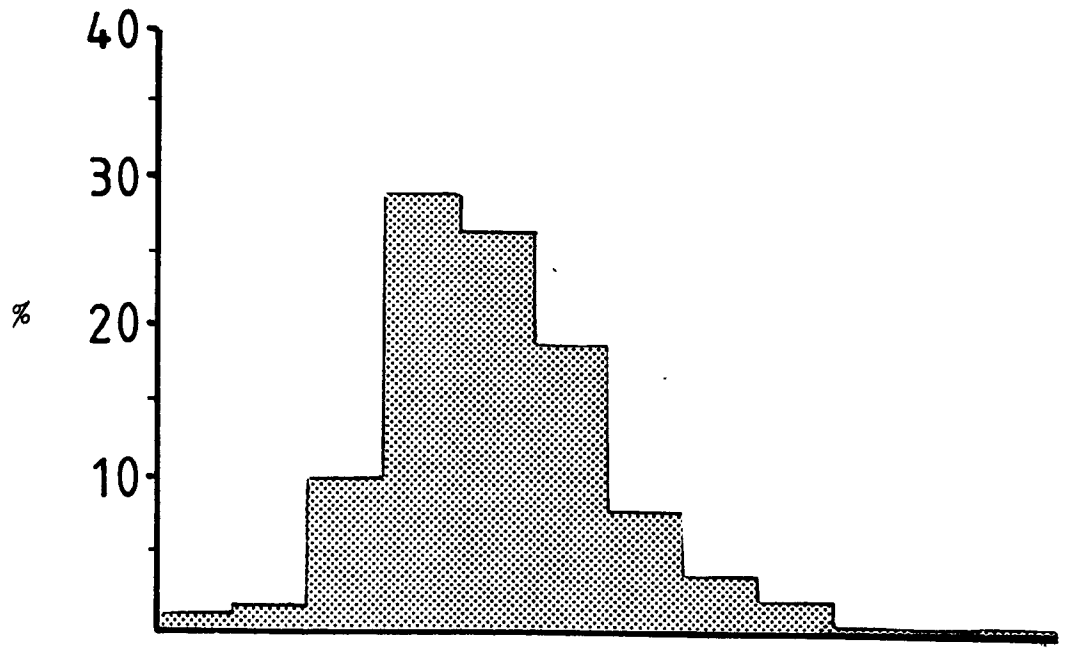


FIGURE 88 : LIMPET LENGTH DISTRIBUTIONS IN CNG I

n = 338

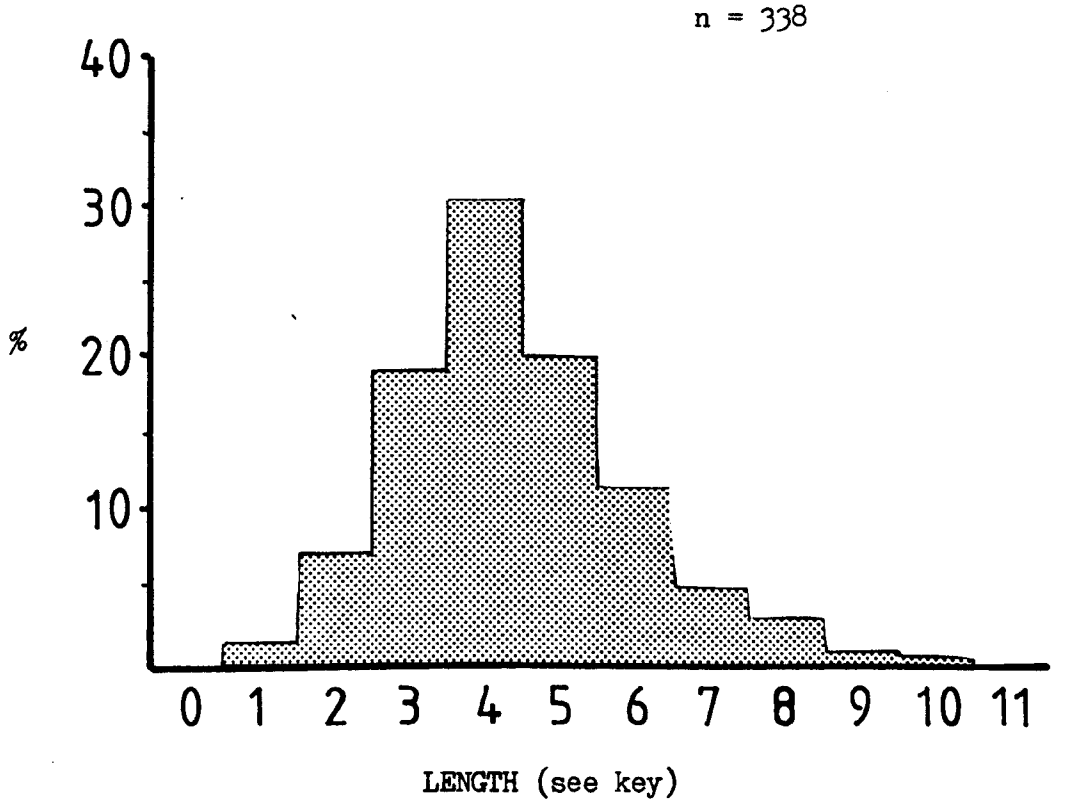


FIGURE 89 : LIMPET LENGTH DISTRIBUTIONS IN CNG II

n = 546

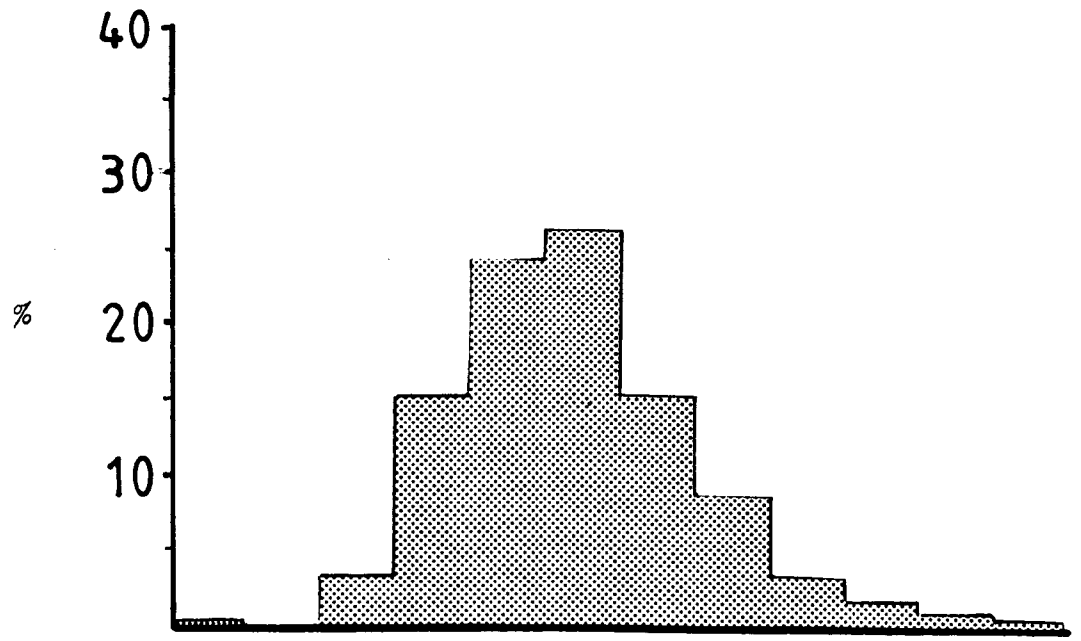


FIGURE 90 : LIMPET LENGTH DISTRIBUTIONS IN CNOC SLIGEACH

n = 467

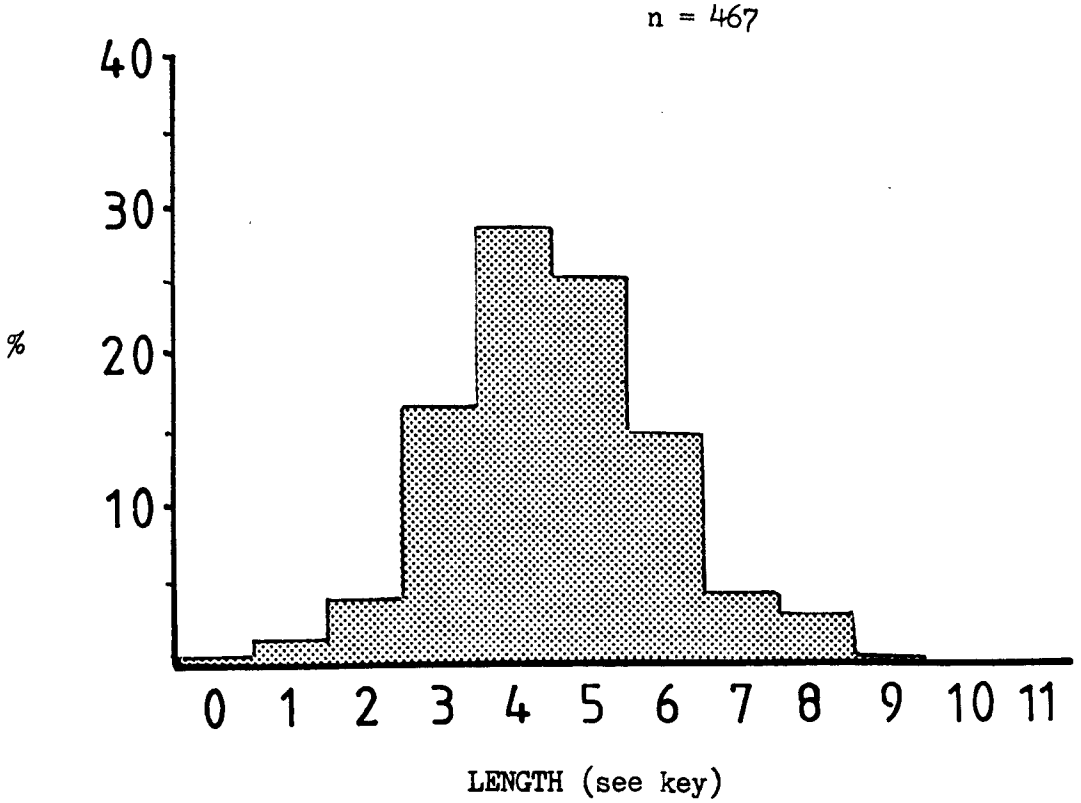


FIGURE 91 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN

n = 1399

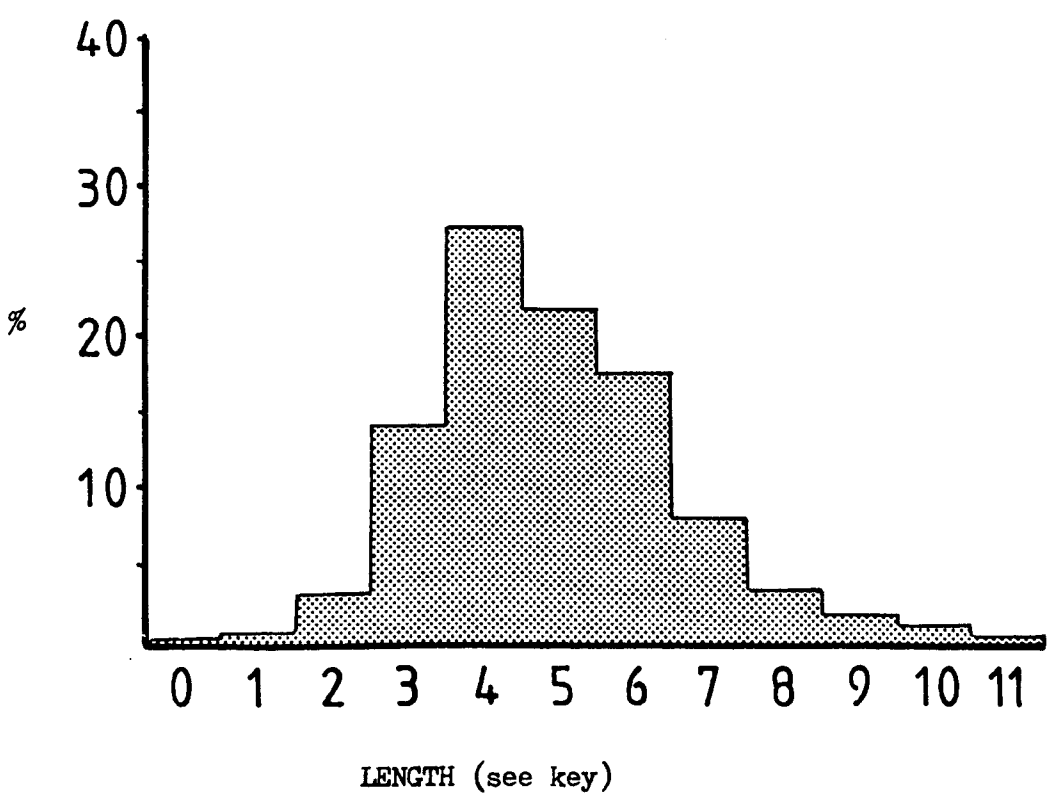


FIGURE 92 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10, LEVEL 9

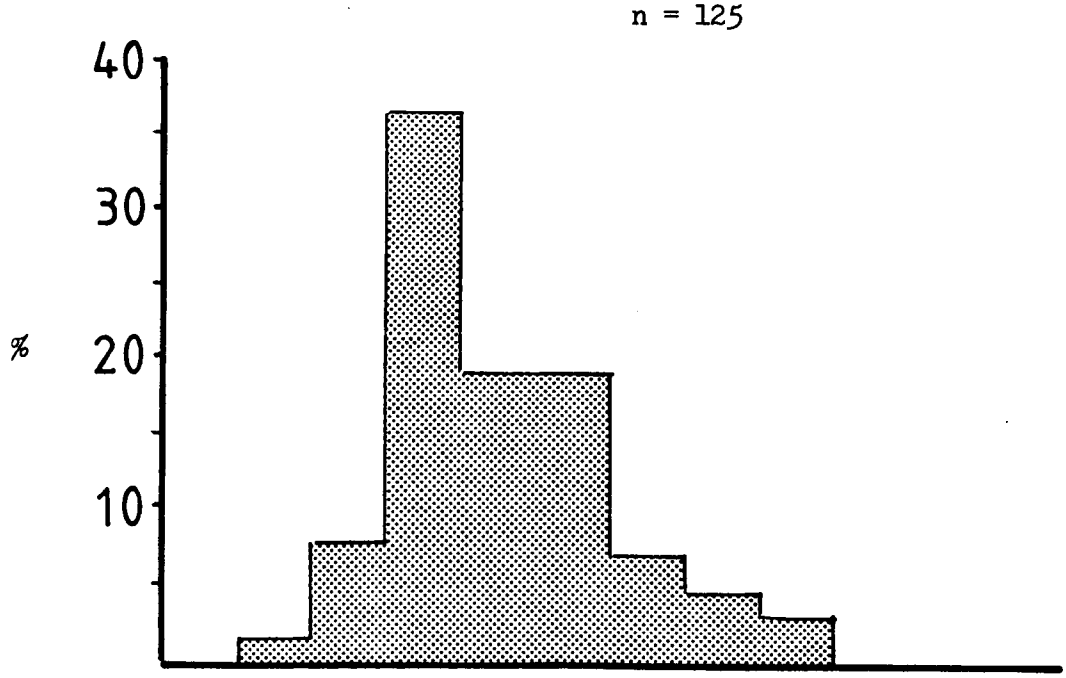


FIGURE 93 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10, LEVEL 10

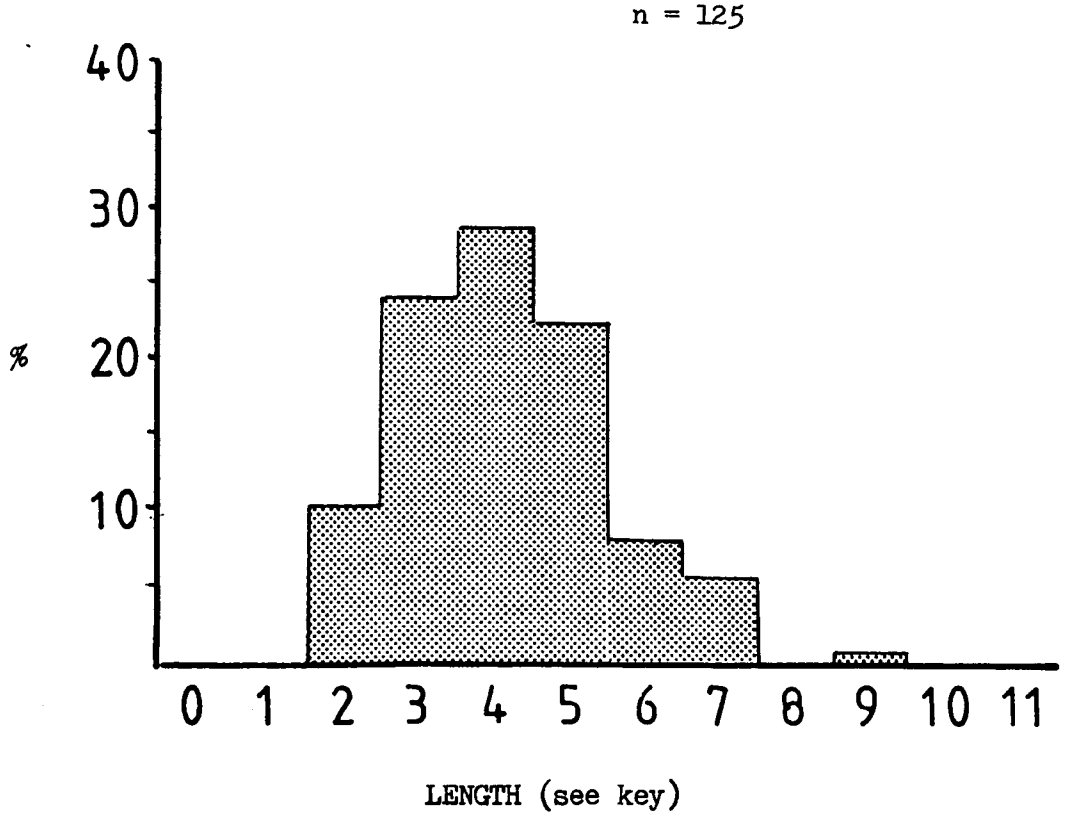


FIGURE 94 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10, LEVEL 11

n = 125

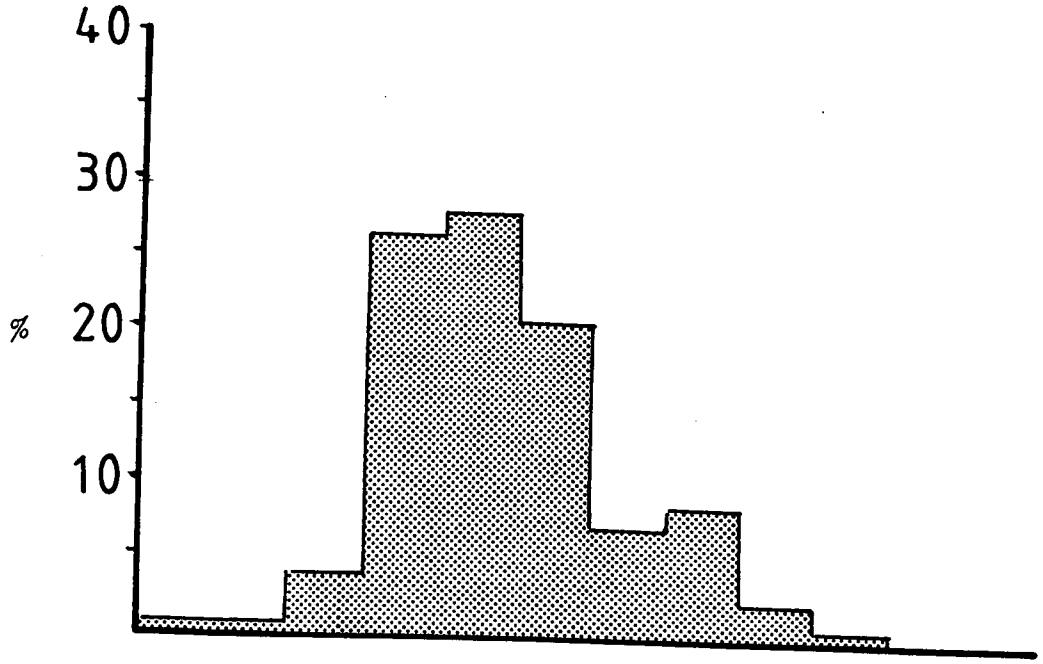


FIGURE 95 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10, LEVEL 12

n = 125

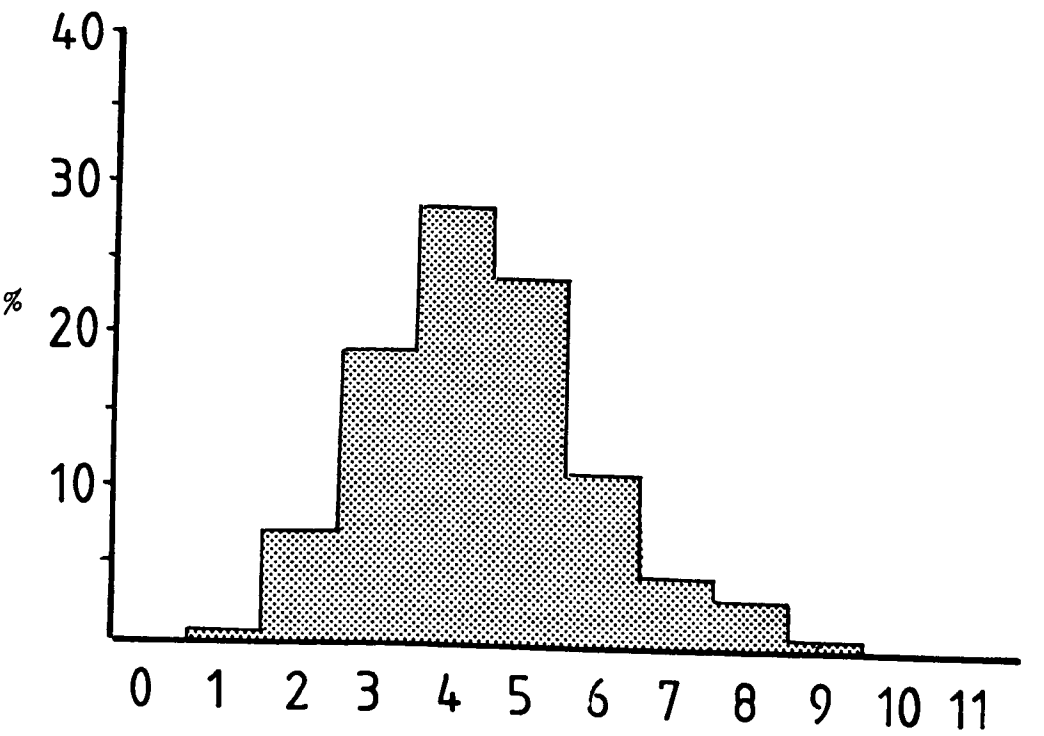


FIGURE 96 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6, LEVEL 17

n = 48

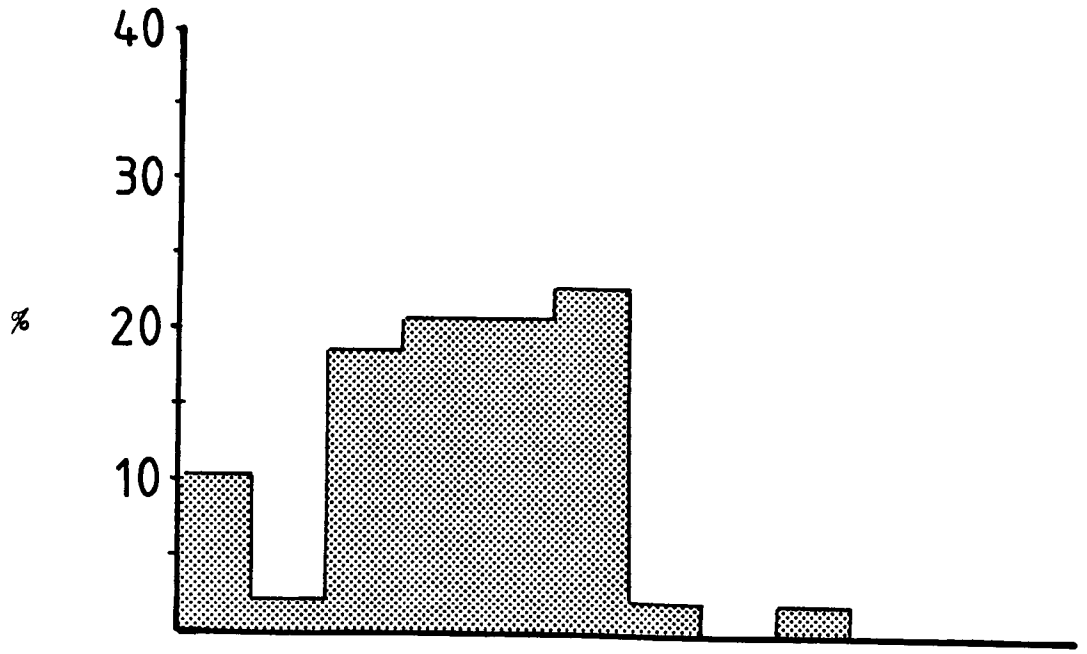


FIGURE 97 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6, LEVEL 18

n = 125

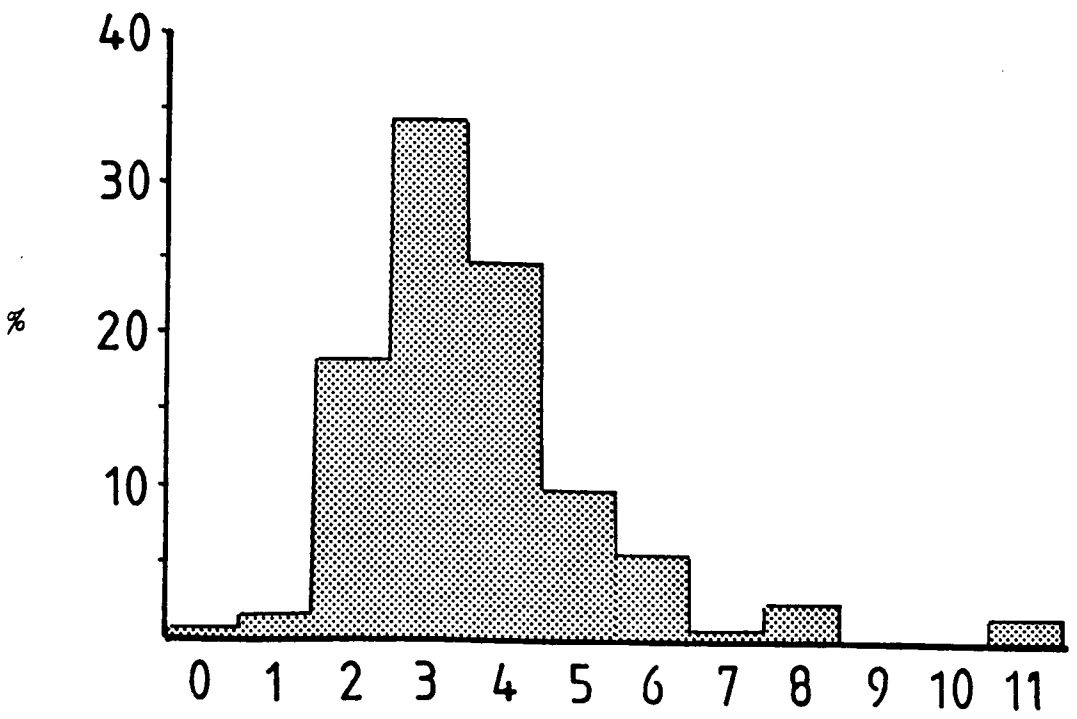


FIGURE 98 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6, LEVEL 20

n = 125

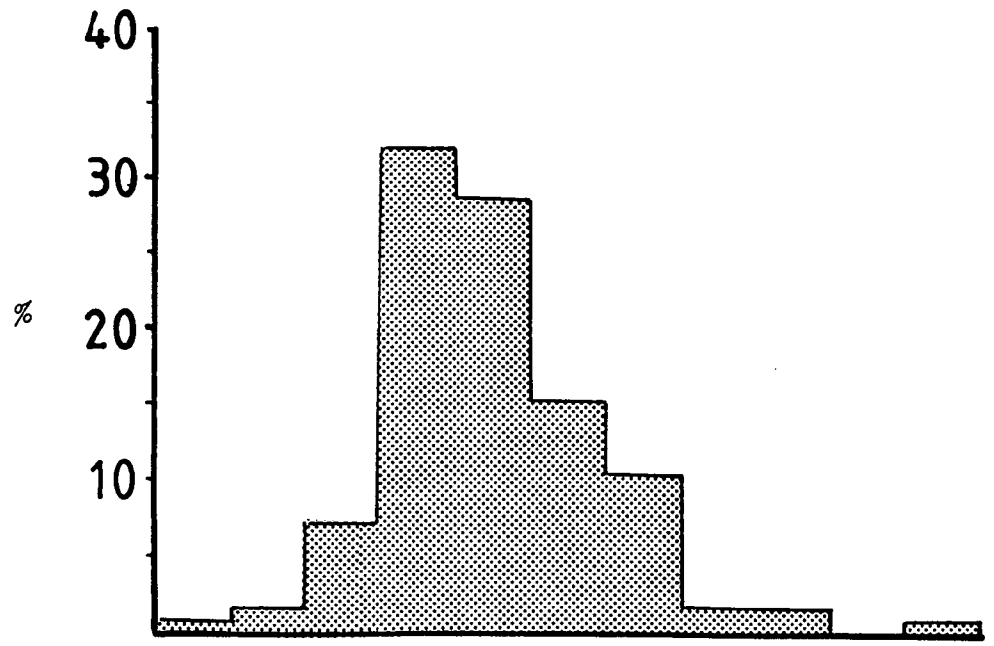


FIGURE 99 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6, LEVEL 21

n = 125

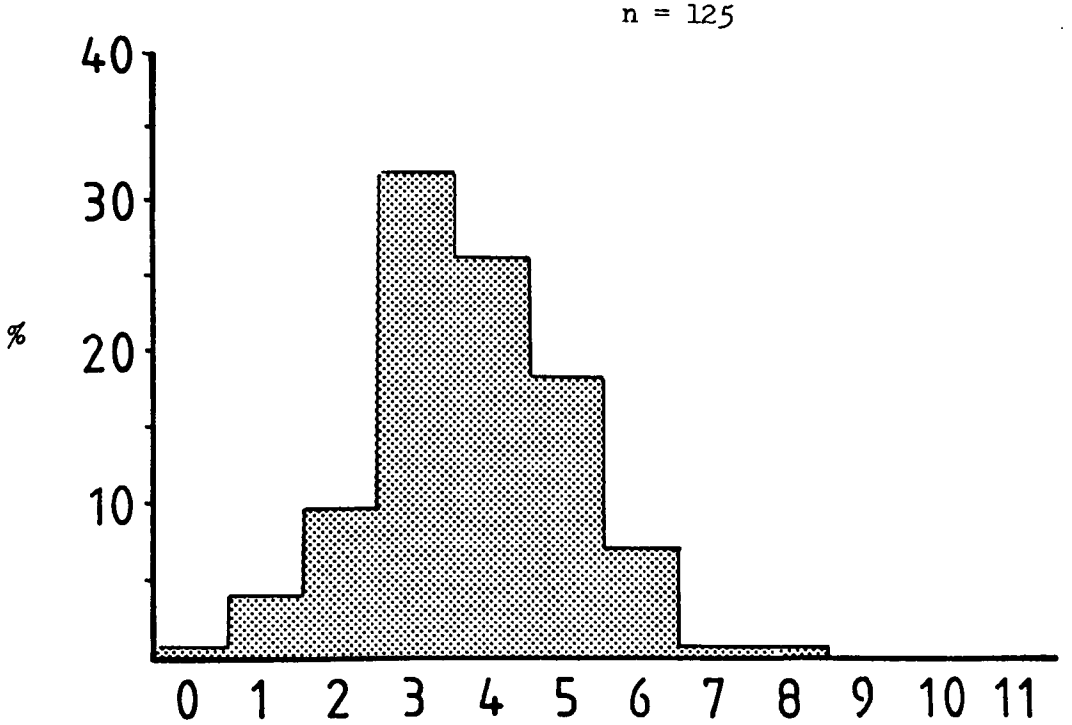


FIGURE 100 : LIMPET LENGTH DISTRIBUTIONS IN CNOC COIG, PREMIDDEN

n = 109

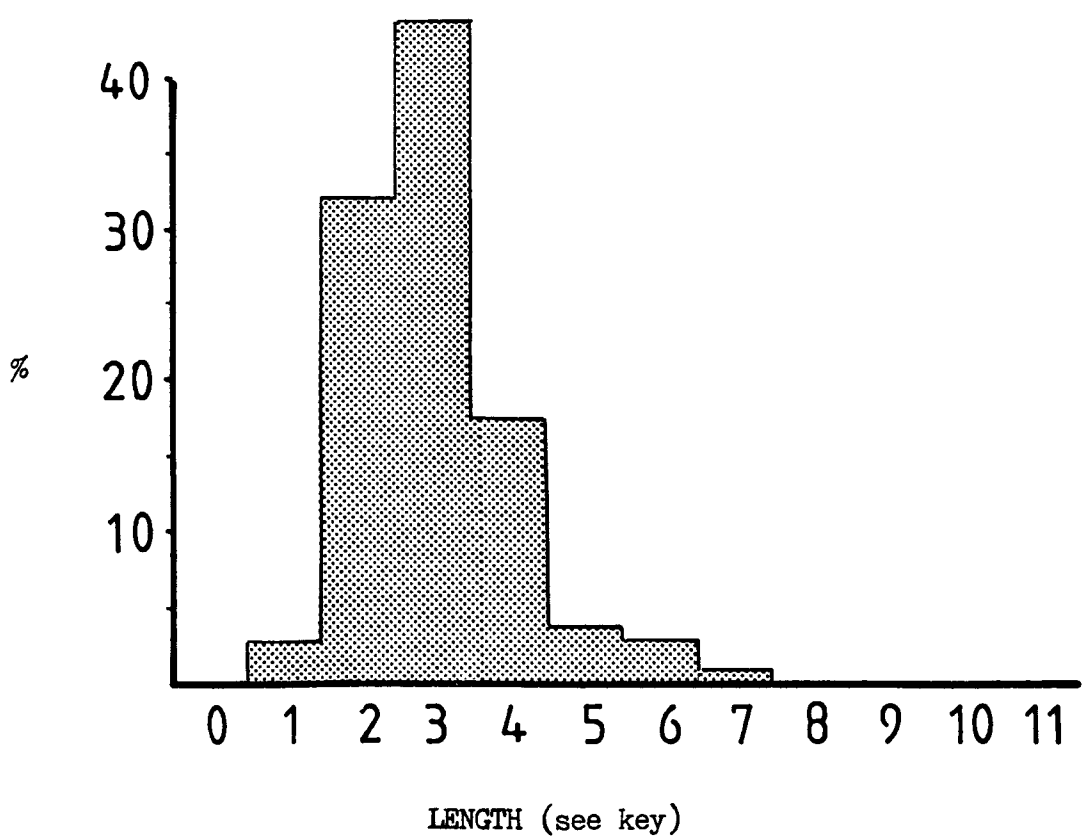


FIGURE 101 : LIMPET LENGTH DISTRIBUTIONS IN CNG I, LEVEL 1

n = 120

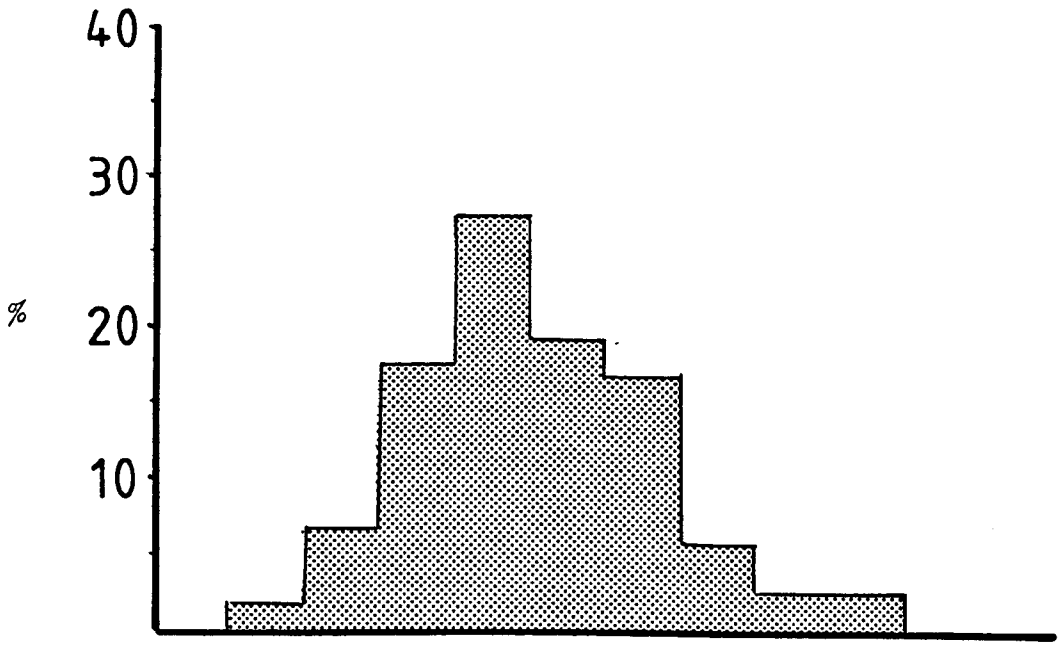


FIGURE 102 : LIMPET LENGTH DISTRIBUTIONS IN CNG I, LEVEL 2

n = 108

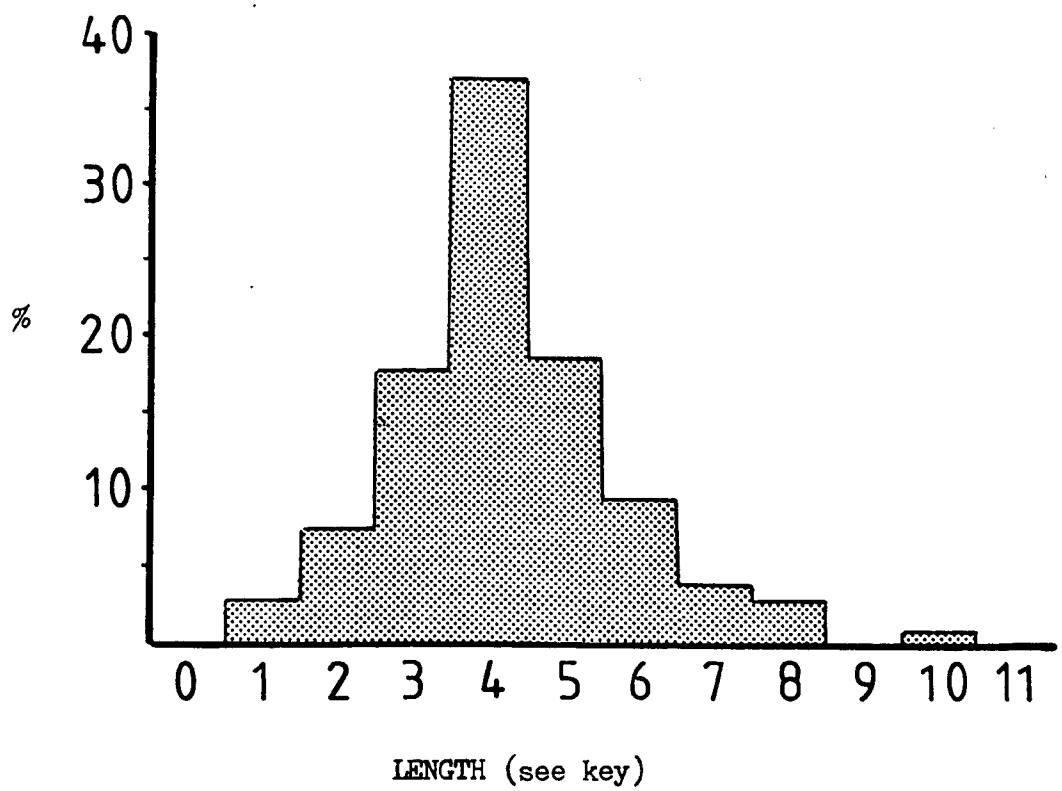


FIGURE 103 : LIMPET LENGTH DISTRIBUTIONS IN CNG I, LEVEL 3

n = 110

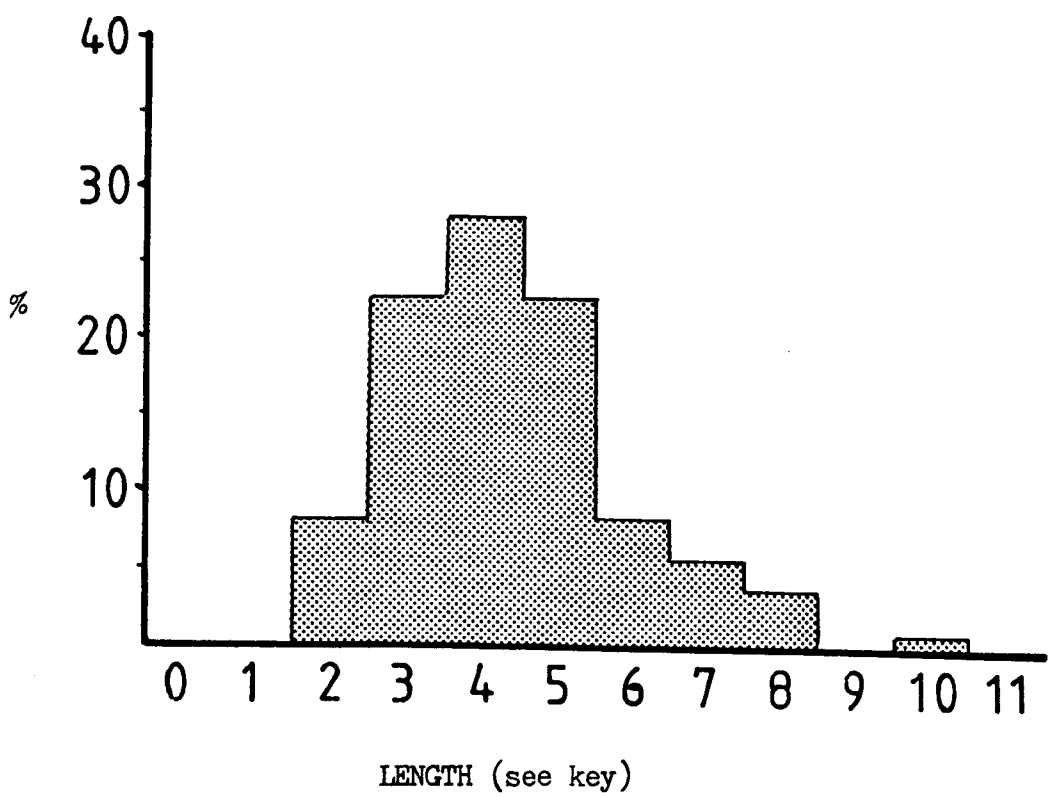


FIGURE 104 : LIMPET LENGTH DISTRIBUTIONS IN CNG II, LEVEL E

n = 46

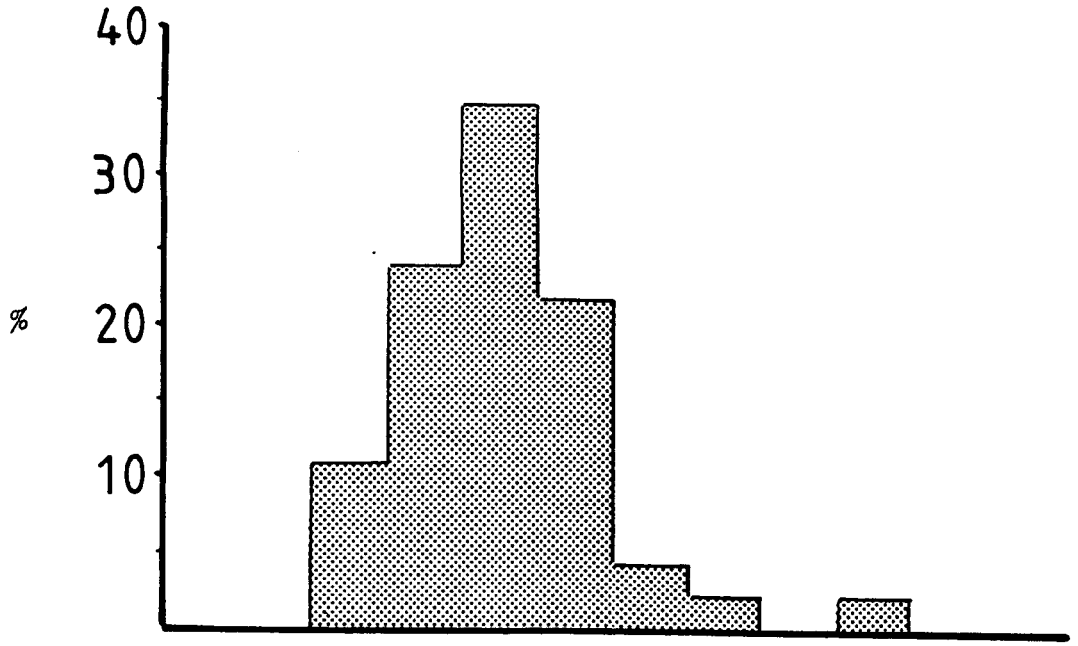


FIGURE 105 : LIMPET LENGTH DISTRIBUTIONS IN CNG II, LEVEL F

n = 125

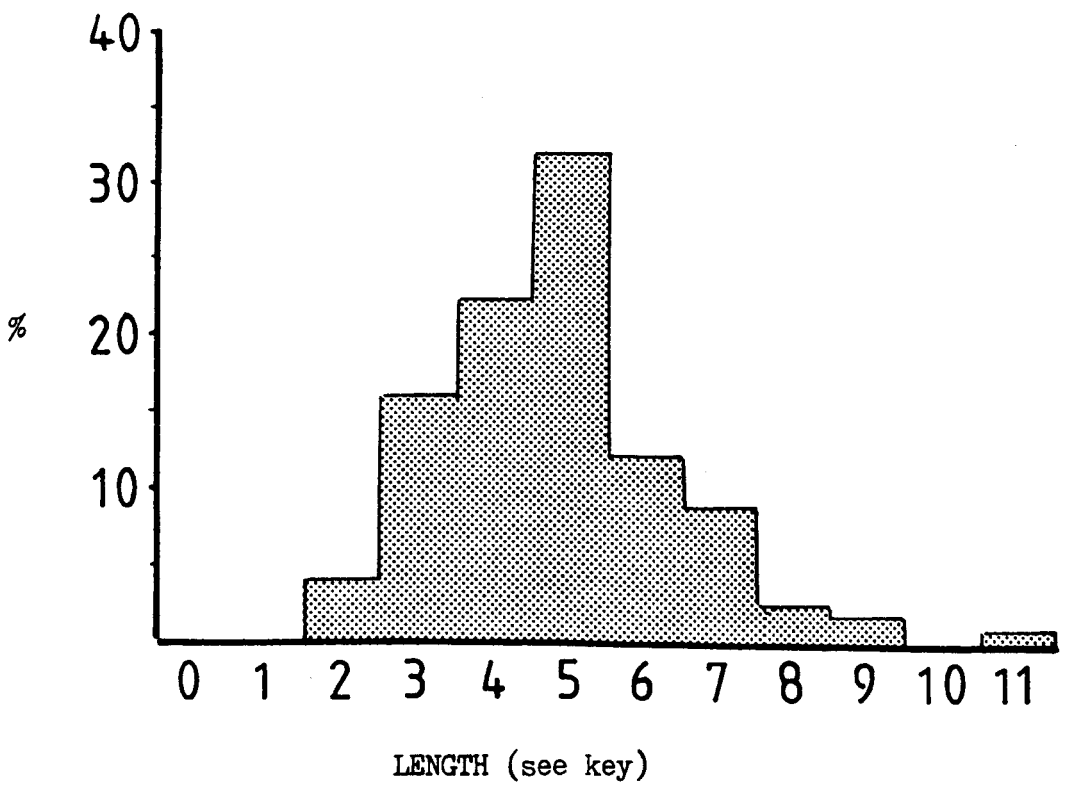


FIGURE 106 : LIMPET LENGTH DISTRIBUTIONS IN CNG II, LEVEL G

n = 125

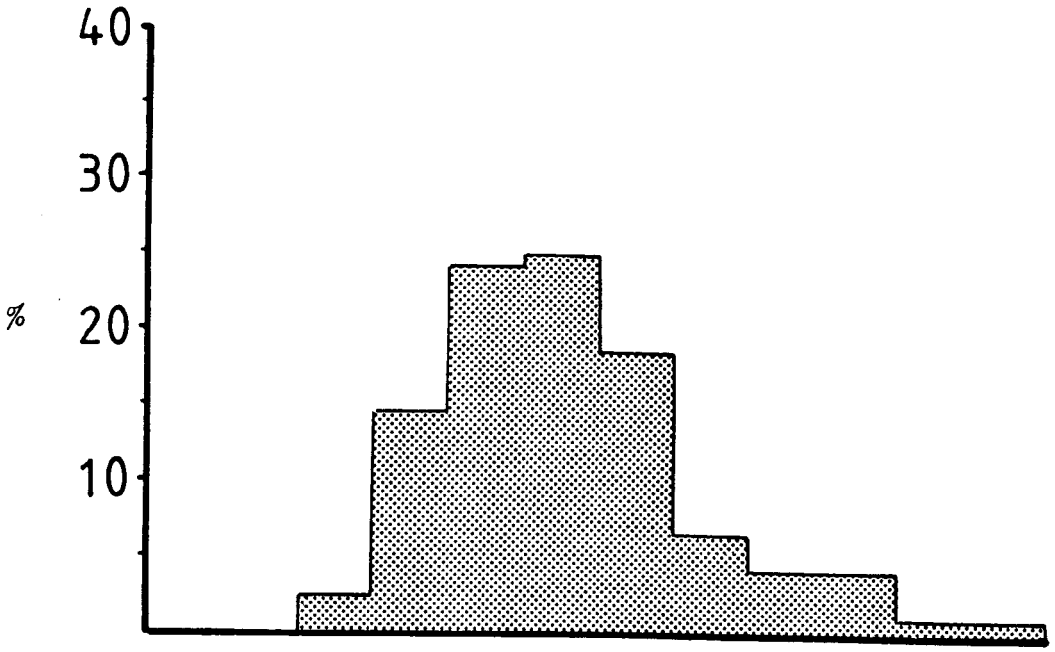
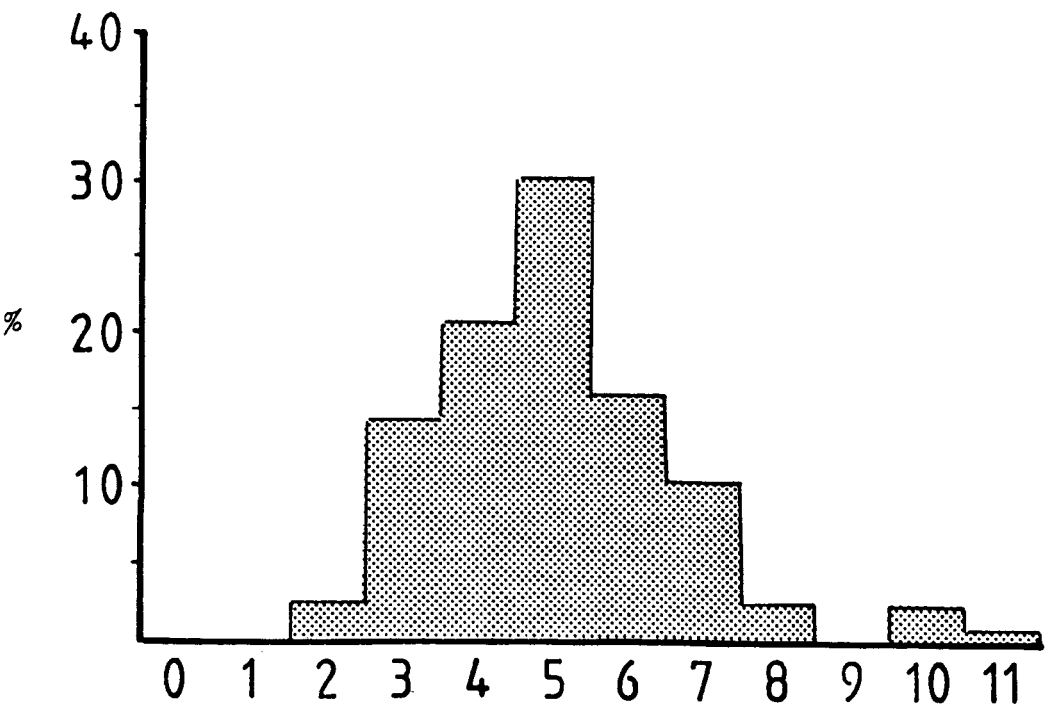


FIGURE 107 : LIMPET LENGTH DISTRIBUTIONS IN CNG II, LEVEL H

n = 125



LENGTH (see key)

FIGURE 108 : LIMPET LENGTH DISTRIBUTIONS IN CNG II, LEVEL J

n = 125

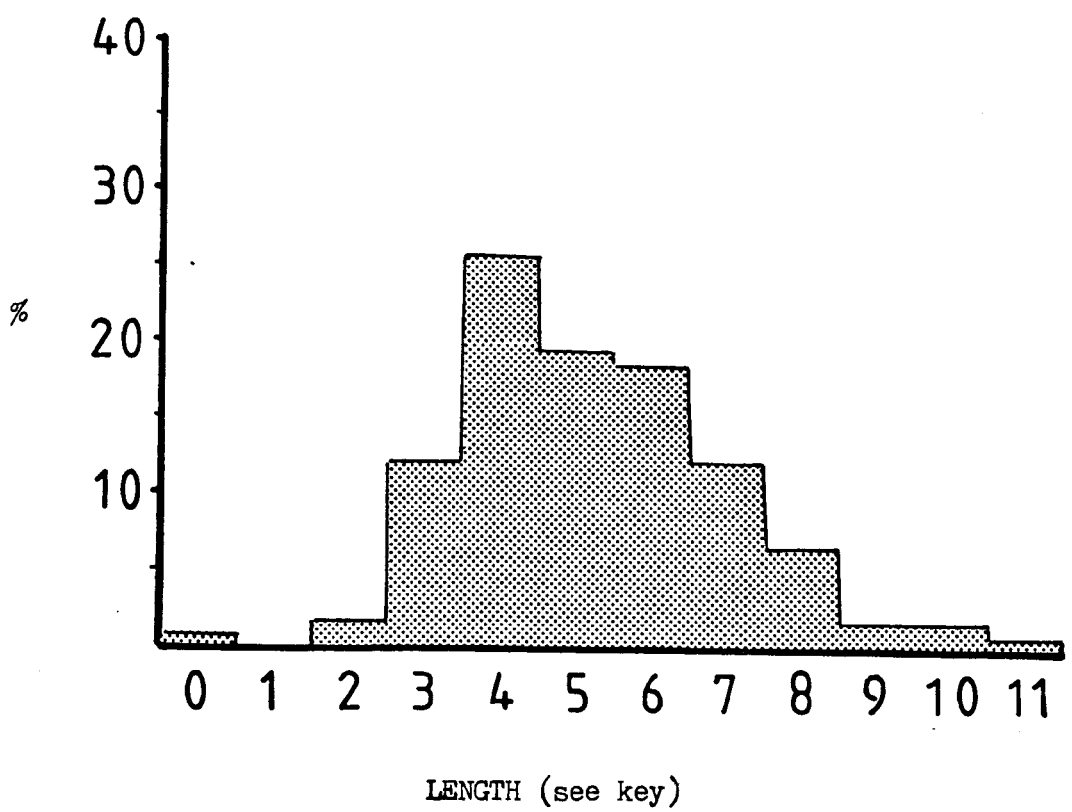


FIGURE 109 : LIMPET LENGTH DISTRIBUTIONS IN CNOC SLIGEACH, LEVEL 28

n = 92

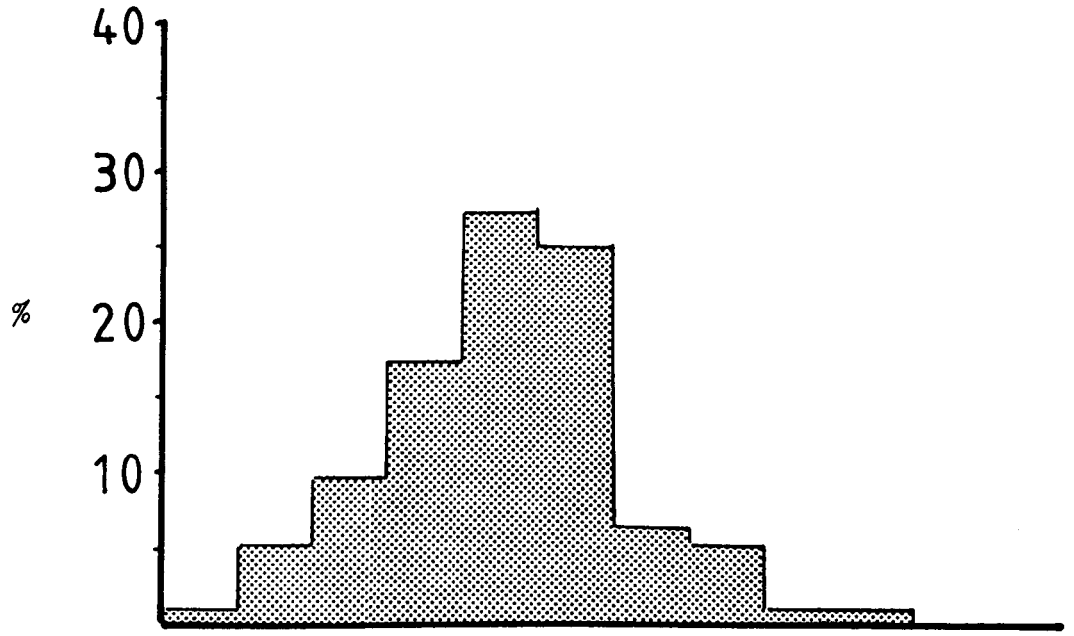


FIGURE 110 : LIMPET LENGTH DISTRIBUTIONS IN CNOC SLIGEACH, LEVEL 29

n = 125

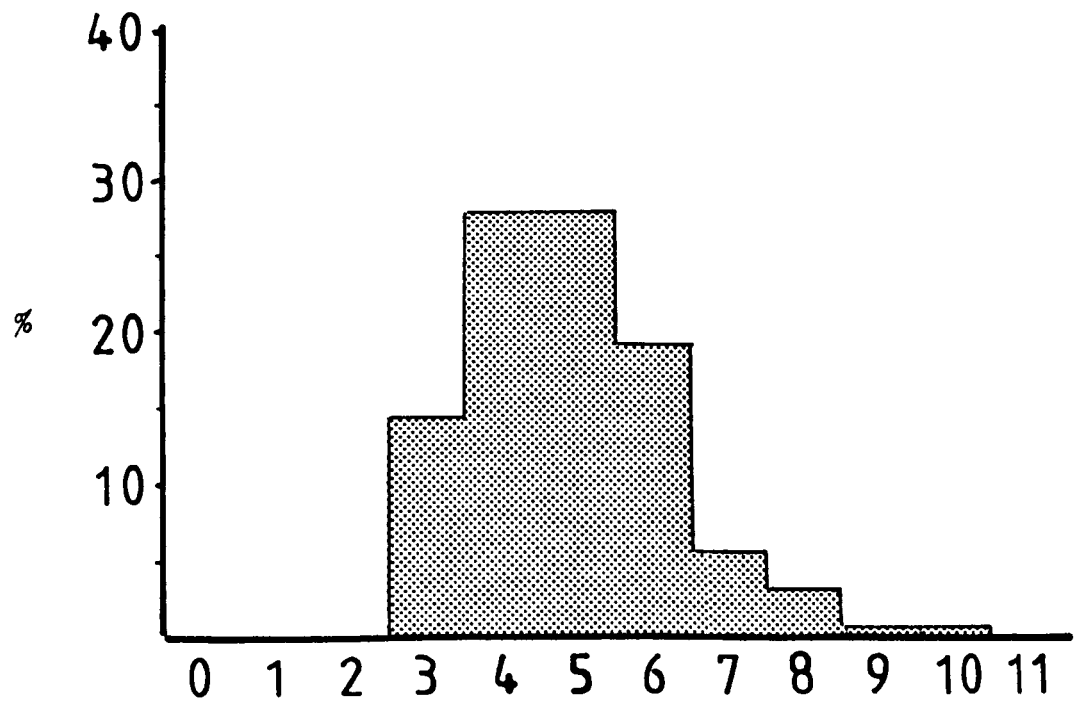


FIGURE 111 : LIMPET LENGTH DISTRIBUTIONS IN CNOC SLIGEACH, LEVEL 30

n = 125

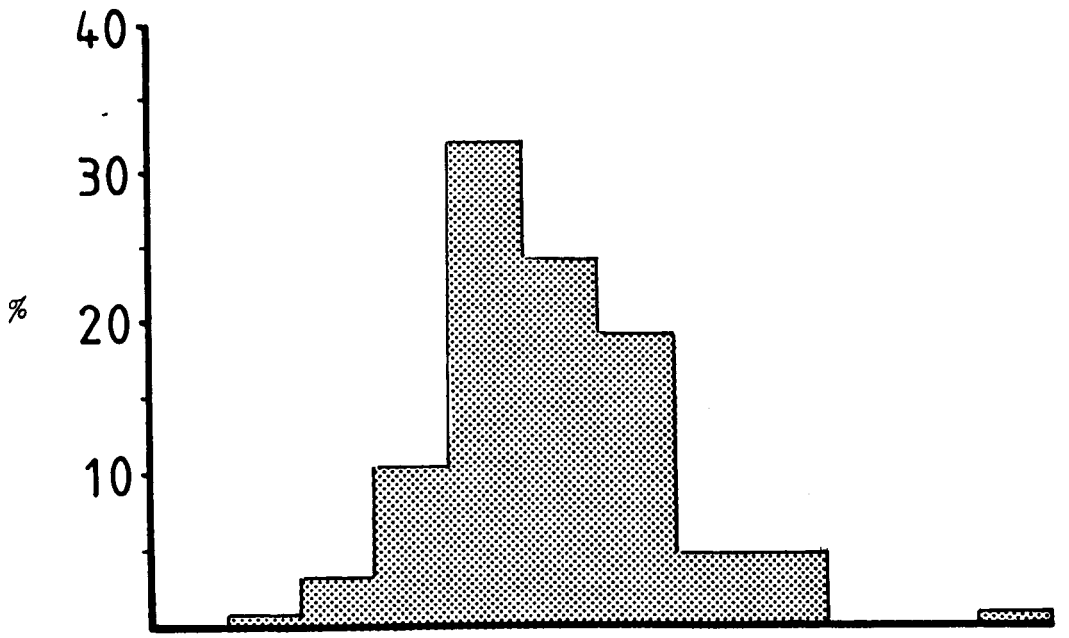


FIGURE 112 : LIMPET LENGTH DISTRIBUTIONS IN CNOC SLIGEACH, LEVEL 31

n = 125

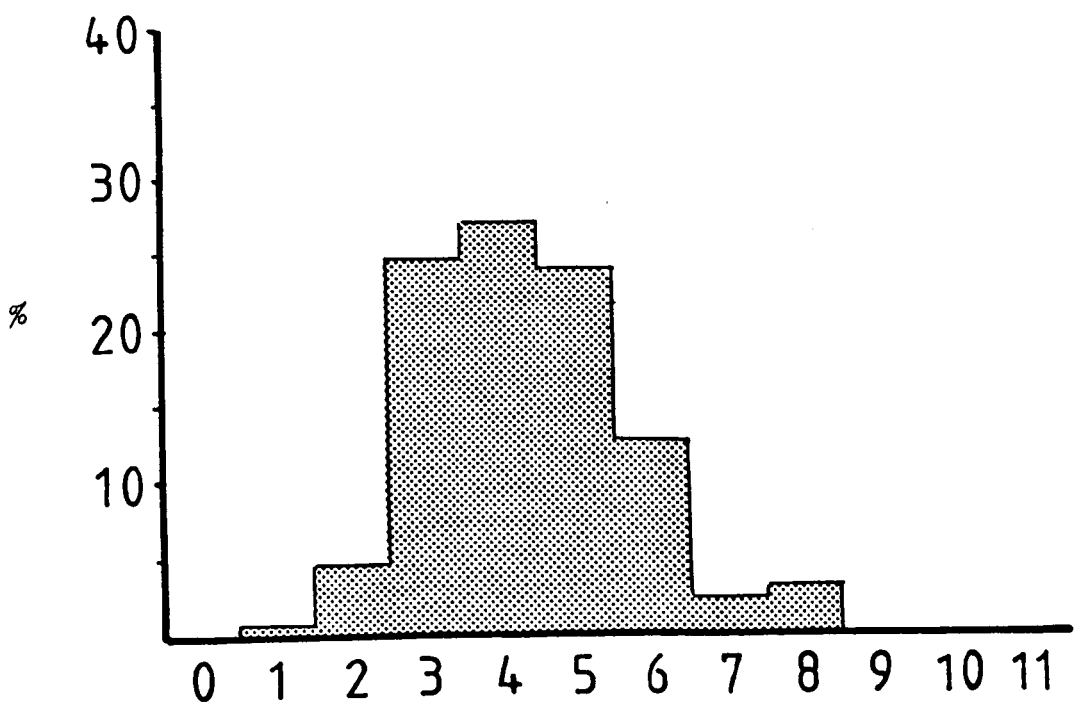


FIGURE 113 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 1

n = 129

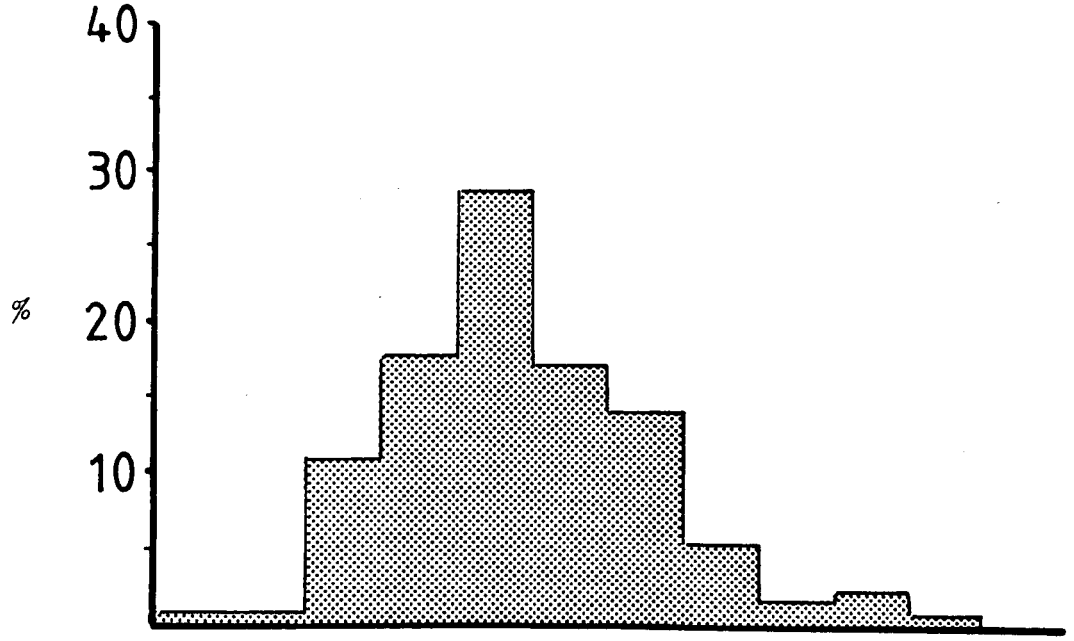


FIGURE 114 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 2

n = 112

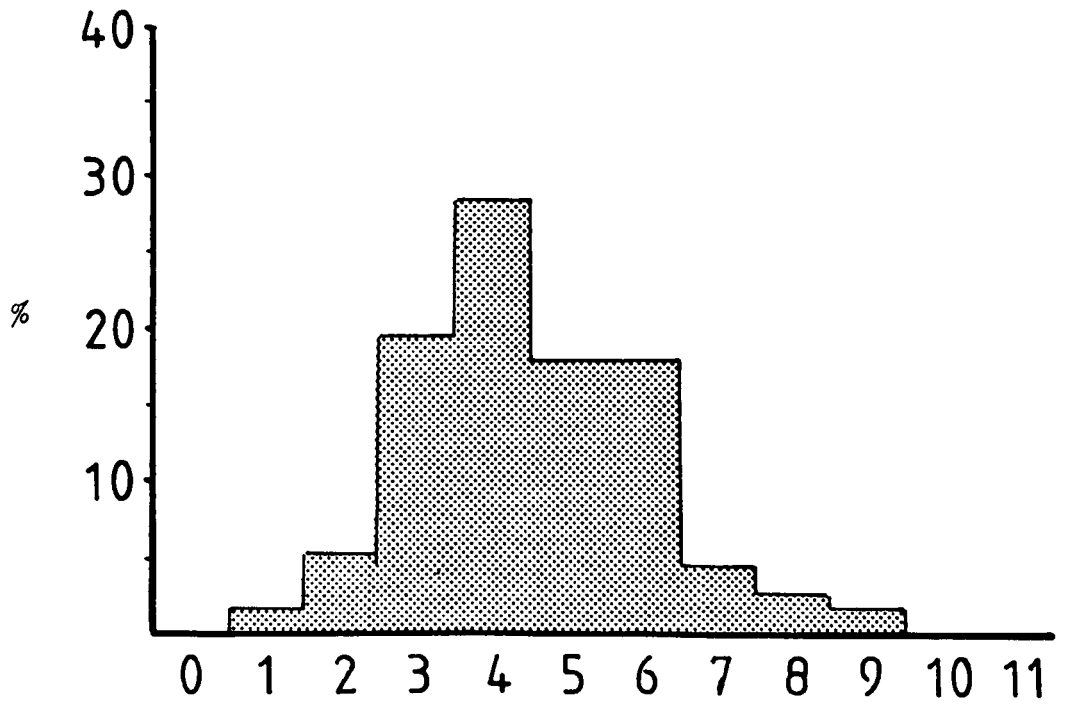


FIGURE 115 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 3

n = 119

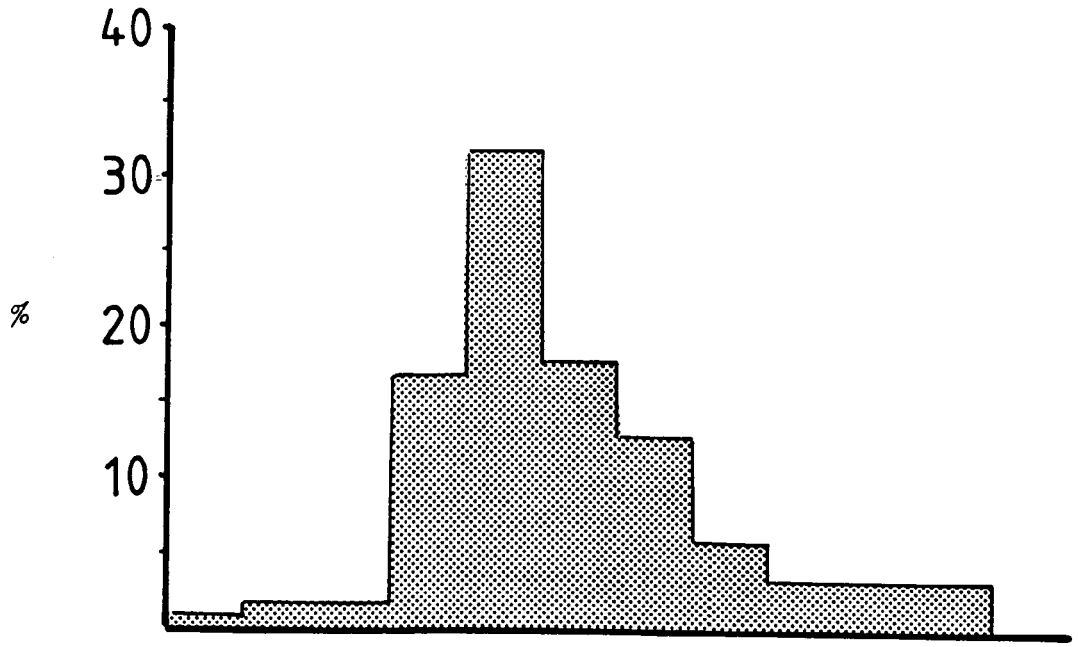


FIGURE 116 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 4

n = 164

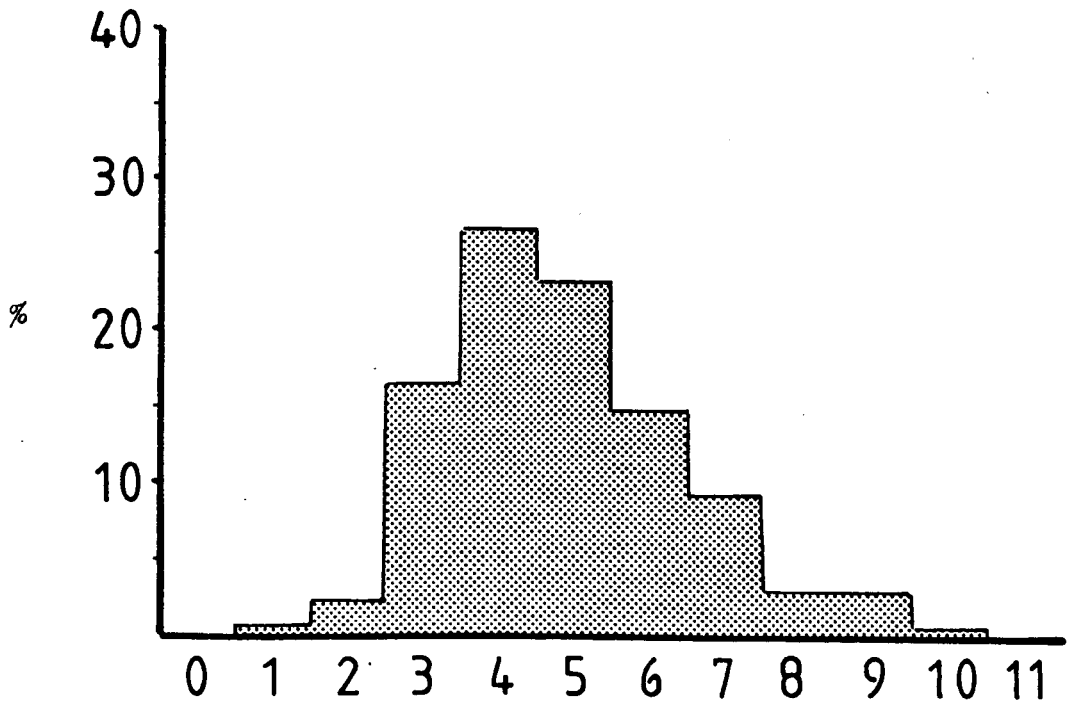


FIGURE 117 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 5

n = 101

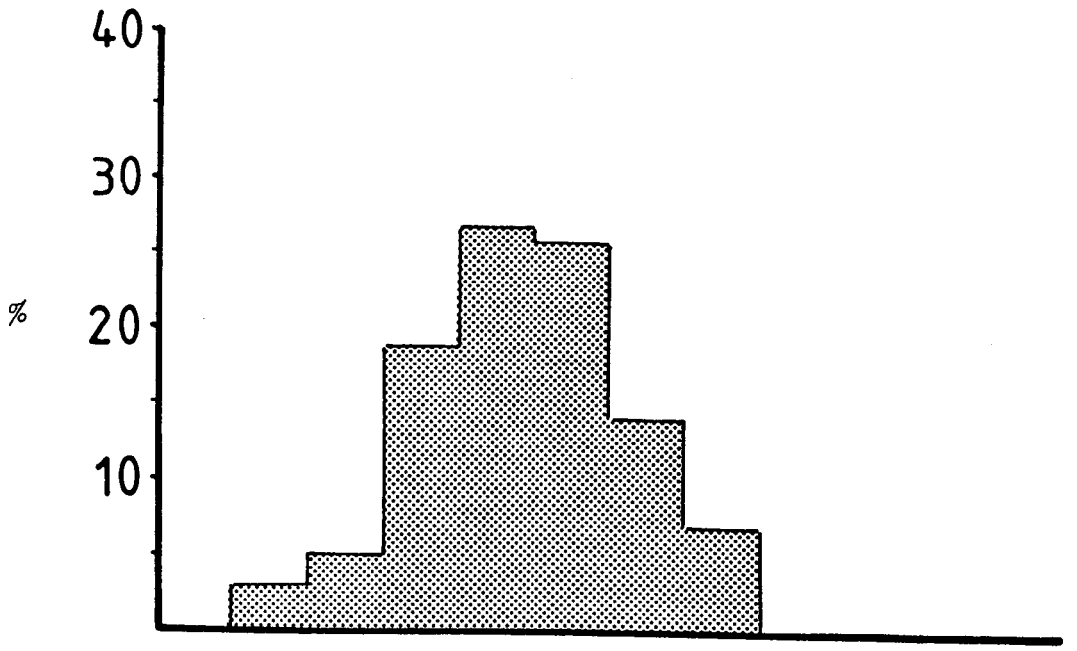


FIGURE 118 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 6

n = 120

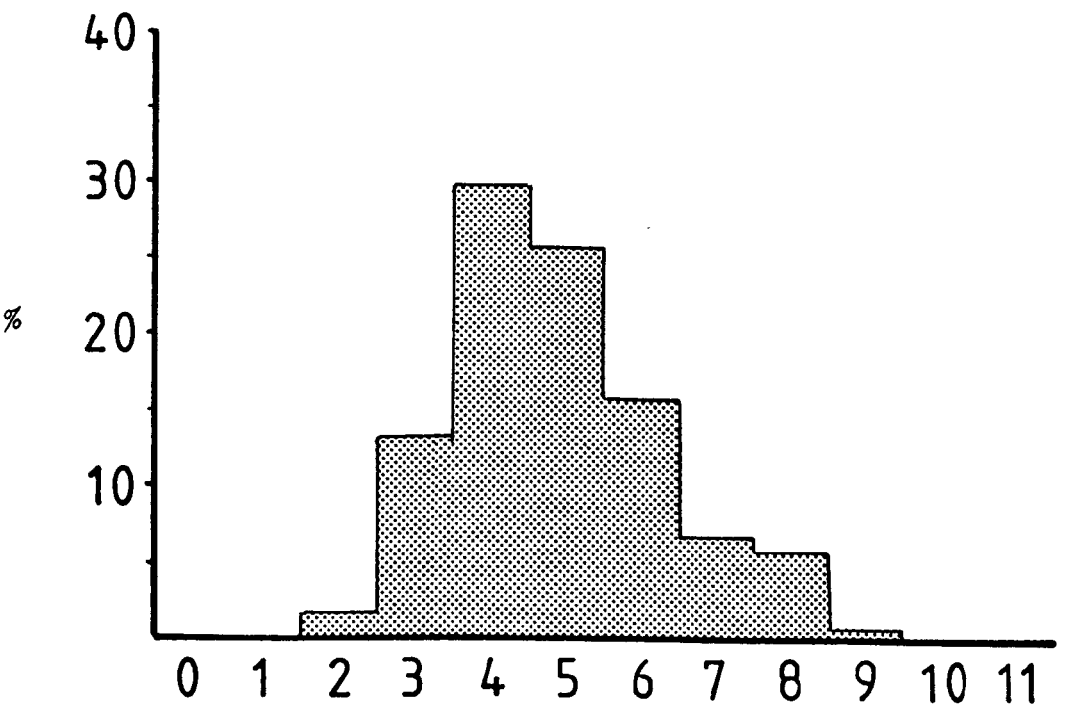


FIGURE 119 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 7

n = 159

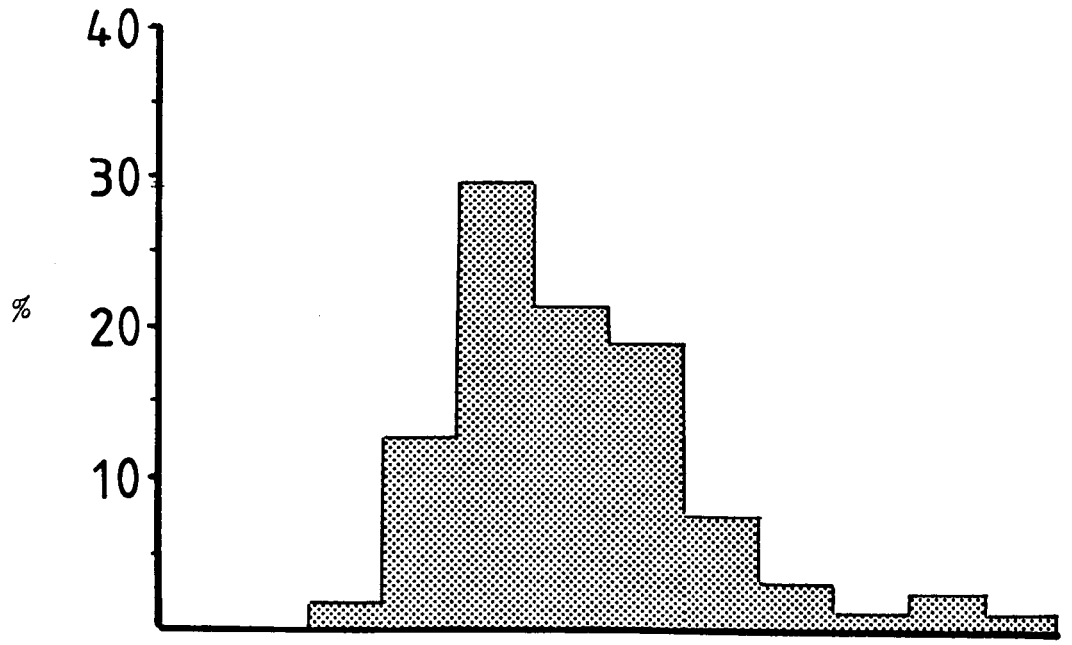


FIGURE 120 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 8

n = 122

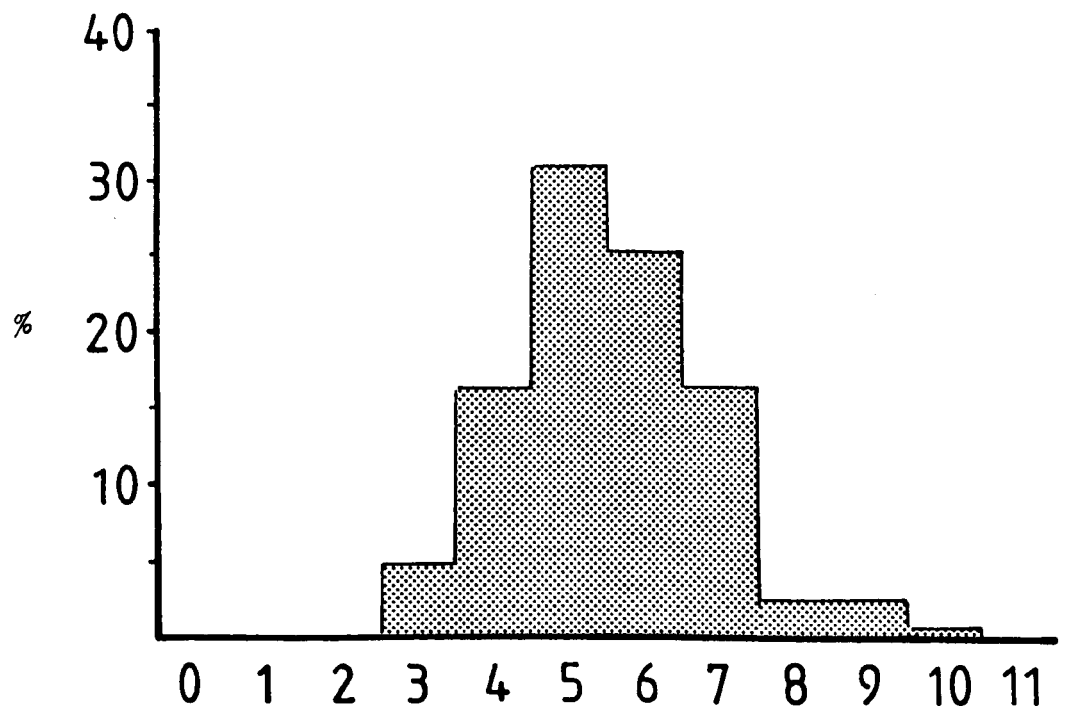


FIGURE 121 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 9

n = 190

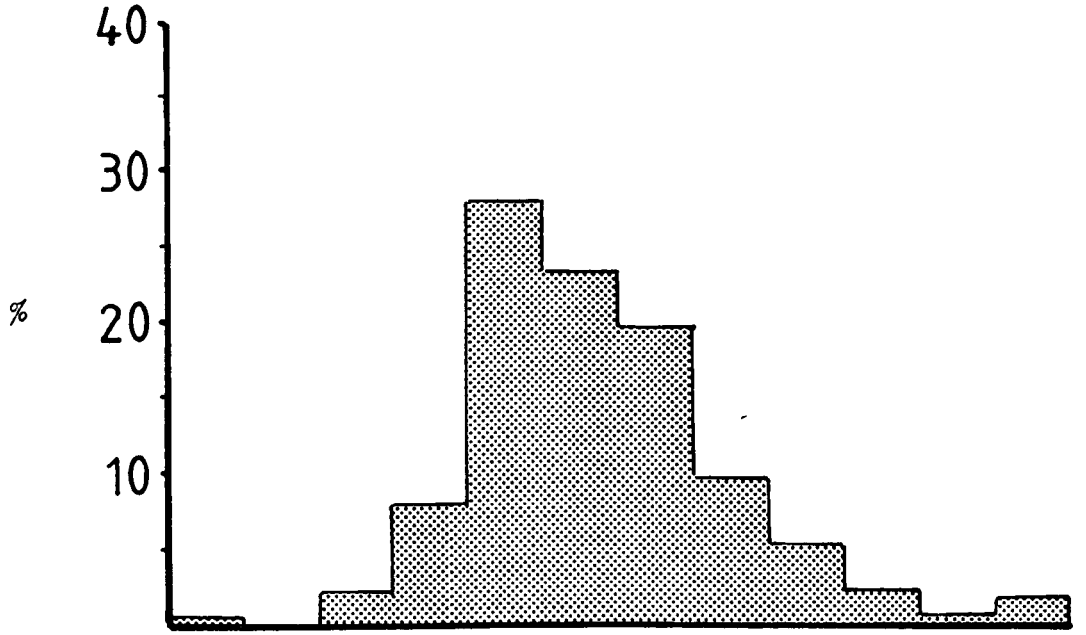


FIGURE 122 : LIMPET LENGTH DISTRIBUTIONS IN PRIORY MIDDEN, LEVEL 10

n = 183

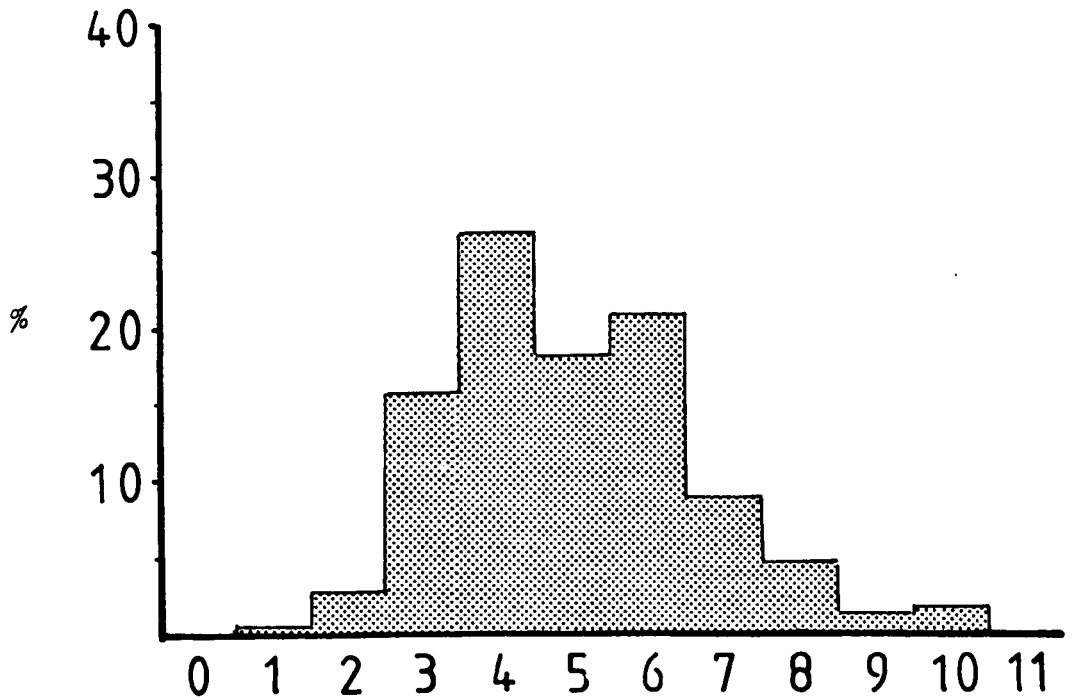
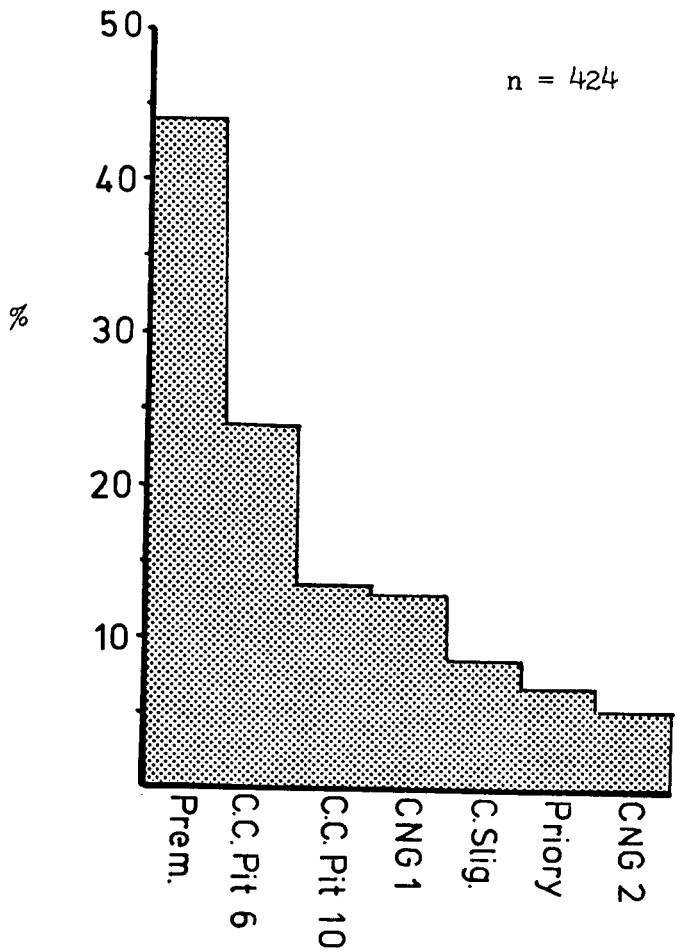


FIGURE 123 : THE PERCENTAGE OF SMALLEST AND LARGEST LIMPETS IN EACH MIDDEN.(% expresses the % of all midden samples except the Premidden.)

SMALLEST 10% (ie $\leqslant$25.6mm shell length)



LARGEST 10% (ie $\geqslant$37.5mm shell length)

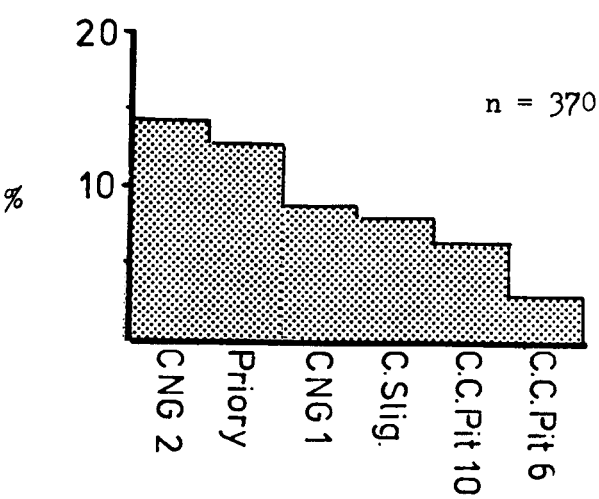
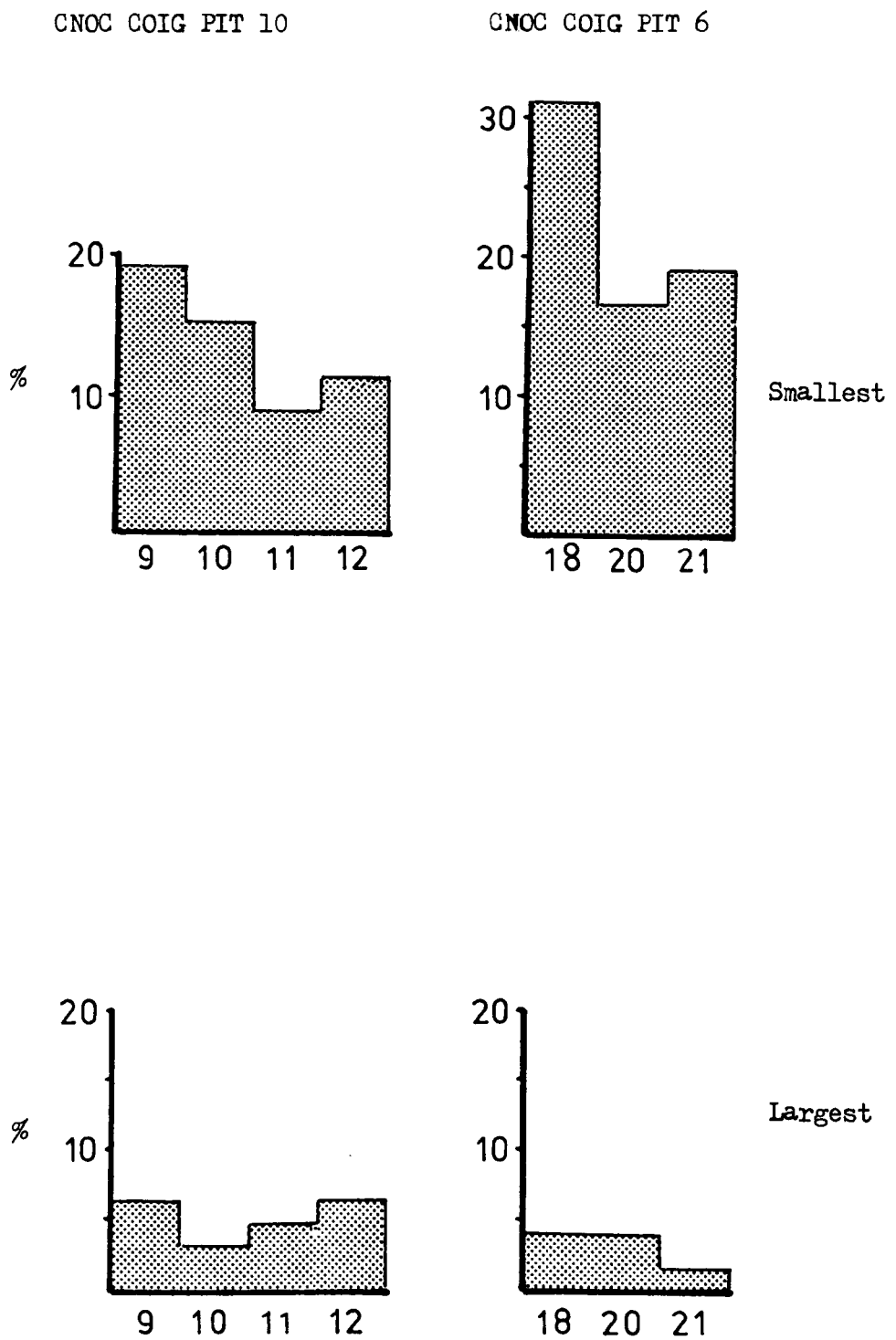
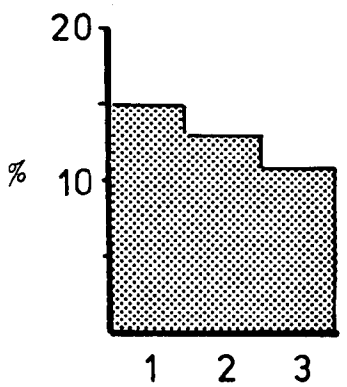


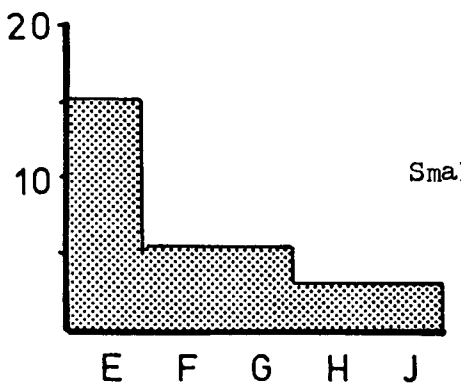
FIGURE 124 : THE PERCENTAGE OF SMALLEST AND LARGEST LIMPETS IN EACH MIDDEN LEVEL. (% expresses the % of all midden samples except the Premidden.)



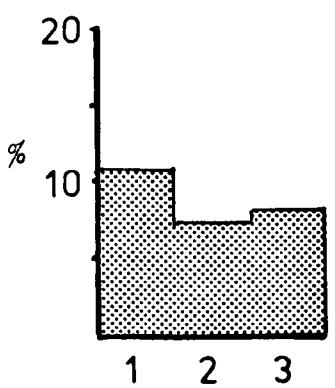
CNG I

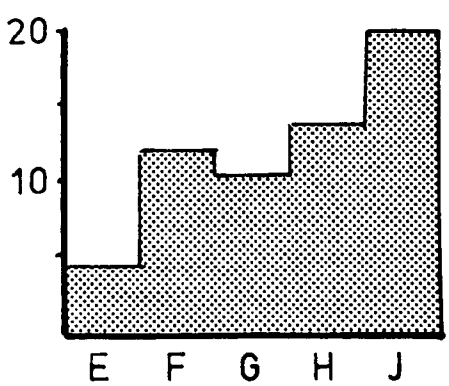


CNG II



Smallest

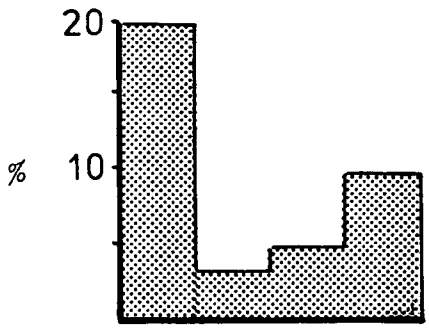




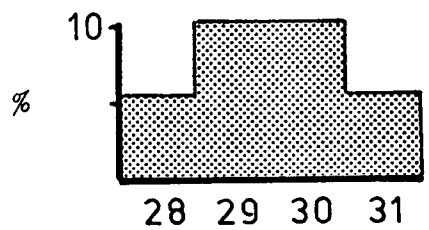
Largest

CNOC SLIGEACH

Smallest

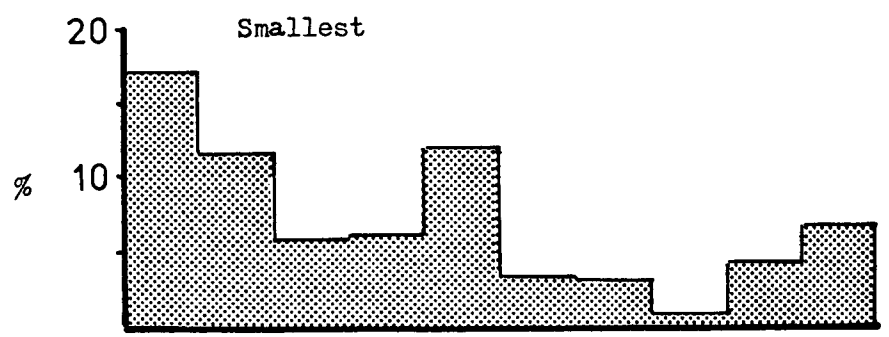


Largest



PRIORY MIDDEN

Smallest



Largest

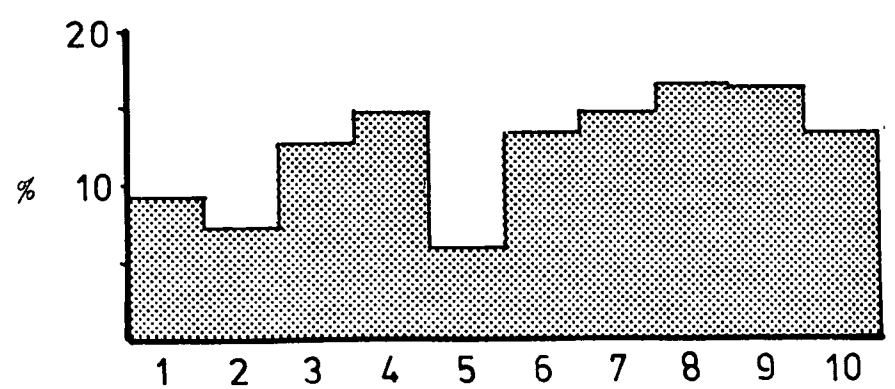


FIGURE 125 : DEGREES OF LIMPET FRAGMENTATION IN CNOC COIG PIT 10

Expressed as the number of apices as a % of the number of whole limpets.

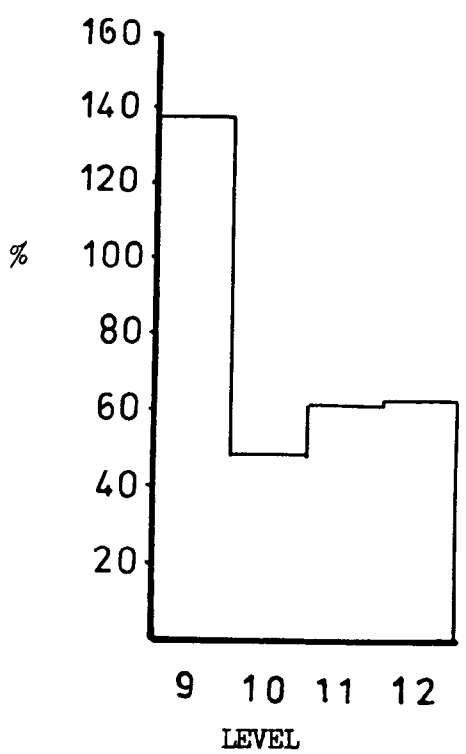


FIGURE 126 : DEGREES OF LIMPET FRAGMENTATION IN CNOC COIG, PIT 6

Expressed as the number of apices as a % of the number of whole limpets.

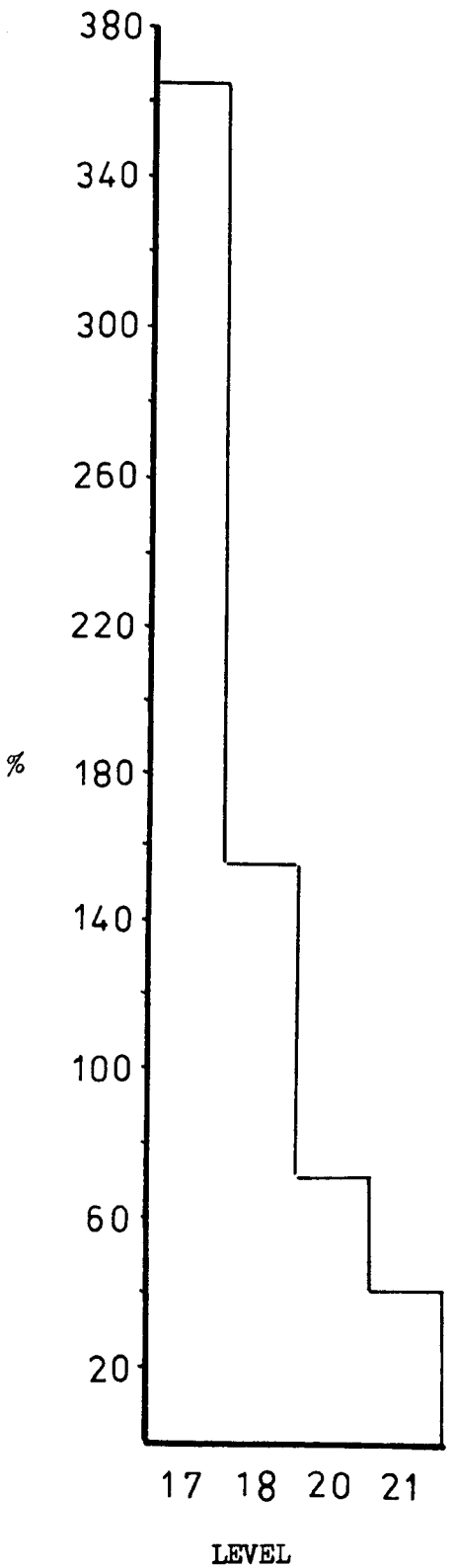


FIGURE 127 : DEGREES OF LIMPET FRAGMENTATION IN CNG I. Expressed as the number of apices as a % of the number of whole limpets.

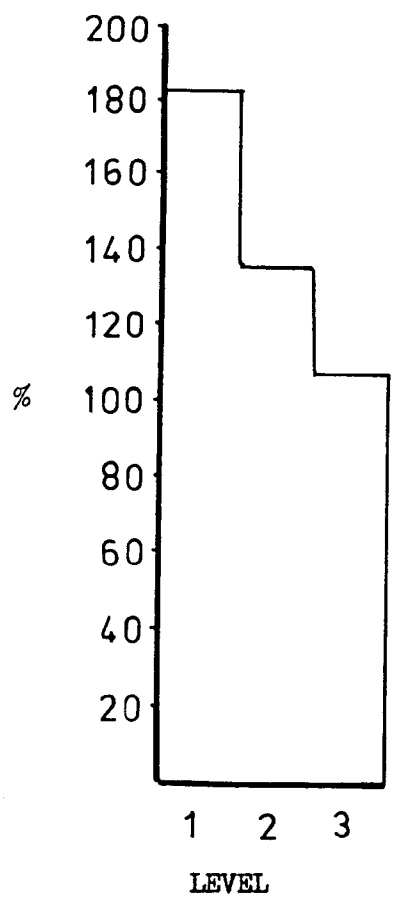


FIGURE 128 : DEGREES OF LIMPET FRAGMENTATION IN CNG II.

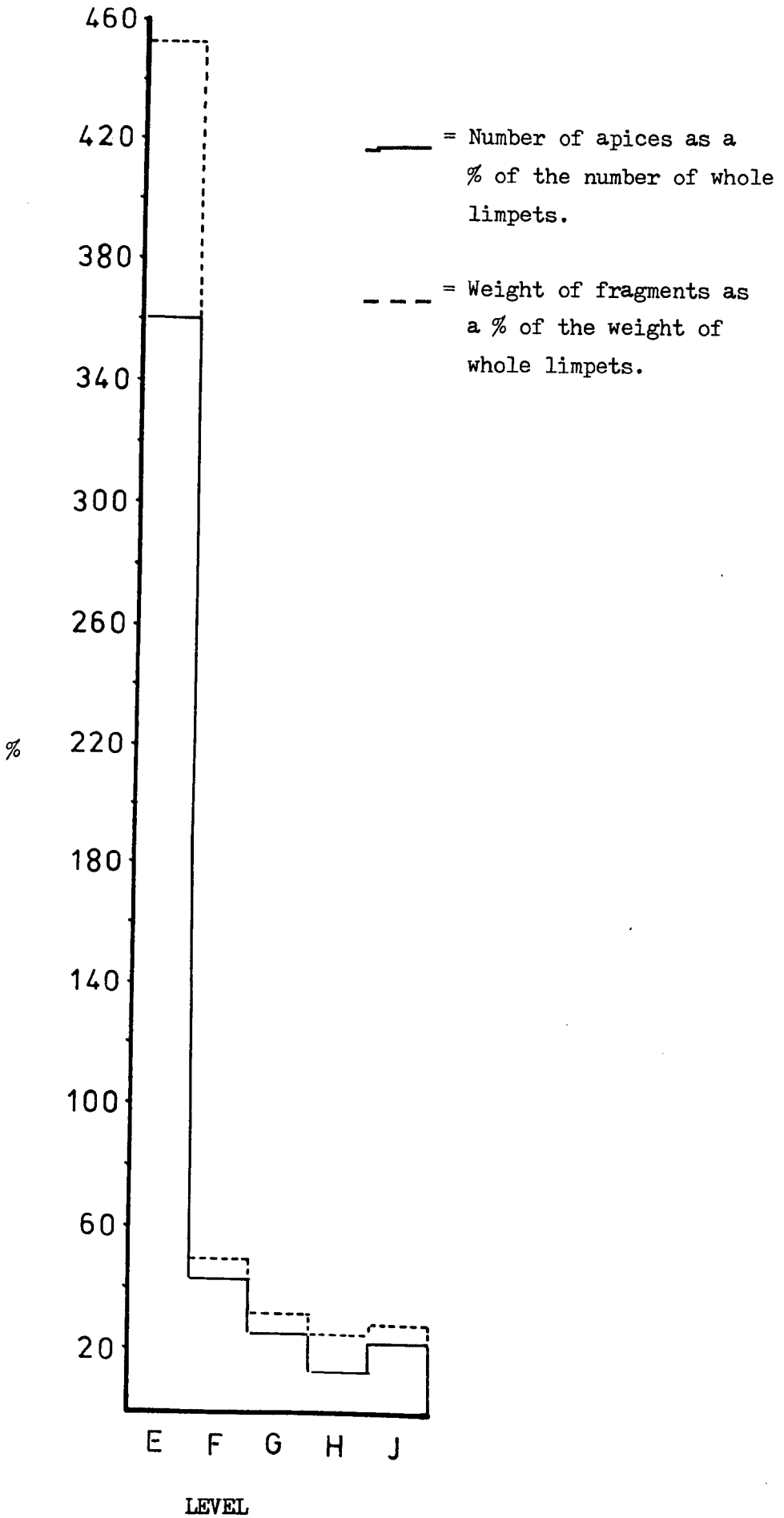


FIGURE 129 : DEGREES OF LIMPET FRAGMENTATION IN CNOC SLIGEACH

_____ = Number of apices as a % of the number of whole limpets.

_ _ _ = Weight of fragments as a % of the weight of whole limpets.

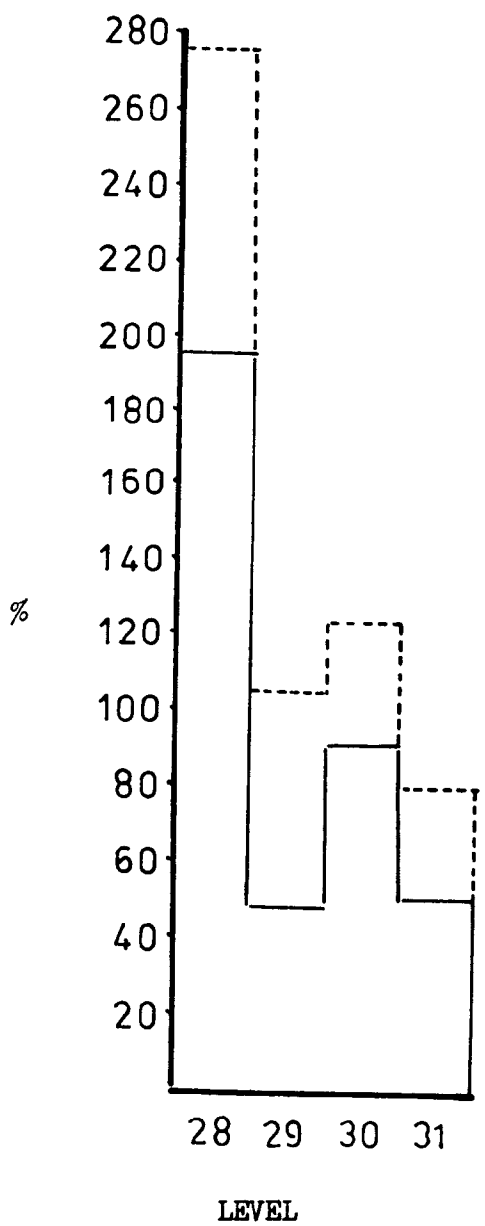
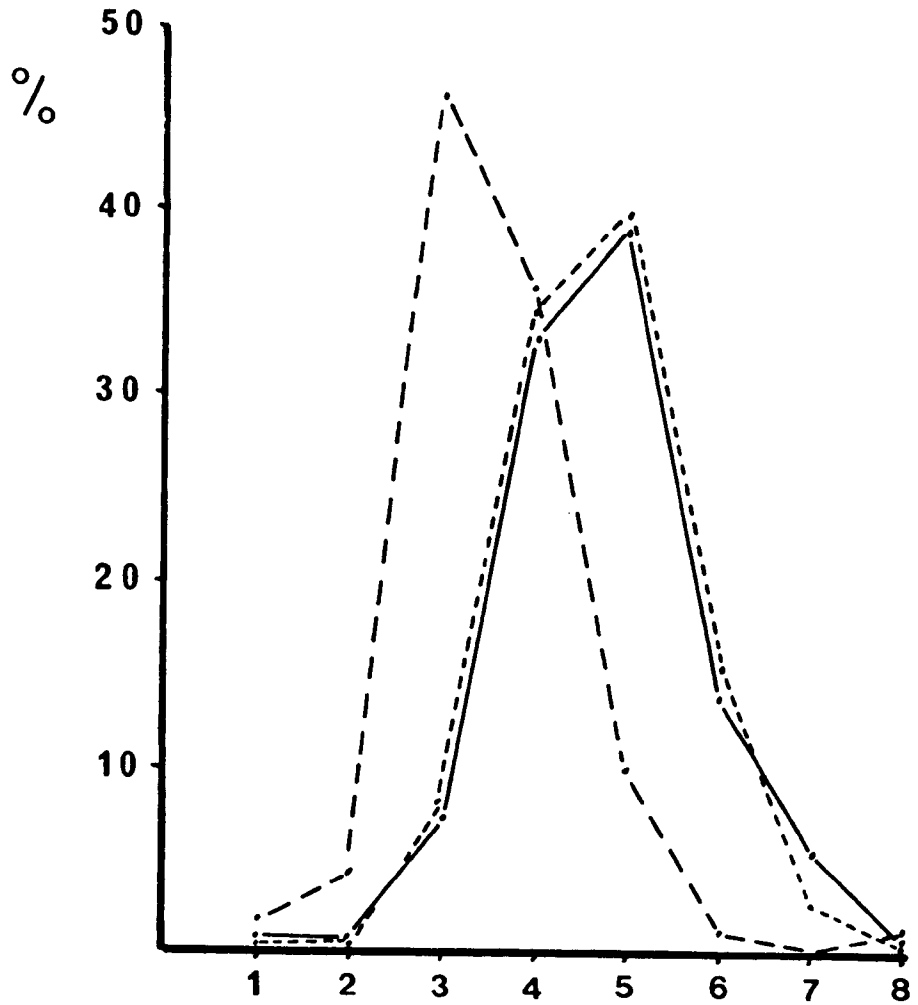


FIGURE 130 : THE DISTRIBUTION OF DIFFERENT SHAPED LIMPETS IN THE MIDDENS COMPARED TO THE MODERN SHORE.



—— modern low shore
—— modern high shore
--- midden

length / height

1 = ≤ 1·49
2 = 1·5 - 1·99
3 = 2·0 - 2·49
4 = 2·5 - 2·99
5 = 3·0 - 3·49
6 = 3·5 - 3·99
7 = 4·0 - 4·49
8 = ≥ 4·5

KEY TO FIGURES 131 TO 150

SHELL LENGTH (mm)

0	under 17.9
1	18.0 - 19.9
2	20.0 - 21.9
3	22.0 - 23.9
4	24.0 - 25.9
5	26.0 - 27.9
6	28.0 - 29.9
7	above 30.0

FIGURE 131 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNOC COIG, PIT 10

n = 111

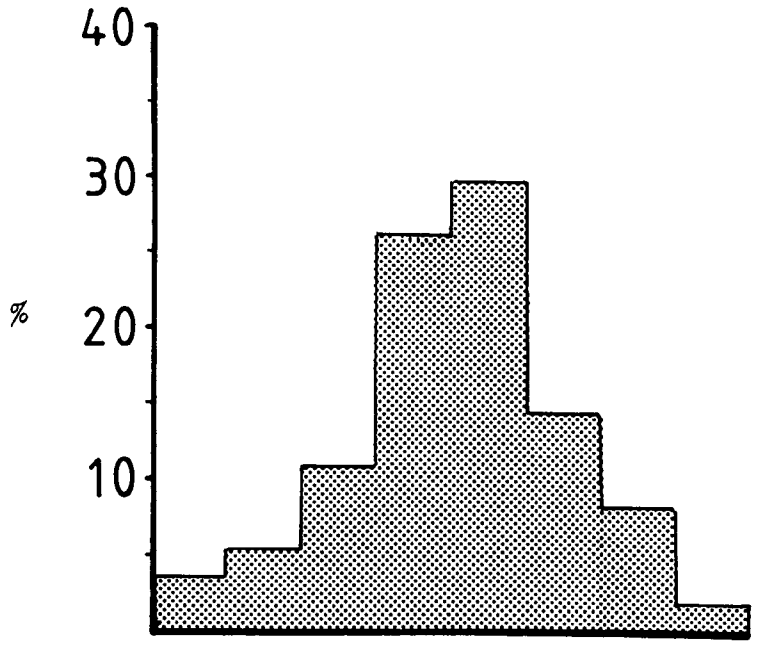


FIGURE 132 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNOC COIG, PIT 6

n = 73

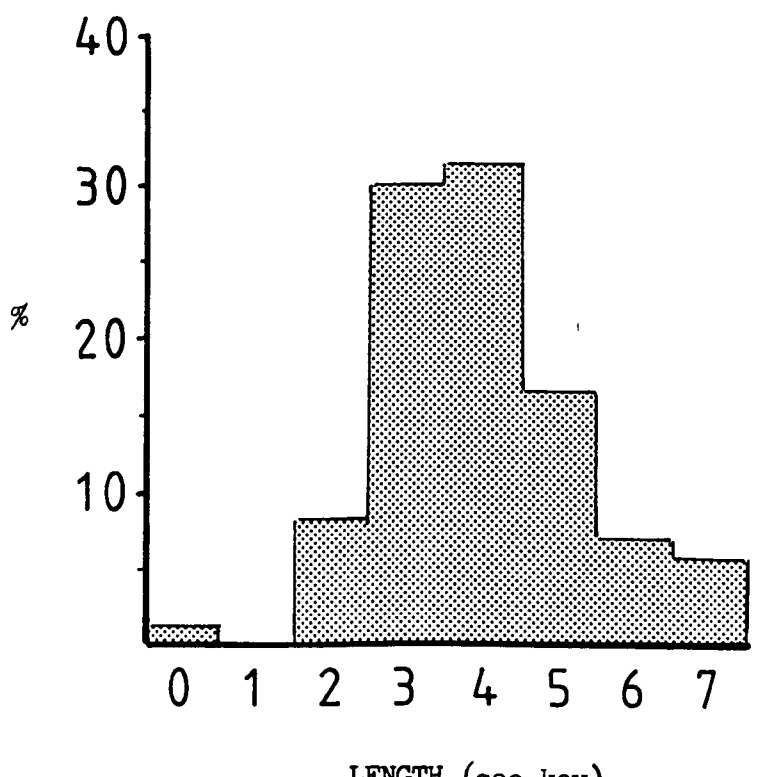


FIGURE 133 : PERIWINKLE LENGTH DISTRIBUTIONS IN BOTH COLUMNS FROM CNOC COIG. n = 184

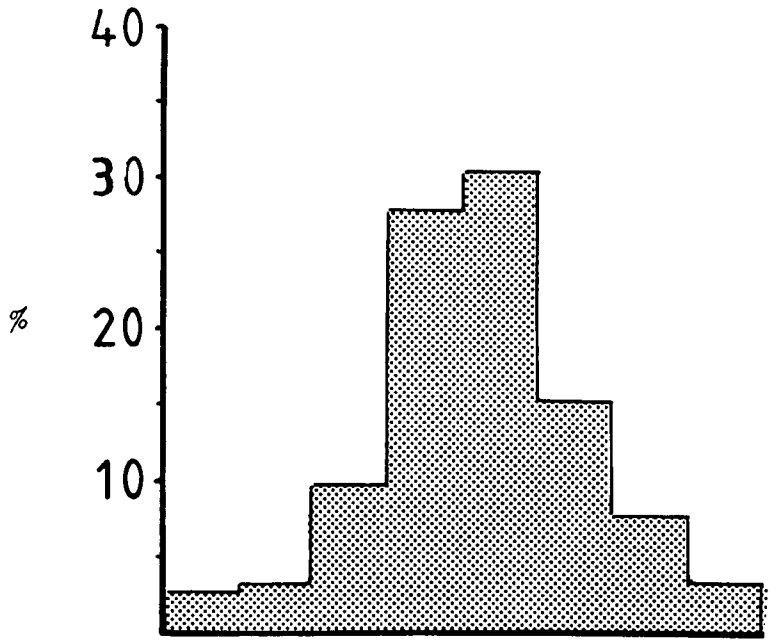


FIGURE 134 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNG I

n = 87

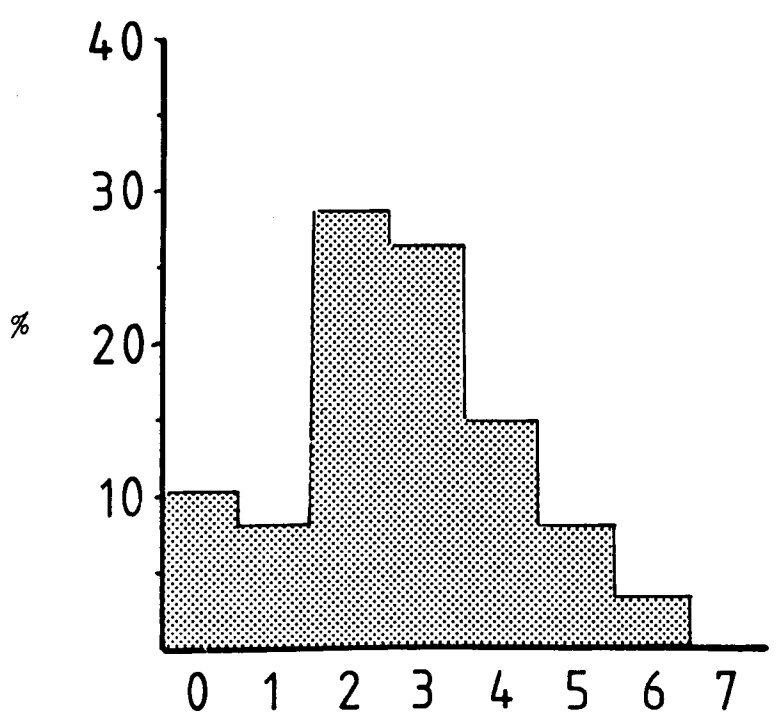


FIGURE 135 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNG II

n = 29

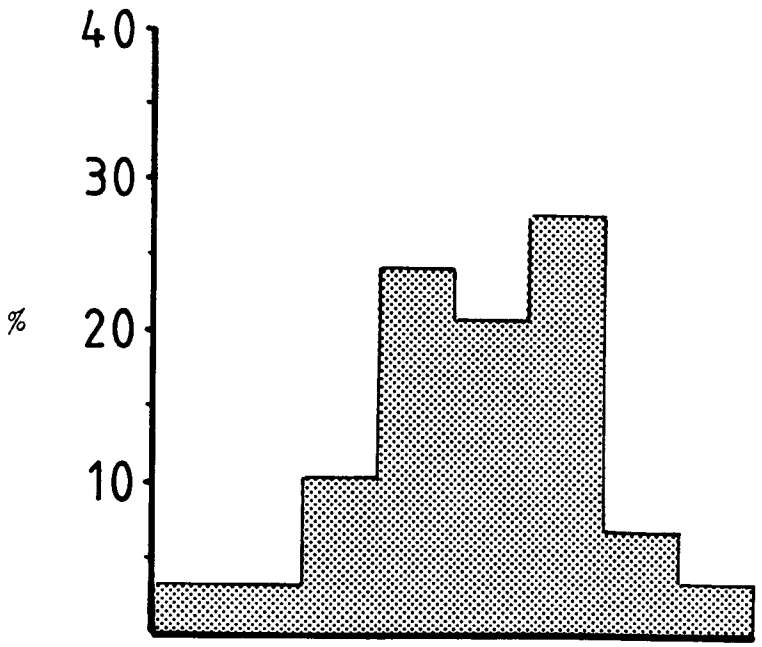


FIGURE 136 : PERIWINKLE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN

n = 197

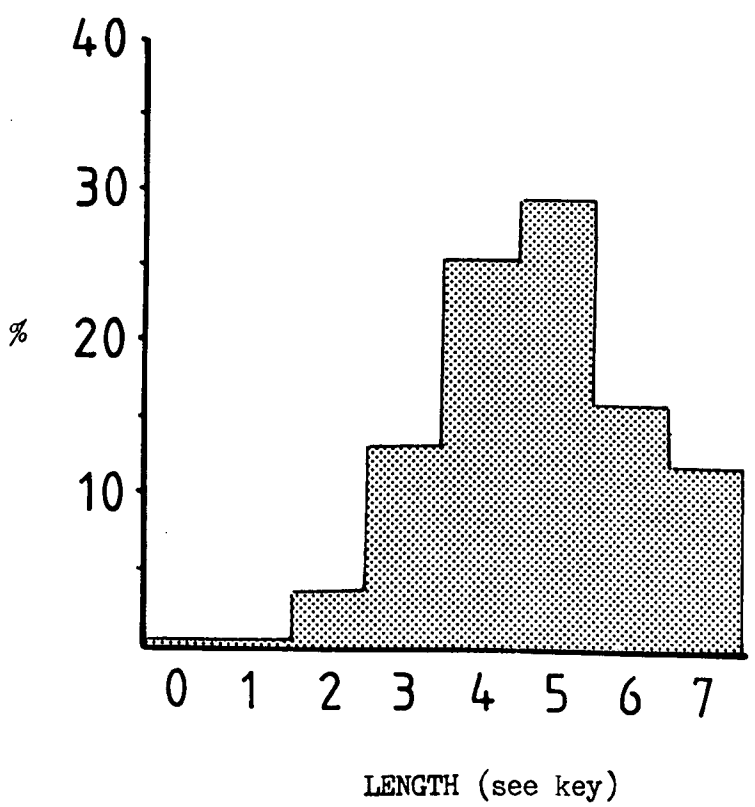


FIGURE 137 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10

LEVEL 9 n = 37

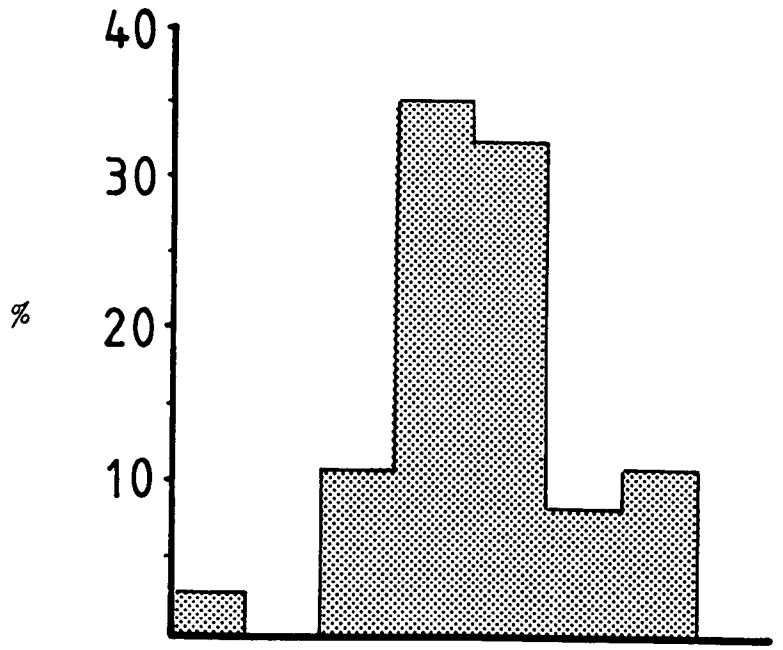


FIGURE 138 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10

LEVEL 10 n = 47

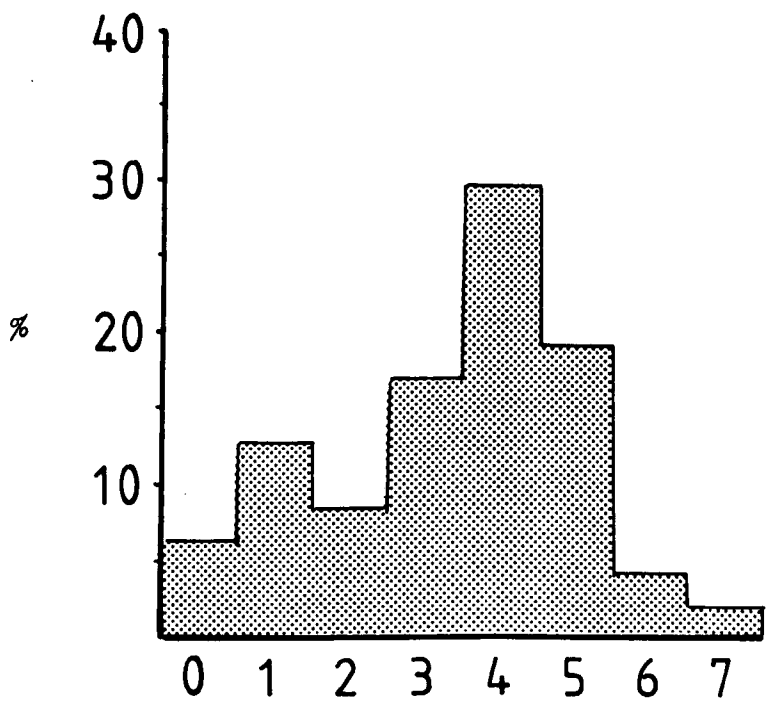


FIGURE 139 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10 LEVEL 11. n = 23

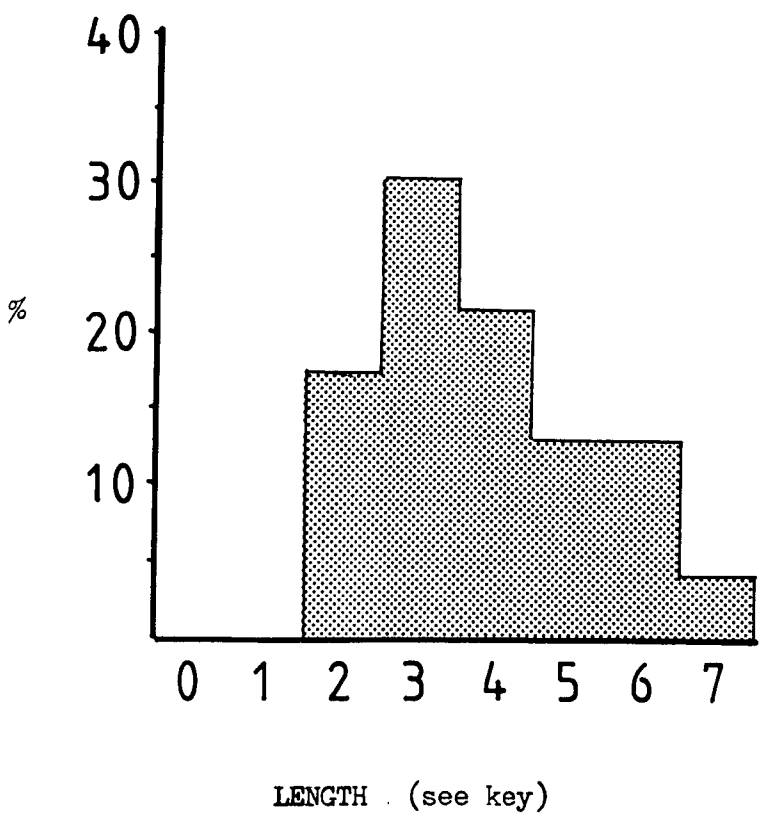


FIGURE 140 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6

LEVEL 20 n = 46

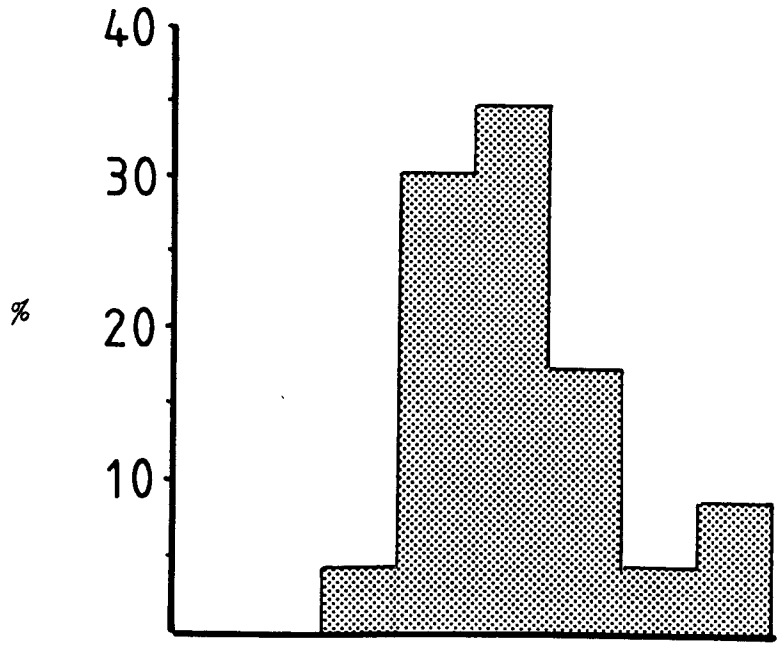
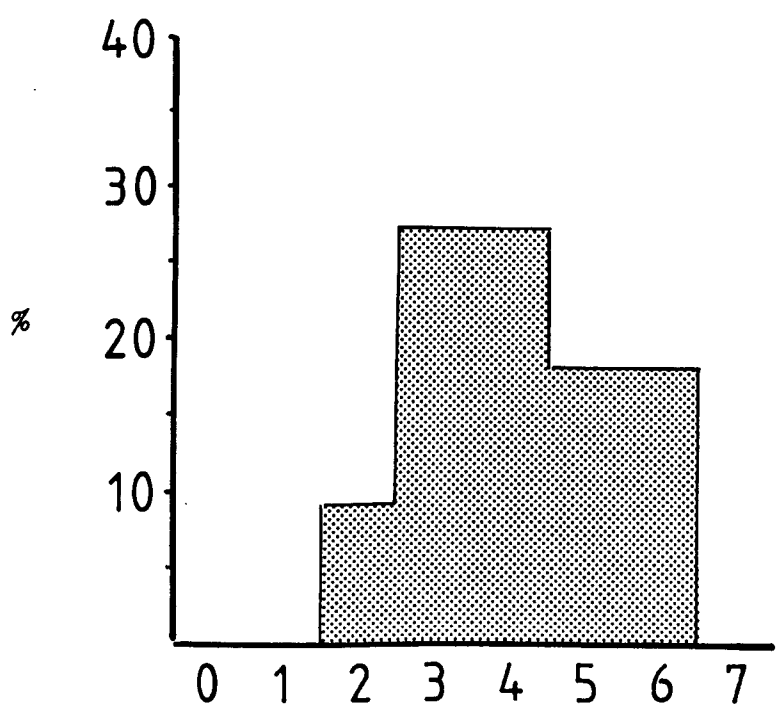


FIGURE 141 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6

LEVEL 21 n = 11



LENGTH (see key)

FIGURE 142 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNG I, LEVEL 2

n = 68

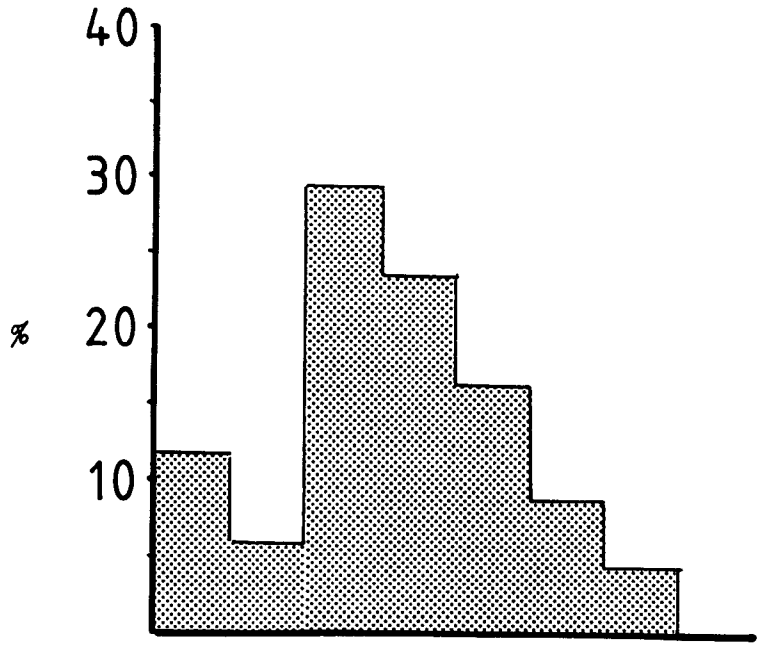


FIGURE 143 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNG I, LEVEL 3

n = 16

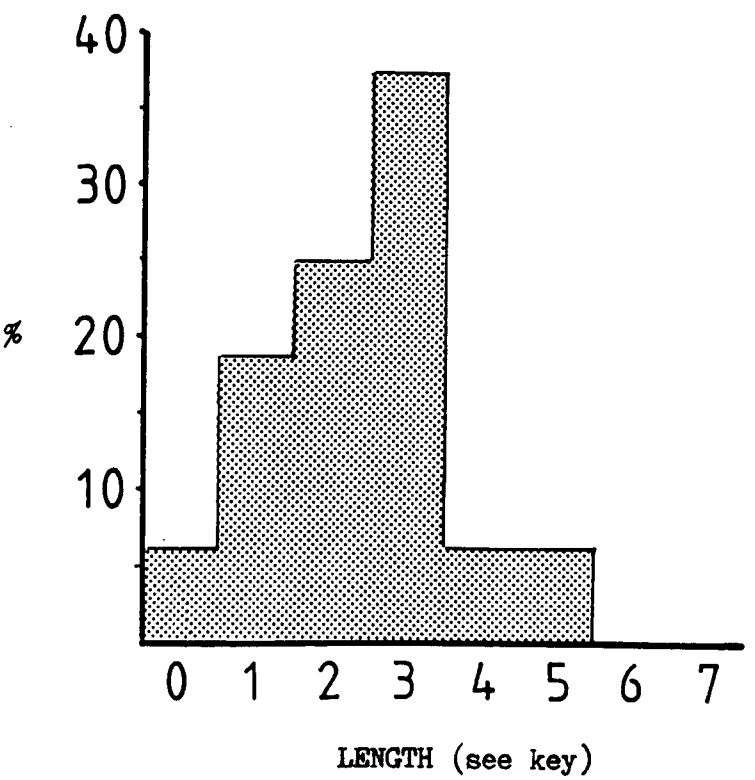


FIGURE 144 : PERIWINKLE LENGTH DISTRIBUTIONS IN CNG II, LEVEL G

n = 13

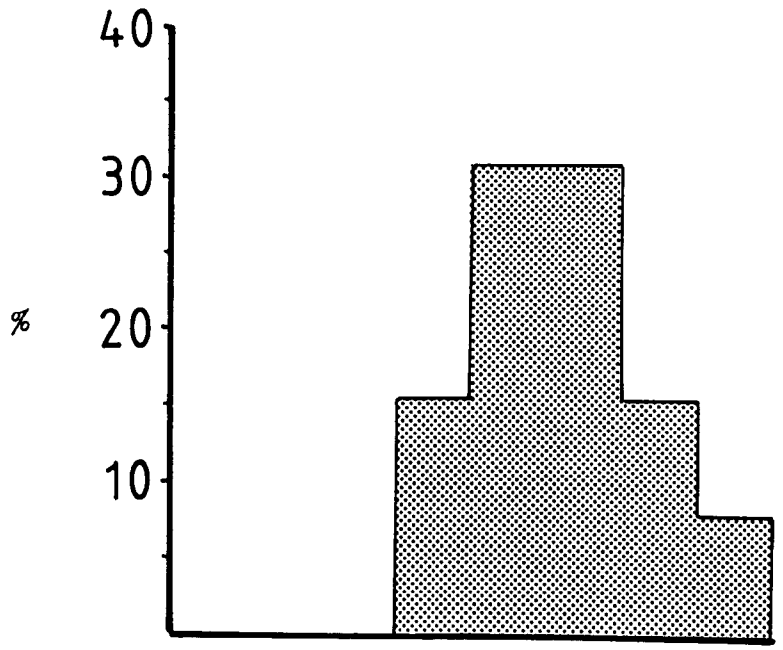


FIGURE 145 : PERIWINKLE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 1.

n = 53

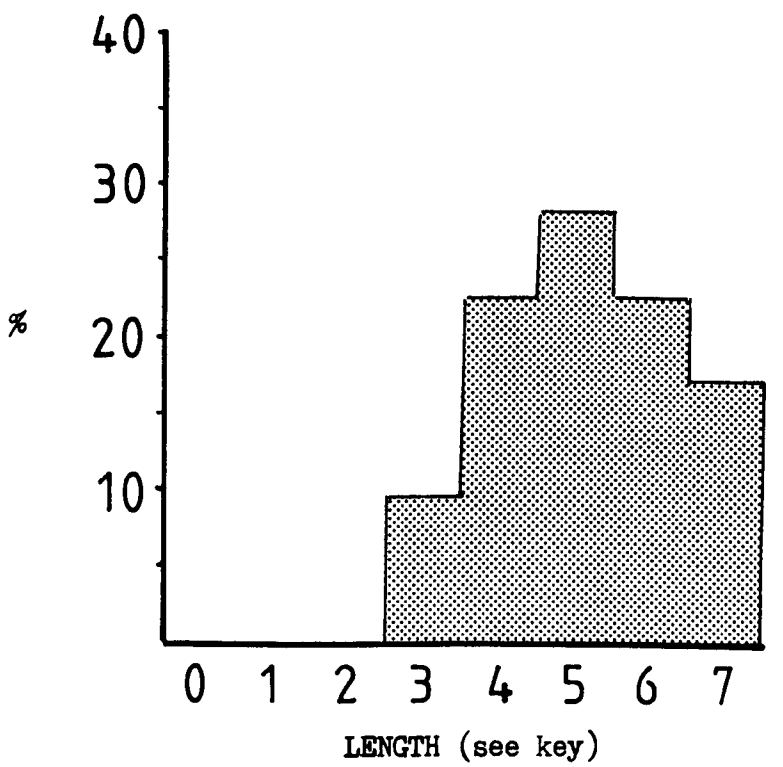


FIGURE 146 : PERIWINKLE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 2. n = 54

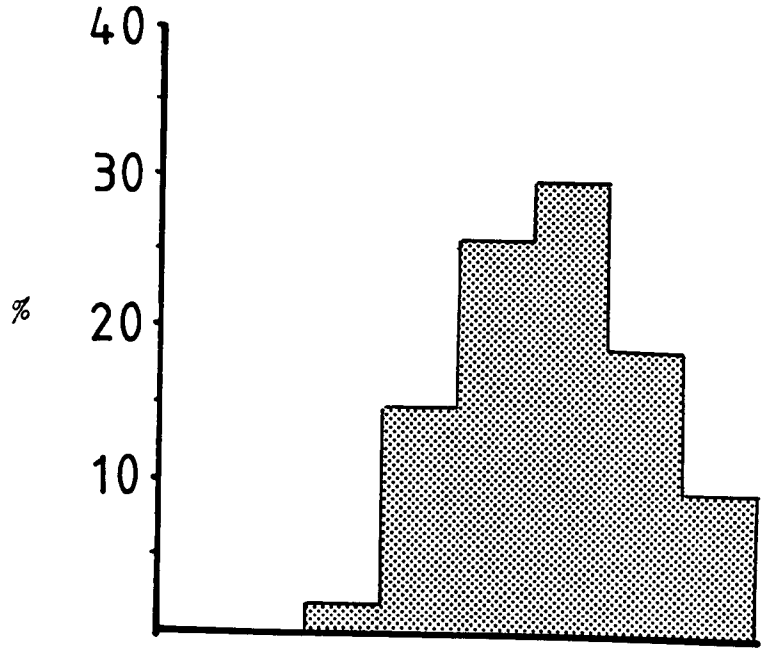


FIGURE 147 : PERIWINKLE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 3. n = 30

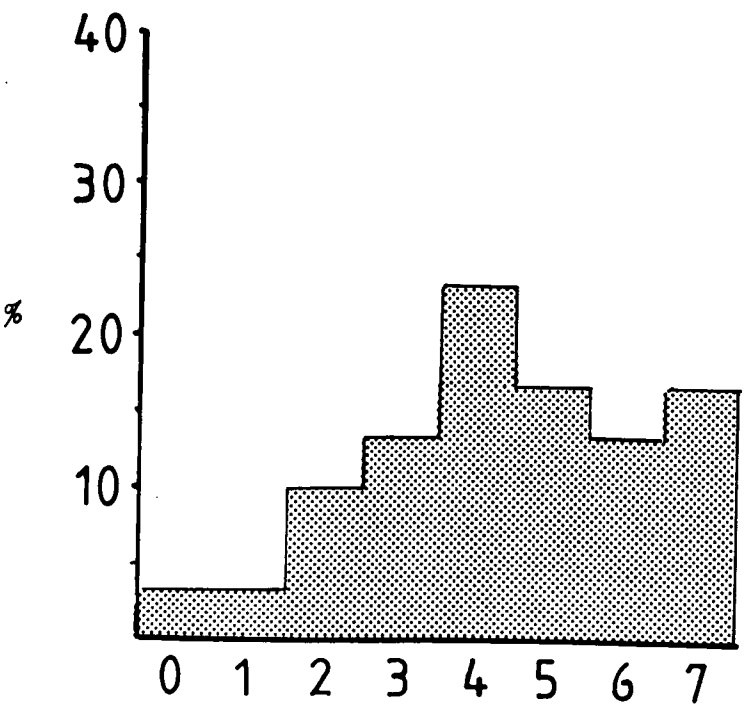


FIGURE 148 : PERIWINKLE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 5.

n = 14

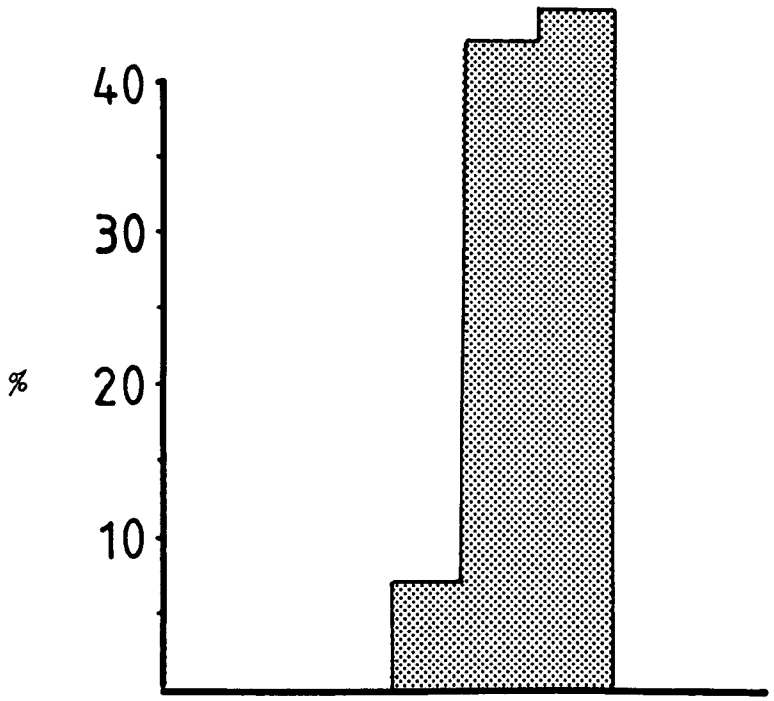


FIGURE 149 : PERIWINKLE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 6.

n = 22

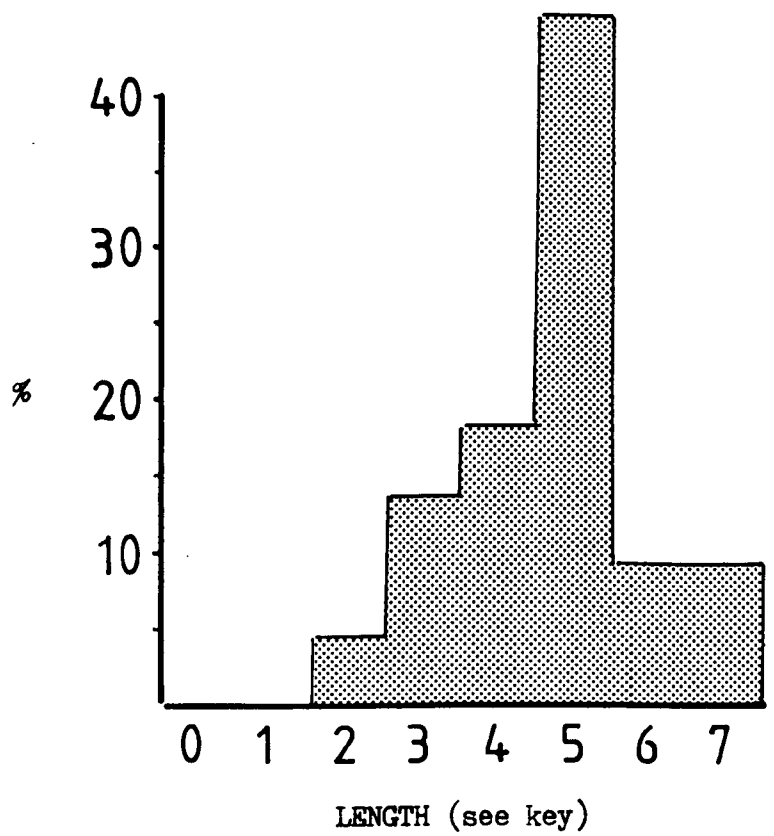
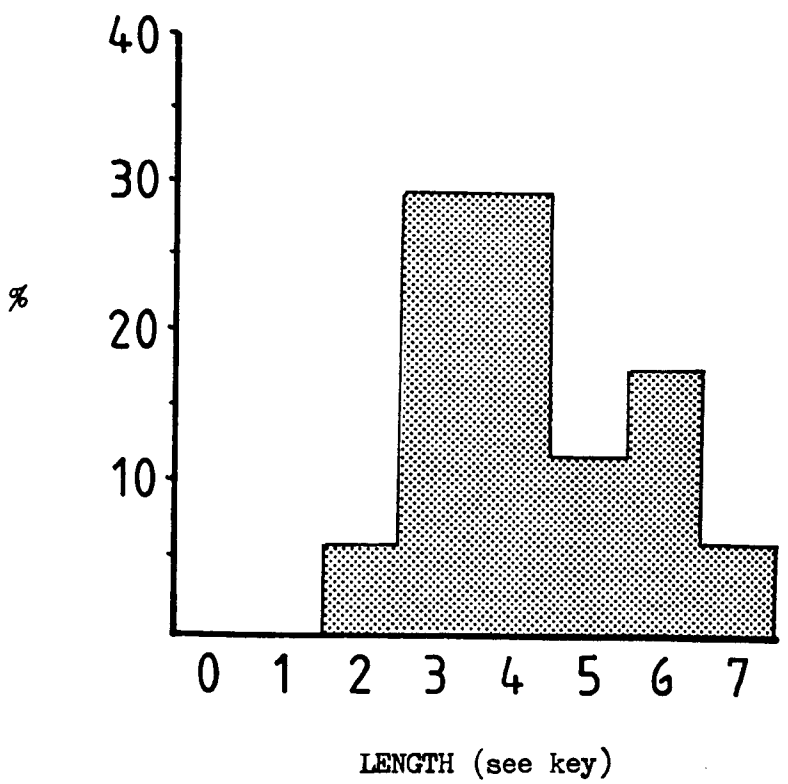


FIGURE 150 : PERIWINKLE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 7. n = 17



KEY TO FIGURES 151 TO 175

APERTURE LENGTH (mm)

1	under 14.9
2	15.0 - 16.9
3	17.0 - 18.9
4	19.0 - 20.9
5	21.0 - 22.9
6	above 23.0

FIGURE 151 : DOGWHELK APERTURE LENGTH DISTRIBITIONS IN CNOC COIG

PIT 10 n = 35

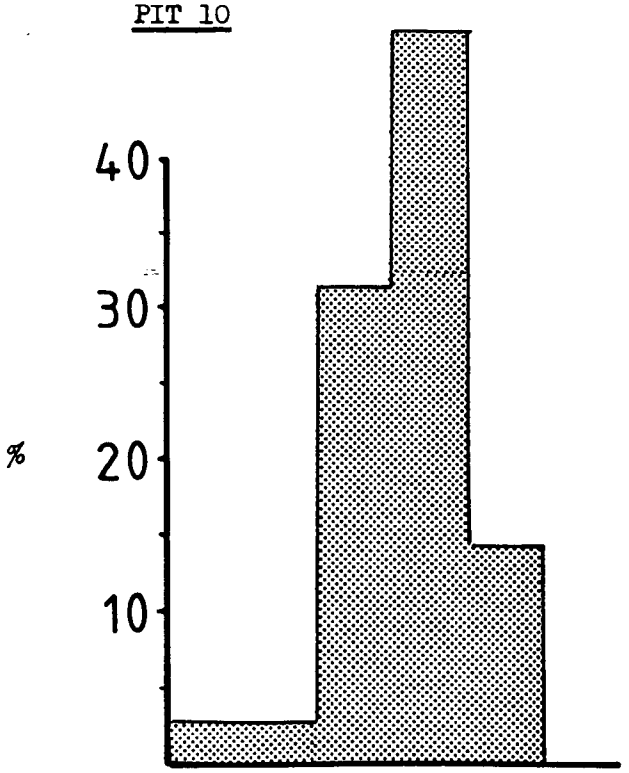


FIGURE 152 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC COIG

PIT 6 n = 130

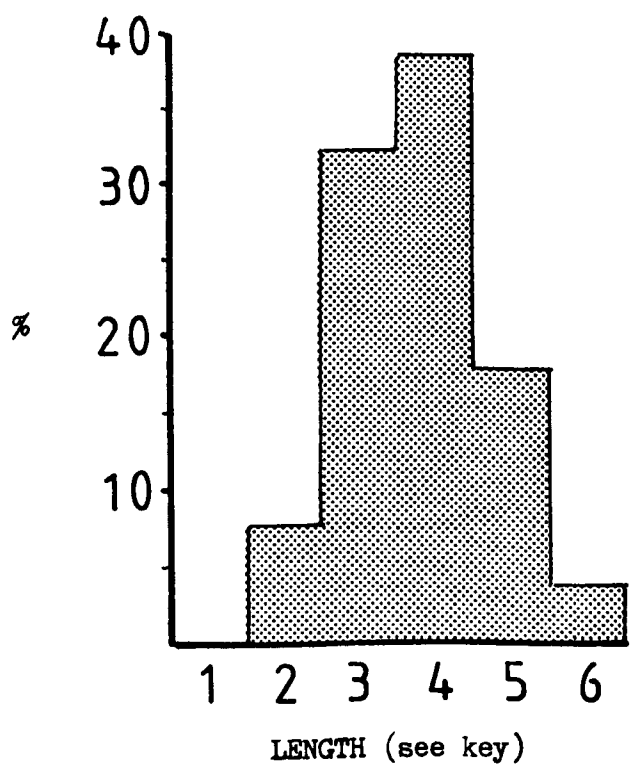


FIGURE 153 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC SLIGEACH

n = 127

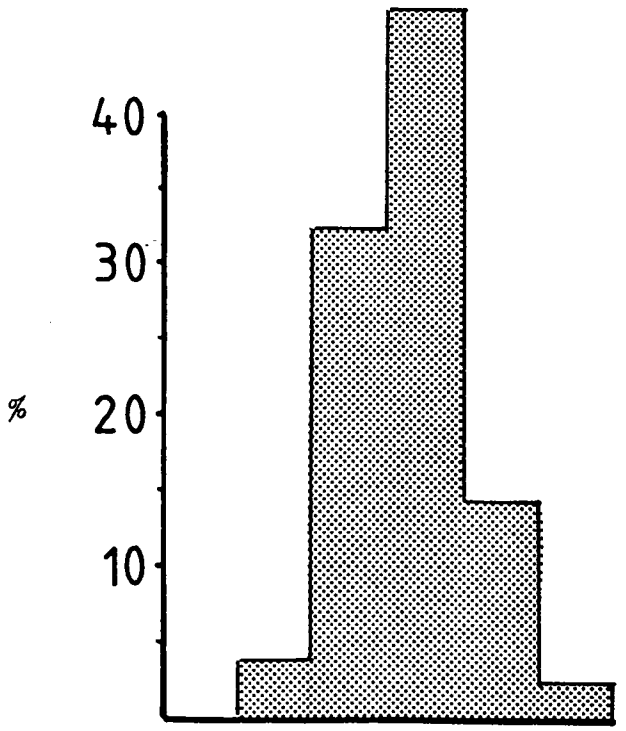


FIGURE 154 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNG I

n = 91

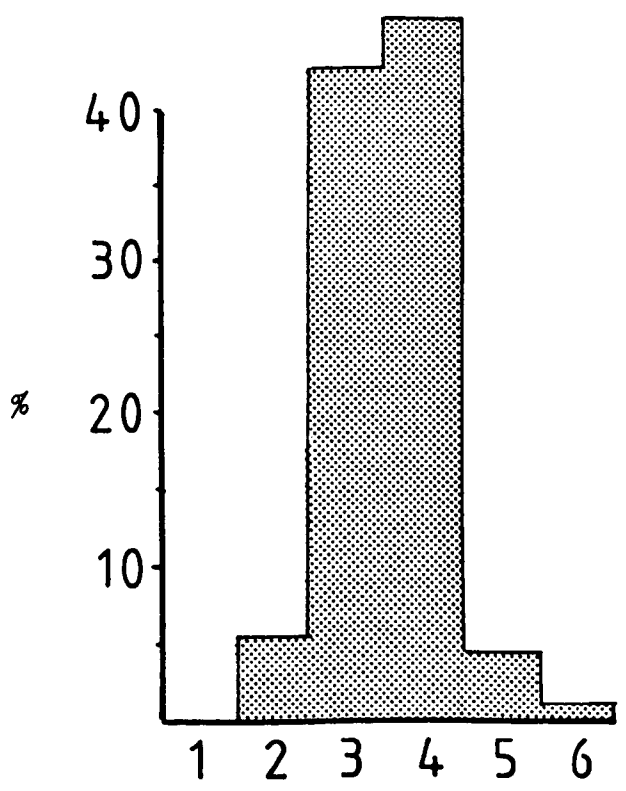


FIGURE 155 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNG II

n = 36

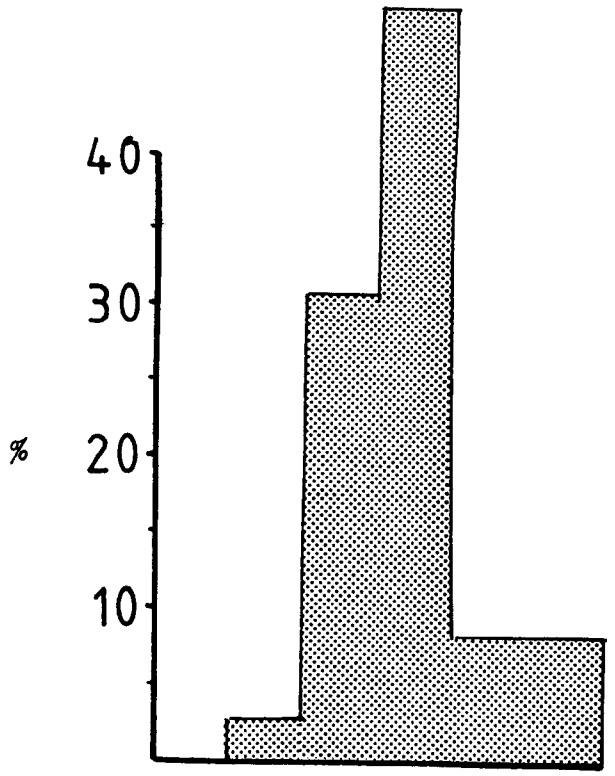


FIGURE 156 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN

n = 68

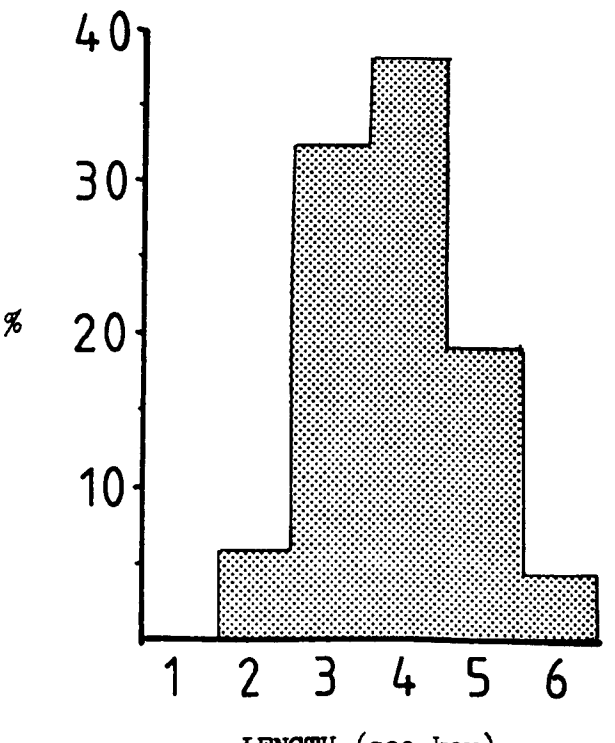


FIGURE 157 : APERTURE LENGTH DISTRIBUTIONS OF ALL WHOLE DOGWHELKS

n = 60

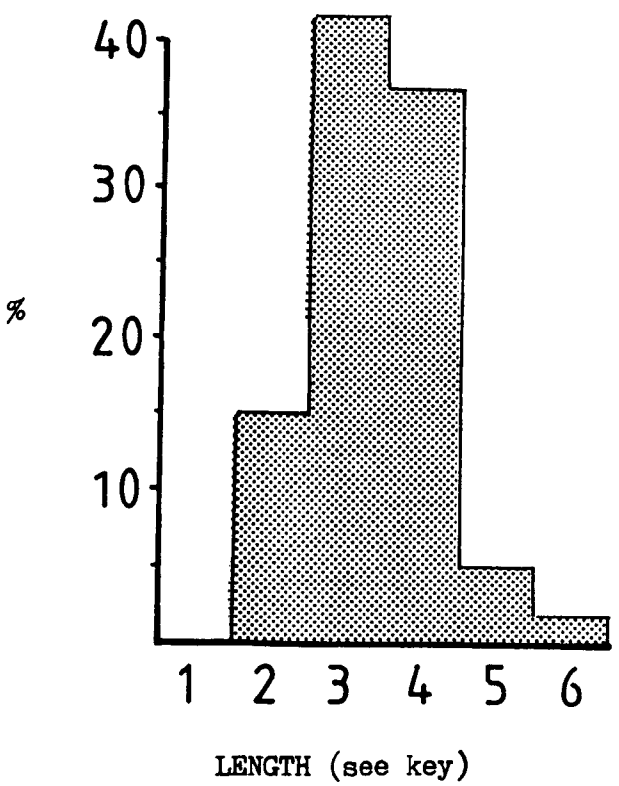


FIGURE 158 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 10, LEVEL 9. n = 23

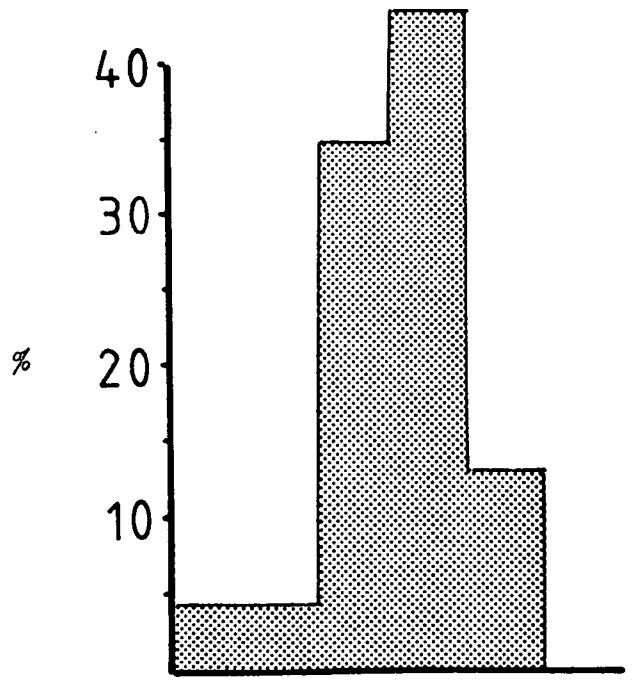


FIGURE 159 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6, LEVEL 17. n = 14

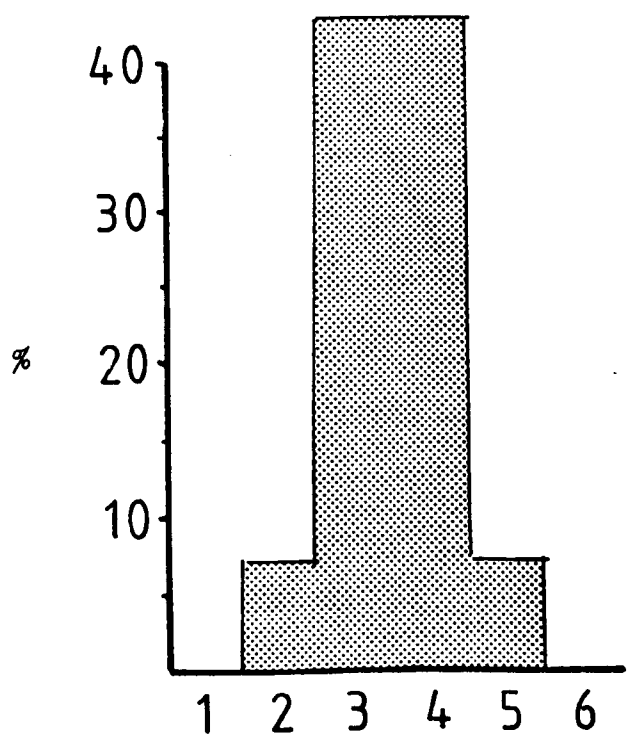


FIGURE 160 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6

LEVEL 18 n = 23

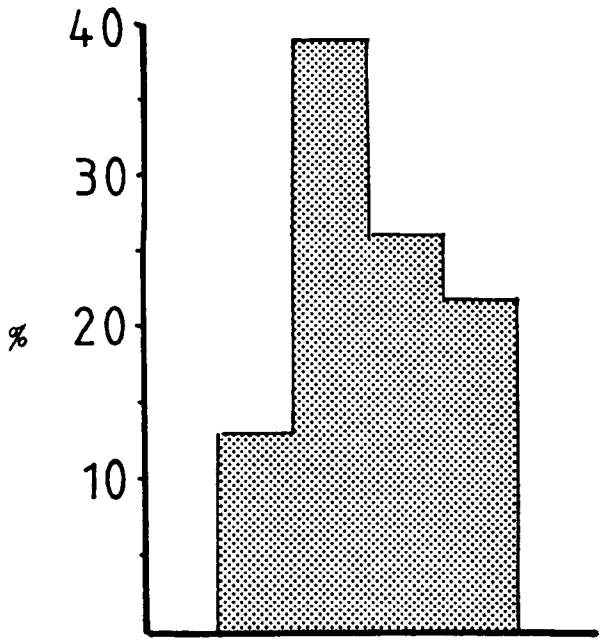


FIGURE 161 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6

LEVEL 20 n = 70

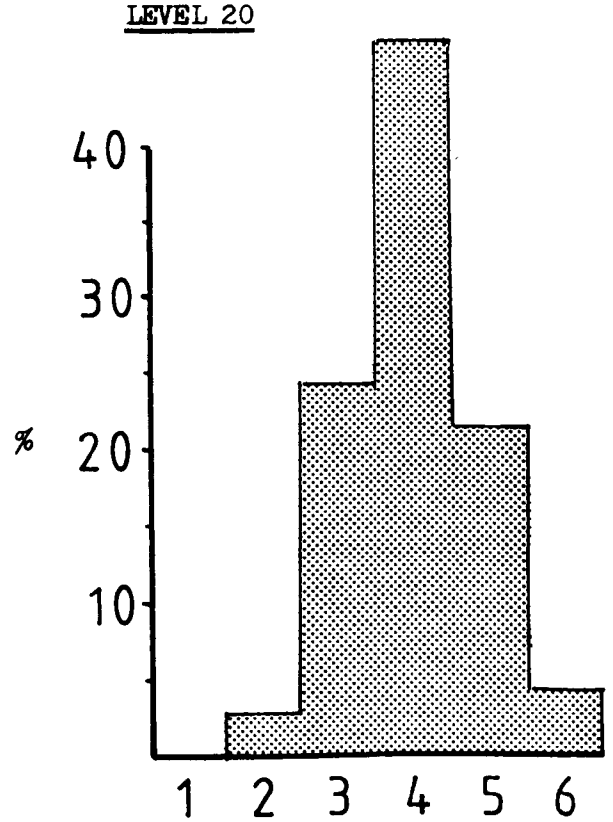


FIGURE 162 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC COIG PIT 6
LEVEL 21 n = 23

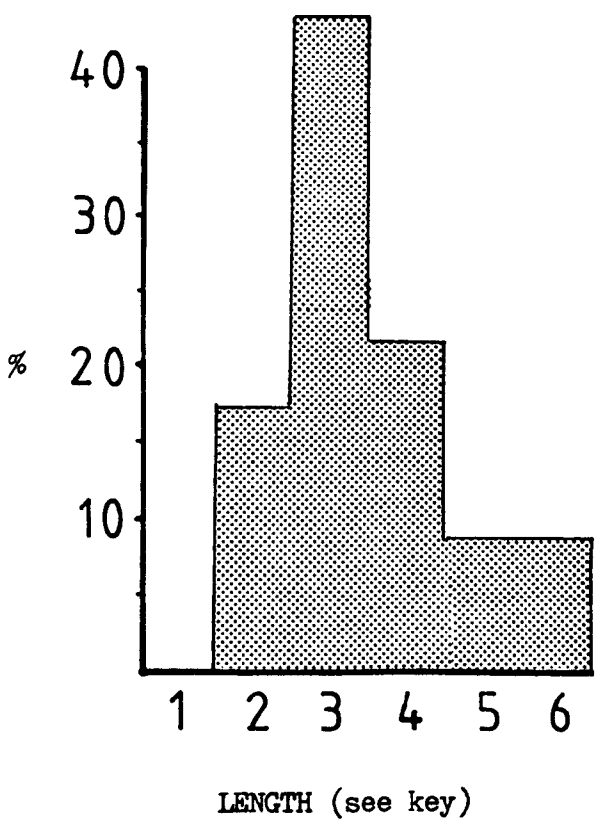


FIGURE 163 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC SLIGEACH

LEVEL 28 n = 44

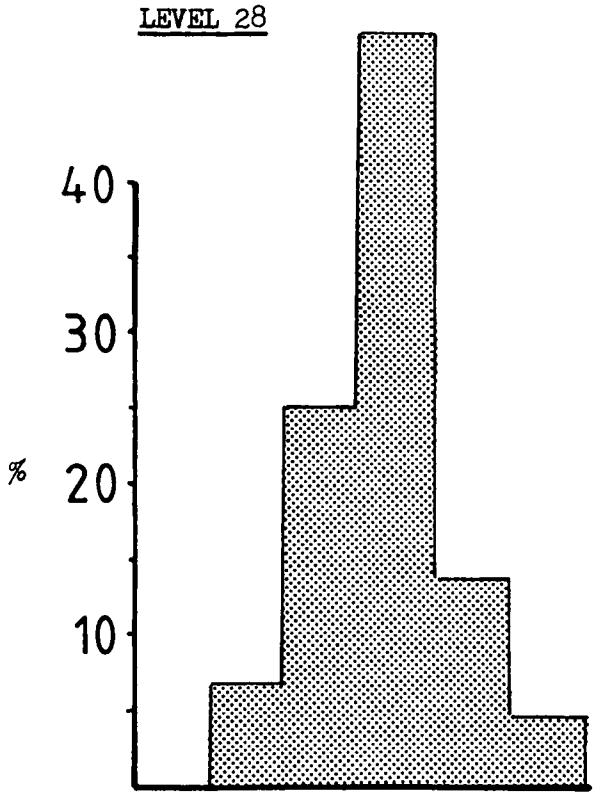


FIGURE 164 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC SLIGEACH

LEVEL 29 n = 44

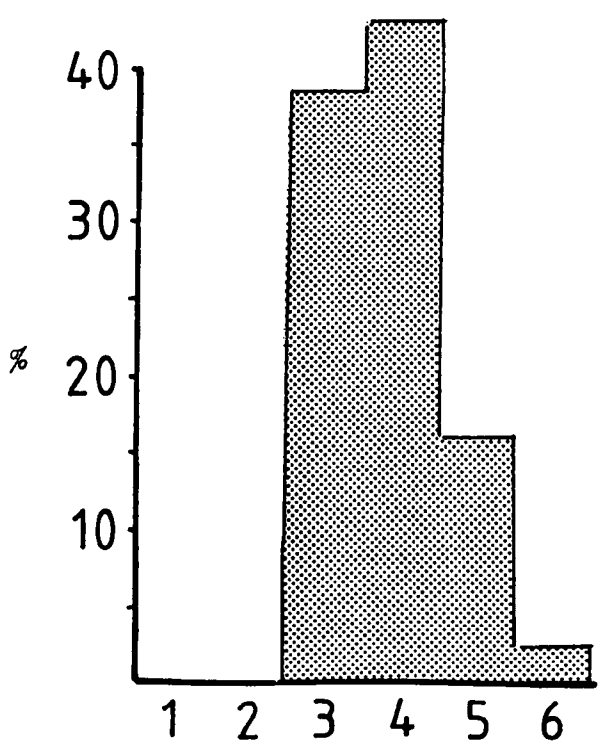


FIGURE 165 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC SLIGEACH

LEVEL 31 n = 26

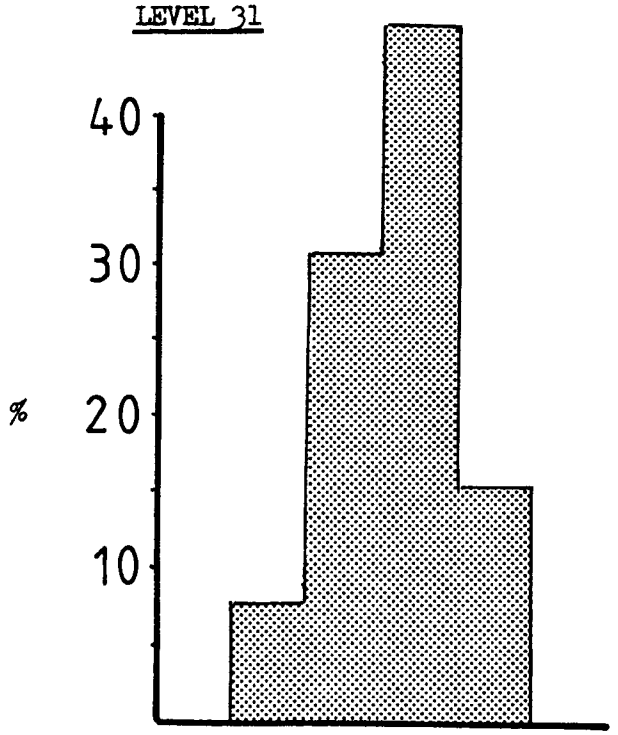


FIGURE 166 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNOC SLIGEACH

LEVEL 32 n = 13

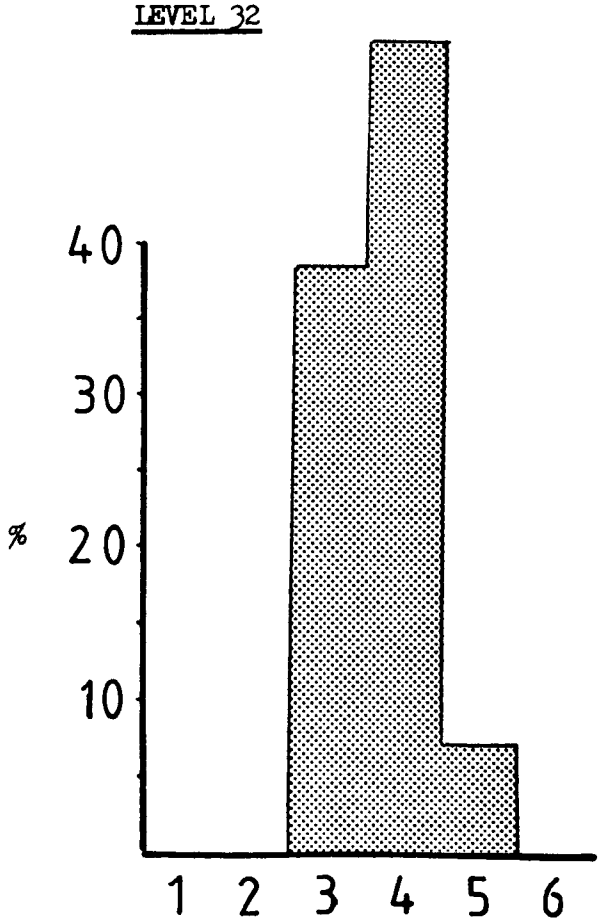


FIGURE 167 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNG I, LEVEL 1

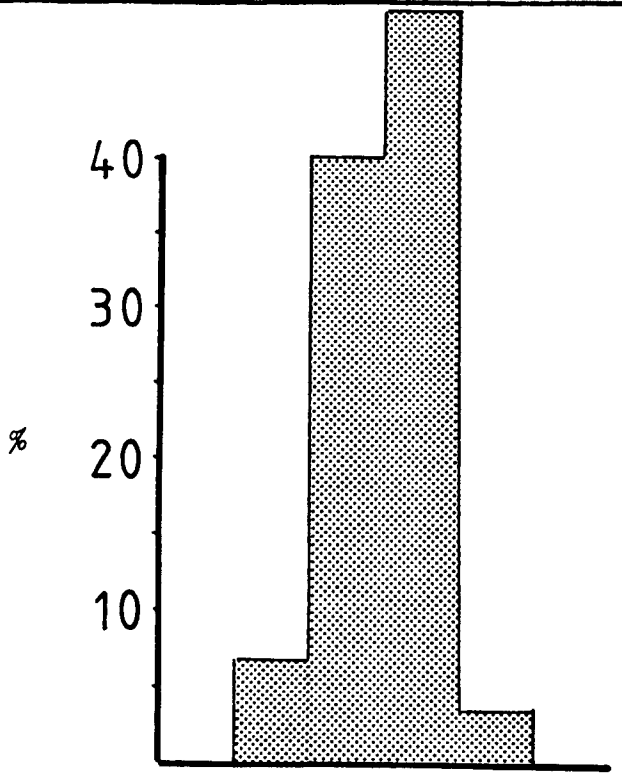


FIGURE 168 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNG I, LEVEL 2

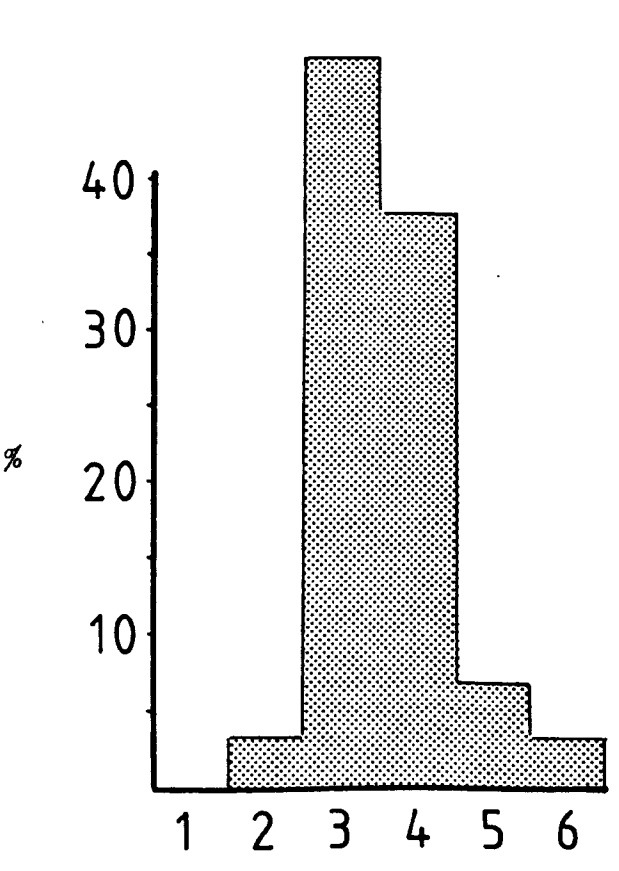


FIGURE 169 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNG I, LEVEL 3

n = 32

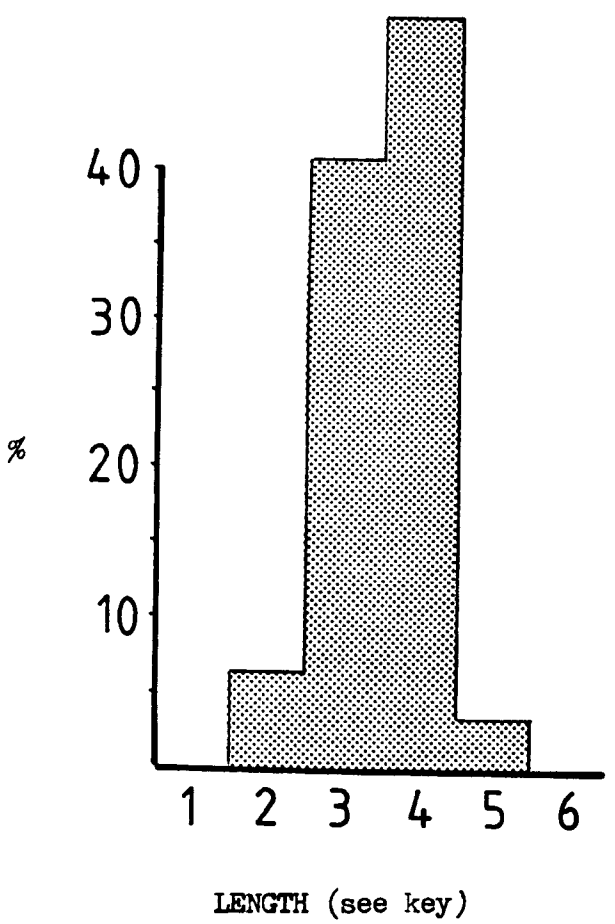


FIGURE 170 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNG II, LEVEL E

n = 22

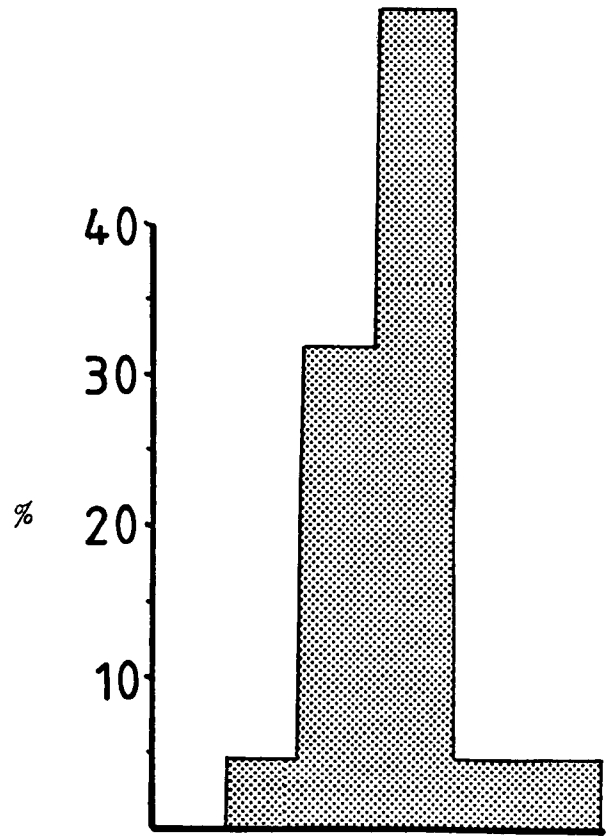


FIGURE 171 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN CNG II, LEVEL F

n = 12

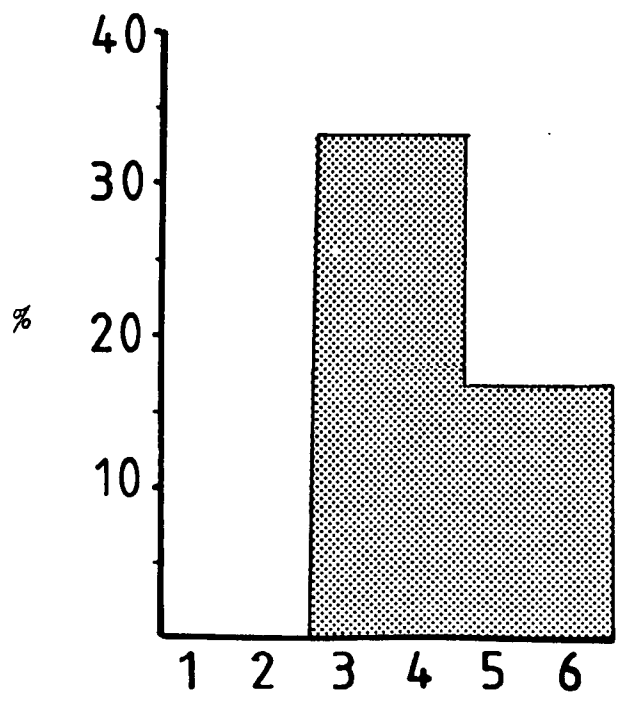


FIGURE 172 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN

LEVEL 1 n = 15

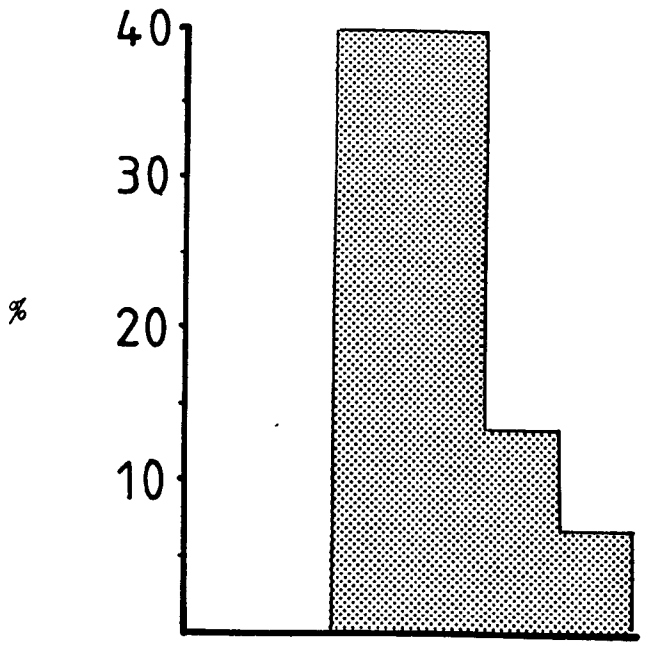


FIGURE 173 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN

LEVEL 2 n = 18

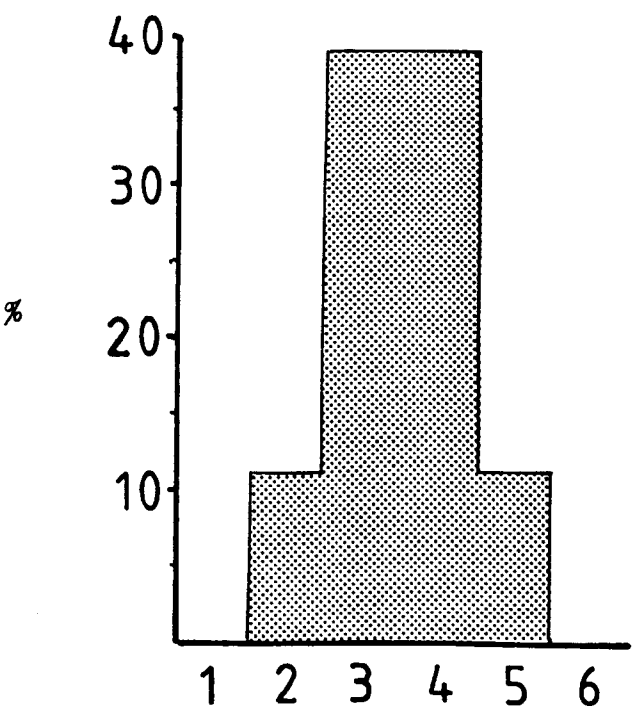


FIGURE 174 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 6 n = 11

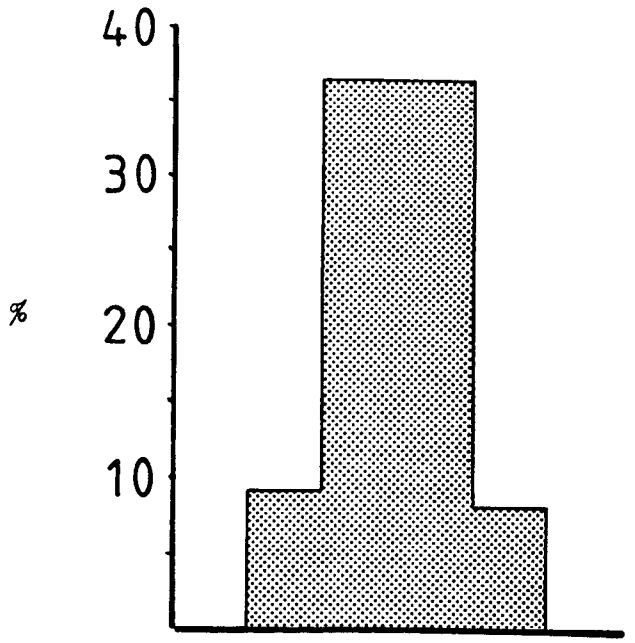
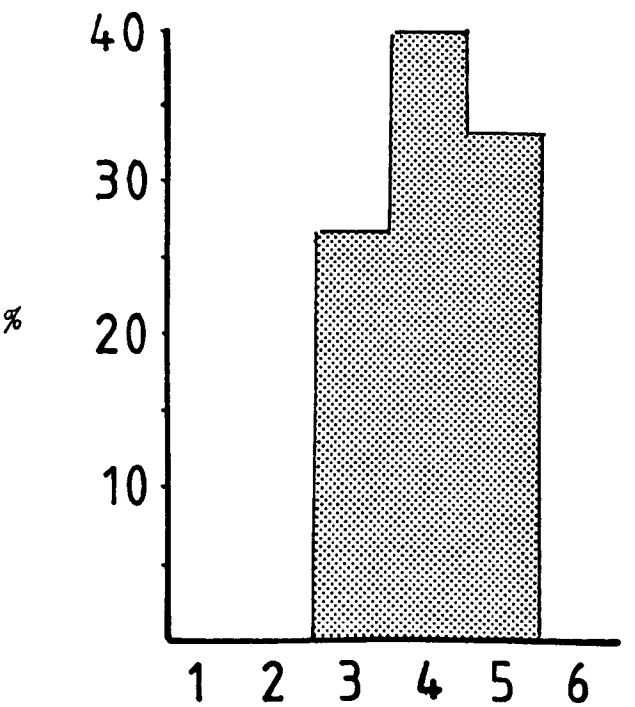


FIGURE 175 : DOGWHELK APERTURE LENGTH DISTRIBUTIONS IN PRIORY MIDDEN LEVEL 7 n = 15



KEY TO FIGURE 176

	SHELL LENGTH (mm)
1	under 21.9
2	22.0 - 23.9
3	24.0 - 25.9
4	26.0 - 27.9
5	28.0 - 29.9
6	30.0 - 31.9
7	above 32.0

FIGURE 176 : LENGTH DISTRIBUTIONS OF ALL WHOLE DOGWHELKS

n = 60

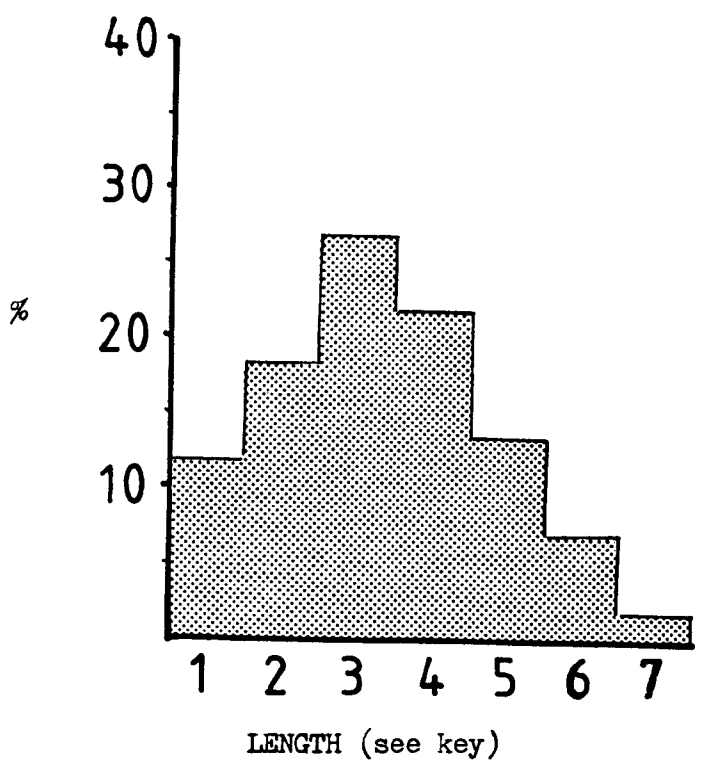


FIGURE 177 : MEAN WEIGHT OF DRY MEAT IN FIVE SHELL WEIGHT CATEGORIES OF ORONSAY LOW SHORE LIMPETS PER MONTH, USED FOR THE CALCULATION OF MIDDEN MEAT WEIGHT VALUES.

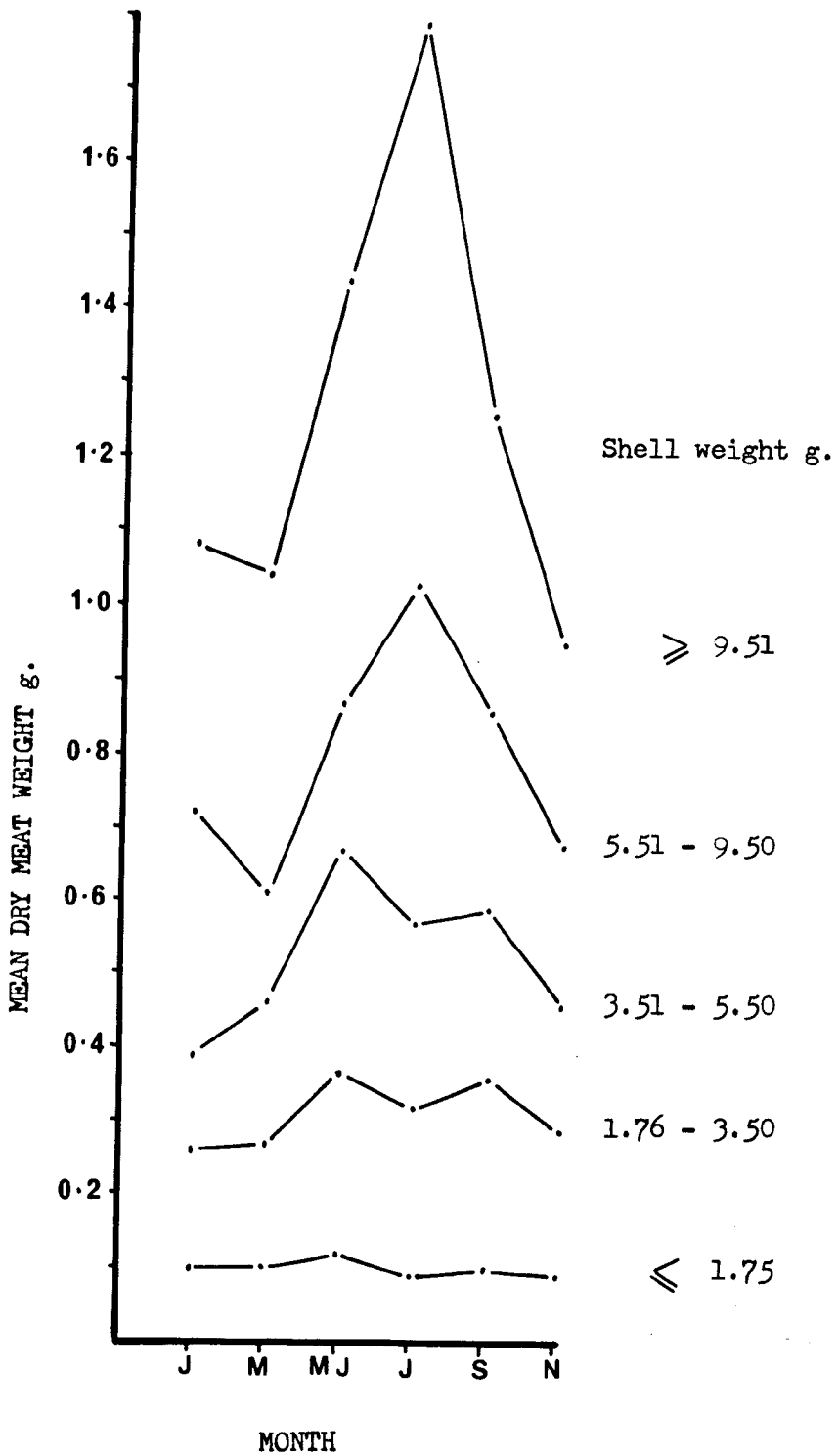


FIGURE 178 : MEAN DRY MEAT WEIGHT OF THE SMALL LOW SHORE AND ALL HIGH SHORE PERIWINKLES.

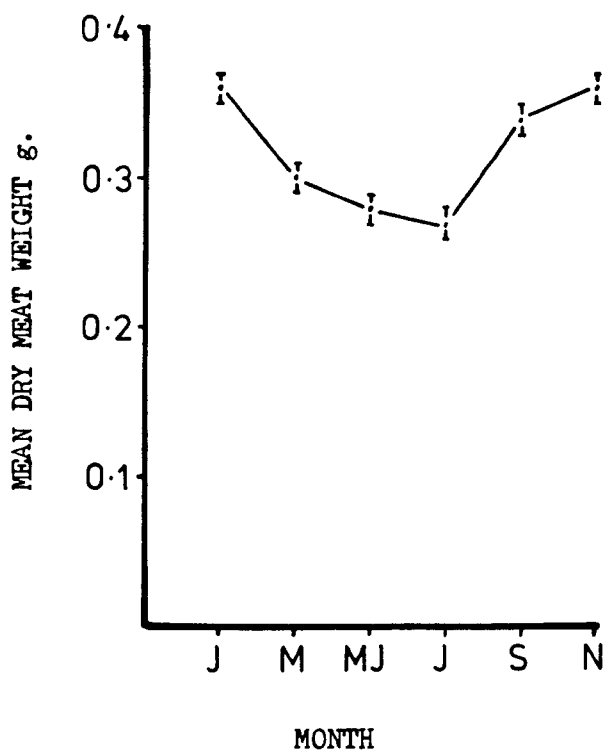


FIGURE 179 : MEAN DRY MEAT WEIGHTS OF ALL LOW AND HIGH SHORE DOGWHELKS

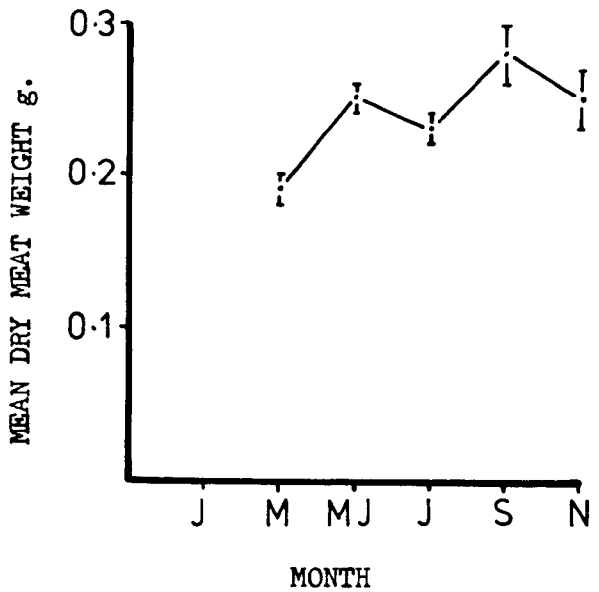


FIGURE 180 : MEAN DRY MEAT WEIGHTS OF LOW SHORE DOGWHELKS

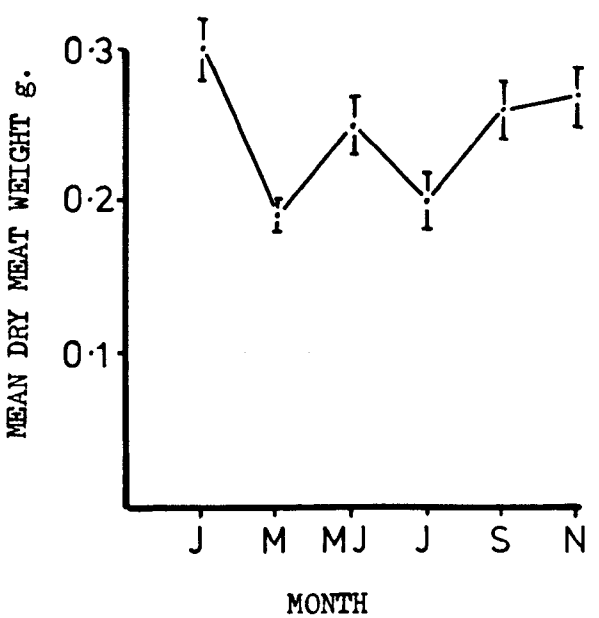


FIGURE 181 : THE RELATIVE PROPORTIONS OF MEAT WEIGHT CONTRIBUTED BY THE THREE SPECIES FROM CNOC COIG PIT 10

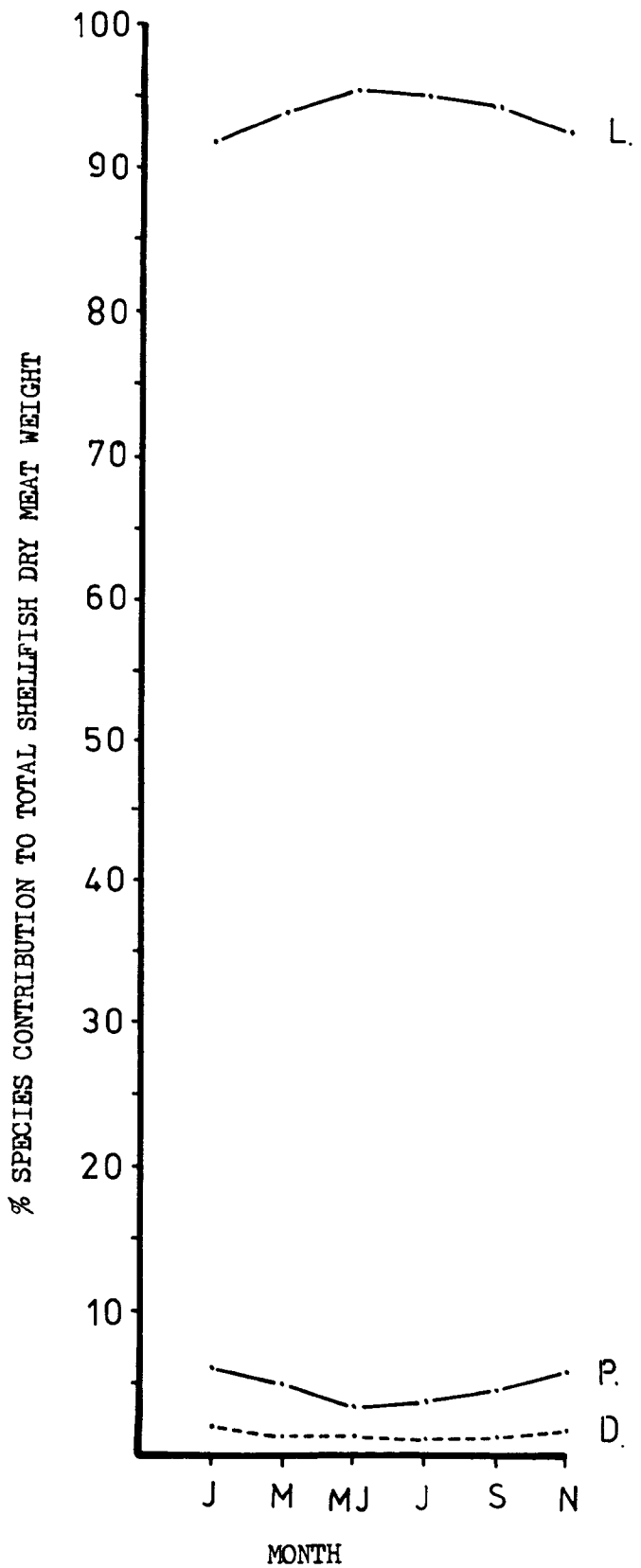


FIGURE 182 : THE RELATIVE PROPORTIONS OF MEAT WEIGHT CONTRIBUTED BY THE THREE SPECIES FROM CNOC COIG PIT 6

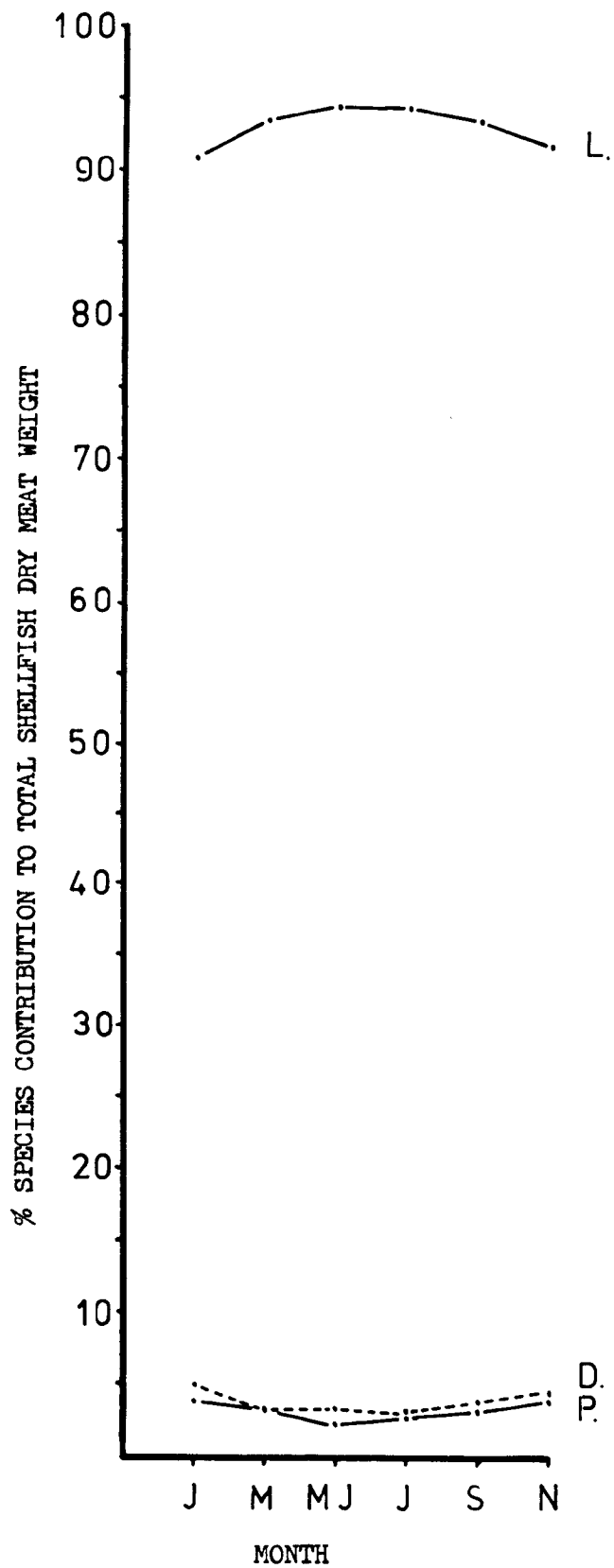


FIGURE 183 : THE RELATIVE PROPORTIONS OF MEAT WEIGHT CONTRIBUTED BY THE THREE SPECIES FROM CNOC SLIGEACH

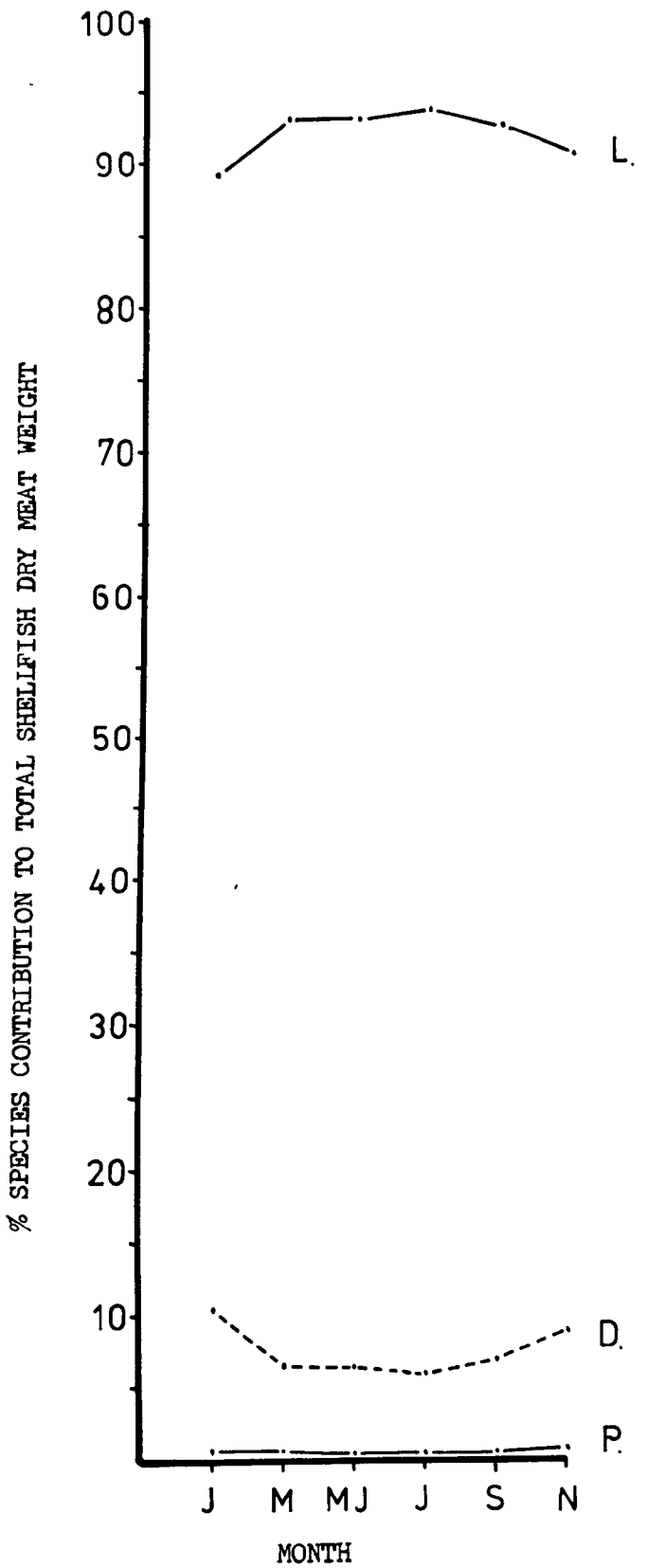


FIGURE 184 : THE RELATIVE PROPORTIONS OF MEAT WEIGHT CONTRIBUTED BY THE THREE SPECIES FROM CNG I

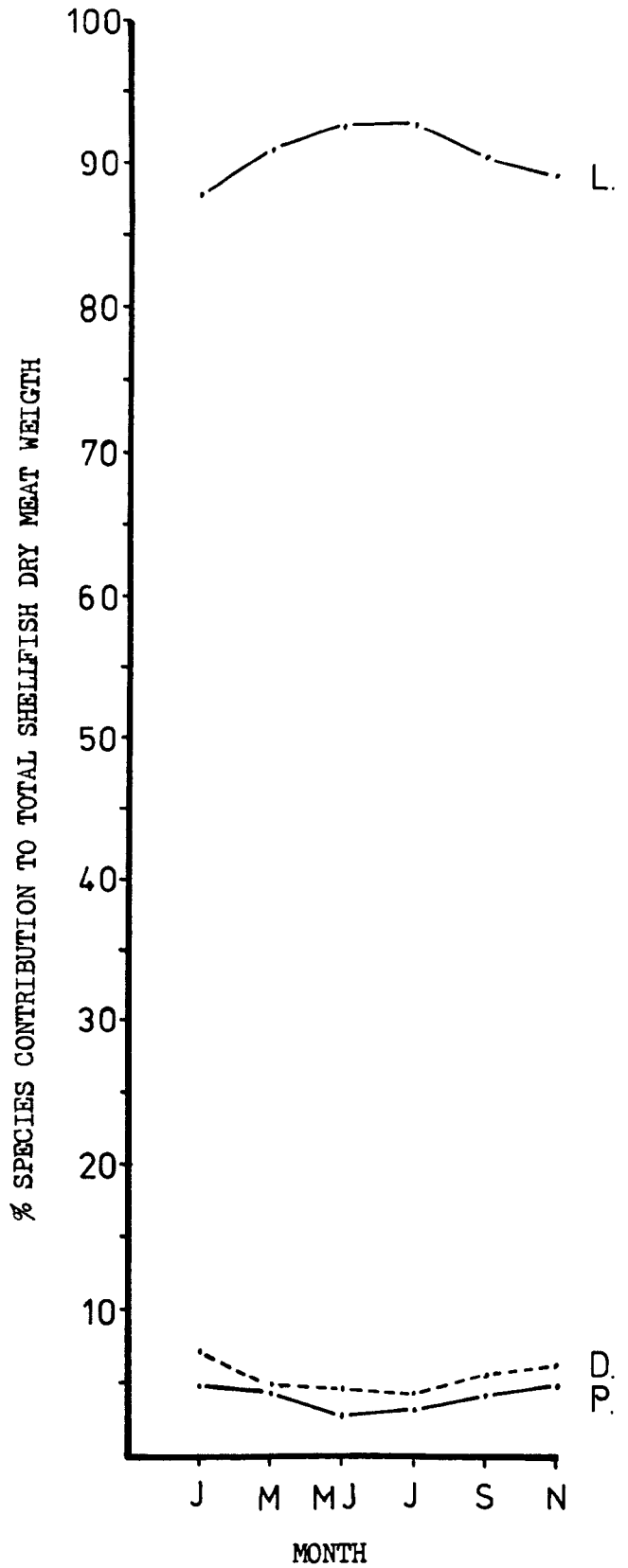


FIGURE 185 : THE RELATIVE PROPORTIONS OF MEAT WEIGHT CONTRIBUTED BY THE THREE SPECIES FROM CNG II

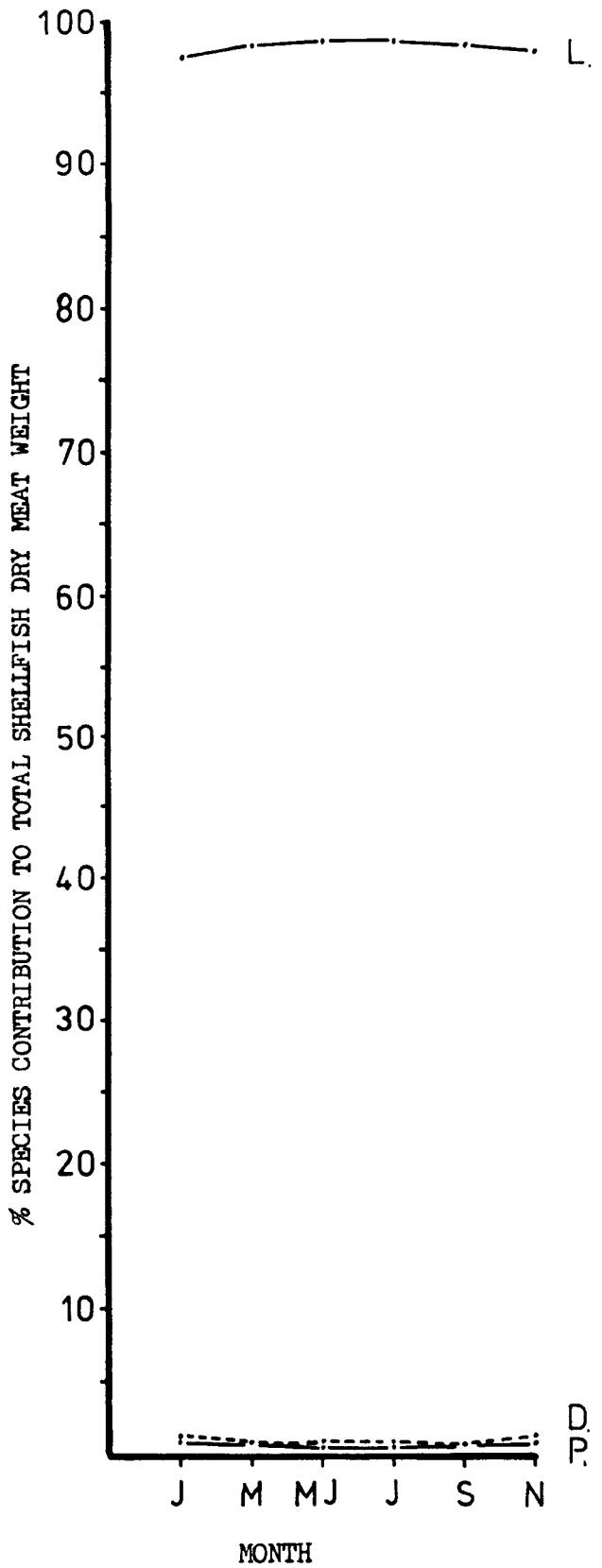
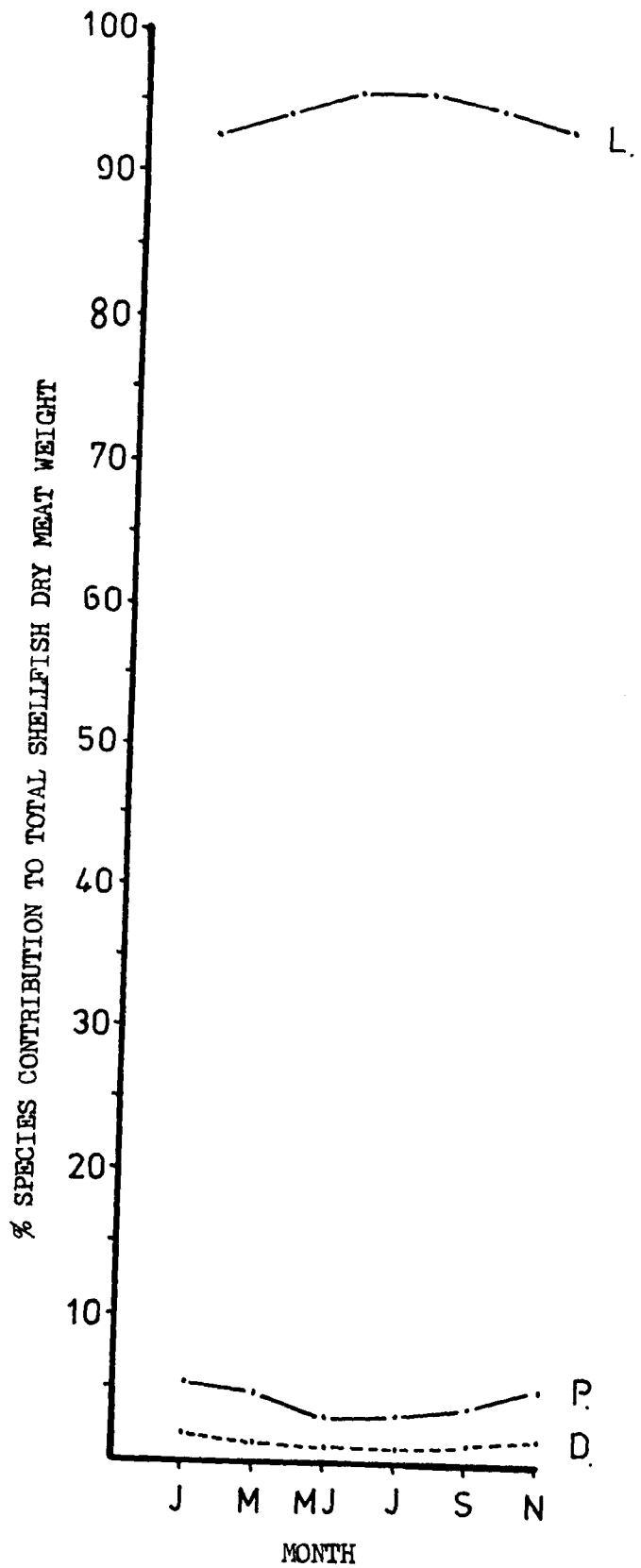


FIGURE 186 : THE RELATIVE PROPORTIONS OF MEAT WEIGHT CONTRIBUTED BY THE THREE SPECIES FROM PRIORY MIDDEN



THE MIDDENS.

PLATE 1 : CNOC COIG

-PLATE 2 : CNG I

PLATE 3 : CNG II

PLATE 4 : CNOC SLIGEACH

PLATE 5 : THE PRIORY MIDDEN

PLATE 6 : LIMPETS

PLATE 7 : PERIWINKLES (below) AND DOGWHELKS

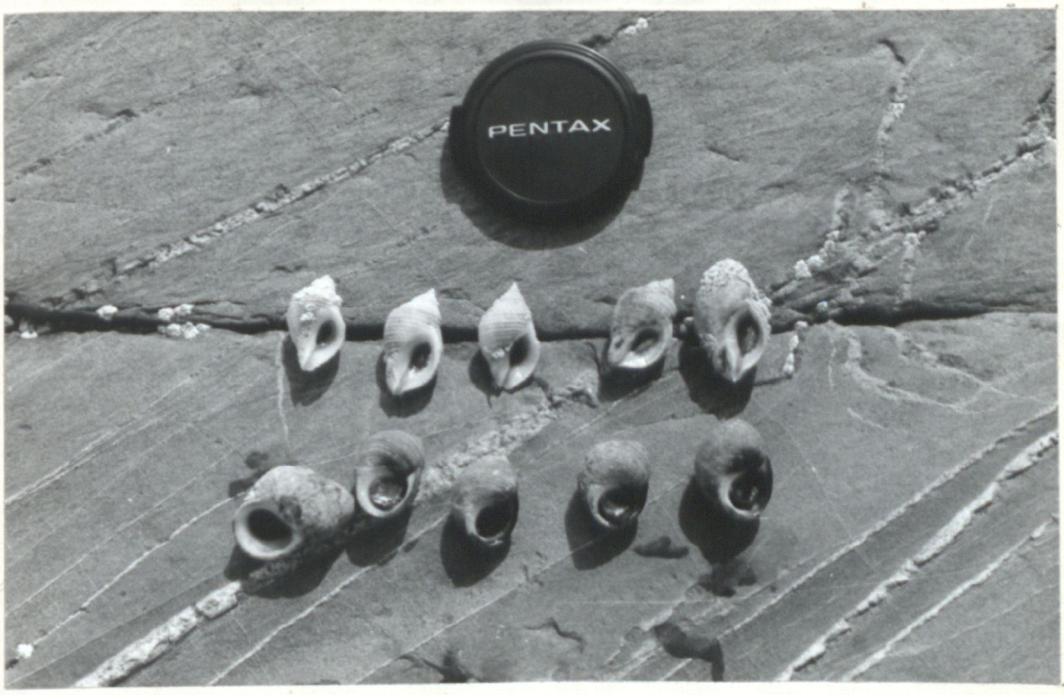


PLATE 8 : THE BARNACLE LINE

THE ORONSAY COLLECTION AREA FOR AN EXAMINATION OF SEASONAL CHANGES IN MEAT WEIGHT

PLATE 9 : FROM UPPER TO LOWER SHORE, WATER AT MLWS

PLATE 10 : THE UPPER AND MID SHORE

PLATE 11 : THE LOWER SHORE, WATER AROUND MLWS

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PLATE 12 : THE LOWER SHORE, WATER AROUND MLWN

PLATE 13 : A LOW SHORE SKERRY

PLATE 14 : FROM UPPER TO LOWER SHORE

PLATE 15 : THE LOWER SHORE

PLATE 16 : THE LOWER SHORE

PLATE 17 : FROM UPPER TO LOWER SHORE

PLATE 18 : THE UPPER SHORE

SAMPLE UNITS FOR AN EXAMINATION OF SHELLFISH POPULATION STRUCTURES AROUND THE ORONSAY COAST

PLATE 19 : UNIT 1A

PLATE 20 : UNITS 1B, and 1B-C

PLATE 21 : UNIT 1B-C

PLATE 22 : UNIT 1C

PLATE 23 : UNITS 1C, and 1C-1

PLATE 24 : THE BARNACLE LINE, MARKING THE BOUNDARY OF UNITS 1C and 1C-1

PLATE 25 : UNITS 2 (foreground) and 3

PLATE 26 : UNIT 4

PLATE 27 : UNIT 5

PLATE 28 : UNIT 6

PLATE 29 : UNIT 7