

relationship of the lateral plane, at speed, to weights and sea conditions. Many of these types were lost as a result of their fatal tendency toward broaching in a following sea.

Even though the Government has preferred to regard the design of its planing types as somewhat beneath the dignity of senior officers, the potentialities of fast boats loom so obvious, in spite of their faults, that developing a science of their performance has become a challenge. Both Dutch and Russian hulls have proved that John Hacker's convex forward sections can eliminate pounding. George Crouch has done much to attain higher speeds. But no customary type is now carrying at speed the loads which conservative hydraulic calculations show should be carried. The list of flaws is much longer, but behind them all there is the constant indication of a tremendous potential in usefulness as normal improvements are made.

The first Navy PTs were evolved from standard practice of the times. It will be noticed that their running lines and deadrise are typical of what was considered conservative. The forefoot was not deep and sharp in section; it was wide and buoyant to prevent plunging. Doubtless the hollow sections are conducive to outright speed in smooth water, and they do give excellent wave-flattening qualities. However, it is here that most pounding takes place and it is no secret that the early PTs invariably pounded themselves to pulp. All kinds of ingenious ideas were tried to make the hulls stronger. Boat after boat limped home with a broken back, and heavy reinforcements were patched on over decks, under decks, along chines and around engine foundations. But the more heavily the structure was stiffened up, like the immovable object, the more the sea demonstrated its irresistible force. With impact pressures of impossible magnitude, the PT was pitifully victimized by its own antagonism to the sea.

The Army has had equally bad luck. Its 72-foot crash boat features the fine entrance of old-time displacement hulls, with the result that not only does the hull plunge disastrously but even in calm water the whole boat is continuously inundated by its own bow wave. However, in the main, the fast boats of all services have been based upon the best rule-of-thumb designs available, and their excellent service in spite of performance is almost as much of a tribute to their designers as to the hardy youngsters who drove them. "Drove" must be the word since "sailed" or "handled" or even "piloted" is far too mild for the plunging, crashing rides these boats delivered.