From the cardio-acceleratory effects of ACh and of extracts of the portions of the CNS of the scorpion, it was inferred that the ACh content was greater (41·26 + 1·2 μg/g wet wt.) in the sub-oesophageal region and least (14·24 + 5·66 μg/g wet wt.) in the meso-somatic region (Table I). Corresponding to the amount of ACh, the per cent acceleratory activity of the isolated heart of scorpion was also much greater when the extract of sub-oesophageal ganglion was added (44%) as compared to the addition of the extracts of other portions of the CNS (Table I). It is suggested that ACh-type of substance in the CNS of the scorpion may play a role in regulation of heart activity.

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CIRCADIAN ACTIVITY OF ADENOSINE-TRIPHOSPHATASE IN THE NERVOUS SYSTEM OF THE COCKROACH, *PERIPLANETA AMERICANA*

THE physiological changes in the activities of succinic dehydrogenase (SDH), phosphorylase and isocitrate dehydrogenase in the scorpions[1–3] and SDH and amino-transferase activities in cockroaches[4] were correlated with the locomotor activity of these animals. Adenosinetriphosphate (ATP) synthesizing system and enhanced biological oxidation of tricarboxylic acid cycle intermediates in rats[5] and ATP degrading system in hamsters[6] were also shown to be associated with their locomotor activity. The present study demonstrates the occurrence of a rhythmic variation of adenosinetriphosphatase (Mg^{2+} ATPase) in the nervous system of the cockroach, *Periplaneta americana*, under normal and constant light conditions.

Rearing of the cockroaches, etc., has already been described[7]. Under constant light (LL) and dark (DD) conditions, the animals were acclimatised for three months. For LL conditions, a light source was arranged 200 cm above the animal cage.

Mg^{2+} ATPase activity was determined according to Tirri *et al.*[8]. The content of inorganic phosphates was determined by the method of Fiske and Subba Row[9]. The enzyme activity was expressed as mg of Pi formed/g wet wt. of fresh tissue.

Mg^{2+} ATPase activity in the nervous system of normal (LD : 12 : 12 hours) animals exhibited cyclic variations with maximal activity at 00·00 h and minimal activity at 12·00 noon (Fig. 1 *a*). The average level of the enzyme activity was higher during 20·00 to 04·00 (dark hours) than during 08·00 to 16·00 (light hours) of the day (Fig. 1 *b*). Similar changes were reported in cholinesterases, dehydrogenases and aminotransferases in cockroaches[7,10,11] and scorpions[1–3]. Rhythmic variations in ATP were shown for vertebrates[5,6]. It is probable that enhanced ATPase activity during dark hours is related to the overt locomotor activity of the cockroaches, which are nocturnal in their habits[12].

Even under LL and DD conditions, persistence in the cyclic variations of ATPase activity was observed (Fig. 1 *a*). But the peak period of activity occurred at 04·00 hours, representing a phase shift by 4 hours over LD animals. Such phase shifts of about 4 hours are within the limits of the period range, *viz.*, 24 hours, of the enzyme activity.[13]

When mean enzyme activity for six (time) intervals under LL and DD conditions was compared with that of LD animals, it registered a loss of 16·2% and 10·0% respectively. This suggests that constant light rather than darkness exerts greater inhibitory effect on the enzyme activity. Moreover, in LL and DD conditions the average level of enzyme activity was

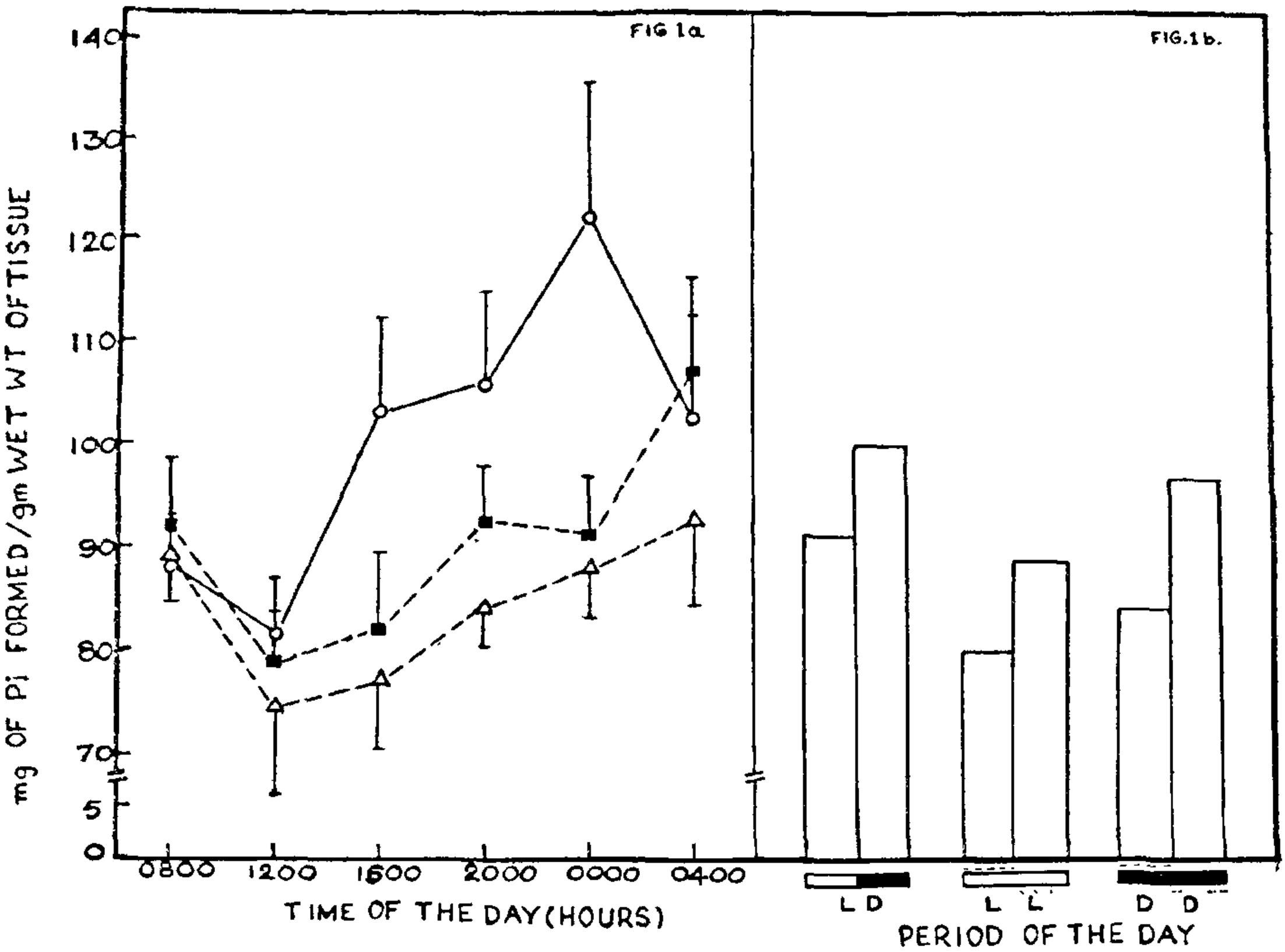

FIG. 1 *a–b*. Fig. 1 *a*. Rhythmic ATPase activity in the nervous system of the cockroach, *Periplaneta americana*, under LD (normal) (○——○), continuous light (LL) (△- - - - -△) and dark (DD) (■- - - - -■) conditions. The enzyme activity was expressed as mgm of Pi formed/gm wet weight of fresh tissue. Total number of animals used were 18 per each experiment. The values are average of four experiments. Fig. 1 *b*. Average level of enzyme (Mgz^{+} ATPase) activity during 20·00 to 04·00 hours (▤ for LD and ▭, ▤ for LL and DD conditions respectively) and 08·00 to 16·00 hours (▭, ▭, ▤ for LD LL and DD conditions respectively). The enzyme activity was expressed as mgm of Pi formed/gm wet weight of fresh tissue. Total number of animals used were 18 per each experiment. The values are average of four experiments.

high during 20·00 to 04·00 hours than during 08·00 to 16·00 hours (Fig. 1 *b*). This would mean that the animals, even under constant conditions continue to maintain its original pattern of enzyme activity. Thus, the periodic oscillations are independent of the environmental light conditions (LL and DD), implying the endogenous nature of the rhythm as suggested by Brady.[14]

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MIXED-COMMUNAL ROOSTING OF INDIAN WHITE BACKED VULTURES IN POONA

WHILE observing the roosting behaviour of some common birds of Poona (Maharashtra) and around, from January 1976 to February 1977, I came across number of mixed-communal roosts of birds.

Usually the associates which I have observed at such roosts are Indian Mynas, *Acridotheres tristis* (Linn.); House and Jungle Crows, *Corvus splendens* Vieillot and *C. macrorhynchos* Wagler; Pariah Kites, *Milvus migrans* (Boddaert); Rose ringed Parakeets, *Psittacula krameri* (Scopoli) and House Sparrows, *Passer domesticus* (Linn.). These associations at mixed-communal roosts are noticed throughout the year. The Cattle Egrets, *Bubulcus ibis coromandus* (Boddaert) and Indian Pond Herons, *Ardeola grayii grayii* (Sykes) also assemble at such mixed roosts only during the non-breeding season while a migratory bird like Rosy Pastor, *Sturnus roseus* (Linn.) roosts together along with the above species for a part of the year. This has also been indicated by Gadgil and Ali[1] (1975) who have given a systematic account of communal roosting of Indian birds.

During the month of June 1976, it was noticed for the first time that the Indian Whitebacked or Bengal Vultures, *Gyps bengalensis* (Gmelin) formed a mixed-communal roost along with the Indian Mynas, House and Jungle Crows and Whitenecked Storks, *Ciconia episcopus* (Boddaert). This mixed congregation was observed on the Poona–Bombay Road near Dapodi, on a Banyan tree, *Ficus bengalensis* L. On counting the number of birds at this mixed roost, it was found that there were 150 Indian Whitebacked Vultures, 300 Indian Mynas, about 150 House and Jungle Crows and a pair of Whitenecked Stork. These countings were made in the evening, when these birds return to the roost. Further observations showed that this mixed-communal roost was constant till september 1976, both in the number of species and in their total population. Subsequently, the roost totally disappeared till February 1977. In the meantime, the Vultures and Storks seem to have migrated from this locality, while Mynas and Crows shifted to another roost about half a kilometer away from the original roosting place.

From the above observations it would appear that Indian Whitebacked Vultures are seen on this mixed-communal roost only during the monsoon from June—September, which is a part of their non-breeding season.

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NEW PARASITES RECORDED ON THE SORGHUM SHOOTFLY, *ATHERIGONA SOCCATA* (RONDANI)

VARIOUS cultural and chemical control methods have been investigated and recommended for the control of shootfly (*A. soccata*), a serious pest of sorghum. However, very little work has been done on identifying and utilizing the natural enemies of this pest. This aspect is now being systematically investigated under the All India Co-ordinated Sorghum Improvement Project at New Delhi.

One to two week old shootfly infested seedlings, having freshly formed dead hearts, were collected from the field and were kept in separate glass jars containing 5 cm layer of moist sand. The number of dead hearts with the shootfly larvae were counted in each jar to determine the percentage of parasitism. The jars were placed at 27° C ± 1° C, the relative humidity ranged between 60 and 70%.

The parasites and shootfly adults emerging in jars were periodically collected and sent to British Museum for identification. It is found that in addition to the two parasites already recorded, viz., *Aprostocetus* sp. and *Callitula hipatitus*