SUMMARY AND CONCLUSIONS

The pectoralis major muscle of birds exhibits great variations in the diameter and sarcoplasmic inclusions of its constituent fibres.

The mean diameter of the fibres varies according to the weight of the muscle and the mode of flight exhibited by the bird. It increases directly with the increase in the weight of the muscle but the rate of increase varies in birds differing in their mode of flight.

The fibres in the pectoralis of flying birds in general contain heavy sarcoplasmic inclusions, but in the pectoralis of many birds, irrespective of their flying habits, broader fibres tend to acquire less granular inclusions and become lighter in colour. In the pectoralis of pigeon, where the distinction between the red (dark) and white (light) fibres is sharp and clear-cut morphologically and biochemically, the red narrow fibres are loaded with fat and mitochondria whereas the broad ones which are practically devoid of them, are loaded with glycogen — about five times more than that in the narrow fibres.

The distribution pattern of the red and the white fibres in the pectoralis of different birds varies considerably and in the pigeon pectoralis, which has been studied in greater detail, it is most striking and definite . Moreover, the distribution of metabolites (fat and glycogen) in the different regions of the muscle is primarily governed by the

distribution pattern of the red and white fibres in this muscle.

The red and white fibres of the pigeon pectoralis react differently in disuse atrophy, induced by putting a plaster cast around the shoulder joint. The white fibres are more suceptible to atrophy than the red fibres.

From the present work the fibre architecture of the pectoralis of birds has emerged as a complex phenomenon of paramount importance, well worthy of extensive studies by future workers, not only for a clearer understanding of the problem of energetics in the flight of birds, but also of the general problem of muscular contraction.