vides "some measure" of incidence control. I feel that the words between quotation marks cannot possibly express the authors' real views. As far as I can judge, Bras d'Or's incidence is under complete control. All that these words do is belittle G's role in Bras d'Or's operation. The whole article tends to convey the impression that Bras d'Or functions on the surface piercing principle, augmented by something unnamed, which on analysis appears to be G's angle of attack control. No data are furnished to show in what measure the two principles actually divide between themselves the task of controlling lift. That would be inconsequential if Bras d'Or were presented as a hybrid configuration. But under the circumstances, there is a need for more precise data. One is reduced to conjectures. I have reasons to believe that Grunberg's contribution to lift control is not secondary at all, and I would not be surprised if variable angle of attack were the senior partner in its association with area variations.

5) Having covered my own case, I feel the responsibility to add a few words on behalf of those whose voices are stilled. The undisputed father of area control is Forlanini, but his was the ladder version. Crocco substituted surface piercing for the ladder. It would seem that research into the other (not-Grunberg) branch of Bras d'Or's family tree should have lead either to Forlanini, the distant progenitor, or, closer, to Crocco. Our admiration for the father of the telephone cannot be dimmed by the recognition that in hydrofoils Bell and Baldwin were only apostles of Forlanini's gospel. They visited Forlanini in Italy, studied his boat, purchased his patents. After several less successful models, thanks to sound engineering and with some improvements, by no means basic, they produced the excellent HD-4, of the ladder type. The HD-4 does not even appear to be in direct line of Bras d'Or's ancestry. I have sympathy for Forlanini and Crocco, who more than anyone else deserve to be remembered in their descendents of the surface-piercing type.

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Comment on "Ram Wing Surface Effect Boat"

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THE paper by R. W. Gallington[1] points out that even if the configuration of a ram-wing boat described in the paper has an aspect ratio of "less than one half of Dr. Lippisch ... the lift over drag ratio is the same or better" than the Aerofoil Boat configuration used by Lippisch.

The statements of Gallington are based on our work done in 1962 with tow tank tests[2] and the flight tests of the experimental Aerofoil Boat X-112.[3,4]

As can be seen from the drag measurements of the boat in tow of a motor boat, the resistance after takeoff from the water surface was 20 lb at a gross weight of 510 lb which corresponds to an $L/D = 25.5$. This value is certainly higher than the measurements shown on Fig. 11 of the paper by Gallington, even if the measurements on the X-112 correspond to $H = 1.0$ ($h/b = 0.05$) of the Fig. 11 of the paper.

The flight tests made in 1972 with the Aerofoil Boat X-113 Am of the Rhein Flugzeugbau GmbH (Germany) have confirmed the performance as well as the stability characteristics of these configurations. But, it must be noted that performance numbers at these low h/b or h/c values are not very essential, since the water surface is seldom so smooth that cruising flight at such small distances from the water surface can be maintained.

It is much more important to obtain high L/D values at distances from the water surface which can be maintained over waves and it is quite obvious that the aspect ratio for such "average sea state conditions" cannot be too small unless increase in power requirement at the larger distances from the water surface is too high for economical flight conditions.

References

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