Bulletin No.XXVIII

Value of mv.

Surface:- The propelling force (or mv) is directly proportional to the surface of the propeller.

Keeping the pitch and speed of rotation constant the greater the surface the greater the mass (m) of the displaced air, but its velocity is unchanged, so that changes in the amount of surface affect only the m element of the propelling force mv. Thus the total value of mv varies directly as the surface.

Pitch:- The propelling force mv varies directly as the square of the pitch.

Keeping the surface and speed of rotation constant then the greater the pitch the greater the mass (m) of the air thrown back and the greater its velocity (v). Thus both the m and v elements vary with the pitch. If we double the pitch we move twice the mass of air at double the velocity and the value of mv is four fold etc.

Rotation:- The propelling force or mv varies directly as the square of the speed of rotation.

Keeping the surface and pitch constant, then the greater the speed of rotation, the greater will be the mass (m) of the air thrown back and the greater its velocity (v). Thus both the m and v elements vary with the speed of rotation. If we double the speed of rotation we move twice the mass of air at double the velocity; and the value of mv would be four fold etc.