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NOTE.—As far as possible, the country of origin quoted in the items refers to the original source.

Heat Transfer and Friction in the Turbulent Boundary Layer of a Compressible Gas at High Speeds. (F. Frankl and V. Voishel, C.A.H.I. Rept. No. 240, Moscow, 1935.) (R.T.P. Translation No. T.M. 1,032.) (110/8349 U.S.S.R.)

In the first part of this paper, the authors consider the two-dimensional problem of a flat plate exposed to symmetrical flow. The x axis is along the plate, the u component of the velocity being in the direction of flow.

Under these conditions, we have for the turbulent region of flow

$$\frac{d\bar{u}}{dt} = -\frac{\partial \tau_{xy}}{\partial y} \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

$$\bar{\rho}\frac{d}{dt}\left(JC_pT + \frac{\bar{u}^2}{2}\right) = -\frac{\partial}{\partial y}\left(\bar{u}\tau_{xy} - J\,\frac{\partial q_y}{\partial y}\right) \quad . \quad . \quad . \quad (2)$$

where τ = turbulent shearing stress.

q = heat transfer per unit area and time.

(The bar indicates mean values.)

Now

$$\tau_{xy} = A\frac{\partial \bar{u}}{\partial y}$$

where A = coefficient of turbulent apparent viscosity.

$$\text{and } q_y = \Lambda\frac{\partial \bar{T}}{\partial y}$$

$$\therefore\ \Lambda = AC_p$$

Substituting in (1) and (2) above, we find that both the velocity u and the total energy $(JC_pT+u^2/2)=l$ satisfy the same linear differential equation. All boundary conditions are therefore satisfied if

$$JC_pT+u^2/2=au+b \tag{3}$$

when a and b are independent of y.

Turning now to the laminar sublayer which modern theory indicates as being always present we have

$$\tau_{xy}=\mu\frac{\partial u}{\partial y}$$

$$q_y=\lambda\frac{\partial T}{\partial y}$$

As there must be continuity of flow over the entire region from laminar sublayer to fully turbulent outside, there can be no discontinuity in $\partial u/\partial y$ and $\partial T/\partial y$ at the surface (index 1) where the laminar sublayer merges into the turbulent surrounding stream. If we now make the further important assumption that both u and T vary linearly across the laminar layer (*i.e.*, dissipation of energy in layer is neglected) we have

$$A_1\left[\frac{\partial u}{\partial y}\right]_1=\tau \text{ at surface of plate.}$$

$$\Lambda_1\left[\frac{\partial T}{\partial y}\right]_1=q \text{ at surface of plate.}$$

Now from (3) it follows that

$$e-e_1=\left[\frac{\bar{e}-e_1}{\bar{u}-u_1}\right](u-u_1)$$

$$i.e.\quad \left[\frac{\partial e}{\partial y}\right]_1=\left[\frac{\bar{e}-e_1}{\bar{u}-u_1}\frac{\partial u}{\partial y}\right]_1$$

From this it follows that

$$u_1+\frac{J_q}{\tau}=\frac{\bar{e}-e_1}{\bar{u}-u_1}$$

Finally, if both T and u vary linearly with thickness of sub-laminar layer

$$T_1=T_*+\frac{q}{\lambda_*}\frac{\mu_*}{T}u_1$$

where the asterisk denotes values at the surface of the plate. It is thus possible to obtain an expression for q involving, besides known boundary values and physical constants, the velocity u_1 at the transition between laminar and superposed turbulent layer.

The authors extend the Kármán hypothesis and assume:—

$$\frac{u_1}{u}=s\sqrt{\psi_*/2} \text{ to hold in compressible flow.}$$

when s = an absolute constant (=11.6).

ψ_* = frictional coefficient at plate surface.

$=2\tau/\rho\bar{u}^2$.

In this manner u_1 is eliminated from the final expression for q.

In an appendix, it is pointed out that energy dissipation must take place in the laminar sublayer and that therefore the linear distribution of temperature assumed above cannot be more than a first approximation.

A parabolic temperature distribution of the type

$$T=T_*-q/\lambda_*y-\frac{\tau^2}{2J\mu_*\lambda_*}y^2$$

is therefore proposed as being in better accord with practical conditions and the expression for q modified accordingly.

As regards friction drag, the authors restrict themselves to the case of the turbulent boundary layer in a flow at constant velocity and zero angle of attack. It is assumed that the fundamental equation of the Kármán turbulence theory remains valid, *i.e.*,

$$k^2\rho \frac{\left(\frac{\partial y}{\partial u}\right)^4}{\left(\frac{\partial^2 u}{\partial y^2}\right)^2} = \tau \qquad \text{(4)}$$

where τ = friction stress at a distance y from plate.
k = absolute constant.

Assunnng constant p and neglecting inertia forces, τ does not depend on y.

By introducing the non-dimensional quantities

$$\eta = \frac{y\sqrt{\rho_* \tau}}{u}$$

$$\phi = u/v_*$$

$$\sigma = \frac{T_*}{T}$$

where $v_* = \sqrt{\tau/\rho_*}$ = so-called friction velocity,

equation (1) reduces to

$$k^2\sigma = \left(\frac{\partial^2\phi}{\partial\eta^2}\right)^2 \Big/ \left(\frac{\partial\phi}{\partial\eta}\right)^4$$

Making use of the expression obtained in the first part of this paper for the heat transfer q, it is possible to express σ as a function of ϕ and thus solve the differential equation (4).

The authors then show how to obtain the friction coefficient ϕ_* as a function of the Mach number, the Reynolds number $\rho_* \bar{u} x/u_*$ at the point x on the plate and T_*/T.

The calculation is again based on a linear distribution of velocity in the laminar sublayer and hence only a rough approximation.

NOTE.—More details of the calculation are given in a subsequent paper by the same authors, C.A.H.I. Report, No. 321, Moscow, 1937, R.T.P. Translation No. 866.

Temperature in Shock Waves and the Possible Connection with the Luminosity of Meteors. (H. Muraour, Z.G.S.S., Vol. 37, No. 9, Sept., 1942, pp. 166-169.) (110/7156 France.)

The author has carried out experiments on the luminous effect accompanying the detonation of high explosive such as Tetranitromethane-Toluol, Hexagon and Nitropental in an atmosphere of argon or helium. The flash of light accompanying these explosions is of very short duration (4×10^{-6} sec.) but reaches a very high intensity (about 1,000 times that of flashlight powder).

The following table gives calculated value for air and argon, T_2 being expressed in °C. absolute:—

	Air.		Argon.	
P_2/P_1	V (m. sec.)	T_2	V (m. sec.)	T_2
2	452	336	413	364
5	698	482	631	585
10	978	705	882	932
20	1369	1126	1240	1618
30	1676	1522	1515	2300
50	2150	2260	1950	3670
100	3020	3860	2760	7080
200	4220	6475	3900	13910
400	5900	10520	5510	27570
1000	9210	19100	8710	68500

The energy distribution in the spectrum corresponds to that of black body radiation of a temperature of about 35,000°C. Theory indicates a definite relationship between the speed of propagation V of such shock waves and the ratio of the temperature and pressures in the wave to the value existing immediately in front of the wave.

It will be noted that for the same pressure ratio, the speed of propagation is slightly higher for air, but that the temperature especially at the higher pressure ratios is considerably lower than in the case of argon. This is due to difference in specific heat values due to heat loss endothermic reactions and ionisation phenomena, the practical temperature will probably be lower than those given in the table, but no experimental data are available.

There is no theoretical difference between shock waves produced by detonation and those accompanying a body travelling at supersonic speed, nor is there a theoretical limit to the speed of propagation of such waves—detonation waves travelling at 16,000 m./sec. have been observed. Since, however, the highest speed of a bullet is less than 3,000 m./sec., luminous phenomena accompanying translation of a body have not so far been observed in the laboratory.

Very high speeds, however, are observed in the case of meteors and shooting stars (10-100 km./sec.).

Their luminous effects are however restricted to high altitude and the question arises whether shock wave can arise at the corresponding low atmospheric pressure (.004 to 2 mm. of mercury). In the case of explosives detonating under reduced pressure, luminous phenomena have been recorded at pressure as low as 10^{-3} mm., but it is not certain whether the light in this case does not originate in the products of combustion.

The author considers it, however, as highly probable that the luminescence of meteors during the last portion of their travel (altitudes of 30 km. pressure or 8 mm. Hg.) can be accounted for by the shock wave. This would also account for the apparent increase in diameter of the source of light with decreasing altitude, as is well known, apparent diameter of 100 and even a 1,000 m. have been recorded for the luminous ball, whilst the true diameter of the meteor is almost certainly much smaller.

This can be accounted for by multiple shock waves being produced as the meteor breaks up in its descent.

The noise accompanying the drop of the meteor in many cases also points to the presence of a shock wave.

Similar luminous phenomena have been observed to accompany explosive eruption of volcanoes.

In conclusion the author pleads for more experimental work on these interesting phenomena.

Wing Loading at High Speeds. (W. Wirz, Flugwehr und Technik, Vol. 4, No. 4, April, 1942, p. 97.) (Digest of lecture given at the E.T.H.) (110/3377 Switzerland.)

Under high speed conditions, the wing loading of an aircraft undergoes a change due to compressibility effects. According to the Prandtl theory, the stream lines are curved to a greater extent under such conditions and this causes a change both in the magnitude and position of the resultant aerodynamic forces.

In addition, wing twist is likely to occur and this causes a change in the angle of incidence along the wing, which in its turn effects the distribution of the load.

Such effects become specially marked during a high speed dive with deflected ailerons and may lead to loss of lateral control or reversal of aileron effect.

In the German strength specifications wing stressing during a dive with aileron action is specially considered (load case 138) and it is laid down that structural safety must be ensured when the aileron deflection is such that an angular velocity of roll $w = .1\ v/b$ is maintained (v = speed of dive, b = total span of wing).

For a rigid wing this corresponds to a constant aileron deflection β (independent of v) and reasonable stressing.

If the wing is however flexible, β increases rapidly with v, becoming infinite at the critical speed corresponding to aileron reversal.

At any given speed v, the torsional stressing of the wing also increases rapidly with increasing flexibility and becomes infinite at the critical wing flexibility.

It thus appears that it may not be possible to reach the angular velocity w laid down in the German specification (control force insufficient) and that in any case wing flexibility introduces severe limitations to the permissible diving speed.

It is concluded that the original specification were drawn up for rigid wings and should be revised so as to correspond more closely to modern designs.

High speed flight require thin sections and it is very difficult to ensure adequate stiffness of the light weight cantilever wings at present in use.

The author is of the opinion that braced monoplane wings or even biplane arrangements deserve renewed attention. Such alternative solutions can be designed to give adequate stiffness without a serious increase in weight. The difficulty will be to design the struts and other fuselage attachments so that their resistance is sufficiently low. In this connection the possibility of designing such components so as to contribute to the lift instead of producing drag only requires serious consideration.

The Horten IV Glider of the Flying Wing Type. (G. Horten, Flugsport, Vol. 34, No. 4, 18/2/42, pp. 51-55.) (110/1177 Germany.)

Photographs show the aircraft on the ground and in flight. Details of the controls as well as drawings of the glider are also given.

The following are the principle characteristics :—

Span	20 m.
Wing area	19.1 m.^{2}.
Aspect ratio	21.
Structural weight	240 kg.
Flying weight	350 kg.
Wing loading	18.3 kg./m.^{2}.
Gliding ratio	37
Rate of vertical descent	.5 m./sec.
Profile thickness at root	10 per cent. of chord.
Dihedral	6° } judged from drawing.
Sweepback	20° } judged from drawing.

Of special interest is the almost prone position of the pilot inside the central wing section (1.6 in. wide). This is of tubular steel construction, the spars forming a bridge across which is suspended a hammock making an angle of 30° with the direction of flight. This in its turn supports the upper portion of the pilot's body, whose knees and feet are housed in a sheet metal "boot" projecting below the wing. The pilot's head then projects only slightly above the normal wing surface and is enclosed in a transparent fairing.

Each wing is fitted with five flaps, of which two (situated respectively above and below the wing nose) project vertically outwards and replace the normal rudder control. They can also be used as diving brakes and are operated by the pilot's feet. The other three flaps are hand controlled and interlinked so as to operate either as aileron or elevator. In this way an effect equivalent to a continuous wing warping can be produced, the differential action reducing the tendency to yaw about the vertical axis when the aircraft is banked.

The inner wing is made of wood whilst the outer tips (2 m. long) are of metal construction.

Counting the central section (tubular steel) the aircraft thus consists of five parts and can be assembled by three men in about five minutes.

The Horten "Flying Wing" Glider—Constructional Details. (G. Horten, Flugsport, Vol. 35, No. 6, 17/3/43, pp. 63-67.) (110/8897 Germany.)

The glider described in Abstract 110/1177 has now carried out over 220 hours flying, including sailing for 9¼ hours under difficult weather conditions (several hours blind flying in clouds).

It appears that about 50 hours flight experience is required before the pilot becomes really used to the prone position and controls the aircraft efficiently. After this period of training, however, the concensus of opinion is that the prone position is less tiring than the normal bucket seat.

In the present article the author gives further constructional details of his glider and discusses some improvements introduced.

The latter mainly concern the hammock support for the body of the pilot. This support is now well padded with sponge rubber and provided with a firm adjustment ensuring utmost comfort. Similarly the recess below the wing for the knees and feet is rendered adjustable so as to provide for an even distribution of the weight.

Improvements have also been carried out in the control rod assembly and the split nose flaps originally fitted for rudder control have been replaced by the more modern perforated diving brakes requiring smaller control efforts.

An elastic strip of electron metal serves as a seal when the brakes are retracted. It is stated that this seal remains in perfect contact even if the wing undergoes considerable deflection.

Spring controlled skids are fitted below the nose of the central wing section and to the rear of the recess housing the pilot's legs.

To reduce friction during take-off, a nose wheel is incorporated, which is jettisoned when the glider is airborne.

The equipment now includes an accumulator battery for warming the pilot's gloves and operating the twin indicator. An oxygen bottle is housed in the "boot" and can be charged from the outside.

In an emergency, a quick release jettisons the cockpit cover and also unfastens the pilot's straps. It is stated that a parachute jump presents no difficulties.

Photographs illustrate various design features.

Comparison of Various Methods for Determining Flight Speed at Great Altitudes. (R. Schmidt, Luftwissen, Vol. 9, No. 9, Sept., 1943, pp. 270-275.) (110/7451 Germany.)

The usual method of determining flight speed from the dynamic pressure record is subject to a number of errors. The chief difficulty is an accurate determination of the static pressure, this measurement being easily falsified by interference from the aircraft structure. The air temperature is also not easily measured at high speeds (stagnation at thermometer) and the dynamic pressure as recorded by a pressure capsule is likely to be affected by hysteris and changes in elasticity of the diaphragm with temperature.

Finally the effect of Mach number on the dynamic pressure is not accurately known. The Dornier works have developed an alternative method for determining flight speed which works on the anemometer principle and is known as an air log. In the absence of friction, the speed of rotation of a small propeller is directly proportional to the relative air speed and by towing the log some distance below the aircraft, interference effects can be easily overcome. The propeller pitch is 4.4 m. which correspond to about 30 revs. per sec. at an air speed of 130 m./sec. The instrument is of torpedo shape and weighs about 8.5 kg. It is suspended from a 30 m. cable and is kept automatically at a certain distance below the aircraft by the action of the negative lift of two lateral wings which counteract the tendency of the cable to rise due to air drag.

Although great care was taken to eliminate the errors inherent in the dynamic pressure method as far as possible, it appears single speed measurements are subject to an error of ± 2 per cent. which can be reduced to ± 1 per cent. if a series of readings are taken and the records suitably averaged. Even under these conditions, however, the errors are three to ten times as those of the log. The great accuracy of the latter makes it specially suitable for investigating small speed changes accompanying differences in drag or airscrew performance. As an example, the effect of painting the suction side of an airscrew blade with anti-glare varnish produced a change in speed of .7 per cent. compared with the polished airscrew under otherwise similar circumstances. If the varnish was further roughened by the addition of sand, the speed of the aircraft dropped by 1.4 per cent. This corresponds to a reduction in airscrew efficiency of 1.4 and 4.2 per cent. respectively.

Tricycle Landing Gears. (Inter. Avia., No. 854-855, 3/2/43, pp. 1-5.) 110/8858 U.S.A.)

1. The susceptibility of the conventional tail wheel landing gear to nosing over, under a strong braking effect, its inherent tendency to ground-loop particularly in a side wind, and the necessity of making a full-stall landing to prevent bouncing have made it less and less satisfactory as landing speeds increased. The tricycle landing gear will eliminate these undesirable characteristics if properly designed, but it may introduce other objectionable features peculiar to its type. Some of these are porpoising, longitudinal instability with the nose wheel off the ground, shimmy of the nose wheel, and failure of the nose wheel strut from excessive dynamic loads. In addition, it should be remembered that the elimination of the faults of the conventional gear will result in increased loads on the tricycle gear and airframe structure. The removal of the possibility of nosing over will lead to faster taxying and manœuvring on the ground; the elimination of the ground loop tendency will result in more cross-wind landings, and the lack of any tendency to bounce will mean more landings at high sinking speeds.

2. The general load distribution of the aeroplane naturally plays a decisive rôle in the determination of the landing gear loads. In order to illustrate these conditions, it is possible to represent the aircraft by an arrangement of two concentrated masses, one of which is located directly over the nose wheel and corresponds to the load produced by the landing impact in a nose wheel first landing, whereas the second is located at a distance aft of the c.g. determined by the distance of the nose wheel from the c.g., and the aeroplane's radius of gyration. A calculation carried out with a single-engined, single-seater tricycle areoplane, driven by an engine and tractor airscrew mounted in the nose, has revealed a radius of gyration of nearly 18.4 per cent. of the aircraft length, whereas the distance of the nose wheel from the c.g. is between 20 and 35 per cent. of the aircraft length. This means that between 46 and 22 per cent. of the aircraft weight acts on the nose wheel; since the static percentage is usually only about 15 per cent., the error in designing from the load in the three-wheel attitude may exceed 200 per cent., assuming the same sinking speed in both conditions. These figures apply only to the type of aeroplane outlined above, while they vary widely in aircraft of other types, depending upon loading conditions, size, etc.; the ratios between nose-first and three-wheel percentages of weight acting on the nose wheel have been found to vary from $4:1$ to $1\frac{1}{2}:1$.

In order to reduce the weight actually on the nose wheel, it is useful to select the largest possible distance between the nose wheel and the c.g.; it is wise, furthermore, to make the travel of the nose wheel considerably greater than that of the main wheels, by which means the acceleration in a nose-wheel-first landing and thus the loads on the nose wheel and structure will be reduced.

3. Of much greater importance than the location of the nose wheel is the *distance of the main wheels aft of the centre of gravity* because it affects more of the properties than any other single characteristic. It influences not only the directional and longitudinal stability, the length of take-off run and the static reaction on the nose wheel, but also the ability to land with excess air speed and high sinking speeds without bouncing.

4. The two requirements outlined restrict the location of the main wheels in relation to the centre of gravity of the aircraft to a small area. The most favourable location of the main wheels is at the minimum distance from the aeroplane's c.g., as determined by the necessity that the c.g. must be situated ahead of the main wheels even when the tail buffer touches the ground.

5. The ready *steerability* during taxying, which may be of importance during the take-off of the tricycle aeroplane, is determined by the distance of the rear wheels aft of the c.g. and the height of the c.g. above the ground line; neither of these dimensions is related to the tread. Since tricycle aeroplanes are inherently directionally stable as long as the main wheels are situated aft of the c.g., the problem becomes one of the degree of directional stability desired. While in a conventional aeroplane the pilot must counteract instability during the execution of a taxying turn or during the landing or take-off by means of differentially operating the wheel brakes, the conditions are just the contrary in the case of a tricycle landing gear; in order to make a taxying turn, the stabilising moment of the nose-wheel landing gear must partly be eliminated. Accordingly, the sharpness of the turn depends on the magnitude of the turning moment that can be applied, which, assuming the turning is done by differential braking, depends on the wheel tread and tyre coefficient of friction. As long as the aeroplane runs at a certain speed, sharp changes of direction are not possible. A normal single-seater fighter, for example, whose tread is assumed to be 8.33 ft., the wheel base 10 ft., the distance of the nose wheel from the c.g. 8.75 ft., and the height of the c.g. above the ground line 5.0 ft., has a turn radius of 175 ft. at a taxying speed of 30 m.p.h. with one main wheel completely blocked. Since the radius is proportional to the square of the speed, no serious consequences would result from locking one wheel even when landing. By increasing the tread, the steering characteristics of the aeroplane are improved somewhat; however, a turn radius less than the minimum should be avoided, owing to the sidewise sliding of the wheels. The aircraft outlined above, for example, would begin to skid at 30 m.p.h. for a radius of turn of 125 ft.; no matter what the tread was increased to beyond the corresponding 13.75 ft., the aeroplane could not turn around in a circle of less than 125 ft. diameter at 30 m.p.h. The effect of the swivelling nose wheel is a stabilising one but makes itself noticeable only at a very small radii of turn and becomes negligible in radii of five times the tread.

Stratospheric Aviation of the Future. (M. Richon, L'Aerophile, Nov., 1938, pp. 77-84.) (Salon Number.) (110-15813 France.)

The principal object of high altitude flight is the possible gain in speed, over ground level, provided the horse-power can be maintained constant by supercharging. From a military point of view we have the further advantages that at altitudes of the order of 10,000 m., it is practically impossible to spot the aircraft from the ground and the chances of hitting it by A.A. fire are negligible.

Nothing definite is yet known about the meteorological conditions existing at such heights. It was thought originally that the air would be very calm at great altitudes. It is not known that winds of great velocity may exist (200 m.p.h.) and although there are indications that their direction may be relatively constant over certain regions (North Atlantic), considerable turbulence at 12,000 m. has been detected in the South Atlantic. The possibility of employing "trade winds" at great altitude thus requires further confirmation. There is, however, no question that navigation should be simplified due to the general absence of clouds, which are rarely present about 7,000 m. The main difficulty of high altitude flight is physiological, types of so called altitude sickness being distinguished by the author.

(1) Sense of exhilaration and well being, followed by a sudden loss of consciousness.

(2) Sudden convulsions.

(3) Severe internal pains followed by cramp of the articular and para-articular regions.

(4) Loss of consciousness without preliminary warning.

In order to study these effects on himself, the author, together with Commander Artold, have stayed in the high altitude chamber of Le Bourget for a period of 48 hours at a pressure of 290 mm. corresponding to an altitude of 7,500 m. Oxygen was breathed through a standard mask, the supply being 280 litre/hour.

A complete medical check was kept over this period and no ill effects were noted either during or after the experiment.

A repetition of the test at an altitude of 10,000 m. however had to be terminated after 15 hours, although the oxygen supply (initially 550 litres/hour) was increased occasionally to 800 litres/hour for short periods.

The symptoms described by the author are of interest. Severe internal pains developed after three hours (shoulder, neck, wrist, knees), and could only be rendered supportable by doubling up on the floor of the cabin. The pains somewhat relaxed after six hours, but were followed by extreme lassitude, it being almost impossible to move. The experiment was discontinued for this reason but the lassitude persisted for some time.

It is evident that oxygen breathing by itself is insufficient to ward off ill effects at altitudes above 7,500 m. unless the exposure is of relatively short duration.

Two alternatives present themselves, the pressure suit and the pressure cabin.

The author refers to experiments with pressure suits carried out in France by Rosenstiel, who is stated to have passed 1½ hours in the pressure chamber at an altitude of 14,500 m. wearing a suit of his design. Further experiments are in abeyance.

The firm of Farman has also designed a pressure cabin which unfortunately crashed from 10,000 m. killing the pilot. The reason for the accident is not known and a new design is in hand.

In view of the extensive series of experiments carried out in the U.S.A. and Great Britain, the author urges the importance of France taking a more energetic part in these developments.

Cabin Supercharging in Scheduled Air Line Operation. (R. L. Ellinger, J.S.A.E., Vol. 51, No. 2, Feb., 1943, p. 72.) (Digest and Discussion.) (Preprint available.) (110/9058 U.S.A.)

The author gives some account of experience gained with the Boeing Stratoliner during commercial operation. This aircraft is fitted with a full-flow pressurised ventilating system, the cabin superchargers being supplied with fresh air from the leading edge of the wing and the discharge from the cabin being regulated so as to maintain the absolute pressure in the cabin equal to that normally found at 8,000 feet for "true" altitudes up to 15,000 feet. (True altitude of 20,000 feet corresponds to 12,000 feet "cabin" altitude.) Two superchargers are fitted, each being capable of handling 225 cubic feet of air per minute at an absolute pressure of about 9 lbs. p.s.i. This corresponds to about 12 cubic feet/minute per passenger if the aircraft is fully loaded (33 plus crew of four) and the relatively large volume of air handled renders minor leaks in the cabin skin and door fittings relatively unimportant. As a matter of fact, for most of the pressurised operation, only a single cabin supercharger is required, the second acting as reserve. The superchargers are driven from the rear of two of the engines and absorb about 25-50 h.p. each.

Continuous high altitude operation was not contemplated with this aircraft. The Stratoliner was designed to fly at higher than the normal altitude only when this becomes necessary from the point of view of passenger comfort and completion of schedule (flying over adverse weather).

Thus over the period January-June, 1941, only 22 per cent. of all the flights were carried out at 10,000 feet and above, requiring supercharging of the cabin. For the remainder of the flights (below 10,000 feet) normal ventilation was employed. Of the supercharged flights, about one-third were at altitudes between 15,000 and 17,000 feet, the highest flight being 23,000 feet for a short period.

In spite of the relatively moderate altitudes of operation, most valuable experience was gained. As already stated, cabin leaks presented no serious difficulties. The cabin had been designed to stand an excess pressure of about 6 lbs. p.s.i. (the normal pressure difference was only of the order of 2½ lb. p.s.i.).

Supercharger control and air conditioning did not prove quite as simple as expected, but a satisfactory solution was found.

Much greater difficulties arose with the cabin superchargers themselves, several bearing failures occurring after less than 200 hours' operation. Such failures generally caused severe damage to the supercharger and its drive, since the installation did not permit disconnecting the supercharger in flight. Particular engines had to be stopped and airscrew feathered. Some form of clutch mechanism is considered essential in future installations.

The aircraft proved exceedingly popular and according to the author there is no question about its commercial justification. The ability of the Stratoliner to fly long stretches of adverse weather, resulted in these craft being the only planes in the air on many occasions when normal passenger planes had to remain grounded on account of their inability to clear the weather with safety and comfort for the passengers.

With further flight experience, the operational altitude of such aircraft will be extended to the commercial ceiling.

Aviation Power Plants. (S. A. Moss, J.S.A.E., Vol. 51, No. 2, Feb., 1943, pp. 69-70.) (Digest and Discussion.) (Preprint available.) (110/9054 U.S.A.)

The so-called integral power plant is a complete power installation built to form the front section of the nacelle and designed, assembled and tested by specialists. Other groups of specialists prepare the plane up to the nacelle fire well and provide the studs to which the power unit is attached. This scheme has the advantage that the engine installation can be quickly removed as a whole for overhaul or replacement. The same plane can thus be fitted with engines of different types or a new type of aircraft fitted with existing engines, provided only that the bulkhead and nacelle outline be standardised. British and German engineers have taken the initiative in developing this idea, which however has not been adopted so far in the U.S.A. It is the object of the author to render the scheme more widely known in America and stipulate research. From the discussion following the paper, it appears that American opinion is still very undecided about the possible merits of the scheme. It was feared that a standardised fireproof bulkhead capable of taking a variety of engine designs would prove unduly large and thus react unfavourably on the aircraft drag. Radiator and oil cooler positions inside the outline of the complete nacelle were also criticised and the necessity of placing turbo-superchargers at some distance from the engines was also stressed. According to A. Nutt (Wright Aeronautical Corporation) efforts to make power plants interchangeable are definitely misdirected. It should rather be the object of the designer to obtain the best power plant for each installation.

On the other hand, J. E. Ellor (Rolls Royce) referred to British experience which showed that interchangeability of air and liquid-cooled engines was not only possible, but practical if the integral system was adopted. Especially in the case of wing nacelles, concessions on cross-section of the bulkhead size was surprisingly little. According to Ellor, the integral power plant can be used to great advantage for the heavier types of multi-engined aircraft.

In his final reply, the author agreed that the integral power plant was ruled out for single-engined aircraft, but hoped that its other possible applications would receive serious attention.

Alloy Steel Castings, Their Properties and Field of Application. (H. Juretzek, Giesserei, Vol. 29, 1942, pp. 217-226 and 243-249.) (110/8970 Germany.)

Alloy cast steels differ in their properties and composition, depending on their special field of application. The author distinguishes the following five classes of utilisation :—

1. General engineering construction, including transport vehicles and aircraft.
2. Steam boilers, turbines and other parts subjected to combined thermal and mechanical stress (chemical industry and synthetic fuel production).
3. Cast tools.
4. Parts requiring high resistance to corrosion, heat and wear.
5. Cast steel magnets.

Some representative types of casting alloy in each case are given below, with the exception of (5), the reader being referred to an article in Tech. Milt. Krupp., 1941, pp. 1-15, for this class of material.

1. The alloy steel most frequently used in Germany has the following app. composition :—

C.	0.26%
Cr.	1.0%
Mo.	0.2%
Mn.	0.8%
Va.	0.1%

Depending on heat treatment, ultimate tensile ranging from about 70 to 125 kg./mm.^{2} can be obtained (44 to 79 tons/sq. in.). The elongation and impact strength over the same range vary from 20-10 per cent. and 18-5 kg. m./cm.^{2} respectively.

Provided that the casting and heat treatment have been carried out correctly, all parts of the steel casting will have the specified strength and the designer can thus count on having a material with properties equal to those of rolled or forged steel without having to worry about direction of grain.

It is interesting to note that whilst the absolute fatigue strength of the casting is slightly lower than that of a forging of same ultimate strength (strength factor 0.4 against 0.45 to 0.5 for the forging), the notch sensitivity is considerably less (strength factor 0.37 against 0.26 for the forging).

Especially marked is the beneficial effect of shot blasting which leads to an improvement of at least 10 per cent. in the fatigue strength of the casting. In judging fatigue strength, the shape of the whole part must be taken into account and a heat treated casting will always be superior to a forging with welded-on parts.

2. The important properties of this class of castings are a high hot elastic limit and creep strength. This is generally achieved by using a relatively high Mo. content (0.5-1 per cent.). Cr. (up to 16 per cent.) is added if corrosion resistance at high temperature is also required.

Guaranteed minimum creep values of 20 kg./mm.^{2} at 650°C. and 10 kg./mm.^{2} at 700°C. can be easily reached with suitable alloys.

3. Cast steel tools are chiefly used for processes involving hot working (mandrels, hot rolls, pressing and drop forging dies).

The chief requirements are high resistance to wear, high toughness and insensitivity to temperature changes. Mn.-Cr.-Mo. alloys with or without Va. are employed, with carbon content of about 0.2 per cent. (pressing dies have a carbon content of up to 0.5 per cent.).

4. Generally speaking, the minimum Cr. contents of stainless and acid resisting cast steels is of the order of 14 per cent., but may go up to 32 per cent.. Cr. may be the only alloying constituent, but Cr.-Ni. or Cr.-Mn. combinations are also used.

It is interesting to note that these alloys have a much greater cavitation resistance than bronze and have been extensively employed for pump impellers. As is well known, sliding contact of stainless steels is apt to cause frettage corrosion. A high carbon chromium steel in the cast condition, on the other hand, will have good sliding properties (ledeburite structure) and is widely employed in high pressure pump mechanism.

Cr.-Ni. cast steel can also be welded without subsequent heat treatment. In order to conserve Cr. it has been found possible to impart corrosion resistance to a low alloy steel casting by surface diffusion of Cr. (outer layer 1 mm. thick will contain over 30 per cent. Cr.).

In conclusion the author emphasises the great progress that has been made in casting technique as illustrated by a series of photographs of representative samples. It is now possible to obtain a wall thickness equal to or only slightly thicker than that of an equivalent bronze casting.

Gang Riveting—a New Method of Riveting Employed by Curtiss-Wright Corporation. (Curtiss Fly Leaf, Vol. 25, No. 4, Sept.-Oct., 1942, p. 19.) (110/8969 U.S.A.)

An important new short-cut in riveting the thin aluminium skin covering on Curtiss Helldiver dive-bombers and Seagull scouting planes has been developed at the Ohio plant of the Curtiss-Wright Corporation. It is claimed that this new method of riveting has reduced the number of hours required for the operation by 70 per cent.

Formerly each rivet was installed in a separate operation. A single rivet was placed in its hole. One employee operated the rivet gun; a second acted as " bucker." Because the operation was done by hand, many times rivets were driven in non-uniformly and had to be re-worked or again the skin was " ringed " by the incorrect angle of the rivet gun, making it necessary to replace the entire skin section. The new system employs a " gang riveter " which can drive up to nine rivets in a single operation. Instead of holding up a fuselage fixture on the assembly lines until the skin has been applied, the thin aluminium covering is now assembled on a bench. The fixture is free to move down the line for other operations which formerly had to wait. When it is completed, the skin is then installed on the fuselage in a large section rather than piece by piece. Gang riveting has also eliminated " ringing " of the skin due to the uniform operation angle of the gang riveter.

Systematic Tests on the Suitability of Bearing Materials. (E. Heidebrock, A.T.Z., Vol. 45, No. 24, 25/12/42, pp. 652-656.) (110/8762 Germany.)

If hydrodynamic lubrication could be assured under all circumstances, the nature of the materials employed for journal and bearing would not effect the friction which would only depend on the viscosity of the oil employed. Whilst this type of lubrication can generally be assured under conditions of high shaft speeds and low loads, the opposite condition of operations lead to such small film thicknesses that molecular surface forces intervene and the friction is now no longer a function of the viscosity only, but depends on the nature of the surfaces and the chemical constitution of the oil. This condition of so-called boundary lubrication is also accompanied by wear and may ultimately lead to seizure (welding of small particles).

Boundary lubrication cannot be avoided when starting up from rest or when the journal speed oscillates about a zero value.

Tests at low speeds are thus of special value in determining the ultimate capacity of the bearing and the author has developed a special test machine in which the changes in journal friction are recorded optically by means of a sensitive spring balance, the speed of rotation being as low as 0.1 mm. sec.

By employing a journal diameter of only 6 mm., and loads between 1-8 kg./cm.^{2}, the original surface finish could be maintained over long periods (no running in) and the consistency of the experiments increased (steady oil film temperature).

For any bearing combination and given load, it is possible to specify a minimum speed of operation, below which the friction, as recorded on the film, becomes very unsteady and shows high peak values. It is assumed that these coincide with the breakdown of hydrodynamic lubrication and the development of boundary conditions.

A classification of bearing materials on the basis of n minimum as given by the tests thus gives an indication of their relative behaviour under these very arduous conditions. An alternative method of classification adopted by the author consists in determining the maximum load which the bearing will carry continuously at a given speed without the oil film temperature exceeding a certain amount.

Generally speaking, the order of merit of a series of bearing materials is not the same in the two classifications, showing that emergency running qualities (low n min.) are not usually associated with high load capacity under more normal conditions of operation.

In conclusion, the author expresses the hope that further tests of the types described will ultimately lead to the elimination of a large number of "replacement" alloys at present being manufactured and the concentration on a few groups which offer possibilities of being the equal of standard materials at present in short supply in Germany.

Application of Supersonics in Metallurgy. (A.T.Z., Vol. 45, No. 24, 25/12/42, p. 668.) (110/8766 Germany.)

Tinned Al. sheet has the advantage that it can be soft soldered. Unfortunately, under normal conditions, it is very difficult to obtain proper adhesion of the tin, since the oxide film on the Al. acts as a barrier. According to the author, this oxide film can be removed and proper anchoring of the tin achieved if the Al. sheet whilst immersed in the bath of molten tin is subjected to high frequency vibration by contacting it with a supersonic generator. A suitable generator of this type consists of a nickel iron tube magnetised by a high frequency current termed to be in resonance with a harmonic of the natural longitudinal frequency of the tube. The tube being only a few centimetres long, frequencies of the order of 1,200 m./sec. are generated.

The velocity of propagation of the sound waves in the molten zinc bath is of the order of 1,200 m./sec. and the Al. sheet in contact with the supersonic generator subjects the contacting zinc particles to very large acceleration and decelerations ($\sim$ 100 g.).

Under these conditions the oxide film is rapidly destroyed and a firm anchoring of the zinc in the aluminium is assured.

The intensity of the sound waves emitted by supersonic generators is very large and may amount to 10 watts/cm.^{2}. (Sound intensity of gun fire 0.001 watts/cm.^{2}.) On account of the small wave length, this implies pressure jumps of the order of 10 atmospherics per mm. and accounts for the high acceleration of the zinc particles referred to above.

The pressure effect of supersonic waves has also been employed to produce finer grain in castings, the melt being exposed to supersonic radiations during solidification and this producing a breaking up of the crystals. Another interesting application of supersonic pressure effects is in the production of a self-lubricating bronze containing about 25 per cent. graphite. Under the action of supersonic radiation, the graphite is finely dispersed in the molten bronze and a homogeneous mixture results. Without such aids, it would be impossible to obtain a satisfactory mixture of the light graphite with the heavy metal.

The Lubrication of Gear Wheels with Special Reference to conditions of Boundary Lubrication. (E. Pietsch, A.T.Z., Vol. 46, No. 1, 10/1/43, pp. 12-14.) (110/8759 Germany.)

A special mechanism has been designed which enables a direct optical record of the tangential friction force on the tooth flank being recorded whilst the gear is transmitting load.

It appears that the coefficient of friction is not affected very much by the degree of finish of the flank (superfinish 10 per cent. lower than normal grinding) but depends markedly on the type of oil employed.

It is interesting to note that since the direction of the friction force reverses at the point of rolling contact a smoother dive results if each of the gear wheels is made double, the two wheels of a unit being displaced relatively to each other by a fraction of the pitch. In order to compensate for unavoidable differences in manufacture, the two halves are not bolted rigidly, but spring coupled. In this way it can be ensured that the load is divided equally and oscillogram records given by the author show conclusively that the friction impulses transmitted to the shaft can be considerably reduced under these conditions, and a very steady drive obtained. Such gears are very suitable for determining the " life " of the lubricant, *i.e.*, the probable running time before a definite amount of oil previously brushed on to the teeth is used up and a marked increase in friction is shown on the record (boundary lubrication).

It is possible to grade oils consistently by this method and some synthetic oils tested by the author proved definitely superior to standard mineral oil.

There appears to be no consistent relationship between viscosity and " life " of the lubricant. Synthetic oils of high viscosity however often show up very well in these tests and the author has devised a special method of feeding such oils to the gears. The oil is introduced to the base of the tooth gap through channels which either communicate with an oil passage in the shaft or with pockets in the gear wheel supplied by a drip feed. The oil is flung out by centrifugal action causing an effective lubrication of the tooth flank. Since the quantity of oil circulated by this method is very small, it may be necessary to incorporate special additional cooling devices on the wheel.

Apart from tests on actual gear wheels, the author has also devised a laboratory instrument for grading oils under condition of boundary lubrication. This simple instrument essentially consists of two flat plates enclosing a very thin film of oil. Under these conditions the plates adhere together and will only separate after a certain time interval when subjected to pulling or shearing forces. It appears that the product force time for separation is constant for a given oil and plate material and bears some relation to the life of the oil as determined from the gear wheel testing machine. It is evident that the boundary film can withstand considerable forces for a short interval of time. If the force, however, exceeds a certain value, the adhesion of the oil is overcome and this may lead to particles of metal being torn out of the surfaces of the process if repeated often enough.

This would account for the peculiar fitting observed on gear wheels and could be reproduced by means of the plate testing machine after about 2×10^6 reversals.

Strength Characteristics of Plastic Bonded Plywood. (G. R. Parsons, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp 1-7.) (110/9032 U.S.A.)

New methods of moulding plywood by the bag process, combined with new adhesives, have opened a wide range of possibilities for the use of plywood in aircraft construction. This paper explains some of the more important advantages of plastic-bonded plywood and presents some of the pertinent basis-strength characteristics. The prediction is made that in the near future with gluing technique advancing rapidly, a thin metal covering glued to a plywood core will be used to great advantage in aeroplanes having high wing loadings. Such construction will combine the high axial strengths of the metals with the good buckling characteristics of the thicker plywood construction.

The author has prepared the following table to compare the basic-strength values of plastic-bonded plywood with those of other materials popular in aircraft manufacture.

			Allowable Loads.			
Material.	Specific Gravity.	Thickness, in.	Tension, lb. per in. width.	Block compression, lb. per in. width.	Shear, lb. per in. width.	EI
24 ST. Al. alloy	2.77	0.052	3200	3200	1924	120.7
24 SRT. Al. alloy	2.77	0.052	3380	3380	2030	120.7
1025 Steel	7.85	0.019	1045	1045	666	16.0
4130 Steel	7.85	0.019	1810	1810	1045	16.6
Magnesium alloy	1.80	0.080	2560	2560	1530	277.3
Spruce	0.40	0.358	3650	2010	412	5230.0
Plywood:—						
Birch face, Poplar core	0.66	0.205	1918	1304	460*a*	1488.6
Mahog. face, Poplar core	0.58	0.247	1738	956	550*a*	1598.4

a Estimated.

NOTE.—The plywood panels are constructed of either birch or African mahogany face veneers of 1/20 and longitudinal grain direction, and having five and seven, respectively, yellow poplar veneers of 1/48 between the faces. These poplar veneers have the outside veneer longitudinal, and then successive veneers have grain directions at right angles.

The table is based upon unit width of material and is so arranged that the density multiplied by the thickness remains a constant. In aircraft construction, the design criterion is usually one of buckling which is dependent upon the EI or stiffness value of the panel under consideration. It is because of this buckling phenomenon that in thin-metal construction, stringers and stiffeners must be added throughout to increase the effective width of sheet capable of carrying compressive loads. Although this addition of stringers and stiffeners strengthens the sheet and makes it capable of carrying the load applied, anyone who has ever done any flying will vouch for the fact that wrinkles are still very much in evidence. To avoid these wrinkles which are evidently harmful to airfoil shapes and laminar-flow characteristics requires a construction in thin metal which is heavy, costly, and quite impractical. Plywood, on the other hand, having such a high value of stiffness factor EI and allowing the use of a much thicker section has no tendency toward wrinkling and can with comparative ease be designed to prevent buckling from occurring.

It has been demonstrated in a series of tests conducted by the author's company that plywood has the ability to carry appreciable loads after buckling. Since all aeroplanes are designed to carry a 50 per cent. overload, it is possible to design plywood wings to avoid buckling up to the loading of any normal flight condition and to allow buckling to occur safely above this load. This factor, combined with the fact that there are no rivet heads or skin laps to interfere with air flow, greatly enhances its application in high speed aeroplanes. Since the elastic limit is very near the ultimate in wood, the advantage of having elastic deformation for any normal flight loads is apparent.

Contrary to public opinion, plywood fabricated with the resinous products used to-day has a greater resistance to fire than has an equal weight aluminium-alloy part. This is especially true when in the presence of flaming oil gasoline.

The added advantage of having bullets leave clean holes in plywood and the ability to repair with ease such holes makes this material especially attractive in the present crisis.

Single or Double Hardening for Motor Car Transmission Gear Wheels Made of Case Hardened Steel. (H. Glaubitz, A.T.Z., Vol. 46, No. 1, 10/1/43, pp. 9-12.) (110/8758 Germany.)

Double hardening for gear wheels, as its name implies, consists of a process involving two quenches, a typical treatment for a case hardening steel being as follows :—

Case hardening	927°C.
Cool to	871°C.
1st Quench in oil, reheat to ...	805°C.
2nd Quench in oil, temper to ...	155°C.

It has been claimed that this process is essential in order to obtain a sufficiently firm grain structure both of the case hardened layer and the internal core.

In the manufacture of gear wheels, however, the double hardening process has proved very expensive on account of the greater risk of warping necessitating an increase in the amount of grinding required.

There is no doubt that single hardening would reduce warping troubles. The difficulty is, however, to provide sufficient hardness of the core without the risk of overheating the case and coarsening the grain structure of the latter unduly. (This may lead to embrittlement and must be avoided especially in gears.)

From German and American experiments it appears that satisfactory results can be obtained by the single hardening process for smaller wheels and relatively thin case (~/mm.) if the quenching temperature is dropped by about 40°C. below the normal (*i.e.*, 830 against 870°C.) great care must be taken that the parts are at a uniform temperature before quenching and the rate of cooling from the case hardening to the quenching temperature must also be accurately controlled. The exact heat treatment will vary with the type of steel employed and will have to be determined by experiment once the right temperature conditions have been determined, there will be no difficulty of reproducing the correct conditions, thanks to the excellent thermometric equipment of the modern metallurgist and the close conformity to specification of modern steels.

According to the author, it was lack of such equipment and variation in steel composition which led to the introduction of the less sensitive double hardening process about 20 years ago.

It appears that with some more research, rough hardening will also become general for larger wheels.

Bearing Strength of Plastics and Plywood. (J. Bond, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 9-14.) (110/9033 U.S.A.)

The specimens used in these tests were representative of commercially available high-impact moulded and laminated plastic sheets and resin-bonded birch plywood. The testing was done in a Riehle 40,000 lb. testing machine, at room temperature, and the loads were applied and removed at a rate of 0.0529 in. per min.

The specimens were placed in a jig consisting essentially of two heavy metal plates separated by two spacer blocks. A plunger slides between the spacer blocks and impinges upon the top of the test specimen. This test specimen is held in place by a bearing pin which runs through the side plates and the specimen, and is constructed of $\frac{3}{8}$ in. ground and polished drill rod. In this jig, the part of the specimen above the bearing pin is compression-loaded when a force is applied to the plunger. The part of the specimen below the bearing pin is essentially unstressed and the deformation, attributable to bearing pressure is measured at this point through the use of multiplying lever. The multiplying lever has two purposes; *i.e.*, it places the Ames dial gauge in a more convenient place for reading, and it also multiplies the deformation so that less error will be made in reading small deformations. The multiplying lever used in these tests was 5 in. long. By means of this lever readings may be made directly to 0.0002 in. Deflections were not measured until the rapid initial deformation had occurred in the test specimens (0.5 to 1 min.). The test jig was accurately centred between the crossheads of the testing machine so that the load would not be applied eccentrically.

Two main types of test were run, *i.e.*, load versus deformation and load versus permanent set. Curves were plotted for load versus deformation in per cent. of bearing-pin diameter, and load versus permanent set in per cent. of bearing-pin diameter.

Three sets of test specimens were used: One set was conditioned in a desiccator at 55 per cent. relative humidity for 96 hr.; one set was immersed in water at room temperature of approximately 70°F. for 96 hr.; and one set was placed in a drying oven in which the temperature was maintained at approximately 160°F. for 96 hr. The main tests were done at 55 per cent. relative humidity, and the other two tests were run to determine the effect of extremes in temperature and moisture upon the bearing strength of the specimen.

The plywoods were definitely inferior to the reinforced plastics in bearing strength. In nearly all cases heating improved the bearing strength of the specimens and soaking in water decreased their bearing strength, as compared to that observed for the specimens conditioned at room temperature and a relative humidity of 55 per cent.

The proposed load versus deformation (4 per cent. of bearing-pin diameter) test gave much more satisfactory results than did the proposed load versus permanent set (0.2 per cent. of bearing-pin diameter) test and, in addition, was easier to perform. For these two reasons the former test is the more desirable.

Application and Unusual Physical Properties of Synthetic Rubbers. (O. D. Cole, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 15-20.) (110/9034 U.S.A.)

This paper deals with some of the applications and more or less unusual physical properties of several of the commercial rubber-like synthetic materials on the market or in advanced stages of development at the present time. The materials which are considered as "synthetic rubbers" fall into four classes: (*a*) Buna S types or copolymers of butadiene and styrene; (*b*) Buna N types, or copolymers of butadiene and acrylonitrile; (*c*) Neoprenes, or polychloroprenes, or copolymers of chloroprene with other materials; and (*d*) Butyl rubber, a copolymer of isobutylene and butadiene. The Thiokols or organic polysulphide polymers might be included among the "synthetic rubbers" by some, but, although they appear to be vulcanisable, their thermo-plasticity makes them useful only to a limited degree in places where elasticity and other rubber-like properties at higher temperatures are desired. Details concerning Buna S type polymer, adopted by the Rubber Reserve Company for use in tyres and as a general purpose rubber, are discussed. Some interesting data on the efficiencies of various synthetic rubber compounds as compared to those of natural rubber compounds at high and low temperatures are shown. Data are also given which indicate that the proper choice of plasticiser is important for compounds to be used for oil-resistant gaskets, sealing rings, and the like.

The Buna S types can be used in nearly all cases to replace natural rubber. Generally satisfactory service as compared to natural rubber has been observed in the case of passenger car tyres. However, it must be pointed out that, with this or any synthetic rubber, as in the case of any new material, certain difficulties are present and must be overcome. For example, truck and heavy duty tyres at present are the result of years of specialised engineering and design, based on the characteristics of natural rubber. In order to meet the service conditions encountered to-day, it may be that some radical departure from present thinking and designs may have to be made in order to fit synthetic rubber into the picture. It is sufficient to say that the Buna S types appear to fit more nearly into the scheme of thinks as we see them to-day than any of the other synthetic rubbers.

The Buna N types of synthetic rubbers are being recommended for all types of mechanical goods such as hose, packings, gaskets, rollers, etc., wherever high resistance to ageing, oils and hydrocarbon solvents is desired.

The Neoprene types are used wherever moderate oil resistance and good resistance to ozone and sunlight are desired. Since it will not support combustion it is widely used as a flameproof, oilproof, wire insulation.

Butyl rubber can best be utilised where its inherent properties of chemical stability, resistance to ozone, light and high impermeability to gases can be used to best advantage. As has been pointed out no entirely satisfactory tyres have as yet been made from Butyl rubber.

One of the major problems which is not stressed in the discussions of synthetic rubber in the press is that of processing. It has been said that synthetic rubbers process just like natural rubber on regular rubber machinery. On the contrary, however, each material behaves differently and, although the difficulties are not insurmountable, even the training of personnel to handle each new material involves considerable time and effort.

Neoprene GN and some of the Buna N types have been found to give results in tyre tread wear tests equal to, or better than, those given by natural rubber. However, several major difficulties in processing and fabrication have caused the trend toward a Buna S type for tyre rubber.

Many of the really serious problems of to-day may be problems only because of the fact that certain handling processes designed for natural rubber are not fundamentally correct for the synthetic rubbers used. Because of this, it is possible that in the future the rubber industry will depend more than ever upon the mechanical engineer for the solution of its processing and handling problems.

Automatic Uniform Rolling-in of Small Tubes. (F. F. Fisher and E. T. Cope, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 53-60.) (110/9037 U.S.A.)

The author reviews some of the current methods of rolling-in small tubes such as are used in surface condensers, feedwater heaters, air and oil coolers, and air heaters, pointing out the shortcomings of each method. It emphasises the fact that no operator who undertakes to roll-in joints by any of these methods must be well trained and must possess considerable skill in using the expander tool. Yet, even in the hands of the most expert operator, uniform joints of optimum rolling cannot be assured. The elongation incident to rolling is always present, as is also the resulting condition of axial loading of the tube which produces complex loading and deformation of the tube sheets. A carefully planned sequence of rolling must be applied in order to distribute this loading in such a manner that the tube failures may be avoided.

An entirely new technique of rolling-in tubes is described. This employs the familiar tools with the addition of appropriate thrust collars. The tool is entered to its full depth into the tube at the beginning of the operation and the current-limiting relay automatically stops the rolling by shutting off the current to the motor when the joint has been expanded by the correct amount as determined previously by laboratory tests on sample joints. This relay is not in the circuit during the starting of the motor or during the backing out of the tool, a very important new development. In this technique the elongation is compensated for in whole or in part by the stretching of the tube during the first stage of the operation, that in which the tube end is enlarged to fit the tube hole.

Requirements for Carburettor Air Filters for Aero Engines. (W. D. Cannon, J.S.A.E., Vol. 51, Feb., 1943, pp. 33-37, 63.) (110/9039 U.S.A.)

The advent of desert warfare has necessitated the use of air filters for aero engines. Air filters already form standard equipment on tractors and automobiles operating in sandy regions of the U.S.A. and on account of the experience gained in this way, it proved relatively easy for the American industry to develop a suitable form of filter for aircraft use. Such a filter must be light and strong, easy to instal, offer minimum obstruction to the air flow and retain its effectiveness over a reasonable period. These requirements are best met by filters of the viscous infringement type, the elements being in the form of knit wire or knit metal ribbon sheets suitably crimped and packed. The mesh of the sheet becomes progressively smaller from the entering face to the rear, and the supports are sufficiently strong to withstand engine backfires. The thickness of the element has been standardised at 2 in. The filter is dipped in engine oil and allowed to drain before installation. This oil traps and holds the sand separated mechanically by the mesh, and if properly installed such a filter will remove 90 per cent. of the sand at a pressure drop of about 4 inches of water, the air speed being 1,000 feet per minute. In all installations, except those fitted with exhaust driven supercharger, the filter is mounted close to the entry of the air scoop and thus precedes both the carburettor and supercharger. The filter is usually inclined to the airstream at an angle of about 30° so as to obtain sufficient filtering area without over-dimensioning the scoop.

Just ahead of the filter ejection slots are provided which bleed off some air which carries with it accumulated dirt and water.

Prior to entering the carburettor, the inductor manifold is usually fitted with an alternative hot air intake (air heated by exhaust manifold) and this in its turn is fitted with a further valve enabling warm air to be taken from the space behind the engine. These alternative air intakes are not provided with filters as they are only used under conditions when sand is not likely to be present in damaging quantities.

As already stated above, in the case of exhaust turbo supercharging systems, the filter is not placed inside the airscoop but on the pressure side of the turbo compressor between intercooler and carburettor. This location was found to have least effect on the functioning of the system.

Typical desert sand consists mainly of silica, the particles ranging in size from 0.05 to 0.0005 inches. About 50 per cent. can be washed out in the standard clay test and of the remainder about 40 per cent. are small enough to be retained by the U.S. standard screen No. 325.

The author makes some reference to the British Vokes filter (accordion pleated wire mesh—no by pass) whilst a captured German filter as fitted to the Me. 109 is described in detail. This filter consists of a cylindrical tube projecting about

12 inches beyond the leading edge of the wing. This tube is clear of internal obstructions and when the front is open will act as a normal intake. On closing the front with a shutter, the air is forced to enter through lateral holes in the cylinder wall and pass through a lining consisting of six layers of crimped dural sheet. These are arranged in such a manner as to cause frequent changes in air direction. The filter is of the dry type and is not considered satisfactory.

A Fully Automatic Fuel Flow Meter (Calibrated Tank Type). (V. Schmidt, A.T.Z., Vol. 45, No. 27, 25/12/42, pp. 670-672.) (110/8767 Germany.)

Fuel flow meters of the calibrated tank type which enable the observer to measure the time taken for the consumption of a given volume or weight of fuel are well known and especially suited for consumption measurements at small rates of flow. They suffer, however, from the defect that several taps have to be operated and the operation of the stop watch require a certain amount of skill. In the new instrument, the observer eye is replaced by a photocell and the liquid in the gauge tube provided with a small opaque float. The electrical circuit is arranged so that on pressing a button, the necessary taps are operated electrically and a stop watch started and stopped as the liquid passes the higher and lower gauge mark respectively. The taps are then reset so that the calibrated tank refills and the instrument is ready for another reading. An engine revolution counter is incorporated so that the total number of revolutions corresponding to the fuel tine are recorded automatically.

By employing calibrated tanks of various sizes, rates of fuel flow from 0.75 l/h to 2,000 l/h can be measured to an overall accuracy of about 0.3 per cent.

What are the Results of Freezing the Electrolyte in Accumulator Batteries. (E. Bleich, A.T.Z., Vol. 45, No. 23, 10/12/42, pp. 641-645.) (110/8764 Germany.)

The freezing point of the electrolyte depends on its density and varies from about $-10°C.$ ($D=1.13$) to $-65°C.$ ($D=1.285$). The latter value corresponds to the fully charged condition and such a battery is evidently immune to freezing even in a severe Russian winter ($-50°C.$).

Discharge of the battery is accompanied by a drop in density of the electrolyte and at $\Delta=1.20$ the freezing point is about $-25°C.$ As a consequence batteries froze regularly during the winter campaign in Russia unless specially protected.

Freezing as such is not harmful to the plates and there is no danger of the battery bursting, even if the density of the electrolyte is as low as 1.02 and the temperature $-40°C.$ This is due to the fact that complete solidification never occurs, a certain amount of liquid slush always remaining and acting as a safety valve (alcohol-water mixture exhibit similar characteristic on freezing).

Reported cases of damage were probably due to careless handling of the battery, the container especially becoming brittle when exposed to severe cold.

A cold or frozen battery has a very high internal resistance and as a result the terminal voltage falls considerably when passing large currents. Under normal conditions (20°C.) a 6V75 AL battery will pass 300 amp. at 5 V. for a few seconds, irrespective of whether the battery was originally fully charged or had already half run down. At $-40°C.$, however, the passage of 300 amps. causes a voltage drop to 2.75 and 1.5 volt respectively, depending on whether the battery had been fully charged or half discharged respectively. The extra drop in the latter case is due to the partial freezing of the electrolyte, the fully charged battery still remaining liquid at $-40°C.$

In this connection it should be remembered that the increase in internal resistance with cold effectively counteracts the normal tendency of self discharge and provided the battery was in reasonable condition before freezing, a simple warming to 20°C. should therefore suffice to render it again workable.

Under no circumstances should a cold or frozen battery be charged electrically without such previous warming. It appears that the passage of the current at very low temperatures is no longer accompanied by marked chemical changes of the plates but simply electrolyses the remaining liquid. Under these conditions excessive frothing takes place which will infallibly lead to corrosion troubles.

In addition, plugs of frozen electrolyte may prevent the free discharge of the gas and the pressure built up may distort or even burst the cell casing.

Influence of Type of Dust on the Performance of Air Filters. (U. Schmidt, Z.V.D.I., Vol. 85, No. 39-40, 4/10/41, p. 800.) (R.T.P. Translation No. 1,755.) (110/29668 Germany.)

The author describes the results of experiments on the resistance and efficiency of air filters of the oil-moistened type.

A constant rate of air supply containing a definite proportion of dust was maintained to the filter, the weight of dust extracted being determined periodically. The ratio of the weight extracted to the total weight admitted determines the efficiency of the filter at any instant. The resistance of the filter (mm. water) was also measured periodically and plotted on a basis of weight of dust extracted.

No details of the type of filter employed are given. The rate of dust admission was of the order of 4 gm. in 24 hours. The efficiency of the filter was of the order of 87 per cent. after one hour's operation and the initial resistance 5 mm. of water.

The experiments showed that the variation of resistance and efficiency with time of operation depend markedly on the type of dust employed (same weight concentration of dust in increasing air).

Most of the tests were carried out with flue ash recovered electrotatically from an electric generating station. This dust was available in large quantities and was characterised by great regularity of the particles (average size about 0.08 mm.). This dust consists mainly of hollow spheres of slag and is of relatively low density.

Comparison tests were also made with road dust with an average particle size of the same order. In this case, however, the particles are much more irregular and of greater density than flue ash.

For the same dust content of the air on a weight basis, the number of flue ash particles is thus greater and on account of their spherical nature, close packing is prevented. The hollow spaces absorb a considerable amount of oil which is thus withdrawn from the filtering circuit and as a result the efficiency of the oil-moistened filter diminishes much more rapidly in the case of flue ash than if road dust is used. Similarly the resistance of the filter plotted on a basis of weight of dust extracted increases more rapidly in the case of flue ash.

From the above it appears that it is essential for the filter to be tested with the type of dust occurring in practice before any opinion as to its performance can be expressed.

Experiments with Piezo Electric Pressure Indicators. (P. Hackemann and others, Z.G.S.S., Vol. 36, No. 9, pp. 187-190, and Vol. 37, No. 4, pp. 68-71.) (110/3545 Germany.)

It appears that the piezo electric indicator commonly used for measuring gas pressures in guns is subject to a number of errors. The layout of this instrument follows that of the well known crusher manometer, the quartz crystal interposed between the piston and set screw taking the place of the buckled cylinder.

As it is essential that the quartz and piston maintain close contact under conditions of variable gas pressure, the quartz must be subjected to an appreciable preliminary compression by tightening the screw. As a result, the calibration of the instrument, *i.e.*, load/deflection shows a distinct kink which roughly corresponds to the point where the piston is lifted off its seating against the control force. Since the compressibility of the control-screw casing system is small, the first part of the calibration curve is much flatter than the rest of the curve for which the piston transmits the full load to the quartz. The early stages of the pressure rise are thus difficult to determine, the calibration moreover, depending on the amount of preliminary compression. The difficulty can be overcome by incorporating a slotted tubular spring between the piston and the fixed quartz abutment. Such a spring can easily be designed to subject the combination to a relatively large preliminary compression whilst still having a much greater flexibility than that of the quartz-housing system.

Under these conditions, the calibration line no longer shows a kink and is independent of the actual amount of precompression over wide limits. Sample records of gas pressure in guns taken with a piezo electric indicator of the old type and as modified by the author show the great improvement obtained.

In conclusion, it should be pointed out that the inclusion of an internal control spring into the piston/quartz system is common practice in piezo electric recorders used as engine indicators.

The novelty of the author's design consists in the very compact arrangement adopted, enabling the instrument to be screwed directly into service barrels as small as 20 mm. calibre.

Abstractor's Note.—For experimental determination of the natural frequency of such instruments, see V.D.I. Forschungshaft 407.

A Survey of Selection and Allocation for Engineering Occupations. (F. Holliday, Journal of the Institution of Production Engineers, Vol. 22, No. 3, March, 1943, pp. 103-136.) (110/8971 Great Britain.)

The demands of the armed forces and industry for men for jobs of an engineering nature necessarily exceeds the number of recruits who have had engineering experience. The problem of picking out from those who have had no engineering experience candidates suitable for training has brought to the fore the importance of devising intelligence and aptitude tests. Considerable work in this direction has been carried out since the large scale intelligence testing was first introduced in the American army during the last war and is reviewed in this paper.

The psychological test is now generally adopted as a means of selecting trainees for technical training in various branches of the armed forces but has not found widespread use in industry. The saving that can be effected in both time and money by eliminating at the source the unfit and inapt cannot be over-estimated. In investigations carried out by the author no less than 17 per cent. of a substantial number of pupil apprentices volunteered the information that they felt quite unfitted to be engineers. The author calculates that of a company's wage bill of £400,000, some £20,000 is wasted as a result of inefficient selection of workers and unsuitable allocation of work.

The author cites numerous illustrations of the beneficial results obtained by suitable psychological tests. In the Philips' Electric Lamp Works as much as 50 per cent. of the workers in the diamond-piercing department, after undergoing 1-2 years training, costing the firm on an average £250 per head, were found to be incompetent. After the introduction of the tests this percentage fell to 12½ per cent.

The author concludes by stressing the importance of extending facilities for training personnel in basic psychology, occupational analysis, the use of psychological tests and the interpretation of test scores and the need to appoint men so trained to industry.

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TITLES AND REFERENCES OF ARTICLES AND PAPERS SELECTED FROM PUBLICATIONS REVIEWED IN R.T.P.3.

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Theory and Practice of Warfare.

Organisation, Tactics, Training.

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
1	6925	France ...	*Can the U.S.A. Become a Great Military Power?* (F. Courten, La Science et la Vie, Vol. 60, No. 292, Dec., 1941, pp. 329-340.)
2	6928	Japan ...	*Japanese Aviation in the Pacific.* (P. Camblanc, La Science et la Vie, Vol. 60, No. 292, Dec., 1941, pp. 389-393.)
3	7609	Switzerland ...	*British Bombing Strategy Against Germany.* (Inter. Avia., No. 844-845, 21/11/42, pp. 1-8.)
4	7626	Switzerland ...	*British Bombing Tactics ("Pathfinder" Aircraft Precedes Attack and Lights Fires in Target Area).* (Inter. Avia., No. 844-845, 21/11/42, pp. 19-20.)
5	7790	Switzerland ...	*Organisation of the British Air Forces.* (Inter. Avia., No. 843, 11/11/42, pp. 1-11.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
6	7845	Germany	...	*Leaders of the Luftwaffe, XXI (H. Graf).* (Aeroplane, Vol. 64, No. 1,653, 29/1/43, p. 132.)
7	6851	G.B. ...	...	*The Speed of Cargo Ships.* (Engineer, Vol. 175, No. 4,544, 12/2/43, p. 132.)
8	7854	U.S.S.R.	...	*Bombing Tactics (from the Russian).* (G. Schethikov, Flight, Vol. 43, No. 1,778, 21/1/43, p. 63.)
9	7884	U.S.A.	...	*Organisation of the U.S. Army Air Force.* (N. F. Silbee, S.A.E.J., Trans., Vol. 51, No. 1, Jan., 1943, pp. 42-46.)
10	7919	G.B. ...	...	*Emergency Landing Grounds in Iceland.* (Flight, Vol. 43, No. 1,782, 18/2/43, p. 183.)
11	6929	Germany	...	*Silhouettes of German and Allied Aircraft Employed in the War Against the Merchant Shipping.* (P. Belleroche, La Science et la Vie, Vol. 60, No. 291, Nov., 1941, pp. 252-253.)
12	7934	Germany	...	*Ploughing Up Airfields (Photo).* (Flight, Vol. 43, No. 1,781, 11/2/43, p. 162.)
				Military Aircraft Design.
13	7620	G.B. ...	...	*New Tails for Beaufighter.* (Inter. Avia., No. 844-845, 21/11/42, p. 15.)
14	7657	Germany	...	*Bibliography of Recent German Patents (1, Aerodynamics; 2, Aircraft; 3, Airscrews; 4, Armament; 5, De-Icing; 6, Engines and Accessories; 7, Factory Equipment and Technique; 8, Ground Equipment; 9, Instruments; 10, Wireless).* (R.T.P.3, Bibliography No. 81, Ministry of Aircraft Production, Feb., 1943.)
15	6941	Germany	...	*Enemy Aircraft Development.* (Engineer, Vol. 175, No. 4,545, 19/2/43, p. 152.)
16	7724	U.S.A.	...	*Airplanes Fit to Fight.* (N. F. Silsbee, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
17	7900	G.B. ...	...	*Fighter Design.* (Flight, Vol. 43, No. 1,779, 28/1/43, pp. 89-92.)
				Armament.
18	6911	U.S.A.	...	*Gun Turret Development in England.* (M. W. Bourdon, Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 34-37, 70.)
19	6827	G.B. ...	...	*British Proposals for Distant-Controlled Gun Turrets.* (P. Armont, La Science et la Vie, Vol. 60, No. 292, Dec., 1941, pp. 352-354.)
20	6933	France	...	*Armour Protection for Cannon Aircraft.* (P. Dublane, La. Science et la Vie, Vol. 60, No. 291, Nov., 1941, pp. 285-291.)
21	6937	France	...	*Modern Infantry Automatic Weapons.* (V. Reniger, La Science et la Vie, Vol. 59, No. 285, May, 1941, p. 423.)
22	7621	Germany	...	*German Machine Gun M.G. 131 (13 mm.).* (Inter. Avia., No. 844-845, 21/11/42, pp. 1 and 16-17.)
23	7805	G.B., Germany		*Phosphorus Incendiary Bombs.* (Inter. Avia., No. 843, 11/11/42, pp. 25-26.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
24	7913	G.B. ...	*Boulton Paul Electric Hydraulic Gun Turrets.* (Flight, Vol. 43, No. 1,780, pp. 122-127, 4/2/43.)
25	7914	Germany ...	*Focke Wulf* 189 *Armament Details* (*Photo*). (Flight, Vol. 43, No. 1,780, 4/2/43, p. 128.)
26	7932	G.B. ...	*Aircraft Gun Control Systems.* (H. G. Conway, Flight, Vol. 43, No. 1,781, 11/2/43, pp. 149-151.)
27	7946	G.B. ...	*Boulton and Paul Electro-Hydraulic Turret.* (Aeroplane, Vol. 64, No. 1,654, 5/2/43, pp. 153-156.)
28	7957	G.B. ...	*" Le Prieur " Rocket in World War, I.* (Aeroplane, Vol. 64, No. 1,655, 12/2/43, p. 200.)
29	8118	G.B. ...	*Parachute Bombs Used by R.A.F.* (*Photo*). (Flight, Vol. 43, No. 1,777, 14/1/43, p. 34.)
30	8180	Germany ...	*Scientific Research on Gunnery and Ballistic Problems.* (H. Schardin, Luftwissen, Vol. 10, No. 1, Jan., 1943, pp. 5-9.)
31	8181	Germany ...	*Ballistic and Technical Problems of Aerial Combat.* (W. Schmidt, Luftwissen, Vol. 10, No. 1, Jan., 1943, pp. 10-14.)
			Equipment.
32	7825	U.S.A. ...	35-*Ton Mobile Crane for Aircraft.* (Engg., Vol. 155, No. 4,024, 26/2/43, pp. 170, 177.)
33	7834	Germany ...	*Emergency Equipment in German Aircraft Operating in North Africa* (*Photo*). (Flight, Vol. 43, No. 1,783, 25/2/43, p. 203.)
34	7847	G.B. ...	*Short " Sunderland " Cockpit Controls* (*Photo*). (Aeroplane, Vol. 64, No. 1,653, 29/1/43, p. 135.)
35	7851	Germany ...	*Supply Containers Used by Germans* (*can be Dropped from Aircraft*). (Flight, Vol. 43, No. 1,778, 21/1/43, p. 62.)
36	7976	G.B. ...	*Handley Page Halifax Instrument Board* (*Photo*). (Aeroplane, Vol. 64, No. 1,656, 19/2/43, p. 219.)
37	8119	G.B. ...	*Portable Metal Runway in N. Africa* (*R.A.F.*) (*Photo*). (Flight, Vol. 43, No. 1,777, 14/1/43, p. 34.)
			Military Types (*British*).
38	7619	G.B. ...	*New Version of Spitfire* (*Merlin* 61). (Inter. Avia., No. 844-845, 21/11/42, pp. 14-15.)
39	7769	G.B. ...	*Halifax II* (*Perspective Drawing*). (C. Winchester, Canadian Av., Vol. 15, No. 11, Nov., 1942, pp. 44-46.)
40	7791	G.B. ...	*De Havilland " Mosquito."* (Inter. Avia., No. 843, 11/11/42, p. 15.)
41	7793	G.B. ...	*Miles " Master " Trainers.* (Inter. Avia., No. 843, 11/11/42, p. 16.)
42	7832	G.B. ...	*Blackburn " Roc "* (*Recog. Details*). (Flight, Vol. 43, No. 1,783, 25/2/43, p. a.)
43	7833	G.B. ...	*Boulton-Paul " Defiant "* (*Recog. Details*). (Flight, Vol. 43, No. 1,783, 25/2/43, p. b.)
44	7844	G.B. ...	*Gloster " Gladiator "* (*Recog. Details*). (Aeroplane, Vol. 64, No. 1,653, 29/1/43, p. 131.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
45	7849	G.B.	*Airspeed Oxford V Trainer.* (Flight, Vol. 43, No. 1,778, 21/1/43, pp. 60-61.)
46	7856	G.B., U.S.A.	*Aircraft of the Anglo-American Air Forces (III).* (Flight, Vol. 43, No. 1,778, 21/1/43, pp. 72-75.)
47	7857	G.B.	*Vickers Armstrong "Walrus II" (Recog. Details).* (Flight, Vol. 43, No. 1,778, 21/1/43, p. a.)
48	7899	G.B.	*Hawker "Typhoon."* (Flight, Vol. 43, No. 1,779, 28/1/43, p. 88.)
49	7905	G.B., U.S.A.	*Aircraft of the Anglo-American Forces (IV).* (Flight, Vol. 43, No. 1,779, 28/1/43, pp. 101-103.)
50	7910	G.B.	*Miles Trainers M. 18 and M. 28.* (Flight, Vol. 43, No. 1,780, 4/2/43, pp. 115-118.)
51	7911	G.B.	*Fairey "Swordfish" (Ident. Details).* (Flight, Vol. 43, No. 1,780, 4/2/43, p. a.)
52	7912	G.B.	*Fairey "Albacore" (Ident. Details).* (Flight, Vol. 43, No. 1,780, 4/2/43, p. b.)
53	7923	G.B.	*Bristol "Bisley" Attack Bomber in Tunisia.* (Flight, Vol. 43, No. 1,782, 18/2/43, p. 168.)
54	7930	G.B.	*Westland "Lysander," II (Recog. Details).* (Flight, Vol. 43, No. 1,781, 11/2/43, p. a.)
55	7938	G.B.	*De Havilland "Mosquito."* (Airc. Eng., Vol. 15, No. 168, Feb., 1943, pp. 47 and 54.)
56	7945	G.B.	*Miles M. 18 and M. 28 Trainers.* (Aeroplane, Vol. 64, No. 1,654, 5/2/43, pp. 151-152.)
57	7951	G.B.	*Vickers Armstrong Wellington II (Photo).* (Aeroplane, Vol. 64, No. 1,655 12/2/43, p. 181.)
58	7953	G.B.	*Bristol Beaufort I (Sectional Drawing).* (Aeroplane, Vol. 64, No. 1,655, 12/2/43, pp. 184-185.)
59	8129	G.B. and U.S.A. ...	*Aircraft of the Anglo-American Forces.* (Flight, Vol. 43, No. 1,777, 14/1/43, pp. 46-49.)
60	8134	G.B.	*Mosquito Squadron (Photo).* (Flight, Vol. 43, No. 1,777, 14/1/43, pp. 35-37.)

Military Types (U.S.S.R.).

61	7908	U.S.S.R. ...	*DB-3F Bomber (Phot).* (Flight, Vol. 43, No. 1,779, 28/1/43, p. 108.)
62	8120	——	*A "Hurricane" in Russia (Photo).* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 38.)

Military Types (U.S.A.).

63	6882	U.S.A. ...	*Fairchild AT-13 Plywood Trainer.* (British Plastics, Vol. 14, No. 165, Feb., 1943, pp. 534-535.)
64	6982	U.S.A. ...	*Thunderbolts Dive at 725 m.p.h.* (Am. Av., Vol. 6, No. 14, 15/12/42, p. 9.)
65	7610	U.S.A. ...	*Consolidated B-24 Heavy Bomber "Liberator."* (Inter. Avia., No. 844-845, 21/11/42, ppii, 11-12.)
66	7611	U.S.A. ...	*Boeing XPBB-1 "Sea Ranger."* (Inter. Avia., No. 844-845, 21/11/42, p. 12.)
67	7612	U.S.A. ...	*Curtiss P-40D (Kittyhawk) and P-40F (Warhawk).* (Inter. Avia., No. 844-845, 21/11/42, p. 12.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
68	7613	U.S.A.	... *Vought-Sikorsky F44-1 "Corsair."* (Inter. Avia., No. 844-845, 21/11/42, pp. 12-13.)
69	7614	U.S.A.	... *Martin B-26 "Marauder."* (Inter. Avia., No. 844-845, 21/11/42, p. 13.)
70	7627	U.S.A.	... *Vultee A-31 "Georgia" Dive Bomber.* (Inter. Avia., No. 844-845, 21/11/42, p. 1.)
71	7795	U.S.A.	... *Grumman TBF-1 Torpedo Bomber "Avenger."* (Inter. Avia., No. 843, 11/11/42, pp. 18-19.)
72	7796	U.S.A.	... *Consolidated B-24D "Liberator."* (Inter. Avia., No. 843, 11/11/42, pp. 19-20.)
73	7842	U.S.A.	... *Flying Fortress.* (P. G. Masefield, Aeroplane, Vol. 64, No. 1,653, p. 125.)
74	7850	U.S.A.	... *North American "Mitchell" (Photo).* (Flight, Vol. 43, No. 1,778, 21/1/43, p. 80.)
75	7852	U.S.A.	... *Lockheed "Ventura" (Photograph).* (Flight, Vol. 43, No. 1,778, 21/1/43, p. 76.)
76	7858	U.S.A.	... *Curtiss "Seagull" (Recog. Details).* (Flight, Vol. 43, No. 1,778, 21/1/43, p. b.)
77	7901	U.S.A.	... *Douglas B. 19 (Ident. Details).* (Flight, Vol. 43, No. 1,779, 28/1/43, p. a.)
78	7909	U.S.A.	... *New Curtiss Dive Bomber A-25.* (Flight, Vol. 43, No. 1,780, 4/2/43, p. 114.)
79	7917	U.S.A.	... *Grumman "Martlet" on Carrier Deck (Photo).* (Flight, Vol. 43, No. 1,782, 18/2/43, p. 164.)
80	7918	U.S.A.	... *Curtiss Dive Bomber A-25 (Photo).* (Flight, Vol. 43, No. 1,782, 18/2/43, p. 165.)
81	7925	U.S.A.	... *Vultee Vanguard Fighter (Recog. Details).* (Flight, Vol. 43, No. 1,782, 18/2/43, p. a.)
82	7926	U.S.A.	... *Brewster Buffalo (Recog. Details).* (Flight, Vol. 43, No. 1,782, 18/2/43, p. b.)
83	7947	U.S.A.	... *American Aeroplanes in Service (Drawings and Specifications).* (Aeroplane, Vol. 64, No. 1,654, 5/2/43, pp. 158-159.)
84	7949	U.S.A.	.. *North American Mitchell I (Photo).* (Aeroplane, Vol. 64, No. 1,655, 12/2/43, p. 172.)
85	7954	U.S.A.	... *Vought-Sikorsky "Corsair" (Recog. Details).* (Aeroplane, Vol. 64, No. 1,655, 12/2/43, p. 192.)
86	7972	U.S.A.	.. *Curtiss A-25 Dive Bomber "Banshee" (Photo).* (Aeroplane, Vol. 64, No. 1,656, 19/2/43, p. 206.)
87	7974	U.S.A.	... *The Lockheed "Vega Ventura."* (Aeroplane, Vol. 64, No. 1,656, 19/2/43, pp. 214-215.)
88	7977	U.S.A.	... *American Aeroplanes in Service (IV) (Silhouettes of Douglas, North American, Consolidated Martin).* (Aeroplane, Vol. 64, No. 1,656, 19/2/43, p. 227.)
89	8124	U.S.A.	... *Consolidated Coronado II (Recog. Details).* (Flight, Vol. 43, No. 1,777, 14/1/43, p. a.)
90	8126	U.S.A.	.. *The Stearman (American Biplane Trainer).* (Flight, Vol. 43, No. 1777, 14/1/43, pp. 41-43.)
91	8132	U.S.A.	.. *Grumman Avenger Dropping Torpedo (Photo).* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 31.)

Military Types (Germany).

92	6908	Germany	... *Focke Wulf F.W. 190A (Sect. Drawing).* (Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 26-27.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
93	7622	Germany	...	*Junkers Ju. 87D Dive Bomber.* (Inter. Avia., No. 844-845, 21/11/42, pp. 11 and 17.)
94	7623	Germany	...	*Bloch 157 (Fighter) and Bloch 175 (Torpedo Bomber).* (Inter. Avia., No. 844-845, 21/11/42, p. 18.)
95	7776	Germany	...	*Focke Wulf 190 A-3 and Me. 210 A-1 (Design Details).* (Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 144-146.)
96	7792	Germany	...	*Junkers Ju. 286 (86P) High Altitude Bomber.* (Inter. Avia., No. 843, 11/11/42, p. 22.)
97	7799	Germany	...	*Messerschmitt Me. 210.* (Inter. Avia., No. 843, 11/11/42, p. 23.)
98	7840	Germany	...	*Ju. 90 Latest Version (Ju. 290 Bomber) (Photo).* (Aeroplane, Vol. 64, No. 1,653, 29/1/43, p. 119.)
99	7841	Germany	...	*Focke Wulf 190 A-3.* (Aeroplane, Vol. 64, No. 1,653 29/1/43, pp. 122-124.)
100	7891	Germany	...	*War Planes of the Axis.* (D. C. Cooke, Coast Artillery J., Vol. 85, No. 5, Sept.-Oct., 1942, pp. 4-11.)
101	7902	Germany	...	*Dornier Do. 26 (Ident. Details).* (Flight, Vol. 43, No. 1,779, 28/1/43, p. b.)
102	7904	Germany	...	*Focke Wulf 190 A-3.* (Flight, Vol. 43, No. 1,779, 28/1/43, pp. 99-100.)
103	7920	Germany	...	*Henschel Hs. 129 (Ground Attack), Two Silhouettes.* (Flight, Vol. 43, No. 1,782, 18/2/43, p. 167.)
104	7921	Germany	...	*Messerschmitt Me. 109 G-2 (Fighter).* (Flight, Vol. 43, No. 1,782, 18/2/43, p. 167.)
105	7922	Germany	...	*Ju. 87 D-1 (Dive Bomber).* (Flight, Vol. 43, No. 1,782, 18/2/43, p. 167.)
106	7929	Germany	...	*Messerschmitt 210 A-1.* (Flight, Vol. 43, No. 1,781, 11/2/43, pp. 143-146.)
107	7931	Germany	...	*Fieseler "Storch" (Recog. Details).* (Flight, Vol. 43, No. 1,781, 11/2/43, p. b.)
108	7956	Germany	...	*Messerschmitt Me. 210 A-1.* (Aeroplane, Vol. 64, No. 1,655, 12/2/43, pp. 194-197.)
109	7968	Germany	...	*Messerschmitt 109 G-2.* (Aeroplane, Vol. 64, No. 1,656,19/2/43, p. 203.)
110	7969	Germany	...	*Henschel Hs. 129 Ground Attack Aircraft.* (Aeroplane, Vol. 64, No. 1,656, 19/2/43, p. 203.)
111	7970	Germany	...	*Junkers 87 D.1.* (Aeroplane, Vol. 64, No. 1,656, 19/2/43, p. 203.)
112	8006	Germany	...	*F.W. 190 and its Engine (B.M.W. 801).* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 566-567.)
113	8125	Germany	...	*Junkers Ju. 90 (Recog. Details).* (Flight, Vol. 43, No. 1,777, 14/1/43, p. b.)
				Military Types (Italy).
114	7843	Italy ...	...	*Fiat C.R. 42 "Freccia" (Recog. Details).* (Aeroplane, Vol. 64, No. 1,653, 29/1/43, p. 130.)
				Military Types (Japan).
115	6973	Japan	...	*Mitsubishi Zero Fighter (Photograph).* (U.S. Air Services, Vol. 27, No. 11, Nov., 1942, p. 15.)
116	7625	Japan	...	*Mitsubishi S-00 Fighter.* (Inter. Avia., No. 844-845, 21/11/42, p. 19.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
117	7955	Japan ...	*Mitsubishi Navy S-00 (Recog. Details).* (Aeroplane, Vol. 64, No. 1,655, 12/2/43, p. 193.)
			Military Types (France).
118	7624	France ...	*Starck AS-20 Light Aeroplane.* (Inter. Avia., No. 844-845, 21/11/42, pp. II, 18-19.)
			Military Transport Planes.
119	6983	U.S.A. ...	*Martin Mars to be Converted to Cargo Transport.* ((Am. Av., Vol. 6, No. 14, 15/12/42, p. 9.)
120	7615	U.S.A. ...	*Martin P.B.M.-3 "Mariner" (Cargo Version).* (Inter. Avia., No. 844-845, 21/11/42, p. 13.)
121	7616	U.S.A. ...	*Curtiss C-76 Cargo Planes.* (Inter. Avia., No. 844-845, 21/11/42, p. 13.)
122	7617	U.S.A. ...	*Lockheed L-46 "Constellation" Cargo Plane.* (Inter. Avia., No. 844-845, 21/11/42, p. 13.)
123	7830	U.S.A. ...	*Lockheed "Constellation" (Transport).* (Flight, Vol. 43, No. 1,783, 25/2/43, pp. 198-201.)
124	7853	U.S.A. ...	*Curtiss Caravan Troop Carrier (Photo).* (Flight, Vol. 43, No. 1,778, 21/1/43, p. 62.)
125	7859	Germany ...	*Modified Ju. 90 Transport (Photo).* (Flight, Vol. 43, No. 1,778, 21/1/43, p. 69.)
126	7860	Germany ...	*B.V. 222 45-Ton Flying Boat.* (Flight, Vol. 43, No. 1,778, 21/1/43, p. 69.)
127	7864	U.S.A. ...	*Curtiss-Wright C-76 Caravan Transport (Wood).* (Am. Av., Vol. 6, No. 15, 1/1/43, p. 44.)
128	7865	U.S.A. ...	*Curtiss-Wright Commando Transport (Photo).* (Am. Av., Vol. 6, No. 15, 1/1/43, p. 45.)
129	7903	U.S.A. ...	*Lockheed "Constellation" (Photo).* (Flight, Vol. 43, No. 1,779, 28/1/43, p. 98.)
130	7928	U.S.A. ...	*Lockheed "Constellation" Transport (Photo).* (Flight, Vol. 43, No. 1,781, 11/2/43, p. 141.)
131	7971	U.S.A. ...	*Douglas C.54 Transport "Skymaster" (Photo).* (Aeroplane, Vol. 64, No. 1,656, 19/2/43, p. 205.)
132	8128	U.S.A. ...	*Curtiss Caravan (Freight Craft) (Photo).* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 45.)
			Gliders.
133	6920	U.S.A. ...	*Ford War Glider (15 Passengers) (Photo).* (Autom. Ind., Vol. 81, No. 10, 15/11/42, p. 54.)
134	6979	U.S.A. ...	*C.G. 4 (15-Passenger Glider) (Photograph).* (Am. Av., Vol. 6, No. 13, 1/12/42, p. 6.)
135	7797	U.S.A. ...	*C.G. 4a and Waco American Transport Gliders.* (Inter. Avia., No. 843, 11/11/42, p. 20.)
136	7831	U.S.A. ...	*Amphibian U.S. Navy Glider XLQ-1 (Photograph).* (Flight, Vol. 43, No. 1,783, 25/2/43, p. 202.)
137	7863	U.S.A. ...	*Cargo Gliders.* (Am. Av., Vol. 6, No. 15, 1/1/43, p. 18.)
138	7907	U.S.A. ...	*Douglas C.47 Towing Ford Glider (Photo).* (Flight, Vol. 43, No. 1,779, 28/1/43, p. 107.)
139	7924	G.B., U.S.A. ...	*War Gliders.* (N. D. Ryder, Flight, Vol. 43, No. 1,782, 18/2/43, pp. 171-174.)
140	7950	Germany ...	*Gotha Go. 246 Glider (Photo).* (Aeroplane, Vol. 64, No. 1,655, 12/2/43, p. 178.)
141	7967	G.B. ...	*Airspeed Horsa Glider (Photo).* (Aeroplane, Vol. 64, No. 1,656, 19/2/43, p. 202.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
142	8122	Germany ...	*German Gliding Record.* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 40.)
			A.R.P. and Barrage Balloons.
143	6931	France ...	*The Destruction of Towns by Blast Bombs.* (C. Rougeron, La Science et la Vie, Vol. 60, No. 291, Nov., 1941, pp. 259-268.)
144	6958	U.S.A. ...	*Liquid CO_2 Fire Extinguishers.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 24, 25/12/42, p. 1,688.)
145	6959	U.S.A. ...	*Mobile Sterilization Unit (Methyl Bromide).* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 24, 25/12/42, p. 1,689.)
146	7747	U.S.A. ...	*Emergency Repair of Gas Mains.* (C. S. Goldsmith, A.S.M.E., Preprints No. 29, Annual Meeting, Nov. 30-Dec. 4, 1942.)
147	7763	U.S.A. ...	*A.R.P. Shop Lighting without Glare.* (Modern Plastics, Vol. 20, No. 1, Sept., 1942, p. 60.)
148	7773	U.S.A. ...	*U.S. Navy Blimps.* (Canadian Av., Vol. 15, No. 11, Nov., 1942, p. 114.)
149	7892	U.S.A. ...	*Barrage Balloons.* (W. H. Kendall, R. H. Redford, Coast Artillery J., Vol. 85, No. 5, Sept.-Oct., 1942, pp. 35-37.)
150	7894	G.B.	*British A.A. Rockets.* (Coast Artillery J., Vol. 85, No. 5, Sept.-Oct., 1942, p. 60.)
151	7987	G.B.	*Extinction of Metal Fires.* (Light Metals, Vol. 5, No. 56, Sept., 1942, p. 340.)

Aero and Hydrodynamics.

Flow (General, including Tunnels and Ejectors).

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
152	6895	U.S.A. ...	*Some Two-Dimensional Aspects of the Ejector Problem.* (J. A. Goff and C. H. Coogan, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 151-154.)
153	6940	G.B.	*Newton and Aerodynamics.* (Th. v. Kármán, Engineer, Vol. 175, No. 4,545, 19/2/43, pp. 149-150.)
154	7872	G.B.	*Wind Pressure on Structures.* (Mech. World, Vol. 113, No. 2,926, 29/1/43, pp. 127-129.)
155	7897	G.B.	*The Free Streaming of Gases in Sloping Galleries.* (E. H. M. Georgeson, Procs. Roy. Soc., Vol. 180, No. 983, 3/7/42, pp. 484-493.)
156	8172	Germany ...	*Symmetrical Potential Flow of a Compressible Gas about a Circular Cylinder in a Free Jet (Sub-Critical Region).* (E. Lamla, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 358-362.)
157	8073	U.S.A. ...	*Study of the Aerodynamic Field of Flow by the Method of Filaments of Smoke.* (J. Valensi, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 520-525.)
158	7804	G.B.	*Symmetrical Vortex Sheet in Sound Sensitive Plane Jets.* (P. Savie and J. W. Murphy, Phil. Mag., Vol. 34, No. 229, Feb., 1943, pp. 139-144.)
159	8074	U.S.A. ...	*Factors Influencing the Energy Ratio of Return Flow Wind Tunnels.* (F. L. Wattendorf, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 526-531.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Turbulence.
160	8043	U.S.A. ...	*The Utilisation of Vortex Photographs for Quantitive Analysis of the Origin of Turbulence and Resistance.* (L. Schiller, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 315-320.)
161	8044	U.S.A. ...	*The Effect of Turbulence on Transition in the Boundary Layer of an Elliptic Cylinder.* (G. B. Schaubauer, Procs. of the 5th International Congress for Applied Mech., 1938, pp. 321-325.)
162	8047	U.S.A. ...	*Contribution to the Symposium on Turbulence.* (L. Prandtl, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 340-346.)
163	8048	U.S.A. ...	*Some Remarks on the Statistical Theory of Turbulence.* (Th. von Kármán, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 347-351.)
164	8049	U.S.A. ...	*Some Recent Researches on Turbulence.* (J. Kampe De Feriet, Procs. of the 5th International Congress for Applied Mech., 1939, pp. 352-355.)
165	8050	U.S.A. ...	*The Use of Statistical Theory in the Study of Turbulence.* (N. Wiener, Procs. of the 5th International Congress for Applied Mech., 1939, pp. 356-358.)
166	8051	U.S.A. ...	*Turbulence Investigations at the National Bureau of Standards.* (H. L. Dryden, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 362-368.)
167	8054	U.S.A. ...	*Note on Shearing Stresses Caused by Large Scale Lateral Mixing.* (C. G. Rossby, Procs. of the 5th Internat. Congress for App. Mechanics, 1939, pp. 379-381.)
168	8055	U.S.A. ...	*The Measurement of Correlation in Fluid Motions.* (E. G. Richardson, Procs. of the 5th Internat. Congress for App. Mechanics, 1939, pp. 382-385.)
169	8056	U.S.A. ...	*A Critical Discussion of Turbulent Flows in Channels and Circular Tubes.* (C. B. Millikan, Procs. of the 5th Internat. Congress for App. Mechanics, pp. 386-392.)
170	8058	U.S.A. ...	*Studies in Eddy Diffusion.* (W. L. Towle and others, Procs. of the 5th International Congress for App. Mechanics, 1939, pp. 396-402.)
171	8066	U.S.A. ...	*Note on the Statistical Theory of Turbulence.* (E. Reissner, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 359-361.)
			Boundary Layer.
172	8042	U.S.A. ...	*Transition as it Occurs Associated with the Following Laminar Separation.* (E. N. Jacobs and A. E. van Doenhoff, Procs. of the 5th Internat. Congress for Applied Mechanics, 1939, pp. 311-314.)
173	8045	U.S.A. ...	*The Stability of Plane Poiseuille Motion.* (J. L. Synge, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 326-332.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
174	8046	U.S.A.	...	*Hot Wires in Flight (Boundary Layer Investigations).* (A. V. Stephens and A. H. Hall, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 336-339.)
175	8057	U.S.A.	...	*A Study in Boundary Layers.* (H. Peters, Procs. of the 5th Internat. Congress for App. Mechanics, 1939, pp. 393-395.)
176	8060	U.S.A.	...	*Experiments on the Effects of Surface Roughness.* (E. F. Relf, Procs. of the 5th International Congress for Applied Mech., 1939, pp. 410-415.)
				Wing Theory and Flutter.
177	7730	U.S.A.	...	*The Relationship Between Reynolds Number and Velocity Distribution.* (L. S. Rhodes, Annual Meeting of the A.S.M.E., Nov.-Dec., 1942.)
178	8059	U.S.A.	...	*Wake Characteristics and Determination of Profile Drag by the Momentum Method.* (A. Silverstein, Procs. of the 5th Internat. Congress for App. Mechanics, 1939, pp. 403-409.)
179	8068	U.S.A.	...	*A Contribution to the Aerofoil Theory for Non-Uniform Motion.* (W. R. Sears, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 483-487.)
180	8069	U.S.A.	...	*An Induced Angle Calculator.* (G. J. Klien, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 488-491.)
181	8100	U.S.A.	...	*On Some Fourier Transforms in the Theory of Non-Steady Flows.* (I. E. Garrick, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 590-593.)
182	8101	U.S.A.	...	*The Flutter Problem.* (T. Theodorsen, Procs. of the 5th Internat. Congress for Applied Mechanics, 1939, pp. 594-597.)
183	8173	Germany	...	*Some Simple Formulæ Used in Wing Theory (Lift Distribution as Affected by Plan and Twist).* (H. B. Helmbold, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 363-366.)
184	8174	Germany	...	*The Downwash Along the Longitudinal Axis of a Wing with a Circulation Distribution According to Betz.* (G. Schulz, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 367-373.)
				General Motion of Aircraft.
185	6989	Germany	...	*Aerodynamics of the Fuselage.* (H. Multhopp, L.F.F., Vol. 18, No. 2-3, 29/3/41, pp. 52-56.) (R.T.P.3, Translation No. 1,220, and T.M. 1,036.)
186	8102	U.S.A.	...	*The General Motion of the Aeroplane.* (S. Brodetsky, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 599-605.)
187	8103	U.S.A.	...	*Curvilinear Dynamics of Airships Based on Towed Model Tests.* (R. H. Smith, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 606-613.)

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ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
188	8171	Germany ...	*Influence of Atmospheric Density Gradient on the Longitudinal Motion of Aircraft (Errata).* (F. N. Schneubel, L.F.F., Vol. 19, No. 10-12, 11/1/43, p. 357.)

Hydrodynamics (including Lubrication and Cavitation).

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
189	6902	U.S.A. ...	*Mechanism of Cavitation Erosion.* (T. C. Poulter, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 193-194.)
190	8061	U.S.A. ...	*Application of Statistical Theory of Turbulence to Hydraulic Problems.* (A. A. Kalinske and E. R. van Driest, Procs. of the 5th Internat. Congress for Applied Mech., 1939, 416-421.)
191	8063	U.S.A. ...	*The Flow of Fluids in Rotating Tanks.* (C. L. Peckeris, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 440-443.)
192	8064	U.S.A. ...	*The Vector Form of the Equations for the Motion of a Solid Through a Liquid.* (L. M. Milne-Thompson, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 444-447.)
193	8065	U.S.A. ...	*On the Hydrodynamical Theory of the Viscosity of Suspensions.* (E. Guth, Procs. of the 5th International Congress for Applied Mech., 1939, pp. 448-455.)
194	8067	U.S.A. ...	*A Contribution to the Theory of Planing Surfaces.* (W. Ballay, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 474-477.)
195	8071	U.S.A. ...	*Contribution to the Question of the Effect of the Basin Walls on Ship Model Tests.* (K. F. Tupper, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 509-512.)
196	8072	U.S.A. ...	*Scale Effect in Tank Tests of Seaplane Models.* (L. P. Coombes, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 513-519.)
197	8075	U.S.A. ...	*Curvilinear Flow of Liquids with Free Surfaces at Velocities Above that of Wave Propagation.* (R. T. Knapp and A. T. Ippen, Procs. of the 5th International Congress for Applied Mechs., 1939, p. 531.)
198	8076	U.S.A.	*Propagation of Finite Discontinuities in a Water Channel (Downstream Phenomena).* (Ph.Deynie, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 537-544.)
199	8077	U.S.A. ...	*Research on the Theory of Running Water (Rivers).* (P. Masse, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 545-549.)
200	8079	U.S.A. ...	*Flow Through Granular Media.* (B. A. Bakhmeteff and N. V. Feodoaff, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 555-560.)
201	8090	U.S.A. ...	*The Thick Film Lubrication of Journal Bearings of Finite Length.* (M. Muskat and F. Morgan, Procs. of the 5th International Congress of Applied Mechs., 1939, pp. 642-648.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
202	8097	U.S.A. ...	*Pressure Drop and Velocity Distribution for Incompressible Viscous Non-Isothermal Flow in the Steady State Through a Pipe.* (A. Lee and others, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 571-577.)
203	8104	U.S.A. ...	*Cavitation Study by the Vibratory Method.* (H. Peters and B. Rightmire, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 614-616.)
204	8105	U.S.A. ...	*Fluid Dynamic Control of Fluid Flow (Control without Movable Mechanical Parts).* (K. D. McMahan, Procs. of the 5th Internat. Congress for Applied Mechanics, 1938, pp. 617-624.)
205	8106	G.B.	*On the Mechanism of the Fluid Oil Film in Bearings with Perfect Lubrication.* (G. B. Karelitz and others, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 625-630.)

Aircraft, Airscrews and Accessories.

Performance.

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
206	6981	U.S.A. ...	*Pressure Cabin for Testing Aircraft Equipment (Photograph).* (Am. Av., Vol. 6, No. 13, 1/12/42, p. 47.)
207	7835	G.B.	*High Altitude Flight—II.* (W. Nichols, Flight, Vol. 43, No. 1,783, 25/2/43, pp. 206-209.)
208	7870	U.S.A. ...	*Aircraft Wheel Balancing Machine.* (Am. Av., Vol. 6, No. 12, 15/11/42, p. 39.)
209	7927	G.B.	*High Altitude Flight (I).* (W. Nicholls, Flight, Vol. 43, No. 1,782, 18/2/43, pp. 180-183.)
210	8175	U.S.A. ...	*Flight Testing for Performance and Stability (with Discussion).* (E. T. Allen, J. Aeron. Sciences, Vol. 10, No. 1, Jan., 1943, pp. 1-30.)
211	8176	U.S.A. ...	*The 1914 Tests of the Langley "Aerodrome."* (C. G. Abbot, J. Aeron. Sciences, Vol. 10, No. 1, Jan., 1943, pp. 31-35.)
212	8177	U.S.A. ...	*Graphical Determination of Distance in Accelerated Aeroplane Motion.* (G. A. Mokrzycki, J. Aeron. Sciences, Vol. 10, No. 1, Jan., 1943, pp. 36-37.)

Stresses.

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
213	6984	G.B.	*Two-Spar Wing Stress Analysis.* (W. J. Goodey, Airc. Eng., Vol. 15, No. 167, Jan., 1943, pp. 2-7.)
214	6885	U.S.A. ...	*Stresses in Space-Curved Rings Reinforcing the Edges of Cut-Outs in Monocoque Fuselages.* (N. J. Hoff, J. Roy. Aeron. Soc., Vol. 47, No. 386, Feb., 1943, pp. 35-83.)
215	7937	G.B.	*Two-Spar Wing Stress Analysis (II).* (W. J. Goodrey, Airc. Eng., Vol. 15, No. 168, Feb., 1943, pp. 38-46.)
216	7672	U.S.A. ...	*The Determination of Fuselage Moments.* (C. E. Poppas, S.A.E. Preprint read at War Engineering Prod. Meeting, Jan. 11-15, 1943.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
217	8024	U.S.A.	...	*General Methods of Calculation of Two-Spar Wings Under Torsion.* (W. Billewicz and A. Jzedzielski, Procs. of 5th Internat. Congress of Applied Mechanics, 1939, pp. 151-158.)
				Cargo Plane Design.
218	7642	U.S.A.	...	*Structural Materials for the Cargo Aeroplane.* (H. D. Hoekstra, S.A.E. Meeting, Dec. 2nd-9th, 1942,, Preprint No. 31.)
219	7643	U.S.A.	...	*Deficiencies of Converted Passenger Aeroplanes for Cargo Transport and Operating Requirements.* (C. Froesch, S.A.E. Meeting, Preprint No. 32, Dec. 2nd-9th, 1942.)
220	7645	U.S.A.	...	*Aeroplane Design for Cargo Transportation.* (Carlos Wood, S.A.E. Meeting, Preprint No. 34, Dec. 2nd-9th, 1942.)
221	7888	U.S.A.	...	*Engineering Design for Air Cargo Systems, including Gliders (Symposium of Papers).* (A. W. Stronberg, S.A.E.J. Journal, Vol. 51, No. 1, Jan., 1943, pp. 15, 18 and 54-56.)
				Air Cargo Operation.
222	6980	U.S.A.	...	*Loading Devices for Cargo Planes (Photograph).* (Am. Av., Vol. 6, No. 13, 1/12/42, p. 22.)
223	7641	U.S.A.	...	*Air Pick-up and Gliders as Related to Future of Air Cargo.* (R. C. Dupont, S.A.E. Meeting, Preprint No. 30, Dec. 2nd-9th, 1942.)
224	7644	U.S.A.	...	*Securing Means for Air Cargo.* (Col. E. S. Evans, S.A.E.Meeting, Preprint No. 33, Dec. 2nd-9th, 1942.)
225	7646	U.S.A.	...	*Some Aspects of Air Cargo Operation in Latin America.* (J. Parker Van Zandt, S.A.E. Meeting, Preprint No. 35, Dec. 2nd-9th, 1942.)
226	7647	U.S.A.	...	*Packaging and Handling of Air Cargo.* (C. G. Peterson, S.A.E. Meeting, Preprint No. 36, Dec. 2nd-9th, 1942.)
227	7648	U.S.A.	...	*The Economies of Post-War Carriage of Air Cargo.* (J. V. Sheehan, S.A.E. Meeting, Preprint No. 37, Dec. 2nd-9th, 1942.)
				Civil Aviation.
228	6852	G.B. ...	...	*Revival of Civil Air Transport.* (Engineer, Vol. 175, No. 4,544, 12/2/43, pp. 132-133.)
229	7659	U.S.A.	...	*Cabin Supercharging in Scheduled Airline Operation.* R. L. Ellinger, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
230	7692	U.S.A.	...	*Pan-American Clippers.* (Commercial Aviation, Vol. 4, No. 8, Aug., 1942, pp. 92-96.)
231	7829	G.B. ...	...	*Air Transport Planning.* (A. J. Cobham, Flight, Vol. 43, No. 1,783, 25/2/43, pp. 196-197.)
232	7846	G.B. ...	...	*The Future of Civil Aviation.* (Aeroplane, Vol. 64, No. 1,653, 29/1/43, p. 137.)
233	7869	U.S.A.	...	*American Air Lines "Air Map."* (Am. Av., Vol. 6, No. 12, 15/11/42, p. 21.)
234	8135	G.B. ...	...	*Post-War Civil Aviation in G.B.* (Nature, Vol. 51, No. 3,824, 13/2/43, pp. 175-177.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Airscrews.
235	6977	U.S.A. ...	*Vibration Test Unit for Curtiss Electric Propellers.* (Bladesman, Vol. 2, No. 1, Sept., 1942, pp. 6-10.)
236	6978	U.S.A. ...	*Propeller Cuffs.* (Bladesman, Vol. 2, No. 1, Sept., 1942, pp. 14-16.)
237	6990	U.S.A. ...	*The Hull and Its Screw Propeller.* (E. A. Stevens, J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 534-576.)
238	7836	G.B.	*Jettisonable Rotor to Provide Extra Lift.* (E. V. Hammond, Flight, Vol. 43, No. 1,783, 25/2/43, pp. 211-212.)
239	7866	U.S.A. ...	*General Motors New Contra Propeller (Photo).* (Am. Av., Vol. 6, No. 15, 1/1/43, p. 48.)
240	7943	U.S.A. ...	*Vought Sikorsky V.S.-300 Helicopter (Photo).* (Aeroplane, Vol. 64, No. 1,654, 5/2/43, p. 143.)
241	8070	U.S.A. ...	*Formulæ for Propeller Characteristics Calculation and the Method to Obtain the Best Pitch Distribution.* (T. Moriya, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 504-508.)

Engines and Accessories.

			Named Types.
242	6985	Germany ...	*Junkers Ju. 211 Aero Engine.* (S. Oldberg and T. M. Ball, Airc. Eng., Vol. 15, No. 167, Jan., 1943, pp. 8-18.)
243	7756	Japan ...	*Some Notes on Design Features of the Mitsubishi Kinsei Engine.* (W. G. Ovens, S.A.E., Preprint No. 4, National Aircraft Production Meeting, Oct. 1-3, 1942.)
244	7933	U.S.A. ...	*Wright Double-Row Cyclone (1,600 h.p. Radial).* (Flight, Vol. 43, No. 1,781, 11/2/43, pp. 156-157.)
245	8123	France ...	*French Gnome et Rhône 18-Cylinder Engine.* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 40.)
246	8127	G.B.	*Gypsy Major I Aero Engine (Overhaul Periods).* (Flight, Vol. 43, No. 1,777, 14/1/43, pp. 44/45.)
			General Design and Performance.
247	6986	G.B.	*Standardization of Aero Engine Components.* (G. Carvelli, Airc. Eng., Vol. 15, No. 167, Jan., 1943, pp. 23-25 and 28.)
248	6987	Germany ...	*Aerodynamic Heat Power Engine Operating on a Closed Cycle.* (J. Ackeret and D. C. Keller, Z.V.D.I., Vol. 85, No. 22, 31/5/42, pp. 491-500.) (R.T.P. Translation No. 1,233 and T.M. 1,034.)
249	7662	U.S.A. ...	*New Materials for Aircraft Engines.* (M. Young and H. H. Hanink, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
250	7667	U.S.A. ...	*Influence of Engine Adjustment and Octane Number on Performance of Commercial Engines.* (D. P. Brenz and others, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
251	7673	U.S.A. ...	*Aviation Power Plants (Design and Construction).* (S. A. Moss, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
252	7705	Germany	...	*Automatic Load-Speed Ignition Control for Spark Ignition Engine* (*Pat.* 688,841). (R. Bosch, Ltd., A.T.Z., Vol. 43, No. 8, 25/4/40, p. 209.)
253	7827	G.B. ...	...	*Definition of Volumetric Efficiency.* (P. H. Schweitzer, Engg., Vol. 155, No. 4,624, 26/2/43, pp. 178-179.)
254	8094	U.S.A.	...	*Mean Pressure Indicators for Internal Combustion Engines.* (S. El. Sawy, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 673-676.)
255	8170	Germany	...	*On the Relation Between Shape, Spectrum and Manufacturing Accuracy of Engine Cams.* (K. Schlaefke, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 353-357.)
				Stresses and Vibration.
256	6898	U.S.A.	...	*Short Gauge Extensometer for Crankshaft Stresses.* (C. W. Gadd, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 191-192.)
257	6905	U.S.A.	...	*Investigation of Self-Excited Torsional Oscillations and Vibration Damper for Induction Motor Drives.* (A. M. Wahl, E. G. Fischer, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 175-183.)
258	6988	Germany	...	*Control of Torsional Vibrations by Pendulum Masses.* (A. Stieglitz, Jahrbuch der deutschen, L.F.F., 1938, Vol. 2, pp. 164-178.) (R.T.P. Translation No. 1,012 and T.M. 1,035.)
259	6995	G.B. ...	...	*Axial Vibrations of Diesel Engine Crankshafts.* (R. Poole, J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 616-646.)
260	7663	U.S.A.	...	*Methods of Stress Determination in Engine Parts.* (C. Lipson, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
261	7726	U.S.A.	...	*Critical Speeds of a Rotor with Unequal Shaft Flexibilities, Mounted in Bearings of Unequal Flexibility—I.* (W. F. Foote and others, Annual Meeting of the A.S.M.E., Nov.-Dec., 1942.)
262	7885	Germany	...	*Endurance Tests on Light Alloy Connecting Rods (from the German).* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 338-340.)
263	8093	U.S.A.	...	*Vibration Isolation of Aircraft Power Plants.* (E. S. Taylor and K. A. Browne, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 656-662.)
264	8178	U.S.A.	...	*Pendulum Type Vibration Absorbers.* (R. G. Manley, J. Aeron. Sciences, Vol. 10, No. 1, Jan., 1943, pp. 38-39.)
				Ring and Cylinder Wear.
265	7670	U.S.A.	...	*The Influence of Lubricating Oil Viscosity on Cylinder Wear.* (H. A. Everett, S.A.E. Preprint, read at War Engineering Prod. Meeting, Jan. 11-15, 1943.)
266	7883	U.S.A.	...	*Importance of Compression Rings in Controlling Oil Consumption.* (M. O. Teator, S.A.E.J. Trans., Vol. 51, No. 1, Jan., 1943, pp. 20-22.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
267	7887	U.S.A. ...	*Piston Rings and Oil Control in a Cycle High Output Diesel Engine.* (F. G. Sholinaker and R. Albright, S.A.E.J. Trans., Vol. 51, No. 1, Jan., 1943, pp. 31-32.)
			Bearings and Static Friction.
268	6921	U.S.A. ...	*Bearing Corrosion in Cn.-Pb. Alloys.* (Autom. Ind., Vol. 87, No. 10, 15/11/42, p. 76.)
269	7631	U.S.A. ...	*Bearings and Bearing Corrosion.* (L. Raymond, J.S.A.E., Vol. 50, No. 12, Dec., 1942, pp. 533-537.)
270	7669	U.S.A. ...	*Corrosion of Bearing Alloys.* (L. M. Tichvinsky, S.A.E. Preprint, read at War Engineering Prod. Meeting, Jan. 11-15, 1943.)
271	7679	Germany ...	*Sliding Friction Wear of Iron and Steel Over the Temperature Range—190° to 700°C. (Digest).* (Stahl und Eisen, Vol. 62, No. 17, 23/4/42, p. 356.)
272	7739	U.S.A. ...	*Static Friction.* (W. Claypoole, A.S.M.E., preprint No. 9, Annual Meeting, Nov. 30-Dec. 4, 1942.)
273	7750	U.S.A. ...	*Bearings and Bearing Corrosion.* (L. Raymond, S.A.E., Preprint No. 9. National Fuels and Lubricants Meeting, Oct. 22-23, 1942.)
274	7818	G.B.	*Thrust Bearings for High Speeds.* (Machinery, Vol. 62, No. 1,579, 14/1/43, pp. 46-47.)
275	7889	U.S.A. ...	*Engine Bearings Replacement (Technique for Installation and Fitting).* (S.A.E.J. Journal, Vol. 51, No. 1, Jan., 1943, pp. 25-40.)
276	8009	G.B.	*Surface Finish of Journals.* (R. W. Dayton and others, Mech. World, Vol. 112, No. 2,920.)
277	8088	U.S.A. ...	*Theoretical Pressure Distribution in Journal Bearings.* (E. O. Waters, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 631-637.)
278	8089	U.S.A. ...	*Thermal Equilibrium in Journal Bearings.* (M. D. Hersey, Procs. of the 5th Internat. Congress of Applied Mechanics, 1939, pp. 638-641.)
			Carburettors and Injection Pumps.
279	7664	U.S.A. ...	*Carburation for the Aircraft Engine.* (F. J. Wiegand, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
280	7706	Germany ...	*Fuel Injection Pump of the Gear Wheel Type (Pat. 688,970).* (O. Posch, A.T.Z., Vol. 43, No. 8, 25/4/40, p. 209.)
281	8001	G.B.	*S.U. Carburettor—Part I.* (F. C. Sheffield, Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 537-543.)
			Air Filters.
282	6914	U.S.A. ...	*Aircraft Engine Air Filters (Digest).* (W. W. Cannon, Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 46-47.)
283	7754	U.S.A. ...	*Requirements for Carburettor Air Filters for Aircraft Engines.* (Wayne D. Cannon, S.A.E., Preprint No. 2, National Aircraft Production Meeting, Oct. 1-3, 1942.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Pumps and Superchargers.
284	7660	U.S.A. ...	*The Elliott-Lysholm Supercharger.* (A. Lysholm and others, S.A.E. Preprint, the War Engineering Prod. Meeting, Jan. 11-15, 1943.)
285	7671	U.S.A. ...	*Hamilton-Whitfield Blower.* (J. E. Whitfield, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
286	7708	U.S.A. ...	*Centrifugal Pump Performance as a Function of Specific Speed.* (A. J. Stephanoff, A.S.M.E. Annual Meeting, Nov.-Dec., 1942.)
287	7794	Switzerland ...	*Brown Boveri Exhaust Supercharger on Merlin Engine.* (Inter. Avia., No. 843, 11/11/43, p. 16.)
			Boost Control.
288	7855	G.B.	*Boost Control.* (W. Maxwell, Flight, Vol. 43, No. 1,778, 21/1/43, pp. 65-66.)
289	8130	G.B.	*Boost Pressure Variation in Merlin Engines.* (N. D. Young and others, Flight, Vol. 43, No. 1,777, 14/1/43, p. 50.)
			Accessory Drives.
290	6922	G.B.	*Rotol Universal Gearbox.* (Autom. Ind., Vol. 87, No. 10, 15/11/42, p. 58.)
291	7712	U.S.A. ...	*Harmonic Analysis of a Hook's Joint Motion.* (F. A. Hiersch, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
292	8010	G.B.	*Hydraulic Variable Speed Drive.* (Mech. World, Vol. 112, No. 2,920, 18/12/42, pp. 584-585.)
			Exhaust Phenomena.
293	7693	Canada ...	*Exhaust Gas Tester (Thermal Conductivity).* (Commercial Aviation, Vol. 4, No. 8, Aug., 1942, p. 128.)
294	7980	G.B.	*Exhaust Pipe Phenomena.* (G. F. Mucklow, Mech. World, Vol. CXII, No. 2,917, 27/11/42, pp. 506-511.)
			Turbines.
295	6991	U.S.A. ...	*End Losses of Turbine Blades (Discussion).* (J. Kreitner, J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 374-376.)
296	6993	U.S.A. ...	*Effect of Nozzle and Bucket Deposits on Turbine Capacity and Efficiency.* (B. O. Buckland, J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 595-605.)
297	7719	U.S.A. ...	*Application of Turbine Supervisory Instruments to Power Generating Equipment.* (J. L. Roberts, H. M. Dimond, A.S.M.E. Annual Meeting, Nov.-Dec., 1942.)
			Diesel Engines.
298	6855	G.B.	*Development of Doxford Marine Diesel.* (W. Ker Wilson, Engineering, Vol. 155, No. 4,022, 12/2/43, pp. 121-122.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
299	6909	U.S.S.R.	...	*Two-Stroke Diesel with Exhaust Turbo-Supercharger (from the Russian).* (J. W. Swisstunoff, A. A. Kuritz, Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 28-31.)
300	6945	G.B. ...	...	*Development of the Dorford Marine Oil Engine.* (W. Ker Wilson, Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 141-143.)
301	6994	Switzerland	...	*Silencers and Suppression of Noise in Oil Engines (Sulzer Review).* (J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 605-616.)
302	7630	U.S.A.	...	*Engineering Piston Rings for High-Speed Diesels.* (P. S. Lane and S. Nixon, J.S.A.E. (Trans.), Vol. 50, No. 12, Dec., 1942, pp. 529-532.)
303	7632	U.S.A.	...	*Diesel Piston Problems (Digest).* (J.S.A.E., Vol. 50, No. 12, Dec., 1942, p. 537.)
304	7633	U.S.A.	...	*Diesel Lubricating Problems (Digest).* (J.S.A.E., Vol. 50, No. 12, Dec., 1942, p. 527.)
305	7697	Germany	...	*Aero Engine Diesels (Review of Non-German Designs).* (H. Schneider, A.T.Z., Vol. 43, No. 8, 25/4/40, pp. 199-203.)
306	7698	Germany	...	*M.A.N.Process for High Speed Diesel Engine (Combustion Space Recessed in Piston).* (S. Meurer, A.T.Z., Vol. 43, No. 8, 25/4/40, pp. 185-190.)
307	7700	Germany	...	*Combustion in Pre-Combustion Chamber (Diesel).* (K. Schnakig, A.T.Z., Vol. 43, No. 8, 25/4/40, pp. 263-264.)
308	7701	Germany	...	*Design Modifications for a 25 per cent. Increase in Diesel Engine Speed.* (L. Geisler, A.T.Z., Vol. 43, No. 8, 25/4/40, pp. 191-196.)
309	7748	U.S.A.	...	*New Methods for the Evaluation and Recording of Piston Skirt Deposits.* (H. R. Luck and others, S.A.E., Preprint No. 7, National Fuels and Lubricants Meeting, Oct. 22-23, 1942.)
310	7823	G.B. ...	...	*Development of the Doxford Marine Oil Engine.* (W. Ker Wilson, Engg., Vol. 155, No. 4,024, 26/2/43, pp. 161-163.)

Fuels and Lubricants.

Fuel and Oil Industry.

311	6932	France	...	*Scientific Search for Natural Oil Deposits.* (H. Doyen, La Science et la Vie, Vol. 60, No. 291, Nov., 1941, pp. 269-276.)
312	6976	G.B. ...	...	*Italy's Oil Industry.* (Petroleum Times, Vol. 47, No. 1,186, 9/1/43, p. 11.)
313	7636	U.S.A.	...	*Meeting Wartime Fuel Problems.* (Ollison Craig, Annual Meeting A.S.M.E., Fuels Division, Preprint No. 100, Sept. 30-Oct. 1, 1942.)
314	7649	U.S.A.	...	*Re-Refining of Aircraft Engine Oils.* (G. K. Brower, S.A.E. Meeting, Preprint No. 38, Dec. 2nd-9th, 1942.)
315	7881	U.S.A.	...	*A Refiner's Viewpoint on Motor Fuel Quality.* (W. M. Holaday and J. Happel, S.A.E.J., Vol. 51, No. 1, Jan., 1943, pp. 1-11.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
316	7995	G.B. ...	...	*Economics of Oil Refining in Great Britain.* (G. Tugendhat, Autom. Eng., Vol. 33, No. 433, Feb., 1943, pp. 59-60.)
				Testing.
317	7628	U.S.A.	...	*Effect of Diesel Fuel on Exhaust Smoke and Odour.* (R. S. Wetmiller and L. E. Endsley, J.S.A.E., Vol. 50, No. 12, Dec., 1942, pp. 509-520.)
318	7675	U.S.A.	...	*Effect of Altitude on the Knocking Tendency of Engines.* (D. B. Brooks, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
319	7751	U.S.A.	...	*Correlation of Laboratory Oil Bench Tests with Full-Scale Engine Tests.* (C. W. Georgi, S.A.E. Preprint No. 10, National Fuels and Lubricants Meeting, Oct. 22-23, 1942.)
320	7807	U.S.A.	...	*High Duty Lubricants and Additives.* (Ind. and Eng. Chem., Vol. 21, No. 1, 10/1/43, pp. 24-25.)
321	7882	U.S.A.	...	*Gasoline Engine Exhaust Odours.* (J. J. Mikita and others, S.A.E.J.,, Trans., Vol. 51, No. 1, Jan., 1943, pp. 12-19.)
322	7962	G.B. ...	...	*The Spectra of Chilled Hydrocarbon Flames.* (A. G. Gaydon, Procs. Roy. Soc., Vol. 179, No. 979, 27/2/42, pp. 439-449.)
323	8086	U.S.A.	...	*Acoustical Analysis of the Pressure Waves Accompanying Detonation in the Internal Combustion Engine.* (C. S. Draper and P. M. Morse, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 727-732.)
324	8146	G.B. ...	...	*Continuous Chemical Gas Analysis with Soap Films as Rate of Flow Indicators.* (R. H. Powell, Metal Industry, Vol. 62, No. 10, 5/3/43, pp. 147-148.)
325	8168	Germany	...	*Measurement of Ignition Lag of Liquid Fuels for Spark Ignition Engines.* (E. Lonn, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 344-346.)
				Gaseous Fuels.
326	7696	Germany	...	*Operation of Transport Diesel Engines with Gaseous Fuels.* (L. Koler, A.T.Z., Vol. 43, No. 8, 25/4/40, pp. 183-184.)
327	7704	Germany	...	*Ammonia-Hydrogen Mixtures for Transport Engines* (*Pat.* 686,809). A. Casale, A.T.Z., Vol. 43, No. 8, 25/4/40, p. 210.)
328	7725	U.S.A.	...	*Constructing the Lirette Mobile Natural Gas Transmission Line.* (W. B. Poor, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
329	7979	G.B. ...	...	*Diesel Ignition on Producer Gas (Glasgow Scheme).* (Mechanical World, Vol. CXII, No. 2,917, 27/11/42, p. 505.)
330	7997	G.B. ...	...	*Portable Gas Producers.* (E. R. Slattery, Autom. Eng., Vol. 33, No. 433, Feb., 1943, pp. 69-72.)
				Replacement Fuels.
331	6924	France	...	*French Home Produced Fuels and Lubricants.* (H. Doyen, La Science et la Vie, Vol. 60, No. 292, Dec., 1941, pp. 314-320.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
332	6934	France ...	*Small Charcoal Burners with Recovery of Volatile Products.* (V. Rubor, La Science et la Vie, Vol. 60, No. 291, Nov., 1941, pp. 298-330.)
333	7999	Australia ...	*Charcoal from Wheat in Australia.* (Autom. Eng., Vol. 33, No. 433, Feb., 1943, p. 83.)
			Powdered Fuels.
334	6853	G.B.	*Burning Sawdust.* (Engineer, Vol. 175, No. 4,544, 12/2/43, p. 139.)
335	7702	Germany ...	*Ash Free Coal Extracts for Operation of Coal Dust Engine.* (W. Wilke, A.T.Z., Vol. 43, No. 8, 25/4/40, pp. 196-198.)
336	7703	Germany ...	*Experiences with Coal Dust Engines in Germany.* (A.T.Z., Vol. 43, No. 8, 25/4/40, p. 198.)
337	7736	U.S.A. ...	*Pulverized Coal in the Metallurgical Industries.* (C. F. Herington, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
			Miscellaneous.
338	6967	G.B.	*Abstracts Issued by the Fuel Research Intelligence Section.* (23 and 30 Jan., 1943.)
339	7982	G.B.	*Treated Cardboard Containers for Petrol.* (Mechanical World, Vol. CXII, No. 2,917, 27/11/42, p. 521.)
			Theory of Elasticity.
			General.
340	6859	G.B.	*Extreme Properties of Matter (Possible Limits of Strength of Density, etc.).* (C. G. Darwin, Engineering, Vol. 155, No. 4,022, 12/2/43, pp. 136-137.)
341	6946	G.B.	*Extreme Properties of Matter.* (C. G. Darwin, Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 144-145.)
342	7652	U.S.A. ...	*Influence of Lattice Distortion on Diffusion in Metals (with Discussion).* (V. G. Mooredian and J. T. Norton, Trans., Am. Inst. of M. and M. Eng. (Met. Div.), Vol. 117, 1935, pp. 89-101.)
343	7710	U.S.A. ...	*The Centre of Shear.* (W. R. Osgood, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
344	7738	U.S.A. ...	*New Five-Bar and Six-Bar Linkages in Three Dimensions.* (M. Goldberg, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
345	7878	G.B.	*Molecular Structure and Rubber-like Elasticity.* (C. W. Bunn, Procs. Roy. Soc., Vol. 180, No. 980, 18/3/42, pp. 40-99.)
346	7890	G.B.	*Some Practically Important Stress Systems in Solids of Revolution.* (R. V. Southwell, Procs. Roy. Soc., Vol. 180, No. 983, 3/7/42, pp. 367-396.)
347	7898	G.B.	*Crystal Theory of Metals, Calculation of the Elastic Constants.* (K. Fuchs and H. W. Peng, Procs. Roy. Soc., Vol. 180, No. 983, 3/7/42, pp. 451-476.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
348	7963	G.B. ...	... *Stress-Strain Curve for the Atomic Lattice of Mild Steel and the Physical Significance of the Yield Point of a Metal.* (S. L. Smith and W. A. Wood, Procs. Roy. Soc., Vol. 179, No. 979, 27/2/42, pp. 450-460.)
349	8021	U.S.A.	... *On the Theory of Dislocations and an Application to the Plane Stress Problem of a System of Forces Acting at a Hole.* (J. N. Goodier, Procs. of 5th Internat. Congress of App. Mechanics, 1939, pp. 129-133.)
350	8029	G.B. ...	... *Stress Concentration in Steel Shafts with Semi-Circular Notches.* (H. F. Moore and R. L. Jordan, Procs. of 5th Internat. Congress of App. Mechanics, 1939, pp. 188-192.)
351	8036	U.S.A.	... *Certain Phases of the Combined Stress Problem.* (J. M. Lessels and C. W. Macgregor, Procs., 5th Internat. Congress for Applied Mech., 1939, pp. 201-207.)
352	8039	U.S.A.	... *On Isotropic Materials with Continuous Transition from Elastic to Plastic State.* (W. Prager, Procs. of the International Congress for Applied Mechanics, 1939, pp. 234-237.)
353	8092	U.S.A.	... *The Deformation of Elastically Mounted Rails Caused by Loads Moving at Constant Horizontal Velocity (Rails Extending to Infinity in Both Directions).* (K. Ludwig, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 650-655.)
354	8138	G.B. ...	... *Classification of Rheological Properties.* (R. Bartlett, Nature, Vol. 151, No. 3,824, 13/2/42, pp. 198-199.)
			Plates and Panels.
355	6900	U.S.A.	... *Buckling of Circular Plates Beyond Critical Thrust.* (K. O. Friedrichs and J. J. Stoker, J. App. Mech., Vol. 9, No. 4, Dec., 1942, p. 192.)
356	6903	U.S.A.	... *Buckling of Rectangular Plates with Built-in Edges.* (S. Levy, J. App. Mech., Vol. 9, No. 4, Dec., 1942. pp. 171-174.)
357	7711	U.S.A.	... *Stresses and Displacements in a Rotating Conical Shell.* (J. L. Meriam, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
358	7744	U.S.A.	... *The Influence of the Shape and Rigidity of an Elastic Inclusion on the Transverse Flexure of Thin Plates.* (Martin Goland, A.S.M.E., Preprint No. 17, Annual Meeting, Nov. 30-Dec. 4, 1942.)
359	7801	G.B. ...	... *Boundary Couples in Thin Plates.* (A. C. Stevenson, Phil. Mag., Vol. 34, No. 229, Feb., 1943, pp. 105-114.)
360	7875	G.B. ...	... *The Buckling of a Long Curved Panel Under Axial Compression.* (D. M. A. Leggett, R. and M., No. 1,899, 18/7/42.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
361	8022	U.S.A. ...	*Application of Orthotropic Plate Theory to Ship Bottom Structure.* (H. H. Schade, Procs. of 5th Internat. Congress of App. Mechanics, 1939, pp. 140-144.)
362	8035	U.S.A. ...	*Experimental Study of Sheet-Stringer Panels Under End Compression.* (L. Ramberg and others, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, p. 199.)
			Structures.
363	6950	G.B.	*Recent Developments in Structural Engineering.* (R. H. Evans, Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 155-156.)
364	7826	G.B.	*Recent Developments in Structural Engineering.* (R. H. Evans, Engineering, Vol. 155, No. 4,024, 26/2/43, p. 176.)
365	8023	U.S.A. ...	*Principles of Moment Distribution Applied to Stability of Structural Members (with Discussion).* (E. E. Lundquist, Procs. of 5th Internat. Congress of App. Mechanics, 1939, pp. 145-149.)
366	8025	U.S.A. ...	*The Application of Reciprocal Force Diagrams to Space Frame Works.* (P. D. Crout, Procs. of 5th Internat. Congress of App. Mechanics, 1939, pp. 159-163.)
367	8026	U.S.A. ...	*Stresses and Deformations in Two-Hinged Vierendeel Truss Arches.* (L. C. Maugh, Procs. of 5th Internat. Congress of App. Mechanics, 1939, pp. 164-170.)
368	8027	U.S.A. ...	*On Methods of Calculating Stresses in the Hulls of Rigid Airships.* (K. Arnstein, E. L. Shaw, Procs. of 5th Internat. Congress for App. Mechanics, 1939, pp. 171-177.)
369	8032	U.S.A. ...	*Strength of a Riveted Steel Frame having Straight Flanges.* (A. H. Stang and others, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, p. 200.)
			Springs.
370	6861	G.B.	*Relaxation Resistance of Ni-Alloy Springs (Load Loss at Constant Height).* (B. B. Betty and others, Metal Industry, Vol. 62, No. 7, 12/2/43, pp. 98-100.)
371	7741	U.S.A. ...	*Volute-Spring Formulas.* (C. J. Holland, A.S.M.E., Preprint No. 12, Annual Meeting, Nov. 30-Dec. 4, 1942.)
372	7742	U.S.A. ...	*Notes on Secondary Stresses in Volute Springs.* (H. O. Fuchs, A.S.M.E., Preprint No. 13, Annual Meeting, Nov. 30-Dec. 4, 1942.)
			Columns.
373	6896	U.S.A. ...	*Long Longitudinal Columns.* (F. G. Switzer, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 189-190.)
374	7802	G.B.	*The Torsion of Fluted Columns.* (A. C. Stevenson, Phil. Mag., Vol. 34, No. 229, Feb., 1943, pp. 115-120.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Stress Distribution.
375	6897	U.S.A. ...	*Experimental Determination of the Isostatic Lines.* (A. J. Durell, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 155-160.)
376	6899	U.S.A. ...	*The Photo-Elastic Analysis of Transverse Bending of Plates in the Standard Transmission Polarscope.* D. C. Drucker, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 161-164.)
377	6906	U.S.A. ...	*Brittle Coatings for Quantitative Strain Measurements.* (A. V. de Forest and others, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 184-188.)
378	7608	G.B.	*Beaumount Indicator for Proof Stress Determinations.* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, pp. 101-102.)
379	7729	U.S.A. ...	*A Photo-Elastic Study of Bolt and Nut Fastenings.* (M. Hetényi, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
380	7732	U.S.A. ...	*The Holding Power and Hydraulic Tightness of Expanded Tube Joints: Analysis of the Stress and Deformation.* (J. N. Goodier, Annual Meeting, A.S.M.E., Nov.-Dec., 1942.)
381	7745	U.S.A. ...	*Measurement of Dynamic Strain.* (C. O. Dohrenwend and W. R. Mehaffy, Preprint No. 18, Annual Meeting, Nov. 30-Dec. 4, 1942.)
382	7761	U.S.A. ...	*Calculation of Modulus of Impact (Plastics).* (A. W. Koon, Modern Plastics, Vol. 20, No. 1, Sept., 1942, p. 88.)
383	7936	G.B.	*Strain Gauge Technique in Design.* (C. R. Strang, Airc. Eng., Vol. 15, No. 168, Feb., 1943, pp. 32-37.)
384	7978	G.B.	*The Filming of Slip Lines (Whitewashed Steel Strip).* (Mechanical World, Vol. CXII, No. 2,917, 27/11/42, p. 505.)
385	8028	U.S.S.R. ...	*The Extension Accompanying Contraction of a Test Bar Undergoing Rupture by Tension (including the Work of Rupture).* (W. Broniewski, Procs. of 5th Internat. Congress of App. Mechanics, 1939, pp. 178-182.)
386	8030	U.S.A. ...	*The "Pack" Test for Determining the Compressive Stress-Strain Graphs for Thin-Wall Material.* (C. S. Aitchison and L. B. Tuckerman, Procs. of the International Congress for Applied Mechanics, 1939, pp. 159-163.)
387	8033	U.S.A. ...	*Photostatic Studies of Three-Dimensional Stress Problems (Bakelite Specimens).* (M. Hetenyi, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, p. 208.)
388	8034	U.S.A. ...	*Thermal Stresses in Cylinders by the Photo-Elastic Methods.* (E. E. Weibel, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 213-220.)
389	8037	U.S.A. ...	*On the Optical Determination of Isopachic Stress Patterns.* (M. M. Frocht, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 221-227.)

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390	8095	U.S.A.	... *Measurement of Impact Strains.* (A. V. Deforest, Procs. of the 5th Internat. Congress for Applied Mechanics, 1939, pp. 673-676.)
			Plastic Flow and Creep.
391	6992	U.S.A.	... *Mechanics of Creep for Structural Analysis.* (J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 578-594.)
392	7731	U.S.A.	... *Effect of Deoxidation Practice on Creep Strength of Carbon-Molybdenum Steel at 850° and 1,000°F.* (R. F. Miller, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
393	7740	U.S.A.	... *A Principle of Maximum Plastic Resistance.* (M. A. Sadowsky, A.S.M.E., Preprint No. 11, Annual Meeting, Nov. 30-Dec. 4, 1942.)
394	8038	U.S.A.	... *Failure of a Material Showing Creep (a Dynamic Theory of Strength).* (M. Riener and A. Freudenthal, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 228-233.)
395	8040	U.S.A.	... *Plastic Flow and Creep in Polycrystalline Materials.* (C. R. Soderberg, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 238-244.)
396	8041	U.S.A.	... *Relaxation of Steels at Elevated Temperatures (a New Automatic Testing Machine).* (A. Nadai and J. Boyd, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 245-248.)
			Vibration.
397	6904	U.S.A.	... *Self-Excited Oscillations in Systems with Retarded Actions.* (N. Minorsky, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 195-196.)
398	7603	G.B. ...	... *Avery-Shenk Dynamic Balancing Machine.* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, p. 102.)
399	7629	U.S.A.	... *Dynamically Stable Spring Suspension for Railway Cars and Motor Coaches.* (P. K. Beemer and F. C. Lindvall, J.S.A.E. (Trans.), Vol. 50, No. 12, Dec., 1942, pp. 521-527.)
400	7727	U.S.A.	... *The Free Lateral Vibrations of a Cantilever Beam with a Terminal Dashpot.* (E. J. McBride, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
401	7743	U.S.A.	... *Effectiveness of Shear-Stressed Rubber Compounds in Isolating Machinery Vibration.* (B. C. Madden, A.S.M.E., Preprints No. 14, Annual Meeting, Nov. 30-Dec. 4, 1942.)
402	7939	G.B. ...	... *Theory of Shock Absorbic Design.* (F. E. Burger, Airc. Eng., Vol. 15, No. 168, Feb., 1943, pp. 51-54.)
403	8080	U.S.A.	... *On the Suppression of Vibrations on Board Large Ocean Liners.* (H. Beghin, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 677-680.)
404	8081	U.S.A.	... *Steady Forced Oscillations of Permanent Non-Linear Systems.* (M. Rauscher, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 681-684.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
405	8082	U.S.A.	...	*On Non-Harmonic Oscillations.* (Y. Watanabe, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 685-689.)
406	8084	U.S.A.	...	*A Note on the Natural Vibration of Semi-Cantilever Beam.* (M. Yamamoto, Procs. of the 5th Internat. Congress for Applied Mech., 1939, pp. 708-711.)
407	8085	U.S.A.	...	*"Spiral" Vibrations of Rotating Machinery.* (R. P. Kroon and W. A. Williams, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 712-718.)
				Fatigue.
408	7707	U.S.A.	...	*The Effect of Rest Periods on the Time and Fatigue Strengths of Metallic Materials.* (Bollenrath, F., and Cornelius, H., N.A.C.A. Paper, Oct., 1942, Trans. No. 104 from V.D.I. Zeitschrift, Vol. 84, No. 18, 4/5/40.)
409	8169	Germany	...	*Bending Fatigue Strength of Connections in Built-up Crankshafts.* (F. Gauss, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 347-352.)
				Materials.
				Al. and Mg. Alloys.
410	6862	G.B. ...	...	*Sand Control in Magnesium Foundries.* (E. M. Cramer, Metal Industry, Vol. 62, No. 7, 12/2/43, pp. 103-104.)
411	6863	U.S.A.	...	*Mg. and Al. Production in the U.S.A.* (Metal Industry, Vol. 62, No. 7, 12/2/43, p. 104.)
412	6875	G.B. ...	...	*Information Bulletin No. 2, Specification and Properties of Wrought Al. Alloys.* (Wrought Light Alloys Dev. Ass., Nov., 1942.)
413	6955	U.S.A.	...	*Developments in the Al. Industry in the U.S.A.* (F. C. Trary, Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 24, 25/12/42, pp. 1,646-1,648.)
414	6960	G.B. ...	...	*Metallography of Mg. Alloys.* (J. B. Hess and P. F. George, Metal Industry, Vol. 62, No. 8, 19/2/43, pp. 114-116.)
415	7654	U.S.A.	...	*Quenching Stresses and Precipitation Reactions in Al.-Mg. Alloys.* (R. M. Bosick and others, Trans. Am. Inst. of M. and M. Engs. (Met. Div.), Vol. 117, 1935, pp. 102-118.)
416	7656	U.S.A.	...	*Effect of Composition on Mechanical Properties and Corrosive Resistance of Some Al. Alloy Die Castings.* (E. H. Dix and J. J. Bowman, Trans. Am. Inst. of M. and M. Engs. (Met. Div.), Vol. 117, 1935, pp. 357-370.)
417	7810	G.B. ...	...	*Metallography of Mg. Alloys.* (J. B. Hess and P. F. George, Metal Industry, Vol. 62, No. 9, 26/2/43, pp. 136-138.)
418	7981	G.B. ...	...	*Al. Casting Alloys (Effect of Minor Alloying Elements).* (Mechanical World, Vol. CXII, No. 2,917, 27/11/42, p. 521.)
419	7986	U.S.A.	...	*Sea Water Magnesium Production in the U.S.A.* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 373-374.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
420	7988	Germany ...	*Reflectivity of Aluminium.* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 377-379.)
421	7991	Germany ...	*Properties and Application of Al. Containing Zinc Base Alloys (Die Castings and Wrought Alloys) (from the German).* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 354-361.)
422	8149	G.B.	*Protection of Mg. and its Alloys.* (Metal Industry, Vol. 62, No. 10, 5/3/43, p. 156.)
423	8167	Germany ...	*Investigations on Al.-Zn.-Mg. Wrought Alloys.* (A. Mühlenbruch, H. J. Seemann, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 337-343.)
			Non-Ferrous.
424	6866	G.B.	*Palladium as a Substitute for Platinum.* (Metal Industry, Vol. 62, No. 7, 12/2/43, p. 109.)
425	7655	U.S.A. ...	*Properties of Platinum Metals.* (E. M. Wise and J. T. Eash, Trans. Am. Inst. of M. and M. Eng. (Met. Div.), Vol. 117, 1935, pp. 313-328.)
426	7713	U.S.A. ...	*Creep and Relaxation of Oxygen-Free Copper.* (E. A. Davis, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
427	7873	G.B.	*Beryllium Copper and its Applications.* (D. W. Crossley, Vol. 20, No. 1, Jan., 1943, pp. 7-9.)
428	7983	G.B.	*Al.-Bearing Heavy Alloys.* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 335-336.)
429	7992	G.B.	*Beryllium Alloys (Patent Review).* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 361-363.)
			Plastics.
430	6840	G.B.	*Oil as an Additional Basic Material for the British Plastic Industry (Digest).* (G. Tugendhat, Plastics, Vol. 7, No. 69, Feb., 1943, pp. 51-52.)
431	6841	Germany ...	*Welding of Thermoplastics (from the German).* (G. Henning, Plastics, Vol. 7, No. 69, Feb., 1943, pp. 53-59 and 92.)
432	6842	G.B.	*Poly-iso-butylene (Vistanex and Isolene).* (Plastics, Vol. 7, No. 69, Feb., 1943, pp. 60-62.)
433	6844	G.B.	*Plastics in Assembled Building Structure (IV).* (G. Teger, Plastics, Vol. 7, No. 69, Feb., 1943, pp. 64-70.)
434	6845	G.B.	*Polyvinylidene Chloride Film Materials.* (E. E. Halls, Plastics, Vol. 7, No. 69, Feb., 1943, pp. 74-80.)
435	6847	G.B.	*Resinoids and Other Plastics as Film Formers (XVI, Laminar Systems).* (B. J. Brajnikoff, Plastics, Vol. 7, No. 69, Feb., 1943, pp. 83-92.)
436	6878	Switzerland ...	*Melamine-Formaldehyde Condensation Products.* (A. Gams and others, British Plastics, Vol. 14, No. 165, Feb., 1943, pp. 508-520.)
437	6879	G.B.	*Behaviour of Plastics Under Vibration.* (British Plastics, Vol. 14, No. 165, Feb., 1943, p. 520.)
438	6883	U.S.A. ...	*Slenderness Ratio of Plastics.* (A. Friedman and E. Lofgren, British Plastics, Vol. 14, No. 165, Feb., 1943, pp. 545-547.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
439	6884	U.S.A.	....	*Mar Resistance of Plastics (Loss of Gloss with Abrasives).* (L. Boor, British Plastics, Vol. 14, No. 165, Feb., 1943, pp. 548-560.)
440	6918	U.S.A.	...	*New Application of Panelyte in the Aircraft Industry (Laminated Plastic) (Digest).* (C. R. Mahaney, Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 48, 76.)
441	6942	G.B. ...	...	*Resilitex (Resilient Woven Textile to Replace Sponge Rubber).* (Engineer, Vol. 175, No. 4,545, 19/2/43, pp. 159-160.)
442	6954	U.S.A.	...	*National Chemical Exposition, Chicago (Plastic Developments).* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 24, 25/12/42, pp. 1,627-1,633.)
443	6963	G.B. ...	...	*Plastics Abstracts No. 41, Jan., 1943, Issued by the Controller of Chemical Research.*
444	6999	G.B. ...	...	*Bonding Plastic and Metal (Plastels).* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, pp. 55-56.)
445	7728	U.S.A.	...	*Physical Properties of Laminated Plastics.* (R. W. Barber, Annual Meeting of the A.S.M.E., Nov.-Dec., 1942.)
446	7758	U.S.A.	...	*New Applications of "Panelyte" in the Aircraft Industry.* (C. R. Mahaney, S.A.E., Preprint No. 6, National Aircraft Production Meeting, Oct. 1-3, 1942.)
447	7760	U.S.A.	...	*Fedralite Piping (Laminated Paper).* (H. W. Richter, Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 48-49.)
448	7764	U.S.A.	...	*Lignin-Enriched Filler.* (J. G. Meiler, Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 64-66, 128-130.)
449	7767	U.S.A.	...	*Mar-Resistance of Plastics.* (L. Boor, Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 79-85, 126-128.)
450	7768	U.S.A.	...	*Plastics Statistics for 1941.* (Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 86-87.)
451	7781	G.B. ...	...	*Resilitex (Textile Resilient).* (Airc. Prod., Vol. 5, No. 53, March, 1943, p. 110.)
452	7789	G.B. ...	...	*Recording Plastometer for Organic Plastics.* (Nature, Vol. 151, No. 3,822, 30/1/42, p. 142.)
453	7960	G.B. ...	...	*Plastic Tubing for Electric Conduits.* (Electrical Times, Vol. 102, No. 2,664, 12/11/42, p. 700.)
				Ply Woods and Wood Plastic.
454	6872	G.B. ...	...	*Interesting Glueing Device for Wooden Aircraft Parts.* (Prod. and. Eng. Bull., Vol. 2, No. 1, Oct., 1942, pp. 15-17.)
455	6880	G.B. ...	...	*Stress-Strain in Compression of Resin-Bonded Plywoods.* (G. Rostler, British Plastics, Vol. 14, No. 165, Feb., 1943, p. 534.)
456	7640	U.S.A.	...	*An Analysis of the Factors Responsible for Raised Grain on the Wood of Oak following Sanding and Staining.* G. G. Marra, Annual Meeting, A.S.M.E., Fuels Division, Preprint No. 104, Sept. 30-Oct. 1, 1942.)

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457	7759	U.S.A. ...	*Low Pressure Laminating.* (J. D. Nelson and G. F. d'Alelio, Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 45-47, 122-124.)
458	7762	U.S.A. ...	*Resin-Bonded Plywood for Gliders.* (Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 52-55.)
459	7765	U.S.A. ...	*Scarfed Joints in Plywood.* (T. D. Perry, Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 74-75, 116-120.)
460	7886	U.S.A. ...	*Wood Plastic in Mass Production of Aircraft.* (S.A.E.J., Trans., Vol. 51, No. 1, Jan., 1943, p. 30.)
461	8002	G.B.	*Moulded Plywood Aircraft (Vidal Process).* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 544-546.)
462	8012	G.B.	*Cementing Stainless Steel Sheet to Plywood.* (Mech. World, Vol. 112, No. 2,920, 18/12/42, p. 595.)
463	8031	G.B.	*Bibliography of Published Information on Wood, Improved Wood and Cellulose Plastics. (Supplement to Earlier Bibliography.)* (R.T.P.3, Bibliography No. 70, Ministry of Aircraft Production, Feb., 1943.)
			Rubber (Natural and Synthetic).
464	6846	U.S.A. ...	*Synthetic Rubber Production in the U.S.A. (Output Figures).* (Plastics, Vol. 7, No. 69, Feb., 1943, p. 80.)
465	7871	G.B.	*Synthetic Rubber (Flow Sheet of Manufacture).* (Mech. World, Vol. 113, No. 2,926, 29/1/43, pp. 127-129.)
466	7879	G.B.	*The Structure of Polychloroprene.* (C. J. Birkitt Clews, Procs. Roy. Soc., Vol. 180, No. 980, 18/3/42, pp. 100-107.)
467	7880	U.S.A. ...	*Synthetic Rubber Production.* (S.A.E.J., Vol. 51, No. 1, Jan., 1943, p. 57.)
468	7940	G.B.	*Modern Synthetic Rubbers (Book Review).* (H. Barron, Airc. Eng., Vol. 15, No. 168, Feb., 1943, pp. 48-49.)
469	7998	G.B., U.S.A. ...	*Rubber Supplies (Natural and Synthetic).* (Autom. Eng., Vol. 33, No. 433, Feb., 1943, pp. 79-80.)
			Solders.
470	7809	G.B.	*High Lead Solders.* (Metal Industry, Vol. 62, No. 9, 26/2/43, p. 134.)
471	7812	G.B.	*A New Bismuth Alloy for Proof Casting (Cerrosafe).* (J. H. Christie, Metal Industry, Vol. 62, No. 9, 26/2/43, p. 140.)
472	8147	G.B.	*Bismuth Solders.* (Metal Industry, Vol. 62, No. 10, 5/3/43, pp. 150-151.)
			Glass and Sapphires.
473	6913	U.S.A. ...	*New Glass Products for War Equipment ("Golden" Glass for Filtering Out Ultra-Violet in the Substratosphere).* (Autom. Ind., Vol. 87, No. 10, 15/11/42, p. 42.)
474	6957	U.S.A. ...	*Synthetic Sapphires (Bearings, Cutting Tools, Injection Nozzles).* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 24, 25/12/42, p. 1,666.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			General (Fund. Properties).
475	6849	G.B. ...	... *Introduction to Soil Mechanics—II.* (W. L. Lowe-Brown, Engineer, Vol. 174, No. 4,544, 12/2/43, pp. 124-126.)
476	6939	G.B. ...	... *Introduction to Soil Mechanics—III.* (W. L. Lowe-Brown, Engineer, Vol. 175, No. 4,545, 19/2/43, pp. 144-146.)
477	6974	G.B. ...	... *References to and Abstracts from Current Literature.* (Bull. of British Non-Ferrous Materials R.A., Dec., 1942, pp. 374-397.)
478	7651	U.S.A.	... *Gases in Metals (Conditions of Association, Defects Due to Diffusion of H_2, Effect of Temp. on Solubility, Blowholes, Method of Removal of Gas, etc.).* (C. A. Edwards, Trans. Am. Inst. of M. and M. Eng. (Met. Div.), Vol. 117, 1935, pp. 13-38.)
479	7800	U.S.A.	... *"Strategic Materials" of the United Nations (Metals).* (Inter. Avia., No. 843, 11/11/43, pp. 21-22.)
480	7811	G.B. ...	... *Uses of Silver in Wartime.* (R. H. Leach and J. H. Christie, Metal Industry, Vol. 62, No. 9, 26/2/43, pp. 139-140.)
481	7838	Germany	... *The Mathematical and Physical Importance of the Partial Molar Coefficients and the Deduction of the Duhern-Margules Law of Partial Pressures.* (K. Fredenhagen, Z. fur Elektrochenic and Ang. Physick Chemie, Vol. 48, No. 3, March, 1942, pp. 136-145.)
482	7862	G.B. ...	... *The Mechanical Properties of Metal Foils.* (B. Chalmers and P. W. Seddon, J. Inst. Metals, Vol. 68, No. 9, Sept., 1942, pp. 283-309.)
483	7959	G.B. ...	... *Removing Dissolved Salts in Water (Deminrolit Process).* (Electrical Times, Vol. 102, No. 2,664, 12/11/42, pp. 696-698.)
484	7961	G.B. ...	... *Interaction Between Adsorbed Substances of Simple Constitution and Insoluble Monolayers.* (K. G. A. Pankhurst, Procs. Roy. Soc., Vol. 179, No. 979, 27/2/42, pp. 393-399.)
485	7965	G.B. ...	... *Condensed Monomolecular Films.* (A. E. Alexander, Procs. Roy. Soc., Vol. 179, No. 979, 27/2/42, pp. 470-499.)
486	7966	G.B. ...	... *Supersonic Dispersion in Gases.* (A. E. Alexander and J. D. Lambert, Vol. 179, No. 979, 27/2/42, pp. 499-511.)
487	8078	U.S.A.	... *Experiments on the Mechanics of Sediment Suspension.* (H. Rouse, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 550-554.)
488	8087	U.S.A.	... *Three Hundred Years of Mechanics of Materials.* (S. C. Hollister, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 735-739.)
			Steel.
489	6886	G.B. ...	... *Deleterious Influence of Tin on Alloy Steels.* (G. R. Bolsover and S. Barraclough, Engineering, Vol. 155, No. 4,022, 12/2/43, p. 128.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
490	7637	U.S.A. ...	*The Elimination of Carry-Over Under Steel-Mill Operating Conditions.* (H. M. Rivers and W. P. Hill, Annual Meeting, A.S.M.E., Fuels Div., Preprint No. 101, Sept. 30-Oct. 1, 1942.)
491	7676	Germany ...	*The Present State of Development of Heat Resisting Cast Steel.* (F. Schulte, Stahl und Eisen, Vol. 62, No. 19, 7/5/42, pp. 389-397.)
492	7677	Germany ...	*The Influence of N_2 on Austenitic and Austenitic-Ferritic Cr.-Ni. Steels.* (R. Scherer and others, Stahl und Eisen, Vol. 62, No. 17, 23/4/42, pp. 347-352.)
493	7680	Germany ...	*The Intercrystalline Stress Corrosion of Steel (with Discussion).* (H. Buckholtz and R. Püsch, Stahl und Eisen, Vol. 62, No. 2, 8/1/42, pp. 21-30.)
494	7681	Germany ...	*The Influence of Alloying Constituents on the Tensile and Fatigue Strength of Heat Treated Steels.* (Stahl und Eisen, Vol. 62, No. 2, 8/1/42, pp. 32-35.)
495	7682	Germany ...	*The Most Suitable Design of Electric Arc Furnaces for Manufacture of Steel.* (H. Muller, Stahl und Eisen, Vol. 61, No. 29, 17/7/41, pp. 685-694.)
496	7783	G.B.	*Forging, Annealing and Normalising Temperatures for Steel.* (Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 121-126.)
497	7684	Germany ...	*Rapid Determination of Cr. and P. in Pig Iron and Steel (Six Minutes).* (Stahl und Eisen, Vol, 62, No. 3, 15/1/42, p. 53.)
498	7824	U.S.A. ...	*High Tension Steels for Light Weight Construction.* (Engg., Vol. 155, No. 4,024, 26/2/43, pp. 167-168.)

Hardness and Temper Brittleness.

499	6857	G.B.	*Chromizing Process for Steel (Atmosphere of Gaseous Chromium Chloride).* (Engineering, Vol. 155, No. 4,022, 12/2/43, p. 130.)
500	7683	Germany ...	*Hardenability of Some Low and High Carbon and Alloy Steels Free from Molybdenum.* (A. Krisch, Stahl und Eisen, Vol. 62, No. 3, 15/1/42, pp. 48-53.)
501	7685	Germany ...	*Direct Reading Brinell Hardness Testing Machine.* (Stahl und Eisen, Vol. 62, No. 3, 15/1/42, pp. 53-54.)
502	7686	Germany ...	*Influence of P. and Several Alloying Constituents on the Temper Brittleness of Structural Steels.* (E. Maurer and others, Stahl und Eisen, Vol. 62, No. 5, 29/1/42, pp. 81-89.)
503	7715	U.S.A. ...	*A Practical Way to Prevent Embrittlement Cracking.* (A. A. Berk, W. C. Schroeder, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
504	8166	Germany ...	*Strength, Depth of Hardening and Toughness of Heat-Treated Replacement Steels (Mn.-Cr.).* (A. Krisch, L.F.F., Vol. 19, No. 10-12, 11/1/43, pp. 331-336.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Welding.
505	6888	G.B. ...	... *Heliarc Welding Process.* (Machinist, Vol. 86, No. 39, 9/1/43, p. 1,043.)
506	6916	U.S.A.	... *Spot Welding in Aircraft (Digest). (Giving Table of Minimum Weld Spacing.)* (G. S. Mikhalapov, Autom. Ind., Vol. 87, No. 10, 15/11/42, p. 48.)
507	6943	G.B. ...	... *Atomic-Hydrogen Welding Equipment.* (Engineer, Vol. 175, No. 4,545, 19/2/43, p. 160.)
508	6997	U.S.A.	... *Welding Fumes from Arc Welding and Their Danger to Health.* (G. C. Harold, J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 650-657.)
509	7653	U.S.A.	... *Welded Pressure Vessels.* (R. K. Hopkins, Trans. Am. Inst. of M. and M. Engs. (Met. Div.), Vol. 117, 1935, pp. 387-398.)
510	7699	G.B. ...	... 83 *Abstracts Issued by the Welding Research Council.* (Vol. 4, No. 4, Nov., 1942.)
511	7753	U.S.A.	... *The Place and Use of Spot Welding in Design and Production of Aircraft.* (G. S. Mikhalapov, S.A.E., Preprint No. 1, National Aircraft Production Meeting, Oct. 1-3, 1942.)
512	7868	G.B. ...	... *Welded Constructed Machine Bases.* (Machinery, Vol. 61, No. 1,578, 7/1/43, p. 5.)
513	7990	G.B. ...	... *Al. Wire Welding Apparatus.* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 352-353.)
			Stretch and Pressing.
514	7678	Germany	... *The Production of Seamless Tubing by the Combined Action of Stretching and Guide Discs.* (Stahl und Eisen, Vol. 62, No. 17, 23/4/42, pp. 353-354.)
515	7819	G.B. ...	... *Sheet Stretching Machine (Sheridan).* (Machinery, Vol. 62, No. 1,599, 14/1/43, p. 51.)
516	7784	G.B. ...	... *Stretch Pressing.* (Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 125-126.)
517	8004	G.B. ...	... *Hydraulic Stretching Press.* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 56-562.)
			Degreasing.
518	6947	G.B. ...	... *"Fraser Heller" Metal Degreasing System.* (Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 146-147.)
519	7885	U.S.A.	... *Chemical Protective Treatment and Cleaning Methods in Aircraft Production (Chrometising, Phosphatising, Anodising, Degreasing for Spot Welding, etc.).* (R. Sanders, S.A.E.J., Trans., Vol. 51, No. 1, Jan., 1943, pp. 223-30.)
			Electroplating.
520	6843	G.B. ...	... *Electroplating on Non-Conducting Materials.* (Plastics, Vol. 7, No. 69, Feb., 1943, p. 63.)
521	6923	U.S.A.	... *Electroplated Zinc in Steel.* (Autom. Ind., Vol. 87, No. 10, 15/11/42, p. 70.)
522	6944	G.B. ...	... *Electroplating on Non-Conducting Materials.* (Engineer, Vol. 175, No. 4,545, 19/2/42, p. 160.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
523	7650	G.B. ...	... *Electrodeposition of Zn. and Cd. on Al. and Al. Alloys.* (B. K. Braund and H. Sutton, Electrodepositions Tec. Soc., Vol. 11, pp. 57-73.)
524	7779	G.B. ...	... *Electroplating Non-Conducting Materials.* (Airc. Prod., Vol. 5, No. 53, March, 1943, p. 108.)
525	7780	G.B. ...	... *Chrome-Plated Parts (Tolerances for Production Components Plated to Engineering Limits).* (H. G. Conway, Airc. Prod., Vol. 5, No. 53, March, 1943, p. 109.)
526	7984	G.B. ...	... *Electrodeposition on Al. and its Light Alloys.* (Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 368-370.)
			Rolling and Drawing.
527	6865	G.B. ...	... *Deep Drawing of Zn. and Zn. Alloys.* (F. Erdmann and H. Hanemann, Metal Industry, Vol. 62, No. 7, 12/2/43, pp. 103-108.)
528	6962	G.B. ...	... *Deep Drawing of Zn. and Zn. Alloys.* (F. Erdmann-Jesnitzer and H. Hanemann, Metal Industry, Vol. 62, No. 8, 19/2/42, pp. 119-120.)
529	7714	U.S.A.	... *The Distribution of Strains in the Rolling Process.* (C. W. MacGregor, L. F. Coffin, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
530	8113	Germany	... *Deep Drawing of Parabolic Containers with a Rubber Die.* (R. Hartmann, Der Betrieb, Vol. 21, No. 9, Sept., 1942, p. 388.)
			Machining, Drilling and Grinding.
531	6887	G.B. ...	... *The Machining of Cast Armour Plate.* (F. W. Lucht, Machinist, Vol. 86, No. 39, 9/1/43, p. 250 F.)
532	6912	U.S.A.	... *Machining Aluminium.* (R. L. Templin, Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 38-42.)
533	7718	U.S.A.	... *Drilling Deep Holes in Magnesium Alloys.* (W. W. Gilbert, A. M. Lennie, A.S.M.E., Annual Meeting, Nov.-Dec., 1942.)
534	7766	U.S.A.	... *Grinding and Machining Cast Resins.* (C. E. Holmes, Modern Plastics, Vol. 20, No. 1, Sept., 1942, pp. 76-77, 130-132.)
535	7817	G.B. ...	... *Abrasive Mounted Wheels and Points.* (Machinery, Vol. 62, No. 1,579, 14/1/43, pp. 42-44.)
536	7993	G.B. ...	... *Heat Treatment and Machinability of 582 Gears.* (Mech. World, Vol. 112, No. 2,920, 18/12/42, pp. 529-580.)
537	7996	G.B. ...	... *Precision Gear Cutting and Grinding (Hobourn Aero Components).* (Autom. Eng., Vol. 33, No. 433, Feb., 1943, pp. 61-68.)
538	8116	Germany	... *The Utilisation of Combined Steel and Ceramic Wheels for the Setting of Grindstones and Their Effect on Obtainable Grinding Fits.* (W. Davihl, Der Betrieb, Vol. 21, No. 9, Sept., 1942, pp. 381-383.)
			Powder Metallurgy.
539	6874	G.B. ...	... *Powdered Metals in Machine Design (Gears and Bearings).* (Machinery, Vol. 61, No. 1,578, 7/1/43, pp. 1-4.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
540	7867	G.B. ...	... *Powdered Metals in Machine Design—II.* (Machinery, Vol. 61, No. 1,578, 7/1/43, pp. 1-4.)
			X-Ray Examination.
541	6868	U.S.A.	... *X-Ray Diffraction Camera for 300°C.* (A. Bretteville, Rev. of Sci. Insts., Vol. 13, No. 11, Nov., 1942, pp. 481-483.)
542	6891	G.B. ...	... *Invesvtigation of Ceramic Materials by Optical and X-Ray Analysis.* (E. Rosenthal, Electronic Engineering, Vol. 15, No. 179, Jan., 1943, pp. 320-323.)
543	7605	G.B. ...	... *Industrial Radiography.* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, p. 87.)
544	7688	Germany	... *Iron Ores—Structural Examination by Means of X-Rays.* (Stahl und Eisen, Vol. 62, No. 5, 29/1/42, p. 94.)
545	7786	G.B. ...	... *Industrial Radiography.* (Airc. Prod., Vol. 5, No. 53, March, 1943, p. 134.)
546	7788	G.B. ...	... *X-Ray Evidence of the Nature of Cold Work in Metals.* (A. R. Stokes and others, Nature, Vol. 151, No. 3,822, 30/1/43, p. 137.)
547	7808	G.B. ...	... *Radiography as an Aid to Foundry Technique.* (W. Gladwell, Metal Industry, Vol. 62, No. 9, 26/2/43, pp. 130-134.)
548	7989	G.B. ...	... *X-Rays and the Light Metal Industry (Examination).* (E. J. Tunnicliffe, Light Metals, Vol. 5, No. 56, Sept., 1942, pp. 341-352.)
549	8148	G.B. ...	... *Location of Flaws by Stereo Radiography.* (T. Rigbey, Vol. 62, No. 10, 5/3/43, pp. 152-153.)
550	8151	Germany	... *New Apparatus for the Non-Destructive Testing of Materials.* (Schweizerische Technische Zeitschrift, 1940, p. 562.)
			Magnetic Methods.
551	7822	G.B. ...	... *Electromagnetic Crack Detector in Welded Tubular Structure.* (Engineer, Vol. 175, No. 4,546, 26/2/43, pp. 178-179.)
552	7935	Germany	... *A New Double Joke Electromagnet for the Testing of Magnet Steels.* (F. Stablien and R. Steinitz, Tech. Milteel Krupp, Vol. 3, 1935, pp. 129-135.)
553	7994	Germany	... *Magnetic Method for Testing the State of Heat Treatment of Fabricated Products.* (H. Lange, Kaiser Wilhelm Inst. fur Eisenf, Vol. 21, No. 6, 1939, pp. 105-113.)
554	7695	Canada	... *Magnaflux Inspection.* (Commercial Aviation, Vol. 4, No. 8, Aug., 1942, p. 136.)
			Instruments.
			Physiological.
555	6871	U.S.A.	... *A Continuous Electronic Pulse Rate Indicator and Recorder.* (M. M. Schwarzschild and M. C. Schelesnyak, Rev. of Sci. Insts., Vol. 13, No. 11, Nov., 1942, pp. 496-501.)
556	6894	G.B. ...	... *Miniature Electrocardiography.* (Electronic Engineering, Vol. 15, No. 179, Jan., 1943, pp. 346-347.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Navigation.
557	7691	Canada ...	*A New Instrument for Celestial Navigation.* (N. W. Storer, Commercial Av., Vol. 4, No. 5, Aug., 1942, pp. 86-90.)
558	7770	Canada ...	*Astral Navigation.* (J. W. Nelson, Canadian Av., Vol. 15, No. 11, Nov., 1942, pp. 48-55.)
559	7798	U.S.A. ...	*Ice Indicator.* (Inter. Avia., No. 843, 11/11/42, p. 21.)
560	7837	G.B.	*Navigation Above Clouds (Astrodome) (Photo).* (Flight, Vol. 43, No. 1,783, 25/2/43, p. 215.)
561	8133	G.B.	*Terrain Altimeter (Television).* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 34.)
			Flow Meter.
562	6877	G.B.	*Float Type Flow Meter.* (J. Sci. Inst., Vol. 19, No. 12, Dec., 1942, pp. 186-187.)
563	7709	U.S.A. ...	*The Effect of Installation on the Coefficients of Venturi Meters.* (W. S. Pardoe, A.S.M.E., Annual Meeting, Nov.-Dec., 1942.)
564	7721	U.S.A. ...	*Results of Tests on Volumeters for Liquid Hydrocarbons.* (J. S. Pigott, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
			Electronic.
565	6864	U.S.A. ...	*A Scanning Electron Microscope.* (Metal Industry, Vol. 62, No. 7, 12/2/43, p. 104.)
566	6869	U.S.A. ...	*Electronic Liquid Level Indicator (Change of Capacitance of Electric Condenser).* (S. C. Coronite, Rev. of Sci. Insts., Vol. 13, No. 11, Nov., 1942, pp. 484-488.)
567	6892	G.B.	*Colour Television.* (Electronic Engineering, Vol. 15, No. 179, Jan., 1943, p. 327.)
568	6893	G.B.	*Electron Optics—Part II.* (D. Gabor, Electronic Engineering, Vol. 15, No. 179, Jan., 1943, pp. 328-337.)
569	7638	U.S.A. ...	*Experience in the Use of Electrostatic Fly-Ash Precipitators.* (J. G. McChesney, Annual Meeting, A.S.M.E., Fuels Division, Preprint No. 102, Sept. 30-Oct. 1, 1942.)
			Instruments—Miscellaneous.
570	6998	U.S.A. ...	*Graphical Measurement of Space and Plane Angles.* (H. E. Steven, J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 660-672.)
571	7694	Canada ...	*Fabric Permeameter (Cambridge Scient. Inst. Co.).* (Commercial Aviation, Vol. 4, No. 8, Aug., 1942, p. 134.)

Production.

Organisation and Control.

572	6858	G.B.	*Wartime Standardisation.* (C. le Maistre, Engineering, Vol. 155, No. 4,022, 12/2/43, pp. 137-136.)
573	6956	U.S.A. ...	*Economies in Alloy Metals Effected in Germany by Standardisation.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 24, 25/12/42, p. 1,654.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
574	7665	U.S.A. ...	*A Body Plant Goes to War (Switch Over from Car to Aircraft Production).* (L. B. Rivard, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
575	7666	U.S.A. ...	*Tool Shop Organisation and Methods.* (W. F. Pioch, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
576	7674	U.S.A. ...	*The Conversion of Plants of the Automotive Industry to War Production.* (J. Geschelin, S.A.E. Preprint read at War Engineering Prod. Meeting, Jan. 11-15, 1943.)
577	7722	U.S.A. ...	*The Pride of America (American Patent System).* (A. A. Potter, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
578	7733	U.S.A. ...	*Ten Years' Progress in Management.* (Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
579	7735	U.S.A. ...	*Progress in Cost Control* (1932-1942). (W. P. Fiske, Annual Meeting, A.S.M.E., Nov.-Dec., 1942.)
580	7815	G.B.	*Practical Quality Control.* (Machinery, Vol. 62, No. 1,579, 14/1/43, p. 33.)
581	7816	G.B.	*Quality Control v. Direct Inspection.* (H. Biggs, Machinery, Vol. 62, No. 1,579, 14/1/43, p. 41.)
582	7941	G.B.	*Quality Control in Production Engineering.* (H. Rissick, Airc. Eng., Vol. 15, No. 168, Feb., 1943, pp. 55-58.)
583	8115	Germany ...	*Review of Literature on Work Planning.* (R. Bach, Der Betrieb, Vol. 21, No. 9, Sept., 1942, pp. 393-394.)
			Research and Training.
584	6949	G.B.	*Post War Industrial Research.* (Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 151-152.)
585	6982	G.B.	*Synchrophone Method of Audio-Visual Instruction.* (Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 157-158.)
586	6961	G.B.	*Industrial Value of Research.* (W. C. Devereux, Metal Industry, Vol. 62, No. 8, 19/2/43, pp. 117-118.)
587	7661	U.S.A. ...	*Co-operative Research Comes of Age.* (C. B. Veal, S.A.E. Preprint, War Engineering Prod. Meeting, Jan. 11-15, 1943.)
588	7752	U.S.A. ...	*Standard Practice Instruction.* (J. Willard Lord, S.A.E., Preprints No. 11, National Fuels and Lubricants Meeting, Oct. 22-23, 1942.)
589	7774	G.B.	*Planning of Science (Summary of Papers Presented at Conference of the Association of Scientific Workers).* (Airc. Prod., Vol. 5, No. 53, March, 1943, p. 136.)
590	7806	U.S.A. ...	*Industrial Research at the Armour Research Foundation,* 1941-1942. (Ind. and Eng. Chem., Vol. 21, No. 1, 10/1/42, pp. 17-26.)
591	7787	G.B.	*I.S.M. Synchrophone (Combined Visual and Aural Training).* (Airc. Prod., Vol. 5, No. 53, March, 1943, p. 134.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
592	7836	G.B. ...	... *Advances of Chemical Kinetics in the Soviet Union.* (N. Seminov, Nature, Vol. 151, No. 3,824, 13/2/43, pp. 185-187.)
593	7915	G.B. ...	... *Sandor Synchrophone Training System (Sound and Friction Combination for Explaining Mechanical Complexities).* (Flight, Vol. 43, No. 1,780, 4/2/43, p. 130.)
594	8140	G.B. ...	... *Organisation of Scientific Research and Development (Conference of Association of Sci. Workers).* (Nature, Vol. 151, No. 3,825, 20/2/43, pp. 203-207.)
595	8145	G.B. ...	... *Education and Training of Engineers—I.* (Engineer, Vol. 175, No. 4,547, 5/3/42, pp. 190-191.)
596	8182	Germany	... *Educational Methods in Aircraft Engineering.* (H. Wenke, Luftwissen, Vol. 10, No. 1, Jan., 1943, pp. 15-22.)
			Production Methods (General).
597	6881	Germany	... *Tegowiro (Hot Wire) Method of Glueing.* (E. Egner, British Plastics, Vol. 14, No. 165, Feb., 1943, pp. 538-540.)
598	6907	U.S.A.	... *Some Aircraft Problems (Rapid Quenching for Dural, Water-Soluble Oil for Forming Operations, etc.).* (T. E. Piper, Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 19, 68, 70.)
599	7600	G.B. ...	... *Drop Hammer Technique (Compound Curvature in Sheet Metal).* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, pp. 57-60.)
600	7604	G.B. ...	... *Infra Red Radiation for Paint Drying and Shrink Fitting Operation.* (Airc. Prod., Vol. 5, No. 52, Feb., 1942, pp. 83-87.)
601	7607	G.B. ...	... *Mobile Assembly Methods (Esarian Trolley).* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, pp. 97-100.)
602	7658	U.S.A.	... *Methods and Metallurgy of Shell (Artillery) Manufacture.* (C. L. Eksorgian, S.A.E., War Engineering Prod. Meeting, Jan. 11-15, 1943.)
603	7668	U.S.A.	... *Substitute Materials—Have We Gone the Limit?* (J. G. Wood, S.A.E., War Engineering Prod. Meeting, Jan. 11-15, 1943.)
604	7757	U.S.A.	... *Impact Extrusion and Cold Pressing of Airplane Parts.* (Phil. Koenig, S.A.E., Preprints No. 5, National Aircraft Production Meeting, Oct. 1-3, 1942.)
605	7785	G.B. ...	... *Sheet Metal Working for Aircraft.* (W. S. Neville, Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 129-133.)
606	7814	G.B. ...	... *Zinc Base Alloy Forming and Blanking Dies for Aeroplane Parts (Kirksite).* (Machinery, Vol. 62, No. 1,579, 14/1/43, pp. 35-40.)
607	8111	Germany	... *Metal Stamping—Basic Time Calculation for Individual Operations.* (H. Gritzbauch and K. Gollnick, Der Betrieb, Vol. 21, No. 9, Sept., 1942, pp. 385-388.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
608	8183	Germany ...	*Light Alloy Extruded Profiles.* (W. Bleicher, G. W. Berger, Luftwissen, Vol. 10, No. 1, Jan., 1943, pp. 23-27.)
			Methods (Named Types).
609	6910	U.S.A. ...	*Douglas Jig Assembly of Tube Lines for Aircraft (Hydraulic, Fuel, etc.).* (Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 32-33, 74.)
610	7601	G.B.	*Avro Lancaster (Fuselage, Wing Tips and Trailing Portion).* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, pp. 61-72.)
611	7602	G.B.	*Machining Hispano Cannon Components (Body and Breech Block).* (Airc. Prod., Vol. 5, No. 52, Feb., 1943, pp. 78-82.)
612	7606	U.S.A. ...	*Wright Engine Production (Cyl. Assemblies).* (F. C. Sheffield, Airc. Prod., Vol. 5, No. 52, Feb., 1943, pp. 89-96.)
613	7618	U.S.A. ...	*"Double Wasp" Test Cells at Ford Works.* (Inter. Avia., No. 844-845, 21/11/42, pp. 13-14.)
614	7690	Canada ...	*Mass Production of Canadian "Anson."* (Commercial Aviation, Vol. 4, No. 8, Aug., 1942, pp. 44-54.)
615	7755	U.S.A. ...	*How Vultee Uses Master Layout for Production.* (S. R. Carpenter, S.A.E., Preprint No. 3 (National Aircraft Production Meeting), Oct. 1-3, 1942.)
616	7771	Canada ...	*Mass Production of Wright Cyclone Engine.* (Canadian Av., Vol. 15, No. 11, Nov., 1942, pp. 68-74.)
617	7772	Canada ...	*Vultee Master Layout for Production (Loft Line of Continued Shapes and Common Reference Lines).* (S. R. Carpenter, Canadian Av., Vol. 15, No. 11, Nov., 1942, pp. 76-82.)
618	7775	U.S.A. ...	*Wright Engine Production.* (P. G. Sheffield, Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 137-141.)
619	7777	U.S.A. ...	*Brewster Bermuda and Buccaneer (Production Method).* (Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 147-148.)
620	7782	G.B.	*Avro Lancaster Production (III).* (W. E. Goff, Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 111-120.)
621	7813	G.B.	*Ford Methods in Merlin Engine Production (Thread Rolling).* (Machinery, Vol. 62, No. 1,579, 14/1/43, pp. 29-33.)
622	7916	Germany ...	*Bibliography of Published Information on Organisation of GermanAircraft Industry and Production Methods (1, Organisation of Labour and Training; 2, Organisation of German Industry; 3, German Production Methods—General (a, Arado; b, Dornier; c, Heinkel; d, Henschel; e, Junkers); 4, Production of Engines).* (R.T.P.3, Bibliography No. 82, Ministry of Aircraft Production, March, 1943.)
623	8003	G.B.	*Light Alloy Foundry for Rolls Royce Merlin Castings (III).* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 548-558.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
624	8005	G.B. ...	...	*Avro Lancaster Large Scale Production.* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, p. 565.)
				Tools.
625	6850	U.S.A.	...	*Aircraft Tooling with Plastics.* (Engineer, Vol. 175, No. 4,544, 12/2/43, pp. 127-130.)
626	6854	G.B. ...	...	*Macrome Process of Treating Tools.* (Engineer, Vol. 175, No. 4,544, 12/2/43, p. 139.)
627	6975	G.B. ...	...	*Spindle Bearings of Machine Tools with High Speed.* (G. Schlesinger, J. Inst. Prod. Engs., Vol. 22, No. 1, Jan., 1943, pp. 1-39.)
628	7874	G.B. ...	...	*Insertion and Housing of Carbide Tools.* (Science Lib. Bibliog. Series, No. 585.)
629	8110	Germany	...	*Reduction of Material Required in the Construction of Machine Tools.* (W. Renthe, Der Betrieb, Vol. 21, No. 9, Sept., 1942, pp. 365-368.)
630	8112	Germany	...	*Reduction in Consumption of High Speed Tool Steels in Machining Operations.* (K. Englehard and W. Trapp, Der Betrieb, Vol. 21, No. 9, Sept., 1942, pp. 369-373.)
631	8114	Germany	...	*Cyaniding of High Speed Tool Steels.* (H. Schaumann, Der Betrieb, Vol. 21, No. 9, Sept., 1942, pp. 375-394.)
				Pipe Bending, Coupling and Tube Expanding.
632	6886	G.B. ...	...	*A Critical Examination of Pipe Couplings and Their Application.* (G. W. McArd, Mech. World, Vol. 114, No. 2,924, 15/1/43, pp. 53-56.)
633	6901	U.S.A.	...	*An Analytical Method for Determining the Flexibility of Piping having Two or More Anchorages.* (H. Miller, J. App. Mech., Vol. 9, No. 4, Dec., 1942, pp. 165-170.)
634	7717	U.S.A.	...	*Experimental Investigation of Tube Expanding.* (E. D. Grimison, the Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
635	8000	G.B. ...	...	*Pipe Bending (Blackburn Precision Process).* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 535-536.)
				Templates and Tracings.
636	6915	U.S.A.	...	*Master Layouts for Production Use (Use of "Shrink" Machine for Transfers) (Digest).* (S. R. Carpenter, Autom. Ind., Vol. 87, No. 10, 15/11/42, pp. 47-48.)
637	6917	U.S.A.	...	*Template Duplication by Dry Offset Printing (Digest).* (W. A. Collins, J. T. Barnes, Autom. Ind., Vol. 87, No. 10, 15/11/42, p. 48.)
638	7778	G.B. ...	...	*Photo Tracings and Production.* (A. Betley, F. W. Coppin, Airc. Prod., Vol. 5, No. 53, March, 1943, pp. 107-108.)
				Inspection.
639	6889	G.B. ...	...	*Testing of the Continuity of Thin Tin Coatings on Steel.* (R. Kerr, J. Soc. Chem. and Ind., Vol. 61, No. 12, Dec., 1942, pp. 181-182.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
640	8008	G.B. ...	... *Internal Inspection of Wing Structures (Foster Introscope).* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 573-576.)
641	8117	Germany	... *Layout and Equipment of the Factory Gauge Inspection Department.* (G. Tuttner, Der Betrieb, Vol. 21, No. 9, Sept., 1942, pp. 389-392.)
			Scrap Salvage.
642	6873	G.B. ...	... *Scrap Identification Tests.* (Nickel Bulletin, Vol. 15, No. 11, Nov., 1942, pp. 163-165.)
643	6996	U.S.A.	... *Rapid Identification of Scrap (including Spark Tests).* (J. Am. Soc. Nav. Engs., Vol. 54, No. 4, Nov., 1942, pp. 649-650.)
644	8007	U.S.A.	... *Scrap Salvage at Boeing and Wright Plants.* (Airc. Prod., Vol. 4, No. 47, Sept., 1942, pp. 571-572.)
			Welfare.
645	8108	G.B. ...	... *Prevention and Control of Hazards in the Radium Dial Painting Industry.* (L. F. Curtiss, J. Ind. Hyg. and Toxicol., 1942, Vol. 24, No. 6, pp. 131-141.) (Bull. of War Med., Vol. III, No. 5, Jan, 1942, p. 301.)
646	8109	U.S.A.	... *Zinc Dermatitis (an Additional Hazard in the Aircraft Industry).* (H. E. Freeman, J. Amer. Med. Ass., 1942, Vol. 119, No. 13, July, 1942, p. 1,016.) (Bull. of War Med., Vol. III, No. 5, Jan., 1943, pp. 301-302.)
647	8139	G.B. ...	... *Health in Industry.* (Nature, Vol. 151, No. 3,824, 13/2/42.)
			Road and Rail Transport.
648	6860	G.B. ...	... *The First Gas Turbine Locomotive.* (A. Meyer, Engineering, Vol. 155, No. 4,022, 12/2/43, pp. 138-139.)
649	6935	France	... *Electric Drive for Cycles.* (La Science et la Vie, Vol. 60, No. 291, Nov., 1941, p. 300.)
650	6948	G.B. ...	... *Trailers for Transporting Aircraft Parts by Road.* (Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 147 and 150.)
651	6953	G.B. ...	... *The First Gas Turbine Locomotives.* (A. Meyer, Engineering, Vol. 155, No. 4,023, 19/2/43, pp. 159-160.)
652	7734	U.S.A.	... *Progress Report Gas Turbine-Locomotive with Electrical Transmission.* (P. R. Sidler, Annual Meeting, A.S.M.E., Nov.-Dec., 1942.)
653	7737	U.S.A.	... *Progress in Railway Mechanical Engineering* (1941-1942). Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
654	7821	G.B. ...	... *Oil Electric Locomotives.* (E. C. Poultney, Engineer, Vol. 175, No. 4,546, 26/2/43, p. 173.)
655	7828	G.B. ...	... *The First Gas Turbine Locomotive.* (A. Meyer, Engg., Vol. 155, No. 4,024, 26/2/43, pp. 179-180.)
656	8121	U.S.A.	... *World's Largest Trailers for Transporting American Bombers.* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 39.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Tank and Tank Warfare.
657	6910	G.B. ...	... *Churchill Tank (Photograph).* (Autom. Ind., Vol. 87, No. 10, 15/11/42, p. 52.)
658	6930	France	... *Flame Throwers in Tank Warfare.* (La Science et la Vie, Vol. 60, No. 291, Nov., 1941, pp. 257-258.)
659	6936	France	... *Methods of Anti-Tank Warfare.* (C. Rougeron, La Science et la Vie, Vol. 59, No. 285, May, 1941, pp. 379-388.)
660	7848	Germany	... *German Anti-Tank Mines.* (Flight, Vol. 43, No. 1,778, 21/1/43, p. 59.)
661	7893	Germany	... *The German 88 mm. Gun (Anti-Aircraft and Anti-Tank).* (J. C. Crockett, Coast Artillery J., Vol. 85, No. 5, Sept.-Oct., 1942, pp. 43-45.)
			Wireless and Electricity.
			Wireless and Radio Shielding.
662	6867	G.B. ...	... *The Speed of Travel of Wireless Waves.* (R. L. Smith-Rose, J. Inst. Elect. Engs., Vol. 90, Pt. 1, No. 25, Jan., 1943, pp. 31-38.)
663	6926	U.S.A.	... *Television Developments in the U.S.A.* (P. Hemardingner, La Science et la Vie, Vol. 60, No. 292, Dec., 1941, pp. 341-351.)
664	6938	G.B. ...	... *Tracing Valve Characteristics with the Cathode Ray Oscillograph.* (G. Bocking, Wireless Engineer, Vol. 19, No. 231, Dec., 1942, pp. 556-563.)
665	7634	U.S.A.	... *Aircraft Engine Radio Shielding.* (D. W. Randolph, J.S.A.E., Vol. 50, No. 12, Dec., 1942, pp. 538-541 and 548.)
666	7803	G.B. ...	... *Further Notes on the Electron Density Distribution of the Upper Ionosphere.* (O. E. N. Rydbeck, Phil. Mag., Vol. 34, No. 229, Feb., 1943, pp. 130-139.)
			Electricity.
667	6951	G.B. ...	... *Progress in Electrical Research.* (Engineering, Vol. 155, No. 4,023, 19/2/43, p. 156.)
668	7836	G.B. ...	... *Mechanism of the Electric Spark, Book Review.* (Nature, Vol. 151, No. 3,824, 13/2/43, pp. 178-180.)
669	7895	G.B. ...	.. *Intrinsic Electric Strength and Conductivity of Varnish Films and Their Variation with Temperature.* (A. M. Thomas and M. V. Griffith, J. Inst. Elect. Engs., Vol. 89, Pt. 1, No. 23, Nov., 1942, pp. 487-498.)
670	7896	G.B. ...	... *Contact Non-Linearity, with Reference to the Metal Rectifier and the Carborundum Ceramic Non-Linear Resistor.* (A. Fairweather, J. Inst. Elect. Engs., Vol. 89, Pt. 1, No. 23, Nov., 1942, pp. 499-518.)
671	7958	Switzerland	... *Simple Method of Measuring High Voltages on Transformers (Leakage Flux).* (Electrical Times, Vol. 102, No. 2,364, 12/11/42, pp. 692-693.)
672	8144	G.B. ...	... *Evolution of Wire Telephony.* (Nature, Vol. 151, No. 3,825, 20/2/43, pp. 227-229.)

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
			Heat Transfer and Temperature Measurement.
673	7635	U.S.A. ...	*Design of Cross-Flow Heat Exchangers from Tested Core Sections.* (P. A. Scherer, J.S.A.E., Vol. 50, No. 12, Dec., 1942, pp. 542-548.)
674	7687	Germany ...	*The Engineer's Concept of Entropy.* (G. Newman, Stahl und Eisen, Vol. 62, No. 5, 29/1/42, pp. 89-91.)
675	7716	U.S.A. ...	*Studies of Heat Transmission Through Boiler Tubing.* (W. F. Davidson and others, A.S.M.E., Annual Meeting, Nov.-Dec., 1942.)
676	7720	U.S.A. ...	*Evaporation-Cooling Primer for Textile Management.* (H. M. Irons, A.S.M.E., Annual Meeting, Nov.-Dec., 1942.)
677	7723	U.S.A. ...	*Recent Developments in Spreader-Stoker Firing (Boilers).* (R. L. Beers, Annual Meeting of A.S.M.E., Nov.-Dec., 1942.)
678	7746	U.S.A. ...	*Measurement of High Temperatures in High Velocity Gas Streams.* (W. J. King, A.S.M.E., Preprint 19, Annual Meeting, Nov. 30-Dec. 4, 1942.)
679	7820	G.B.	*Chimney Loss Measurements without CO_2 Meters (Temp. Drop at Economiser).* (R. H. Parsons, Engineer, Vol. 175, No. 4,546, 26/2/43, pp. 165-166.)
680	7838	Germany ...	*Isentropic Changes of Condition of a Gas Undergoing Dissociation and the Method of Sonic Dispersion for the Study of Very Rapid Homogenous Gas Reactions.* (G. Damköhler, Z. fur Electrochemic and Ang. Physic, Cherme, Vol. 48, No. 3, March, 1942, pp. 116-131.)
681	7964	G.B.	*An Elementary Theory of Thermal Diffusion of Gases.* (R. Firth, Procs. Roy. Soc., Vol. 179, No. 979, 27/2/42, pp. 461-469.)
682	8011	G.B.	*Refrigerating Evaporators and Condensers.* (D. Gordon, Mech. World, Vol. 112, No. 2,920, 18/12/42, pp. 588-591.)
683	8096	U.S.A. ...	*The Influence of Pressure on Heat Transfer in Evaporation.* (M. Jakab, Procs. of the 5th International Congress for Applied Mechanics, 1939, pp. 561-564.)
684	8098	U.S.A. ...	*The Effect of Vibration on Heat Transfer by Free Convection from a Horizontal Cylinder.* (P. C. Martinelli and L. M. K. Boelter, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 578-584.)
685	8099	U.S.A. ...	*Concepts of Efficiency of Heat Transfer and Pressure Drop Relations in Heat Exchangers.* (R. H. Norris, Procs. of the 5th Internat. Congress for Applied Mechanics, 1939, pp. 585-589.)
			Photography.
686	6876	G.B.	*High Speed Camera for Simultaneous Photographic and Oscillographic Records (1,000 frames/sec.).* (H. W. Baxter, J. Sci. Inst., Vol. 19, No. 12, Dec., 1942, pp. 183-185.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
687	8142	G.B. ...	...	*Photographic Sensitivity.* (S. O. Rawlings, Nature, Vol. 151, No. 3,825, 20/2/25, pp. 210-215.)

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688	8052	U.S.A.	...	*On the Influence of Stability and Instability on the Wind Profile and the Eddy Conductivity Near the Ground.* (H. V. Sverdrup, Procs. of the 5th Internat. Congress for Applied Mechs., 1939, pp. 369-372.)
689	8053	U.S.A.	..	*On the Rôle of Isentropic Mixing in the General Circulation of the Atmosphere.* (C. G. Rossby, Procs. of the 5th Internat. Congress for App. Mechanics, 1939, pp. 373-378.)
690	8062	U.S.A.	...	*The Relation Between Wind Velocity and Height during a Thunder Storm.* (R. H. Sherlock, M. B. Stout, Procs. of the 5th International Congress for Applied Mechs., 1939, pp. 436-439.)
691	8131	U.S.A.	..	*Vapour Trails of Fortresses (Photograph).* (Flight, Vol. 43, No. 1,777, 14/1/43, p. 31.)

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692	6890	U.S.A.	...	*Micro-Electrodes for Measuring Local Oxygen Tension in Animal Tissues.* (P. W. Davies and F. Brink, Rev. of Scientific Insts., Vol. 13, No. 12, Dec., 1942, pp. 524-533.)
693	7942	G.B. ...	...	*The Prevention of Eye Injuries.* (R. G. Meyer, Airc. Eng., Vol. 15, No. 168, Feb., 1943, pp. 59-60 and 58.)
694	8013	Germany	...	*The Effects of Acceleration on the Blood Volume of the Heart, Illustrated by Means of X-Ray Ciné-Photographs (Kymograms).* (H. Peiffer, Luftfahrtmedizin, Vol. 3, No. 2, 1938-9, pp. 82-95.)
695	8014	Germany	...	*The Capacity for Work at High Altitudes.* (A. Koch, L.F.M., Vol. 3, No. 2, 1938-9, pp. 97-103.)
696	8015	Germany	...	*The Comparative Effects of Low Pressure and Oxygen Deficiency on the Human Organism. (I) Study of Physical Well-Being and Respiration.* (D. Hartman, L.F.M., Vol. 3, No. 2, 1938-9, pp. 117-123.)
697	8016	Germany	...	*The Position of the Body and its Effect on Altitude Tolerance.* (E. Schafer, L.F.M., Vol. 3, No. 2, 1938-9, pp. 257-266.)
698	8017	Germany	...	*Comparative Studies of Stereoscopic Vision by Means of the Cords Space-Sense Apparatus, the Zeiss Stereoscope and Pulfrich Test Diagrams.* (H. Ziegler, L.F.M., Vol. 3, No. 2, 1938-9, pp. 302-308.)
699	8018	Germany	...	*The Rôle of the Electro-Cardiogram in Examining Candidates for Flying Fitness.* (F. Brauch, L.F.M., Vol. 3, No. 1, 1938-9, pp. 1-7.)
700	8019	Germany	...	*CO_2 and O_2 Additions for High Altitude Breathing.* (J. Jongbloed and A. J. Waldschut, L.F.M., Vol. 3, No. 1, 1938-9, pp. 8-11.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
701	8020	Germany	...	*The Blood Flow in the Internal Carotid Artery as Affected by Breathing CO_2 Under Conditions of Oxygen Want.* (Th. Benzinger, L.F.M., Vol. 3, No. 1, 1938-9, pp. 46-54.)
702	8107	G.B. ...	...	*Transportation of Patients by Aeroplane.* (W. R. Lovelace and J. Hargreaves, J. Av. Med., 1942, Vol. 13, No. 1, pp. 2-25.) (Bull. of War Medicine, Vol. III, No. 5, Jan., 1943, pp. 299-300.)
703	8143	G.B. ...	...	*Physiology of Colour Vision.* (E. N. Willmer, Nature, Vol. 151, No. 3,825, 20/2/43, pp. 227-229.)
704	8179	Germany		*Aviation Medicine Helps the War.* (D. Hippke, Luftwissen, Vol. 10, No. 1, pp. 3-5, Jan., 1943.)
				Mathematics.
705	6870	U.S.A.	...	*Mechanical Multiharmonograph (Graphing Functions and Solutions of Non-Linear Simultaneous Equations).* (S. L. Brown and L. L. Wheeler, Rev. of Sci. Insts., Vol. 13, No. 11, Nov., 1942, pp. 493-495.)
706	8083	U.S.A.	.	*The Reduction of the Solution of Certain Partial Differential Equations.* (H. Poritsky, Procs. of the 5th Internat. Congress for Applied Mechanics, 1939, pp. 700-707.)