definite specific identification however can be given at this stage, there being a single specimen only.

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A *GRIFFITHIDES* FROM THE FENESTELLA SERIES OF KASHMIR

THIS note records the occurrence of *Grffithides* from the Fenestella Series of Kashmir. Only one specimen of a well-preserved glabella (along with eyes) was collected from the Black Shales exposed near Yanzar Fishing Rest House (33° 55′ : 75° 17′). The specimen closely resembles *Griffithides longiceps*, Portlock described from the Mississippian of Ireland.[1,2]

The glabella is pyriform and expanded anteriorly; basal lobes distinct from glabella; eye small and lunate; the dimensions are: length 10·00 mm,; width (at the anterior end) 7·50 mm. and (at the posterior end) 5·50 mm.

Fragments of trilobites comprising almost exclusively of pygidia are common in the Fenestella beds exposed near Yanzar, and are not in a satisfactory state of preservation for specific identification. No remains of Cephalothorax had been known till October 1964 when one of us (V. J. G.) found a well-preserved glabella from these rocks.

The known pygidia[3,4] have been identified as species of *Phillipsia* by various workers. But the associated glabella (Fig. 1) differs from that of *Phillipsia* by the absence of lateral glabellar furrows, nor obviously can we be absolutely certain that the pygidia and the (only) associated glabella belong to the same species.

FIG. 1. *Griffithides* sp., × 2¼.

The present form closely resembles *Griffithides longiceps*, Portlock from the Mississippian of Ireland. The characters of the glabella differentiate it from *Griffithides breviceps*, Gheyselinck and *Griffithides globiceps*. But no definite specific identification of the glabella can be given at this stage, there being a single specimen, not in organic union with the pygidium.

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NITROGEN CONTENT OF THE LAMELLIBRANCH *DONAX CUNEATUS* LINNAEUS

THE chemical composition of several bivalves has been studied (Vinogradov).[1] The sand dwelling lamellibranch *Donax cuneatus*, however, has not been studied so far, and the present note reports the nitrogen content of this species occurring along the sandy shores of Tondi.

The total nitrogen and non-protein nitrogen were determined using the method described by Stayermark.[2] The protein values were calculated from the values obtained for protein nitrogen. Animals with meat weight ranging from 213 to 633 mg. were used in the present study.

TABLE I

Total nitrogen and protein and non-protein nitrogen of Donax cuneatus. *Each is a mean of 10 estimations*

No.	Wet weight mg.	Total nitrogen %	Non-protein nitrogen %	Protein nitrogen %	Protein %
1	258·06	2·84	1·04	1·80	11·25
2	368·14	2·70	0·99	1·71	10·69
3	466·20	2·42	0·70	1·72	10·75
4	633·00	2·38	0·87	1·51	9·44

The total nitrogen values vary from 2·38 to 2·84% of the body weight (wet weight), and

there is a decrease in nitrogen content with increase in body weight. These values compare favourably with the values reported in other lamellibranchs like *Ostrea edulis*, *Mya arenaria*, *Pecten irradiatus*, and *Venus mercenaria* which were found to have a nitrogen value of 2·11%, 2·18%, 2·36% and 2·67% respectively (Payen[3]; Atwater[4]). Similarly, Balland[5] found 1·8% of nitrogen in the living matter of *Mytilus edulis* and Atwater (1892) found 1·56% in *Crassostrea virginica*. Srinivasan[6] has reported a nitrogen value of 2·56% in *Martesia fragilis* and 3·19% in *Martesia striata*. In *Donax* the non-protein nitrogen is much less, ranging from 0·7 to 1·04%. The mean values for non-protein nitrogen and total nitrogen are 0·90% and 2·59% respectively, the ratio of the two being 1 : 2·88.

From this, the calculated value for protein nitrogen is 1·69%. The total protein content calculated from this value is 10·53%, similar to the protein values in other bivalves. In *Ostrea edulis* the protein content ranges from 8·6 to 12·6%, in *Mytilus edulis* 8·9 to 11·7%, *Mytilus munahuensis* 11·3 to 19·4%, *Enoplochiton niger* 24·7%, *Pecten maximus* 17·5% and in *Cardium edule* it is 13·2% (Reviewed by Borgstrom,[7] 1962). In *Martesia fragilis* the protein content varied from 3·5 to 11·5% (Srinivasan, 1961). The protein content of *Donax cuneatus* which ranges from 9·44 to 11·25% is thus found to be comparable with the values obtained for other lamellibranchs.

Donax occurs in large numbers in our sandy shores. It is also used as a source of food by the poorer section of the people. Even though the protein content is generally less in bivalves than in fishes (8·8–23·8%) or Crustaceans (9·4-15·3%) they form a supplemental item in the food. Since *Donax* occurs in very dense populations they may perhaps be exploited to a greater extent than now.

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DIURNAL VARIATION IN CHLOROPHYLL CONTENT OF LEAVES OF GROUNDNUT PLANTS (*ARACHIS HYPOGEA*)

THE controversy relating to continuous changes in chlorophyll content throughout the life of the leaf due to destruction of chlorophyll molecules in darkness and their regeneration in light was revived recently by Godnev *et al.*[1] Earlier, Wendel[2] observed large diurnal fluctuations in chlorophyll content and suggested the existence of diurnal rhythm for the same. Seybold[3] contradicted Wendel's views and doubted the correctness of his data. Virgin[4] noted that in young leaves protochlorophyll, precursor to chlorophyll *a* (a major component of total chlorophyll), is formed throughout the 24 hours but during daytime it cannot be isolated as it is immediately converted to chlorophyll *a*. Recently Wickliff and Aronoff[5] carried out a detailed study of the problem with an elaborate statistical lay-out and concluded on the basis of statistical analysis of their data that the mature leaves of soybean plants showed, if at all, a negligible variation of 1% in the chlorophyll content during a period of 24 hours thus proving the lack of diurnal variation. They however pointed out the possibility of its existence in young leaves which would need verification by measurements which eliminate the influence of biological variations. Keeping in view this precaution, the present investigation was carried out on relatively young leaves (second open leaves from the shoot-tips) of groundnut (TMV-2) plants.

Beginning at 7-00 a.m. on a clear day, samples (by punch method) were taken at random in triplicate at 3-hour intervals till next morning from the central portion of the proximal leaflets of the second leaf on the main shoot of 45 days old uniform plants, raised in pots kept in the open. Throughout the experiment one plant was sampled only once. Each of the three samples for each time of observation was immediately analysed for the total chlorophyll content according to Arnon's method,[6] using Bausch and Lomb 'Spectronic 20' colorimeter. The data are represented in the graph and also examined