Table 1 refers to flies (*Glossina morsitans*) collected in the field.

TABLE 1.

Category	Fat, per cent of dry weight	Gross water per cent	Water, per cent of non-fatty weight
Males			
Stage I	25·87	62·19	69·55
Stage II	35·28	60·96	70·83
Stage III	24·53	63·62	69·89
Stage IV	14·56	64·77	68·43
Young	15·93	68·88	72·63
Females			
Mature	16·84	64·44	68·73
Young	15·25	68·92	72·36

Just-fed flies are normally inactive in Nature, but from laboratory experiments it is found that these contain nearly 75 per cent water in non-fatty body weight, the percentage of water in blood. By rapid excretion, water is eliminated immediately after feeding, up to 8 mgm. being removed in the first quarter of an hour.

The results are interpreted in the following way:

Fat is synthesized after feeding, and reaches a maximal proportion in stage II of hunger. Thereafter it diminishes until the next meal (stage III or stage IV). During the inactive period immediately after feeding the water content is depressed below the normal 70 per cent of fatless weight, and as it rises towards the normal, activity is resumed in late stage I. Thereafter the percentage is maintained close to 70 per cent, but falls slightly as hunger increases and loss of water can no longer be made good. It appears that death from 'starvation' occurs when the percentage falls to about 65 per cent.

In wild, young flies, for some unexplained reason, the percentage is higher at about 72½. My colleague, Mr. W. H. Potts, finds that in just-emerged individuals it is even higher.

To summarize the significant differences in the first and third numerical columns of Table 1, stage II is in each case significantly different from all the others. Stages I and III are indistinguishable from each other but significantly different from the rest, except that in the third column the old females, because of high variance, are not quite distinguished from stage I males. Stage IV and all females and young males are indistinguishable as to fat percentage; in water percentage of fatless weight the young flies are distinct from all the others, but the sexes of young flies and of hungry males and old females are respectively indistinguishable. (Females taken in Nature are nearly always hungry.)

It is of interest that Buxton and Lewis[3] in Northern Nigeria found 63 per cent water in gross weight for wild male *G. submorsitans* and 60 per cent for wild females. These figures become 69 per cent in both cases when fat is eliminated from wet and dry weights. It is likely that some of these females were partly pregnant, as such flies have a higher fat content and therefore a lower percentage of water in the gross body weight.

Mr. Jack's point, that, when the proportion of water is so high, a small change in the ratio may indicate important losses, is well made.

C. H. N. JACKSON.
Department of Tsetse Research,
Shinyanga,
Tanganyika Territory.

[1] NATURE, **139**, 31 (1937).
[2] *Proc. Zool. Soc.*, (4), 811 (1936).
[3] *Phil. Trans. Roy. Soc.*, B, **224**, 205.

Effect of Centrifuging on *Amœba proteus* (*Y*)

IN *Amœba proteus*, the cytoplasmic bodies are the nutritive spheres, crystals, neutral red bodies, mitochondria, sudanophil fat and a single contractile vacuole.

Fig. 1 illustrates the stratification of the various cytoplasmic components according to their specific gravity after centrifuging. Fat (*F*) and the contractile vacuole (*CV*) being the lightest, occupy the centripetal position. Next is clear cytoplasm (*C*), then the mitochondria (*M*) followed by a layer of neutral red bodies (*NR*), a layer of crystals (*CRY*) and the nutritive spheres (*NS*) which are the heaviest component of the cell and occupy the extreme centrifugal position. The nucleus (*N*) occupies a position in between the crystals and the nutritive spheres, and the chromatin (*CR*), being the heaviest material in the nucleus, collects towards the heavy side of the cell.

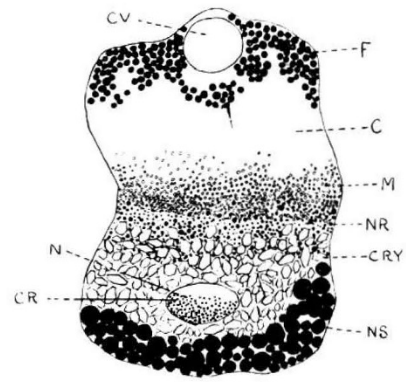

Fig. 1.

The nutritive spheres contain glycogen as a form of reserve food material. It is very interesting to note that no homologue of the Golgi apparatus appears to exist in *Amœba proteus*, and that the wall of the contractile vacuole does not blacken with osmic acid even after prolonged periods.

B. N. SINGH.
Department of Zoology,
Trinity College,
Dublin.
March 5.

Excretion from Leguminous Root Nodules

VIRTANEN[1,2], using pea, vetch and clover, has amply confirmed the suspicion of some earlier workers by showing that under certain conditions (for example, in sand culture) there is an excretion of fixed nitrogen in the form of amino-acids from the nodules of these plants into the rooting medium. It does not follow that this finding may be extended to leguminous plants in general. In experiments carried out as an extension of published work[3], and with the assistance of Mr. I. W. Prentice, I have been unable, by analysis of the rooting medium, to find evidence of excretion of fixed nitrogen from the nodules of soya bean plants at any stage in development, although extensive fixation occurred within the nodules. The plants were grown in open sand-cultures, initially sterile.

These negative results may be due, not to the absence of excretion, but to (*a*) excretion being