of this material on aluminum sheet and aluminum castings is said to be similar.

Copies of the booklet may be obtained by writing to Oakite Products of Canada, Ltd., 65 Front St. E., Toronto, Ont.

● The new Wales TWIN-COLUMN PRESSES are described and illustrated in Catalogue TC which is available from Wales-Strippit of Canada Ltd., 344 Sherman Ave. N., Hamilton, Ont. These presses may be used for all types of blanking, forming, drawing and bending. Also, Wales hole punching and notching equipment can be used efficiently in these presses. A self-contained shearing attachment is available as optional equipment for precision shearing.

HIGH SPEED PAINT

IF ONE jet fighter is 20 mph faster than another in combat, the pilot may owe a victory not to an aerodynamacist or an engineer—but to a paint expert. Research into new paints has pushed up the top speed of jet fighters, as well as giving them a protective coating and camouflage.

The importance of paint was drummed home in the early years of the last war. A captured German fighter was found to be 16 mph faster than the Spitfire. Experts were given orders to bring the Spitfire up to par. They tried everything without success, and then hit on the paint solution. By using a thinner smoother paint, they cut down drag over the wings and the plane had the 16 mph more speed that mattered.

In those days it was not appreciated that bumps and rivets on the wing caused so much drag. One expert proved it by building a completely smooth wing and then showing the drag effect of rivet heads by sticking split peas over the wing. Once the necessity for smoothness was appreciated, it became a problem of adapting the smooth surface for easy big-scale production in the factories.

Today, the high-speed jet fighter is still more susceptible to rough surfaces—even a fly on the wing can cause turbulence. The air must flow in a smooth "laminar flow" over the wing or it tends to become turbulent and causes drag at very high speed and at low speeds.

Paint experts are constantly working toward a protective coat which is durable, smooth, and light. The paint is tested under every condition it will meet in service. It is "scratched" to test its toughness, bent in hot and cold tanks down to —70 deg. C to test its flexibility, and put in an "accelerated weather tank." This sprays it alternatively with synthetic sea-water and subjects it to blistering ultra-violet light.

STUDY JET FUELS

AS THE military services and the civil airlines gradually turn over to jet aircraft, the demand for large quantities of special gas-turbine fuel is becoming urgent. The standard fuel for jet aircraft is kerosene but its supply is limited. Oil experts now believe that the time has come to introduce a new turbine fuel, at any rate for military planes, which will be more plentiful.

Like most other spirits, kerosene is extracted from crude oil. But it represents only a fraction of the crude—some 7% to 10%. If some of the other "fractions" of the crude oil could be included, much larger quantities of gas-turbine fuel would be available.

Gas turbine engines have been built so that they are capable of running on ordinary aviation fuel but, although large quantities of this can be refined, its use in high-speed jets is limited. The main disadvantage is that it boils at low temperatures and atmospheric pressures. In other words, as the jet aircraft climbs up above the weather, the fuel in its tanks will begin to boil and much of it lost overboard through the vent pipes.

There are, of course, ways of stopping this, by pressurizing the fuel tanks or providing gas outlets, but they increase the weight, cut down the amount of fuel which can be carried and restrict range.

Again, using ordinary gasoline rather than kerosene means more risk of fire. Because of the low flash point of kerosene, designers have been able to put fuel tanks in places where they would never have put aviation gasoline.

These are some of the difficulties of adding the lighter fractions to the new fuel. The amount of heavier oils which can be used is also limited. One reason is their relatively low freezing point, which means that the fuel tanks have to be heated and more weight added.

What experts are now seeking is a fuel which will retain the good properties of kerosene and yet be simple to refine in large quantities.