

increased clockwise turning following fields stronger than the Earth's and increased counter-clockwise turning following fields weaker. This similarity obtained despite the fact that the snails had been south-directed while the planarians in the present investigation were north-directed.

Inspection of Fig. 1 reveals that the worms turn less far to the right in response to the 4- to 6-gauss fields than to the 1- to 2-gauss ones, and right-turning response to the 0.05- to 0.1-gauss fields averages about the same as to the 4- and 6-gauss ones. Therefore, the highly significant differences in after-effects among these ranges as shown in Fig. 2 cannot be attributed simply to a tendency of the worms to maintain in the subsequent control field the same path in the orientation apparatus that resulted from direct response to the experimentally reversed magnetic fields. Some other explanation must be sought. It is postulated that the phenomenon reflects acclimation or accommodation of the magnetoreceptive mechanism toward the altered strengths. This behaviour is interpreted as further evidence suggesting that the organism is, normally, physiologically adjusted in some manner to the strength of geomagnetism, even to specific vector strengths.

The general similarities of responses of the planarians to those obtained earlier for mud-snails suggest that responsiveness to the horizontal magnetic vector may be a fundamental and widespread biological property.

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Distribution of the Genus *Nephrops* (Crustacea Decapoda Macrura) in the Indo-Pacific Region

A SURVEY of the northern part of the South China Sea recently carried out by R.V. *Cape St. Mary*, of the Fisheries Research Station, Hong Kong, has shown that considerable numbers of *Nephrops* spp. (Crustacea Decapoda Macrura) are present in this region. Four species have so far been obtained: *N. thompsoni* Bate, *N. sagamiensis* Paris, and two which are new¹. The most abundant species is *Nephrops thompsoni* Bate, previously known only from the original specimen obtained by the *Challenger* Expedition and a second specimen from Formosa². One of the new species is almost equally abundant.

The widespread occurrence of these lobsters has been revealed during the systematic trawling survey of the South China Sea being carried out as part of the programme of R.V. *Cape St. Mary*. Further prospecting cruises are being undertaken to determine whether or not *Nephrops* is present in commercially exploitable quantities.

In the northern part of the South China Sea *Nephrops* has been found only on soft muds off the edges of the continental shelf, mainly between 100 and 200 fathoms, although one species was obtained at 450 fathoms. Attempts to catch *Nephrops* on oceanic banks have so far been unsuccessful. In November 1964, R.V. *Cape St. Mary* obtained *N. thompsoni* at 94-98 fathoms off North Borneo. The original record of this species was from the Philippines between Manila and Samboang. The results

so far obtained indicate that *N. thompsoni* is probably present all around the continental slopes of the South China Sea.

The European *Nephrops norvegicus* (L.) is now extensively exploited by the north-west European and Mediterranean fisheries, where it has become a luxury product sold under such names as scampi, langoustine and Dublin-Bay prawn. Until recently the tropical species of *Nephrops* has not been exploited, but a commercial fishery based on the New Zealand species, *N. challengerii* Balss, is now being developed^{3,4}. *N. norvegicus* is abundant in depths of 25-50 fathoms and its fishery presents no special problems. The Indo-Pacific species occur mainly at depths of more than 100 fathoms where few local vessels are yet able to fish.

No systematic surveys have been undertaken for *Nephrops* in tropical waters, but the recent results obtained in the South China Sea by R.V. *Cape St. Mary* indicate that this genus may be more abundant and widespread than has been supposed. Two new species have recently been found in Australian waters^{5,6}, and there are numerous scattered records from the Indian Ocean. The purpose of this communication is to draw the attention of fishery research workers in the Indo-Pacific region to the possibility that quantities of *Nephrops* may be present at suitable localities and depths, and that further efforts should be made to investigate their distribution and biology. Any further information concerning the distribution of adult *Nephrops*, or their larvae, in the Indo-Pacific region would be welcomed by me.

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ENTOMOLOGY

Ascorbic Acid in the Larval Stages of *Plusia signata* (Lepidoptera: Noctuidae)

DAY¹ found that in the larva of *Tineola*, the columnar but not the goblet cells contain vitamin C. Dadd² reported that vitamin C is essential in the development of *Schistocera gregaria*. Gilmour³ found ascorbic acid widely distributed among insects and synthesized by them. An investigation of different larval instars of *Plusia signata* was undertaken to determine the distribution of ascorbic acid in different tissues in these stages.

The histological presence of ascorbic acid was demonstrated by the silver method as modified by Bacchus⁴, and its estimation was performed by the indophenolxylylene extraction method of Robinson and Stotz⁵.

Histological sections showed that the presence of ascorbic acid was greatly marked in different tissues during different instars. First instar larvae which had hatched about 1 h before, and which had not yet started feeding, showed even impregnation throughout the gut epithelium and blood cells. The cells of the spinning glands exhibited very little impregnation, in fact, only localization in the supra-nuclear regions of the cells. Fat bodies and nerve cells also contained small amounts of ascorbic acid. In the second and third instars, the accumulation of ascorbic acid appeared to have increased only in the mid-gut epithelium and blood cells. The cells of the spinning glands in these stages exhibited very slight increase of ascorbic acid, but the impregnated cells now showed an even distribution throughout: the ascorbic acid was not