With these assumptions we can apply Zanstra's formula for the ratio of the integral brightness of the corona to that of the sun :

$$L \sim \int_{x_0}^{\infty} \frac{x^2}{e^x - 1} dx \Big/ \int_{x_1}^{x_2} \frac{x^2}{e^x - 1} dx, \ x = \frac{h\nu}{kT},$$

where T is the sun's effective temperature; h and k are well-known constants; ν_0 will be in our case the frequency corresponding to the head of the Lyman series ($32 \cdot 84 \times 10^{14}$); ν_1 and ν_2 are the limits of frequency for photographic rays ($\nu_1 = 5 \cdot 95 \times 10^{14}$ and $\nu_2 = 9 \cdot 10 \times 10^{14}$). Expressing L in differences of stellar magnitudes Δm we get:

T.	Δm.	m_c.
6400	18·0	− 8·0
6200	99·1	− 6·9
6000	20·0	− 6·0
5800	20·8	− 5·2

(m_c is stellar magnitude of the corona ; $m = -26 \cdot 0$ mag.)

We can conclude from these data that even in the case of lowest admissible effective sun's temperature, we should obtain on the plates the effect of a relatively faint but characteristic bright line spectrum, superposed on the continuous spectrum of the corona (Russell, Dugan, Stewart, " Astronomy ", vol. 2, p. 507).

It should be noted that the proposed explanation of the bright coronal lines is related to a fact noticed by Balanovsky and Perepelkin (*Mon. Not. Roy. Ast. Soc.*, **88**, p. 747), namely, that the coronal material seems to be attracted by the solar prominences. This may be due to the fact that a part of the high frequency quanta, being absorbed by the prominence, does not reach the coronal matter and produces a darkening of the corona over the prominences. In that case the coronal emission lines ought to weaken considerably above a prominence ; and such an effect, if observed during an eclipse, would afford a proof of the photoelectric origin of the coronal emission spectrum.

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Growth-gradients and the Axial Relations of the Body.

IN previous communications (see Huxley, 1927, *Biol. Zentralbl.*, **47,** 151) it has been pointed out that in Crustacea the presence of a centre of active growth,

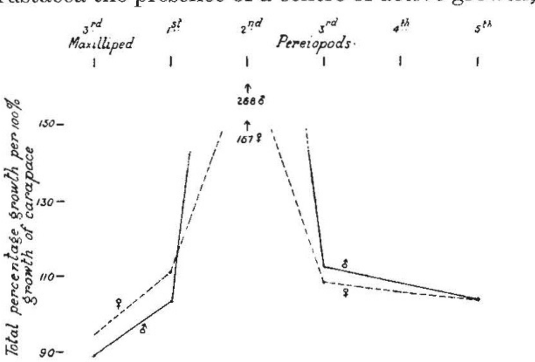

FIG. 1.—Amount of growth in length per 100 per cent growth of carapace-length in male and female prawns (*Palæmon carcinus*).

for example, in a male chela, is associated with excess growth of the other walking legs. The third maxilliped, however, is not affected in this way, but appears to be slightly decreased in the male. The question arose whether this was a positional effect, appendages anterior to the growth-centre being inhibited in their growth, those posterior being accelerated, or whether, since the maxilliped was an appendage of different type from the pereiopods, its growth was not correlated with theirs.

To settle this question, measurements have been made on a large Indian species of *Palæmon* (*P. carcinus*) in which the second pereiopod, not the first, is enlarged as the male chela. The material was presented by the Zoological Survey of India, through the kindness of Col. Seymour Sewell.

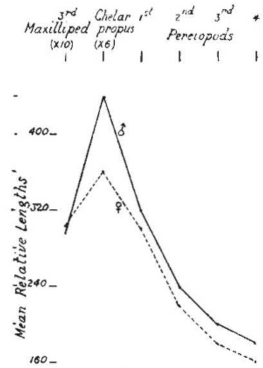

FIG. 2.—Relative lengths (in per cent of carapace-length) of male and female spider-crabs (*Inachus dorsettensis*). After M. E. Shaw, *Brit. Jour. Exper. Biol.*, **6**, 145.

The results appear quite definite. For 100 per cent increase in carapace-length, the percentage increase in length of the various limbs measured are as follows:

	Maxilliped.	Pereiopod.				
	3rd	1st	2nd	3rd	4th	5th
♂	89·0	103·2	*268·0*	*112·2*	*107·8*	*103·2*
♀	*94·6*	*111·1*	167·0	108·1	105·2	103·1

The accompanying diagram (Fig. 1) shows the results graphically. Fig. 2 shows the effect in *Inachus*, where the first pereiopod is the large chela. Other methods of analysing the figures confirm this conclusion; namely, that exceptionally active growth in one appendage is correlated with a slight acceleration of growth in the appendages posterior to it, a slight retardation in those anterior.

It has previously been established that the heterogonic growth of an appendage takes place most rapidly in a 'growth-centre' near its tip, and that there is a 'growth-gradient' down from this region towards the trunk. It would thus appear that when the local growth-gradient of the appendage reaches the trunk, it is influenced by the axial relations of the whole animal, and affects the regions posterior to the appendage in a different way from those anterior to it. No view has as yet been put forward as to the mechanism of this influence, and we should welcome any suggestions bearing upon it.

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Growth and Longevity of Whales.

ACCORDING to Mr. N. A. Macintosh (British Association Report, 1928) Blue whales and Fin-whales grow quickly and probably reach maturity in the short space of two years; Mr. Macintosh's statement implies that, in favourable circumstances, these great animals might increase in number fairly quickly, but that they die without attaining any great age.

In the case of the Greenland whale the duration of gestation and lactation are unknown, but the following facts suggest that it takes more than two years to reach maturity, that it multiplies very slowly, but that it attains a considerable age.

1. So far as can be ascertained now, the Greenland