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STEP

AUTHOR: Zalesskiy, Yu. M., Candidate of Biological Sciences

TITLE: The insect and the aircraft

PERIODICAL: Priroda, no. 11, 1962, 51-58

TEXT: The principles of insect flight are studied from the point of view of their application to flying craft. Early attempts at formulating an aerodynamic theory of insect flight, and at creating entomopters, are mentioned. The flight of diptera, hymenoptera, orthoptera, coleoptera and lepidoptera is analyzed and graphically illustrated. The speed and economy of insect flight, and the relationship between wing-beat frequency and lift, are briefly discussed. The existence of pterostigmata in insects, which correspond to the antifrutter devices on aircraft wings, is cited as an example of how much research could have been saved if the functions of insects' flight organs had been studied. The use of a propelling air wave such as that produced by a butterfly's wings, and the lemniscatic wing stroke of many insects, is considered to be of possible use in aviation.

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The insect and the aircraft

N.V. Pogorzhel'skiy, I.N. Vinogradov and G.A. Gladkikh have designed a wind turbine using lemniscatic wing motion, which needs only a very light wind to operate it. The existence of the Meganeura with their wing span of 80-110 cm indicates that the principles of insect flight may be applied up to a certain size limit in flying craft, which must be determined experimentally. Individual features of insect flight, such as the smooth safe landing of a bee on an uneven surface such as a petal, could be copied in aircraft design. Entomopters could be employed for light tasks such as carrying light loads, aerial survey, carrying aerological instruments up to a high altitude, flying and landing in mountainous territory, and also for sporting purposes. There are 11 figures.

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