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The Anti-Tank Armament of the Fighter Aeroplane. (C. Rougeron, Inter. Avia., No. 807, 16/3/42, pp. 1.4.) (101/1 Switzerland.)

In order to obtain a satisfactory firing accuracy in aerial fighting, the distance of attack must be as small as possible, as a result of which the projectile with a high muzzle velocity hits the opposing aircraft's armour with a force differing only little from its energy upon leaving the barrel. In contrast, the distance of attack by aircraft on tanks can be increased from 500 m. to 1,000 m. (550 yds. to 1,100 yds.) without material effect on the firing accuracy. Not only is the aeroplane forced to maintain a greater distance of attack by the ground defences, but a minimum altitude is required anyway for an attack in a dive. For a given muzzle energy, the projectile with a moderate muzzle velocity loses a much lower percentage of its energy in the course of its trajectory than the projectile with a high muzzle velocity.

Thus, since a moderate muzzle velocity of the projectile is sufficient to meet the requirements of firing accuracy, an additional advantage results as regards the power of penetration. The percentage of the aircraft speed that is added to the muzzle velocity of the projectile increases with decreasing muzzle velocities. A comparison of a 20 mm. shell weighing 120 grams (0.264 lb.) with a 37 mm. shell weighing 760 grams (1.675 lb.) which, for a given energy at the muzzle, have a velocity of 900 m. and 358 m. (2,950 ft. and 1,175 ft.), respectively, shows that the projectile of small muzzle velocity gains a much greater percentage of energy due to the forward speed of the aeroplane. For an aircraft speed of 600 km./h. (about 375 m.p.h.), the energy increase of the 37 mm. shell amounts to 55 per cent. On the other hand, the absolute projectile velocity then amounts to 525 m. (about 1,720 ft. a second), a value guaranteeing a sufficient measure of firing accuracy for distances of air attack on tanks ranging from 500 m. to 1,000 yds.

It seems to be clear, therefore, that the fighting conditions between two aeroplanes or between an aeroplane and a tank call for two different weapons in the case of identical muzzle energy of the projectiles employed. If these considerations are taken into account, these differences should purposely be increased. Already to-day the 15 mm. cannon of the latest version of the Messerschmitt Me. 109 fighter and the 37 mm. cannon of the Bell Airacobra or the latest Russian fighters are well known.

Magnesium Fires. (Metal Industry, Vol. 60, No. 15, 10/4/42, p. 158.) (101/2 Great Britain.)

According to a U.S. Bureau of Mines report, a new and more effective method of extinguishing magnesium fires in commercial plants has been developed by the Bureau. Whilst designed for places where magnesium is being handled continuously, the method is said to be equally effective against incendiary bombs in wartime. Hard coal-tar pitch in granulated or flaked form is said to be a highly satisfactory substance for extinguishing a magnesium flame, as the pitch softens and forms an airtight blanket which quickly smothers the flame. This method is regarded as superior to the use of sand and water, or prepared compounds such as carbon tetrachloride, carbon dioxide and foam. Powdered pitch should not be used, as it has explosive characteristics similar to those in coal and other dusts. Further advantage claimed for pitch for use in industrial plants is that it is not abrasive and not likely to damage costly machinery.

Protection Against Power Plant Fires in the Air (Digest). (G. L. Pigman, S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 55-56.) (101/3 U.S.A.)

General objectives of C.A.A. fire-test programme.

1. To determine the characteristics necessary for adequate power plant fire detectors; to develop such detectors if none are available; and to determine their proper location in typical power plant installations.

2. To determine the possibilities of extinguishing fires in aircraft power plants; to evaluate various fire extinguishing agents for this application; and to determine the best methods of application of these agents.

3. To determine the temperatures encountered in the cowling, firewall nacelle, and in the wing during typical oil and gasoline fires, and to find out about the fire resisting qualities of various materials used for these parts.

4. To determine the causes of ignition of petrol and oil fires and means whereby these dangers might be reduced.

Some of the extinguishing agents tried by means of various arrangements of different types of nozzles were: Carbon dioxide, methyl bromide, carbon tetrachloride, and commercial products containing sodium bicarbonate and potassium carbonate. Of these, the choice narrowed down to carbon dioxide and methyl bromide, with methyl bromide being rated as most efficient.

Detectors tested were of five general types: Metal expansion types, fusible alloy types, thermocouple types, and ionisation types. Concluding his discussion of detectors, the author states that there are available satisfactory unit-type detectors, and that there is strong promise of satisfactory continuous-type detectors within the near future.

The following are among the general conclusions presented with reference to the materials phase of the problem:—

1. The integrity of conventional aluminium-alloy monocoque nacelle structure can be seriously jeopardised by engine fires within a few seconds from the start of such fires.

2. The aluminium alloy N.A.C.A. cowling is not damaged by severe engine fires of long duration.

3. Portions of the accessory cowling and nacelle skin reach temperatures of 2,000°F. during a fire, which cause aluminium alloys to melt and will remove practically all load-bearing ability from stainless steel.

Aural Plane Detector Operated by One Man. (American Aviation, Vol. 5, No. 21, 1/4/42, p. 30.) (101/4 U.S.A.)

The device with all accessories including, a self-contained power supply, is housed in a case smaller than a gas mask container. Slung over the watcher's shoulder, it enables him to act as an independent mobile aeroplane pick-up unit.

In action, the spotter puts on a headpiece consisting of earphones topped by a parabolic " concentrator " of sound waves, from which wires are plugged into an amplifying apparatus in the case.

When a low-pitched sound in the earphones indicates the approach of a plane, the spotter turns his body until the sound is at its loudest. He is then facing the oncoming plane and is able to focus his binoculars swiftly and accurately on the aircraft.

The device has been approved by technicians of the U.S. Army Signal Corps.

Light Alloy Armour Plates. (Le vie dell' aria, 8/3/42, p. 5.) (101/5 Italy.)

According to experiments carried out by Panseri at the Institute of Metals, Milan, a 20 mm. plate of Avonal (Duralumin) will just stop a bullet of the Italian service rifle M.91 (calibre 6.5 mm.), a plate 18 mm. thick being perforated. The resistance to penetration for this size bullet is thus equal to a steel armour plate 6 mm. thick. The type of impact is however entirely different in the two cases. In the case of steel, the impact is to some extent elastic and parts of the plate as well as the bullet may rebound with considerable velocity thus causing possible further damage. With the dural plate, however, considerable plastic deformation takes place, the bullet being imprisoned in the material and no splinters formed. Best results are obtained with the light alloy plate if the heat treatment has been such as to render the material as ductile as possible (15-20 per cent. elongation at fracture). It will be noted that the employment of the light alloy implies no saving in weight, its increases in thickness being roughly proportional to the ratio of densities. Besides being, however, easier to produce and mount the light alloy plate by its plastic qualities may give better protection against projectiles already deformed or A.A. shell splinters. Against direct hits by armour piercing bullets, however, the steel plate is the more economical in weight.

Two-Dimensional Potential Flow Past a Smooth Wall with Partly Constant Curvature. (W. v. Koppenfels, L.F.F., Vol. 17, pp. 189-195, No. 7, 20/7/40.) (R.T.P. Translation T.M. No. 996.) (101/6 Germany.)

The speed of a two-dimensional potential flow past a smooth wall, which evinces a finite curvature jump at a certain point and approximates to two arcs in the surrounding area, has a vertical tangent of inflection at the critical point when plotted as a function of the arc length of the boundary curve. Close to this point the speed W is a function of the arc length σ in the form

$$\frac{W}{W_0}=1+\left(\frac{1}{\pi}\right)\left(1-\frac{\rho_1}{\rho_2}\right)\log\left|\frac{\sigma}{\rho_1}\right|+P(\sigma)$$

where ρ_1, ρ_2 = radii of curvature of 2 arcs.

W_0 = constant velocity along x axis (prior to transformation).

$P(\sigma)$ = power series defining further variations of speed along contour.

The method discloses that in the vicinity of the curvature jump the assumption for Pohlhausen's boundary layer equation (into which the first two-speed derivatives enter) are no longer given. In consequence of the pronounced pressure change at the critical point a breakdown of the boundary layer is anticipated.

The Temperature of Unheated Bodies in a High Speed Gas Stream. (E. Eckert and W. Weise, F.G.I., Vol. 12, No. 1, Jan.-Feb., 1941.) (R.T.P. Translation T.M.1,000.) (101/7 Germany.)

A body that neither receives nor gives off heat, assumes the temperature of the air in a flow at low speed. But at airspeeds of the order of sonic velocity its temperature is higher, the effects of compression and friction becoming marked. This phenomenon is of technical importance in many respects. When the temperature in a flowing gas is recorded, the temperature of the thermometer, of course, registers the same increase; hence the effect must be known if the true gas temperature is to be obtained from the thermometer reading. The knowledge of the temperature of the unheated body in airflow is a requisite for heat transfer estimates. If the body, because of heating or cooling, has a higher or lower temperature than it would have unheated, it gives off or absorbs heat. On aircraft these phenomena becomes significant by wing-skin cooling, insulation of pressure cabins, and icing.

The temperature which the unheated body assumes in the air stream is termed its " specific temperature " by the author.

The present report deals with temperature measurements on cylinders of 0.2 to 3 millimeters diameter in longitudinal and transverse air flow at speed of 100 to 300 meters per second. Within the explored test range (*i.e.*, the probable laminar-boundary-layer region), the temperature of cylinders in axial flow is practically independent of the speed and in good agreement with Pohlhausen's theoretical values. In transverse flow, however, cylinders of certain diameter manifest a close relationship with speed, the ratio of the temperature above the air of the body to the adiabatic stagnation temperature first decreasing with rising speed and then rising again above a Mach number of 0.6. The importance of this " specific temperature " of the body for heat transfer studies at high speed is discussed.

New Method of Extrapolation of the Resistance of a Model Flying Boat to Full Size. (W. Sottorf, L.F.F., Vol. 16, No. 8, 20/8/39.) (R.T.P. Translation T.M. No. 1,007.) (101/8 Germany.)

The previously employed method of extrapolating the total resistance to full size according to the cube of the scale and thereby foregoing a separate appraisal of the frictional resistance, was permissible for large models and floats of normal size. But faced by the ever increasing size of aircraft a re-examination of the problem of extrapolation to full size is called for. A method is described by means of which, on the basis of an analysis of tests on planing surfaces, the variation of the wetted surface over the take-off range is analytically obtained. The friction coefficients are read from Prandtl's curve for turbulent boundary layer with laminar approach. With these two values a correction for friction is obtainable.

Worked out examples indicate that resistance variations analytically determined and those derived from measurements give a practical approximation. A former scale series with the corrections applied to three resistance curves shows good agreement. The step from the 10-ton to the 100-ton flying boat with correction applied is found to be not critical for extrapolation from a model of customary size at the present time.

Some Simplified Methods in Aerofoil Theory. (M. A. Biot, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 185-190.) (101/9 U.S.A.)

The use of the acceleration potential in thin aerofoil theory was introduced by L. Prandtl. The method has since been applied by several authors to problems of steady and non-steady flow in both compressible and incompressible fluids. A striking feature of this method is that no use has to be made of vortex wakes because the acceleration potential is everywhere continuous in the fluid. Such concepts as the trailing vortices and the induced downwash play no direct part in this theory.

The purpose of the present article is the treatment of two-dimensional aerofoil theory in an incompressible fluid by the combined use of conformal transformation and the acceleration potential. This method of approach greatly simplifies the solution of certain aerofoil problems.

The fundamental properties of the acceleration potential in an incompressible fluid are discussed, and it is shown how the problem of finding the acceleration potential can be solved by conformal representation of the aerofoil on a circle. A simple relation is derived between the velocity and the "stream function" corresponding to this potential. The method is next applied to the stationary aerofoil with and without flap, and to the determination of the aerofoil camber line and thickness function for a given pressure distribution along the chord. The simplicity of the method is especially apparent for the case of the oscillating aerofoil. For the sake of brevity only translatory oscillations are considered.

The Theory of the Lifting Line in Unsteady Motion. (K. Jaeckel, L.F.F., Vol. 19, No. 2, 20/3/42, pp. 57-63.) (101/10 Germany.)

The author develops the fundamental equations for the potential functions characterising a two- or three-dimensional wing of negligible curvature and thickness set at a small angle of incidence, assuming a velocity discontinuity brought about by a suitable vortex distribution both on the wing and over the trailing vortex sheet. In the case of steady motion the author's expression assumes in the limit of vanishing chord the form given by Prandtl for the lifting line.

The author shows, moreover, that the expressions maintain their significance for slow periodic motion and that good approximate solutions for this "quasi-steady" state can be obtained. It appears that under these conditions the Prandtl circulation equation maintains its significance.

In conclusion the author indicates how the theory could be extended to deal with the general case of unsteady motion.

The Effect of Natural Wind on a Large Cylinder (8 in. high, 2 in. diameter). (A. Proll, Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, pp. 220-222.) (101/11 Germany.)

The pressure distribution on a cylinder in steady flow has been investigated both theoretically (ideal fluid) and experimentally (in the wind tunnel). The effect of turbulence and gustiness of natural wind, however, profoundly affects the results, as was shown by full-scale experiments on a vertical cylinder 8 m. high and 2 m. diameter. The resultant force on this cylinder could be measured directly on a spring balance, whilst the pressure distribution was recorded by multimanometers over three horizontal sections (top, centre, bottom). The velocity and direction of the wind was automatically recorded by a special anometer situated 10 m. above the ground.

Apart from yielding interesting results on wind structure, the full-scale experiments show that the distribution of negative pressure over the cylinder is generally unsymmetrical, the suction maxima on the left and right hand side at any instant differing by as much as 40 per cent. This unsymmetrical loading must be allowed for when estimating wind forces on circular structures such as gas holders. Comparative experiments on the same cylinder fitted with eight vertical ribs attached to the surfaces caused a considerable reduction in the values of the suction force and the fitting of such ribs on full-scale structures is strongly recommended. Although the Reynolds number of these experiments extended to 4×10^6 against only 0.6×10^6 for wind tunnel models, it is felt that further tests on existing full-scale structures are required before the subject of wind loading can be put on a satisfactory basis.

Windscreen De-icing. (Inter. Avia., No. 807, 16/3/42, p. 12.) (101/12 U.S.A.)

For some time various American air carriers have been experimenting with devices to keep the windscreens of commercial transport aeroplanes free from ice. Tests conducted by American Airlines Inc. with rotary and return-stroke type windscreen wipers operating in conjunction with de-icer fluids promised satisfactory results. United Air Lines, on the other hand, conducted tests which have induced the company to turn down the idea of moving windscreen wipers. The line in question is now equipping its aircraft with double windscreen panes, the front pane consisting of safety glass $\frac{1}{4}$ in. thick, and the rear pane of a transparent plastic $\frac{1}{8}$ in. thick, with a $\frac{1}{4}$ in. air space between the two. For the heating of the air space between the two panes, hot air of a temperature of 175 deg. F. is conducted from the cabin heating system to the panes and leaves through an exhaust duct leading to the outside. The experiences so far gathered by United Air Lines with this type of ice-free windscreen are stated to have shown better results than have been obtained with mechanical windscreen wipers and de-icer fluids.

Stress Analysis of Circular Frames. (H. Fahlbusch and W. Wagner, L.F.F., Vol. 18, No. 4, 22/4/41.) (R.T.P. Translation T.M. 999.) (101/13 Germany.)

The stresses in circular frames of constant bending stiffness, as encountered in thin-wall shells, are investigated from the point of view of finite depth of sectional area of frame. The solution is carried out for four fundamental load conditions :—

(1) Localised radial force on frame.

(2) Localised movement acting along a diameter of the frame.

(3) Localised tangential force acting along the neutral fibre of the frame.

(4) Localised tangential force acting along the outer periphery of the frame.

The method is illustrated by a worked out example.

The solutions hold for circular frames with small sectional depth compared to curvature radius r. In this case the curved member acts similar to a straight member. Hence the stress distribution was assumed linear and the cross sections presumed to remain plane. The effect of the longitudinal and transverse forces on the displacement factors was disregarded. In addition, the bending stiffness of the shell plate compared with that of the circular frame was presumed to be small, and the departure of the frame contour from the circular shape due to elastic strain was discounted.

The Stresses in Stiffener Openings. (K. Marguerre, L.F.F., Vol. 18, No. 7, 19/7/41.) (R.T.P. Translation T.M. 1,005.) (101/14 Germany.)

As the initial step in the analysis of stress distribution in three dimensionally curved rings (as employed for stiffeners in stressed skin aircraft designs), the ring formed by the intersection of two circular cylinders is explored for three categories of load; tension in both cylinders (produced by hydrostatic pressure on the cylinder walls), axial force in the large cylinder, and lastly, shear in the large cylinder. The discussion of these three load cases enables general conclusions concerning the behaviour of the ring stressed by the shell forces and affords numerical data for the most important load categories (obtainable from the above by super-position). The quantitive results are illustrated in figures and condensed in simple approximate formulæ.

The three explored load distributions are three column loads for the unstiffened cylindrical shell; hence they create in the undisturbed shell a pure membrane stress attitude. The author assumes that this membrane stress attitude is not materially disturbed by the elastic interference effect between the stiffener opening and the skin. This assumption is met in the " extreme " case of a very stiff ring and a thin-wall shell without frames (or with frames located at some distance from the opening).

In the opposite extreme case (not discussed by the author) of a ring rigid in strain but flexible in bending and of a shell closed all around by closely placed stiff frames or curved floors—" egg surface "—the state of stress and strain is utterly different.

The true shell lies between the two extremes. If the ring is distinctly rigid in bending and the shell is either thick-walled or forms an egg surface, a complicated elastic interference effect results which defies calculation and must be ascertained experimentally. The present solution supplies the basis for such experiments by enabling the estimation of the maximum bending stresses to be expected through the determination of their upper limit.

Surface Protection of Aircraft by Means of Paints and Lacquers. (W. Jaeger, Der Flieger, Vol. 21, No. 1, Jan., 1942, p. 20.) (101/17 Germany.)

It is now generally recognised that a smooth external surface (especially of the wings) is of the greatest importance for high speed aircraft. Surface protection by anodic oxidation although attractive from the point of view of weight, suffers from the drawback of producing a relatively rough surface, even if, as usual, a subsequent coating of lacquer is applied. Modern acryl resin lacquers weigh about 80 gm. per m.^{2} for the usual single coat. As two or even three coats may be necessary in order to obtain sufficient smoothness of the outer skin of anodised material, the author suggests that anodic treatment should be reserved for those structural parts of the aircraft for which surface friction is not critical.

When comparing different methods of surface protection, increase in frictional drag may be of much greater importance than weight added.

Kinetic Energy Correction to Predicted Rate of Climb. (F. C. Phillips, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 172-174.) (101/18 U.S.A.)

The assumption of zero acceleration along flight path, generally made in the interest of simplification in climb performance calculations, is pointed out, and the general performance equation re-stated for the case of finite acceleration. This assumption is shown to result in optimistic predicted rates of climb. The percentage error involved is analysed and shown to increase rapidly with aeroplane loading and with altitude, particularly in the stratosphere.

The war emergency is accelerating tremendously the trend toward higher operating altitudes and higher loadings for military aircraft. Increasing climb errors involved by these trends will shortly be of appreciable magnitude. The case of a high altitude bomber is given to illustrate this quantitatively. It is recommended that allowance be made, in establishing climb performance guarantees and in correlating computed and flight rates of climb, for the error incurred by assumption of zero acceleration along the flight path.

An Improved Longitudinal Stability Calculation. (H. P. Liepmann, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 181-184.) (101/19 U.S.A.)

The conventional method of calculating static longitudinal stability is improved by taking into account the moment of the fuselage in addition to the wing and tail moments about the centre of gravity of an aeroplane. The general equation for the fuselage moment, which is always unstable or stalling, is derived and presented in terms of the dynamic pressure, the angle of attack and two constants which depend on the shape of the fuselage only. These constants are explained theoretically and approximate values for them are given. These approximations lead to a simplified equation for the fuselage moment which is correct up to an angle of attack of about 12°, as shown by comparison with existing experimental results. It is also pointed out, that in calculating the fuselage moment for a stability investigation of an aeroplane, the downwash induced by the wing should be taken into consideration. A static stability calculation is carried through for an aeroplane for which the total moment about its centre of gravity is known from test results. A comparison of theoretical and experimental value shows that the improved method is in much better agreement with tests than the conventional method of stability calculation.

Resin Bonded Wood Laminates for Shell Type Aircraft Structures. (A. A. Gassner, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 161-171.) (101/20 U.S.A.)

Wood as lumber is not homogeneous and it is not isotropic; it is also more sensitive to atmospheric influences than are the metals. Wood veneers plus synthetic resin as bonding medium will react more nearly like a homogeneous material, and, by suitable design and by consideration of the applied stresses, a construction can be built that will be fully able to carry the required loads, even though the material is not fully isotropic.

Surface coating with synthetic resin finishes makes these structures highly impervious to atmospheric influences and resin impregnation of the basic veneers can be used to make the laminations practically immune against moisture.

These wood-base laminations are exceedingly well suited for the construction of full-stressed shells for aircraft parts with very few internal stiffeners.

In Duramold design, many very thin veneers are used to obtain the highest possible homogeneity at reasonable cost. While commercial plywood of $\frac{1}{4}$ inch thickness is, for instance, built up from five plies, the Duramold construction would use for the same thickness 10 to 12 plies. Commercial plywood is difficult to bend even on large radii, and the bending or forming of commercial plywood to pronounced compound curvature is impractical. Duramold can be moulded to small single radii and it can be readily moulded to very pronounced compound curved shapes, because each of the very thin veneers is formed separately which requires only small pressures and which introduces hardly any stresses into the single veneer. Then the veneers are formed in the mould to the desired shape, while the layers are bonded together at the same time by the resin.

By the use of the stress analysis methods described by the author and based on a long series of tests and investigations, a number of aircraft structures have been designed, constructed and tested.

One of these designs is the stabiliser for the Fairchild M-62 low-wing training plane. This stabiliser is a stressed-skin type without longitudinal stringers and without a front spar. It consists merely of moulded top and bottom shells, whose thickness tapers from approximately $\frac{1}{4}$ inch at the centre line of the aeroplane to $\frac{3}{32}$ inch at the stabiliser tip, of a light rear spar that takes vertical shear and is used for the attachment of elevator and fuselage fittings, of a leading edge-former that curves in one part into the tip bows, and of a few chordwise ribs. The shell is, on account of its thickness, a very stiff one and assures the maintenance of the proper aerofoil section under all conditions of flight loads. In combination with the remainder of the structure it assures very high torsional stiffness, and load tests have shown that the torsional twist of this stabiliser was only 0.50 degree under full design load, consisting of the pertaining stabiliser-down and elevator-up loads. The complete weight of this Duramold stabiliser is the same as of the plywood-plus-spars type of the original design.

The Technical Cohesive Strength of Metals (28 *References*). (D. J. McAdam, J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 155-165.) (101/21 U.S.A.)

By the technical cohesive strength of metals is meant, not the interatomic forces, but the technically estimated resistance to fracture. An example of such resistance to fracture is the "true" breaking stress of a tension test specimen, the breaking load divided by the sectional area at fracture. In such a test, however, the fracture usually occurs after more or less plastic extension. The technical cohesive strength thus measured, therefore, is not that of the original metal, but of metal which has been plastically deformed during the test. By plastic deformation, the cohesive strength is greatly altered.

Ludwik pointed out the need for knowledge of the initial cohesion limit and of its variation with plastic deformation. He showed that ductility and the work of deformation to fracture depend upon the initial difference between the technical cohesion limit and the resistance to plastic deformation (flow stress). He also showed that a notch in a specimen under tension causes triaxial tensile stress in the minimum section, and thus raises the flow stress in relation to the cohesion limit. A notch thus tends to increase the tensile strength (based on the reduced section) and to decrease the ductility and total work. With Ludwik's work as a foundation, Kuntze developed a method for the use of notched specimens in obtaining values of the technical cohesion limit.

Over a period of years several different criteria have been proposed for the conditions necessary for fracture. According to the earliest of these theories, fracture occurs when the maximum principal stress reaches a limiting value. Other such criteria suggested are the maximum shear and the maximum strain. It has also been suggested that the fracture of ductile metals is determined by the maximum shear, but that the fracture of brittle materials is determined by the maximum principal stress. According to the original views of Mohr, however, the stress at either yield or fracture depends upon both the normal stress and the shearing stress on the plane of yield or fracture. Bridgman came to the conclusion that the conditions for rupture are more complex than has been generally supposed.

Since the investigation of Griffith, however, the prevalent view has been that fracture is determined only by the greatest principal tensile stress, and occurs when this stress reaches a value that depends only upon the state of the metal at the instant of fracture. The technical cohesion limit thus is thought to be the same whether the metal is under unidirectional or polarsymmetric tensile stress. These views have been endorsed by Kuntze as a result of his investigations. The work of Kuntze is the basis of prevalent views as to the variation of the cohesive strength of metals with plastic deformation.

An Extension of the Sand-Heap Analogy in Plastic Torsion Applicable to Cross Sections having One or More Holes. (M. D. Sadowsky, J. Applied Mech., Vol. 8, No. 4, December, 1941, pp. 166-168.) (101/22 U.S.A.)

In this paper the author cites the basic theory of the sand-heap method of plasticity as developed by A. Nadai, which involves determination of the twisting moment M in plastic torsion by means of the formula $M=2\,(k/m)\,V$, where V=volume of sand-heap, m=slope of heap, k=maximum value of shearing stress in plastic flow (in this method sand is piled on a horizontal plate of similar shape to the section undergoing twist). The author explains the principles upon which the analogy is modified to apply in the case of cross sections having one or more holes, such as a twisted shaft. The technique developed to meet such cases is described in detail and a mathematical analysis is given which results in a twisting moment formula for a cross section with holes, equivalent in accuracy to that of the original equation for the simple case of a twisted bar.

Solution of Problems in Elasticity by the Framework Method. A. Hrennikoff, J. Applied Mech., Vol. 8, No. 4, December, 1941, pp. 169-175.) (101/23 U.S.A.)

Because of mathematical difficulties which make the solution of differential equations of the theory of elasticity impossible in many cases, the author has been impelled to seek some other method of approach than one of pure mathematical analysis. The method outlined in this paper is of this character and may with some qualifications be applied to problems of two-dimensional stress, bending of plates, bending of cylindrical shells, the general case of three-dimensional stress, and a great variety of others. Essentially, the method consists in replacing the continuous material of the elastic body being studied by a framework of bars arranged according to a definite pattern, the elements of which are endowed with elastic properties suitable to the type of problem. This framework is then analysed, according to the procedure outlined in the paper for various types of elastic problems. Examples of the application of the principles involved are also given.

Lateral Buckling of I Section Column with Eccentric End Loads in Plane of Web. (B. Johnston, J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 176-180.) (101/24 U.S.A.)

When a relatively slender column of the symmetrical *I* or *WF* shape is loaded eccentrically in the plane of the web by longitudinal end loads it may fail by elastic instability involving a combination of lateral bending and twisting. Timoshenko has shown that in the case of the solid rectangle a considerable end eccentricity causes the critical buckling load to be only slightly less than the Euler critical load for the same strip loaded axially. The corresponding solution for the *WF* or *I* column, presented by the author, shows that relatively small eccentricities of the longitudinal end load applied in the plane of the web cause a large falling off from the Euler critical load.

For the ideally straight column, with a material perfectly elastic up to the yield point, there would be a critical l/r ratio for any given eccentricity, column length, and material. Below this critical ratio the column would fail by yielding, according to the secant or eccentricity formula. Above the critical ratio the failure would be by elastic instability with respect to lateral bending and twisting.

Applications of the equations is made to two structural wide flange sections, of light and medium weight, and the results are presented in the form of diagrams.

Effect of Threaded and Serrated Holes on the Limited Time and Fatigue Strength of Flat Alloy Strips. (H. Burnheim, L.F.F., Vol. 18, No. 2-3, 29/3/41, pp. 102-106.) (R.T.P. Translation T.M. No. 994.) (101/25 Germany.)

The present report deals with fatigue tests under initial tension and repeated stress on flat test specimens of 3116.5 duralumin and A.Z.M. 3510.1 electron with plain unloaded and pin-loaded holes (tension lugs) of different forms. From the findings, which are presented in the form of Wohler curves, the ratio σ_{orig}/σ_n (notch sensitivity factors) and $\sigma_B : \sigma_n$ are computed for 10^4, 10^5, 10^6, and 10^7 number of cycles.*

It was found that the notch effect of the serrated holes in both metals is greater than that of the threaded holes and that it, in turn, is greater than that of the

* σ_{orig} = stress withstood by undrilled specimen.
σ_n = ditto when drilled.
σ_B = tensile strength of material.

cylindrical holes for both the unloaded holes and the pin-loaded holes. On the loaded holes the notch effect for all three forms assumes much greater values than on the unloaded ones; hence the limited time and fatigue strength of the tension lugs is considerably lower. While the fatigue strength ratio of plain and drilled specimens (notch effect factor) increases very little on the unloaded holes, it rises considerably with the number of cycles on the loaded ones. The ratio $\sigma_B : \sigma_{n\ orig}$ increases much more with the number of load cycles, especially on the tension lugs. The exceedingly unfavourable behaviour of the serrated tension lugs of the A.Z.M. electron was unusual.

In the remarks on the types of failure the peculiar location of the break on the serrated tension lugs is pointed out.

The Creep of Laminated Syntheic Resin Plastics. (H. Perkuhn, L.F.F., Vol. 18, No. 1, 28/2/41.) (R.T.P. Translation T.M. No. 995.) (101/26 Germany.)

If plastics are stressed so highly that they can be used at about the same weignt for construction as metal, unusually high deformations can occur at the comparable stresses permissible for metals in aircraft design, depending upon the kind of stress and the design of the structural part. The deformations will be high because of the low elastic modulus of plastics and the incipient creep under protracted loads even for low stresses. The effect of time on the deformation—the plastic and the elastic portion—of laminated synthetic resin plastics even at room temperature is already comparable to that of metal structures at high temperatures such as do not occur under normal service conditions. The long-time loading strength of a number of laminated synthetic resin plastics was ascertained and the effect of moulding pressure and resin content determined. The best value was observed with a 30 to 40 per cent. resin content. The long-time loading strength also increases with increasing moulding pressure up to 250 kg./cm.^{2}; a further rise in pressure affords no further substantial improvement.

The creep strength is defined as the load which in the hundredth hour of loading produces a rate of elongation of 5×10^{-4} per cent. per hour. The creep strength values of different materials were determined and tabulated.

The effect of humidity during long-time tests is pointed out.

Determination of the Bending and Buckling Effect in the Stress Analysis of Shell Structures Accessible from One Side Only. (A. Dose, L.F.F., Vol. 18, Nos. 2-3, 29/3/41.) (R.T.P. Translation T.M. 997.) (101/27 Germany.)

The practical use of the data of individual strain measurements on thin-wall shell structures with the usual instrumental means, say, for checking the mathematical principles, is frequently open to question because of the disturbing effect of flexural strains induced by more or less severe bulging of the skin. Modern structural methods of air frames do not permit the elimination of flexural strains in many cases through measurements from two sides. These strains may be of considerable extent even though invisible to the naked eye. As a result the conventional strain gauges do not always give reliable values for the strains in the median layer. This report describes a device (spherometer) for ascertaining the bending and buckling effect in stress measurements on shell structures accessible from one side only. Beginning with a discussion of the relationship between flexural strain and certain parameters, the respective errors of the test method for great or variable skin curvature within the test range are analysed and illustrated by specimen example.

Stress Determination and Fatigue. (J. O. Almen, Trans. S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 53-61.) (101/29 U.S.A.)

It is in machines where weight is all-important, such as in aeroplane engines, or where weight and cost must both be considered, as in automobiles, that the inadequacy of our means of stress determination and our ignorance of fatigue strength of materials are most keenly felt. Calculated stresses are in themselves meaningless and are of value only when they are interpreted in terms of experience. Although conceding that the accuracy of stress data from photo-elastic and extensometer readings is usually greater than that obtained from the most involved mathematical analysis, the author shows by fatigue tests that these methods are far from reliable.

In the major part of this paper, $S-N$ diagrams* with linear and logarithmic co-ordinates, combinations of these co-ordinates, and three-dimensional co-ordinates, are discussed. This discussion brings out the effect on fatigue strength of varying degrees of stress concentration; of surface treatment of the test specimens; of stress range; and presents considerable fatigue data on ball bearings. It is shown that, when fatigue-test results are run on a large number of commercially identical parts over a sufficiently large load range, the scatter of the test points when plotted on logarithmic co-ordinates, falls within a well-defined pattern which tends to radiate from a point at high stress and low number of stress cycles and to diverge to a broad bond at low stress and high number of stress cycles.

Brittle Point of Rubber upon Freezing. (M. L. Selker and others, Ind. Eng. Chem. (Ind. Ed.), Vol. 34, No. 2, Feb., 1942, pp. 157-160.) (101/30 U.S.A.)

This paper supplies the need for a simple, rapid, and accurate method of determining the brittle temperature of rubber and allied materials. The method depends on the fact that, when either natural or synthetic rubber is cooled a temperature is reached where the material will fracture under bending stress. This temperature is sharply defined and varies with composition and structure of the material.

The brittle temperature of soft vulcanised rubber is substantially independent of the state of cure within the limits found in industrial practice. However, in rubber-sulphur compounds where a large amount of sulphur is used, there is nearly a linear dependence of brittle temperature on combined sulphur. Additions of reinforcing pigments produce little effect, whereas coarse fillers raise the brittle temperature.

With the exception of butadiene polymer and butadiene-styrene copolymer, all synthetic rubbers have higher brittle temperatures than rubber (app. $-30°$C. against $-50°$C.). In contrast to natural rubber compounds the carbon-black-reinforced stocks of the synthetics show a lower brittle temperature than the crude material. Brittle temperature is independent of molecular weight within wide limits above a minimum value.

Industrial Progress in Synthetic Rubberlike Polymers. (H. I. Cramer, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 2, Feb., 1942, pp. 243-251.) (101/31 U.S.A.)

The development of synthetic rubberlike polymers is being accelerated greatly by the national emergency. The annual production of these new vital materials has now increased to the point where it can be expressed in tens of thousands of tons.

Formerly the application of the synthetic rubbers depended upon their superiority in some specific respects over natural rubber. With the completion of the new plants now planned and under construction in the U.S.A. sufficient of the synthetic product should become available so that attention can be given to those applications involving simple replacement of the natural product.

Over a score of synthetic elastic polymers have been produced on a commercial scale. The discussion is limited to a review of the raw materials required, the

*S = stress range.
N = Number of cycles.

commercial syntheses, applications, and costs of the polymers of butadiene or derivatives, the polybutenes, the alkyline polysulphides, and the plasticised polyvinyl chlorides.

The production capacity of synthetic rubber plants in the United States, built and in the course of construction, is discussed.

Vinylidene Chloride Polymers ("Saran" Upholstery Fabrics, etc.). (W. C. Goggin and R. D. Lowry, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 3, March, 1942, pp. 327-332.) (101/32 U.S.A.)

Vinylidene chloride plastic as a new and unusual material is discussed from the standpoint of history, chemical and physical structure, outstanding characteristics, methods of fabrication, and application.

These resins differ from familiar plastic materials in that they exhibit crystallinity, as can be demonstrated by X-ray diffraction patterns. While presenting some mechanical problems, the control of this crystallinity offers a wide range of properties and unique fabrication techniques. The extrusion and continuous orientation of vinylidene chloride plastic is now a commercial accomplishment. Injection moulding of these resins, along with control of moulding properties, is presented for the first time. Applications are cited illustrating some fabrication methods as well as the unusual characteristics of chemical inertness, water resistance, high strength, toughness, and abrasion resistance. Upholstery fabrics made of this material (trade name "Saran") have already reached extensive application.

Lateral Instability of Unsymmetrical I Beams. (H. N. Hill, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 175-180.) (101/33 U.S.A.)

An expression is derived for calculating the critical bending moment at which lateral buckling will occur in an I beam which is unsymmetrical about the principal axis normal to the web. The expression is derived for the case in which the beam is subjected to pure bending. This problem differs from the similar problem involving the buckling of beams of symmetrical I cross section in that the shear centre of the section does not coincide with the centre of gravity.

Experimental verification of the expression is obtained from the results of tests made to study the lateral buckling of unsymmetrical aluminium alloy I beams under pure bending.

Buckling of a Column with Non-Linear Lateral Supports. (H. S. Tsien, J. Aeron. Sci., Vol. 9, No. 4, Feb., 1942, pp. 119-132.) (101/34 U.S.A.)

During the investigation of the buckling phenomenon of thin spherical shells and thin cylindrical shells, it was found that for these structures the load sustained is not a linear function of the deflection even when the stresses are below the elastic limit and are proportional to the corresponding strains. This non-linear load vs. deflection relation gives a buckling phenomenon entirely different from that of the classical theory. However, the exact solution of these problems involves a pair of non-linear partial differential equations. It is difficult to obtain an exact solution. The method adopted in these investigations is the so-called energy method, where a plausible form of deflection of the shell is assumed, first with certain undetermined parameters, and then these parameters are determined by the condition that the first variation of the strain energy of the system must be zero. Although this method yields quite satisfactory results for the cases investigated, it is felt that due to the novel nature of the problem, an exact solution is very desirable. Experiments on a column with non-linear lateral supports show that the essential characteristics of the buckling of curved shells can be reproduced by this structure. The problem of a column with non-linear lateral supports is, however, much simpler than the problem of curved shells, and an exact solution can be obtained without any mathematical difficulty. In the present paper, an exact solution of the column problem is carried out.

With supporting springs whose characteristic simulates that found in the case of a curved shell, a straight unbuckled column may have an elastic energy and end shortening equal to those of a buckled state with finite deflection even at a load far below the classical buckling load. If the end plates of the testing machine are brought slightly nearer, the elastic energy for the unbuckled state will be higher than the buckled state. Therefore, at a small disturbance, the column will jump to the buckled equilibrium state. This means that the recorded buckling load in a testing machine can be lower than that of classical theory even for a perfect specimen without initial deflection. This critical point can be further lowered by the elasticity of the testing machine. Hence, it seems that the buckling load calculated by means of classical theory really has very little bearing on the actual load carrying ability of this type of structure.

Shear Distribution among Three or More Shear Webs. (H. W. Sibert, J. Aeron. Sci., Vol. 9, No. 4, Feb., 1942, pp. 133-134.) (101/35 U.S.A.)

The shear webs of a metal wing do not carry all the vertical shear force on the wing because some of the shear load is carried by each segment of the skin that is not horizontal. It would be on the side of safety to assume that the entire vertical shear force on the wing is carried by the shear webs. With this assumption, the distribution of the resultant shear force at any cross-section to two shear webs can be determined from the fact that the sum of these two shear forces equals the resultant shear force and their moment about any point equals the moment of the resultant shear force about the same point. With more than two shear webs the Principle of Least Work will have to be employed. The case of three shear webs, based upon the assumption that the shear webs carry all the vertical shear, is worked out in detail by the author. The procedure for a wing with four or more shear webs is outlined, the case of tension-field shear webs being considered only in each case.

Eccentricity in Columns. (K. G. Merriam, J. Aeron. Sci., Vol. 9, No. 4, Feb., 1942, pp. 135-137.) (101/36 U.S.A.)

By relating eccentricity to slope at the end of a column, the mechanism of eccentricity behaviour in flat-end loadings is discussed.

For both flat-end and pin-end cases, explanation is offered for the experimentally observed tendency, at failing loads, for the grouping ec/r^2 (called γ) to assume a value below a definite maximum.*

Two non-dimensional graphical representations of the load-maximum stress relation for columns are given, and values of length and γ are stated for use with such charts, which can be employed to solve most column problems involving primary failure by translation, regardless of slenderness ratio or material involved.

Improvement in Light Alloy Screw Connections. (H. Cornelius, Z.V.D.I., Vol. 86, No. 13-17, 4/4/42, pp. 218-219.) (101/37 Germany.)

Experiments were carried out with light alloy screws and nuts of the sizes M 10×1.5 and M 6×1 (metric pitch of 1.5 and 1 mm., outside diameter of thread 10 and 6 mm. respectively). The alloy (composition not stated) is known under the trade name Durmess (Lauta Works) and is stated to be specially suited for automatic screw cutting, yielding a smooth tooth flank. The screws and nuts were anodically oxidised (exolated) and subsequently impregnated with a special wax compound. The tests show that the screws treated as above could be stressed

* e = eccentricity of loading.
c = distance of extreme filament from neutral axis.
r = radius of gyration of cross-section of column.

almost to the limit of the tensile strength of the thread core without any tendency to seizure in the threads.

It is stated that the new process is specially to be recommended for light alloy screws requiring frequent dismantling.

Axial Vibrations of Diesel Engine Crankshafts. (R. Poole, Inst. Mech. Engs. J. and Procs., Feb., 1942, pp. 167-182.) (101/38 Great Britain.)

The paper describes an investigation carried out to determine the magnitude of axial vibration of engine crankshafts, with the object of establishing that axial resonance may occur within the normal running range of an engine.

The author gives the results of tests on various makes of engine using a portable vibrograph to record the axial movement of the crankshaft. In some cases the torsional oscillation was measured simultaneously by means of a universal vibrograph. The vibrograph records show that at certain speeds some engines are subject to a very marked increase in axial vibration of a magnitude consistent with a condition of axial resonance.

The author describes a test in which the natural frequency of axial vibration of a crankshaft is determined experimentally by using an a.c. electromagnet as a means of applying an alternating force.

Expressions are derived for calculating the axial deflection of a crankshaft due to the piston load, and also for calculating the axial deflection under an axial load. It is suggested that the relation between these two deflections determines the magnitude of the axial force set up by the piston loading.

From a series of load-deflection tests, carried out on a number of crankshafts, the author determines the value of empirical factors to be used in estimating the axial stiffness.

Two-Speed Supercharger Drives. (F. M. Kincaid, S.A.E.J., Vol. 50, No. 3, March, 1942, pp. 80-96.) (101/39 U.S.A.)

A single speed supercharger with a compression ratio adequate for maximum power at high altitudes will supply more air than the engine can safely use at low altitudes. Two-speed supercharger drives are provided to obtain high power for take-off at low altitudes and maximum power at high altitudes with one blower.

The Wright two-speed drive utilises a single compound spur-gear system with the intermediate gears connected by a rotating hydraulically actuated friction clutch for the high ratio, and a planetary reduction gear with a clutch in the low ratio. A later model has the intermediate gears coupled by a roller clutch in low ratio and a planetary step-up gear and stationary clutch in high ratio.

The Pratt and Whitney two-speed drive utilises hydraulically operated cone clutches for both the low and high ratio. A fluid coupling is used to accelerate the impeller to a speed between that of the high and low ratio drives for the shifting operation only. Two parallel units are used to reduce the gear sizes.

Bristol uses three clutch units equally disposed above the driveshaft so that each unit carries one-third of the load. Each unit contains two multiple-disc clutches, one for each ratio. Oil for the hydraulic actuating cylinders is cleaned by a pair of centrifuges before it enters the clutch units.

The Rolls-Royce supercharger drive uses semi-centrifugal mechanically actuated clutches. One clutch is provided for the low ratio and two similar clutches for the high ratio. The mechanical linkage is operated by a hydraulic cylinder with scavenge oil pressure.

In the Junkers two-speed drive, a pair of bevel gears drive a layshaft connected to the impeller shaft by two intermediate gears. The low ratio intermediate gear is coupled to the shaft by a roller clutch. The high ratio gear is connected by a mechanically operated friction clutch. An aneroid mechanism prevents engagement of the high ratio clutch at low altitudes.

The Mercedes-Benz DB-601 engine has a variable-speed supercharger drive consisting of a straight forward gear system driving the final drive-shaft at a speed slightly higher than the highest ratio. The speed is then reduced by a fluid coupling. Operation of the drive is entirely automatic, the ratio of the coupling being regulated by a control unit actuated by an aneroid capsule. The slip of the fluid coupling in low ratio at the lower altitudes causes the oil in the coupling to be heated considerably. This would be a great disadvantage in transport or patrol planes intended for operation at low altitudes. However, this might be an advantage for fighter craft as the high heat rejection would aid in quickly warming up the system while climbing to high altitudes.

Aircraft Carburettor Airscoops and Their Effect on Fuel/Air Metering in Flight (with Discussion). (F. C. Mock, S.A.E.J., Vol. 50, No. 3, March, 1942, pp. 102-104.) (101/40 U.S.A.)

The design of a carburettor airscoop involves:—

1. Location of the intake opening to receive full airspeed ram and exert minimum drag (which involves knowledge and experiment as to the external air flow around the aeroplane); and

2. Conducting the intake air to enter the carburettor with uniform pressure across its stream with minimum turbulence, and minimum loss of impact pressure (which involves the study of internal air flow).

In general, the two main objectives, maximum ram and minimum disturbances of carburation, go hand in hand and have the same structural requirements.

An analysis is given of the principles of fuel-air metering, by measuring the air velocity differential through air orifices of fixed size, and transmitting this differential, corrected for variations of air density, to secure corresponding fuel flow differential through selected fuel orifices. A description is then given of the departures from steady full-stream air flow encountered in flight service, and the manner in which these affect air speed metering.

Methods are given for detecting, measuring, and curing disturbances from these sources.

Recommendations also are given for improved warm and cold air control, for protection against ice formation in the intake system, by eliminating the variable ram differential between cold and warm air flow which exists with most current scoop designs.

In conclusion, the need is emphasised for freer co-operation between the aeroplane, engine, and carburettor engineers; and for recognition in our procurement procedure of the need for preliminary check tests in actual flight, on prototype aeroplanes, of the design and characteristics of not only the scoop and carburettor, but also all other engine accessories whose functioning may be affected by differences between flight and ground-test conditions.

Gas Turbine Progress (Digest). (J. T. Rettaliata, S.A.E.J., Vol. 50, No. 3, March, 1942, pp. 32-33.) (101/41 U.S.A.)

Two obstacles to the development of the combustion-gas turbine have been overcome in recent years—to-day's better materials enable temperatures of 1,000°F. to be used; and an axial compressor, upon which years of aerodynamical research have been spent, affords the necessary high efficiency compressor unit.

In modern lay-out a five-stage reaction type gas turbine is directly coupled to a fifteen-stage axial compressor. Air from the atmosphere enters the compressor where its pressure is raised. Part of the air discharged from the compressor is used for combustion purposes in the oil burner; the remaining air flowing through the annular space and cooling the products of combustion to a satisfactory turbine inlet temperature. The gas, a mixture of air and combustion products, then expands through the turbine from which it is exhausted to the atmosphere. The power developed by the turbine is greater than that required by the compressor and the excess power is supplied to the generator. In order to start the unit from a standstill, a motor is provided to bring the unit up to about 25 per cent. of normal speed at which point the turbine is capable of driving the compressor.

The unit is controlled by a speed governor connected to the fuel-oil supply; in this way the inlet gas temperature to the turbine is varied, thus changing the power developed by the turbine. An emergency governor actuates a by-pass valve around the turbine when a designated overspeed is exceeded. The turbine and compressor are connected through a solid coupling which enables their equal axial thrusts to neutralise each other, thus eliminating the necessity of balanced pistons.

At the present time the principal commercial application of the gas-turbine axial compressor unit in the United States has been in oil refineries. A 2,200 h.p. gas-turbine locomotive, with electrical transmission, is being built by Brown-Boveri for Swiss Federal Railways. Other natural and favourable applications will develop from time to time and will probably include marine propulsion, blast-furnace plants, wind tunnels, special power plants, and other special applications.

Direct Injection in Internal Combustion Engines. (J. E. Tuscher, Pubs. Sci. Tech. du Minist. de L'Air, No. 89, 1939.) (R.T.P. Translation T.M. No. 993.) (101/42 France.)

The author claims that his study of retarded cycles, during which combustion takes place entirely during the expansion stroke, has provided a means for reducing the combustion speed and for increasing the concentration of the air-fuel ratio up to saturation while maintaining a high thermal efficiency. According to him, the combination of a short injection period and retarded cycle will produce the greatest specific power from a Diesel engine, while reducing, at the same time, the fatigue of its parts to within acceptable limits.

Researches on a single cylinder two-stroke Diesel (bore 125 mm., stroke 170 mm., 8 h.p., 800 r.p.m. normal rating) have led to a solution for reducing the fatigue of the Diesel engine by permitting the preservation of its components and, at the same time, raising its specific horse-power to a par with that of carburettor engines, whilst maintaining for the Diesel engine its prerogative of burning heavy fuel under optimum economical conditions.

The feeding of Diesel engines by injection pumps actuated by engine compression achieves the required high speeds of injection readily and permits rigorous control of the combustible charge introduced into each cylinder and of the peak pressure in the resultant cycle.

The suppression of the mechanical control of the pumps and the pressure lines simplifies the construction of direct-injection engines and improves their dependability in service.

Linking Factors of Overhaul Periods for Aircraft Engines (Digest). (M. Whitlock, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 56.) (101/43 U.S.A.)

The limited factor for aircraft engine overhaul periods is the accumulation of the centrifuged deposit in the crankpin which limits the overhaul period to approximately 1,000 hr. The crankpin deposit not only throws the carefully balanced crankshaft out of balance but, as the deposit level reaches the end of the oil tube, the foreign material normally centrifuged out is allowed to pass into the master rod bearing where it promotes wear.

The condition can be alleviated, by decreasing the tendency for the oil to sludge, by decreasing the amount of lead in the lubricating system through improvement in ring sealing and fuel refining, and by providing effective filtering facilities in the lubricating system. Then, the overhaul period would be expected to be limited at 1,500 hr. by the pitting of reduction gear teeth, wear and failure of the master-rod bearing, wear on piston rings, and pitting of the crankshaft main bearing.

There is a definite need for a relocation of the oil pressure regulating valve, for facilities to remove entrapped air from the scavenged oil, for improved valve and valve-guide design, and for an improved ignition harness.

Air Flow Through Inlet Valves (Digest). (G. B. Wood and others, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 57.) (101/44 U.S.A.)

Improvement of the volumetric efficiency of engines is usually done by the cut-and-try method. The authors arbitrarily group the pertinent factors (despite some considerable overlapping) as follows :—

Heat-transfer effects;
Steady flow resistance; and
Pulsation of the intake gases.

Stressing the importance of steady flow characteristics at the inlet valve, the authors conclude that improving these characteristics was tantamount to increasing the effective area of cross-section of the inlet passage.

Many engines have sharp corners immediately upstream from the throat of constriction between the valve and its seat, and the curves given in this report indicate that even a slight breaking of the corners in the port and under the valve head will make an appreciable difference in the flow capacity. The length of the radius depends to a considerable extent on the design of the remainder of the port.

Co-operative Engine Wear Studies (Digest). F. L. Miller and others, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 64.) (101/45 U.S.A.)

Contrary to the general belief, merely improving lubricating characteristics does not automatically reduce engine wear; rather, wear depends largely upon engine operating conditions even with oils of better oiliness. No single laboratory engine or test machine has been developed to the point where "acceptable" correlation of wear with service seems possible.

A distinction between the wear characteristics of straight mineral oils and certain compounded mineral oils can be made but as yet the data are not sufficiently sensitive to allow more extensive conclusions. Wear was greater during the break-in period with oils containing oiliness additives, but afterwards it was less.

The authors concluded that scuffing wear is the kind which can best be correlated between engine and laboratory machine tests, and the most certain to be improved with oiliness agents.

Still another point is the relationship between the results of tests made with so-called extreme pressure test machines and those made on other machines or in actual engines. It is obvious that lubricants containing additives having greater extreme pressure properties show to advantage in such tests. It is not equally obvious, however, that such compounds are actually superior in service. Nevertheless, when compared with straight uncompounded lubricants, it would appear that they definitely reduce wear, or at least that of the scuffing type.

Wright High Performance Flat Engine. (Inter. Avia., No. 808-809, 28/3/42, pp. 16.) (101/46 U.S.A.)

U.S. Patent No. 2,259,102 recently assigned to Rudolph Daub of the Wright Aeronautical Corp. (applied for on June 10th, 1939), is of interest. The patent drawing illustrates a liquid-cooled engine featuring four cylinder banks; one set of two banks each, one bank arranged above the other, from an angle of 30 deg. This relatively small angle makes possible a low height of the engine, and due to the fact that the cylinder axes intersect only on the opposite side of the crankshaft axis the width of the engine is kept within moderate limits. Both these advantages could have been incorporated also in the design of a horizontal " H " engine; the new Wright design differs from the latter inasmuch as for the power transmission the two crankshafts of equal function are replaced by a single main crankshaft. On each crankpin of the main crankshaft is mounted an independent bearing spool to which are journalled the four connecting rods in the manner of the articulated connecting rods of a radial engine with symmetrically arranged crank pins. The bearing spool or connecting rod end possesses a vertical arm, on the free end of which acts the corresponding crank pin of an auxiliary crankshaft. The latter is driven by the main crankshaft via an intermediate gear in the same sense and at identical angular velocity; its cranks possess the same eccentricity as the corresponding cranks of the main crankshaft and are maintained in a position parallel to the latter at all times, so that the bearing spool continuously maintains its upright position. Each of the four pins upon which the connecting rods act therefore rotates around an axis passing through the central plane of the corresponding cylinder bank. As a result, identical conditions of motion are produced for the piston and connecting rods, as if a separate crankshaft were provided for each cylinder bank. The small loads absorbed by the auxiliary crankshaft enable the crank pins of the auxiliary crankshaft to be made small enough so that they can pass between the cheeks of the main crankshaft; at the same time, the two shafts can only be mounted at a small distance away from each other. The new type of design will be especially suited, like the horizontal " H " arrangement, for multi-cylinder high-performance engines designed for submerged installation in the wings of large aeroplanes or so-called " flying-wing " aircraft.

Protection for Rubbing Surfaces of Light Alloy Pistons. (H. Schwarz, Aluminium, Vol. 24, No. 3, March, 1942, pp. 106-110.) (101/47 Germany.)

Much care is expended on the surface finish of modern light alloy pistons. After fine machining, the material is stress relieved by suitable heat treatment and finally ground or machined with diamond or carbide tools. In spite of all precautions, however, the surface protuberances still remaining require gradual removal by a prolonged running-in process in the engine itself, otherwise local zones of seizure may arise. Even after this smoothing out process has been completed, further difficulties may arise if the oil film is insufficient (cold starting, etc.). Many attempts have therefore been made to provide the light alloy surface with a protective coating of some other material of better running qualities than the aluminium alloy. Thus by electrolytic oxidation, a hard film of Al. oxide may be produced, which moreover is to a certain extent oil absorbent. This latter quality is however not retained for long and the results according to the author, have not been altogether satisfactory. Electrolytic deposits of tin, cadmium and lead have also been employed, the first to an appreciable extent in the U.S.A. According to the author, however, best results are obtained by a coating of graphite, provided a sufficiently close deposit can be obtained. Details of the German process for ensuring this are not given.

Silver Lined Bearings for Aircraft Engines. (Ind. and Eng. Chem. (News Ed.), Vol. 4, No. 3, 10/2/42, p. 191.) (101/48 U.S.A.)

Silver lined bearings are being used effectively in aircraft engines of the radial air-cooled type and also in engines designed for liquid cooling. Some of the bearings are complete rings coated inside and outside with silver and some are split and coated on the inside surface only. Silver is understood to be capable of carrying a higher load than babbitt, to be a better conductor of heat, and to retain its hardness at temperatures above those feasible with babbitt.

Properties of Austenitic Exhaust Valve Steels Containing Manganese. (H. Cornelius, L.F.F., Vol. 19, No. 2, 20/3/42, pp. 44/56.) (101/49 Germany.)

The normal exhaust valve steel has the following approximate composition:—

C	...	...	...	0.45	per cent.
Si	...	...	...	1.5	,,
Mn	...	...	...	0.8	,,
Cr	...	...	...	15	,,
Ni	...	...	...	13	,,
W	...	...	...	2.5	,,

Besides two steels of this type, the author investigated nine further austenitic steels with smaller Ni content (4-8 per cent.) and higher Mn content (3-7 per cent.) The investigation covered the following points:—Structure, density, thermal expansion, thermal conductivity, wear resistance, scaling resistance, static and dynamic strength both before and after long period annealing at 700°C., hardness and creep at elevated temperatures. Experiments were also carried out on the possibility of nitriding steels of this type. The author concludes that the Ni content can be cut down to 4.5 per cent. without deleteriously affecting the material for the particular employments envisaged. Such replacement valve steels have the following composition:—

C	...	...	0.42— 0.52	per cent.
Si	...	...	1.5 — 2.0	,,
Mn	...	...	3 — 5	,,
Ni	...	...	4.5 — 6	,,
Cr	...	...	17.5 —18.5	,,
W	...	...	0.9 — 1.5	,,

Heinkel Jet Propulsion Patent. (Inter. Avia., No. 810-811, 8/4/42, pp. 12-12.) (101/51 Germany.)

The Heinkel arrangement differs fundamentally from the Caproni-Campini design inasmuch as the blower is not driven by a recipracating engine but by means of a gas turbine built integrally with the blower. In the German design the fuel is injected into a combustion chamber kept under pressure and through which passes part of the air delivered by the blower. The fresh air enters the blower axially and leaves it at its circumference; from there part of the compressed air is guided through a jacket surrounding the circular combustion chamber by which means the chamber is cooled and the heat dissipated through its walls recovered. Of this cooling air, again only part is fed through slots into the combustion chamber where it is used for the combustion of the fuel injected through the nozzle. The combustion gases are subsequently mixed with the cooling air emerging from the jacket and with the remainder of the air directly leaving the blower; as a result the temperature of the gas mixture is reduced to a level at which the surrounding metal is unaffected. Finally, the gas mixture expands in the gas turbine, thus delivering the power required to drive the blower. At the same time the exhaust retains sufficient energy to discharge at high velocity through the rear duct opening of the jet propulsion unit of the aircraft, and to furnish the thrust required for the propulsion of the latter.

The Present State of Research on Engine Knock. (F. Dreyhaupt, A.T.Z., Vol. 44, No. 21, 10/11/41, pp. 521-532.) (101/52 Germany.)

From a review of published materials the author draws the following conclusions regarding engine knock:—

Shock waves emanating from the primary flame front cause the unburnt charge to be heated up above adiabatic compression temperature. At first, however, these waves are damped rapidly and the corresponding temperature rise is slight and uniform. Subsequent waves are however sufficiently powerful that their passage initiates a preliminary reaction which at first is flameless, but ultimately gives rise to a secondary flame. This secondary flame is propagated at a higher speed than the primary flame but the speed is still low compared with true detonation. Further secondary zones of combustion may arise due to the formation of intermediate combustion products of lower ignition temperature (induction period).

The ultimate cause of the knock is thus a shock (detonation) wave. This, however, does not lead directly to the knock but only serves to initiate a preliminary chemical reaction of the fuel which utlimately leads to the complete combustion of the hitherto unburnt charge by a high speed " secondary " flame. The author's explanation accounts for two well established experimental facts :—(1) The temperature of the unburnt charge is higher than can be accounted for by ordinary adiabatic compression and (2) the discontinuity in primary and secondary flame speeds at the instant knock arises.

The Compressed Sewage Gas Filling Station at Stuttgart. (W. Ryssel, A.T.Z., Vol. 44, No. 21, 10/11/41, pp. 534-536.) (101/53 Germany.)

The Stuttgart Sewage Farm produces about 90,000 m.^{3} of methane per day. The gas is passed through a 6 in. pipe to a gas coke plant (distance six miles) where the H_2S is removed and the pure methane stored in a gas holder. From this holder it passes a further 1½ miles to the pumping station where it is compressed to 350 atmospheres and passed to the adjoining filling station. Four tap-off places are provided, the gas bottles on the vehicles being charged in position. About 200 vehicles are supplied per day, which corresponds to an average supply of 450 m.^{3} per vehicle (bus or lorry).

Since 1 m.^{3} of methane is roughly equivalent to 1 litre of petrol, this means that the equivalent of about 100 gallons of petrol is available per vehicle per day (two fillings of eight array bottles).

The cost of production of the methane at the sewage farm = 6.6 pfennig per m.^{3} and the cost of compression = 3.9 pfennig (including depreciation of plant, etc.). Counting another pfennig for bottles installed on vehicles, the total cost amounts to 11.5 pfennig per m.^{3} against a petrol price of 35.5 pfennig per litre. This represents a yearly saving of 250,000 RM. (over £12,000 at par).

Ammonia Acetylene Mixtures for Internal Combustion Engines. (A.T.Z., Vol. 44, No. 21, 10/11/41, pp. 540-541.) (101/54 France.)

Acetylene is soluble in liquid ammonia and under a pressure of 10 atmospheres the mixtures will consist of about 78 per cent. NH_3 and 22 per cent. C_2H_2 on a weight basis, the calorific value being of the order of 6,000 K. cals. per kg. According to French experiments on a 40 h.p. Citroen engine, no particular difficulties in operation with this fuel were experienced, the heat consumption being of the order of 2,250 K. cals./b.h.p. hour against 2,400 K. cals./b.h.p. hour when operating on petrol. As the containers have only to stand a moderate pressure (10 atmospheres at 15°C. and 35 atmospheres at 50°C.) they can be relatively light (1 kg. dead weight per kg. of content). The main drawback is the high cost of the fuel. Although the French report gives no details, the German reviewer estimates the prices of 1 kg. of NH_3 and C_2H_2 to be 80 pfennig and 210 pfennig respectively. With petrol at 58 pfennig per kg., this means that the ammonia-acetylene operation per b.h.p. hour comes out three to four times as expensive as petrol operation.

Producer Gas for Road Transport. (B. Reid, The Railway Gazette, 1941, price 6/-.) (The Engineer, Vol. 173, No. 4,493, 20/2/42, p. 161.) (101/55 U.S.A.)

At one time it was thought that the producer gas vehicle would be a common object on our highways. When the articles which are here reprinted were first published, less than a thousand producers were in service and twice that number under construction. That is a long way from the target of 10,000 which had been visualised, and even that number would still leave the producer vehicle almost a rarity. The reason for this lack of interest is probably to be found mainly in the fact that the supplies of liquid fuel are almost adequate for the reduced services; that the over-all economy of producer vehicles is sketchy and uncertain; and that all the technical problems—particularly that of filtering the gas—have not been solved. Mr. Brian Reed deals very clearly with the various aspects of his subject, both economical and technical, and vehicle users should welcome this reprint. The producer gas vehicle has proved itself; it may have a future after the war; that will depend upon the success of engineers in overcoming certain defects, particularly in the larger sizes, and more still upon the price of appropriate fuels.

Composition of Catalytically Cracked Petrols. (J. R. Bates and others, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 2, Feb., 1942, pp. 147-152.) (101/56 U.S.A.)

Since the advent of commercial catalytic cracking of petroleum to produce petrol there has been much speculation concerning the reason for the high octane number of this material as a motor fuel in comparison with fuels produced by thermal cracking, and those produced from the virgin crude by simple distillation. The work presented here shows that this high octane is due to the presence of a large excess of isoparaffins over normal paraffins in the lower boiling portions of the petrol and to a high content of aromatic compounds in the high boiling fractions. These relations are not affected by the olefin content of the petrol which may vary over a wide range with varying conditions of cracking.

Liquefaction of Methane Gas Investigated in Italy. (Industry and Engineering Chemistry (News Ed.), Vol. 20, No. 4, 25/2/42, p.280.) (101/57 Italy.)

Liquefaction of methane gas has been studied in laboratories of the Italian State Railways. It is reported that the problems involved are difficult to solve because of the complicated and costly plant required. Meanwhile investigations into problems of the methane gas engine have also been conducted by the National Motor Institute at Naples.

There are considerable natural deposits of methane gas in Italy. The more important ones are those in Parma province, Tuscany, Emilia, and Romagna which are developed by the Ente Nazionale Metano, a 20,000,000 lire company formed in 1940. The gas is carried in pipe lines to Florence and Bologna. Construction of a large circuit has been proposed connecting Ferrara, Padua, Milan, and Turin with a long pipe line which would also be able to draw on the extensive though rather scattered deposits in the Po Valley. Most of the gas used at present is still being carried in chrome-molybdenum steel cylinders with a capacity of 30 to 50 cubic meters. There are about 75,000 of these, but because of the time taken up by filling, storing, and transporting, only one in ten of these cylinders is in actual use at any given time. More containers cannot be manufactured at present because of the shortage of metals. The Italian methane gas production was estimated at 26,000,000 cubic meters for 1940. One cubic meter of methane gas is said to be equivalent to 1.5 litres of petrol.

Inertia of Dynamic Pressure Arrays. (H. Weidemann, L.F.F., Vol. 17, pp. 211-215, No. 7, 20/7/40.) (R.T.P. Translation T.M. 998.) (101/58 Germany.)

There is a certain time lag in dynamic pressure changes before they are visible to the pilot on the indicator dial. This lag depends upon the size of the employed tubing and the characteristics of the indicating instrument. A new mathematical term "pneumatic time constant," which depends only on the dimensions of the tubing and of the indicator, enables the comparison of different dynamic pressure arrays. The pneumatic time constant is an indication of the inertia of a dynamic pressure array and is, in its structure, exactly like the electric time constant and indicates the time rate in which the test quantity has decreased to its eth part, or the time rate after which it has built up to $1/e$ of its final value. This time constant is therefore an indication of the inertia of the compensating process and hence is defined as "the inertia." Viewed electrically, the formula for the time constant is given by :—

$$t' = RC \text{ seconds } \begin{pmatrix} R = \text{resistance} \\ C = \text{capacity} \end{pmatrix}$$

With R^* as the flow resistance of the tubing, and C^* as the capacity of the aneroid capsule, "the inertia" of the dynamic pressure system becomes

$$t' = R^*C^* \text{ seconds.}$$

Rate of Icing Recorders. (E. Brun and E. Vassy, Pub. Scient. and Techn. du Secretariat d'Etat à l'Aviation, B.S.T. No. 95.) (101/59 France.)

Two types of instruments are described. In the first, a wire is mounted in close proximity to and parallel to the axis of an electrically-heated wing profile. The combination is pivoted near the nose of the profile and exposed symmetrically to the relative wind. Ice deposits on the wire lead to an increase in drag which causes the combination to deflect about the pivot axis. After a fixed time interval, the wire is de-iced by means of an electric current and the process repeated. In the second type of recorder, a hollow drum is rotated slowly about an axis perpendicular to the relative wind. A stationary electric heater placed eccentrically inside the drum towards the rear ensures that the trailing edge of the cylinder is kept clear of ice. The increase in thickness of deposit over the front of the cylinder is recorded optically (gradual screening of a photo-electric cell).

As an alternative to this device, the central section of the drum may be omitted, the two end plates being rotated independently and acting as an electrical condenser, the capacity of which depends on the thickness of the ice deposit. Fixed internal heaters inside the rotating plates again ensure that the trailing edges of the plates are kept clear of ice.

All the three devices described above have been tested in a refrigerated wind tunnel but no flight tests have so far been carried out. In the author's opinion, the condenser type (described last) is the most likely to give practical results on an aircraft.

A New Electron Microscope Technique for Studies on Grain Structure of Metals. (J. Frank. Inst., Vol. 233, No. 2, February, 1942, p. 180.) (101/60 U.S.A.)

Ordinarily, specimens to be viewed in the electron microscope are mounted on an extremely thin film of transparent collodion for direct examination. The new technique developed by R.C.A. Laboratories involves the making of an exact replica of the metal's grain structure in collodion. The replica, of about one-half inch of etched metal surface, is made in three steps. A layer of silver is first evaporated on to the metal surface, thick enough to be stripped off mechanically. Then a drop of collodion dissolved in amyl acetate is sprayed on the under side of the silver, filling over the changes in profile in the silver service. The silver is then dissolved in dilute nitric acid, leaving the collodion layer intact. This positive replica in collodion is mounted on the microscope. Variations in the thickness of the replica correspond to the irregularities in the original metal surface, and are reproduced on the screen or photographic plate in the microscope as variations in brightness.

Electrical Equipment for the Experimental Study of the Dynamics of Fluids. (C. Ferrari, Soc. Ital. Progresso della Scienze, Rome, 1938.) (R.T.P. Translation T.M. No. 1,006.) (101/61 Italy.)

The major part of this report deals with the hot wire anemometer and its application to ordinary air speed and direction measurements, as well as its employment in research on turbulence (correlation factor).

The remainder of the paper describes a condenser type of electric dynamometer specially adapted for measuring the forces acting on an aerofoil or complete model undergoing rotation in a wind tunnel (*e.g.*, spinning). The shaft to which the rotating model is fixed is mounted on two ball bearings carried on a wire suspension consisting of a set of vertical and horizontal wires for each bearing. The horizontal pull on each wire is transmitted to a condenser forming part of an electric oscillatory circuit, enabling the force (but not its phase angle) to be measured directly on a galvanometer. The phase angle is subsequently determined by subjecting the suspension system to the action of a known couple (by the addition of out of balance weights rotating with the shaft) and measuring the combined aerodynamic and mechanical response.

Although alternative spinning balances of a completely mechanical type (such as the N.A.C.A. balance) can be employed, the author states that the electrical dynamometer is much simpler. Moreover, the mechanical spinning balance is only feasible when used in conjunction with a special vertical wind tunnel, whilst the electric type can be readily installed in normal horizontal tunnels.

A New Instrument for Celestial Navigation. (N. W. Storer, J. Aeron. Sci., Vol. 9, No. 4, Feb., 1942, pp. 138-142.) (101/62 U.S.A.)

An instrument is described in which a pair of mirrors and a prism deflect the light of two particular stars into a telescope in such a manner that, when the images of the two are seen superimposed in the centre of the field of view, the telescope axis must be pointing directly at the celestial pole. The angular elevation of the telescope is then equivalent to the latitude, and the rotational position of the mirror combination about the telescope axis shows the sidereal time. The direction of gravity may be indicated either by a bubble cell or by a pendulum stabilised in some manner. A preliminary model, making use of a bubble, has given a probable error of one setting of about 0.1° in both latitude and longitude, successive readings being separated by less than two minutes of time.

Recent Advances in Physics. (T. H. Osgood and R. B. Bowersox, Ind. and Eng. Chem. (News Ed.), Vol. 4, No. 3, 10/2/42, pp. 178-178.) (101/63 U.S.A.)

The following developments are selected as of interest to the engineer.

(1) It is important to the physicist and the metallurgist to know the rate of diffusion of atoms of one material through another or of one material through itself, in the solid state. Carburisation of steel, rates of hardening, and heat treatment of castings all depend on this diffusion process. Progress is being made toward measurement of these rates by means of radioactive tracer isotopes. These isotopes disintegrate after a relatively short period with the emission of alpha or beta particles or gamma rays, which may be detected by Geiger-Muller counters or an ionisation chamber and serve to indicate the presence of the tracer. Many of the radioactive isotopes can now be obtained in commercial quantities, and more than 350 such isotopes of the stable elements are known.

(2) Several methods of attack are open to the research worker who wishes to examine a surface under the high magnification possible with the electron microscope.

V. K. Zworykin and E. G. Ramberg of the R.C.A. Research Laboratories have reported a new method involving the preparation of a thin replica of the surface.

This replica may then be investigated with the transmission-type electron microscope. A thick layer of metal (silver) is evaporated on the surface in question and then stripped off. Collodion is applied to this negative replica surface, and the metal is dissolved away from the collodion by means of acid. This leaves a thin positive collodion replica of the original surface whose ridges and hollows may be deduced from the density of the final photograph. The density at a point on the photograph is inversely proportional to the thickness of the collodion film at the correspondence point, so that a bright spot on the photograph would represent a high spot on the original surface.

Some Notes on the Experiments with the Artificial Horizon, with Special Reference to the Sperry Type. (K. Magnus, L.F.F., Vol. 19, No. 2, 20/3/42, pp. 23-43.) (101/64 Germany.)

After discussing the various methods available for controlling the position of the axis of a gyro horizon subjected to precession, the case of the Sperry instrument is considered in detail. This artificial horizon owes its directional properties to the reaction of four air jets, the nozzles of which are controlled by small gravity pendulums. These nozzles are either fully open or fully closed when the horizon departs by $\pm 2°$ from the mean position of the pendulums, and for deflection greater than this the restoring force is thus constant. The author describes a simple graphical method by means of which the deviation curve of the horizon can be obtained for any aircraft path consisting of a succession of circular arcs. The rate of turn giving the maximum error is given by

$$W_{\text{crit}} = \sqrt{\left(\frac{2\,dg}{v}\right)}$$

where

v = path speed.
d = precision speed due to nozzle moments.
g = 0.0028/sec. for particular Sperry instrument tested.

At 350 m.p.h., the maximum deflection from the true vertical is of the order of 15° and the instrument takes about two minutes to recover.

The error can be reduced by reducing the nozzle moment and increasing the impulse of the rotor. As an alternative, the number of nozzles can be increased. Thus by fitting eight gravity controlled nozzles instead of the standard four, the author was able to reduce the maximum error by 20 per cent.

A Novel Type of Directional Antenna System. (H. Pigge, H.F.T., Vol. 54, No. 6, December, 1939, pp. 190-194.) (101/65 Germany.)

As is well known, directional propagation of high frequency radiation is obtained whenever the radiation fields of the antenna elements are caused to interfere along predetermined paths. This is usually achieved by a suitable distribution of a series of currents of the same amplitude and phase over a real or virtual plane surface, differences in the various solutions being confined to the particular feed method adopted.

The solution proposed by the author (patented in 1937) is based on the voltage distribution on dipoles of resonance length, a special system of feeding both the single radiation as well as their combination (conductor and reflector dipoles) ensuring directional propagation.

It is claimed that the method simplified the arrangements required for optimum energy input and also leads to structural simplicity of the array. After a detailed discussion of the directional properties of such dipole combinations, the radiation diagram, radiation resistance and feed are calculated for a typical example and compared with experimental results, the agreement being satisfactory.

Training of Aeronautical Engineers in Germany. (Inter. Avia., No. 807, 16/3/42, p. 9.) (101/66 Germany.)

The German Ministry of Education issued new regulations concerning the curriculum and the examinations at German Technical Colleges already at the beginning of 1940; they have been published in print only recently. In aeronautical subjects, as well as in subjects of machine engineering, electro-engineering or shipbuilding, the candidates must attend at least seven terms; to obtain admittance to the three final terms, students must pass a preliminary examination. In addition, practical experience of at least one year is required, half of which must be accomplished before the beginning of the studies, the other half between terms. At the Institute of Technology at Vienna and Graz there exist training workshops, the attendance at which during a period of six months may be counted as the first half of the required period of practical experience. Among aeronautical subjects a student may specialize on one of three, namely, airframe design and construction, engine design and construction, or aeroplane piloting and control. All the German Technical Colleges provide courses up to the preliminary examination: the final training period in all aeronautical subjects can be accomplished either at Berlin or Brunswick; the study of airframe design and construction may be completed, furthermore, also at the Technical Colleges of Aix-la-Chapelle, Breslau, Danzig, Darmstadt, Munich, Stuttgart, and Vienna.

American Aircraft Production (Figures and Estimates). (Inter. Avia., No. 808-809, 28/3/42, pp. 1-9.) (101/67 U.S.A.)

Official statistics on the production of American aircraft material have only been published up to September 1941. Making reasonable assumptions for the remaining three months of that year, the author estimates that a total of 20,000 aircraft, 30,000 engines (1,000 hp. or more each) and less than 30,000 v.p. propellers were produced during the whole of 1941. The 20,000 aircraft included about 11,000 combat machines of which 6,500 were exported (mainly to G.B.). According to an official statement of the Aeronautical Chamber of Commerce, by the end of 1941, the aircraft labour force amounted to 390,000 persons, and the factory space to 46 million sq. ft.

For 1942 and 1943, annual production of 45,000 and 100,000 combat machines are aimed at. As long ago as 1940, T. P. Wright estimated that a labour force of 800,000 persons and a factory space of 90 million square feet would be required for an annual output of 50,000 aircraft. In addition to the construction of new plants, a prodigious expansion of the already vast American motor-car Industry is thus called for.

German Technical Exhibitions. (Inter. Avia., No. 808-809, 28/3/42, p. 15.) (101/68 Germany.)

An important part of the subcontracting system employed in the German munitions industry, particuarly in the aircraft industry, is formed by permanent regional "contract exchanges" organized in large German industrial centres. A central German contract exchange was inaugurated in Berlin on 11-12-41. In the aircraft industry the system has now been elaborated—an aeronautical technical exhibition has been added to this central exchange. In this manner, manufacturers able to accept sub-contracts are made familiar with the components to be produced. By closing down a large proportion of the manufacturing facilities formerly engaged in civilian work, it is anticipated that large new manufacturing resources will be made available.

German Labour Force. (Inter. Avia., No. 810-811, 8/4/42, p. 13.) (101/69 Germany.)

Reports on the German Four-year plan give a certain indication of the labour force employed in the German industry. Before the outbreak of war, the German workers employed in the Reich totalled approximately 24,500,000, strengthened already at that time by about 500,000 foreign workers. In spite of this record employment, a shortage of 500,000 workers existed already then. The outbreak of war and the attendant mobilization caused a severe strain on the labour supply; a small portion of the labour loss as a result of the call-ups was replaced by diverting workers from the industry operating for civilian purposes to the munitions industry; the difficulties were augmented also by the fact that contrary to expectations the availability of female labour dropped at the beginning of the war. According to the author the following new labour reservoirs have been tapped in the meantime: 1,300,000 female workers added since the beginning of the war; 2,140,000 foreign workers added from 25 countries; these are augmented by approximately 1,600,000 prisoners of war working for the German war effort; the latter figure may shortly be increased by the employment of Soviet-Russian prisoners.

LIST OF SELECTED TRANSLATIONS.

No. 44.

NOTE.—Applications for the loan of copies of translations mentioned below should be addressed to the Secretary (R.T.P.3), Ministry of Aircraft production, and not to the Royal Aeronautical Society. Copies will be loaned as far as availability of stocks permits. Suggestions concerning new translations will be considered in relation to general interest and facilities available.

Lists of selected translations have appeared in this publication since September, 1938.

ARMAMENT AND THEORY OF WARFARE.

TRANSLATION NUMBER AND AUTHOR.		TITLE.
1423	Frey, F.	*On the Calculation of the Impact Force of Bombs.* (S.T.Z., No. 24, 13/6/40, pp. 293-294.)
1430	Heinkel, E.... ...	*Anti-Dazzle Devices in Cockpits (Digest).* (German Patent 691,758, Flugsport, 3/7/40, p. 109.)

AERODYNAMICS.

1426	Dudakov, V. ...	*Faster Than Sound (the Problem of Supersonic Flight).* (Aeroplane, U.S.S.R., Vol. 18, No. 1, January, 1941, pp. 13-14.)
1446	Söhngen, H. ...	*Lift Distribution Corresponding to Arbitrary Non-Steady Motion (Two-Dimensional).* (L.F.F., Vol. 17, No. 11-12, 10/12/1940, pp. 401-420.)

AIRCRAFT AND GLIDERS.

1422	Wenke, H.	*Simple Derivation of Equations for the Take-off and Landing Process.* (Luftwissen, Vol. 8, No. 3, March, 1941, pp. 91-95.)
1427	——	*Towing Rope Head with Conical Attachment for Ropes Provided with Internal Electrical Leads.* (German Patent No. 713,058, Flugsport, Vol. 34, No. 1, 7/1/42, p. 84.)

AIRSCREWS.

1429	Cordes, G.	*The Importance of the Aerodynamic Moment on the Blade in Variable Pitch Mechanisms.* (L.F.F., Vol. 18, No. 11, 20/11/41, pp. 373-377.)

TRANSLATION NUMBER AND AUTHOR.		TITLE.
1440	Lorenzelli, E. ...	*The Calculation of the Bending Vibration Frequency of the Rotating Airscrew Blade.* (L'Aerotecnica, Vol. 20, No. 11, November, 1940, pp. 815-833.)

ENGINES.

1432	Petchenko	*Starting Engines at Low Temperatures.* (Air Fleet News, U.S.S.R., Vol. 19, No. 1, Jan., 1937, pp. 36-37.)
1433	Geiger, J.	*Engines Stresses Induced by Rapid Pressure Rise and Fuel Knock.* (A.T.Z., Vol. 44, 10/7/41, pp. 327-335.)
1438	Skuridin, A. A. ...	*Ignition Apparatus for Starting Engines in Winter.* (Civil Aviation, U.S.S.R., Vol. 9, No. 10, October, 1939, pp. 21-23.)

SUPERCHARGERS.

1425	Pfau, H.	*Effect of the Performance of Individual Stages on the Overall Characteristics of Multi-Stage Superchargers.* (Jahrbuch d. deutsch., L.F.F., 1938, Vol. 2, pp. 196-202.)
1445	Null, v. d. W. ...	*Exhaust Turbo Superchargers for Aero Engines.* (Z.V.D.I., Vol. 85, No. 43-44, 1/11/1941, pp. 847-857.)

GYROSCOPIC INSTRUMENTS.

1428	Mayorov, S. A. ...	*Operation of Gyroscopic Instruments at High Altitude.* (Civil Aviation, U.S.S.R., Vol. 9, Sept., 1939, pp. 25-26.)
1435	Wintergerst, S. ...	*The Behaviour of Single Gyroscopic Systems in Flight.* (Z.V.D.I., Vol. 84, No. 2, 13/1/1940, pp. 30-38.)

MATERIALS.

1421	Nitsche, R. ... ... Salewski, E. ...	*The Influence of Temperature on the Strength of Plastics (2nd Report).* (Kunstoffe, Vol. 31, No. 11, November, 1941, pp. 381-388.)
1424	——	*German Specification Sheets (Covering Certain Light Alloys).*
1434	Bungardt, W. ... Schaitberger, G. ...	*Wrought Alloys of Aluminium Zinc Magnesium Capable of Age Hardening.* (L.F.F., Vol. 18, No. 1, 28/2/41, pp. 26-31.)
1437	Nitsche, R. ... ... Salewski, E. ...	*The Influence of Temperature on the Strength of Plastics (1st Report).* (Kunstoffe, Vol. 29, No. 8, August, 1939, pp. 209-220.)

WIRELESS.

1436	Bunimovitch, V. I....	*The Use of Rectangular Resonators in Ultra High Frequency Technique.* (J. Tech. Phys., U.S.S.R., Vol. 10, No. 8, 1940, pp. 640-646.)

TITLES AND REFERENCES OF ARTICLES AND PAPERS SELECTED FROM PUBLICATIONS RECEIVED IN R.T.P.3 DURING MARCH, 1942.

Notices and abstracts from the Scientific and Technical Press are prepared primarily for the information of Scientific and Technical Staffs. Particular attention is paid to the work carried out in foreign countries, on the assumption that the more accessible British work (for example, that published by the Aeronautical Research Committee) is already known to these Staffs.

Theory and Practice of Warfare.

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
1	1011	Switzerland ...	*On the Calculation of the Impact Force of Bombs.* (F. Frey, Schweiz. Technische Zeitschrift, No. 24, 13/6/40, pp. 293-294.) (R.T.P. Translation No. 1,423.)
2	1021	Netherlands ...	*Parachute Flares (from the Dutch).* (Luftwissen, Vol. 8, No. 12, Dec., 1941, p. 385.)
3	1022	Netherlands ...	*Torpedo Dropping from Aircraft (from the Dutch).* (Luftwissen, Vol. 8, No. 12, Dec., 1941, p. 388.)
4	1030	G.B.	*Avro Lancaster Heavy Bomber (Four Engines).* (Inter. Avia., No. 798, 4/1/42, pp. 11-12.)
5	1031	Australia ...	*Wackett CA-4 Medium Bomber.* (Inter. Avia., No. 798, 4/1/42, p. 12.)
6	1032	U.S.A. ...	*Curtiss P.40F (Packard Build Merlin Engines).* (Inter. Avia., No. 798, 4/1/42, p. 13.)
7	1033	U.S.A. ...	*Curtiss Wright C.55 Twin-Engined Sub-Stratosphere Transport.* (Inter. Avia., No. 798, 4/1/42, pp. 13-14.)
8	1036	Germany ...	*Focke Wulf Kurier I and II.* (Inter. Avia., No. 798, 4/1/42, pp. 15-16.)
9	1037	France ...	*VG30 and VG50 French Fighter Designs (New Non-Military High Speed Versions under Development at the Arsenal, Lyons).* (Inter. Avia., No. 798, 4/1/42, p. 16.)

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ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
10	1040	G.B./Germany ...	*Aircraft Losses during the War—Comparisons of British and German Claims.* (Inter. Avia., No. 798, 4/1/42, pp. 19-20.)
11	1041	U.S.A. ...	*U.S.A. Supply Base in Eritria.* (Inter. Avia., No. 798, 4/1/42, pp. 18-19.)
12	1043	U.S.A. ...	*Boeing B19 Engine Cowling (Photograph).* (Inter. Avia., No. 798, 4/1/42, p. 1.)
13	1044	U.S.A. ...	*Anti-Aircraft Gun Carriages (Bofors).* (J. E. Trainer, Army Ordnance, Vol. 22, No. 130, Jan.-Feb., 1942, pp. 542-544.)
14	1046	U.S.A. ...	*Early Applications of the Machine Gun (Part III).* (C. Goddard, Army Ordnance, Vol. 22, No. 130, Jan.-Feb., 1942, p. 579.)
15	1047	U.S.A. ...	*Clearing House for Defence Inventions (the National Inventors' Council in the U.S.A.).* (E. P. Bicknell, Army Ordnance, Vol. 22, No. 130, Jan.-Feb., 1942, pp. 582-585.)
16	1057	G.B.	*Short Stirling Engine Nacelles.* (Inter. Avia., No. 801, 31/1/42, p. 12.)
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26	1070	Germany ...	*Bucker Bestmann Bu. 181 Trainer.* (Inter Avia., No. 802, 10/2/42, p. 12.)
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87	1284	U.S.A.	... *Troop Gliders.* (L. B. Barringer, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 27-28, 118.)
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152	1507	Germany	...	*Searchlight and Acoustical Spotters of the German Luftwaffe (Illustrated).* (O. Steingraeber, Luftwelt, Vol. 9, No. 3, 1/2/42, pp. 42-53.)
153	1547	U.S.A.	...	*Barrage Balloons.* (R. E. Turley, Coast Artillery Journal, Vol. 85, No. 1, Jan.-Feb., 1942, pp. 20-24.)
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155	1549	U.S.A.	...	*Trial Shot Plotting Chart for A.A. Guns.* (M. G. Pohl, Coast Artillery Journal ,Vol. 85, No. 1, Jan.-Feb., 1942, pp. 57-60.)
156	1550	Germany	...	*The Importance of Transport Aircraft in Large Scale Operations of an Air Force (Refers Mainly to Ju. 52, in Europe, Russia and Libya).* Wehrtechnische Monatshefte, Vol. 46, No. 1, Jan., 1942, pp. 8-19.)
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160	*1565	Germany	...	*The Mathematics of Curves of Pursuit (Relative Motion of Fighter with respect to Attacked Bomber).* (F. Gabriel, Luftwissen, Vol. 9, No. 1, Jan., 1942, pp. 21-24.)
161	1566	Germany	...	*Focke Wulf F.W. 190 (Silhouette).* (Flight, Vol. 41, No. 1,735, 26/3/42, p. 279.)
162	1568	Germany	...	*Heinkel He. 177 Heavy Bomber.* (Flight, Vol. 41, No. 1,735, 26/3/42, p. 285.)
163	1570	Germany	...	*Me. 115 in Russia.* (Flight, Vol. 41, No. 1,735, 26/3/42, pp. 286-287.)
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166	1580	Italy	...	*Relative Ballistics during Dive Bombing.* (N. Cavicchioli, R. Guiliano, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 798-806.)

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167	*1002	Italy	...	*Anti-Vibration Mounting of the Guidonia Low Pressure Supersonic Wind Tunnel.* (R. Songia, Riv. Aeron., Vol. 17, No. 4, April, 1941, pp. 1-14.)

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168	*1008	Germany ...	*The Laminar Boundary Layer of Elliptic Cylinders and Ellipsoids of Revolution under Symmetrical Flow Conditions.* (J. Pretoch, L.F.F., Vol. 18, No. 2, 29/12/41, pp. 397-402.)
169	1126	Germany ...	*Wind Loads on Structures.* (H. Seitler, W.R.H., Vol. 23, No. 2, 15/1/42, p. 27.)
170	1131	U.S.A. ...	*Graphical Solution of Fluid Friction Problems.* (E. S. Dennison, Engineering, Vol. 153, No. 3,972, 7/2/42, pp. 179-180.)
171	1206	G.B.	*Cavitation.* (Sci. Lib. Bibliog. Series, No. 568, 11/2/42.)
172	1303	U.S.A. ...	*The Separation of Liquid from Vapour Using Cyclones.* (A. Pollar and others, Trans. A.S.M.E., Vol. 64, No. 1, Jan., 1942, pp. 31-41.)
173	*1328	Germany ...	*Observations of the Effect of Wing Appendages and Flaps on the Spread of Separation of Flow Over the Wing.* (G. Hartwig, L.F.F., Vol. 18, Nos. 2-3, 29/3/41.) (R.T.P. Translation T.M. 988.)
174	*1330	Germany ...	*Contribution to the Aerodynamics of Rotating Wing Aircraft (Pt. II).* (G. Sissingh, L.F.F., Vol. 17, No. 7, July 20th, 1940.) (R.T.P. Translation T.M. 990.)
175	*1331	Germany ...	*The Oscillating Wing with Aerodynamically Balanced Elevator.* (H. G. Kussner and I. Schwarz, L.F.F., Vol. 17, No. 11 and 12, 10/12/40.) (R.T.P. Translation T.M. 991.)
178	*1371	U.S.A. ...	*A Simple Method of Applying the Compressibility Correction in the Determination of True Air Speed.* (W. C. Schoolfield, Inst. Aeron. Sciences, 10th Annual Meeting, Jan., 1942, pp. 1/19.)
179	*1408	Switzerland ...	*On the Effect of Laminar and Turbulent Flow on the X-Ray Diffraction Diagrams of Water and Nitrobenzol.* (W. R. Dubs, Z.V.D.I., Vol. 85, No. 2, 11/1/41, pp. 50-52.)
180	*1453	Germany ...	*Flow of Incompressible Fluid Through Centrifugal Rotors.* (W. Spannkake, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 108.)
182	1489	Italy ...	*The Induced Velocity Field of a Helicoidal Vortex and its Application to Airscrew Investigations.* (A. Ferri, Atti di Guidonia, No. 57-58, 10/9/41, pp. 265-296.)
183	1490	Italy ...	*The Surface Friction of a Smooth Plate in Parallel Flow (Review of Problems).* (U. Messina, Atti di Guidonia, Nos. 59-61, 10/10/41, pp. 297-332.)
186	1528	U.S.A. ...	*The Resistance Coefficient of Commercial Round Wire Grids.* (B. Eckert and F. Pflüger, N.A.C.A. Tech. Memo., No. 1,003, Jan., 1942, pp. 1-11.)
187	1538	G.B.	*Supersonic Flow in Turbines and Compressors.* (R.T.P. Translation No. 1,327.) (K. W. Sorg, J.R. Aeronautical Society, Vol. 46, No. 375, March, 1942, pp. 64-85.)
188	1575	U.S.A. ...	*On Some Vortex Theorems of Hydrodynamics.* (M. Munk, J. Aeron. Sci., Vol. 9, No. 3, Jan., 1942, pp. 90-96.)

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189	1579	Italy ...	*Elementary Theory of an Ideal Thermo Propulsive System.* (E. Gambarucci, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 774-797.)
190	1583	Italy ...	*Determination of the Law of Distribution of the Circulation Along the Radius of a Given Screw by the Method of Kawada.* (C. Ferrari, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 816-819.)
191	1584	Italy ...	*Wake Due to the Hull and its Effect on Marine Propellers.* (Pierrottet, E., La. Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 819-821.)
192	1587	Italy ...	*Dynamics and Thermodynamics of Jet Propulsion.* (L. Poggi, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 826-829.)
193	1589	Italy ...	*Relationship Between Shape of Ejector and Reaction Produced in the Case of Supersonic Flow (Digest).* (A. Castagna, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 829-830.)
194	1592	Italy ...	*The Present State of Research on Non-Steady Lift.* (Cicala, P., La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 759-773.)
195	1601	Germany ...	*Flutter of Shallow Chord Profile.* (A. Schallenkamp, L.F.F., Vol. 19, No. 1, 20/1/42, pp. 11-12.)

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196	1004	Italy ...	*Example of Commercial Four-Engined Aircraft* (A. Gaviraghi, Riv. Aeron., Vol. 17, No. 4, April, 1941, pp. 39-68.)
197	1005	Switzerland ...	*Operational Requirements of a Large Air Port.* (R. Gsell, Strasse and Verkehr (Special Planning Number), Vol. 27, No. 20, 3/10/41, pp. 354-356.)
198	1006	Switzerland ...	*The Planning of Air Ports in Switzerland for Internally Continental and Trans-Continental Traffic.* (E. Amstutz, Strasse and Verkehr (Special Planning Number), Vol. 27, No. 20, 3/10/41, pp. 362-376.)
199	1007	Switzerland ...	*Air Port Planning as Affected by Weather and Climate.* (O. Weber, Strasse and Verkehr (Special Planning Number), Vol. 27, No. 20, 3/10/41, pp. 377-383.)
200	*1018	Germany ...	*New Methods for Making Glued Repairs on Plywood Wing Covering for Aircraft (Use of the Needle Clamp).* (Luftwissen, Vol. 8, No. 12, Dec., 1941, p. 374.)
201	*1020	Germany ...	*Aircraft Lighting (Position Lights, Landing, Searchlight, Cabin and Instrument Lights).* (G. Reisberg and E. Rasler, Luftwissen, Vol. 8, No. 12, Dec., 1941, pp. 380-389.)
202	1038	France ...	*Potez Scan* 161 *Giant Flying Boat (Six Engines).* (Inter. Avia., No. 798, 4/1/42, pp. 16-17.)
203	1077	U.S.A./G.B....	*Curtiss CW.* 20 *Transport.* (Inter. Avia., No. 799, 14/1/42, pp. 12-13.)
204	1079	France ...	*Amiot* 370 *and* 356 *Postal Plane.* (Inter. Avia., No. 799, 14/1/42, p. 14.)

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206	1082	U.S.A. ...	*Northrop Tailless Aircraft.* (Inter. Avia., No. 799, 14/1/42, pp. 16-17.)
207	1088	G.B.	*Airscrew Performance Estimation.* (K. B. Gillmore and others, Airc. Eng., Vol. 14, No. 156, Feb., 1942, p. 39.)
208	1090	G.B.	*Rotol Contra Rotating Airscrew.* (Airc. Eng., Vol. 14, No. 156, Feb., 1942, p. 42.)
209	1091	G.B.	*Glider Performance Calculations.* (K. W. Turner, Airc. Eng., Vol. 14, No. 156, Feb., 1942, pp. 46-48.)
210	1092	G.B.	*Blade Stall during Take-off (Discussion).* (A. V. Cleaver and E. J. Andrews, Airc. Eng., Vol. 14, No. 156, Feb., 1942, p. 49.)
211	*1099	France ...	*Leduc-Breguet Jet Propulsion Aircraft.* (Inter. Avia., No. 800, 22/1/42, p. 10.)
212	1103	Germany ...	*Klemm Kl. 107 Touring Aeroplane (Semi-Monocoque Design).* (Inter. Avia., No. 800, 22/1/42, p. 11.)
213	1138	Italy ...	*Campini Jet Propelled Aircraft (Photograph).* (Flight, Vol. 41, No. 1,731, 26/2/42, p. 180.)
214	1142	Switzerland ...	*Overseas Air Services at Present Working.* (Inter. Avia., No. 798, 4/1/42, pp. 22-23.)
215	1170	Germany ...	*Double Wall Pressure Cabin (Pat. No. 714,784).* (Henschel, Flugsport, Vol. 34, No. 2, 21/1/42, p. 85.) (Pat. Coll. No. 21.)
216	1171	Germany ...	*Method of Locking Inspection Cover Plates in Aircraft Walls (Pat. No. 714,966).* (Junkers, Flugsport, Vol. 34, No. 2, 21/1/42, p. 85.) (Pat. Coll. No. 21.)
217	1172	Germany ...	*Reinforced Cover Plate for Aircraft Walls (Pat. No 715,004).* (Henschel, Flugsport, Vol. 34, No. 2, 21/1/42, p. 85.) (Pat. Coll. No. 21.)
218	1173	Germany ...	*Aircraft Wing with Variable Camber Flaps (Pat. No. 715,266).* (Messerschmitt, Flugsport, Vol. 34, No. 2, 21/1/42, p. 86.) (Pat. Coll. No. 21.)
219	1175	Germany ...	*Single Spar Cantilever Wing Construction (Pat. No. 715,410).* (Klemm, Flugsport, Vol. 34, No. 2, 21/1/42, p. 87.) (Pat. Coll. No. 21.)
220	1176	Germany ...	*Aircraft Elevator Control Responding to Acceleration Perpendicular to Aircraft Axis and Preventing Dangerous Control Movements (Pat. No. 714,900).* (Messerschmitt, Flugsport, Vol. 34, No. 2, 21/1/42, p. 87.) (Pat. Coll. No. 21.)
221	1177	Germany ...	*Flying Wing Type Glider Horten IV (Prone Position of Pilot).* (Flugsport, Vol. 34, No. 4, 18/2/42, pp. 51-55.)
222	1179	Germany ...	*Johnson Experimental Plane with Two Separate Contra Rotating Propellers Facing Each Other.* (Flugsport, Vol. 34, No. 4, 18/2/42, p. 57.)
223	1183	Germany ...	*Pressure Cabins for High Altitude Aircraft (Pat. No. 715,460).* (Henschel, Flugsport, Vol. 34, No. 4, 18/2/42, p. 93.) (Pat. Coll. No. 23.)

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224	1184	Germany ...	*Lateral Control Device Operating by Ejected Air* (*Pat. No.* 715,656). (D.V.L., Flugsport, Vol. 34, No. 4, 18/2/42, pp. 93-94.) (Pat. Coll. No. 23.)
225	1185	Germany ...	*Lateral Control Device Incorporating Flap and Boundary Layer Suction* (*Pat. No.* 716,274). (Dornier, Flugsport, Vol. 34, No. 4, 18/2/42, pp. 94-95.) (Pat. Coll. No. 23.)
226	1186	Germany ...	*Vibration Damper for Aircraft Structural Parts* (*Pat. No.* 715,862). (Heinkel, Flugsport, Vol. 34, No. 4, 18/2/42, p. 95.) (Pat. Coll. No. 23.)
227	1187	Germany ...	*Device for Locking Aircraft Control Surfaces and Flaps* (*Pat. No.* 715,863). (Henschel, Flugsport, Vol. 34, No. 4, 18/2/42, pp. 95-96.) (Pat. Coll. No. 23.)
228	1188	Germany ...	*Control for Large Aircraft Incorporating Gearing* (*Pat. No.* 715,922). (Blohm and Voss, Flugsport, Vol. 34, No. 4, 18/2/42, p. 96.) (Pat. Coll. No. 23.)
229	1189	Germany ...	*Spring Legs for Aircraft* (*Pat. No.* 715,584). (Elektron, Flugsport, Vol. 34, No. 4, 18/2/42, p. 96.) (Pat. Coll. No. 23.)
230	1191	Germany ...	*High Performance Glider F.A.B. 3.* (Flugsport, Vol. 34, No. 3, 4/2/42, pp. 33-35.)
231	1194	Germany ...	*Retractable Undercarriages* (*Pat. Nos.* 714,251 *and* 714,464). (Messerschmitt, Flugsport, Vol. 34, No. 3, 4/2/42, p. 89.) (Pat. Coll. No. 22.)
232	1196	Germany ...	*Air Brakes (Flat Surface Provided with Grid Channels to Direct Air Laterally)* (*Pat. No.* 714,465). (Dornier, Flugsport, Vol. 34, No. 3, 4/2/42, p. 90.) (Pat. Coll. No. 22.)
233	1197	Germany ...	*Air Brakes (Staggered Sections Along Tail Turning about Central Axis and Withdrawing Completely into Fuselage* (*Pat. No.* 714,466). (Dornier, Flugsport, Vol. 34, No. 3, 4/2/42, p. 90.) (Pat. Coll. No. 22.)
234	1198	Germany ...	*Air Brakes (Partial Withdrawal of Undercarriage)* (*Pat. No.* 714,845). (Messerschmitt, Flugsport, Vol. 34, No. 3, 4/2/42, p. 90.) (Pat. Coll. No. 22.)
235	1230	Germany ...	*The Utilisation of Light Alloys in Modern Transport Vehicles.* (W. Bleicher, Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, pp. 49-54.)
236	1256	G.B.	*Underground Aircraft Factories.* (Aeroplane, Vol. 62, No. 1,606, 6/3/42, pp. 276-278.)
237	1258	U.S.A. ...	*Twelve-Seater Amphibian Glider of the U.S.A. (Drawing).* (Flight, Vol. 41, No. 1,732, 5/3/42, p. 193.)
238	1266	G.B.	*Early Triplane Examples (Bristol Pullman and Bristol Braemar).* (Flight, Vol. 41, No. 1,732, 5/3/42, p. 209.)
239	1279	G.B.	*Coolant and Washing Systems.* (Airc. Prod., Vol. 4, No. 41, March, 1942, pp. 237-240.)
240	1287	U.S.A. ...	*C.A.A. Development Programme on Airports.* (L. D. Clay, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 52-55.)

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241	1290	U.S.A. ...	*Flight Instructions on How to Prevent Stalling.* (J. R. Hoyt, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 67, 102.)
242	1292	U.S.A. ...	*The Fowler Flap.* (H. R. Foottit, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 71-72, 88.)
243	1293	U.S.A. ...	*Portable Landing Mats for Advanced Airfields.* (Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, p. 74.)
244	1315	G.B.	*Army Liaison Aircraft.* (Aeroplane, Vol. 62, No. 1,607, 13/3/42, pp. 293-295.)
245	1317	G.B.	*Wartime Transport in Europe.* (Aeroplane, Vol. 62, No. 1,607, 13/3/42, p. 309.)
246	1319	G.B.	*Piggott-Parr Biplane of the Year* 1940 *(Contra Rotating Airscrews, etc.).* (C. M. Poulsen, Flight, Vol. 41, No. 1,733, 12/3/42, pp. 228-229.)
247	1348	U.S.A. ...	*Roadside Flight Strips and Landing Ramps.* (L. Eiserer, American Aviation, Vol. 5, No. 14, 15/12/41, pp. 8-9, 14.)
248	1349	U.S.A. ...	*Portable Hydraulic Test Unit.* (American Aviation, Vol. 5, No. 14, 15/12/41, p. 46.)
249	1351	U.S.A. ...	*Civil Flying Research.* (American Aviation, Vol. 5, No. 14, 15/12/41, pp. 43, 46.)
252	1365	G.B.	*Bibliography on Air Brakes.* (R.T.P.3 Bibliographies.)
253	1367	Germany ...	*Henschel 8,000-ton Hydraulic Press for Aircraft Parts (Photograph).* (Signal, No. 3, Feb., 1942.)
254	1369	U.S.A. ...	*Dynamic Balancing Applied to Transport Aircraft Propellers.* (J. G. Luttrell, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942.)
255	*1370	U.S.A. ...	*Load Factors Obtained on Civil Aeroplanes in Acrobatic Manœuvres.* (E. I. Ryder, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-7.)
256	*1375	U.S.A. ...	*General Flight Analysis of the Helicopter.* (M. Knight, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-21.)
257	*1376	Germany ...	*Ground Vibration Tests.* (C. D. Pengelley, Inst. Aeron. Sciences, 10th Annual Meeting, Jan., 1942, pp. 1-29.)
258	*1377	U.S.A. ...	*A Kinetic Energy Correction to Predicted Rate of Climb.* (F. C. Phillips, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-6.)
259	*1381	U.S.A. ...	*The Design of Rotor Blades.* (R. H. Prewitt, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-11.)
260	*1383	U.S.A. ...	*Tricycle Landing Gear Design.* (E. S. Jenkins and A. F. Donovan, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-88.)
261	1386	U.S.A. ...	*Further Developments of the Theory of Propeller Tip Interference.* (A. Gail, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-7.)
262	1387	U.S.A. ...	*Operating Requirements for Air Cargo Transportation.* (C. P. Graddick, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-14.)

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263	1388	U.S.A. ...	*Stress Analysis of Rings for Monocoque Fuselages.* (N. J. Hoff, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-17.)
264	1391	U.S.A. ...	*Economic Effects of Airport Size and Airway Deficiencies.* (A. E. Blonquist, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-14.)
265	1396	U.S.A. ...	*Fatigue Failures Affecting Transport Aircraft.* (H. E. Hoben, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-10.)
266	1413	U.S.A. ...	*Langley Touring Plane (Vidal Plastic Process).* (Inter. Avia., No. 796-797, 20/12/41, p. 12.)
267	1419	Germany ...	*German Tailless Aircraft.* (Inter. Avia., No. 796-797, 20/12/41, p. 15.)
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269	1421	U.S.A./G.B....	*Gliding (British and American Developments).* (Inter. Avia., No. 796-797, 20/12/41, pp. 20-21.)
270	1430	France ...	*Potez Scan 161.* (Inter. Avia., No. 794-795, 13/12/41, p. 18.)
271	*1439	U.S.A. ..	*Will Accessories Improve the Pay Load?* (Autom. Ind., Vol. 86, No. 2, 15/1/42, pp. 34-35.)
272	1448	Germany ...	*Photographs of Quick Take-off Aircraft at the Staaken Competition in 1932 (Breda 33, Klemm. Kl. 32, Heinkel He. 64, etc.).* (Aeroplane, Vol. 62, No. 1,608, 20/3/42, p. 325.)
273	1450	G.B.	*The Articulated Undercarriage.* (H. G. Conway, Aeroplane, Vol. 62, No. 1,608, 20/3/42, pp. 336-338.)
274	1506	France ...	*New French Air Service Research Institute.* (Inter. Avia., No. 806, 9/3/42, p. 20.)
275	1469	Sweden ...	*Expansion of Swedish Aircraft Industry.* (Inter. Avia., No. 805, 27/2/42, pp. 11-12.)
276	1474	U.S.A. ...	*American Helicopter Developments.* (Inter. Avia., No. 805, 27/2/42, p. 14.)
277	*1476	U.S.A. ...	*Glider Development in the U.S.A.* (Inter. Avia., No. 805, 27/2/42, p. 15.)
278	*1478	U.S.A. ...	*Flight Strips for Emergency Landing Grounds.* (Inter. Avia., No. 805, 27/2/42, p. 21.)
279	1484	France ...	*Bloch 161 Commercial Transport.* (Inter. Avia., No. 803-804, 19/2/42, pp. 14-15.)
280	1485	France ...	*Potez Scan 161 Giant Flying Boat.* (Inter. Avia., No. 803-804, 19/2/42, p. 15.)
283	1529	U.S.A. ...	*Contribution to the Ideal Efficiency of Screw Propellers.* (W. Hoff, L.F.F., Vol. 18, No. 4, April 22nd, 1941.) (R.T.P. Translation T.M. 1,002.)
285	1581	Italy ...	*Aerodynamics of the Airscrew (Digest).* (E. Pistolesi, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 811-813.)
286	1582	Italy ...	*Influence of the Finite Blade Width on the Aerodynamic Characteristics of the Propeller (Theory Experiment) (Digest).* (Ferrari, C., La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 813-815.)

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287	1585	Italy ...	*Cavitation in Marine Propellers (Digest).* (E. Castagneto, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 821-823.)
288	1586	Italy ...	*Effect of the Free Surface on the Functioning of the Marine Propeller (Digest).* (C. Possio, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, p. 823.)
289	1590	Italy ...	*Dynamometer Tests on Contra Rotating Airscrews (Digest).* (M. Panetti, L'Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 830-831.)
290	1591	Italy ...	*The Goldstein Propeller of Minimum Induced Resistance Compared with the Standard Propeller.* (C. Mortorino, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 831-832.)
291	1571	Germany ...	*Modern Problems in Aircraft Construction, I.* (G. Boch, Translated from Luftwissen, Vol. 9, No. 1, Jan., 1941, pp. 6-16. Flight, Vol. 41, No. 1,735, 26/3/42, pp. 289-294.)
292	1569	G.B.	*Bristol 72 Racing Aircraft of the Year* 1922. (Flight, Vol. 41, No. 1,735, 26/3/42, pp. 286-287.)
293	1600	Germany ...	*The Effect of Propeller Slipstream on Downwash.* (A. V. Barnoff, L.F.F., Vol. 19, No. 1, 20/1/42, pp. 1-10.)

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294	994	G.B.	*Durability of Gears.* (Mansin, Mech. World, 5/9/41, pp. 153-155.) (Abstracted in Met. Vick. Tech. News Bull., No. 779, 12/9/41, p. 11.)
295	996	G.B.	*High Efficiency Turbine Units.* (Groff, Power Plant Energy, Aug., 1941, pp. 58-60.) (Abstracted in Met. Vick. Tech. News Bull., No. 779, 12/9/41, p. 12.)
296	*997	U.S.S.R. ...	*Thermo-Chemical Steam Transformer.* (Eng. and B.H. Review, Sept., 1941, pp. 84-88.) (Abstracted in Met. Vick. Tech. News Bull., No. 779, 12/9/41.)
297	*1009	Germany ...	*The Effect of the Subsidiary Connecting Rod on the Forces Acting Perpendicular to the Crankshaft Axis.* (A. Kimmel, L.F.F., Vol. 18, No. 12, 29/12/41, pp. 403-416.)
298	*1017	Germany ...	*Steam Power Plants for Aircraft.* (E. Knornschild, Luftwissen, Vol. 8, No. 12, Dec., 1941, pp. 366-373.) (R.T.P. Trans. 1,456.)
299	*1023	Germany ...	*Drive and Control of Aero Engine Superchargers.* (W. V. der Null and H. Pfan, Z.V.D.I., Vol. 85, No. 51-52, 27/12/41, pp. 981-989.)
300	1024	Germany ...	*The Present State of Development of the Velox Boiler.* (W. G. Noack, Z.V.D.I., Vol. 85, No. 51-52, 27/12/41, pp. 967-975.)
301	1027	Japan ...	*High Speed Japanese Coal Dust Injection Engine.* (H. Wahl, Z.V.D.I., Vol. 85, No. 51-52, 27/12/41, p. 989.)
302	1049	Germany ...	*The Mechanics of the Differential Drive.* (A. Jante, A.T.Z., Vol. 45, No. 1, 10/1/42, pp. 5-11.)

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303	1050	Germany ...	*Early Examples of Gas and Petrol Engines (Year* 1878-1879). (A.T.Z., Vol. 45, No. 1, 10/1/42, pp. 12-15.)
304	1052	U.S.A. ...	*Stress and Deflection in Reciprocating Parts of Internal Combustion Engines.* (R. L. Boyer and T. O. Knivinen, Trans. A.S.M.E., Vol. 63, No. 6, Aug., 1941, pp. 499-504.)
305	*1056	U.S.A. ...	*Air Supply and Icing Protection of Aircraft Carburettors.* (Inter. Avia., No. 801, 31/1/42, pp. 1-5.)
306	1072	G.B.	*Rolls Royce Merlin XX.* (Inter. Avia., No. 802, 10/2/42, p. 14.)
307	1078	Germany ...	*B.M.W.* 801 *(Twin Row Radial).* (Inter. Avia., No. 799, 14/1/42, p. 13.)
308	1124	Germany ...	*Light Weight Diesel Engine Construction.* (M. Schonberg, W. R. H., Vol. 23, No. 2, 15/1/42, pp. 18-22.)
309	1133	G.B.	*Rolls Royce Merlin Aero Engines.* (Engineer, Vol. 173, No. 4,494, 27/2/42, pp. 178-180.)
310	1136	G.B.	*Rolls Royce Merlin XX.* (Flight, Vol. 41, No. 1,731, 26/2/42, pp. 9-g.)
311	1155	G.B.	*Rolls Royce Merlin XX Motor.* (Aeroplane, Vol. 62, No. 1,605, 27/2/42, pp. 248-249.)
312	1193	Germany ...	*Jumo 211 B and D Petrol Injection Engine.* (Flugsport, Vol. 34, No. 3, 4/2/42, pp. 39-44.)
313	1195	Germany ...	*Elastic Mounting for Adjustable Power Plants (Variable Distance from Water Surface) (Pat. No.* 714,333). (Heinkel, Flugsport, Vol. 34, No. 3, 4/2/42, pp. 89-90.) (Pat. Coll. No. 22.)
314	1199	Germany ...	*Special Engine Mounting for Several Radial Engines Placed One Behind the Other (Pat. No* 714,252). (B.M.W., Flugsport, Vol. 34, No. 3, 4/2/42, p. 91.) (Pat. Coll. No. 22.)
315	1232	Germany ...	*Copper Plated Piston Rings for Steam Engines.* (Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, p. 61.)
316	1235	Germany ...	*Damping of Intake and Exhaust Noises of Diesel Engines.* (Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, pp. 57-58.)
317	1262	U.S.A. ...	*Two-Speed Blower Drives.* (F. M. Kincaid, Flight, Vol. 41, No. 1,732, 5/3/42, pp. 199-204.)
318	1264	Italy ...	*New Italian Aero Engine.* (Flight, Vol. 41, No. 1,732, 5/3/42, p. 206.)
319	1280	G.B.	*Bristol Hercules, Part II.* (Airc. Prod., Vol. 4, No. 41, March, 1942, pp. 243-253.)
320	1316	G.B.	*Bristol Aero Engine with Special Reference to the Hercules Series.* (Aeroplane, Vol. 62, No. 1,607, 13/3/42, pp. 296-300.)
321	1320	Italy ...	*Isotta-Fraschini "Gamma" Aero Engine* (1,600 *h.p.*). (Flight, Vol. 41, No. 1,733, 12/3/42, p. 232.)
322	1336	G.B.	*The Future of the Railway Oil Engine.* (B. Reed, Engineering, Vol. 153, No. 3,974, 13/3/42, pp. 218-220.)
323	1337	G.B.	*Rolls Royce Merlin XX (No. II).* (Engineer, Vol. 173, No. 4,495, 6/3/42, pp. 199-201.)

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324	1341	G.B. ...	...	*Pitting of Gudgeon Pins.* (E. B. Parker, Engineer, Vol. 173, No. 4,495, 6/3/42, p. 208.)
325	1344	G.B. ...	...	*Rolls Royce Merlin XX Aero Engines.* (Engineering, Vol. 153, No. 3,973, 6/3/42, pp. 184-186 and 190.)
329	*1378	U.S.A.	...	*The Correction of Engine Output to Standard Conditions.* (D. S. Hersey, Inst. Aeron. Sci., 10th Annual Report, Jan., 1942, pp. 1-37.)
330	*1399	U.S.A.	...	*The Efficiency of Combustion Turbines with Constant Pressure Combustion.* (W. Piening, L.F.F., Vol. 17, No. 9, Sept. 20th, 1940.) (R.T.P. Translation T.M. 975.)
331	*1410	Germany	...	*Velocity and Pressure in the Curved Vane Passage of Hydraulic Gears.* (C. Wiesesberger, Z.V.D.I., Vol. 85, No. 2, 11/1/41, pp. 55-56.)
332	1422	Germany	...	*German Aircraft Engine Terminology.* (Inter. Avia., No. 796-797, 20/12/41, p. 25.)
333	1440	U.S.A.	...	*Two-Speed Supercharger Drives.* (Autom. Ind., Vol. 86, No. 2, 15/1/42, p. 35.)
334	*1458	Germany	...	*Lubrication Phenomena between Piston Ring and Cylinders.* (R. Poppinga, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 116.)
335	1459	Germany	...	*Electrical Speed Control for Water Turbines.* (G. August, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, pp. 121-122.)
336	1460	Germany	...	*Valves of Foreign Aircraft Engines (Review of British and American Articles).* (W. Herbrick, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, pp. 117-120.)
337	1475	U.S.A.	...	*Lycoming O-435 Engine (175 h.p.).* (Inter. Avia., No. 805, 27/2/42, p. 14.)
339	1524	Germany	...	*The Control of Eccentric Vane Compressors.* (M Jackmann, Z.V.D.I., Vol. 84, No. 24, 15/6/40, pp. 413-419.)
340	1552	U.S.A.	...	*Metallizing Equipment for Engine Cylinders.* (Trade Winds, Feb., 1942, pp. 14-15, 18.)
341	1553	U.S.A.	...	*Strengthening Sand Mould for Cylinder Head Pins.* (Trade Winds, Feb., 1942, p. 11.)
342	1554	U.S.A.	...	*Educational Sound Film for Aircraft Engine Operation.* (Trade Winds, Feb., 1942, pp. 12-13.)
343	1558	G.B. ...	...	*Compact Steam Generator (300 lb./hour) for Heating and Decontamination.* (The Engineer, Vol. 173, No. 4,496, 13/3/42, p. 236.)
344	1567	U.S.A.	...	*Allison V 1,810 C 15 Engine.* (G. Geoffrey Smith, Flight, Vol. 41, No. 1,735, 26/3/42, pp. 281-284.)
345	1588	Italy	...	*Exhaust Reaction of Four-Stroke Internal Combustion Engines.* (A. Capetti, La Aerotecnica, Vol. 21, No. 12, Dec., 1941, pp. 827-829.)
346	1595	Germany	...	*The Mechanics of the Differential.* (A. Janke, A.T.Z., Vol. 45, No. 2, 25/1/42, pp. 32-38.)
347	1596	Germany	...	*The Motion of the Desaxé Connecting Rod.* (O. Ambs, A.T.Z., Vol. 45, No. 2, 25/1/42, pp. 39-43.)
348	1599	U.S.A.	...	*Bearing Materials in American Aero Engines.* (A.T.Z., Vol. 45, No. 2, 25/1/42, p. 43.)

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349	1602	Germany ...	*The Compression Process in Centrifugal Superchargers Taking Friction into Account.* (C. Pfleiderer, L.F.F., Vol. 19. No. 1, 20/1/42, pp. 13-22.)

FUELS AND LUBRICANTS.

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
350	1016	G.B.	*Physical Aspects of Boundary Lubrication.* (Beeck, J. App. Physics, July, 1941, pp. 512-518.) (Abstract in Met. Vick. Tech. Bull., No. 777, 29/8/41, p. 9.)
351	1051	U.S.A. ...	*Lubrication of General Electric Steam Turbines (with Discussion).* (C. Dantsizen, Trans. A.S.M.E., Vol. 63, No. 6, Aug., 1941, pp. 491-498.)
352	1108	G.B.	*Glycol/Water Mixture Preferable to Prestone (Less Viscous, Better Heat Transfer, Not Inflammable).* (Inter. Avia., No. 800, 22/1/42, p. 13.)
353	1114	G.B.	*Classification of Rheological Properties.* (G. W. Scott-Blair, Nature, Vol. 149, No. 3,772, 14/2/42, pp. 197-198.)
354	1123	U.S.A. ...	*Importance of Crude Selection in 100 Octane Fuel Production.* (W. L. Nelson, The Oil and Gas Journal, Vol. 40, No. 34, Jan., 1942, pp. 14-15.)
355	1139	G.B.	*Features of Lubrication (Colloidal Graphite).* (Flight, Vol. 41, No. 1,731, 26/2/42, pp. 182-183.)
356	1245	Germany ...	*The Tendency of Diesel Fuels to Coking at the Fuel Jet.* (F. Kneule, Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, pp. 76-78.)
357	1248	Germany ...	*Improvements in Mobile Wood Gas Generators.* (Z.V.D.I., Vol. 86, No. 56, 7/2/42, pp. 90-91.)
358	1347	G.B.	*Wood Refuse for Steam Raising.* (R. B. Gillham, Engineering, Vol. 153, No. 3,973, 6/3/42, pp. 198-200.)
359	*1400	Germany ...	*Regeneration of Used Mineral Lubricating Oils.* (K. Thamas, Z.V.D.I., Vol. 85, No. 2, 11/1/41, pp. 33-39.)
360	1441	U.S.A. ...	*Removal of Mercaptans in High Octane Fuel.* (Autom. Ind., Vol. 86, No. 2, 15/1/42, p. 43.)
361	1491	Italy ...	*Experiments with Ketones and the Possibility of Their Utilisation as a Constituent of 100 Octane Fuel.* (V. Ceccarini, Atti di Guidonia, No. 55-56, 20/8/41, pp. 237-264.)
362	*1505	Switzerland ...	*International Petrol Supply.* (Inter. Avia., No. 806, 9/3/42, pp. 16/17.)
363	1527	Germany ...	*Effect of Alcohol Addition on the Octane Rating of Petrol.* (M. Lackmann, Z.V.D.I., Vol. 84, No. 24, 15/6/40, pp. 422-423.)
364	1564	Germany ...	*The I.G. Low Temperature Chamber for Lubrication Research.* (Luftwissen, Vol. 9, No. 1, Jan., 1942, pp. 19-20.)
365	1593	Germany ...	*Knock Rating by Electro Acoustical Methods.* (P. Funk, A.T.Z., Vol. 45, No. 2, 25/1/42, pp. 21-25.)
366	1594	Germany ...	*Octane Rating in Multi-Cylinder Engines.* (A. W. Schmidt, A.T.Z., Vol. 45, No. 2, 25/1/42, pp. 26-31.)

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367	1597	Germany ...	*Solid Fuels for Gas Generators* (*Recent Experience*). (A.T.Z., Vol. 45, No. 2, 25/1/42, pp. 44-45.)
368	1598	Sweden ...	*An Interesting Swedish Gas Generator* (*Kalle*). (A.T.Z., Vol. 45, No. 2, 25/1/42, pp. 45-47.)
			INSTRUMENTS.
369	998	G.B.	*Vibration Meter.* (Scott, Gen. Radio Exp., June, 1941, pp. 1-8.) (Abstracted in Met. Vick. Tech. News Bull., No. 779, 12/9/41, p. 10.)
370	1053	U.S.A. ...	*Thermometric Time Lag* (*Liquid or Vapour Type*). (R. Beck, Trans. A.S.M.E., Vol. 63, No. 6, Aug., 1941, pp. 531-543.)
371	1067	U.S.A. ...	*Bartow Viewing Device* (*Stereostroboscope*). (Inter. Avia., No. 802, 10/2/42, p. 15.)
372	1115	G.B.	*Stereoscopic Television.* (J. L. Baird, Electronic Engineering, Vol. 14, No. 168, Feb., 1942, pp. 620-621.)
373	1200	Germany ...	*Warm Air Supply to Venturis Operating Aircraft Instruments* (*Exhaust Heated*) (*Pat. No. 714,938*). (Focke Wulf, Flugsport, Vol. 34, No. 3, 4/2/42, p. 91.) (Pat. Coll. No. 22.)
374	1205	G.B.	*The Electron Microscope.* (Sci. Lib. Bibliog. Series, No. 567, 29/1/42.)
375	1207	G.B.	*High Speed Electric Motors for Wind Tunnel Experiments* (*Power-Driven Aircraft Models*). (Clymer, G.E. Rev., Nov., 1941, pp. 599-600.) (Abstract in Met. Vick. Tech. News Bull., No. 802, 20/2/42.)
376	1209	G.B.	*Electromagnetic Strain Gauge.* (Hively, G.E. Rev., Nov., 1941, pp. 621-623.) (Abstract in Met. Vick. Tech. News Bull., No. 802, 20/2/42, p. 11.)
377	1210	G.B.	*Machine Tool Electric Pressure Gauge.* (Hand, G.E. Rev., Nov., 1941, pp. 605-607.) (Abstract in Met. Vick. Tech. News Bull., No. 802, 20/2/42, p. 11.)
378	1212	Germany ...	*The Electrostatic Electron Microscope and Some New Results in Metallurgy.* (H. Mahl, Z. Mettalk., Vol. 33, No. 2, Feb., 1941, pp. 68-73.)
379	1220	Germany ...	*The Measurement of Internal Tyre Temperatures by Means of the Needle Thermocouple.* (Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, pp. 21-22.)
380	1222	Germany ...	*Electrical Engine Indicator* (*Capacity Basis*). (Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, p. 22.)
381	1246	Germany ...	*Electrical Transmission of Instrument Readings by the Resistance Method* (*A.E.G. Advert.*). (Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, p. 35.) (Advertisement section.)
382	1257	G.B.	*Stereoscopic Television.* (Wireless World, Vol. 48, No. 2, Feb., 1942, pp. 31-32.)
383	1268	G.B.	*The Magnetic Compass.* (F. C. Stewart, Engineering, Vol. 152, No. 3,954, 24/10/41, pp. 326-327.)
384	1283	U.S.A. ...	*The Weems School of Navigation.* (W. Winter, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 24-26, 112.)

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385	1288	U.S.A. ...	*Instrument Landing System of the C.A.A.* (J. Easton, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 57-59.)
386	1291	U.S.A. ...	*Ground Trainer for Simulating Navigation in the Air.* (B. N. Pearse, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 70 and 104.)
387	1304	U.S.A. ...	*Analysing Governor System Performance by Means of Special Instruments.* (A. F. Schwendner, Trans. A.S.M.E., Vol. 64, No. 1, Jan., 1942, pp. 43-47.)
389	*1380	U.S.A. ...	*New Developments in Simplified Control.* (R. H. Upson, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-12.)
390	*1384	U.S.A. ...	*Effect of Magnetic Field Distribution in Magnetic Inspection.* (F. L. Fuller, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-10.)
391	1393	U.S.A. ...	*Guide Vanes for the Cup Anemometer.* (A. Klemin and W. C. Walling, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-11.)
392	*1397	U.S.A. ...	*The Automatic Radio Compass.* (W. L. Webb and G. O. Essex, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-30.)
393	1406	Germany ...	*Automatic Gear Change on Drum Recorders for Transient Phenomena.* (W. Oesingham, Z.V.D.I., Vol. 85, No. 2, 11/1/41, p. 49.)
394	1442	U.S.A. ...	*Tempil Sticks for Recording Temperatures (Smear Marks Liquify).* (Autom. Ind., Vol. 86, No. 2, 15/1/42, p. 43.)
395.	1466	Germany ...	*Instrument Bearings. Corrections to Pfliers Article, Z.V.D.I., Vol. 84, (1940), pp. 575-580.* (Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 128.)
396	1510	G.B.	*An Electrical Engine Indicator for Measuring Static and Dynamic Pressures.* (Martin and others, A.I.E.E. Trans., Supplt. to El. Eng., June, 1941, pp. 513-523.) (Abstract in Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 7.)
397	*1516	G.B.	*Electrical Characteristics of Stroboscopic Flash Lamps.* (Murphy and Edgerton, J. App. Phy., Dec., 1941, pp. 848-855.) (Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 12.)
398	*1522	U.S.A. ...	*Brilliance Control of Aircraft Instrument Lights.* (J. Aeron. Sci. (Rev. Sect.), Vol. 9, No. 3, Jan., 1942, p. 60.)
399	1526	Germany ...	*Materials for Slack Diaphragms.* (M. Lackmann, Z.V.D.I., Vol. 84, No. 24, 15/6/40, pp. 421-422.)
400	1543	G.B.	*The Thyratron Time-Base Circuit.* (O. S. Puckle, Electronic Engineering, Vol. 14, No. 169, March, 1942, pp. 664-666.)
401	1545	G.B.	*Cathode Ray Oscillograph in Industry.* (W. Wilson, Electronic Engineering, Vol. 14, No. 169, March, 1942, p. 692.)
402	1559	U.S.A. ...	*Throat Microphones.* (Coast Artillery Journal, Vol. 85, No. 1, Jan.-Feb., 1942, pp. 76-77.)

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			MATERIALS.
403	*990	U.S.S.R. ...	*Stress Test on Rotating Drive with Numerous Holes.* (Teverovskiy, Sov. Kotloturbo, No. 11, 1940, pp. 402-411.)
404	*991	U.S.S.R. ...	*Thick-Coated Electrodes for Boiler Welding.* (K. A. Khakimyanova and E. A. Poatzebenko, Sov. Kotloturbo, No. 11, 1940, pp. 395-397.)
405	*992	U.S.A. ...	*Experiments on Ball and Roller Bearings Under Conditions of High Speeds and Small Oil Supply.* (G. Getzlaff, Year Book of German Aeronautical Research, 1938, Vol. 2, pp. 110-118.) (R.T.P. Translation T.M. 945.)
406	993	G.B.	*Surface Treatment of Light Metals.* (Neurath and Einerl, Chemical Age, 6/9/41, pp. 131-133.) (Abstract in Met. Vick. News Bull., No. 779, 12/9/41, p. 7.)
407	995	G.B.	*Methods of Selection of Ball and Roller Bearings.* (Ungar, Machinist, 30/8/41, pp. 192-193.) (Abstracted in Met. Vick. Tech. News Bull., No 779, 12/9/41, p. 8.)
408	999	G.B.	*Limits and Fits and Limit Gauges.* (Mech. World, 5/9/41, pp. 167-168.) (Abstracted in Met. Vick. Tech. News Bull., No. 779, 12/9/41, p. 13.)
409	*1010	Germany ...	*Corrosion Fatigue of Some Wrought Al. Alloys Under the Influence of Hot Liquids.* (F. Bollenrath and W. Bungardt, L.F.F., Vol. 18, No. 12, 29/12/41, pp. 417-424.)
410	1012	G.B.	*The Corronising Process of Metal Coating.* (Rimbach, Met. Finishing, July, 1941, pp. 360-364.) (Abstract in Met. Vick. Tech. News Bull., No. 777, 29/8/41, p. 4.)
411	1013	G.B.	*Weldability—Weld Metal Cracks.* (Spraragen and Claussen, Weld. J., July, 1941, pp. 289-305.) (Abstract in Met. Vick. Tech. News Bull., No. 777, 29/8/41, p. 5.)
412	1014	G.B.	*Casting in Rubber Moulds.* (Smith, Steel, 7/7/41, pp. 50-57, 78-80.) (Abstract in Met. Vick. News Bull., No. 777, 29/8/41, p. 6.)
413	*1019	Germany ...	*Critical Load and Breaking Strength of Ball Bearings Used in Aircraft Construction (Controls, etc.).* (H. Perret, Luftwissen, Vol. 8, No. 12, Dec., 1941, pp. 375-379.)
414	1025	Germany ...	*Criticism of the Force-Flux Concept in Stress Investigations.* (R. Monfang, Z.V.D.I., Vol. 85, No. 51-52, 27/12/41, p. 994.)
415	1028	Germany ...	*Fatigue Strength of Steels at Low Temperatures.* (W. Hempel, Z.V.D.I., Vol. 85, No. 51-52, 27/12/41, pp. 992-993.)
416	1029	Germany ...	*Hydrogen Sensitivity of Certain Steels During Galvanic Processes.* (H. Fischer, Z.V.D.I., Vol. 85, No. 51-52, 27/12/41, p. 993.)
417	1034	U.S.A. ...	*Explosive Rivets (du Pont de Nemours Co.).* (Inter. Avia., No. 798, 4/1/42, p. 14.)

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418	1035	U.S.A.	...	*Cherry Self-Plugging Hollow Rivet.* (Inter. Avia., No. 798, 4/1/42, p. 14.)
419	*1042	G.B. ...	...	*New Magnesium Alloy.* (Metal Industry, Vol. 60, No. 8, 20/2/42, p. 147.)
420	*1055	U.S.A.	...	*Recommended Codes of Procedure for Fatigue Testing of Hot-Wound Helical Compression Springs (with Discussion).* (C. T. Edgerton, Trans. A.S.M.E., Vol. 63, No. 6, Aug., 1941, pp. 553-560.)
421	1076	G.B. ...	...	*Pytram Ducts (Cellulose Fibre Laminations Impregnated with Bonding Material).* (Inter. Avia., No. 799, 14/1/42, p. 12.)
422	1095	G.B. ...	...	*Data Sheet No. 7 (Light Alloys).* (Airc. Eng., Vol. 14, No. 156, Feb., 1942, p. 56.)
423	1119	Germany	...	*Mathematical Consideration Applied to the Solidification Process of Castings (Change of Volume).* (E. Schell, Z. fur Metallk., Vol. 34, No. 1, Jan., 1942, pp. 2-9.)
424	1120	Germany	...	*Modern Developments in Metal Cladding.* (W. Engelhardt, Z. fur Metallk., Vol. 34, No. 1, Jan., 1942, pp. 12-16.)
425	1121	Germany	...	*Some Special Ag.-Mn. Alloys for Electrical Resistances.* (A. Schulze, Z. fur Metallk., Vol. 34, No. 1, Jan., 1942, pp. 16-19.)
426	1122	G.B. ...	...	*Routine Spectrographic Analysis of Mg. Alloys.* (G. P. Carter, Metal Industry, Vol. 60, No. 9, 27/2/42, pp. 159-162.)
427	1125	Germany	...	*Beams with Elastic Supports.* (W. Dahlmann, W.R.H., Vol. 23, No. 2, 15/1/42, pp. 22-25.)
428	1127	Germany	...	*Material Testing on a Statistical Basis (Laws of Probability) (with Discussion).* (G. Lehmann, W.R.H., Vol. 23, No. 1, 1/1/42, pp. 6-15.)
429	1129	G.B. ...	...	*Substitute Tungsten High Speed Steels.* (Engineering, Vol. 153, No. 3,972, 27/2/42, pp. 167-168.)
430	1130	G.B. ...	...	*Graphite Coatings for Electrostatic Screening.* (Engineering, Vol. 153, No. 3,972, 27/2/42, p. 178.)
431	1140	G.B. ...	...	*Spectrographic Analysis of Mg. Alloys.* (G. P. Carter, Metal Ind., Vol. 60, No. 8, 20/2/42, pp. 140-143.)
432	1141	G.B. ...	...	*The Hardening of Steel and the Electron Microscope, II.* (Metal Ind., Vol. 60, No. 8, 20/2/42, p. 145.)
433	1174	Germany	...	*Method of Constructing Hollow Slats (Pat. No. 715,100).* (Fieseler, Flugsport, Vol. 34, No. 2, 21/1/42, pp. 86-87.) (Pat. Coll. No. 21.)
434	1182	Germany	...	*Tool for Ceiling Wire Springs.* (Flugsport, Vol. 34, No. 4, 18/2/42, pp. 60-61.)
435	1190	Germany	...	*Manufacture of Aircraft Parts of Low Density by Combination of Hollow Fillers and Plastics.* (Dornier, Flugsport, Vol. 34, No. 4, 18/2/42, p. 96.)
436	1204	G.B. ...	...	*Magnetostriction (1930 to date).* (Science Lib. Bibliog. Series, No. 566, 20/1/42.)

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437	1208	G.B. ...	... *Metal Spraying.* (Pitcairn, Met. Ind., 23/1/42, pp. 50-51.) (Abstract in Met. Vick. Tech. News Bull., No. 802, 20/2/42, p. 9.)
438	1211	Germany	... *Micro Hardness Measurements Carried Out on Structure Elements of Bearing Metals.* (A. Rapp and H. Hanemann, Z. Mettalk., Vol. 33, No. 2, Feb., 1941, pp. 64-67.)
439	1213	Germany	... *Creep Strength of Zn. Alloys.* (F. Pawick and M. Prender, Z. Mettalk., Vol. 33, No. 2, Feb., 1941, pp. 84-96.)
440	1215	Germany	... *Some Load Tests on Reinforced Concrete Shell Structures.* (Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, p. 26.)
441	1216	Germany	... *The Facilitation of Cold Working of Metals (e.g., Drawing) by Phosphate Layers Deposited on the Surface.* (A. Durer and others, Z.V.D.I., Vol. 86), No. 1-2, 10/1/42, pp. 15-18.)
442	1217	Germany	... *The Tightening of Nuts by Hand (Relative between Moment Applied and Stress in Threads).* (Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, p. 25.)
443	1219	Germany	... *Simple Methods for the Design of Link Drives.* (Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, pp. 27-28.)
444	1221	Germany	... *Proposed Symbols for Expressing States of Heterogeneous Equilibrium in Alloy Research.* (Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, p. 28.)
445	1227	Germany	... *Complete and Generalised Similarity in Elastic Problems.* (H. Weber, Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, pp. 59-60.)
446	1228	Germany	... *Synthetic Resin Bearings for Rolling Mills.* (Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, p. 48.)
447	1231	Germany	... *First Class Wooden Road Bridges (1,000 feet long) Built in Three Months.* (Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, pp. 54-55.)
448	1234	Germany	... *Electric Ovens for the Hard Soldering of Hard Metal Tips on Tools (Mass Production).* (A.E.G. (Advert.), Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, p. 19.)
449	1236	G.B. ...	... *Nickel Clad Steels.* (T. Waterfall, Prac. Eng., Vol. 5, No. 109, 19/2/42, pp. 129-130.)
450	1243	Germany	... *The Buckling of Rectangular Plates, Subjected at all Four Edges to Normal Stresses in the Plane of the Plate.* (K. Kloppel and K. H. Lies, Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, pp. 71-75.)
451	1247	Germany	... *The Mechanical Testing of Soft Rubber.* (A. Schob, Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, pp. 88-89.)
452	1250	Germany	... *The Influence of the Method of Fixation on the Fatigue Strength of Un-alloyed Steels.* (H. Cornelius, Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, pp. 91-92.)
453	1251	Germany	... *Machinability of Al. Alloys for Automatics.* (F. Meyer, Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, p. 92.)
454	1252	Germany	... *Measurement of Tensions in Wire Ropes.* (K. Albers, Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, pp. 92-93.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
455	1267	G.B. ...	...	*Investigation on Shaft Fillets.* (P. Grodzinski, Engineering, Vol. 152, No. 3,954, 24/10/41, pp. 321-324.)
456	1272	G.B. ...	...	*Synthetic Adhesives for Plywood and Bakelite.* (Engineering, Vol. 152, No. 3,954, 24/10/41, p. 336.)
457	1273	G.B. ...	...	*The Effect of Antimony on Magnesium.* (W. R. D. Jones and L. Powell, Engineering, Vol. 152, No. 3,954, 24/10/41, pp. 328-330.)
458	1274	G.B. ...	...	*General Observations on Vibrations.* (J. Calderwood, Engineering, Vol. 152, No. 3,954, 24/10/41, pp. 339-340.)
459	1275	G.B. ...	...	*Diamond Tools.* (Airc. Prod., Vol. 4, No. 41, March, 1942, pp. 222-223, 229-233.)
460	1278	G.B. ...	...	*Spot Welding Equipment.* (*R.T.P. Translation No.* 1,344.) (Airc. Prod., Vol. 4, No. 41, March, 1942, pp. 237-240.)
461	*1296	Germany	...	*The Effect of Temperature on the Strength of Plastics. 2nd Report. Impact Strength Under Bending.* (R. Nitsche and E. Salewski, Kunststoffe, Vol. 31, No. 11, Nov., 1941, pp. 382-388.)
462	*1297	Germany	...	*The Effect of Temperature on the Strength of Plastics. Strength Under Bearing.* (R. Nitsche and E. Salewski, Kunststoffe, Vol. 29, No. 8, Aug., 1939, pp. 209-220.)
463	1299	Germany	...	*The Importance of Mn. in Al.-Cu.-Mg. Alloys in the Annealed and Age Hardened Condition (with Discussion).* (K. L. Dreyer and M. Hansen, Z. Metallk., Vol. 33, No. 5, May, 1941, pp. 193-204.)
464	*1300	Germany	...	*The Weldability and Crack Sensitivity of High Duty Light Alloys as Predicted from the Phase Diagram.* (R. Mechel, Z. Metallk., Vol. 33, No. 5, May, 1941, pp. 205-207.)
465	1301	Germany	...	*The Intercrystalline Corrosion of Zn. Alloys, I. (The Importance of Alloy Structures.)* (E. Andres and K. Lohberg, Z. Metallk., Vol. 33, No. 5, May, 1941, pp. 208-212.)
466	1302	Germany	...	*The Intercrystalline Corrosion of Zn. Alloys, II. (Notes on the Steam Bath Tests.)* (K. Lohberg, Z. Metallk., Vol. 33, No. 5, May, 1941, pp. 213/214.)
467	1307	G.B. ...	...	*Bibliography of Papers on Rubber in Aircraft Design.* (Compiled by Research Association of British Rubber Manufacturers.)
468	*1326	Germany	...	*The Mechanical Properties of Wood of Different Moisture Content within* $-200°$ *to* $+200°C$. *Temperature Range.* (F. Kollman, V.D.I., Forschungsheft. No. 403, July-Aug., 1940.) (Translation T.M. 1,984.)
469	*1327	Germany	...	*Factors Influencing the Fatigue Strength of Materials.* (Bollenrath, F., L.F.F., Vol. 17, No. 10, Oct. 26th, 1940.) (R.T.P. Translation T.M. 987.)

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470	*1329	Germany	...	*Buckling Tests on Eccentrically Loaded Beam Columns.* (J. Cassens, L.F.F., Vol. 17, No. 10, Oct. 26th, 1940.) (R.T.P. Translation T.M. 989.)
471	*1332	Germany	...	*Statistical Analysis of the Time and Fatigue Strength of Aircraft Wing Structures.* (H. W. Kaul, Jahrbuch, 1938, der deutschen L.F.F.) (R.T.P. Translation T.M. 992.)
472	1334	G.B. ...	...	*Researches on the Structure of Alloys (Published by British Non-Ferrous Research Association).* (W. Hume-Rothery, Engineering, Vol. 153, No. 3,974, 13/3/42, p. 216.)
473	1335	G.B. ...	...	*Some Recent Trends in Steel Manufacture.* (G. A. V. Russell, Engineering, Vol. 153, No. 3,974, 13/3/42, pp. 217-218.)
474	1338	G.B. ...	...	*The High Frequency Induction Furnace.* (T. F. Wall, Engineer, Vol. 173, No. 4,495, 6/3/42, pp. 209-211.)
475	1342	G.B. ...	...	*Relation Between Tensile and Fatigue Limits.* (J. M. Lessels, Engineer, Vol. 173, No. 4,495, 6/3/42, p. 208.)
476	*1362	U.S.A.	...	*Relief of Residual Stress in Streamline Tie Rods by Heat Treatment.* (R. E. Pollard and F. M. Reinhart, N.A.C.A. Tech. Note, No. 832, Nov., 1941, pp. 1-29.)
479	*1372	U.S.A.	...	*Economic Advantages of Certain Aluminium Alloys for Aircraft Construction.* (K. F. Thornton, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-21.)
480	*1373	U.S.A.	...	*Bending and Torsional Design Charts for Round Chrome Molybdenum Tubing.* (V. C. Trimarchi, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-12.)
481	1374	U.S.A.	...	*Review of Present Day Welding of Aircraft Steels.* (A. J. Williamson and J. P. Dods, Inst. of Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-10.)
482	*1379	U.S.A.	...	*The Lateral Instability of Unsymmetrical I-Beams.* (H. N. Hill, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 2-17.)
483	1382	U.S.A.	...	*Elastic Theory as a Tool in Sheet Metal Forming Problems.* (T. R. Shanley, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-32.)
484	1385	U.S.A.	...	*Flash Butt Welding of Chrome Moly. Steel.* (W. S. Evans, Inst. Aeron. Sci., 10th Annual Report, Jan., 1942, pp. 1-15.)
485	1390	U.S.A.	...	*Aircraft Plywood Specification No. 12.* (Haskelite Manufacturing Corp. Inst., 10th Annual Meeting, Jan., 1942, pp. 1-11.)
486	1392	U.S.A.	...	*Preliminary Static Test of a Magnesium Alloy Wing.* (E. W. Corlon and J. C. Mathics, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-8.)
487	1394	U.S.A.	...	*X-Ray Examination of Aircraft Castings (Control and Value).* (B. C. Boulton, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-15.)

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488	1395	U.S.A.	...	*Control Procedure of Torch Welding in Aircraft.* (E. Dudley, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-22.)
489	*1398	U.S.A.	...	*Aluminium Alloys for Aircraft.* (T. L. Fritzlen, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-30.)
490	1401	Germany	...	*Stress Distribution in Boilers in the Neighbourhood of Pipe Fittings.* (F. A. Willers, Z.V.D.I., Vol. 85, No. 2, 11/1/41.)
491	1402	Germany	...	*Spectro-Chemical Rapid Analysis of Steels in American Large Scale Manufacture.* (H. Kaiser, Z.V.D.I., Vol. 85, No. 2, 11/1/41, pp. 40-43.)
492	*1403	Germany	...	*Tests on Emery Wheels and the Grindability of Metals.* (K. Gottwein, Z.V.D.I., Vol. 85, No. 2, 11/1/41, pp. 43-44.)
493	1404	Germany	...	*Electrical Under-Water Welding and Cutting.* (H. Schmidt, Z.V.D.I., Vol. 85, No. 2, 11/1/41, pp. 45-47.)
494	*1405	Germany	...	*Thermo Chrome Temperature Measuring Crayons.* (F. Penzig, Z.V.D.I., Vol. 85, No. 2, 11/1/41, p. 48.)
495	1409	Germany	...	*The Elastic Line of Compressed Spiral Springs (Based on Trans. A.S.M.E., Vol. 62 (1940), pp. 319-329).* (S. Gross, Z.V.D.I., Vol. 85, No. 2, 11/1/41, pp. 52-54.)
496	1428	U.S.A.	...	*Neoprene F.R. (Cold Resisting Synthetic Rubber).* (Inter. Avia., No. 794-795, 13/12/41, p. 18.)
497	1443	U.S.A.	...	*"Saran" Synthetic Resin Tubing.* (Autom. Ind., Vol. 86, No. 2, 15/1/42, p. 43.)
498	1451	Germany	...	*V.D.I., 10th Annual Meeting on "Wood as an Engineering Material."* (F. Gernlein and W. Dannies, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, pp. 100-102.)
499	*1452	Germany	...	*Torsional Fatigue Strength of High Tensile Steel.* (H. Cornelius and F. Bollanrath, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, pp. 103-108.)
500	1455	Germany	...	*Foundations for Large Machine Tools.* (E. Ransh, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, pp. 109-111.)
501	1456	Germany	...	*Factors Influencing the Crack Sensitivity of Electric Welds.* (E. Dorgerlok, Z.V.D.I., Vol. 86, No. 7-8, p. 123.)
502	1461	Germany	...	*Embrittlement of Metals Caused by Compression.* (Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 124.)
503	1462	Germany	...	*Effect of Cold Rolling and Annealing on the Hysterisis Loss of Transformer Steels.* (Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 125.)
504	1463	Germany	...	*New Synthetic Glue for Wood (Pressal).* (Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 125.)
505	1464	Germany	...	*Plugging of Porous Castings by Means of Plastics.* (Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 126.)
506	1465	Germany	...	*Automatic Welding of Thin Sheets by Means of the Hafergut Process.* (Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 126.)

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507	1508	G.B. ...	... *Application of Ignitions to Resistance Welding Control.* (Bivens, A.I.E.E., Trans. Suppt. to El. Eng., June, 1941, pp. 471-478.) (Abstract from Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 4.)
508	*1509	G.B. ...	... *Hardness and Microstructure Tests on Welds.* (Sparagen and Claussen, Weld. J. Suppt., Dec., 1941, pp. 561-602.) (Met. Vick. Tech. News Bull. No. 800, 6/2/42, p. 15.)
509	*1511	G.B. ...	... *Contact Resistance in Welding.* (Tylecote, Weld. J. Supplt., Dec., 1941, pp. 591-602.) (Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 15.)
510	*1512	G.B. ...	... *Portable Spot Welding.* (Mech. World, 23/1/42, p. 83.) (Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 8.)
511	*1513	G.B. ...	... *Non-Destruction Testing.* (Auto. Engr., Dec. 1941, pp. 448-450.) (Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 11.)
512	1514	G.B. ...	... *High Speed Welding Electrodes.* (de Lange and Waddington, Weld. Ind., Jan., 1942, pp. 287-289.) (Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 11.)
513	1516	G.B. ...	... *Metal Coating.* (Wein, Met. Finishing, Dec., 1941, pp. 666-672.) (Met. Vick. Tech. News Bull., No. 800, 6/2/42, p. 13.)
514	*1521	U.S.A.	... *Statics of Circular-Ring Stiffeners for Monocoque Fuselages.* (W. Steida, L.F.F., Vol. 18, No. 6, 30/6/41, pp. 214-222.) (R.T.P. Translation T.M. 1,004.)
515	1523	Germany	... *Endurance and Fatigue Strength of Some Simple Structural Parts Made of Metal.* (F. Bollenrath and H. Cornelius, Z.V.D.I., Vol. 84, No. 24, 15/6/40, pp. 407-412.)
516	1525	Germany	... *Deep Drawing Tests on Alloy Steel Sheets.* (M. Lackmann, Z.V.D.I., Vol. 84, No. 24, 15/6/40, pp. 419-420.)
517	1530	G.B. ...	... *Recent Swedish Progress in Powder Metallurgy.* (D. W. Rudorff, Metal Industry, Vol. 60, No. 11, 13/3/42, pp. 188-190.)
518	1531	G.B. ...	... *Porosity in Aluminium Castings.* (W. Wilson, Metal Industry, Vol. 60, No. 11, 13/3/42, pp. 191-192.)
519	1532	G.B. ...	... *X-Ray Investigation into Cold Rolled Mg. Alloy Sheet.* (L. Frommer, Metal Industry, Vol. 60, No. 11, 13/3/42, pp. 192-194.)
520	1533	G.B. ...	... *Anodic Treatment of Al. in the Chromic Acid Bath.* (O. F. Tarr and others, Metal Industry, Vol. 60, No. 11, 13/3/42, pp. 194-196.)
521	1535	G.B. ...	... *The Fusion Welding of Non-Ferrous Alloys.* (H. Martin, Metal Industry, Vol. 60, No. 10, 6/3/40, pp. 172-173.)
522	1536	G.B. ...	... *Engineering Possibilities of Plastics.* (Metal Industry, Vol. 60, No. 10, 6/3/40, p. 176.)
523	1537	G.B. ...	... *Spot Welding of Light Alloys.* (Metal Industry, Vol. 60, No. 10, 6/3/40, p. 182.)

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524	1540	U.S.A. ...	*Manufacture and Processing of Al. and its Alloys.* (P. P. Ziegler, Mech. Eng., Vol. 64, No. 2, Feb., 1942, pp. 106-108.)
525	1541	U.S.A. ...	*Synthetic Rubber.* (O. M. Hayden, Mech. Eng., Vol. 64, No. 2, Feb., 1942, pp. 109-112.)
526	1542	G.B.	*Materials, Cutting Tools and Machinability Index.* (Geo. Schlesinger, S. Inst. Prod. Engs., Vol. 21, No. 2, Feb., 1942, pp. 63-102.)
527	1544	G.B.	*Plastics in the Radio Industry (the Electrical Properties of Plastics).* (E. G. Couzens and W. G. Wearmouth, Electronic Engineering, Vol. 14, No. 169, pp. 667-671, March, 1942.)
528	1546	G.B.	*Germany's Mineral Position.* (C. W. Wright, Metal Industry, Vol. 60, No. 10, 6/3/40, pp. 174-176.)
529	1551	Germany ...	*Shortage of Aluminium in the U.S.S.R.* (Wehrtechnische Monatshefte, Vol. 46, No. 1, Jan., 1942, pp. 5-8.)
530	1555	G.B.	*The High Frequency Induction Furnace.* (T. F. Wall, The Engineer, Vol. 173, No. 4,496, pp. 223-225, 13/3/42.)
531	1557	G.B.	*Surface Hardness of Metals.* (Bruce Chalmers, The Engineer, Vol. 173, No. 4,496, 13/3/42, pp. 232-234.)
532	1563	Germany ...	*Plastics in Aircraft Construction.* (Luftwissen, Vol. 9, No. 1, Jan., 1942, pp. 17-19.)
533	1576	U.S.A. ...	*A Suggestion for Columns of Varying Section.* (C. O. Harris, J. Aeron. Sci., Vol. 9, No. 3, Jan., 1942, pp. 97-99.)

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534	*989	U.S.S.R. ...	*Influence of Surfaces on the Coefficient of Heat Exchange.* (W. A. Rachko, Sov. Kotloturbo, No. 11, 1940, pp. 411-414.)
535	1026	Germany ...	*Experiments on Heat Exchanges Used in Gas Liquifaction.* (V. Grigull, Z.V.D.I., Vol. 85, No. 51-52, 27/12/41, pp. 975-976.)
536	1054	U.S.A. ...	*Vapourisation Inside Horizontal Tubes (with Discussion).* (W. H. McAdams and others, Trans. A.S.M.E., Vol. 63, No. 6, Aug., 1941, pp. 545-552.)
537	1132	G.B.	*Lamps for Radiant Heating.* (Engineering, Vol. 153, No. 3,971, 20/2/42, p. 1,147.)
538	1238	G.B.	*The Efficient Production of Light of the Electric Discharge.* (V. F. Francis, Nature, Vol. 149, No. 3,775, 7/3/42, p. 278.)
539	1350	U.S.A. ...	*Infra-Red Drying Process in the Aircraft Industry.* (American Aviation, Vol. 5, No. 14, 15/12/41, pp. 43, 48.)
540	*1407	Germany ...	*Resonance Vibrations in Pipe Lines.* (E. Lettam, Z.V.D.I., Vol. 85, No. 2, 11/1/41, p. 52.)
541	1454	Germany ...	*Drying Paint by Means of Carbon Filament Lamps.* (Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 122.)

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542	*1578	U.S.A.	...	*The Transmission of Light in the Atmosphere with Application to Aviation.* (H. G. Houghton, J. Aeron. Sci., Vol. 9, No. 3, Jan., 1942, pp. 103-107.)
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543	1000	G.B. ...	...	*Electric Optical Field Mapping by Means of Colloidal Solutions of Bentonite.* (Mueller, J. Opt. Soc. Am., April, 1941, pp. 286-291.) (Abstract in Met. Vick. Tech. News Bull., No. 779, 12/9/41, p. 10.)
544	1003	Italy	...	*Simple Method of Carrying Out Wind Landings in a Given Direction by Means of Wireless Bearings.* (G. Ferrari, Riv. Aeron., Vol. 17, No. 4, April, 1941, pp. 17-37.)
545	1116	G.B. ...	...	*Sunvic Hot Wire Vacuum Switch.* (G. L. Woolnough, Electronic Engineering, Vol. 14, No. 168, Feb., 1942, pp. 625-627.)
546	1118	G.B. ...	...	*Short Wave Direction Finding on Land.* (Electronic Engineering, Vol. 14, No. 168, Feb., 1942, p. 645.)
547	1223	Germany	...	*New Type of Wireless Valve Using Pressed Glass Instead of Steel Base.* (Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, p. 29.)
548	1226	Germany	...	*D.C. and A.C. Electric Drives in Industry.* (H. Kind, Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, pp. 44-48.)
549	1229	Germany	...	*Nickel Platinum Contacts for Small Currents.* (Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, p. 61.)
550	1239	G.B. ...	...	*Control Characteristic of Thyratrons and Ignitrons.* (N. de B. Knight, Nature, Vol. 149, No. 3,775, 7/3/42, p. 278.)
551	1240	G.B. ...	...	*Hot Cathode Gas-Filled Triodes (Thyratrons) and Their Application in Research and Industry.* (A. J. Maddock, Nature, Vol. 149, No. 3,775, 7/3/42, p. 278.)
552	1277	G.B. ...	...	*Aircraft Electrical Wiring, Part III (Installation and Maintenance of the Breeze System—Wiring and Layout Diagrams).* (Airc. Prod., Vol. 4, No. 41, March, 1942, pp. 234-236.)
553	1473	U.S.A.	...	*American Wireless Controlled Target Planes.* (Inter. Avia., No. 805, 27/2/42, p. 14.)
554	1479	U.S.A.	...	*Ultro High Frequency as Standard for American Aircraft Radio.* (Inter. Avia., No. 805, 27/2/42, pp. 22-23.)
				METEOROLOGY AND PHYSIOLOGY.
555	1113	G.B. ...	...	*Potable Water from Sea Water.* (A. Parker, Nature, Vol. 149, No. 3,772, 14/2/42, pp. 184-186.)
556	1117	G.B. ...	...	*The Sun and the Ionasphere.* (S. Chapman, Electronic Engineering, Vol. 14, No. 168, Feb., 1942, pp. 631-632, 638.)

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557	1241	G.B. ...	... *Downward Radiation of the Earth's Atmosphere at Poona and Bombay.* (Nature, Vol. 149, No. 3,775, 7/3/42, pp. 279-280.)
558	1242	G.B. ...	... *Forecasting Monsoon Rainfall in India.* (Nature, Vol. 149, No. 3,775, 7/3/42, p. 280.)
559	1285	U.S.A.	... *Physiological Effects of Flight.* (T. C. Gillmer, Flying and Pop. Av., Vol. 30, No. 2, Feb., 1942, pp. 33-34, and 110-112.)
560	1325	G.B. ...	... *Physiological Effects of High Altitude Flight.* (V. L. Grubery, Flight, Vol. 41, No. 1,733, 12/3/42, pp. 236-238.)
561	1432	G.B. ...	... *Absence of Vapour Trails in Libya.* (Inter. Avia., No. 794-795, 13/12/41, p. 23.)
562	1577	U.S.A.	... *The Measurement of Visibility.* (M. Luckiesk and F. K. Mass, J. Aeron. Sci., Vol. 9, No. 3, Jan., 1942, pp. 100-102.)

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563	*1001	U.S.A.	... *The Elimination of Hypo from Photographic Images.* (J. I. Crabtree and others, J. Frank. Inst., Vol. 230, No. 6, Dec., 1940, pp. 701-725.)

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564	1015	G.B. ...	... *Large Scale Production Results with Lead Bearing Steels.* (Metallurgia, Aug., 1941, pp. 99-101.) (Abstract in Met. Vick. News Bull., No. 777, 29/8/41, p. 6.)
565	1039	G.B./U.S.A. ..	*Assembly of American Aircraft in Great Britain.* (Inter. Avia., No. 798, 4/1/42, p. 19.)
566	1045	U.S.A.	... *Graphic Production Control.* (J. D. Mooney, Army Ordnance, Vol. 22, No. 130, Jan.-Feb., 1942, pp. 547-556.)
567	1058	U.S.A.	... *U.S.A. War Production Board.* (Inter. Avia., No. 801, 31/1/42, pp. 10-11.)
568	1066	U.S.A.	... *U.S.A. War Production Board.* (Inter. Avia., No. 802, 10/2/42, pp. 5-6.)
569	1085	U.S.A.	... *American Aircraft Industry Estimates of Future Output.* (Inter. Avia., No. 799, 14/1/42, pp. 18-26.)
570	1093	Germany	... *Labour for the Metal Trades in Germany. (R.T.P. Translation No.* 1,342.) (H. Hildebrandt, Airc. Eng., Vol. 14, No. 156, Feb., 1942, pp. 51-52.)
571	1094	G.B. ...	... *Salvaging Worn Parts.* (Airc. Eng., Vol. 14. No. 156, Feb., 1942, pp. 53-55.)
572	1096	G.B. ...	... *Liaison Between Design and Production.* (A. J. Schroeder, Airc. Eng., Vol. 14, No. 156, Feb., 1942, pp. 57-58.)
573	1098	U.S.A.	... *Synthetic Rubber Production in the U.S.A.* (Inter. Avia., No. 800, 22/1/42, p. 14.)
574	1218	Germany	... *The Production of Thick Walled Tubes of Large Diameter by the Roeckner Radial Rolling Process.* (H. Hoff, Z.V.D.I., Vol. 86, No. 1-2, 10/1/42, pp. 19-21.)

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575	1237	G.B. ...	... *Skilled Man Power in the Services.* (Nature, Vol. 149, No. 3,775, 7/3/42, pp. 255-258.)
576	1244	Germany	... *Reward for Inventions Produced by the Factory Staff.* (Z.V.D.I., Vol. 86, No. 5-6, 7/2/42, p. 93.)
577	1343	G.B. ...	... *Mass Production and the Aeroplane.* (Engineer, Vol. 173, No. 4,495, 6/3/42, pp. 206-207.)
578	1389	U.S.A.	... *Advances in Production and Assembly of Plywood in Aircraft Construction.* (H. G. Bersie and E. C. Clarke, Inst. Aeron. Sci., 10th Annual Meeting, Jan., 1942, pp. 1-23.)
579	1434	U.S.A.	... *Training Engineers for the Aircraft Engine Industry.* (A. J. Meyer, Autom. Ind., Vol. 86, No. 2, 15/1/42, pp. 20-22, 56.)
580	1435	U.S.A.	... *West Coast Aeroplane Industry (Douglas, Northrop, Consolidated).* (Autom. Ind., Vol. 86, No. 2, 15/1/42, pp. 24-31, 65.)
581	1534	G.B. ...	... *Reclaiming Scrap Metal in America.* (W. A. Phair, Metal Industry, Vol. 60, No. 11, 13/3/42, pp. 197-198.)
582	1539	U.S.A.	... *Mass Production for the Aircraft Engine Industry.* (H. B. Linsley, Mech. Mg., Vol. 64, No. 2, Feb., 1942, pp. 100-105.)
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583	1048	G.B. ...	... *Biological and Aerodynamical Problems of Animal Flight.* (*Translated from "Die Naturwissenschaft,"* 13/6/41.) (E. von Holst and D. Kuckemann, J. Roy. Aeron. Soc., Vol. 46, No. 374, Feb., 1942, pp. 39-56.)
584	1112	G.B. ...	... *Sources of Scientific Information.* (R. S. Hutton, J. Inst. Civil Engs., Vol. 17, No. 4, Feb., 1942, pp. 349-358.)
585	1156	G.B. ...	... *Rolls Royce Technical Abstracts.* (Vol. 111, No. 2, Feb., 1942.)
586	1157	G.B. ...	... *Wireless Engineer Abstracts and References, Compiled by the Radio Research Board.* (March, 1942, Nos. 615-924.)
587	1158	G.B. ...	... *Bristol Aero Engine Dept. Technical Abstracts.* (Vol. 6, No. 7, 18/2/42.)
588	1159	G.B. ...	... *Bristol Aero Engine Dept. Technical Abstracts.* (Vol. 6, No. 8, 25/2/42.)
589	1160	G.B. ...	... *Bristol Aero Engine Dept. Technical Abstracts.* (Vol. 6, No. 9, 4/3/42.)
590	1161	G.B. ...	... *Rotol Digest.* (Vol. 3, No. 7, 18/2/42.)
591	1162	G.B. ...	... *Rotol Digest.* (Vol. 3, No. 8, 25/2/42.)
592	1163	G.B. ...	... *Rotol Digest.* (Vol. 3, No. 9, 4/3/42.)
593	1164	G.B. ...	... *Wireless Engineer Index to Abstracts and References for 1941.*
594	1165	G.B. ...	... *Fuel Research Intelligence Section Summary for weeks ending 31st Jan. and 7th Feb., 1942.*
595	1166	G.B. ...	... *Fuel Research Intelligence Section Summary for weeks ending 14th Feb. and 21st Feb., 1942.*

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596	1167	G.B. ...	... *Aerodrome Abstracts No.* 14-39 (*Compiled by Road Research Laboratory*). (Vol. 1, No. 2, 1942.)
597	1168	G.B. ...	... *Abstracts Issued by the I.A.E. Automobile Research Committee.* (Abstracts, Nos. 610-649, Dec., 1941.)
598	1224	Germany	... *The Adaptation of Heavy Lorries for Snow Clearing.* (Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, p. 38.)
599	1225	Germany	... *The Stressing of Lorry Chassis.* (Z.V.D.I., Vol. 86, No. 3-4, 24/1/42, pp. 58-59.)
600	1270	G.B. ...	... *Method of Finding Equation to Curves.* (J. C. Barnes, Engineering, Vol. 152, No. 3,954, 24/10/41, p. 334.)
601	1271	G.B. ...	... *Fundamental Problem of Energy.* (H. Chatley, Engineering, Vol. 152, No. 3,954, 24/10/41, pp. 335-336.)
602	1295	Germany	... *Aeronautical Training for Cadets at the National Political School (Potsdam).* (Der Adler, Vol. 26, 30/12/41, pp. 812-813.)
603	*1305	U.S.S.R.	... *Industrial Research in U.S.S.R. during* 1941. (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 2, 25/1/42, pp. 100-102.)
604	*1306	Germany	... *Industrial Research in Germany during* 1941. (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 2, 25/1/42, pp. 91-96.)
605	1308	G.B. ...	... *Bristol Aero Engine Dept. Technical Abstracts.* (Vol. 6, No. 10, 11/3/42.)
606	1309	G.B. ...	... *Rotol Digest.* (Vol. 3, No. 10, 11/3/42.)
607	1345	G.B. ...	... *Paper Economy in the Drawing Office.* (Engineering, Vol. 153, No. 3,973, 6/3/42, p. 192.)
608	1346	G.B. ...	... *Sizes of Drawing Paper and Cloth.* (Engineering, Vol. 153, No. 3,973, 6/3/42, pp. 196-197.)
609	1366	G.B. ...	... *Quarterly Bibliography of Experimental Tank Work.* (Science Lib. Bibliog. Series, Nos. 27 and 28, July-Dec., 1941.)
610	1457	Germany	... *Control of Hydraulic Brakes on Transport Vehicles (Discussion).* (P. Koesseler and F. Ostwald, Z.V.D.I., Vol. 86, No. 7-8, 21/2/42, p. 112.)
611	1492	G.B. ...	... *Rotol Digest.* (Vol. 3, No. 11, 18/3/42.)
612	1493	G.B. ...	... *Fuel Research Intelligence Section, Summary for weeks ending 28th Feb. and 7th March.*
613	1494	G.B. ...	*Bristol Aero Engine Dept. Technical Abstracts and Information.* (Vol. 6, No. 11, 18/3/42.)
614	1574	U.S.A.	... *New Pathways in Aeronautical Theory (Generalised Relaxation Method) (with Discussion).* (R. V. Southwell, J. Aeron. Sci., Vol. 9, No. 3, Jan., 1942, pp. 77-89.)
615	1603	Germany	... *From Bird Flight to Human Flight.* (Flugsport, Vol. 34, No. 2, 21/1/42.)

TITLES AND REFERENCES OF ARTICLES AND PAPERS SELECTED FROM PUBLICATIONS RECEIVED IN R.T.P.3 DURING APRIL, 1942.

Notices and abstracts from the Scientific and Technical Press are prepared primarily for the information of Scientific and Technical Staffs. Particular attention is paid to the work carried out in foreign countries, on the assumption that the more accessible British work (for example, that published by the Aeronautical Research Committee) is already known to these Staffs.

Theory and Practice of Warfare.

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
1	1605	Germany ...	*Long Range Seaplane Reconnaissance BV138 (3 Jumo 205A Oil Engines.* (Flugsport, Vol. 34, No. 5, 4/3/42, pp. 68-70.)
2	1608	Germany ...	*Drinking Water Bag for Seaplanes.* (Flugsport, Vol. 34, No. 5, 4/3/42, p. 78.)
3	1611	Germany ...	*Spent Ammunition Shoot for Aircraft Guns. (Pat. No. 715,923.)* (Heinkel (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 97.)
4	1631	G.B.	*Bibliography No. 11 on Methods of Bombing and Types of Bombs, with Addendum No. 1 (up to Jan., 1937).*
5	1634	G.B.	*Bibliography 14A on Theory of Aerial Warfare Published in the German Press, Jan. to June, 1936.*
6	1640	G.B.	*Bibliography No. 20 on Construction and Design of Bomb-proof Buildings and Shelters (up to Feb., 1937).*
7	1653	G.B.	*Repair Depot for American Aircraft in Great Britain.* (Flight, Vol. 41, No. 1,736, 2/4/42, pp. 305-307.)
8	1654	Italy ...	*Macchi C202 Fighter (Photograph).* (Flight, Vol. 41, No. 1,736, 2/4/42, p. 311.)
9	1655	Germany ...	*Topical Aircraft Problems II.* (G. Bock, Luftwissen, Vol. 9, No. 1, pp. 6-16.) (Flight, Vol. 41, No. 1,736, 2/4/42, pp. 315-319.)

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10	1656	U.S.A. ...	*Fortress I and II, Identification Details.* (Flight, Vol. 41, No. 1,736, 2/4/42, p. 323.)
11	1657	U.S.A. ...	*Boeing 17E Fortress (Photograph).* (Aeroplane, Vol. 62, No. 1,609, 27/3/42, p. 342.)
12	1658	U.S.A. ...	*Douglas Devastator Torpedo Bomber (Photograph).* (Aeroplane, Vol. 62, No. 1,609, 27/3/42, p. 348.)
13	1659	Germany ...	*Focke Wulf F.W. 190 Fighter (Drawing).* (Aeroplane, Vol. 62, No. 1,609, 27/3/42, p. 351.)
14	1660	Germany ...	*Heinkel He. 177 Heavy Bomber (Drawing).* (Aeroplane, Vol. 62, No. 1,609, 27/3/42, p. 351.)
15	1661	G.B.	*Westland Whirlwind (Photograph).* (Aeroplane, Vol. 62, No. 1,609, 27/3/42, p. 356.)
16	1663	U.S.A. ...	*Douglas B. 18A (Digby) and Curtiss Wright CW20 (Identification Details).* (Aeroplane, Vol. 62, No. 1,609, 27/3/42, p. 363.)
17	*1665	Switzerland ...	*The Anti-Tank Armament of the Fighter Aeroplane.* (C. Rougeron, Inter. Avia., No. 807, 16/3/42, pp. 1-4.)
18	1666	G.B.	*Westland Whirlwind.* (Inter. Avia., No. 807, 16/3/42, pp. 5-6.)
19	1667	G.B.	*Beaufighter II.* (Inter. Avia., No. 807, 16/3/42, p. 6.)
20	1668	G.B.	*Hawker Typhoon.* (Inter. Avia., No. 807, 16/3/42, pp. 6-7.)
21	1671	Germany ...	*Blohm and Voss B.V. 222 Long Distance Reconnaissance Flying Boat.* (Inter. Avia., No. 807, 16/3/42, p. 9.)
22	1676	Italy ...	*Stick Bombing at Variable Altitude and Speed.* (A. Tommasi, L'Aerotecnica, Vol. 21, No. 1, Nov., 1941, pp. 686-703.)
23	1679	U.S.A. ...	*Chemistry in Warfare (Research and Development).* (M. E. Barker, Army Ordnance, Vol. 22, No. 131, March-April, 1942, pp. 738-739.)
24	1680	U.S.A. ...	*Chemical Defence (Characteristics of Principal Military Weapons—Gas, Smoke, Flame).* (A. W. Waitt, Army Ordnance, Vol. 22, No. 131, March-April, 1942, pp. 740-744.)
25	1681	U.S.A. ...	*Protection Against War Chemicals (Chart).* (W. P. Burn, Army Ordnance, Vol. 22, No. 131, March-April, 1942, p. 744a.)
26	1683	U.S.A. ...	*Protective Concealment.* (P. Rodyenko, Army Ordnance, Vol. 22, No. 131, March-April, 1942, pp. 759-761.)
27	1685	G.B.	*Discussion on Wave Action in Gun Run-up Springs.* (Inst. Mech. Engs. J. and Procs., Feb., 1942, pp. 181-187.)
28	1687	G.B.	*Vickers Armstrong Wellington.* (Aeroplane, Vol. 62, No. 1,610, 3/4/42, p. 379.)
29	1688	G.B.	*Westland Whirlwind I.* (Aeroplane, Vol. 62, No. 1,610, 3/4/42, p. 380.)
30	1689	U.S.S.R. ...	*New Aeroplanes of the Red Air Fleet.* (Aeroplane, Vol. 62, No. 1,610, 3/4/42, pp. 382-383.)
31	1690	U.S.A. ...	*Douglas A. 20B (Boston III) (Photograph).* (Aeroplane, Vol. 62, No. 1,610, 3/4/42, p. 370.)

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32	1721	G.B.	*Torpedo Aircraft.* (Engineer, Vol. 173, No. 4,497, 20/3/42, p. 248.)
33	1734	Germany ...	*Calculation of Shell Trajectories.* (L. Ottsen, Z.G.S.S., Vol. 37, No. 2, Feb., 1942, pp. 21-26.)
34	1735	Germany ...	*Inertia Effects in Composite Shells.* (C. Waninger, Z.G.S.S., Vol. 37, No. 2, Feb., 1942, pp. 28-29.)
35	1762	Germany ...	*General Review of Structural Practice in German Aircraft.* (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 62-64.)
	1763	Germany ...	*Superficial Examination of Ju.* 88-*A*-6. (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 64-68.)
37	1765	Germany ...	*Performance Trials of Ju.* 88-*A*-6. (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 68-70.)
38	1766	Germany ...	*Messerschmitt Me.* 109-*E.* (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 70-72.)
39	1767	Germany ...	*Performance Tests on Me.* 109*F*1/2. (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 72-74.)
40	1768	Germany ...	*Aerodynamic Comparison of Me.* 109 *F and E.* (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 74-75.)
41	1770	U.S.A. ...	*Curtiss Cleveland Dive Bomber.* (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 79-80.)
42	1771	U.S.A. ...	*Vought Sikorsky Chesapeake Dive Bomber.* (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 79-81.)
43	1783	Germany ...	*Standardisation of Light Weight Fire Brigade Vehicles (A.R.P.).* (H. Brunswig, Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, pp. 956-957.)
44	1789	Germany ...	*Bucker "Bestmann" Trainer (Photograph).* (Luftfelt, Vol. 9, No. 4, 15/2/42, p. 78.)
45	1794	Portugal ...	*Winged Bombs Fly with Their Own Motive Power.* (Revista do Ar, Vol. 5, No. 53, Feb., 1942, p. 23.)
46	1827	Germany ...	*Tail Turret of Do.* 17 *(Photograph).* (Auto Italiana, Vol. 23, No. 3, 30/1/42, p. 22.)
47	1828	Italy ...	*Folding Light Weight Bicycle.* (Auto Italiana, Vol. 23, No. 4, 10/2/42, p. 6.)
48	1829	U.S.A. ...	*Insignia of Rank in the U.S. Army Air Force.* (Flight, Vol. 41, No. 1,737, 9/4/42, p. 340.)
49	1830	U.S.A. ...	*Identification Details of Tomahawk and Mustang.* (Flight, Vol. 41, No. 1,737, 9/4/42, p. (b).)
50	1831	G.B.	*Short Sunderland (II).* (Aeroplane, Vol. 62, No. 1,611, 10/4/42, p. 409.)
51	1832	Germany ...	*Training of Aircraft Gunners.* (Luftwelt, Vol. 9, No. 5, 1/3/42, pp. 92-93.)
52	1833	Germany ...	*Examples of Naval Aircraft.* (H. Zuerl, W.T.M., Vol. 46, No. 2, Feb., 1942, pp. 35-39.)
53	1835	Germany ...	*Some notes on Time and Contact Fuses.* (V. Ludwig, W.T.M., Vol. 46, No. 2, Feb., 1942, pp. 45-48.)
54	1848	Germany ...	*Effect of Mounting on the Penetration of an Elastic Plate by a Shell.* (M. Gercke, Ing. Arch., Vol. 12, No. 6, Dec., 1941, pp. 337-343.)
55	1861	U.S.A. ...	*Management's Role in Defence.* (W. L. Batt, J. Frank. Inst., Vol. 233, No. 2, Feb., 1942, pp. 125-133.)

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56	1897	Germany	...	*Motor Sledge Ambulances on Russian Front.* (Flight, Vol. 41, No. 1,738, 16/4/42, p. 371.)
57	1898	G.B. ...	...	*Official Data on German and Italian Aircraft.* (Flight, Vol. 41, No. 1,738, 16/4/42, pp. 377-378.)
58	1914	G.B. ...	...	*The Effect of High Explosives on Structures.* (J. D. Bernal, J. Inst. Civil Engineers, Vol. 17, No. 6, April, 1942, pp. 7-9.)
59	1918	G.B. ...	...	*Westland "Whirlwind."* (Inter. Avia., No. 808-809, 28/3/42, p. 13.)
60	1925	U.S.A.	...	*A.A. Guns of the U.S.A.* (Inter. Avia., No. 808-809, 28/3/42, pp. 17-18.)
61	1927	G.B. ...	...	*Airborne Infantry for Great Britain.* (Inter. Avia., No. 808-809, 28/3/42, p. 22.)
62	1928	G.B. ...	...	*Balloon Protection for Convoys.* (Inter. Avia., No. 808-809, 28/3/42, p. 26.)
63	1932	Germany	...	*Development of the Arado Aircraft Types.* (Der Flieger, Vol. 21, No. 1, Jan., 1942, pp. 2-9.)
64	1933	Germany	...	*Servicing F.W. 200 Condor (Photographs).* (Der Flieger, Vol. 21, No. 1, Jan., 1942, pp. 2-9.)
65	1935	Germany	...	*He. 115 Torpedo Plane (Photograph).* (Der Flieger, Vol. 20, No. 12, Dec., 1941, p. 391.)
66	1936	Germany	...	*Do. 18 Long Distance Reconnaissance Flying Boat (Photograph).* Der Flieger, Vol. 20, No. 12, Dec., 1941, p. 393.)
67	1937	Germany	...	*Some Results of Shell and Machine Gun Fire on Junkers, Heinkel and Messerschmitt Aircraft (Photograph).* (Der Flieger, Vol. 20, No. 12, Dec., 1941, pp. 397-403, 406-408.)
68	1942	U.S.A.	...	*Flight Strip Programme Overseas for U.S. Aeroplanes.* (Am. Av., Vol. 5, No. 20, 15/3/42, p. 11.)
69	1955	G.B. ...	...	*Handley Page Halifax II.* (Aeroplane, Vol. 62, No. 1,613, 24/4/42, pp. 465-470.)
70	1957	G.B. ...	...	*Recognition Details (Beaufighter and Whirlwind).* (Aeroplane, Vol. 62, No. 1,613, 24/4/42, pp. 476-477.)
71	1959	G.B. ...	...	*Handley Page Halifax.* (Engineer, Vol. 173, No. 4,502, 24/4/42, pp. 344-346.)
72	1961	Japan	...	*Mitsubishi "OO" Navy Fighter.* (Engineer, Vol. 173, No. 4,502, 24/4/42, p. 347.)
73	1968	U.S.A.	...	*Martin "Mariner" Patrol Bomber (Photograph).* (Am. Av., Vol. 5, No. 21, 1/4/42, p. 27.)
74	*1969	U.S.A.	...	*Aural Aircraft Detector Operated by One Man.* (American Aviation, Vol. 5, No. 21, 1/4/42, p. 30.)
75	1975	Germany	...	*Rubber Dinghies for Rescue Work.* (Der Adler, No. 17, 268/41, pp. 442-443.)
76	1991	U.S.A.	...	*Unorthodox Warplane Designs.* (Autom. Ind., Vol. 86, No. 3, 1/2/42, pp. 30-31 and 80.)
77	2007	U.S.A.	...	*Douglas Boston III.* (Flight, Vol. 41, No. 1,738, 16/4/42, pp. 372-373.)
78	2021	U.S.A.	...	*Douglas "Dauntless" Navy Dive Bomber (Photograph).* (Aeroplane, Vol. 62, No. 1,612, 7/4/42, p. 429.)
79	2022	G.B./Germany		*Discrepancies in Air Ministry and M.A.P. Figures on German Aircraft.* (Aeroplane, Vol. 62, No 1,612, 17/4/42, pp. 430-431.)

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80	2023	U.S.A. ...	*Filling Ammunition Magazine on Bell P.39 (Photograph).* (Aeroplane, Vol. 62, No. 1,612, 17/4/42, p. 434.)
81	2024	G.B.	*Bristol Beaufighter.* (Aeroplane, Vol. 62, No. 1,612, 17/4/42, p. 437.)
82	2025	G.B.	*Air Ministry Data on German, Italian and Japanese Aircraft (Silhouettes and Performances).* (Aeroplane, Vol. 62, No. 1,612, 17/4/42, pp. 438-439.)
83	2026	G.B.	*British Transport Aircraft for Communication.* (Aeroplane, Vol. 62, No. 1,612, 17/4/42, pp. 440-441.)
84	2027	U.S.A. ...	*Curtiss Tomahawk Fighter (Photograph).* (Aeroplane, Vol. 62, No. 1,612, 17/4/42, p. 445.)
85	2028	U.S.A. ...	*Douglas Boston III.* (Aeroplane, Vol. 62, No. 1,612, 17/4/42, pp. 448-449.)
86	2030	France ...	*French Experiments with Conical Bore Guns.* (W.T.M., Vol. 46, No. 3, March, 1942, pp. 53-56.)
87	2031	Germany ...	*Explosive Mixtures of Tetranitromethane and Nitrogen Tetroxide with Hydro Carbons.* (A. Stettbacher, Z.G.S.S., Vol. 37, No. 3, March, 1942, pp. 42-45.)
88	2032	Germany ...	*The Calculation of Shell Trajectories.* (L. Ottsen, Z.G.S.S., Vol. 37, No. 3, March, 1942, pp. 48-51.)
89	2033	Germany ...	*Modern Dust Masks.* (H. Eisenbarth, Z.G.S.S., Vol. 37, No. 3, March, 1942, pp. 54-56.)
90	2034	Germany ...	*The Role of Artillery in Warfare.* (K. Justrow, Z.G.S.S., Vol. 37, No. 3, March, 1942, pp. 45-47.)
91	2035	Germany ...	*Automatic Rifles for Infantry.* (W. Gloede, Z.G.S.S., Vol. 37, No. 3, March, 1942, pp. 52-53.)
92	2038	Japan ...	*Japan's Air Power—Specification Details of Machines.* (Flight, Vol. 41, No. 1,739, 23/4/42, pp. 392-397.)
93	2039	G.B.	*The Halifax Heavy Bomber.* (Flight, Vol. 41, No. 1,739, 23/4/42, pp. 398-405.)
94	2045	Germany ...	*F.W. 190 Fighter.* (Engineer, Vol. 173, No. 4,501, 17/4/42, p. 329.)
95	2046	G.B.	*Relative Characteristics of Enemy Aircraft.* (Engineer, Vol. 173, No. 4,501, 17/4/42, p. 330.)
96	2057	Germany ...	*Arado 198 Reconnaissance.* (Flugsport, Vol. 34, No. 7, 1/4/42, p. 97.)
97	2058	Germany ...	*Arado 199 Seaplane Trainer.* (Flugsport, Vol. 34, No. 7, 1/4/42, pp. 97-98.)
98	2059	France ...	*Delanne 20-T-02 Two-Seat Fighter.* (Flugsport, Vol. 34, No. 7, 1/4/42, pp. 99-100.)
99	2062	Germany ...	*Machine Gun Mounting on German Bomber (Photograph).* (Flugsport, Vol. 34, No. 7, 1/4/42, p. 103.)
100	2070	Germany ...	*Elastic Steady Brackets for Bomb Suspension Gear (Pat. No. 715,353).* (M. W. Neubrandenburg (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 107.)

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101	2071	Germany ...	*Mechanical Device for Control of Bomb Magazines (Pat. No.* 717,632). (Siemens (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 107.)
102	2119	Germany ...	*Bombing During a Dive or Climb.* (H. Athen, L.F.F., Vol. 17, No. 7, 20/7/40, pp. 216-220.)
103	2125	Italy ...	*Warplanes of the Future.* (G. Stefani, Inter Avia., No. 810-811, 8/4/42, pp. 1-7.)
104	2128	Italy ...	*Long Range Bomber Piaggio P.*108 (*Bruno Mussolini*). (Inter. Avia., No. 810-811, 8/4/42, p. 23.)
105	2130	France ...	*Bréguet* 730 *Four-Engined Reconnaissance Flying Boat.* (Inter. Avia., No. 810-811, 8/4/42, p. 11.)
106	2134	Germany ...	*Ju.* 88-*A*6. (Inter. Avia., No. 810-811, 8/4/42, p. 15.)
107	2156	Japan ...	*Types of Japanese Warplanes.* (Der Adler, No. 2, 27/1/42, p. 36.)
108	2158	Germany ...	*Coastal A.A. Batteries.* (H. Franz, Der Adler, No. 2, 27/1/42, pp. 50-51.)
109	*2160	Italy ...	*Light Alloy Armour Plate.* (Le Vie dell'Aria, 8/3/42, p. 5.)
117	1677	U.S.S.R. ...	*Parachute Jumping (from Civil Aviation, U.S.S.R., Feb.,* 1941). (V. V. Strielzov, L'Aerotecnica, Vol. 21, No. 11, Nov., 1941, pp. 745-749.)
122	1788	Germany ...	*Labour Corps, Maintenance and Ground Personnel of the Luftwaffe (with Photographs Illustrating Lay-out of Landing Grounds, Construction of Hangars, Repairs in the Field, etc.).* (B. Proclik, Luftwelt, Vol. 9, No. 4, 15/2/42, pp. 62-75.)

AERODYNAMICS AND HYDRODYNAMICS.

110	1609	U.S.A./G.B....	*American and British Boundary Layer Research.* (Flugsport, Vol .34, No. 5, 4/3/42, pp. 145-148.) (Profile Coll. No. 36.)
111	1625	G.B.	*Biblography No.* 5 *on Aerodynamic Interference (up to May,* 1936).
112	1628	G.B.	*Bibliography No.* 8 *on High Speed Flow Phenomena, including Supersonics. With Addendum No.* 1 *(up to Jan.,* 1937).
113	1638	G.B.	*Bibliography No.* 18 *on Skin Friction and Boundary Layer (up to Dec.,* 1936). *(With Addendum No.* 1, *up to July,* 1938).
114	1643	G.B.	*Bibliography No.* 23 *on Resistance of Solids Immersed in Liquids (up to Nov.,* 1937).
115	1662	G.B.	*Altitude Table of Physical Constants for Air.* (Aeroplane, Vol. 62, No. 1,609, 27/3/42, p. 361.)
116	1675	Italy ...	*The Present State of Research on Non-Steady Motion of a Lifting Surface (II).* (P. Cicala, L'Aerotecnica, Vol. 21, No. 11, Nov., 1941, pp. 671-685.)
118	1724	G.B.	*Resistance to Cavitation Erosion.* (R. Beeching, Engineering, Vol. 53, No. 3,975, 20/3/42, pp. 238-240.)
119	1744	G.B.	*Resistance to Cavitation Erosion.* (R. Beeching, Engineering, Vol. 153, No. 3,977, 3/4/42, pp. 278-280.)

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120	1747	Germany ...	*Experimental Investigation on the Resistance and Velocity Distribution in Pipes Provided with Regular Roughness (Turbulent Flow).* (H. Mobins, W.R.H., Vol. 22, No. 23, 1/12/41, p. 355.)
121	1748	Germany ...	*Experimental and Theoretical Investigation on the Type of Flow at the Rear of Sharp Edged Obstructions and its Relation to the Resistance Problem.* (F. Walter, W.R.H., Vol. 22, No. 23, 1/12/41, p. 355.)
123	*1809	Germany ...	*Two-Dimensional Potential Flow Past a Smooth Wall with Partly Constant Curvature.* (W. v. Koppenfels, L.F.F., Vol. 17, No. 7, 20/7/40.) (R.T.P. Translation T.M. No. 996.)
124	1851	Germany ...	*Numerical Calculation for Changes in Level of Hydraulic Surge Chambers in Presence of Damping.* (K. Karas, Ing. Arch., Vol. 12, No. 6, Dec., 1941, pp. 370-402.)
126	*1930	Italy ...	*Electrical Equipment for the Experimental Study of the Dynamics of Fluids.* (C. Ferrari, Societa Italiana per il Progresso delle Scienze Roma, 1938, XVI.) (R.T.P. Trans. T.M. No. 1,006.)
127	*1931	Germany ...	*New Method of Extrapolation of the Resistance of a Model Planing Boat to Full Size.* (W. Sottorf, L.F.F., Vol. 16, No. 8, 20/8/39.) (R.T.P. Translation T.M. No. 1,007.)
128	1954	G.B.	*The Pressure Wave System in the Periodic Flow of Liquid in a Pipe.* (R. S. Silver, Phil. Mag., Vol. 33, No. 219, April, 1942, pp. 315-318.)
129	*1970	U.S.A. ...	*Kinetic Energy Correction to Predicted Rate of Climb.* (F. G. Phillips, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 172-174.)
130	*1973	U.S.A. ...	*An Improved Longitudinal Stability Calculation.* (H. P. Liepmann, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 181-184.)
131	*1974	U.S.A. ..	*Some Simplified Methods in Airfoil Theory.* (M. A. Biot, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 185-190.)
132	2092	Germany ...	*The Theory of the Lifting Line in Unsteady Motion.* (K. Jaeckel, L.F.F., Vol. 19, No. 2, 23/4/42, pp. 57-63.)
133	*2118	Germany ...	*Two Dimensional Potential Flow Along a Smooth Wall with Discontinuities in Curvature.* (W. V. Koppenfels, L.F.F., Vol. 17, No. 7, 20/7/40, pp. 189-195.) (Available as R.T.P. Translation T.M. 996.)
134	2120	Germany ...	*Contribution to the Aerodynamics of Rotary Wing Aircraft.* (G. Sissingh, L.F.F., Vol. 17, No. 7, 20/7/40, pp. 196-203.)
135	2124	Germany ...	*Correlation of Data on the Statistical Theory of Turbulence.* (K. Weighardt, L.F.F., Vol. 18, No. 1, Feb. 28th, 1941.) (R.T.P. Translation No. 1,201 and T.M. 1,008.)
136	2139	Germany ...	*A Simple Method for Investigating the Generalised Longitudinal Motion of an Aircraft.* (C. Dahmen, L.F.F., Vol. 17, No. 8, 20/8/40, pp. 221-235.)

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137	2141	Germany ...	*New Resistance Law for Smooth Plates.* (F. Schultz-Grunow, L.F.F., Vol. 17, No. 8, 20/8/40.)
138	2159	Germany ...	*The Effect of Natural Wind on a Large Cylinder (8 m. high 2 m. diameter).* (A. Proll, Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, pp. 220-222.)

AIRCRAFT, AIRSCREWS AND ACCESSORIES (INCLUDING GROUND EQUIPMENT).

139	1604	Italy ...	*Piaggio P. 108C Four-Engined Transport Plane.* (Flugsport, Vol. 34, No. 5, 4/3/42, pp. 67-68.)
140	1607	Hungary ...	*Hungarian Soaring Flight Record (29 hr. 37 min.).* (Flugsport, Vol. 34, No. 5, 4/3/42, p. 77.)
141	1610	Germany ...	*Incorporation of Gravity Controlled Pressure Element in Aircraft Control Circuit (Safety Device). (Pat. No. 716,106.)* (Messerschmitt (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 97.)
142	1612	Germany ...	*Locking Device for Hydraulically Operated Control Rods. (Pat. No. 715,461.)* (Mahle (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 97.)
143	1614	Germany ...	*Energy Store for Operating Retractable Undercarriage. (Pat. No. 715,712.)* (Messerschmitt (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, pp. 97-98.)
144	1616	Germany ...	*Aircraft Control Rod Operation. (Pat. No. 715,739.)* (Elektron (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 98.)
145	1617	Germany ...	*Eccentric Vane Pump for Control Rod Operation. (Pat. No. 715,785.)* (Elektron (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 99.)
146	1618	Germany ...	*Hydraulically Operated Distant Control Systems. (Pat. No. 716,503.)* (V.D.M. (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 99.)
147	1619	Germany ...	*Air Release Valve for Hydraulically Operated Aircraft Brakes. (Pat. No. 715,786.)* (Elektron (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 99.)
148	1620	Germany ...	*Pump for Aircraft Brakes. (Pat. No. 716,067.)* (Elektron (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, pp. 99-100.)
149	1621	G.B. ...	*Bibliography No. 1 on Metal Construction Applied to Aircraft (up to May, 1936). With Addendum No. 1 (up to Jan., 1938.)*
150	1624	G.B. ...	*Bibliography No. 4 on the Flying Flea. With Addenda Nos. 1-3 (up to July, 1937).*
151	1630	G.B. ...	*Bibliography No. 10 on Muscular (Flapping) Flight (up to June, 1936).*
152	1635	G.B. ...	*Bibliography No. 15 on Rotating Wing System Aircraft. With Addendum No. 1 (up to Feb., 1937).*
153	1636	G.B. ...	*Bibliography No. 16 on Propeller Stressing and Associated Phenomena (up to Oct., 1936).*
154	1645	G.B. ...	*Bibliography No. 26 on Recent Types of American Aircraft (up to April, 1938).*
155	1646	G.B. ...	*Bibliography No. 27 on Auxiliary Launching Devices (up to May, 1938).*
156	1670	G.B. ...	*Rotol Contra-Rotating Airscrews.* (Inter. Avia., No. 807, 16/3/42, pp. 7-8.)

ITEM NO.	R.T.P. REF.			TITLE AND JOURNAL.
157	*1674	U.S.A.	...	*Windshield De-icing.* (Inter. Avia., No. 807, 16/3/42, p. 12.)
158	1678	U.S.S.R.	...	*Aircraft Icing (from Civil Aviation, U.S.S.R., Feb., 1941).* (V. S. Alexandrov, L'Aerotecnica, Vol. 31, No. 11, Nov., 1941, pp. 749-751.)
159	1691	U.S.A.	...	*Douglas D.C. 4 Transport (Photograph).* (Aeroplane, Vol. 62, No. 1,610, 3/4/42, pp. 392-393.)
160	1692	G.B. ...	...	*Tailless Aircraft Types.* (Aeroplane, Vol. 62, No. 1,610, 3/4/42, p. 398.)
161	1732	Germany	...	*Agricultural and Technical Aspect of Airfield Construction.* (W. Paeschke, Flughafen, Vol. 9, No. 9, Sept., 1941, pp. 9-11.)
162	1733	Germany	...	*The Manuring of Airfield Grass.* (G. Kaven, Flughafen, Vol. 9, No. 9, Sept., 1941, pp. 17-18.)
163	1737	Germany	...	*Agricultural and Technical Aspects of Airfield and Airport Design.* (W. Paeschke, Flughafen, Vol. 9, No. 10, Oct., 1941, pp. 10-16.)
164	1740	G.B. ...	...	*Aerodrome Abstracts (D.S.I.R.), Nos.* 1-13. (J. Inst. Civ. Engs., Vol. 18, No. 5, March, 1942, pp. 15-21.)
165	1741	G.B. ...	...	*Soil Mechanics in Road and Aerodrome Construction.* (A. H. D. Markwick, J. Inst. Civ. Engs., Vol. 18, No. 5, March, 1942, pp. 62-87.)
166	1824	France	...	*Control of Colour Temperature of Incandescent Lamps for Position and Signalling Purposes.* (M. Roulleau, Pub. Scient. et Techn. du Secretariat d'etat a L'Aviation, B.S.T. No. 92.) (Abstract in Airc. Eng., Jan., 1942, p. 22.)
167	1839	G.B. ...	...	*Cavitation in Ships Propellers.* (S. Goodell, Engineer, Vol. 173, No. 4,500, 10/4/42, pp. 309-320.)
169	1915	G.B. ...	...	*Aerodrome Abstracts Nos.* 14-39 *(D.S.I.R.).* (J. Inst. Civil Engineers, Vol. 17, No. 6, April, 1942, pp. 14-23.)
170	1916	Germany	...	*The Design of Marine Propellers—Review of Present Position.* (H. Lerbs, W.R.H., Vol. 23, No. 4, 15/2/42, pp. 57-62.)
171	1920	France	...	*Potez-Scan* 161 *Giant Flying Boat.* (Inter. Avia., No. 808-809, 28/3/42, p. 14.)
172	1924	U.S.A.	...	*Flying Trials of B.*19. (Inter. Avia., No. 808-809, 28/3/42, pp. 16-17.)
173	1943	U.S.A.	...	*Glider Developments in the U.S.A.* (Am. Av., Vol. 5, No. 20, 15/3/42, p. 14.)
174	1956	G.B. ...	...	*Handley Page Types* (1909 *to date*). (Aeroplane, Vol. 62, No. 1,613, 24/4/42, p. 471.)
175	1965	Germany	...	*Increase in Propulsion Efficiency by Nozzle Propellers.* (L. Kort, W.R.H., Vol. 23, No. 6, 15/3/42, pp. 88-89.)
176	1967	Germany	...	*Present State of Development of Voith-Schneider Propellers.* (G. Franz, W.R.H., Vol. 23, No. 6, 15/3/42, p. 90.)
177	1976	Germany	...	*Some Examples of Unorthodox Aircraft (Canard, Flying Wing, Paddle Type, etc.).* (G. Meyer, Der Adler, No. 17, 26/8/41, pp. 445-446.)
178	2008	U.S.A.	...	*Review of Progress in Rotating Wing Aircraft during* 1941. (A. Klemin, J. Aeron. Sci. (Rev. Sect.), Vol. 9, No. 4, Feb., 1942, pp. 9-11.)

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179	2009	U.S.A.	...	*Bibliography on Slots and Flaps.* (J. Aeron. Sci. (Rev. Sect.), Vol. 9, No. 4, Feb., 1942, pp. 58-61.)
180	2029	U.S.A.	...	*American Export Airlines (North Atlantic).* (Aeroplane, Vol. 62, No. 1,612, 17/4/42, p. 450.)
181	2048	France	...	*Racing Monoplane "Max Holste 20."* (Flugsport, Vol. 34, No. 6, 18/3/42, pp. 80-81.)
182	2049	Germany	...	*Note on Cierva Patent for Overcoming Vibration in Helicopter Drives.* (Flugsport, Vol. 34, No. 6, 18/3/42, pp. 84-86.)
183	2051	Germany	...	*Rotating Windscreen for Aircraft (Pat. No.* 717,240). (Atlas (Pat. Coll. No. 25), Flugsport, Vol. 34, No. 6, 18/3/42, p. 101.)
184	2052	Germany	...	*Device for Simultaneous Operation in the Same Direction of Divided Control Surfaces on Large Aircraft (Pat. No.* 717,369). (Blohm and Voss (Pat. Coll. No. 25), Flugsport, Vol. 34, No. 6, 18/3/42, pp. 101-102.)
185	2053	Germany	...	*Safety Device for Take-off (Interlocking of Engine Switch and Aircraft Controls) (Pat. No.* 717,793). (Henschel (Pat. Coll. No. 25), Flugsport, Vol. 34, No. 6, 18/3/42, pp. 101-102.)
186	2054	Germany	...	*Helicopter Control (Pat. No.* 717,714). (German Govt. (Pat. Coll. No. 25), Flugsport, Vol. 34, No. 6, 18/3/42, p. 103.)
187	2055	Germany	...	*Snow Skid for Aircraft (Pat. No.* 716,725). (Heine (Pat. Coll. No. 25), Flugsport, Vol. 34, No. 6, 18/3/42, pp. 103-104.)
188	2056	Germany	...	*Retractor Mechanisms for Twin Wheel Struts (Pat. No.* 718,047). (Heinkel (Pat. Coll. No. 25), Flugsport, Vol. 34, No. 6, 18/3/42, p. 104.)
189	2064	Germany	...	*Composite Airscrew Blade (Metal—Wood) (Pat. No.* 716,781). (Heine (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 105.)
190	2065	Germany	...	*Variable-Pitch Airscrew Mechanism (Pat. No.* 717,370). (Argus (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, pp. 105-106.)
191	2066	Germany	...	*Variable Diameter Airscrew (Pat. No.* 700,361). (Heidelberg (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 106.)
192	2067	Germany	...	*Facilitating Take-off for Steam Driven Aircraft (Pat. No.* 715,585). (A.E.G. (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 106.)
193	2069	Germany	...	*Fireproof Bulkhead Fitting for Rapidly Detachable Electric Leads (Pat. No.* 715,983). (Henschel (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 107.)
194	2073	Germany	...	*Wind Direction Indicator for Airports (Pat. No.* 714,253). (A.E.G. (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 108.)
195	2084	Germany	...	*Snow Ploughs Operated by Lorries.* (K. Croce, A.T.Z., Vol. 44, No. 19, 10/10/41, pp. 473-475.)
196	2126	U.S.A.	...	*Glider Training in the U.S.A.* (Inter. Avia., No. 810-811, 8/4/42, p. 24.)
197	2127	France	...	*Potez Scan 161 Six-Engined Flying Boat.* (Inter. Avia., No. 810-811, 8/4/42, p. 10.)

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198	2129	France ...	*Bloch 161 Four-Engined Transport.* (Inter. Avia., No. 810-811, 8/4/42, p. 11.)
199	*2132	Germany ...	*Heinkel Jet Propulsion Patent.* (Inter. Avia., No. 810-811, 8/4/42, pp. 12-13.)
200	2157	Germany ...	*Aircraft Icing (Illustrated).* (O. Hollbach, Der Adler, No. 2, 27/1/42, pp. 38-39.)

ENGINES AND ACCESSORIES (INCLUDING PUMPS AND TURBINES).

ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.
201	1613	Germany ...	*Tiltable Power Plant Installation (Pat. No. 716,363).* (Dornier (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 100.)
202	1615	Germany ...	*Automatic Fuel Pump Installation for Multi-Tank Systems (Pat. No. 716,364).* (Heinkel (Pat. Coll. No. 24), Flugsport, Vol. 34, No. 5, 4/3/42, p. 100.)
203	1622	G.B.	*Bibliography No. 2 on Engine Performance as Affected by Lubrication, Cylinder Wear and Piston Rings (up to March, 1936). With Addendum No. 1 (up to Oct., 1936).*
204	1627	G.B.	*Bibliography No. 7 on "Jet and Rocket Propulsion." With Addenda Nos. 1-4 (up to 1941).*
205	1639	G.B.	*Bibliography No. 19 on Air Vibration in Engine Pipelines, with Special Reference to Scavenging (up to Feb., 1937).*
206	1642	G.B.	*Bibliography No. 22 on Springs and Spring Couplings (up to July, 1937).*
207	1664	G.B.	*Historical Review of Aircraft Power Plant Installation (Effect on Design, View and Drag).* (Flight, Vol. 41, No. 1,734, 19/3/42, pp. 249-255.)
208	1669	G.B.	*Rolls Royce Merlin XX.* (Inter. Avia., No. 807, 16/3/42, pp. 6-7.)
209	*1684	G.B.	*Axial Vibrations of Diesel Engine Crankshafts.* (R. Poole, Inst. Mech. Engs. J. and Procs., Feb., 1942, pp. 167-182.)
210	1704	G.B.	*History and Development of the Radial Flow Steam Turbine (Ljungström).* (P. S. Wakefield, J. Inst. Elect. Engs. (General), Vol. 89, No. 15, March, 1942, pp. 147-151.)
211	1709	G.B.	*Aerodynamics of Steam Turbine Blades (Turbine and Aerodynamic Blade Pitch).* (R. Dowson, Engineering, Vol. 153, No. 3,976, 27/3/42, p. 255.)
212	1715	G.B.	*Fans (Types, Characteristics and Application).* (C. G. Ferguson, Engineer, Vol. 173, No. 4,499, 27/3/42, pp. 274-276.)
213	1745	Germany ...	*Light Weight Ship Diesels with Special Reference to Crankcases Made of Silumin Gamma.* (W. Hartl, W.R.H., Vol. 22, No. 23, 1/12/41, pp. 341-350.)
214	1753	G.B.	*Fans (Types, Characteristics and Applications).* (C. G. Ferguson, Engineer, Vol. 13, No. 4,499, 3/4/42, pp. 294-296.)
215	1754	G.B.	*"Specialliod" Slotted Skirt Piston.* (Autom. Eng., Vol. 32, No. 421, March, 1942, p. 90.)

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216	1756	G.B. ...	*Valve Springs (Surge and Vibration).* (Autom. Eng., Vol. 32, No. 421, March, 1942, pp. 95-100.)
217	1761	G.B. ...	*Roesch Axial Engine.* (Autom. Eng., Vol. 32, No. 421, March, 1942, pp. 120-122.)
218	*1791	U.S.A.	*Two-Speed Supercharger Drives.* (F. M. Kincaid, S.A.E.J., Vol. 50, No. 3, March, 1942, pp. 80/96.)
219	*1792	U.S.A.	*Aircraft Carburettor Airscoops and Their Effect on Fuel/Air Metering in Flight (with Discussion).* (F. C. Mock, S.A.E.J., Vol. 50, No. 3, March, 1942, pp. 102-104.)
220	*1793	U.S.A.	*Gas Turbine Progress (Digest).* (J. T. Rettaliata, S.A.E.J., Vol. 50, No. 3, March, 1942, pp. 32-33.)
221	*1806	France	*Direct Injection in Internal Combustion Engines.* (J. E. Tuscher, Pubs. Sci. Tech. du Minist de L'Air, No. 89, 1939.) (R.T.P. Trans. T.M. No. 993.)
222	1863	U.S.A.	*A New Theory of Combustion in Diesel Engines II (Knock Due to H_2 from Dissociated Fuels).* (M. G. Fiedler, J. Frank. Inst., Vol. 233, No. 2, Feb., 1942, pp. 143-174.)
223	*1867	U.S.A.	*Protection Against Power Plant Fires in the Air (Digest).* (G. L. Pigman, S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 55-66.)
224	1869	U.S.A.	*Bearings for Heavy Duty Automotive Engines.* (A. B. Willi, Trans. S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 62-72.)
225	1871	U.S.A.	*Icing Problems in Aircraft Induction Systems (with Discussion).* (L. B. Kimball, Trans. S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 40-51.)
226	*1873	U.S.A.	*Linking Factors of Overhaul Periods for Aircraft Engines (Digest).* (M. Whitlock, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 56.)
227	*1874	U.S.A.	*Airflow Through Inlet Valves (Digest).* (G. B. Wood and others, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 57.)
228	1877	U.S.A.	*Ignition Accelerators for Compression Ignition Engines (Digest).* J. S. Boger, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 63.)
229	1879	U.S.A.	*A New Fuel Injection Nozzle for High Speed Diesel and Petrol Engines (Digest).* (C. R. Alden and R. K. Weldy, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 63.)
230	*1881	U.S.A.	*Co-operative Engine Wear Studies (Digest).* (F. L. Miller and others, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 64.)
231	1896	Germany	*Mercedes-Benz D.B. 601 n.* (Examination of the Engine Fitted to the Me. 109F, Me. 110, He. 113 and Macchi C. 200) (G. Geoffrey Smith.) (Flight, Vol. 41, No. 1,738, 16/4/42, pp. 365-369.)
232	*1923	U.S.A.	*Wright High Performance Flat Engine.* (Inter. Avia., No. 808-809, 28/3/42, p. 16.)
233	1938	U.S.A.	*Bearings and Lubrication.* (R. J. S. Pigott, Mech. Eng., Vol. 64, No. 4, April, 1942, pp. 259-269.)
234	1944	G.B. ...	*"Specialloid" Piston Manufacture.* (Autom. Eng., Vol. 32, No. 422, April, 1942, pp. 137-148.)

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235	1945	Germany ...	*M.A.N. Diesel with Non-Turbulent Combustion Chamber.* (Autom. Eng., Vol. 32, No. 422, April, 1942, pp. 149-150.)
236	1946	G.B.	*Rubber Suspension for Cycles and Motor Cycles.* (C. Macbeth, Autom. Eng., Vol. 32, No. 422, April, 1942, pp. 151-155.)
237	1948	G.B.	*Influence of Cylinder Proportions on the Air Movement in the Compression Ignition Engines.* (C. B. Dicksee, Autom. Eng., Vol. 32, No. 422, April, 1942, pp. 159-161.)
238	1962	G.B.	*Terminology of Turbines, Pumps and Fans.* (H. Addison, Engineer, Vol. 173, No. 4,502, 24/4/42, p. 349.)
239	1987	Germany ..	*Present State of German Research on Wear, with Special Reference to Cylinders and Piston Wear (with Extensive Bibliography).* (R. Poppinga, A.T.Z., Vol. 44, No. 10, 25/5/41, pp. 247-260.)
240	1989	Germany ...	*The Lysholm Supercharger (Roots Type with Twisted Impellers).* (A.T.Z., Vol. 44, No. 10, 25/5/41, pp. 263-265.)
241	1990	U.S.A. ...	*Replacement Pistons Made of Cast Iron.* (Autom. Ind., Vol. 86, No. 3, 1/2/42, p. 20.)
242	1993	U.S.A. ...	*New Diesel Fuel Injection Nozzle (Ex-Cell-O).* (Autom. Ind., Vol. 86, No. 3, 1/2/42, pp. 34-35.)
243	*2019	U.S.A. ...	*Silver-Lined Bearings for Aircraft Engines.* (Ind. and Eng. Chem. (News Ed.), Vol. 4, No. 3, 10/2/42, p. 191.)
244	2086	Germany ...	*Aircooled Engines for Lorries.* (A.T.Z., Vol. 44, No. 19, 10/10/41, pp. 482-483.)
245	2087	Germany ...	*The History of the Transport Diesel Engine.* (A.T.Z., Vol. 44, No. 1, 10/1/41, pp. 9-17.)
246	2093	Germany ...	*Measurement of Aero Engine Torque on High Altitude Test Benches and in Flight.* (C. R. Himmler, Z.V.D.I., Vol. 84, No. 26, 29/6/40, pp. 445-452.)
248	2131	France ...	*Hispano Suiza 241T (24 Cylinders, 3,000 h.p.).* (Inter. Avia., No. 810-811, 8/4/42, pp. 11-12.)
249	2135	G.B.	*Rolls Royce Vulture (24 Cylinders, 2,000 h.p.).* (Inter. Avia., No. 810-811, 8/4/42, p. 15.)
250	2136	Sweden ...	*Volvo Aircraft Engines.* (Inter. Avia., No. 810-811, 8/4/42, p. 17.)
251	2151	Germany ...	*Exhaust Smoke of Transport Diesel Engines.* (U. Schmidt, Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, pp. 205-207.)
252	2154	Germany ...	*Two-Cycle Diesel with Exhaust-Driven Scavenge and Supercharging Pump (Piston Valve in Head).* (E. Ehmsen, Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, pp. 215-217.)

FUELS AND LUBRICANTS (INCLUDING METHODS OF TESTING).

253	1637	G.B.	*Bibliography No. 17 on Lubrication (up to Nov., 1936). With Addendum No. 1 (up to 1939).*
254	1673	U.S.A. ...	*American Production of 100 Octane Fuels.* (Inter. Avia., No. 807, 16/3/42, p. 11.)

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255	1746	Germany ...	*Recent Experience with Producer Gas for Ship Propulsion (Pilot Ignition).* (K. Schmidt, W.R.H., Vol. 22, No. 23, 1/12/41, pp. 351-354.)
256	1805	G.B.	*Quarterly Bibliography on Lubrication (Oct.-Dec., 1941).* (Sci. Lib. Bibliog. Series, No. 36, Oct.-Dec., 1941.)
257	1822	G.B.	*Fuel Research Intelligence Section. Summary for Weeks Ending 14th and 21st March, 1942.)*
258	1826	France ...	*Study of Oiliness (Pt. 2).* (F. Charron, Publ. Scient. et Techn. du Secretariat D'etat a L'aviation, P. Sc. T. No. 169.) (Abstract in Airc. Eng., Jan., 1942, p. 22.)
259	1866	U.S.A. ...	*Lower Octane Rating Petrol (Effect on Car Design, Operation and Maintenance).* (S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 29-31.)
260	1875	U.S.A. ...	*Maintenance Problems Resulting from Low Octane Fuels (Digest).* (W. H. Hubner and others, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 58.)
261	1878	U.S.A. ..	*Testing of Heavy Duty Motor Oils.* (H. C. Maugey, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 65.)
262	1880	U.S.A. ...	*An Oil Corrosion Tester (Digest).* (N. Macboull, S.A.E.J., Vol. 50, No. 2, Feb., 1942, p. 64.)
263	*1882	U.S.A. ...	*Composition of Catalytically Cracked Petrols.* (J. R. Bates and others, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 2, Feb., 1942, pp. 147-152.)
264	1892	G.B.	*Fuel Research Intelligence Section. Summary of Work for Weeks Ending 28th March and 4th April, 1942.*
265	1947	Australia ...	*Gas Producers in Australia.* (J. L. Campbell, Autom. Eng., Vol. 32, No. 422, April, 1942, pp. 156-158.)
266	1949	G.B.	*Anti-Knock Fuels.* (C. Campbell, Mech. Eng., Vol. 32, No. 422, April, 1942, pp. 163-165.)
267	1964	G.B.	*Dry Lubrication by Means of "Oil Dag."* (Engineer, Vol. 173, No. 4,502, 24/4/42, p. 356.)
268	1978	Germany ...	*On the Ageing of Lubricating Oils on Engines Using Wood Gas Generators.* (E. Kuhl, A.T.Z., Vol. 44, No. 16, 25/8/41, pp. 395-399.)
269	1980	Germany ...	*Examples of French Mobile Gas Generators.* (A.T.Z., Vol. 44, No. 16, 25/8/41, pp. 404-406.)
270	1988	Sweden ...	*Stockholm Exhibition for Mobile Gas Generators.* (A.T.Z., Vol. 44, No. 10, 25/5/41, pp. 260-262.)
271	1994	U.S.A. ...	*Oil Corrosion Tester.* (Autom. Ind., Vol. 86, No. 3, 1/2/42, pp. 35-36.)
272	*2006	Italy ...	*Liquefaction of Methane Gas Investigated in Italy.* (Industry and Engineering Chemistry (News Ed.), Vol. 20, No. 4, 25/2/42, p. 280.)
273	2043	G.B.	*Ignition Velocity of Some Gas Mixtures.* (J. T. Forsyth and D.G.R. Davies, Engineering, Vol. 153, No. 3,979, 17/4/42, pp. 314-316.)
274	2068	Germany ...	*Partitioned Fuel Tank (ensuring Feed at Various Altitudes) (Pat. No. 715,834).* (Dornier (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 107.)

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275	2078	G.B ...	*Fuel Research Intelligence Section. Summary of Work for the Weeks Ending 11th and 18th April,* 1942.)
276	2081	Germany	*Gas Generators at the Vienna Autumn Fair* (1941). (A.T.Z., Vol. 44, No. 18, 25/9/41, pp. 442-446.)
277	2082	Germany	*Conditions for the Production of Generator Gas Rich in Hydrogen.* (J. Groosdz, A.T.Z., Vol. 44, No. 18, 25/9/41, pp. 447-449.)
278	2083	Germany	*Danger of CO Poisoning with Gas Generators.* (A.T.Z., Vol. 44, No. 18, 25/9/41, pp. 449-450.)
279	2085	Germany	*Mobile Generators at the Vienna Autumn Fair* (1941). (S. Szenasy, A.T.Z., Vol. 44, No. 19, 10/10/41, pp. 478-481.)
280	2089	Germany	*Accelerators for Diesel Fuels.* (A.T.Z., Vol. 44, No. 1, 10/1/42, p. 17.)
281	2096	Germany	*Mixture Formation in High Performance Diesel Engines.* (M. Scheuermeyer, Z.V.D.I., Vol. 84, No. 27, 6/7/40, pp. 482-483.)
282	2100	Germany	*The D.V.L. Knock Indicator (Based on Pressure Acceleration).* (F. Lichtenberger, Z.V.D.I., Vol. 86, No. 11-12, 21/3/42, pp. 181-183.)
			INSTRUMENTS.
283	1626	G.B. ...	*Bibliography No.* 6 *on Flying by Instruments (up to May,* 1936).
284	1633	G.B. ...	*Bibliography No.* 13 *on Aircraft Instruments (up to August,* 1936).
285	1723	G.B. ...	*Valve Position Indicator.* (Engineer, Vol. 173, No. 4,497, 20/3/42, p. 256.)
286	1749	G.B. ...	*Photo-Electric Smoke Meters.* (R. J. Wey, Engineer, Vol. 173, No. 4,499, 3/4/42, pp. 283-285.)
287	*1823	France	*Rate of Icing Recorders.* (E. Brun and E. Vassey, Pub. Scient. et Techn. du Secretariat d'Etat à L'Aviation, B.S.T. No. 95.)
288	1836	G.B. ...	*Photo-Electric Smoke Meters.* (R. J. Wey, Engineer, Vol. 173, No. 4,500, 10/4/42, pp. 300-303.)
289	1876	U.S.A.	*Electric Induction Dynamometers.* (M. P. Wincher, S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 73-74.)
290	1940	U.S.A.	*Automatic Wear Measuring Device.* (C. W. Muhlenbruch, Mech. Eng., Vol. 64, No. 4, April, 1942, pp. 289-290.)
291	1958	G.B. ...	*Photo-Electric Smoke Meters, IV.* (R. J. Wey, Engineer, Vol. 173, No. 4,502, 24/4/42, pp. 342-345.)
292	1992	U.S.A.	*Optical Engine Indicator (Juhasz).* (Autom. Ind., Vol. 86, No. 3, 1/2/42, pp. 33-34.)
293	*2013	U.S.A.	*A New Instrument for Celestial Navigation.* (V. W. Storer, J. Aeron. Sci., Vol. 9, No. 4, Feb., 1942, pp. 138-140.)
294	2037	Germany	*Development of Instruments for Ship Performance Measurements.* (H. Hoppe, W.R.H., Vol. 23, No. 5, 23/4/42, pp. 66-72.)
295	2074	U.S.A.	*Aids for Analysing High Speed Action (with numerous photographs).* (J. Am. Soc. Nav. Engs., Vol. 54, No. 1, Feb., 1942, pp. 97-108.)

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296	2075	U.S.A. ...	*Probability Graph Paper and its Engineering Application.* (J. Am. Soc. Nav. Engs., Vol. 54, No. 1, Feb., 1942, pp. 103-119.)
297	2090	Germany ...	*Experiments with the Artificial Horizon with Special Reference to the Sperry Types.* (K. Magnum, L.F.F., Vol. 19, No. 2, 23/4/42, pp. 23-43.)
298	*2123 1811	Germany ...	*The Inertia of Dynamic Pressure Recording Installations.* (H. Weidemann, L.F.F., Vol. 17, No. 7, 20/7/40, pp. 211-215.) (Available as R.T.P. Trans. T.M. 998.)
299	2140	Germany ...	*Zero Thrust Recorder and Control Locking Device as Aids for Flight Tests.* (W. Stiess, L.F.F., Vol. 17, No. 8, 20/8/40, pp. 236-238.)
300	2143	Germany ...	*Some Notes on the Representation of a Spherical Surface on a Plane (Map Projections).* (J. Lense, L.F.F., Vol. 17, No. 8, 20/8/40, pp. 251-255.)

MATERIALS AND ELASTICITY (INCLUDING TESTING).

301	1606	Germany ...	*Fully Automatic Screw Thread Testing Machine.* (Flugsport, Vol. 34, No. 5, 4/3/42, pp. 70-72.)
302	1623	G.B.	*Bibliography No. 3 on Torsional Vibration (up to Sept., 1938).*
303	1641	G.B.	*Bibliography No. 21 on Hardness of Metals (up to June, 1937).*
304	1644	G.B.	*Bibliography No. 25 on Corrosion of Aluminium Alloys (up to Dec., 1937).*
305	1652	G.B.	*Concrete at Low Temperatures.* (Nature, Vol. 149, No. 3,778, 28/3/42, p. 360.)
306	1686	G.B.	*Discussion on Creep Recovery of 17C Steel.* (Inst. Mech. Engs. J. and Procs., Feb., 1942, pp. 187-188.)
307	1694	G.B.	*Alloys of Magnesium.* (F. A. Fox, Metal Industry, Vol. 60, No. 13, 27/3/42, pp. 220-223.)
308	1695	G.B.	*Wire Drawing.* (Metal Industry, Vol. 60, No. 13, 27/3/42, p. 223.)
309	1696	G.B.	*Beryllium (Present and Future Application).* (L. L. Stott, Metal Industry, Vol. 60, No. 13, 27/3/42, pp. 224-226.)
310	1697	Germany ...	*Fundamental Experiments on the Cold and Hot Rolling of Metals into Sheet and Strip, with Special Reference to Al. and Al. Wrought Alloys (Data on Lead and Steel for Comparison), Part I—Cold Rolling.* (O. Emicke and K. H. Lucas, Z. fur Mettalk., Vol. 34, No. 2, Feb., 1942, pp. 25-38.)
311	1698	Germany ...	*Structural Changes in Metals Accompanying Extension and Reversed Stressing, II (Considerations on Damping Capacity) (52 References).* (A. Thum and C. Petersen, Z. fur Mettalk., Vol. 34, No. 2, Feb., 1942, pp. 39-46.)
312	1699	U.S.A.	*Vibration and Rubber Springs.* (W. C. Keys, Mech. Eng., Vol. 64, No. 3, March, 1942, pp. 175-180.)

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313	1700	U.S.A.	...	*Urea Carbamide Treatment of Lumber.* (J. F. T. Berliner, Mech. Eng., Vol. 64, No. 3, March, 1942, pp. 181-186.)
314	1701	U.S.A.	...	*Hot Quenching of High Speed Steel.* (R. H. McCarthy, Mech. Eng., Vol. 64, No. 3, March, 1942, pp. 201-207.)
315	1703	G.B. ...	...	*Electric Arc Welding.* (T. A. Long, J. Inst. Elect. Engs. (General), Vol. 89, No. 15, March, 1942, pp. 138-142.)
316	1705	G.B. ...	...	*Automatic Welding in Ship Construction.* (Engineering, Vol. 153, No. 3,976, 27/3/42, pp. 241-243.)
317	1707	G.B. ...	...	*Automatic Bulkhead-Ring Bending Machine.* (Engineering, Vol. 153, No. 3,976, 27/3/42, p. 247.)
318	1710	G.B. ...	...	*Surface Hardness of Metals (Discussion).* (Engineering, Vol. 153, No. 3,976, 27/3/42, p. 256.)
319	1711	G.B. ...	...	*Constitution of Al. Alloys (Discussion).* (Engineering, Vol. 153, No. 3,976, 27/3/42, pp. 256-257.)
320	1716	G.B. ...	...	*The Design of Drawing Dies.* (C. P. Bernhoeft, Metal Industry, Vol. 60, No. 12, 20/3/42, pp. 204-208.)
321	1717	G.B. ...	...	*Sorting of Light Alloys (Floating in Heavy Liquids).* (Metal Industry, Vol. 60, No. 12, 20/3/42, p. 210.)
322	1718	G.B. ...	...	*Plating Problems.* (Metal Industry, Vol. 60, No 12, 20/3/42, pp. 211-214.)
323	1719	G.B. ...	...	*Fusion Welding of Non-Ferrous Alloys.* (Metal Industry, Vol. 60, No 12, 20/3/42, p. 214.)
324	1722	G.B. ...	...	*Inspection of Arc Welded Work.* (Engineer, Vol. 173, No. 4,497, 20/3/42, pp. 254-256.)
325	1725	G.B. ...	...	*Friction and Adhesion.* (Metal Industry, Vol. 60, No. 14, 3/4/42, p. 238.)
326	1726	G.B. ...	...	*The Alloys of Magnesium.* (F. A. Fox, Metal Industry, Vol. 60, No. 14, 3/4/42, pp. 239-241.)
327	1727	G.B. ...	...	*Fusion Welding of Non-Ferrous Alloys.* (C. S. Rigby, Metal Industry, Vol. 60, No. 14, 3/4/42, p. 241.)
328	1728	G.B. ...	...	*Electric Deposition of Chromium.* (G. Dubpernell, Metal Industry, Vol. 60, No. 14, 3/4/42, pp. 243-246.)
329	1736	Germany	...	*Plastics in Ship Building.* (W.R.H., Vol. 22, No. 22, 15/11/41, pp. 330-335.)
330	1742	G.B. ...	...	*The Testing of Welds.* (H. N. Pemberton, Electrician, Vol. 128, No. 3,328, 13/3/42, pp. 226-228.)
331	1750	G.B. ...	...	*Synthetic Rubber.* (O. M. Hayden, Engineer, Vol. 173, No. 4,499, 3/4/42, pp. 285-287.)
332	1751	G.B. ...	...	*Grain Size Control in Steel.* (E. Wood and S. T. Harrison, Engineer, Vol. 173, No. 4,499, 3/4/42, p. 291.)
333	1752	G.B. ...	...	*Precision Pipe Bending (I).* (Engineer, Vol. 173, No. 4,499, 3/4/42, pp. 292-293.)

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334	1755	G.B. ...	... *Cemented Carbide Tools (Review of German Practice).* (Autom. Eng., Vol. 32, No. 421, March, 1942, pp. 91-94.)
335	1757	G.B. ...	... *Chromium Plating.* (Autom. Eng., Vol. 32, No. 421, March, 1942, p. 100.)
336	1760	G.B. ...	... *Cd, Cm and Pb Alloy Bearings.* (Autom. Eng., Vol. 32, No. 421, March, 1942, p. 117.)
337	1764	G.B. ...	... *Data Sheet No. 8 (Mechanical Properties of Steel Bars and Forgings).* (Airc. Eng., Vol. 14, No. 157, March, 1942, p. 88.)
338	1769	G.B. ...	... *The Eccentric Circular Tube.* (T. S. Wilson, Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 76-78.)
339	1772	U.S.A.	... *Molybdenum Steels.* (Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 83-86, 90.)
340	1773	G.B. ...	... *Rubber and the Aircraft Industry.* (T. L. Garner, Airc. Eng., Vol. 14, No. 157, March, 1942, pp. 87, 90.)
341	1776	U.S.A.	... *Steels and Alloys Developed for Use at Elevated Temperatures in Petroleum Refineries as Still Tubes and Other Parts.* (B. B. Morton, Trans. A.S.M.E., Vol. 64, No. 2, Feb., 1941, pp. 113-119.)
342	1778	Germany	... *Steel Worm Wheels with cast on Bronze (Diffusion Process).* (F. G. Altmann, Vol. 85, No. 49-50, 13/12/41, pp. 939-940.)
343	1779	Germany	... *Protection of Operation Against X-Rays in Material Testing.* (H. Schaefer, Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, pp. 947-952.)
344	1780	Germany	... *Lead Cadmium Accumulator with very small Self-Discharging Rate.* (Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, p. 963.)
345	1781	Germany	... *Rapid Testing of Building Materials for Frost Resistance.* (E. Gaber, Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, pp. 955-956.)
346	1782	Germany	... *Influence of Heat Treatment on the Characteristics of Steel Wire.* (M. Hempel, Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, p. 960.)
347	1784	Germany	... *Electrolytic Method for Producing Thin Fe-Ni Sheets.* (Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, p. 963.)
348	1785	Germany	... *Testing the Deep Drawing Capacity of Light Alloy Sheet.* (H. Guth, Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, pp. 957-958.)
349	1786	Germany	... *Automatic Manufacture of Quartz Tubing.* (W. Hansleim, Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, pp. 958-959.)
350	1787	G.B. ...	... *Moisture Content of Yarns (Electrical Measurement).* (H. Maklo, Z.V.D.I., Vol. 85, No. 49-50, 13/12/41, p. 961.)
351	*1795	U.S.A.	... *The Technical Cohesive Strength of Metals (28 References).* (D. J. McAdam, J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 155-165.)

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352	*1796	U.S.A.	...	*An Extension of the Sand-Heap Analogy in Plastic Torsion Applicable to Cross-Sections having One or More Holes.* (M. A. Sadowsky, J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 166-168.)
353	1797	U.S.A.	...	*An Extension of the Photoelastic Method of Stress Measurement to Plates in Transverse Bending (Discussion).* (J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 187-189.)
354	*1798	U.S.A.	...	*Solution of Problems in Elasticity by the Framework Method.* (A. Hrennikoff, J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 169-175.)
355	1799	U.S.A.	...	*Analysis of Clamped Rectangular Plates (Discussion).* (J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 184-185.)
356	*1800	U.S.A.	...	*Lateral Buckling of I-Section Column with Eccentric End Loads in Plane of Web.* (B. Johnston, J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 176-180.)
357	1801	U.S.A.	...	*Critical Speed Behaviour of Unsymmetrical Shafts (Discussion).* (J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 181-182.)
358	1802	U.S.A.	...	*Normal Modes of Vibration of Beams having Non-collinear Elastic and Mass Axes (Discussion).* (J. Applied Mech., Vol. 8, No. 4, Dec., 1941, pp. 182-184.)
359	1804	G.B. ...	...	*Moisture in Textiles (especially its testing) (1937 to date).* (Sci. Lib. Bibliog. Series, No. 570, 1942.)
360	*1807	Germany	...	*Effect of Threaded and Serrated Holes on the Limited Time and Fatigue Strength of Flat Alloy Strips.* (H. Bürnheim, L.F.F., Vol. 18, No. 2-3, 29/3/41.) (R.T.P. Translation T.M. No. 994.)
361	*1808	Germany	...	*The Creep of Laminated Synthetic Resin Plastics.* (H. Perkühn, L.F.F., Vol. 18, No. 1, 28/2/41.) (R.T.P. Translation T.M. No. 995.)
362	*1810	Germany	...	*Determination of the Bending and Buckling Effect in the Stress Analysis of Shell Structures Accessible from One Side Only.* (A. Dose, L.F.F., Vol. 18, Nos. 2-3, 29/3/41.) (R.T.P. Translation T.M. 997.)
363	*1812	Germany	...	*Stress Analysis of Circular Frames.* (H. Fahlbusch and W. Wagner, L.F.F., Vol. 18, No. 4, 22/4/41.) (R.T.P. Translation T.M. 999.)
364	*1815	Germany	...	*The Stresses in Stiffener Openings.* (K. Marguerre, L.F.F., Vol. 18, No. 7, 19/7/41.) (R.T.P. Translation T.M. 1,005.)
365	1834	Germany	...	*Methods of Magnesium Production.* (F. W. Landgraeber, W.T.M., Vol. 46, No. 2, Feb., 1942, pp. 42-44.)
366	1840	G.B. ...	...	*Precision Pipe Bending (II).* (Engineer, Vol. 173, No. 4,500, 10/4/42, pp. 312-315.)
367	1841	G.B. ...	...	*Testing of Welds.* (H. N. Pemberton, Engineer, Vol. 173, No. 4,500, 10/4/42, pp. 315-316.)

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368	1843	G.B. ...	...	*Germany's New Mineral Position.* (C. W. Wright, Engineering, Vol. 153, No. 3,978, 10/4/42, pp. 284-285.)
369	1844	G.B. ...	...	*Heat Conductivity of Beryllium-Cobalt-Copper Alloys.* (Engineering, Vol. 153, No. 3,978, 10/4/42, p. 287.)
370	1845	G.B. ...	...	*Mechanisation of Foundries.* (A. S. Beech, Engineering, Vol. 153, No. 3,978, 10/4/42, pp. 298-300.)
371	1846	U.S.A.	...	*Simple Determination of Particle Size Distribution for Sizes between* 1 *and* 40 *Microns by Sedimentation.* (W. O. Hinkley, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 1, 15/1/42, pp. 10-18.)
372	1850	Germany	...	*Application of the Law of Virtual Displacement and the Theorem of Reciprocity in the Dynamics of Framed Structures.* (V. Kolousek, Ing. Arch., Vol. 12, No. 6, Dec., 1941, pp. 363-370.)
374	1855	G.B. ...	...	*The Effect of Ultrasonics on Molten Zinc (Speeding Up of Fe Solution).* (G. Schmid and A. Roll, Metal Industry, Vol. 60, No. 15, 10/4/42, pp. 252-253.)
375	*1858	G.B. ...	...	*Magnesium Fires.* (Metal Industry, Vol. 60, No. 15, 10/4/42, p. 158.)
376	1859	G.B. ...	...	*Friction and Adhesion.* (Metal Industry, Vol. 60, No. 15, 10/4/42, p. 259.)
377	1860	G.B. ..	...	*Alloys of Magnesium.* (F. A. Fox, Metal Industry, Vol. 60, No. 15, 10/4/42, pp. 260-262.)
378	1862	U.S.A.	...	*Stability of Oscillations in Systems Obeying Mathieu's Equation.* (J. G. Brainerd, J. Frank. Inst., Vol. 233, No. 2, Feb., 1942, pp. 135-142.)
379	*1864	U.S.A.	...	*A New Electron Microscope Technique for Studies on Grain Structure of Metals.* (J. Frank. Inst., Vol. 233, No. 2, Feb., 1942, p. 180.)
380	1865	U.S.A.	...	*Developments in Fibre Glass.* (J. Frank. Inst., Vol. 233, No. 2, Feb., 1942, p. 203.)
381	1868	U.S.A.	...	*Phenol-Formaldehyde Plastics in Automotive Vehicles.* (S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 32 and 68.)
382	*1872	U.S.A.	...	*Stress Determination and Fatigue.* (J. O. Alman, Trans. S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 53-61.)
383	*1883	U.S.A.	...	*Brittle Point of Rubber upon Freezing.* (M. L. Selker and others, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 2, Feb., 1942, pp. 157-160.)
384	1884	U.S.A.	...	*Effect of Reinforcing Pigments on Rubber Hydrocarbons.* (F. S. Thornhill and W. R. Smith, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 2, Feb., 1942, pp. 218-224.)
385	*1886	U.S.A.	...	*Industrial Progress in Synthetic Rubber-like Polymers.* (H. L. Cramer, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 2, Feb., 1942, pp. 243-251.)

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386	1889	U.S.A. ...	*Recovery of Chemicals from Steel Pickling Liquors and Copperas Waste.* (H. W. Gehm, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 3, March, 1942, pp. 382-384.)
387	*1890	U.S.A. ...	*Vinylidene Chloride Polymers ("Saran" Upholstery Fabrics, etc.).* (W. C. Goggin and R. D. Lowry, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 3, March, 1942, pp. 327-332.)
388	1899	G.B.	*Cast Iron in Relation to Engineering (with Discussion).* (E. J. L. Howard, Jl. of Inst. Production Engineers, Vol. 21, No. 3, March, 1942, pp. 103-122.)
389	1926	U.S.A. ...	*Synthetic Rubber Production in the U.S.A.* (Inter. Avia., No. 808-809, 28/3/42, pp. 18-19.)
390	*1934	Germany ...	*Surface Protection of Aircraft by Means of Paints and Lacquers.* (W. Jaeger, Der Flieger, Vol. 21, No. 1, Jan., 1942, p. 20.)
391	1941	U.S.A. ...	*Advance of Rubber and Plastics in 1941 (with Extensive Bibliography).* (Mech. Eng., Vol. 64, No. 4, April, 1942, pp. 295-300.)
392	1950	G.B.	*The Stresses in an Incomplete Ring Subject to Uniform Shear and Compression on its Inner Surface.* (J. T. Newing, Phil. Mag., Vol. 33, No. 219, April, 1942, pp. 241-257.)
393	1952	G.B.	*The Bending of Thin Uniform Loaded Plates Bounded by Cardioids, Lemniscates and Certain Other Quartic Curves.* (B. Sen, Phil. Mag., Vol. 33, No. 219, April, 1942, pp. 294-302.)
394	1963	G.B.	*Plastics (a New Material of Construction).* (C. Chapman, Engineer, Vol. 173, No. 4,502, 24/4/42, pp. 353-355.)
395	1966	Germany ...	*Recent Developments in Roller Bearings.* (R. Mundt, W.R.H., Vol. 23, No. 6, 15/3/42, pp. 90-91.)
396	*1971	U.S.A. ...	*Lateral Instability of Unsymmetrical I Beams.* (H. N. Hill, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, pp. 175-180.)
397	1972	U.S.A. ...	*Notes on Determination of Strain Distribution by Photogrid Process.* (W. K. Bodger, J. Aeron. Sci., Vol. 9, No. 5, March, 1942, p. 180.)
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399	1983	Germany ...	*The Effect of Si as an Alloying Constituent of Structural Steels, S.T. 52.* (W. Mantel, Stahl und Eisen, Vol. 62, No. 11, 12/3/42, pp. 222-228.)
400	1986	Germany ..	*The Use of Lead and Silver in American Structural Steels.* (A.T.Z., Vol. 44, No. 9, 10/5/41, p. 240.)
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417	2020	U.S.A. ...	*National Symposium on Spectographic Analysis.* (Ind. and Eng. Chem. (News Ed.), Vol. 4, No. 3, 10/2/42, p. 197.)
418	2036	Germany ...	*Light Alloys in Ship Building.* (W. Bleicher, W.R.H., Vol. 23, No. 5, 23/4/42, pp. 72-77.)
419	2042	G.B.	*The Testing of Watches.* (Engineering, Vol. 153, No. 3,979, 17/4/42, p. 308.)
420	2060	Germany ...	*Simple Tool for Bending Alloy Sheet (Junkers).* (Flugsport, Vol. 34, No. 7, 1/4/42, pp. 100-101.)
421	2061	Germany ...	*Improved Tool for Securing Ball Bearings by Beading (Arado).* (Flugsport, Vol. 34, No. 7, 1/4/42, pp. 101-102.)

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423	2076	U.S.A.	...	*Acrylic Plastics.* (J. Am. Soc. Nav. Engs., Vol. 54, No. 1, Feb., 1942, pp. 120-123.)
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428	2097	Germany	...	*Steels for Roller Bearings.* (H. Diergarten, Z.V.D.I., Vol. 86, No. 11-12, 21/3/42, pp. 167-170.)
429	2098	Germany	...	*The Effect of a Single High Overload on Fatigue and Endurance.* (A. Thum and A. Erker, Vol. 86, No. 11-12, 21/3/42, pp. 171-174.)
430	2101	Germany	...	*Weldable Hard Metals.* (F. Repatz, Z.V.D.I., Vol. 86, No. 11-12, 21/3/42, pp. 181-183.)
431	2102	Germany	...	*Wear of Metallic Materials.* (R. Kobitzsch, Z.V.D.I., Vol. 86, No. 11-12, 21/3/42, p. 189.)
432	2105	Germany	...	*Fatigue in Springs.* (Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, p. 154.)
433	2107	Germany	...	*Composite Light Alloy Pistons (Steel Inserts).* (Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, pp. 153-154.)
434	2108	Germany	...	*High Duty Bearings Made of Synthetic Compressed Resins (including Application in Aircraft).* (E. Gilbert and K. Lurabaum, Z.V.D.I., Vol. 86, No. 9-10, 7/3/42.)
435	2109	Germany	...	*Elastic Deformation of Straight Spur Wheels (Two-Teeth Engagement).* (F. Karas, Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, pp. 154-155.)
436	2110	Germany	...	*Self-Clearing Electric Plugs (Telephone Circuits, etc.).* (Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, pp. 150-151.)
437	2111	Germany	...	*Automatic Press for Die Casting Thermoplastics.* (Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, pp. 151-152.)
438	2112	Germany	...	*Performance Rating of Hard Metal Tools.* (Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, pp. 152-153.)
439	2113	Germany	...	*The Stiffness Factor (Bending Strength/Deflection at Failure) as a Criterion for Cast Iron.* (A. Gimmy, Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, pp. 155-156.)

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441	2115	Germany ...	*Metallic Wear Under Conditions of Dry Friction.* (E. Siebel, Z.V.D.I., Vol. 86, No. 9/10, 7/3/42, p. 157.)
442	2116	Germany ...	*Welding of Synthetic Fabrics.* (K. Mienes, Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, p. 157.)
443	2121	Germany ...	*A Simple and Rapid Determination of the Natural Frequency of Beams Fixed at One End with Special Reference to Aircraft Wings.* (R. V. Wolff, L.F.F., Vol. 17, No. 7, 20/7/40, pp. 204-206.)
444	2122	Germany ...	*The Stressing of Rectangular Sheets Under Uniform Fluid Pressure.* (M. Neubert and A. Sommer, L.F.F., Vol. 17, No. 7, 20/7/40, pp. 207-210.)
445	2142	Germany ...	*The Fatigue Strength of Riveted Dural Sheet.* (E. Hottenrott, L.F.F., Vol. 17, No. 8, 20/8/40, pp. 247-250.)
446	2144	Germany ...	*Light Alloy Riveting Wire (Effect of Ageing and Degree of Upset).* (E. V. Rajakovies, Aluminium, Vol. 24, No. 1, pp. 5-8.)
447	2145	Germany ...	*Effect of Annealing Temperature on Al.-Cu.-Mg. Alloys.* (A. Metting, Aluminium, Vol. 24, No. 1, Jan., 1942, pp. 9-12.)
448	*2146	Germany ...	*Comparison of the Relative Surface Protection Afforded to Mg. Alloys by Chemical and Electro Chemical Deposits.* (H. Winterheger, Aluminium, Vol. 24, No. 1, Jan., 1942, pp. 12-16.)
449	2150	Germany ...	*Modern Research on Brake Linings and Brake Drums.* (G. Niemann, Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, pp. 199-205.)
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454	1682	U.S.A. ...	*Black-Outs and Industrial Plant Protection.* (F. D. McHugh, Army Ordnance, Vol. 22, No. 131, March-April, 1942, pp. 756-758.)
455	1713	G.B. ...	*Statistical Control of Quality.* (Engineer, Vol. 173, No. 4,498, 27/3/42, pp. 266-267.)
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457	1743	G.B. ...	... *Single Purpose Machine Tools for Wartime Production.* (Engineering, Vol. 153, No. 3,977, 3/4/42, pp. 265-267.)
458	1758	G.B. ...	... *Induction Hardening.* (Autom. Eng., Vol. 32, No. 421, March, 1942, p. 100.)
459	1759	G.B. ...	... *Quality Control by Sampling Inspection.* (B. P. Dudding, Autom. Eng., Vol. 32, No. 421, March, 1942, pp. 109-113.)
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462	1837	G.B. ...	... *Some Problems of Production.* (A. Woodburn, Engineer, Vol. 173, No. 4,500, 10/4/42, pp. 306-307.)
463	1838	Sweden	... *Swedish Underground Factory.* (Engineer, Vol. 173, No. 4,500, 10/4/42, p. 307.)
464	1842	G.B. ...	... *Air Hydraulic Riveting Intensifier.* (Engineer, Vol. 173, No. 4,500, 10/4/42, p. 316.)
465	1856	G.B. ...	... *Solvent Economy in Trichlorethylene Degreasing Plants.* (W. F. Jesson, Metal Industry, Vol. 60, No. 15, 10/4/42, pp. 254-256.)
466	*1917	U.S.A.	... *American Aircraft Production (Figures and Estimates).* (Inter. Avia., No. 808-809, 28/3/42, pp. 1-9.)
467	1919	G.B. ...	... *Underground Aircraft Factories.* (Inter. Avia., No. 808-809, 28/3/42, pp. 13-14.)
468	*1922	Germany	... *German Technical Exhibitions.* (Inter. Avia., No. 808-809, 28/3/42, p. 15.)
469	1960	G.B. ...	... *Statistical Quality Control I.* (Engineer, Vol. 173, No. 4,502, 24/4/42, pp. 346-347.)
470	1982	Germany	... *Special Courses in Jena University on "Fine Measurements in Industry."* (A.T.Z., Vol. 44, No. 16, 25/8/41, p. 414.)
471	1984	Germany	... *Female Labour in the Motor Car Industry.* (A.T.Z., Vol. 44, No. 9, 10/5/41, pp. 223-224.)
472	2040	U.S.A.	... *The United States Standards of Measurements.* (L. J. Briggs, Engineering, Vol. 153, No. 3,979, 17/4/42, pp. 306-307.)
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474	2050	Germany	... *Angle Bending Device for Presses (Junkers).* (Flugsport, Vol. 34, No. 6, 18/3/42, p. 87.)
475	2099	Germany	... *Mass Production in the Clothing Industry.* (W. Weber, Z.V.D.I., Vol. 86, No. 11-12, 21/3/42, p. 180.)
476	2103	Germany	... *The Labour Problem in Germany.* (Z.V.D.I., Vol. 86, No. 11-12, 21/3/42, p. 190.)

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477	2104	Germany ...	*Standardisation in the German "Wehrmacht."* (M. Klein, Z.V.D.I., Vol. 86, No. 9-10, 7/3/42, pp. 129-134.)
478	*2133	Germany ...	*German Labour Force.* (Inter. Avia., No. 810-811, 8/4/42, p. 13.)
479	2137	Sweden ...	*Swedish Underground Factories.* (Inter. Avia., No. 810-811, 8/4/42, p. 17.)
480	2138	G.B.	*Ford Aircraft Production.* (Inter. Avia., No. 810-811, 8/4/42, p. 18.)
481	2148	Germany ...	*Working Experience with a New Type of Low Frequency Induction Furnace for Light Alloys.* (H. Capitaine, Aluminium, Vol. 24, No. 2, Feb., 1942, pp. 69-71.)
482	*2149	Germany ...	*The Performance of Emery Wheels as Affected by Coolants and Lubricants.* (H. Opitz and W. Vits, Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, p. 198.)
483	2153	Germany ...	*The Ventilation of Work Rooms.* (Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, p. 215.)

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484	1647	G.B.	*Bibliography No. 28 on Ice Accretion (up to March, 1941).*
485	1649	G.B.	*Potable Water from Sea Water.* (W. B. Yapp and A. Parker, Nature, Vol. 149, No. 3,778, 28/3/42, p. 357.)
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487	1714	G.B.	*Atmospheric Pollution.* (Engineer, Vol. 173, No. 4,498, 27/3/42, p. 273.)
488	1803	G.B.	*Papers on Atmospheric Scattering* (1936 *to date*). (Sci. Lib. Bibliog., No. 569, 1942.)
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491	1632	G.B.	*Bibliography No. 12 on Noise, with Addendum No. 1 (up to 15th June, 1939).*
492	1648	G.B.	*A New Method of X-Ray Crystallography.* (E. P. Abraham and others, Nature, Vol. 149, No. 3,778, 28/3/42, pp. 355-356.)
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494	1708	G.B.	*X-Ray Crystallography (the Meaning of Extra Reflections).* (K. Lonsdale, Engineering, Vol. 153, No. 3,976, 27/3/42, pp. 254-255.)
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496	1774	U.S.A. ...	*The Performance of Flat Plate Solar Heat Collectors.* (H. C. Hottel and B. B. Woertz, Trans. A.S.M.E., Vol. 64, No. 2, Feb., 1942, pp. 91-104.)
497	1775	U.S.A. ...	*A Method of Determining Unsteady State Heat Transfer by Means of an Electrical Analogy.* (V. Paschkis and H. D. Baker, Trans. A.S.M.E., Vol. 64, No. 2, Feb., 1942, pp. 105-112.)
498	*1813	Germany ...	*The Temperature of Unheated Bodies in a High Speed Gas Stream.* (E. Eckert and W. Weise, F.G.I., Vol. 12, No. 1, Jan.-Feb., 1941.) (R.T.P. Translation T.M. 1,000.)
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500	1849	Germany ...	*The Perspective of Optical Reflections on Surfaces of Revolution.* (W. Richter, Ing. Arch., Vol. 12, No. 6, Dec., 1941, pp. 344-363.)
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508	1629	G.B.	*Bibliography No. 9 on Photo-Cells and Television (up to June, 1936).*
509	1650	G.B.	*Magnetostriction in Permalloy.* (Nature, Vol. 149, No. 3,778, 28/3/42, p. 359.)
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512	1730	G.B. ...	*The Formula of the Selenium Barrier Layer Photo-Cell.* (R. A. Houstoun, Phil. Mag., Vol. 33, No. 218, March, 1942, pp. 226-227.)
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514	1739	U.S.A.	*A New Series of Insulators for Ultra High Frequency Tubes.* (L. R. Shardlow, R.A.C. Review, Vol. 5, No. 4, April, 1941, pp. 498-504.)
515	1815	G.B. ...	*Wireless Engineer Abstracts and References Compiled by the Radio Research Board.* (Nos. 925-1,278, April, 1942.)
516	1929	U.S.A.	*Radio Progress During* 1941 (*Electronics, Transmitter and Antennas, Receivers, Frequency Modulation, Television, Facsimile, Wave Propagation, Piezoelectricity, Electroacoustics*) (*with Extensive Bibliography*). (Procs., I.R.E., Vol. 30, No. 2, Feb., 1942, pp. 57-71.)
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518	1995	U.S.A.	*Minimum Distance Requirements in Gamma Radiography of* 1 *in. and* 3 *in. Steel Sections.* (H. F. Kaiser and others, J. Am. Soc. Nav. Eng., Vol. 54, No. 1, Feb., 1942, pp. 15-49.)
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520	2072	Germany	*Wireless Beacon Array for Guiding Aircraft on a Given Path (Pat. No.* 712,030). (Telefunken (Pat. Coll. No. 26), Flugsport, Vol. 34, No. 7, 1/4/42, p. 108.)

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521	1790	U.S.A.	*Selection of Tyres for Earth-Moving Equipment (Heavy Loads on Soft Ground).* (W. Lee, S.A.E.J., Vol. 50, No. 3, March, 1942, pp. 73-79.)
522	1870	U.S.A.	*Rolling Resistance of Pneumatic Tyres as a Factor in Car Economy.* (W. F. Bellingsley and others, Trans. S.A.E.J., Vol. 50, No. 2, Feb., 1942, pp. 37-37 and 72.)
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524	1985	Germany	*Design Problems in Change Speed Gears for Motor Cars.* (B. Eckert, A.T.Z., Vol. 44, No. 9, 10/5/41, pp. 225-239.)
525	2088	Germany	*Colonial Transport Vehicles.* (A.T.Z., Vol. 44, No. 1, 10/1/41, pp. 18-20.)

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527	1712	G.B. ...	...	*Sir Charles Parsons and the Royal Navy.* (S. Goodall, Engineer, Vol. 173, No. 4,498, 27/3/42, pp. 261-263.)
528	1816	G.B. ...	...	*Rotol Digest.* (Vol. 3, No. 12, 25/3/42.)
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532	1820	G.B. ...	...	*Bristol Aero Engine Dept. Technical Abstracts.* (Vol. 6, No. 12-13, 1/4/42.)
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535	1893	G.B. ...	...	*Rotol Digest.* (Vol. 3, No. 15, 15/4/42.)
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544	1905	Germany	...	*Physikalische Berichte.* (Vol. 22, No. 12, 15/6/41, pp. 1,209-1,308.)
545	1906	Germany	...	*Physikalische Berichte.* (Vol. 22, No. 16, 15/8/41, pp. 1,597-1,692.)
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552	1913	Germany ...	*Physikalische Berichte.* (Vol. 23, No. 2, 15/1/42, pp. 241-276.)
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554	2077	G.B.	*Rolls Royce Technical Abstracts and Information.* (Vol. 3, No. 4, April, 1942.)
555	2079	G.B.	*Rotol Digest.* (Vol. 3, No. 16, 22/4/42.)
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