isolated from all external disturbances. The platinum resistance thermometer was used as a stirrer.

The accompanying graph (Fig. 1) representing these observations shows a distinct slowing down of the rate of change of temperature at −105·4° C. (see the part A B of the curve). The transformation point is very clearly indicated in this heating curve. The parts of curve above and below the point −105·4° C. are to a high degree of approximation straight lines, making different angles with the temperature axis, which shows that the specific heat of ethyl ether undergoes a change at −105·4° C.

The transformation of liquid ether described above is the second observed case of such a phenomenon, the first one being the discovery of liquid helium I. and helium II. by W. Keesom and M. Wolfke (*Comm. Leiden*, 190 *b*).

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Sept. 30.

The Development of the Mesoderm in Gastropods.

IN 1891 Erlanger reported that in the freshwater snail *Paludina* the mesoderm was formed as a hollow pouch budded out from the primitive gut or archenteron. From a portion of this pouch, which may be regarded as the secondary body-cavity or cœlom, the pericardial sac was formed. Such a mode of the formation of the cœlom, though normal in Echinodermata and Chætognatha and also in *Amphioxus* and the Enteropneusta, was hitherto unknown in Mollusca, and Erlanger's results were received with a storm of scepticism. Later, Tönniges (1896) examined the development of *Paludina* and denied the validity of Erlanger's results, and asserted that the mesoderm arose as small cells budded from the ectoderm. The most recent worker on the subject (Dautert, 1929) has confirmed Tönniges's conclusions.

It seemed as if Erlanger had been utterly discredited. During this summer Mr. Fernando, a student working in my laboratory, re-examined *Paludina*. He found all the stages figured by Erlanger and completely confirmed his results. But he also found the stages figured by Dautert and Tönniges and showed that the differing results of these two workers were due to the old embryological error of missing out stages in development.

Fernando's results may serve as a warning against accepting negative results in zoology. Positive results are a definite addition to our knowledge: they may be misinterpreted and later workers may supply better interpretations, but negative results which suggest that positive results are entirely imaginary are almost always due to defective observation.

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Vitamin A and Carotene.

RECENT work by Moore and others (see, for example, Moore, *Biochem. Jour.*, **24**, 692; 1930) has left little doubt that, in the rat, carotene can function as a precursor of vitamin A. Experiments which I have just carried out have indicated that the same holds true in the fowl also. White Leghorn chickens, six weeks old, were given a synthetic diet free from vitamin A to which irradiated ergosterol was added to supply vitamin D. Control birds receiving this diet succumbed in about six weeks, their livers giving negative tests for vitamin A either by the antimony chloride test or by the absorption spectrum. To other birds, after a preliminary period of vitamin A depletion, daily doses of carotene (1 mgm.) or cod liver oil concentrate (10 mgm.) were given, with the result that complete cures were effected and satisfactory growth restored. The livers of all these birds, receiving either carotene or concentrate, gave positive tests for vitamin A, the oils yielding an intense blue colour with antimony chloride and showing a strong absorption band in the region of 328 $\mu\mu$.

As well as indicating that the ability to transmute carotene into vitamin A may hold fairly generally throughout the animal kingdom, the experiments would seem to afford an explanation of the results of Palmer and Kempster (*Jour. Biol. Chem.*, **39**, 331; 1919), who found that while xanthophyll fed to fowl reared on a diet free from carotenoids quickly increased their pigmentation, carotene had no such effect. The transmutation of carotene into the colourless vitamin A would account for this very simply.

A full account of the experiments will be published elsewhere.

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Denaturation of Proteins by Urea.

THE important article by Sir Frederick G. Hopkins which appeared in NATURE on Aug. 30 and Sept. 6 records many valuable new observations on which he is to be congratulated. It has, indeed, only one defect, and, at his request, I write to make that good, namely, the absence of all reference to the observations made many years ago by myself and my delightful friend Dr. N. G. Chavasse, a man who was twice awarded the V.C., and whose loss is to me one of the major tragedies of the War. The fact that Sir Frederick knew nothing of these observations is, however, very intelligible, since the first paper (*Jour. of Physiol.*, **28**, pp. 23-26; 1902) appeared obscurely in the *Proceedings*, only, of the Society concerned, and the second (*Proc. Faraday Soc.*, March 1913; German translation in *Zeits. f. Kolloide*, **12**, pp. 250-252; 1913) was entitled "Graded Protein Sols".

Let me add that during the last two years Mr. J. Hatton has been working on this subject under my supervision, and that in 1929 we found, like Sir Frederick, that the rate of denaturation of approximately isoelectric egg-albumin by urea had a negative temperature coefficient. Other results of ours will now be found in the Proceedings of the Biochemical Society published in *Chemistry and Industry*, Oct. 10, 1930, p. 851. That account should be supplemented by the statement that, in the case of sheeps' wool, much, though apparently not all, of the substances the thiol or disulphide groups of which have become 'unmasked' passes into the urea solution.

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Oct. 13.

Oviposition of *Hæmatopota pluvialis*, Linné.

DR. CAMERON'S interesting account, in NATURE of Oct. 18, p. 601, of the oviposition habits of Tabanid flies, and especially of those of *Hæmatopota pluvialis*, L., suggests that the following observation may be worth recording. On Aug. 24, 1925, at Waidbruck (Ponte all' Isarco), Italian Tyrol, I observed a female of *Tabanus glaucopis*, Mg., laying her eggs on the leaves of the common plantain, *Plantago lanceolata*. The plant was growing in a dry hay-field, not in the immediate vicinity of water.

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