HELICOPTER DEVELOPMENT IN FRANCE...

The line of attack chosen by S.N.C.A.S.O. is to have an engine or gas turbine driving a compressor in the fuselage. The compressed air is passed through the hub, which has rotating joints, and is then directed through the blade tips. The fuel fed at low pressure into the hub is then delivered by centrifugal force along the blades, to be atomized under very high pressure by the jets in the combustion chambers. It is ignited by a spark plug and an engine or gas turbine driving a compressor in the fuselage, so reducing to a minimum the displacement required. This is particularly free from the vibration to which all mechanically-driven helicopters are subject.

The blades are attached to the hub by two leaf springs, located one on each side of the tubular frame, which serves at the same time as an air duct and a droop-stop. These springs provide the equivalent of flapping hinges, and their flexibility in torsion allows blade-pitch change by a conventional spider arrangement.

Blades are of composite wood and metal construction assembled by glueing the hollow spar (which is of duralumin and of elliptical cross-section) being surrounded by hardwood with a balsa trailing edge. The whole is fabric-covered and enamelled.

Directional control by pedals operates two rudders, one on each side of the tail, whose hinge line is at 45 deg. The downwash from the rotor acting on these rudders gives adequate directional control when hovering.

S.O. 1100 ARIEL

This is the experimental machine commenced in 1946 and which made its first ground-running trials in the summer of 1948.

Several flights were made during 1948 and in the spring of 1949 the final phase of testing was reached and has now been completed. The thermo-propulsive system is now working very well, and the aircraft has shown good manoeuvrability and excellent stability characteristics. It has a Mathis G.7 seven-cylinder radial developing 160 h.p., is fitted, and it drives a Turbomeca compressor through a step-up gearbox. The gross weight is 1,870 lb.

S.O. 1110 ARIEL II

This two-seater has an engine/compressor unit consisting of a Mathis G.8 vee-eight engine developing 200 h.p. and a Turbomeca compressor. It has the same rotor, 35.8 ft in diameter, as the S.O. 1100. Empty weight is 1,905 lb. As normal gross weight is 2,475 lb, the useful load would amount to 35.5 per cent of the gross weight. The estimated performance at a gross weight of 2,475 lb is:

- Maximum speed, 107 m.p.h.; vertical rate of ascent, 295 ft/min; hovering ceiling, 4,900 ft; cruising speed, 880 lb; best climbs 985 ft/min; normal cruising range, 156 miles. For a still-air cruising range of 62.5 miles the weight would be 1,675 lb. By reducing the flaps, the roll ratio of the S.O. 1100, which the great Derby firm made to the Allies winning ove.

Defence Committee to be told that German bombers were approaching and that the radio beam which directed them was laid on a line which passed over Derby. We would far rather have heard that the beam was laid on Downing Street, or that parachutists were dropping in St. James's Park. For all our fighters in the Battle of Britain were powered by Rolls-Royce Merlin engines, and the advantages of the Rolls-Royce system over the Merlins is a matter of record.

The book leads us on through the war years and so to the jet era; and the author ends with an unexpected but illuminating chapter on the kind of man who has the kind of mind that produced the jet. "He has what I call genius," he says, "that the director ... must have made vast fortunes, but such an assumption is not borne out by the facts." At his death, Sir Henry Royce left a sum much in excess of the estimated value of his property, and the large sums which are now as soon forgotten. On March 29th, 1949, Mr. Nockolds reminds us, £145,000 of the £1,150,000 issued capital was made up of "workers' stock," held by employees who are thus able to reap as they sow.

FAIREY APPRENTICES' SKILL

During the past year an impressive list of successes has been gained by members of the apprentice training scheme in the Hayes and Stockport factories of the Fairey Aviation Ltd. Apprentices are given National certificates and 17 Higher National certificates in mechanical engineering. Four gained City and Guilds intermediate certificates in machine-shop engineering and three their B.Sc. (Eng.) degrees. Another Hayes apprentice, Denis Howe, a student of Southall Technical College, was awarded the Hele-Shaw prize and gold medal, the supreme award of the Council of the Institution of Mechanical Engineers. Mr. Howe was subsequently awarded an S.B.A.C. scholarship to the College of Aeronautics.

PROUD RECORD

The author who sets out to write a book round a story of an industrial achievement, however great or historical that achievement may be, sets himself a formidable task, for unless he has a master of the story as the author well finds that he has produced little more than a glorified publicity brochure. Harold Nockolds, in the new, post-war edition of his classic history of Rolls-Royce,* has avoided all the pitfalls, and the result is a story that stands very firmly on its own merits.

Here we have, again, the fascinating story of the birth of the great firm, and of the building of its sturdy foundations by the two tireless visionaries working life as a "commercial courier," the Hon. C. S. Rolls (to meet his death, in the year 1910, in a flying accident), Claude Johnson, and a few dependable men. There follow chapters which will have a nostalgic appeal to all who are old enough to remember motoring and "motors" in the days before the Kaiser's War: then comes the story of Royce's intensive work, in 1914, on the design of his first aircraft engine—in which he was assisted by A. G. Elliott and E. W. Hives, both of whom were destined to direct the fortunes of the great firm in later years. So successful were they in their planning, and so efficient the subsequent production effort, that R.R. engines powered more than half the British aircraft used in 1914-18.

Equally interesting, both to motoring and aviation enthusiasts, is the story of the inter-war years, with the Schneider Trophy Races (for which the famous "R" engine, forebear of the Merlin, was designed) and land-speed records as high spots.

Few readers of Flight will need reminding of the contribution which the first Derby firm made to the Allies winning of Hitler's War, but in these newest chapters of Mr. Nockolds' book the story is told in detail for the first time. The firm's production of the lightning-fast Spitfire, best summary of the words of Sir Archibald Sinclair, who was Air Minister at the time. Recalling those fateful days of 1940, he said, "I deduced," he says, "that the directors ... must have made vast fortunes, but such an assumption is not borne out by the facts." At his death, Sir Henry Royce left a sum much in excess of the estimated value of his property, and the large sums which are now almost forgotten. On March 29th, 1949, Mr. Nockolds reminds us, £145,000 of the £1,150,000 issued capital was made up of "workers' stock," held by employees who are thus able to reap as they sow.