

## THE CONSUTA SYSTEM IN AVIATION

EVEN in this age of rapid development, it is a far cry from the experimental hull of a steam-launch to that of a flying-boat, much more its plane construction or any further constructive aerial project.

So, purely from the aviation standpoint, it suffices to sketch how far, and from what origins, the "Consuta" system has been developed, and apparently perfected, by its inventor, Mr. S. E. Saunders, of Cowes, Isle of Wight, up to its use for the hulls of the largest flying-boats now in the Service. These, indeed, have displayed such merit that one might say that their successful production constitutes the greatest of Mr. Saunders' many achievements and distinctions. Even more than the O.B.E. with which he has recently been decorated.

The "Consuta" system itself is soon described, since it consists, essentially, of sewing together veneers of plywood laid in different directions, with layers of fabric between, to make a complete skin. Advisedly, the word "essentially" is used. For the mere working principle, as such, is to-day much what it was eighteen years ago when it first took shape—as awl and hand-stitching carefully selected veneers with copper wire—in the 40-ft. steam-launch "Consuta" built to be the umpire's boat at Henley, when its weight even then was established at 2 lbs. per square foot, including frames, keel and longitudinals.

But its development, up to its present stage of wholesale and purely mechanical production of a wooden fabric almost as the web leaves the loom and in like quantity, is not only the result of eighteen years' incessant work and experiment—after all the record of many inventions—but of both work and experiment continued in the pursuit of an ideal of commercial as well as mechanical perfection, long after most men would have considered the result good enough to stand. So that to-day's sheet construction comes out at considerably less than 1 lb. per square foot: at which, remembering that it can be made gastight, it appears to offer great possibilities for rigid airship envelope construction.

Incidentally, the record of this development is also the history of that of the highest class of high-speed motor-craft known, as finally exemplified by the Duke of Westminster's "Ursula," champion for two years at Monte Carlo, and thus finally barred from further competition—of the displacement type—and by Mr. Mackay Edgar's "Maple-Leaf IV"; the hydroplane which won the International motor-boat race—between the United States and ourselves as defenders and challengers—two years in succession, piloted by Mr. T. O. M. Sopwith.

Here it may be usefully interpolated, for better comprehension of the purpose as well as the possibilities of the "Consuta" system, that, structurally, the basis of its ideal is the "coque"; the French description of any hollow self-contained structure from an egg-shell to a ship's hull. The former gives the best definition, since both its shape and the cohesive nature of its material give it the utmost resistance to both internal and external stresses for a given weight, that is known to exist. And as this form, the egg-shell, is merely a rigid skin, the constructional effort in the "Consuta" development has been to eliminate as far as possible, defects as to weight on the one hand, and of frame construction with its tendency to localise pressures and other stresses, on the other.

But the particular interest of the "Consuta" system from an aviation standpoint, and therewith Mr. S. E. Saunders' subsequent connection with the aero-industry, is this: that despite the existence of the Donnet-Leveque hydro-aeroplane, and even earlier, projects and original patents for the more efficient type which has the *whole of its after-body* clear of the water, little or nothing had been done in the British development of this variety of aircraft until, in 1913, the Mortimer-Singer prize was offered; when Mr. S. E. Saunders, in conjunction with Mr. Sopwith, designed a flying-boat—which Mr. Saunders built on the "Consuta" system—to win this prize. It will be remembered that wheels were fitted to lower from the sides of the hull to enable it to start from and alight on land, and that the motor fitted was a 100 h.p. Green. The easy success of this craft, as piloted by Mr. Harry Hawker with Lieut. Spenser Gray, R.N., as passenger, is also too recent history to have been forgotten.

This hull, however, was but the precursor of several others, as well as more ambitious aero-constructions; the most striking of which was the Perry-Beadle twin-tractor flying-boat, exhibited at the Aero Show of 1914, which had its lower main plane, tail plane, elevator, fin and rudder constructed on the "Consuta" system, as well as its hull.

With the outbreak of War, Mr. Saunders set out to build aeroplanes upon official patterns, and on the largest practicable scale; and so built extensive factories beside his original works at East Cowes, acquiring indeed practically all the immediately available land for the purpose, as well as more, further up the Medina, below Whippingham. However, for the time being, the Admiralty, despite their favourable experience with the "Consuta" system, as the only one apparently capable of standing the shock of heavy gunfire, as used in whalers and service-boats, appeared to have overlooked the flying-boat as a useful type.

Nevertheless, Mr. Saunders, with characteristic enterprise, continued to develop the system of "Consuta" manu-



Mr. S. E. Saunders, O.B.E.

facture to a further commercial stage for wholesale output; and latterly decided to employ huge sewing machines—of the Singer leather-stitching model many times enlarged—to stitch the veneers of plywood, after they had been laid upon and cemented to one another, with intermediate bonding layers of linen; the whole, as an immense "web" of composite wooden fabric, being hot-press-ironed upon long steel-faced tables. This, with the substitution of a special stitching twine for the former copper wire, brought the "Consuta" system to its present stage.

Thus, when the Admiralty decided to employ the flying-boat for submarine chasing, Mr. S. E. Saunders was ready; and the wholesale output of these hulls, practically at the rate of a score a week, became simply a matter of special organisation in his existing shops, and extending to still others at West Cowes. And that is little more than the bare bones of the story of the development of the Saunders "Consuta" system in the face of difficulties that would fill a volume, despite all seeming success in latter years. It is also a slight record of honours won—merely by ready for the foreseen emergency—many times over.

### An Italian Airship Lost

WHILE engaged in a reconnaissance flight over Pontedera, Genoa and Albenga on the morning of January 28, an Italian airship, owing to motor trouble, had to come down

about 500 yards from its landing place. The crew got out and prepared to make the ship fast, but a sudden gust of wind caught it and, notwithstanding the efforts of the crew to hold the ship down, it broke loose and rapidly drifted out of sight. None of the crew was injured.