International Council for the Exploration of the Sea

C.M.1971/J:6
Pelagic Fish (Southern) Committee

Some Observations on the Biology of Trichiurus lepturus L. from Cape Blanc to the Cape Verde Area

by

Jan Wojciechowski[x)]

Cutlassfish or ribbonfish, Trichiurus lepturus L. of the Trichiuridae family, known as "palasz" in Poland, is of considerable importance to the Polish deep-sea fisheries operating on the West African shelf. As shown by commercial catches, this fish occurs in large numbers in the area from Cape Blanc to Cape Verde. The catch of this species in 1970 in the Polish fishery reached about 1 000 metric tons and had shown a relatively steady increase. It makes, on an average, about 5% of the bottom trawl catches and 15% of the pelagic trawl catches. The majority of our catch is taken by bottom trawl.

Until now the biology of the cutlassfish from the N.W. African waters has not been studied. Our observations were made in the period from January to May 1970, and were carried out on board the commercial fishing vessel B-23 - M/T "Murena" operating in this area.

A total of 11 000 specimens was measured and 2 600 analysed in more detail. These were measured and weighed, their sex, maturity stage, age and food composition were determined.

Length and weight composition

The length data were grouped into 5 cm (total length) size classes. The length of cutlassfish caught by M/T "Murena" varied from 30 to 145 cm. There was a prevalence of specimens 40 to 50 cm and 95 to 105 cm long. (Figure 1, Table 1). 1 090 specimens were weighed with guts and gonads. The minimum weight was 30 g and the maximum 4 500 g. Most frequent were fishes weighing 0.5 to 0.7 kg. From January to May the monthly length frequencies shifted slightly to the right. This was most likely connected with their growth.

Age composition

The species is scaleless. The age was determined from 2 600 otoliths collected in the period of observations. The pairs of otoliths were removed from the fish, cleaned, and examined with the help of a projector, using xylene as clearing agent.

---

x) Jan Wojciechowski
College of Agriculture
Faculty of Marine Fishery
Department of Sea Fishery Resources
Ul. Kazimierza Królewicza 3
Szczecin-5, Poland

The otolith is rather elliptical in shape, rounded at the posterior end, and pointed at the anterior end. Its inner surface is convex, while the outer is concave. A small groove is found on the inner surface parallel to the length of the otolith. Growth zones can better be seen on the convex surface. They were reasonably distinct in the anterior field. There were some difficulties to interprete the growth rings, but most of them could be traced completely around the otolith.

Some information on the age could also be obtained from the Petersen curve shown in Figure 1.

Age composition of the samples is given in Figure 3. In the area of observations, fish belonging to the age groups 1 to 4 were most numerous. It is most probable that the relative numbers of age groups 1 and 2 are underestimated because the selectivity of the trawl net has some influence on the length and age composition of the catches. (Mesh size in the cod-end was 5 cm)

The mean length of the age groups was as follows:

Age group	1	2	3	4	5	6	7	8
Mean length (cm)	47	84	95	105	115	120	130	140
%	23.2	22.0	23.2	23.1	6.8	1.5	0.1	0.1

Maturity and sex ratio

These observations were based on 2 600 specimens. In the cutlassfish the right ovary and the right testis were much better developed than the left ones. This refers only to the size of the gonad, the ova in both ovaries were equally well developed.

As is shown in Figure 1 the sex of cutlassfish can be determined by eye at a length of more than 70 cm. Males prevailed up to 110 cm length and females from the length of 110 cm onwards.

Fish in different maturity stages according to Maier's scale, were found during the investigated period. Running individuals (stage VI) were found throughout our observations. Spent fish were very seldom encountered in the catches. They constituted about 2% of the total number of fish examined.

Feeding and food composition

The present study on the food habits of cutlassfish was based on observations of stomach contents of about 140 specimens during the period in question. In almost all months the majority of the examined stomachs were empty. The number of fish in which food occurred was about 5% of the total number of examined specimens. The food of the cutlassfish is not varied. In the stomachs, the following groups of organisms were found:

Crustacea (Euphausiacea, Shrimps)
Cephalopoda (Loligo sp., Sepia sp.,)
Fishes (Trachurus sp., Sardinella sp., Sardinops sp., Conger sp.,)
Organic remains

In many cases, where the food was in a semi-digested state, identification of the organic remains as to species was not possible. The food composition changes regularly with the growth of the fish.

In regard to its kind of food, the life cycle of cutlassfish can be divided into various periods:

40 to 70 cm - food mainly consisting of Euphausiacea,

70 to 90 cm - Euphausiacea, shrimps, small fish and Cephalopoda,

over 90 cm - fish and Cephalopoda

There are no data concerning the food composition of small specimens up to 40 cm in length.

The food composition indicates that young specimens of cutlassfish has some tendency to bottom-pelagic life, since their food mainly consisted of Euphausiacea. As the cutlassfish grow, pelagic species become more important in its food, and it is possible that the fish gradually turns to a more pelagic life. In addition small specimens occur only in bottom trawl catches while the adults are found both in bottom and pelagic trawls.

Average percentage of cutlassfish with various items of food in different months:

Month	Euphausiacea	Shrimps	Calamaries	Fishes	Organic remains
January	15	10	10	35	30
February	5	-	-	45	50
March	50	5	10	20	15
April	40	5	-	35	20

Other observations

As mentioned before, this species occurs in our trawl catches both bottom and pelagic, throughout the year, but mostly in the period May - June. At day-time the fish was found near the bottom. In night-time the bottom shoals dispersed and the cutlassfish ascended to the upper layers. These diurnal vertical migrations were associated with the night by feeding of cutlassfish on Trachurus sp. and other organisms. The best catches were, as a rule, made from 10 a.m. to 6 p.m. Most of them were taken at a depth of 90 to 120 metres.

Table 1. Length composition of the cutlassfish (Trichiurus lepturus) catches in 1970 (January to May).

Length in cm.	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145 x)
%	2.4	2.2	5.4	6.2	3.1	2.1	1.8	1.1	0.8	4.1	9.8	7.8	7.4	10.9	12.1	11.3	5.8	3.4	1.5	0.5	0.2	0.1	-

x) Maximum length observed 145 cm.

Table 2. Average weight composition of the cutlassfish (Trichiurus lepturus) catches in 1970.

Length in cm.	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140
Average weight in g	34	65	99	193	324	418	666	914	1 197	1 727	2 185

Maximum weight noted 4 500 g.

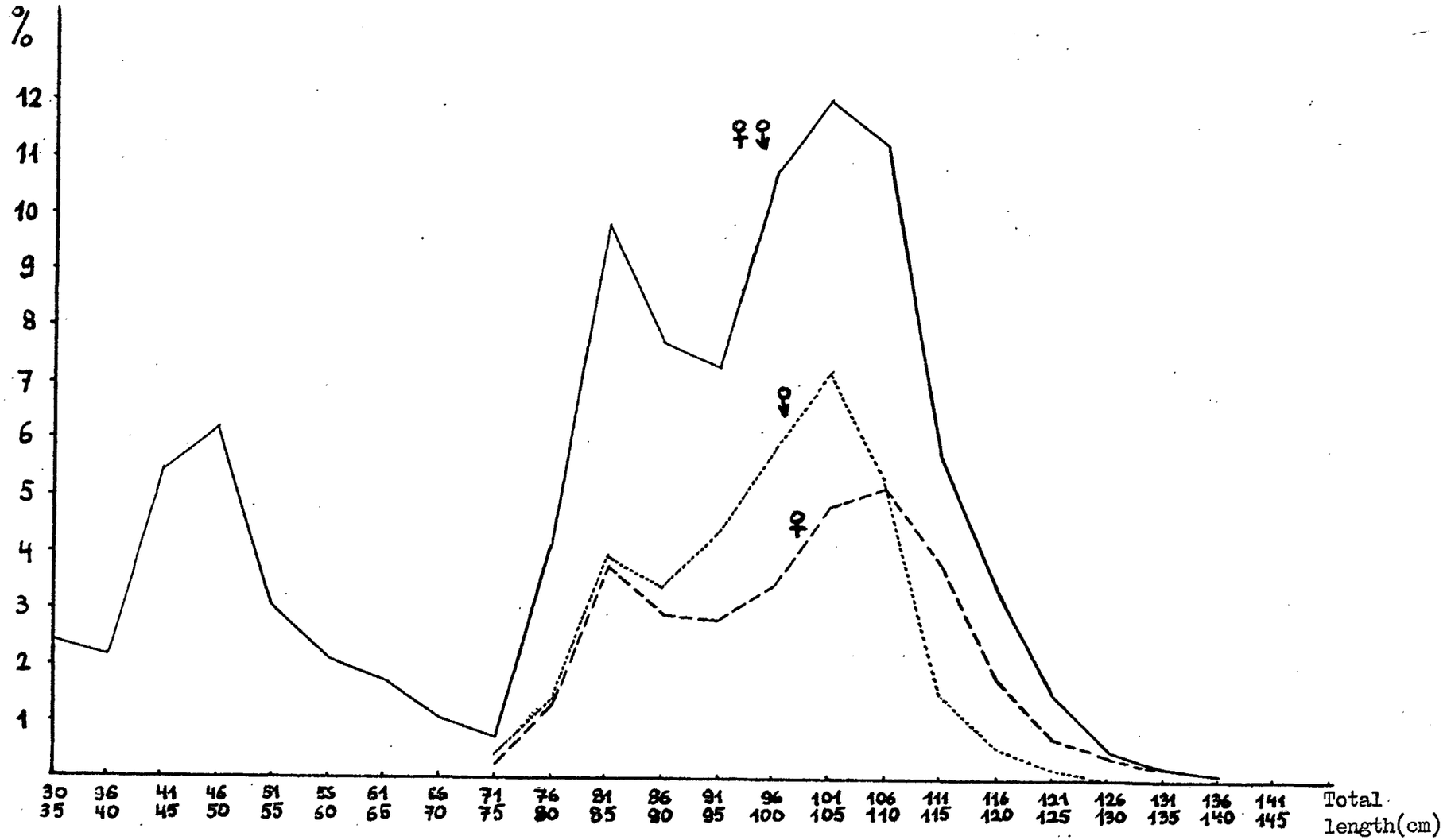

Figure 1. Length composition of the catches of Trichiurus lepturus L. in 1970 (Jan./Mar.).

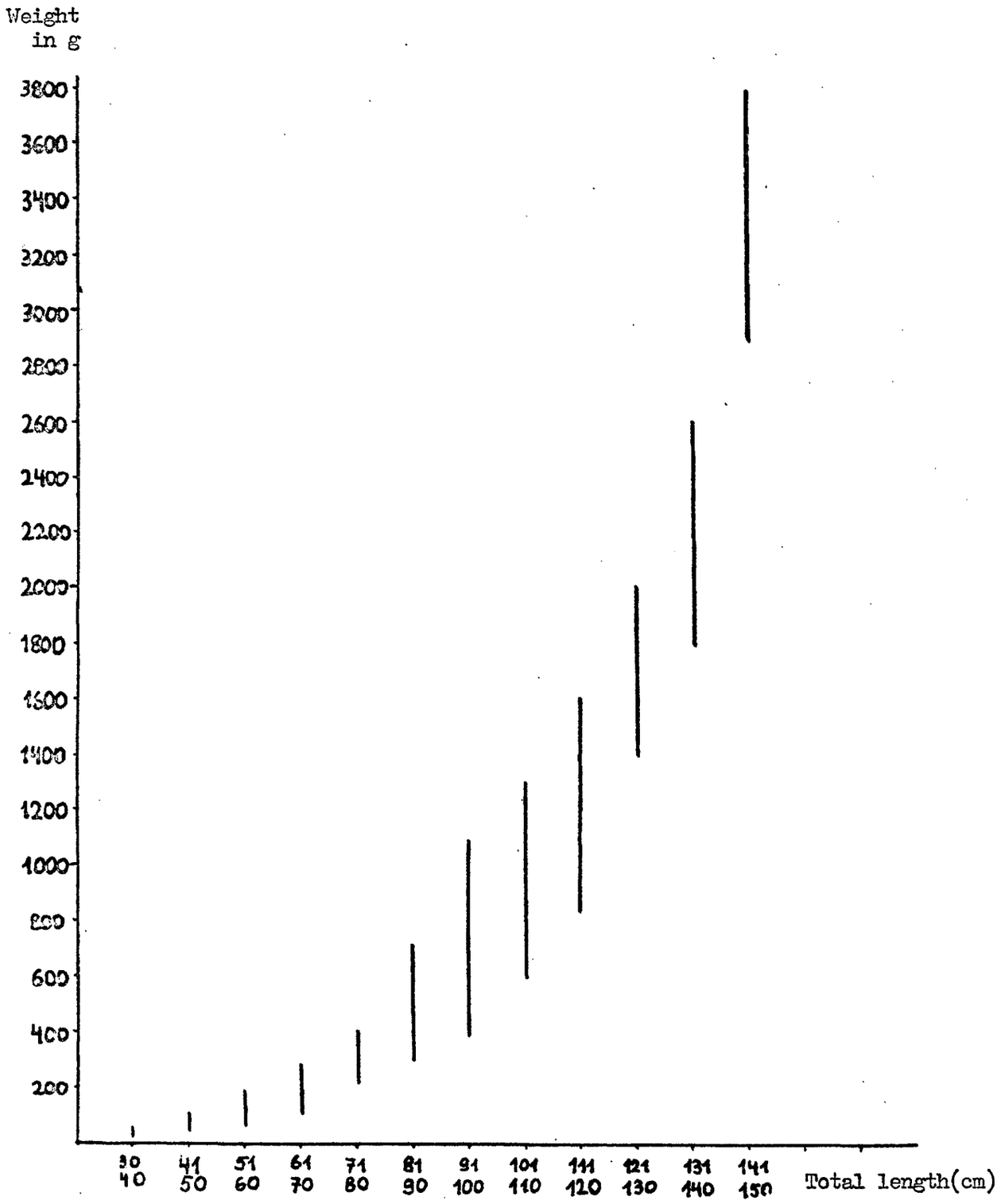

Figure 2. Length/weight relationship of Trichiurus lepturus L.

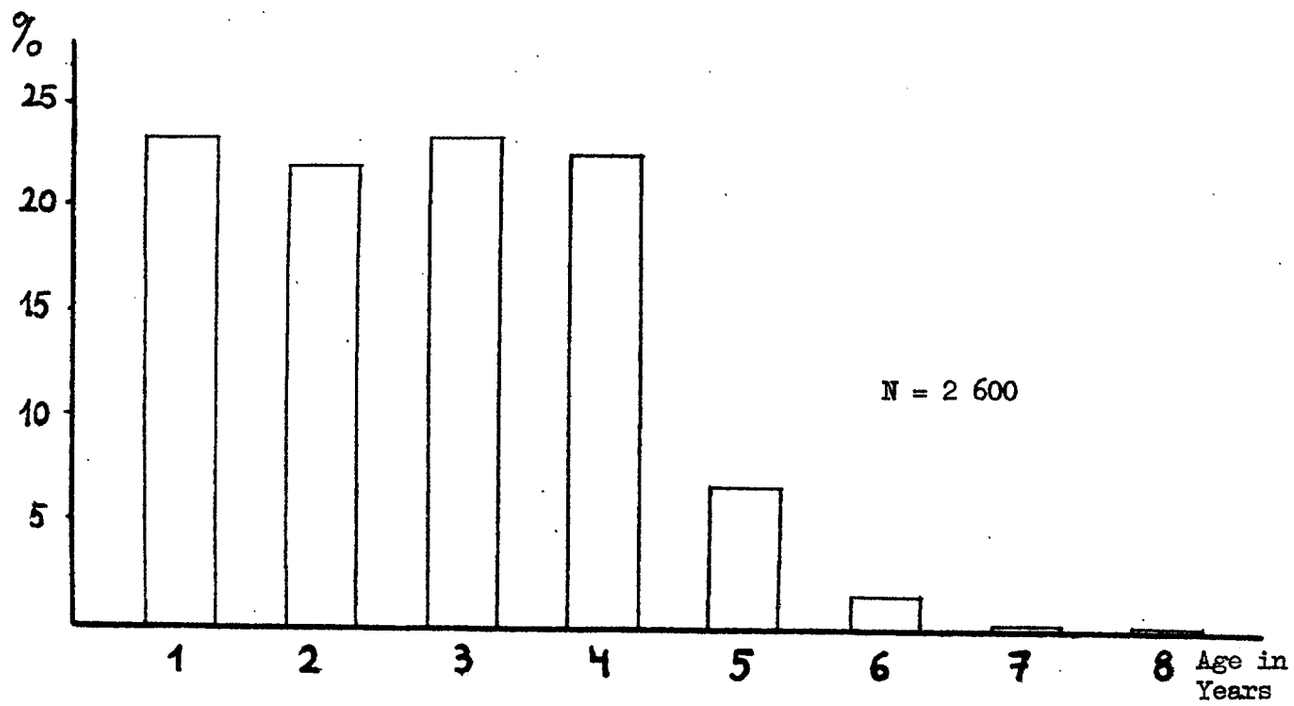

Figure 3. Age composition in %.

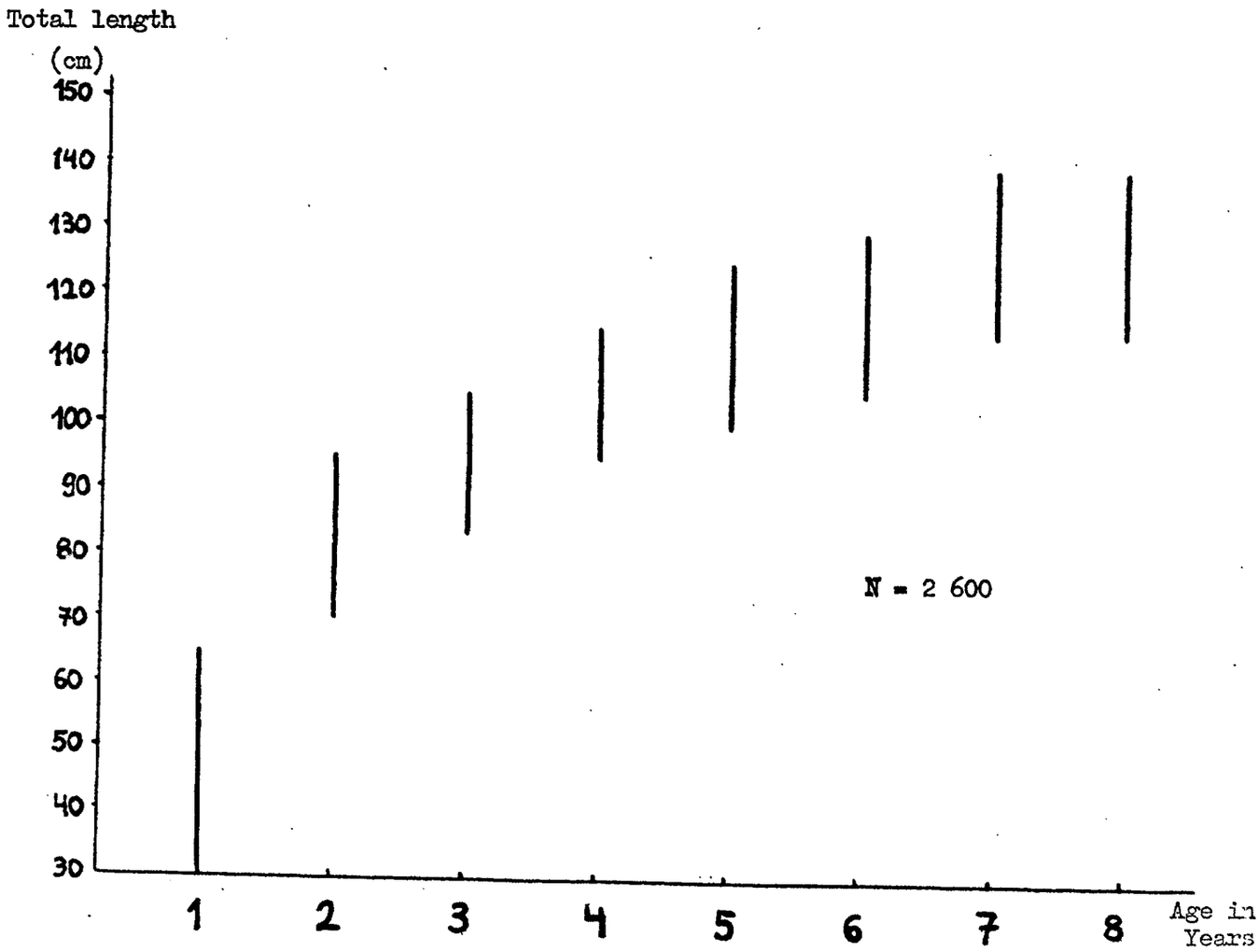

Figure 4. Length/age relationship.