The spectrum of the perienteric fluid oxyhæmoglobin is of the same type as that of the body-wall pigment.

The main derivatives of the *Ascaris* pigments were prepared and were found to be related to each other in the manner characteristic of hæmoglobin derivatives. Such differences as were observed in the mode of their formation could be attributed to the low deoxygenation velocity of the oxyhæmoglobins.

Millikan[4,5] has shown that interspecific differences in the oxygen affinities of hæmoglobins are the result chiefly of variations in the velocity of association of the pigments with oxygen. He found the dissociation velocities to be of the same order in hæmoglobins having widely different oxygen affinities. The hæmoglobins of *Ascaris* depart from this rule. Oxygen dissociates from the perienteric fluid hæmoglobin 10,000 times, and from the body-wall hæmoglobin 2,500 times more slowly than it does from sheep hæmoglobin.

The ability of *Ascaris* to deoxygenate the hæmoglobin of the body-wall provides evidence that this pigment may have significance as an oxygen carrier at the low tensions of the gas which prevail in the mammalian gut. Laser has shown[6] that the oxidative enzymic system of the parasite is well adapted to such low tensions of oxygen.

A pigment having similar spectroscopic properties and oxygen relations to that of the perienteric fluid of *Ascaris* was found to occur in the perienteric fluid of *Strongylus* sp. from the horse.

A more detailed account of this work will be published elsewhere.

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'Ant Butter'

RECENTLY my father-in-law, M. Platonoff, asked me whether I could give him any information concerning a soft pliable yellow substance which he had found in the nests of wood ants in the forests of the U.S.S.R. The substance was in the form of small lumps and was sought by the peasants, who termed it 'ant butter' (Mouroveenue Maaslo). He did not know for what purpose the peasants used it. It is said that bears seek the 'ant butter', and a disturbed ants' nest used to be taken as an indication of their presence.

This substance was undoubtedly the ant 'incense' of Linnaeus. The occurrence of ant 'incense' ('wirak') was first recorded by Linnæus[1], who described ants collecting resin from juniper bushes and stated that the peasants gathered the pieces of resin from the nests of *Formica rufa* L. and used it as incense, terming it 'wirak'. Wheeler[2] points out that this is probably derived from the German "Weihrauch", incense. De Geer[3] both records and also figures the resin, and states that the wood ants collect it from the pine and fir trees. He says ". . . the ants collect it [the resin] in little masses of irregular form and varying size, of which the colour is sometimes white, sometimes yellow, and often of a dirty white; the substance is more or less hard except for that which has been amassed fairly recently. . . ."

Réaumur[4] experimented by placing bits of resin in ants' nests, "to see whether they will take on the peculiar quality that makes them resemble myrrh or amber". He also had some correspondence with De Geer on the subject.

Donisthorpe[5] states that "In Northumberland and Scotland these ants (*Formica rufa*, L.) collect huge quantities of yellow resin—'ant amber'—from the fir trees; I have seen nests full of it".

I have often observed wood ants climbing pine trees in the New Forest (presumably to collect resin) and coming down with their crops full, but have never actually seen the 'ant amber'.

The practice of collecting resin seems to be a widespread habit among the wood ants of the coniferous forests and woods of Europe, but I know of no record of this behaviour from America, nor has anyone yet determined for what purpose, if any, the ants use the resin.

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[1] *Vetensk. Akad. Handl.*, 37 (1741).
[2] Réaumur, "The Natural History of Ants" (trans. by Wheeler), 226 (New York, 1926).
[3] "Memoires", **2**, Pt. 2, 1066 (1771), (Fig. 15 of plate 41).
[4] *loc. cit.*, p. 123 and p. 213.
[5] "British Ants", 2nd edition, 291 (London, 1927).

Protein Content of Earthworms

CERTAIN historical events in 1940 interested us in the possible dietetic value of the protein content of earthworms. We found that two Germans[1] and two repetitive Japanese[2] had shown that all the usual amino-acids produced by hydrolysis of mammalian protein were also obtained from earthworms (*Lumbricus terrestris*), but they gave no quantitative figures of total protein with which we were concerned and which we now report.

Technique. We dealt with common earthworms of a variety of colours and sizes dug from Wiltshire and the London area. At first we analysed worms after keeping them 4–6 days in moss or oatmeal (the scouring process employed by anglers), but found that much 'earth' matter remained, varying from 25 to 45 per cent of the fresh weight. We therefore took large worms, killed them in ethyl alcohol, split and washed them earth-free and dried them roughly to their original moisture. Of these a known weight (sometimes one worm, sometimes two to four) was then desiccated and the nitrogen estimated by Kjeldahl ($P = N \times 6{\cdot}25$).

	1	2	3	4	5
Fresh worm (cleaned) (gm.)	4·66	8·0	5·0	15·0	26·0
Desiccated (gm.)	0·91	1·66	0·95	2·2	3·7
Water (per cent)	80·4	79·0	81·0	86·0	85·0
Protein, dry worm (per cent)	71·5	62·0	62·0	69·0	71·0
Protein, fresh worm (per cent)	13·95	12·9	11·7	9·9	10·0

Total fat estimation (ether and petroleum ether extracts) on three uncleaned samples were 1·3, 1·0 and 0·76 per cent of fresh weight, equals 1·5 per cent average on the de-earthed worm.

The free sugar or total carbohydrate was not estimated.

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[1] Ackermann, D., and Kutscher, F., *Z. Biol.*, **75**, 315 (1922).
[2] Murayama, Y., and Aoyama, S., *Yakugakuzasshi*, No. 469, 221 (1921); No. 484, 482 (1922).