RECENT TRENDS IN PLANING

A naval architect raises some points in connection with the development of fast, seaworthy motor boats . . .

HAVING had a hand in guiding the development trend of modern planing hulls, domestic and foreign, I find that the basic principles of monohedron hulls as first recorded in *Naval Architecture of Planing Hulls* have been in the last few years generally incorporated into the standard practice of planing hull design, both naval and private. However, there are some details which should be restudied in the light of this widespread experience.

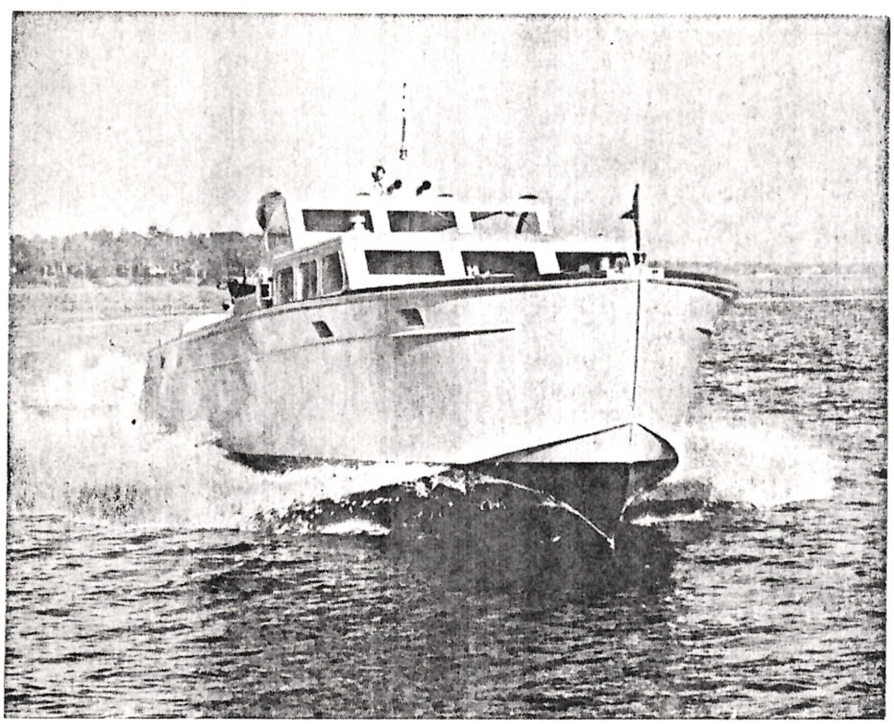
Specifically, I am now inclined to doubt that any important relationship exists between weight and sea-keeping ability. My doubts have also extended into the field of dimensionless coefficients, particularly those involving load and power. And finally, I would like to revise horsepower charts to coincide more nearly with catalog ratings and average usable power of today's engines. These are the major points which seem to call for review.

In the first place, a planing type hull is one which is capable of absorbing relatively high power and of converting some of the excess power into speed. Without high proportionate power the planing hull is not in its element and is actually slower than a comparable displacement hull. The speed potential of any planing hull rests basically on its ability to absorb and use high power; not on what is commonly known as an easily driven form. The speed potential of a displacement hull, on the other hand, varies according to its length, power being more of a secondary matter. These are fundamental concepts to be kept in mind.

The planing hull cannot be used for low-powered service in heavy hulls because its long, flat buttock lines end at a deeply immersed transom instead of sweeping back up to the water's edge where the water flow may be released gently. By ending abruptly at the transom it is assumed that they do not end at all but rather that they extend indefinitely in the water flow as if part of a much longer hull. This is a very apparent phenomenon and has direct bearing not only on speed potential but on hull steadiness, which will be discussed later.

Where the dividing line may come between displacement and planing performance is subject to a number of pertinent factors and is never sharply defined. But in general, a speed-length ratio of around 2.0 for ordinary ship forms is a fairly reasonable boundary. Long, lean hulls tend to operate with wave-making resistances so low that speed-length ratios may run considerably higher. Rowing shells and even destroyer forms retain displacement flow lines at ratios well above those which can be reached by wider and more practical forms. However, in speaking of normal forms, a speed-length ratio of 2.0 seems to indicate a general boundary region. Below this figure every hull, regardless of shape, is a displacement hull anyway and should be refined accordingly for minimum power. Beyond a speed-length ratio of 2.0, some sort of planing type would normally be considered. The border line is broad and involves compromise with factors other than speed alone.

Most important of these additional factors is weight. And weight, in turn, is largely a matter of its relationship to power and, to a lesser degree, the area of the plane. Thus a heavily loaded hull with sufficient excess power and wide beam may give as good planing performance as a lightweight job with only moderate power. But in either case the horse-power per pound must be greater, frequently several times as great, as would be required in ordinary practice for the gentle propulsion of a displacement hull.



A Huckins Offshore 48 cruising at 20 knots with a weight-power ratio of 65 pounds per horsepower