thyroid compounds of the thiocarbamide type with no taste-blind differentiating quality, such as creatinine (synthesized via creatine (*Org. Synthesis*, **4**, 15; 1925); such a creatinine is free of picric acid, which is present in commercially available preparations. No. 7 in Table 1), an isosterically substituted thiocarbamide, are likely to produce their anti-thyroid activity[2] through another mechanism than that characteristic for compounds No. 1, 2 and 3.

Biochemical, genetic, pathophysiological and psychological aspects of the part played by thyroxine and its precursors in the mechanism of taste and 'taste-blindness' are under study and will be published elsewhere.

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Flight by Man-Power

BEING interested in the possibility of flight by man-power, we have read Dr. D. R. Wilkie's communication[1] on the "Work Output of Animals: Flight by Birds and by Man-power".

We agree[2] that for mechanical similarity the power requirement is a function of (weight)$^{1.167}$. Moreover, for flying insects and birds[3] we obtained from Pütter's data a different exponent for this statistical relationship, namely (weight)$^{0.667}$. It is interesting to note that according to the theory of biological similarity[2], the limits for these exponents of body-weight are 1·167 for mechanical similarity, and 0·667 for the electrodynamical similarity, whereas for biological similarities, power is a statistical function of (weight)$^{0.73}$.

Thus, in accordance with the principle of mechanical similarity the power requirement for a flying machine is proportional to (weight)$^{1.167}$; the same relationship was obtained by Nonweiler (quoted in Dr. Wilkie's paper) based on purely aerodynamic considerations. This equivalent conclusion provides evidence that the power necessary to initiate flight exclusively by muscular effort, without additional external forces (potential energy, wind velocity, etc.), is a function of (weight)$^{1.167}$. The slope of this theoretical relationship (line *E* of Fig. 1 in Dr. Wilkie's paper) intersects line *C* of the same graph, which represents the steady-state maximal effort that man is able to perform in oxygen balance for at least 5–30 min.

The theory of biological similarities[2] states that all power functions of living beings are related to (weight)$^{0.73}$, and since it was found[3] that flying insects and birds have mean power requirements which are a statistical function of (weight)$^{0.667}$, we presume that this represents the optimal conditions of natural flight which man should try to achieve during artificial flight.

Furthermore, from the experimental data of Bjerknes and of Müllenhoff, we have calculated[3], by extrapolation from the regression equation based on data for a weight range from the fly to the stork, that a man-powered flying machine (70 kgm. man and 30 kgm. flight-accessories) should have approximately the following characteristics for slow flapping flight: (*a*) flight surface, 6 m.^{2}; (*b*) pressure, 16·8 kgm./m.^{2}; (*c*) speed, 18·2 m./sec.; (*d*) power, 6 kgm.-m./sec.; (*e*) force of the wing-beat, 19·3 kgm.-weight; (*f*) speed of the wing tip, 5·8 m./sec.; (*g*) length of the wing, 3·15 m.; (*h*) wing-beats per second, 0·592/sec.

Another aspect of the same problem is related to the different density of birds and men. In order to have similar flight conditions, it might be wise to construct a man-powered flying machine of approximately the same density of those of insects and birds, so that the aerodynamics of the whole machinery should be similar to the natural models. The transfer of muscular power to the wings and the sensory information of the actual flight conditions must be based on the flight-physiology of insects and birds, since the reflex regulation of flight is of paramount importance.

We agree with Dr. Wilkie in the sense that man-powered flight is possible and should be tested experimentally, because new hypotheses and materials (both metals and plastics) are available which can be used to solve some of the engineering problems involved.

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Effect of Nitrate Ion on the Distribution of Sucrose in the Rat's Ventricle

CURRENT work in this laboratory shows that the exposure of driven rat ventricle strips to Locke's solutions, in which all the chloride has been substituted by nitrate, results in an increase of the total sodium in the tissue. In order to determine how this increase was partitioned between the extracellular and the intracellular compartments we attempted to measure the extracellular space by the distribution of sucrose. The results presented below show that this cannot be done in the case of nitrate, and reveal an interesting feature of the action of this anion, which may be that of increasing the permeability of cardiac tissue to a molecular species not ordinarily considered as being able to traverse the cell membrane.