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Ballistic and Technical Problems of Aerial Combat. (T. W. Schmidt, Luftwissen, Vol. 10, No. 1, Jan., 1943, pp. 10-17.) (115/1 Germany.)

With a fixed gun, it is necessary for the fighter to approach a moving target along the so-called curve of pursuit.

This path, referred to a target travelling in a straight line, takes the simple form

$$r = \frac{\{ r_{90} (\tan \theta/2)^n \}}{\sin \theta}$$

where r = distance between two aircraft at any instant.
θ = angle between radius vector and target course.
n = speed of fighter/speed of target.
r_{90} = distance when $\theta = 90°$.

The following table gives r/r_{90} for $n = 1.5$ at various values of θ:—

$\theta°$	0	10	20	30	40	45	50	60	70	80	90
r/r_{90}	0	.149	.216	.277	.342	.377	.416	.507	.623	.781	1.000

It is interesting to note that $d\theta/dt = v_t \sin \theta/r$ gives the apparent angular velocity of approach of the fighter relative to the target and $dr/dt = v_F - v_t \cos \theta$ is the relative velocity of approach along the radius vector (v_F and v_t are fighter and target speeds respectively). On account of the finite speed of the bullet, the aim must be in front of the target and the actual curve of approach will differ appreciably from the simple theoretical case.

The aim is correct if trajectories of target and bullet intersect at the same instant.

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Assuming the target to move in a straight line at constant speed, its subsequent positions will be a series of circles in the flight plane. If the gun is considered at rest in the same plane the trajectories of the bullet fired in any direction will also intersect this plane in a series of circles.

A possible hit can therefore be scored at all points of intersection of two sets of circles with the same parameter.

It is interesting to note that if the original distance between gun and target exceeds a certain fraction of the maximum range, it may be impossible to score a hit if the target is moving away from the gun. Moreover, this field of escape may include a considerable angle on either side of the original gun target line.

The following table gives the maximum effective firing distance of a gun with a muzzle velocity of 620 m./sec. and a maximum range of 3,300 m. At distances greater than these values, it will be just possible for the target to escape when flying away from the gun at the speed given in the table.

Max distance (m.)	...	3,300	1,900	1,150	650	350
Target speed (km./h.)	...	0	200	400	600	800

The rapid decrease of effective distance with target speed will be noted.

When taking into account the motion of the gun, it is convenient to consider two limiting cases.

(1) Gun is Moving in Direction of Fire.

Relative to the ground, the muzzle speed is increased by the vectorial component of the gun velocity and the resultant bullet velocity is at a smaller angle of elevation than for the stationary gun.

The first effect tends to increase the range, but the second diminishes it.

The net effect is, however, generally an increase. Thus for the gun considered and sighted at 400 (elevation $\sim 22°$) motion of the gun at 150 m./sec. increases the range to 470 m.

Relatively to the gun, however, the bullet range is shortened to 360 m., the difference being the distance moved by the gun in the time for the trajectory to intersect the horizontal plane.

With diminution in density (increase in altitude) both the ground and relative ranges increase.

It is interesting to note that at an altitude of 4,000 m. the relative trajectory becomes identical with that of the gun at rest, the old range of 400 m. being restored.

This so-called " equivalent altitude " is of importance since the normal ballistic tables will apply under these conditions.

(2) Lateral Fire.

When the gun is firing at right angles to its path, the trajectory of the bullet relatively to the gun has a double curvature in space. When viewed in a lateral direction the bullet appears to lag behind the gun by an angle which depends on the speed of the gun, muzzle velocity of bullet and ballistic characteristics of the latter. Whilst earlier investigators were of the opinion that such lateral fire would constitute serious ballistic difficulties (Cazaux) it is now known that stable trajectories can be ensured. The problem cannot, however, be considered by any means as completely solved.

Regions of Infinite Acceleration and Flow Realms in a Compressible Fluid. (M. G. Scherberg, J. Aeron. Sci., Vol. 10, No. 7, July, 1943, pp. 223-226.) (115/2 U.S.A.)

It appears probable that the shock wave is a physical necessity for making possible a compressible flow which would otherwise require infinite acceleration, just as circulation round an aerofoil overcomes the need for infinite acceleration at the trailing edge.

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It is therefore of interest to investigate under what conditions regions of infinite acceleration would theoretically arise in the potential isentropic flow of a compressible fluid. Some aspects of this problem have already been considered by von Kármán in a previous issue of this Journal (Vol. 8, No. 9, July, 1941, pp. 337-355). The present paper deals with the same subject in a more general manner.

Using polar co-ordinates, the two dimensional potential flow is given by

$$\left(\frac{rv}{a^2}\right)(\dot{v}-rw^2)-\frac{\partial v}{\partial r}r-v+\left(\frac{r^2w}{a^2}\right)(r\alpha+2wv)-r\left(\frac{\partial w}{\partial\theta}\right)=O \quad . \quad . \quad (1)$$

where r = radius vector.
θ = angular position of above.
v = radial velocity
w = angular velocity
α = angular acceleration
P = pressure
a = velocity of sound
} at point $r_1\theta$.

In the above

$$(\dot{v}-rw^2)=-\left(\frac{1}{\rho}\right)\left(\frac{\partial p}{\partial r}\right)=\text{radial component of acceleration.}$$

$$(2vw+rd)=-\left(\frac{1}{\rho}\right)\left(\frac{\partial \rho}{r\partial\theta}\right)=\text{transverse component of acceleration.}$$

$$((rw)^2+v^2)^{1/2}=V=\text{resultant velocity at } r_1\theta.$$

Choosing a reference system for which the radial component of acceleration is zero, the (transverse) acceleration is given by

$$A=\left[\frac{V^2}{rw}\right]\left[\frac{\partial v/\partial r}{\{(rw/a)^2-1\}}\right]$$

If $\partial v/\partial r$ is finite, $A\to\infty$ as $rw\to a$, *i.e.*, under these conditions, infinite acceleration occurs if the component of the velocity in the direction of the acceleration vector reaches the value of the local velocity of sound.

If the V and A vectors are permanently at right angles, it is clear that there is no such component and hence A cannot become infinite (circular flow).

If V and A are in the same direction (radial flow), $A\to\infty$ when $V\to a$.

If, however, $\partial v/\partial r=0$, A may be finite although $rw=a$ (flow round a corner, with exception of corner itself).

Similarly $rw\neq a$ cannot give rise to infinite acceleration unless $\partial v/\partial r\to\infty$.

For finite value of $\partial v/\partial r$, the appearance of infinite acceleration as we pass from sonic to supersonic V can thus be delayed or altogether avoided if we ensure a sufficiently large angle between the V and A vectors. This generally applies to the forward portion of an aerofoil (fairly large curvature) and V may thus reach sonic values over this region without $A\to\infty$. On the other hand, a sharp change in curvature of the aerofoil immediately aft of this point may cause the V component in the direction of A to reach sonic value and unless $\partial v/\partial t\to O$ in this region, $A\to\infty$. The general acceleration formula may also be written as

$$A=\left(\frac{V}{rw}\right)^2\left(\frac{\partial v}{\partial r}\right)\left\{\frac{[1-(V/V_m)^2]}{[(rw/V_c)^2+(v/V_m)^2-1]}\right\}$$

where V_m = max. speed attainable (expansion into a vacuum)
$=(2/(1-\gamma)^{1/2}\,a_0$ (a_0 = velocity of sound with fluid at rest)
$V_c=a$ = local velocity of sound.

The velocity field is thus divided into two realms by the ellipse

$$(rw/V_c)^2+(v/V_m)^2=1$$

with semi-axes V_c and V_m respectively.

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When the hodograph of a stream line comes near or crosses this hodograph ellipse, large acceleration may be expected unless $\partial v/\partial r \to 0$.

Tail Buffeting. (G. Abdrashitov, C.A.H.I. Report No. 395, Moscow, 1939.) (R.T.P. Translation No. T.M. 1,041.) (115/3 U.S.S.R.)

In its wider sense, buffeting denotes forced vibrations of any part of the aircraft structures due to the aerodynamic action of the wake. On account of the dangerous vibrations which may be induced in the tail surface when subjected to the wake from the wings, it is usual to restrict the term to this special class of phenomenon.

In spite of a considerable amount of theoretical and experimental work, it cannot be said that the phenomena in the wake are fully understood. There is no doubt that the velocity in the wake undergoes periodic variations associated with the periodic shedding of the Kármán vortices by the body originating the wake. It appears that the frequency f of the disturbance bears a definite relationship to the stream velocity V and the dimension b of the body responsible for the wake (measured at right angles to V, *i.e.*,

$$f = \frac{(K+V)}{b} \text{ vibrations/sec.}$$

where K = so-called Strouhal constant
$= \sim .20$ for plates or aerofoils.

It should, however, be pointed out that the experimental verification of this law has so far been limited to $Re \sim 200{,}000$ and further investigations at higher Reynolds numbers are urgently wanted. According to the author's experiments, $K = \sim .10$ at $Re = 10^6$.

Although the centre of the wake conforms to the so-called downward angle, the downward deflection increasing with the lift, there is a rapid diminution in this deflection as soon as the stalling angle is reached, and at larger angles of attack the wake is practically in the direction of the incident air stream, the most intense disturbances being in line with the wing nose. The width of the wake is usually defined by means of total pressure surveys. There is evidence that as far as buffeting is concerned, the influence of the wake extends beyond the limits thus defined. At small angles of incidence the wake is very narrow, but it broadens out rapidly as the stall is approached.

Very little is as yet known about the amplitude of the velocity disturbances in the wake and the rate of decay with distance. The theoretical treatment is very difficult on account of the unsteady nature of the flow and the effect of viscosity.

In order to simplify the problem, the author assumes that the wake causes a periodic change in the incidence α of the tail, *i.e.*,

$$d\alpha = A \sin w\tau$$

where A = maximum change of α.
w = wake frequency.

The extra lift per unit length at the section x of the tail thus becomes

$$dp = \left(\frac{\partial C_y}{\partial \alpha}\right) A \sin w\tau \rho V^2 t\,(x)$$

where $t\,(x)$ = chord of tail and V = velocity of air.

[It will be noticed that the lift coefficient C_y is referred to ρV^2.]

Assuming the tail surface to correspond to a cantilever beam, the problem then reduces itself to that of forced vibrations. Only aerodynamic damping will be considered. If

y = deflection at any section.
$\dot{y}/V$ = change of incidence due to motion.
$(\partial C_y/\partial \alpha)\,\rho V t\,(x)\,\dot{y}$ = damping force.

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The equation of motion thus becomes

$$\left(\frac{\partial^2}{\partial x^2}\right)\left(EI\frac{\partial^2 y}{\partial x^2}\right)+m\,(x)\,\ddot{y}+\text{damping force}=\text{excitation force},$$

where $m\,(x)$ = mass per unit length at section x.

Assuming a uniform beam of constant section

$$\begin{aligned} m\,(x) &= m = \\ EI &= \text{constant}. \\ t\,(x) &= t = \text{constant}, \end{aligned}$$

and the equation reduces to

$$EIy^{IV}+m\ddot{y}+a_1 V\dot{y}=k_1 V^2 \sin w\tau$$

where a_1 and k_1 are constants.

$a_1 V/2m$ represents the damping coefficient ($\sim \partial C_y/\partial\alpha \,.\, V$) of the natural vibrations of the system.

It will be noted that the damping is positive, provided the tail operates below the stall.

Limiting ourselves to this condition, the forced vibrations only need be considered and it is easily shown that the maximum deflection under resonance is given by

$$Y\ \text{max.} = \text{constant} \times f\,(x) \times \left\{\frac{V}{\sqrt{(EI/m)}}\right\}$$

where $f\,(x)$ determines the mode of vibration of the beam (usually the fundamental). The aerodynamic properties of the tail thus do not enter into the expression and only the elastic properties appear. For a given mode and elastic characteristics, the maximum deflection thus varies directly as V, and the frequency of the vibrations under resonance is the same as the natural frequency of the system = frequency w of external disturbance.

Similar expressions can be obtained for the case of pure torsional vibrations. In this case, however, the natural frequency itself depends on V and diminishes with increasing V. Moreover, the deflection at resonance does not only depend on the elastic properties of the tail, as was the case in pure bending, but the aerodynamic characteristics also affect the result.

The case becomes very much more complicated if both flexural and torsional oscillations exist together. In practice this must nearly always be the case due to relative displacement of the elastic and inertia axes.

The solution of the two systems of partial differential equations are expressed by the author in the form

$$\begin{aligned} y &= f\,(x)\,\zeta\,(\tau) \\ \theta &= \phi\,(x)\,\psi\,(\tau) \\ \text{where } \zeta &= A\cos w\tau + B\sin w\tau \\ \psi &= C\cos w\tau + D\sin w\tau \end{aligned}$$

Provided $f\,(x)$ and $\phi\,(x)$ are known, the constants A, B and C can be determined, although the expressions are very cumbersome.

The author has solved the problem in a special case, assuming that $f\,(x)$ and $\phi\,(x)$ (*i.e.*, the form of the tail vibration) in the flow is the same as in a vacuum.

The results show that in the presence of both forms of vibration the forced bending oscillations increase almost directly as V and reach a well pronounced maximum at resonance (in this particular case at $V = 110$ m./sec.). As regards bending, therefore, the tail conforms closely to the predictions of the simplified theory for one degree of freedom only (bending). The forced torsional oscillations, on the other hand, only become marked when the resonance speed of the bending vibration is approached. This appears to indicate that tail failure due to buffeting may be mainly due to bending stresses, which was the opinion arrived at in the famous Meopham accident (Ju. 13).

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The author next carried out simple experiments on the buffeting of a tail surface of 585 mm. semi-span tapering from 262 mm. (root chord) to 131 mm. at the tip. This model was supported elastically on a single spar in such a way that the entire load is taken on the spar.

The model could be placed at various distances behind the main wing of 600 mm. chord originating the wake, and tests were carried out both with an isolated wing and in the presence of a fuselage, simulated in this case by a flat board.

The position of the tail surface was in a plane tangential to the top surface of the wing and parallel to the incident flow, experience having shown that vibrations were most pronounced in this position (tail in line with vortices shed by top surface of wing).

The experiments showed that buffeting only occurred if there was separation of flow at the main wing. In the absence of a fuselage this means that the wing incidence must be above the critical ($\sim 20°$). Vibrations, when they occur, are strictly periodical with a Strouhal number of about .1, provided the tail does not stall. If the tail setting is near the stalling value, the wake disturbance causes the tail flow to alternate between normal and breakaway flow and the response is no longer a periodic vibration.

In the presence of a fuselage, a wake begins to form at the wing root before the stall of the wing as a whole, provided V is sufficiently high. The resulting vibration at the tail is however not important till the critical angle of the main wing is reached. Even in this case, however, the amplitudes are throughout much less than in the case of a free wing, *i.e.*, the fuselage exerts a powerful damping influence.

The frequency of the induced vibrations is however not affected by the presence of the fuselage.

In conformity with the formulæ developed, increasing the stiffness of the wing raises the air velocity for resonance and reduces the amplitude of the maximum deflections.

The author finally investigates the magnitude of the aerodynamic load on the tail due to buffeting. The maximum value of this load is given by

$$\left(\frac{A\partial C_y}{\partial \alpha}\right)\rho V^2 S$$

where A = amplitude of α variation and S = area of tail surface.

Similarly the maximum aerodynamic steady load is given by

$$C_y \text{ max. } \rho V^2 S.$$

By referring the air load due to buffeting to this standard load, a non-dimensional buffeting load coefficient is obtained, defined as

$$C = \frac{(A\partial C_y/\partial \alpha)}{C_y \text{ max.}}$$

Knowing $\partial C_y/\partial \alpha$ and the periodicity of the wake, the value of A (the amplitude of the incidence variation due to buffeting) can be obtained from the amplitude of the forced vibrations (recorded photographically) making use of the differential equation of motion. The experimental results show that just before the stall of the main wing ($\alpha = 20°$), C increases in the absence of a fuselage from about .20 to .60 as tail resonance is approached, but it is in excess of 1.0 for large angles of incidence ($\alpha = 30°$). In the latter case there is practically no speed effect. In the presence of a fuselage, the C values are practically halved.

Summing up, the author draws the following conclusions:—

(1) Buffeting is a resonance effect, the periodicity w of the wake agreeing with the natural frequency p of the tail under bending.

(2) The periodicity of the wake can be estimated from the air speed and the dimensions of the main wing, the Strouhal number being of the order of .12.

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At 300 m.p.h. and a wing chord of 10 feet, $\alpha = 20°$, the wake frequency is of the order of 30 vibrations per second. To prevent resonance, the wing frequency must be appreciably above this figure.

(3) The magnitude of the wing vibration at resonance increases steadily with V. The additional load due to buffeting may amount to 50 or even 100 per cent. of the normal aerodynamic load on the tail.

(4) The wake only contains sufficient energy to induce marked vibrations if the wing originating it is stalled (separation of flow).

(5) Although the wake under these conditions has considerable width, the most dangerous tail position is in line with the top surface of the wing.

The remedies to obviate buffeting are thus clearly indicated:—

(1) Separation of flow at the main wing must be avoided. This applies especially to the root fillets.

(2) The tail must be placed well above the top surface of the main wing.

(3) The natural frequency of the tail should be above that of the wake.

In conclusion, it must be emphasised that the actual character of the tail vibration is very complex and can only be very roughly represented by the simplified system assumed by the author. It is felt, however, that the treatment adopted will give to the practical designer an inkling of the factors involved in producing critical conditions.

Problems of Aircraft Development. (A. Lippisch, Luftwissen, Vol. 10, No. 4, April, 1943, pp. 113-118.) (115/4 Germany.)

Lilienthal was the first who demonstrated experimentally that a slightly cambered surface is a more efficient lift producing agent than a flat plate (1871). Such a surface will produce lift even at zero incidence, thus showing that the momentum theory of lift, till then generally accepted, was untenable.

His subsequent treatise (published in 1890) contained the germ of the modern circulation theory but was completely ignored in Germany.

Although Lilienthal carried out a large number of flights with his glider lasting as long as one minute and covering 300-400 m., his machine suffered from structural weakness due to his attempted copy of bird wing shape. Moreover his method of control (shifting weight of body) was unsatisfactory. It was left to the Americans, Chanute and Wright, to devise the strutted and wire braced biplane construction which by freeing itself from the bird analogy provided a sound engineering solution which held the field for a long time.

The Wrights were also the first to solve the problem of control without altering the position of the c.g. of the aircraft. From the aerodynamic point of view, subsequent development has been rather slow, and until fairly recently improvements in performance were almost entirely due to the larger and more reliable power plants becoming available. The return to glider flying in Germany after World War I concentrated attention on the question of aerodynamic efficiency and this together with the rapid advance in aerodynamic theory paved the way to the modern high speed aircraft in which the drag is reduced to a minimum.

Whilst one source of drag, i.e. that due to boundary layer friction is now fairly well understood, the other source due to interference between the propeller, wing and fuselage is far from being under control.

The author is of the opinion that the "all wing" type of aircraft, by suppressing body/wing interference, presents a promising line of development in this connection, especially if fitted with rear propellers.

In such a machine, all the control surfaces will be carried on the wing and are thus clear of slip stream and downwash effects.

Certain parts of modern high speed aircraft are already subjected to supersonic flow conditions, although the aircraft as a whole is still moving well under sonic speed.

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Such compressibility effects will become more pronounced as the aircraft speed increases. They lead to an appreciable increase in the drag and reduce the factor of safety of the structure. Although the latter difficulty might be overcome by the introduction of higher quality materials in the danger zones, there is no doubt that any marked further increase in flying speed over present day maxima will call for radical changes in design of the aircraft. The author concludes with the hope that German science will find a satisfactory solution for this pressing problem.

Problem of Routine Propeller Balancing. (J. T. Farrah, J. Aeron. Sci., Vol. 10, No. 7, July, 1943, pp. 209-212.) (115/5 U.S.A.)

Unbalance exists to a varying degree in all engine propeller combinations but does not build up to large amplitudes in every case. The propeller gear ratio has a large effect since it determines the frequency of phase coincidence between engine and propeller. Thus a 3:2 gear ratio results in a phase agreement every three revolutions, whilst a 16/11 ratio is only in phase every 16 revolutions and thus preferable.

In addition to gear ratio, the noticeable effects of unbalance depend markedly on the power plant suspension, resonance characteristic of the aircraft, distribution of slip stream, etc., and may thus vary considerably for different types of aircraft. Thus the author instances the case of a propeller tip being sheared off accidentally during take-off of a scheduled air liner and the unbalance not being noticed until the engine was throttled back for the next landing.

The absence of noticeable effects during flight is thus no guarantee of balance and much more sensitive tests must be applied before freedom from avoidable stresses can be assumed.

The author describes an electrical device for this purpose which essentially consists of an electromagnetic vibration pick-up which is clamped to the aircraft structure, the induced current being fed to the stationary coils of a watt meter, whilst the phase of a separate current flowing through the moving coil is adjustable. By observing the phase shift required for max. watt meter reading when adding a known unbalance to the original propeller, both the direction and amount of any original unbalance can be obtained and corrected by suitable balance weights.

The usual procedure is to balance the propeller on the original aircraft, with the engine running on the ground. Thus in addition to any inherent propeller unbalance both the effects of engine unbalance and slip stream are allowed for. It is not surprising that a propeller balanced in this manner may show considerable static and dynamic unbalance when tested by itself in a balancing machine.

Nevertheless propeller tests with the engines on the test bench should prove very valuable, since they may obviate the need of a subsequent balance on the aircraft which is always a tedious and expensive process.

Every effort should be made to render suitable equipment for this purpose generally available.

In conclusion, the author stresses the need for manufacturers building into their propellers ready means for correcting unbalance that may develop during use.

Aerodynamic Considerations of Rotors in Hovering and Vertical Climb Conditions. (C. H. Kármán, J. Aeron. Sci., Vol. 10, No. 7, July, 1943, pp. 201-208.) (115/6 U.S.A.)

The blade element theory of propellers depends on a knowledge of the magnitude and direction of the air stream relative to the moving blade for all distances along the radius.

In addition to the forward and circumferential speeds of the element, the value of the so-called interference flow must be known.

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In the ordinary vortex theory, this interference flow is calculated from the induced velocity due to the helical vortex shed by the propeller, under the assumption that the spacing of the vortex is sufficiently close to represent a uniform solenoid (∞ number of blades).

The results obtained in this manner are in satisfactory agreement with practice for a finite number of blades provided the pitch and thrust coefficients are relatively small.

An accurate theoretical solution for the general case of propellers of high pitch/diameter ratios with a finite number of blades has not yet been obtained.

Goldstein has, however, obtained an exact solution for a finite number of blades, provided a definite circulation distribution exists on the blades such that the flow in the wake at a large distance behind the propeller is identical with the potential flow associated with the uniform axial motion of equidistant helicoidal surfaces of finite radius R. According to the ordinary vortex theory, the inflow angle β is given by the relation

$$\sigma C_L = (4 \tan \beta \,.\, \sin \phi) \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where σ = solidity $= Bb/2r$ (B = number of blades, b = blade width).

$\phi = \theta - \alpha = \beta + \phi_0$.

θ = section blade angle.

α = angle of attack for infinite aspect ratio.

α_0 = geometric angle of advance.

The Goldstein expression is identical with (1), except that the right hand side is multiplied by a factor k which depends on the number of blades B, ϕ and x ($=r/R$).

The author gives these k factors in a series of graphs from which the representative values are given in the following table:—

	Number of Blades B.											
		2			3			4			6	
ϕ	x = .3	.75	.95	.3	.75	.95	.3	.75	.95	.3	.75	.95
0	1	1	1	1	1	1	1	1	1	1	1	1
10	1	.89	.45	1	.96	.55	1	.98	.63	1	1	.77
20	.96	.67	.27	.99	.80	.37	1	.87	.44	1	.94	.55
30	.94	.50	.20	.97	.66	.27	.98	.75	.33	.98	.85	.45
40	.93	.41	.16	.97	.56	.22	.98	.65	.27	1.0	.78	.37
60	.92	.37	.13	1.02	.48	.19	1.02	.58	.23	1.02	.70	.32

For each blade number, k is given for three representative stations $x = r/R$. As $B \to \infty$, $k \to 1$ for all stations, *i.e.*, the ordinary and Goldstein vortex theories give identical results.

For a finite number of blades, as already stated, the Goldstein solution is only correct for a particular circulation distribution leading to a wake of constant pitch and diameter travelling at a constant axial speed (independent of r).

This corresponds to the condition of minimum energy loss. According to the author, however, the Goldstein correction factor even when applied to the general case of circulation distribution presents a marked improvement over the original vortex theory as applied to helicopter problems.

For precise analysis, the following procedure is adopted:—

ϕ_0 and θ are known.

(1) Assume β—this gives ϕ, since $\beta + \phi_0 = \phi$. Hence C_L can be calculated for the given rotor element, using equation (1).

(2) This C_L must agree with the tabulated lift coefficients for infinite aspect ratio for the given section at the angle of attack $\alpha = \theta - \phi$.

These two values of C_L must agree. If not, repeat calculation with a different value of β.

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(3) Knowing C_L, C_D follows (experimental data) and hence the power and thrust coefficients can be calculated.

$$\left.\begin{aligned}\frac{dC_T}{dx}&=\left(\frac{\pi^3}{4}\right)x^3\sigma C_L\left(\frac{\cos^2\beta}{\cos^2\phi_0}\right)\cos\phi\left\{1-\tan\phi\left(\frac{C_D}{C_L}\right)\right\}\\ \frac{dC_P}{dx}&=\left(\frac{\pi^4}{4}\right)x^3\sigma C_L\left(\frac{\cos^2\beta}{\cos^2\phi_0}\right)\sin\phi\left\{1+\cot\phi\left(\frac{C_D}{C_L}\right)\right\}\end{aligned}\right\} \quad (2)$$

These are plotted on an x basis and on integration give C_T and C_P for the complete propeller.

Simplified System of Calculations.

When the plan and pitch distribution are known, it is possible to express C_P in terms of the local value at $x=.75\,R$, *i.e.*,

$$C_p=9.22\frac{\sin 2\beta\sin^2\phi}{\cos^2\phi_0}\left\{1+\left(\frac{C_D}{C_L}\right)\cot\phi\right\}k$$

In this case the integrating factor has been chosen as .6 corresponding to optimum loading conditions.

The calculation has been carried out by the author for a three-bladed rotor for β ranging from 2 to 14° and C_D/C_L from 0 to .06 with ϕ_0 as parameter (0–6°), the results being presented in tabular form.

Now if

P = h.p. input to rotor.
ρ = air density.
n = rev. per second.
D = diameter of rotor.

$$C_p=P/\rho n^3D^5$$

If C_p is known, the above tables can be used to calculate β, since

$$\phi_0=\tan^{-1}V/2\pi rn.$$

(A correction factor T for β is given by the author, if the number of blades differ from 3.)

Substituting for the solidity factor in equation (1) we obtain C_L and hence C_D (provided coefficients of section are available).

From equation (2) the ratio C_T/C_p readily follows and the thrust of the rotor is finally given by

$$T=C_T/C_p\times\text{horse-power}/60\ nD\times 33{,}000.$$

Now if $V_s/2$ = slipstream velocity at rotor

$$T=\rho\pi R^2V_s^2/2.$$

Also KE of slipstream (input per second) $=\rho\,(\pi R^2/4)\,V_s^3$.

Assuming that the whole of the h.p. input to the rotor reappears as slipstream energy

$$T_{ideal}=10.4\,D^{2/3}\,(\text{h.p.})^{2/3}\times(\rho/\rho_0)^{1/3}$$

It is thus possible to estimate the so-called figure of merit of the rotor in hovering flight, T/T_{ideal}.

In conclusion the author points out that the optimum $(b/D)\,C_L$ distribution for hovering flight as given by the Goldstein theory calls for a marked taper in this factor as we proceed towards the tip. The load distribution also shifts slightly towards the tip with an increasing number of blades. General aerodynamic considerations show, however, that such an optimum blade design conflicts with the most desirable feature for horizontal top speed and rotors designed for autorotation.

Nevertheless, the optimum design criteria are most desirable in planning the necessary compromise solutions.

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Further experimental data on the performance of helicopter rotors in forward flight are urgently wanted.

Designed Strengthened Materials. (R. S. Smith and H. Gray, J. Aeron. Sc., Vol. 10, No. 7, July, 1943, pp. 213-217.) (115/7 U.S.A.)

Ordinary corrugated sheet has the following disadvantages:—

(1) The buckling strength is only increased for loads parallel to the corrugations. The strength perpendicular to the corrugation is reduced.
(2) The weight per unit projected area is increased.
(3) The workability of the corrugated sheet is limited.

The authors describe a new process of transferring wavy line patterns to one or both surfaces of the sheet metal by passing it through special rollers.

The object of this so-called " design strengthening " is to achieve a re-distribution of metal in flat sheets so as to improve both the strength/weight and rigidity/weight ratios. The degree of improvement depends on the design of the pattern impressed and its depth.

The pattern can be applied to strengthen the sheet in one direction without weakening it in a perpendicular direction or alternatively the pattern can be such that there is an improvement in two directions at right angles. Displacement of metal can be increased to improve rigidity or decreased to meet other requirements of the finished part. The radii of the lobes in the pattern may be increased to improve transverse fatigue stress values or reduced to secure maximum flexural rigidity. Plain areas can be incorporated for riveting. Since the sheet remains substantially flat after treatment (the distance between successive waves varying between 1/32 and $\frac{1}{2}$ in., whilst the depth of the waves is of the order of 0.2 in.), the weight per unit projected area is the same as that of the original material and the workability as regards stamping, drawing, forming or welding remains unchanged.

The author gives data on the strength characteristic of several types of steel and aluminium sheet, both in the original flat state and after " design strengthening."

The following table shows the improvement obtained:—

Material.	Tensile.	Buckling (cylinder test).	Flexural rigidity (beam test).
Stainless steel (full hard).	Prop. Limit increased 25 per cent. Yield decreased 5 per cent., ultimate increased 8 per cent.	Ultimate buckling strength unaffected. Yield strength increased by 26 per cent. Prop. limit increased by 35 per cent.	E.I. increased by over 80 per cent.
Alclad.	Yield unaffected, ultimate increased by 15 per cent.	No results given.	E.I. increased about 100 per cent.
Carbon steel (cold rolled).	Ultimate up by 30 per cent. Yield increased by over 250 per cent.	Buckling strength increased 70 per cent.	E.I. increased about 15 per cent.
Cr. Mo steel (cold rolled).	Ultimate up by 20 per cent.	Buckling strength increased 44 per cent.	No results given.

Buckling of Al. Alloy Columns and Plates. (H. L. Langhaar, J. Aeron. Sciences, Vol. 10, No. 7, July, 1943, pp. 218-222.) (115/8 U.S.A.)

The Euler buckling equation for columns can be put into the form:—

$$\sigma_{crit} = E_e \times \left\{ \frac{1}{(L/\pi\rho \times 1/\sqrt{C})^2} \right\}$$

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where E_e = effective Young's modulus.
L = length of column.
ρ = radius of gyration of section.
C = end fixity constant.
= 1 (both ends free).
= 4 (both ends fixed).

Similarly for a plate

$$\sigma_{crit} = E_e \times \left\{ \frac{1}{(b/t \times 1/\sqrt{K})} \right\}$$

where b = width of plate.
t = thickness.
K = constant, depending on aspect ratio, end fixity, Poisson ratio and type of loading.

In the elastic range, $E_e = E$ = constant and plotting σ_{crit} against either $L/(\pi\rho\sqrt{c})$ or $b/(t\sqrt{K})$ will produce the well known Euler hyperbola. In the non-elastic range, E_e is variable and less than E with the result that σ_{crit} falls below the Euler hyperbola. The author has carried out a series of experiments on the buckling strength of 24S Al. alloy in the form of columns of various cross-sections as well as plates.

He concludes that

(1) E_e is the same for columns or plates, provided the material has the same yield point.

σ_{crit} is thus a constant for the same values of either

$$\frac{L}{(\pi\rho\sqrt{c})} \text{(columns or} \frac{b}{(t\sqrt{K})} \text{(plates).}$$

(2) In the inelastic range (*i.e.*, departure from Euler curve) σ_{crit} is for the materials examined is approximately given by the linear equation

$$\sigma_{crit} = F_y \left[1.2 - .506\, X \sqrt{F_y/E} \right]$$

where

F_y = yield stress of material.
E = Young's modulus.
$X = L/(\pi\rho\sqrt{c})$ or $b/(t\sqrt{K})$ depending on whether columns or plates are tested.

(3) the separation between the elastic and inelastic ranges occurs at the point $X = 1.58\sqrt{(E/F_y)}$.

In conclusion, the author shows how the charts prepared by him can be used for the analysis of a hot type stringer section undergoing buckling.

For such a combination, the ultimate load P per panel is given by

$$P = \sigma_s A_s + 2t\,(W_1 + W_2)\,\sigma_m$$

where

A_s = cross-sectional area of stringer.
σ_s = ultimate stringer stress (either local or column failure σ_{st} or σ_{sc} whichever is the smaller).
σ_m = max. plate stress (either plate stress σ_{ps} corresponding to σ_s or plate stress σ_{pr} to cause buckling between the rivets, whichever is the smaller).
W_1 = effective width corresponding to stringer span b_1.
W_2 = effective width corresponding to clear plate span b_2.
t = thickness of plate.
t_s = thickness of stringer.
b_s = width of stringer side wall.

σ_{sf} corresponds to $b_s/t_s\sqrt{K}$ abscissa in the chart, with $K = 2.3$ (experimental value).

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σ_{sc} corresponds to $L/\pi\rho\sqrt{C}$ abscissa in the chart, with C as a linear function of L/ρ ranging from $C=3$ at $L/\rho=0$ to $C=3.6$ at $L/\rho=80$.

If plate and stringer are of the same material, $\sigma_{ps}=\sigma_s$. If not, σ_{ps} must be determined by comparative stress-strain curves.

σ_{pr} producing buckling between the rivets corresponds to the failure of a column length $p-d$ (when p=rivet pitch and d=diameter of rivet) and $\rho=t/\sqrt{12}$.

Assuming $C=4$, σ_{pr} corresponds to the abscissa $\sqrt{3}\,(p-d)/\pi t$ on the chart.

Again σ_m is the smaller of the two values σ_{ps} and σ_{pr}.

EFFECTIVE WIDTH.

On the assumption that the stress distribution between consecutive rivet rows is a cosine wave with maximum σ_m on the rivet line and minimum value σ_{cr} midway between the rivet lines.

$$W_1=(\tfrac{1}{4})\,b_1\ (1+\sigma_{cr1}/\sigma_m)$$
$$W_2=(\tfrac{1}{4})\,b_2\ (1+\sigma_{cr2}/\sigma_m)$$

σ_{cr1} and σ_{cr2} correspond to the abscissæ $b_1/t\sqrt{K}$ and $b_2/t\sqrt{K}$ respectively on the chart, with $\sqrt{K}=2.2$ (mean exp: results).

The author states that the method described gives P within ± 10 per cent. provided the buckling stress of the plate is at least 15 per cent. of σ_s. For weaker plates, P is overestimated, mainly because the formulæ for the effective width W_1 and W_2 no longer hold.

Piezo Electric Pressure Recorders of High Natural Frequency—Vibration Characteristics and Protection Against Interference by Inertia Forces. (W. Gohlke, U.D.I. Research Paper No. 407, 1941.) (R.T.P. Translation No. T.H. 1,040.) (115/9 Germany.)

A piezo electric pressure recorder comprises the following parts:—

(1) Pick-up proper.
(2) Amplifier.
(3) Recorder.
(4) Connecting cables.
(5) Power supply.

In an ordinary indicator the pressure is measured directly by the compression of a spring. In the piezo electric instrument this spring is replaced by a quartz crystal, the compression of which is measured indirectly by the electric charge generated.

Items 2-5 can be designed so as to reproduce satisfactorily electric currents of a frequency up to 10,000 cycles/sec., although most of the commercial equipment available at the moment suffers from more or less distortion at frequencies above 4,000 cycles/sec.

The author primarily concerns himself with sources of error in the pick-up itself. Such an instrument essentially consists of a piston transmitting the gas pressure to one side of the quartz, the other side being held in the casing. A control spring between piston and casing subjects the quartz to a certain amount of pre-compression and ensures contact between piston and quartz.

Neglecting the mass of the quartz (which can be made very small) the system has two degrees of freedom corresponding to natural oscillations of the piston relatively to the casing and the casing relatively to its attachment (e.g. engine frame).

The piston oscillations are controlled by its mass and by the elasticity of the quartz and control springs, whilst the casing oscillations depend on the mass and elasticity of the latter.

On applying a force of constant amplitude but variable frequency to the piston the compression of the quartz will become very large in the regions of the

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resonance of the system, and the static calibration will obviously not apply. Due to the interaction of the two components of the system, however, the amplification factor may differ from unity (the static value) at an appreciable distance from the resonance point and may even assume negative values if the two natural frequencies are fairly close together.

It is clear, therefore, that the static calibration cannot be applied with confidence unless the frequency response of the recorder is known. Although in a two-mass system this response curve might be calculated theoretically, this is no longer possible in an actual instrument which generally has more than two degrees of freedom and for which the elastic restraints and damping coefficients are not known accurately. It becomes therefore necessary to measure the frequency response curve experimentally.

In order to reproduce actual conditions, this would necessitate subjecting the piston to a gas pressure cycle of known amplitude and variable frequency. This is not being feasible, the author has adopted an indirect method in which the quartz is excited electrically and the response of the piston recorded by means of a variable air gap condenser. The difficulty in this method is to ensure that the forcing impulses are of constant amplitude over the whole range of frequencies and that no harmonics are introduced.

It can easily be shown that the two types of response curves (direct and indirect excitation) are of similar form, provided the damping in the pressure recorder is small.

The author has tested a number of commercial and some special designs of pick-ups in this manner over the frequency range 1,000 to 100,000 cycles per second, the response being plotted in the form x/xa when x and xa are the displacement (amplitude) of the piston at frequencies of to 2,000 cycles respectively.

All the records showed a considerable number of minor resonance peaks in addition to well marked principal resonance at the natural period of the system.

For the commercial types this natural frequency varied between 9,000 and 24,000 cycles per second, whilst some of the special types had a natural frequency as high as 44,000 cycles per second. This was brought about by a reduction in the mass of the piston and the employment of tubular springs for the pre-stressing. By combining spring and piston in one unit (the solid bottom of the tube acting as piston) the natural frequency can even be raised to over 100,000 cycles/sec.

It thus appears that commercial pick-ups should be suitable for frequencies ranging from 2,000 to 6,000 cycles per second, i.e. $\frac{1}{4}$ of their respective natural frequencies. At this distance the amplification factor should be substantially unity. Similarly the special designs should be up to 40,000 cycles/sec.

This, however, pre-supposes the absence of minor resonance periods inside the working range. As already pointed out, such minor disturbances exist even in the best instruments and their possible presence must be allowed for before the static calibration can be applied.

The response curves discussed above refer to the instrument proper. If the pressure recorder is used in conjunction with an unsuitable adaptor, gas vibrations of relatively low frequency and considerable amplitude may falsify the records.

All the instruments tested by the author had a relatively rigid mounting of the quartz, one surface of the latter being pressed against an abutment in the casing. When used as an engine indicator, the casing itself is liable to be subjected to accelerations of high amplitude, which on being transmitted to the quartz may falsify the pressure record.

It is interesting to note that by adopting a fully flexible mounting of the quartz, e.g. by placing it between two diaphragms fixed in the casing, it is possible to eliminate inertia effects of the quartz, i.e. the piezo electric record is no longer affected by acceleration of the instrument casing.

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Such a compensation is, however, only possible if the spring constants of the two diaphragms are exactly alike, i.e. equal loads must produce equal displacements. This is very difficult to ensure when the need of precompression is considered and the different type of loading of the two diaphragms is taken into account (lower diaphragm uniform gas load, top diaphragm concentrated load).

In any case the arrangement would be useless as an engine indicator on account of change in elasticity of the diaphragms with temperature. If a piston is fitted, compensation of inertia forces requires a certain difference in the spring characteristics of the two diaphragms and this reduces the sensitivity of the pressure recorder still further. The author suggests a design in which this difficulty is overcome by loading the top diaphragm by a mass equal to that of the piston. At the same time the pre-stressing is effected by a separate internal tubular spring. It is claimed that this type of instrument would combine the advantages of high natural frequency with insensitivity to longitudinal accelerations of the casing. No experiments to substantiate this appear to have been published.

Medical Research in Some Aspects of Aircraft Design. (W. E. Russell and others, J. Aeron. Sci., Vol. 10, No. 7, July, 1943, pp. 227-231.) (115/10 U.S.A.)

In order to obtain the full advantages associated with the improvement in the performance of modern aircraft, it is essential that the resistance of the crew to physiological disturbances be raised to the highest possible pitch.

Such disturbances are associated mainly with acceleration (cerebral anæmia), rate of climb (" bends ") and altitude (Anoxia). In addition, with the increased time of flight now generally possible, we have the cumulative effects of cold and fatigue, noise and vibration.

The extra physiological stresses involved call for strict and periodic medical examination of the crew combined with educational courses during which the crew become familiarised with the symptoms heralding the onset of physiological disturbances. In this connection the low pressure chamber has proved invaluable.

The Boeing Company have developed a standard " denitrogenation " period of at least 45 minutes before any flight above 25,000 feet is allowed.

During the whole of this period, oxygen is breathed accompanied by mild physical exercise, the crew wearing standard equipment.

It is stated that this treatment has led to almost complete immunity from " bends."

There seems to be no doubt that the ill effects of prolonged flights at great altitudes can only be overcome in a satisfactory manner by the pressure cabin and its incorporation in high altitude aircraft of the future will be one of the main directions in which design will help to combat physiological hazards. The dangers of a sudden pressure release, especially in the case of combat planes, must, however, not be lost sight of and special oxygen masks capable of dealing with excess emergency requirements will have to be developed.

In addition to this major line of development, the authors are of the opinion that the designer could do much to reduce the risks during crash landings by a closer study of internal fittings in the aircraft. In an extreme crash, the aircraft practically disintegrates and the tearing, crushing and grinding injuries are nearly always fatal. In the so-called " marginal " crash, however, the main structure remains more or less intact, the injuries to the crew resulting from being projected against parts of the internal structure. If the human body could be evenly supported, very high rate of deceleration can be withstood without fatal results, and there are several cases on record where a free fall from altitudes up to 150 feet was not even accompanied by serious injuries, provided the body landed in a prone position. The author states that plans are under way for crashing planes under controlled conditions and measuring by means of

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strapped dummies the distribution of the forces in the seat belts and restraining harness, as well as the motion of different parts of the dummy. It is well known that head injuries are the most common cause of fatality and the possibility of the head striking any projecting part of the internal structure during deceleration of the aircraft must be avoided. The authors are of the opinion that once experimental data are available much can be done to reduce fatal injuries during "marginal" crashes.

LIST OF SELECTED TRANSLATIONS.

No. 61.

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

TRANSLATION NUMBER AND AUTHOR.		TITLE AND REFERENCE.
		AERODYNAMICS.
		(*a*) COMPRESSIBILITY.
1865	Prandtl, L. ...	*Compressibility Effect in Air Flow.* (Schriften d. deutschen Akademie der Luftfahrtforschung, No. 30, pp. 1-16.)
1872	Prandtl, L. ...	*General Considerations on the Flow of Compressible Fluids.* (Proceedings of the Volta High Speed Conference, Rome, 1935, pp. 169-197.)
		(*b*) NON-STEADY MOTION.
1867	Cicala, P. ...	*Present State of Research on the Non-Steady Motion of a Lifting Wing.* (L. Aerotecnica, Vol. 19, No. 9-12, Sept.-Dec., 1941, pp. 557-591, 670-685, 759-773.)
		(*c*) CIRCULATION.
1874	—— ...	*The Tunnel Wall Corrections of Rolling and Yawing Moments for a Model with Asymmetric Distribution of Lift.* (Rijks voor de Luchvaart, 1921-1927, pp. 240-255.)
1883	Keller, C. ...	*Kinetic Energy Losses Behind Blade Grids as a Result of Periodic Variation in the Circulation.* (Report of the Institute of Aerodynamics, Technische Hochschule, Zurich, 1934, pp. 167-187.)
		AIRCRAFT AND ACCESSORIES.
1853	Billioque ...	*A Device for Automatically Maintaining the Transverse Stability of an Aircraft in the Presence of Reduced Speed Caused by Diminished Lift.* (*German Patent* 688,035.) (Flugsport, Vol. 32, No. 6, 13/3/40, p. 92.)

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TRANSLATION NUMBER AND AUTHOR.		TITLE AND REFERENCE.
1862	——	*Airborne Machine Gun MG-131.* (Flugsport, Vol. 34, No. 26, Dec., 1942, pp. 407-409.)
1885	Pistolesi, E. ...	*Some Considerations on the Static Longitudinal Stability with Special Reference to Aircraft of the Canard Type.* (L. Aerotecnica, Vol. 22, No. 5, May, 1942, pp. 213-223.)

MATERIALS.

(*a*) PLASTIC AND FIBRES.

1869	Opitz, H. ... Reese, H. ...	*Wear of Plastic Gear Wheels.* (Kunststoffe, Vol. 32, No. 9, Sept., 1942, pp. 263-269.)
1873	Leilich, K.	*Plasticizers for Polyvinyl Chloride.* (Koll Zeitschrift, Vol. 99, No. 1, April, 1943, pp. 107-113.)
1876	Ulrich, M. ... Miller, F. ...	*Strength of Gear Wheels Made from Laminated Plastics.* (Kunststoffe, Vol. 32, No. 9, Sept., 1942, pp. 270-273.)
1878	Kratky, O.	*The Mechanical Properties of Fibrous Substances in Relation to Their Molecular Structure.* (Z. f. Papier, Vol. 56, No. 1-2, 29/1/38, pp. 2-5.)

(*b*) TOOLS.

1871	Perchland, H. ...	*Wear of Cutting Tools as Affected by Their Shape.* (Der Betrieb, Vol. 21, No. 8, Aug., 1942, pp. 335-336.)
1875	Schallbrook, H. ... Bieling, W. ...	*Cutting Capacity of Re-Cut and Chemically Sharpened Files.* (Werkstatt und Betrieb, Vol. 75, No. 8, Aug., 1942, pp. 175-179.)

(*c*) LIGHT ALLOYS.

1880	Semmler, E. ...	*The Structure of Aluminium Oxide Films Used in Surface Structure Investigations by the Contact Film Method (Electron Microscopy).* (Z. f. Metallk., Vol. 34, No. 10, Oct., 1942, pp. 239-251.)
1881	Mahl, H. ... ... Pewlek, F. ...	*Ultra Microscopic Examinations of Aluminium Alloys.* (Z. f. Metallk., Vol. 34, No. 10, Oct., 1942, pp. 232-236.)
1882	Ardenne, M. V. ... Kircher, H.	*Comparison Between Optical and Electron Microscope Records. (Proof of Identity of Contact Film and Parent Surfaces for Hydronalium.)* (Z. f. Metallk., Vol. 34, No. 10, Oct., 1942, pp. 236-237.)

HEAT FLOW.

1866	Breton, J. L. ...	*Protection Against Frost of Freshly Cast Concrete.* (Recherches et Inventions, pp. 73-74.)
1868	Pfriem, H.	*Calculation of the Temperature Fields Variable in Time Possessing Spherical Symmetry by a Difference Method.* (L.F.F., Vol. 19, No. 6, 20/6/42, pp. 197-198.)

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TRANSLATION NUMBER AND AUTHOR.		TITLE AND REFERENCE.
		ELASTICITY AND STRENGTH.
1870	Meyer, J.	*Calculation of Torsional Oscillation Systems Including an Elastically Mounted Epicyclic Gear.* (L.F.F., Vol. 19, No. 6, 20/6/42, pp. 199-200.)
1877	Geiger, J.	*Determination of Crankshaft Stresses in Critical Regions with Account of Damping.* (A.T.Z., Vol. 43, No. 16, 25/8/40, pp. 403-406.)
1879	Tcherayshevsky, J. H.	*Steadiness of Certain Vibrations of Turbine Discs.* (Sov. Kotloturbo, No. 3, March, 1940, pp. 102-106.)
1884	Thoma, D. ... Schilhausl, M. ...	*Stresses and Deformations Under Torsion of Thin-Walled Hollow Cylinders with Circular Cut-Out.* (L.F.F., Vol. 19, No. 6, 20/6/42, pp. 210-214.)

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THEORY AND PRACTICE OF WARFARE.

Training and Organisation.

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1	11481	U.S.A. ...	*Organisation of the American Naval Air Transport Service.* (Inter. Avia., No. 867, 1/5/43, pp. 24-25.)
2	11607	U.S.A. ...	*Suggestions for a Popular Gas Lecture.* (O. Eisenschiml, Ind. and Eng. Chem. (News Ed.), Vol. 21, No. 10, 25/5/43, pp. 760-761.)
3	11643	U.S.A. ...	*Training Flight Test Crews, Pt. II.* (E. T. Allen, Aviation, Vol. 42, No. 5, May, 1943, pp. 118-119 and 417-418.)
4	11783	G.B.	*Technical Training in the R.A.F.* (By D. Vine, Flight, Vol. 43, No. 1,820, 24/6/43, p. 667.)
5	11924	Canada ...	*Paratroop Training, Seth Halton.* (Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 38-42.)
6	11947	G.B.	*Armstrong-Siddeley Technical School (Photograph).* (Aeroplane, Vol. 64, No. 1,674, 25/6/43, p. 727.)
7	11949	Norway ...	*Free Norway's Air Arm.* (Aeroplane, Vol. 64, No. 1,674, 25/6/43, pp. 728-730.)
8	11965	G.B.	*Air Gunner Training.* (Flight, Vol. 43, No. 1,797, 3/6/43, pp. 577-580.)
9	11978	Greece ...	*Greek Air Squadrons.* (Aeroplane, Vol. 64, No. 1,671, 4/6/43, p. 644.)
10	11993	G.B.	*Education in the A.T.C.* (Aeroplane, Vol. 64, No. 1,673, June 18, 1943, p. 691.)
11	12246	Italy	*Paratroop Selection.* (Flight, Vol. 44, No. 1,803, 15/7/43, p. 69.)

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12	12285	G.B. and U.S.A. ...	*British and American Methods of Training Pilots.* (P. G. Sturges, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 64-65, 158.)
13	12304	U.S.A. ...	*Training Navy Air Technicians.* (F. Tupper, Jr., Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 121-122, 130.)
14	12348	U.S.A. ...	*Organization of the U.S. Naval Air Service.* (Inter. Avia., No. 871, 26/5/43, pp. 1-7.)
			General Strategy.
15	11516	G.B.	*Air Losses During the War.* (Engineer, Vol. 176, No. 4,565, 9/7/43, p. 21.)
16	11545	G.B.	*Bombing and Bomber.* (Engineer, Vol. 176, No. 4,566, 16/7/43, pp. 50-51.)
17	11648	U.S.A. ...	*Sub. Hunting by Coastal Air Patrol.* (Aero Digest, Vol. 42, No. 5, May, 1943, pp. 113-115.)
18	11707	U.S.A. ...	*Problems of Global Air War.* (N. F. Sibsbee, A.S.M.E. Preprint, April 26-28, 1943.)
19	11779	U.S.A. ...	*American Air Policy.* (By Major F. A. de V. Robertson, V.D., Flight, Vol. 43, No. 1,820, 24/6/43, p. 658.)
20	11781	G.B.	*The Middle East Theatre of War Operations (Map).* (Flight, Vol. 43, No. 1,820, 24/6/43, pp. A-B.)
21	11983	G.B.	*Gliders for Bombing?* (Aeroplane, Vol. 64, No. 1,671, 4/6/43, p. 660.)
			General Design and Equipment.
22	11615	U.S.A. ...	*Design Analysis of the Bell Aerocobra (with Detailed Drawing).* (E. E. Miller, Aviation, Vol. 42, No. 5, May, 1943, pp. 126-155.)
23	11654	U.S.A. ...	*Jettisonable Steel Fuel Tanks.* (Aero Digest, Vol. 42, No. 5, May, 1943, pp. 151-153.)
24	11772	G.B.	*Details of the Mosquito IV (Drawings).* (Aeroplane, Vol. 65, No. 1,675, 2/7/43, pp. 14-15.)
25	11810	U.S.A. ...	*Portable Steel Grating Mats for Roads and Runways.* (Mechanical Engineering, Vol. 65, No. 3, March, 1943, p. 21.)
26	11841	Germany ...	*Materials in Enemy Aircraft (Fafnir 323 P. 1 Engine).* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 149-154.)
27	11890	G.B.	*Emergency Oxygen Unit for Use in Parachute Escape or in Case of Failure of Regular Oxygen Supply at High Altitudes.* (W. M. Boothby and others, J. Aviation Med., 1940, June, Vol. 11, No. 2, pp. 59-66. Bulletin of War Medicine, Vol. 1, No. 3, Jan., 1941, pp. 194-196.)
28	11957	G.B.	*New Vosper Air-Sea Rescue Launch.* (Flight, Vol. 43, No. 1,798, 10/6/43, p. 599.)
29	11958	G.B.	*The Dive Bomber—Design, Development and Application.* (Flight, Vol. 43, No. 1,798, 10/6/43, pp. 601-605.)
30	11769	G.B.	*Armoured Vests for Bomber Crews.* (Aeroplane, Vol. 65, No. 1,675, 2/7/43, pp. 5, 10.)
31	11972	G.B.	*New Type of Airborne Lifeboat.* (Aeroplane, Vol. 64, No. 1,671, 4/6/43, p. 636.)

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33	11977	Germany	...	*A New Dive Brake* (*Dornier Patent*). (Aeroplane, Vol. 64, No. 1,671, 4/6/43, p. 643.)
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36	12243	G.B. ...	...	*New Type of Rubber Dinghy, Designed for Dropping from Spitfires.* (Flight, Vol. 44, No. 1,803, 15/7/43, pp. 62-63.)
37	12252	G.B. ...	...	*Airborne Lifeboat.* (Flight, Vol. 43, No. 1,799, 17/6/43, p. 628.)
38	12253	G.B. ...	...	*The Dive-Bomber—Progress and Development* (*Contd.*) (*Photographs*). (Flight, Vol. 43, No. 1,799, 17/6/43, pp. 629-633.)
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40	12262	G.B. ...	...	*The Use of Parachute for Arrester Gear.* (Flight, Vol. 44, No. 1,804, 22/7/43, p. 103.)
41	12292	U.S.A.	...	*Camouflage Experiment with North American Mustang* (*Photo*). (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 72.)
42	12293	G.B. ...	...	*Instrument Panel of Short Stirling* (*Photo*). (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 72.)
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46	11640	U.S.A.	...	*Designing Gun Turrets as Integral Part of Aircraft* (*Pt.* 2). (L. G. Frise, Aviation, Vol. 42, No. 5, May, 1943, pp. 247-253.)
47	11944	U.S.A.	...	*Bomb Plotting by Sound.* (Aeroplane, Vol. 64, No. 1,674, 25/6/43, p. 721.)
48	11989	G.B. ...	...	*The Assessment of Aircraft Armament.* (P. G. Masefield, Aeroplane, Vol. 64, No. 1,672, 11/6/43, pp. 672a-677.)
49	11990	G.B. ...	...	*The Bomb Bays of a Handley Page Halifax* (*Photograph*). (Aeroplane, Vol. 64, No. 1,672, 11/6/43, p. 681.)
50	12254	Japan	...	*Jap Machine Guns "96" and "92"* (*Photograph*). (Flight, Vol. 43, No. 1,799, 17/6/43, p. 634.)
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52	12280	U.S.A.	...	*The Norden Bombsight.* (K. Rand, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 37-38, 148.)

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53	12286	U.S.A.	... *Development of Both Offensive and Defensive Armament.* (P. G. Masefield, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 66, 86-93.)
54	12294	U.S.A.	... "*Liberator*" *and* "*Marauder*" *Tail Gun Emplacement* (*Photo*). (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 73.)
55	12335	Germany	... *Technical Warfare* (*Distribution of Shell Splinters*). (K. Justrow, Z.G.S.S., Vol. 38, No. 5, May, 1943, pp. 81-85.)
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58	11489	G.B. ...	... *De Havilland Mosquito II.* (Inter. Avia., No. 868, 10/5/43, p. 7.)
59	11529	G.B. ...	... *The Hawker Typhoon* (*Recognition Details*). (Airc. Eng., Vol. 15, No. 173, July, 1943, pp. 198-199.)
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61	11746	G.B. ...	... *De Havilland Mosquito II.* (Inter. Avia., No. 869-870, 18/5/43, pp. 9-10.)
62	11747	G.B. ...	... *Spitfire Mark IX.* (Inter. Avia., No. 869-870, 18/5/43, pp. 1 and 10.)
63	11760	G.B. ...	... *Hawker Typhoon* (*Photograph*). (Inter. Avia., No. 869-870, 18/5/43, p. 1.)
64	11762	G.B. ...	... *Hawker Hurricane II D* (*Photo*). (Inter. Avia., No. 869-870, 18/5/43, p. 11.)
65	11764	G.B. ...	... *Avro Lancaster I* (*Photograph*). (Aeroplane, Vol. 65, No. 1,675, 2/7/43, p. 2.)
66	11777	G.B. ...	... *Hawker Hurricane II D* (*Recognition Details*). (Flight, Vol. 43, No. 1,820, 24/6/43, p. 655.)
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69	11956	G.B. ...	... *Spitfire V* (*with Clipped Wings*). (Flight, Vol. 43, No. 1,798, 10/6/43, p. 596.)
70	11959	G.B. ...	... *D.H. Moth Minor* (*Recognition Details*). (Flight, Vol. 43, No. 1,798, 10/6/43, p. a.)
71	11960	G.B. ...	... *G.A. Owlet* (*Recognition Details*). (Flight, Vol. 43, No. 1,798, 10/6/43, p. B.)
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73	11970	G.B. ...	... *Spitfires for Russia* (*Photograph*). (Aeroplane, Vol. 64, No. 1.671, 4/6/43, p. 635.)
74	11974	G.B. ...	... *Bristol Beaufighter Carrying Torpedo* (*Photograph*). (Aeroplane, Vol. 64, No. 1,671, 4/6/43, p. 638.)
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76	11981	G.B.	*The Hawker Typhoon 1B (Recognition Details).* (Aeroplane, Vol. 64, No. 1,671, 4/6/43, pp. 648-649.)
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78	11992	G.B.	*The New Halifax II, Series 1A (Photograph).* (Aeroplane, Vol. 64, No. 1,673, June 18, 1943, pp. 690-692.)
79	11996	G.B.	*New Types for Spitfires (Photograph).* (Aeroplane, Vol. 64, No. 1,673, June 18, 1943, p. 694.)
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81	12265	G.B.	*Handley Page Halifax, Mark I and II (Photographs).* (Flight, Vol. 44, No. 1,804, 22/7/43, pp. 92-93.)
82	12290	G.B.	*Hawker Typhoon (Recognition Details).* (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 71.)
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86	11463	U.S.A. ...	*Sikorsky Helicopter.* (Aviation, Vol. 42, No. 4, April, 1943, p. 237.)
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91	11486	U.S.A. ...	*Lockheed L-49 Constellation Tail Unit (Photo).* (Inter. Avia., No. 867, 1/5/43, p. 1.)
92	11490	U.S.A. ...	*Boeing B-17 Long Range Bombers.* (Inter. Avia., No. 868, 10/5/43, p. 7.)
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173	12255	Germany	... *Axis Report of New German Altitude Glider.* (Flight, Vol. 43, No. 1,799, 17/6/43, p. 634.)
			Anti-Tank and Artillery Practice.
174	11785	U.S.A.	... *Fire Power for Victory.* (By Maj.-Gen. Levin H. Campbell, Jr., Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 493-495.)
175	11787	U.S.A.	... *New Tank Destroyer M. 10* (*Photograph*). (Army Ordnance, Vol. 24, No. 138, May-June, 1943, p. 502.)
176	11788	U.S.A.	... *New 3-inch Mobile Anti-Tank Gun* (*Photograph*). (Army Ordnance, Vol. 24, No. 138, May-June, 1943, p. 502.)
177	11792	U.S.A.	... *American Artillery* (*Photograph*). (Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 513-520.)
178	11793	U.S.A.	... *Prevention Maintenance, Pt. III. The Mechanic's Rôle in the Field.* (By Brig.-Gen. J. Kirk, Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 542-544.)
179	11794	G.B. ...	... *The British 6-Pounder Anti-Tank Gun.* (By H. Rowan Robinson, Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 545-546.)
180	11796	U.S.A.	... *New Ordnance Weapon "Bazooka."* (Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 550-551.)

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ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL.

AERODYNAMICS AND HYDRODYNAMICS.

Profile Theory.

181	12392	Germany ...	*Aspect Ratio Correction Factor for Rectangular Elliptical and Quasi-Elliptical Wings.* (*Profile series No.* 38.) (J. Kleinwächteiz, Flugsport, Vol. 35, No. 11, 14/7/43, pp. 153-156.)
182	12715	Germany ...	*Contribution to Profile Theory—V* (*Theory of the Method of Singularities*). (H. B. Helmbold, L.F.F., Vol. 20, No. 6, 30/6/43, pp. 192-195.)
183	12716	Germany ...	*Contribution to Profile Theory—VI. Second Approximation to the Calculation of the Velocity Distribution by the Method of Singularities.* (F. Keune, L.F.F., Vol. 20, No. 6, 30/6/43, pp. 196-206.)
184	12719	Germany ...	*Two-Dimensional Theories of the Slotted Flap for Infinitely Thin Profiles.* (A. Kupper, L.F.F., Vol. 20, No. 1, 20/1/43, pp. 22-28.)

Air and Gas Flow.

185	11372	G.B.	*Fluid Flow Through Restrictions.* (L. S. Greenland, Airc. Eng., Vol. 15, No. 172, June, 1943, pp. 160-164.)
186	11444	U.S.A. ...	*Air Flow Visualization Opens New Avenues of Research.* (E. T. Saxl, Aviation, Vol. 42, No. 4, April, 1943, pp. 148-151 and 326-329.)
187	11575	Germany ...	*Equations of Flow for Gas-Liquid Mixtures* (*Foam*). (G. Heinrich, Z.A.M.M., Vol. 22, No. 2, April, 1942, pp. 117-118.)
188	12714	Germany ...	*On an Approximate Method for Determining the Two-Dimensional Potential Flow of a Compressible Fluid.* (W. Gröbner, L.F.F., Vol. 20, No. 6, 30/6/43, pp. 184-191.)
189	12720	Germany ...	*The Flow of Compressible Fluids about Solid Bodies* (*about Subsonic Speeds*). (F. Eser, L.F.F., Vol. 20, No. 7, 20/7/43, pp. 220-230.)
190	12721	Germany ...	*The Theory of the Unsteady Compression Shock* (*Two-Dimensional Problem*) (*Gas Flow*). (R. Sauer, Ing. Archiv., Vol. 14, No. 1, 1943, pp. 14-20.)
191	12722	Germany ...	*Unsteady Gas Flow in Nozzles and Diffusors with Some Notes on Flow having Spherical Symmetry.* (F. Schultz-Grunow, Ing. Archiv., Vol. 14, No. 1, 1943, pp. 21-29.)
192	12733	Germany ...	*The Experimental Solution of Two-Dimensional Potential Problems by Electrical Dipole Fields.* (K. Schmidt, Ing. Archiv., Vol. 14, No. 1, 1943, pp. 30-52.)

Turbulence.

193	12717	Germany ...	*Some Notes on the Theory of Free Turbulence.* (L. Prandtl, Z.A.M.M., Vol. 22, No. 5, Oct., 1942, pp. 241-243.)

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ITEM NO.	R.T.P. REF.	TITLE OF JOURNAL.	
194	12718	Germany	... *A New Approximate Method for the Numerical Evaluation of Free Turbulence Problems.* (H. Görtler, Z.A.M.M., Vol. 22, No. 5, Oct., 1942, pp. 244-254.)
195	12724	U.S.A.	... *Tail Buffeting.* (G. Abdrashitov, Trans. C.A.H.I., No. 395, Moscow, 1939.) (R.T.P. Trans. No. T.M. 1,041.)
			Boundary Layer.
196	12725	Germany	... *The Heat Transfer to a Plate in Flow at High Speed.* (E. Eckert, O. Drewitz, Forschung, Vol. 11, No. 3, May-June, 1940.) (R.T.P. Trans. No. T.M. 1,045.)
197	12726	Germany	... *Heat Transfer of Aerofoils and Plates.* (O. Seibert, Jahrbuch der deutsche, L.F.F., 1938, pp. 11, 245-256.) (R.T.P. Trans. T.M. 1,044.)
			Axial Fan Performance.
198	12727	U.S.S.R.	... *Theoretical Determination of Axial Fan Performance.* (E. Struve, C.A.H.I., Report No. 295, Moscow, 1937.) (Available as R.T.P., Trans. No. T.M. 1,042.)
			Two-Stage Turbo Blower Investigations.
199	12728	U.S.S.R.	... *Experimental Investigation of a Model of a Two-Stage Turbo Blower.* (S. Dovjik and W. Polikovsky, C.A.H.I., Report No. 191, Moscow, 1935.) (R.T.P., Trans. No. T.M. 1,043.)
			Hydrodynamic Equations.
200	12320	G.B. ...	... *The Equations of Hydrodynamics in a Very General Form.* (R. and M. 1903, Nov., 1942.)
			AIRCRAFT, AIRSCREWS AND ACCESSORIES.
			Civil Transport and Air Cargo.
201	11756	G.B. ...	... *British Civil Aviation Crisis.* (Inter. Avia., No. 869-870, 18/5/43, pp. 27-28.)
202	11758	Germany	... *Stuttgart Air Transport Research.* (Inter. Avia., No. 869-870, 18/5/43, p. 30.)
203	11765	G.B. ...	... *Memorandum of S.B.A.C. on Air Transport.* (Aeroplane, Vol. 65, No. 1,675, 2/7/43, pp. 4-5.)
204	11923	Canada	... *The Skyways are the Highways of To-morrow.* (W. A. Hunter, B.A., Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 22-37.)
205	11955	G.B. ...	... *Post-War Transport Aircraft—II (Wilbur Wright Memorial Lecture).* (Aeroplane, Vol. 64, No. 1,674, 25/6/43, pp. 742-742a.)
206	11962	G.B. ...	... *Post-War Transport Aircraft (Wilbur Wright Memorial Lecture) (Contd.).* (Flight, Vol. 43, No. 1,798, 10/6/43, pp. 612-617.)
207	11968	G.B. ...	... *Post-War Transport Aircraft (31st Wilbur Wright Memorial Lecture).* (E. P. Warner, Flight, Vol. 43, No. 1,797, 3/6/43, pp. 581-586.)
208	11969	G.B. ...	... *Commercial Air Transport—its Past History and Future Prospects.* (Sir F. Handley Page, Flight, Vol. 43, No. 1,797, 3/6/43, pp. 586-587.)

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209	11982	G.B.	*Post-War Transport Aircraft* (*31st Wilbur Wright Memorial Lecture*). (Aeroplane, Vol. 64, No. 1,671, 4/6/43, pp. 654-657.)
210	11984	G.B.	*Commercial Air Transport.* (Sir F. Handley Page, Aeroplane, Vol. 64, No. 1,671, 4/6/43, p. 637.)
211	11991	G.B.	*Post-War Transport Aircraft* (*31st Wilbur Wright Memorial Lecture*) (*Contd.*) (E. Warner, Aeroplane, Vol. 64, No. 1,672, 11/6/43, pp. 683-685.)
212	12002	G.B.	*Post-War Transport Aircraft* (*31st Wilbur Wright Memorial Lecture*) (*Contd.*). (Aeroplane, Vol. 64, No. 1,673, June 18, 1943, pp. 712-714.)
213	12214	G.B.	*Post-War Transport Aircraft* (*31st Wilbur Wright Memorial Lecture*). (E. P. Warner, Engineering, Vol. 156, No. 4,046, July 30, 1943, pp. 95-96.)
214	12258	——	*Post-War Transport Aircraft—Pt. III* (*Wilbur Wright Memorial Lecture*). (Flight, Vol. 43, No. 1,799, 17/6/43, pp. 635-638.)
215	12282	U.S.A. ...	*Transporting Curtiss P-40 in a Douglas "Skytrain."* (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 47.)
216	12327	U.S.A. ...	*Packaging and Handling of Air Cargo.* (C. G. Peterson, J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 210-219.)
217	12352	G.B.	*Civil Aviation Development in the U.S.A. and G.B.* (Inter. Avia., No. 871, 26/5/43, pp. 22-25.)
			Civil Aircraft Types.
218	11500	France ...	*Caudron C.R. 920 Mail Aeroplane.* (Inter. Avia., No. 868, 10/5/43, p. 17.)
219	12351	G.B.	*N.N.H. Racing Aircraft* (*Nuffield-Napier-Heston*). (Inter. Avia., No. 871, 1, 26/5/43, pp. 11-12.)
			Testing and Stability.
220	11499	Italy	*Italian Safety Competition* (*Santangels Stall Indicator*). (Inter. Avia., No. 868, 10/5/43, p. 17.)
221	11528	G.B.	*The Latest Stability of Aeroplanes—A. New Geometrical System of Analysis.* (H. L. Price, Airc. Eng., Vol. 15, No. 173, July, 1943, pp. 193-198.)
222	11565	U.S.A. ...	*General Instability of Monocoque Cylinders.* (N. J. Hoff, J. Aeron. Sci., Vol. 10, No. 4, April, 1943, pp. 105-114.)
223	11657	U.S.A. ...	*Streamlining Dynamic Stability Computations—Pt. I.* (M. M. Munk, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 205-206 and 288.)
			Structural Design.
225	10991	U.S.A. ...	*Aircraft Standards Index* (*Standards Adopted by S.A.E. and N.A.S.C.*). (Autom. Ind., Vol. 88, No. 6, 15/3/43, pp. 100 and 193-200.)
226	11527	G.B.	*Analytical Geometry in Common Layouts—II. Folding Wings Employing a Skew Hinge Axis.* (K. W. Hetzel and S. J. Garvey, Airc. Eng., Vol. 15, No. 173, July, 1943, pp. 188-192.)

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227	11530	G.B.	*Aircraft Structural Research.* (F. R. Shanley, Airc. Eng., Vol. 15, No. 173, July, 1943, pp. 200-206.)
228	11597	G.B.	*Plastics in Aircraft Construction.* (D. W. Brown, Plastics, Vol. 7, No. 74, July, 1943, pp. 296-301.)
229	11624	U.S.A. ...	*Points on Plastics in Aircraft Engineering—Pt. II.* (J. Sasso, Aviation, Vol. 42, No. 5, May, 1943, pp. 187-190 and 360-363.)
230	11649	U.S.A. ...	*Cellulose Acetate Sheet Plastic for Aircraft.* (W. E. Moeller, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 183-191.)
231	11653	U.S.A. ...	*Non-Ferrous Alloys for Aeroplanes and Engines.* (J. B. Johnson, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 169-171.)
232	11700	U.S.A. ...	*Problems Affecting the Uses of Wood in Aircraft.* (R. W. Hess, A.S.M.E. Preprint, April 26-28, 1943.)
233	11753	U.S.A. ...	*Inst. of Aeron. Sci., 11th Annual Meeting, List of Papers.* (Inter. Avia., No. 869-870, 18/5/43, pp. 16-17.)
234	11800	U.S.A. ...	*Problems in Aircraft Structural Research.* (By F. R. Shanley, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 169-178.)
235	11805	U.S.A. ...	*Moulded Plastic Bonded Veneers and Wood in Aircraft Construction.* (By R. J. Nebesar, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 197-201.)
236	11820	Switzerland ...	*The Aerodynamic Design of Wing Strut Roots.* (By W. Pfenninger, from Flugwehr und Technik, No. 9, 1942, pp. 237-241.) (Engineer's Digest, Vol. 4, No. 2, Sept., 1943, pp. 57-60.)
237	11925	Canada ...	*Progress in Aircraft Plywood.* (T. D. Parry, Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 44-45.)
238	11926	Canada ...	*Aircraft Plastics.* (J. Delmonte, Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 88-94.)

Accessories (Windscreens, Gears, etc.).

239	11356	Germany ...	*Control Rod Mounting for Pressure Cabins.* (*Pat. series No.* 4, 732,595.) (Messerschmitt, Flugsport, Vol. 35, No. 9, 19/5/43, p. 27.)
240	11357	Germany ...	*Fowler Flap with Aileron Action.* (*Pat. series No.* 4, 732,917.) (Heinkel, Flugsport, Vol. 35, No. 9, 19/5/43, p. 23.)
241	11462	U.S.A. ...	*Bird Proof Windshield.* (Aviation, Vol. 42, No. 4, April, 1943, p. 237.)
242	11540	G.B.	*Spray Shields for Seaplanes* (*Lumarith Plastic Sheets*). (British Plastics, Vol. 15, No. 170, July, 1943, p. 91.)
243	11664	U.S.A. ...	*Bevel Gears in Aircraft—Pt. II.* (A. H. Candee, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 314, 317-318, 328.)
244	11743	U.S.A. ...	*Protection of Landing Wheel Tyres.* (C. R. Mason and W. H. Elliot, S.A.E. Nat. Aeron. Meeting Preprint, April 8-9, 1943.)

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245	11744	U.S.A. ...	*New Wind Shield Developments.* (A. L. Morse, S.A.E. Preprint, Nat. Aeronautic Meeting, April 8-9, 1943.)
246	12281	U.S.A. ...	*Bird Proof Windshields.* (A. L. Morse, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 40-42.)
247	12331	U.S.A. ...	*Symposium on Remote Control for Aircraft.* (J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 33-40.)
			Propellers and Fans.
248	11359	G.B.	*Propellers for Merchant Ships.* (Machinery, Vol. 63, No. 1,604, 8/7/43, pp. 36-41.)
249	11373	G.B.	*Eleventh Annual Meeting of the Institute of Aeron. Sci. (Review of Papers, etc.).* (A. Klemlin, Airc. Eng., Vol. 15, No. 172, June, 1943, pp. 165-173.)
250	11566	U.S.A. ...	*A Tabular Method of Propeller Blade Stress Analysis.* (J. Stuart, Vol. 10, No. 4, April, 1943, pp. 115-118.)
251	11617	U.S.A. ...	*The Problem of Opposite Propeller Rotation, Inboard or Outboard?* (J. H. Hamlet, Aviation, Vol. 42, No. 5, May, 1943, pp. 156-161 and 393.)
253	11829	G.B.	*Design and Operation of Axial Flow Fans.* (Sheet Metal Industry, Vol. 17, No. 192, April, 1942, p. 648.)
254	12216	G.B.	*Rotol V.P. Marine Propellers.* (Engineering, Vol. 156, No. 4,046, July 30, 1943, p. 93.)
255	12287	U.S.A. ...	*The Use of Counter-Rotating Propellers.* (T. B. Martin, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 67-68, 165-166.)
			Airports and Hangars.
256	10970	G.B.	*Land Drainage Machinery.* (Engineer, Vol. 175, No. 4,560, 4/6/43, pp. 442-443.)
257	11466	U.S.A. ...	*Wood Replaces Steel in New Blimp Hangars.* (Aviation, Vol. 42, No. 4, April, 1943, p. 307.)
258	11551	G.B.	*Problems of Land Drainage.* (E. Lathan, Engineering, Vol. 156, No. 4,043, 9/7/43, pp. 22-24.)
259	11738	G.B.	*Aerodrome Abstracts Compiled by D.S.T.R. (Road Research Laboratory).* (Vol. 11, No. 4.) (Abstract Nos. 59-77.)
260	12084	U.S.A. ...	*Report of Committee D. 18 on Soils for Engineering Purposes, Preprint No. 79.* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
261	12283	Canada ...	*Mobile Airport Control.* (J. Montagnes, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 50, 102.)
262	12284	U.S.A. ...	*Post-War Air Terminals.* (H. J. Lubig, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 60-61, 160.)
			Servicing and Maintenance.
263	11389	U.S.A. ...	*Correct Repair of Transparent Sections.* (B. MacIntosh, Aviation, Vol. 42, No. 3, March, 1943, p. 248.)
264	11457	U.S.A. ...	*Aircraft Servicing Organisation.* (A. L. Fornoff, Aviation, Vol. 42, No. 4, April, 1943, pp. 211-213 and 355-359.)

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265	11635	U.S.A.	... *Tail Inspection Stand.* (Aviation, Vol. 42, No. 5, May, 1943, p. 239.)
266	11641	U.S.A.	... *American Modification Centre in England.* (M. V. Cave, Aviation, Vol. 42, No. 5, May, 1943, pp. 255 and 410.)
267	11941	Canada	... *Aircraft Maintenance and Overhaul.* (E. J. Hatton, Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 94-98.)
268	11951	G.B. ...	... *Naval Air Dockyard.* (Aeroplane, Vol. 64, No. 1,674, 25/6/43, pp. 732-734.)
269	11999	G.B. ...	... *Naval Air Dockyard—I.* (Aeroplane, Vol. 64, No. 1,673, June 18, 1943, pp. 699-701.)

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Named Types.

270	11778	G.B. ...	... *The Cheetah X Engine.* (Flight, Vol. 43, No. 1,820, 24/6/43, pp. 656-657.)
271	11988	Germany	... *The 1,600 h.p. B.M.W. 801 Aero Motor (Detailed Photographs).* (Aeroplane, Vol. 64, No. 1,672, 11/6/43, pp. 671-672.)
272	12220	G.B. ...	... *"Jumo" 211 A., B. and D. Fuel Injection System.* (Engineer, Vol. 176, No. 4,569, 6/8/43, pp. 113-116.)
273	12227	Germany	... *Diesel Engines for Ships.* (E. Ehmsen, Schiff und Werft, Vol. 44-24, No. 11-12, June, 1943, pp. 181-186.)

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274	11621	U.S.A.	... *Advantages of Forged Engine Mounts.* (Ch. Frey, Avation, Vol. 42, No. 5, May, 1943, pp. 176 and 394-397.)
275	11626	U.S.A.	... *Welded Seam Inlet Elbows for Pratt and Whitney Engines.* (Aviation, Vol. 42, No. 5, May, 1943, pp. 199 and 393.)
276	11628	U.S.A.	... *Details of Engine Mount Installed on Fleetwings B.T. 12 Basic Trainer.* (Aviation, Vol. 42, No. 5, May, 1943, p. 205.)

Performance and Operation.

277	11618	U.S.A.	... *Power Generation for Aircraft Engines.* (R. L. Findley, Aviation, Vol. 42, No. 5, May, 1943, pp. 162-165 and 351.)
279	11742	U.S.A.	... *Operating Temperature and Stresses of Aluminium Aircraft Engine Parts.* (E. J. Willis and R. G. Anderson, S.A.E. Nat. Aeronautic Meeting, April 8-9, 1943.)
280	11746	U.S.A.	... *Operating Characteristics of Lubrication Systems for an Aircraft Power Plant Installation Under Simulated Altitude Conditions (Sea Level to 40,000 Feet).* (H. A. Scrymgeour, S.A.E. Preprint, Nat. Aeronautic Meeting, April 8-9, 1943.)
281	12326	U.S.A.	... *Influence of Engine Adjustment and Octane Number on Performance of Commercial Engines.* (D. P. Brenz and others, J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 198-209.)
282	12332	U.S.A.	... *Storage Battery Performance at Low Temperature (Summary of Paper).* (J. H. Little, J.S.A.E., Vol. 51, No. 6, June, 1943, p. 36.)

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			Pumps, Turbines, Superchargers.
283	11666	U.S.A.	... *The Pesco Rotary Air Pumps.* (Aero Digest, Vol. 42, No. 5, May, 1943, p. 331.)
284	12211	G.B. ...	... *Hydrostatically Operated Chemical Dozing Pump.* (Engineering, Vol. 156, No. 4,046, July 30, 1943, pp. 86-87.)
285	12325	U.S.A.	... *The Elliott-Lysholm Supercharger.* (A. Lysholm and others, J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 193-197.)
286	12230	Germany	... *Possibilities of the Combustion Turbine Applied to Ship Propulsion.* (R. Schmid, Schiff und Werft, Vol. 44-24, No. 11-12, June, 1943, pp. 199-200.)
287	11701	U.S.A.	... *Theory of the Expanding of Boiler and Condenser Tube Joints Through Rolling.* (A. Nadai, A.S.M.E. Preprint, April 26-28, 1943.)
288	12015	U.S.A.	... *Requirements for Relief of Over-Pressure in Vessels Exposed to Fire.* (J. J. Duggan and others, Preprints of Papers Presented at the Los Angeles Meeting of the A.S.M.E., June 14-17, 1943.)
289	12016	U.S.A.	... *Temperature Relations in Journal Bearing Systems.* (M. Muskat and F. Morgan, Preprints of Papers Presented at the Los Angeles Meeting of the A.S.M.E., June 14-17, 1943.)
			Thermodynamics, Deposit Analysis.
290	12017	U.S.A.	... *Investigation of Large Diesel Engine Wrist Pins, Pistons and Crankcase Explosions.* (F. E. Faast, Preprint of Papers Presented at the Los Angeles Meeting of the A.S.M.E., June 14-17, 1943.)
			Accessories (Plugs, Piston Rings, etc.).
291	11047	G.B. ...	... *New Flexible Shaft Coupling.* (Engineering, Vol. 155, No. 4,039, 11/6/43, p. 476.)
292	11205	Germany	... *Locking Device for Cowlings.* (*Pat. series No.* 3, 730,269.) (Messerschmitt, Flugsport, Vol. 35, No. 8, 21/4/43, p. 17.)
293	11371	G.B. ...	... *Engine Crankshaft Frequency Curves.* (J. Morris and W. J. Evans, Airc. Eng., Vol. 15, No. 172, June, 1943, pp. 136-139 and 164.)
294	11637	U.S.A.	... *Cowl Flap Stand.* (Aviation, Vol. 42, No. 5, May, 1943, p. 243.)
295	12018	U.S.A.	... *Cylinder and Ring Life with Porous Chromium Plated Rings.* (T. C. Jarrett, Preprint of Papers Presented at the Los Angeles Meeting of the A.S.M.E., June 14-17, 1943.)
296	12019	U.S.A.	... *Porous Chromium in Engine Cylinders.* (R. Pyles, Preprints of Papers Presented at the Los Angeles Meeting of the A.S.M.E., June 14-17, 1943.)
297	12241	G.B. ...	... *Oil Seals.* (Automobile Engineer, Vol. 33, No. 438, July, 1943, pp. 291-293.)
298	12266	G.B. ...	... *Thermocouple Plugs.* (Flight, Vol. 44, No. 1,804, 22/7/43, pp. 94-95.)
			Repair and Maintenance.
299	10764	G.B. ...	... *Reclaiming Worn Parts.* (Autom. Eng., Vol. 33, No. 435, April, 1943, pp. 165-167.)

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300	11039	G.B. ...	... *Repair of Damaged Aero Engines.* (Engineer, Vol. 175, No. 4,561, 11/6/43, pp. 470-472.)
301	11448	U.S.A.	... *Proper Care of Compressed Air Plants.* (E. C. Powers, Aviation, Vol. 42, No. 4, April, 1943, pp. 179-180 and 389-390.)
302	11632	U.S.A.	... *Engine Overhaul Station for Training Planes.* (J. R. Horton, Aviation, Vol. 42, No. 5, May, 1943, pp. 231-235 and 363-367.)
303	11636	U.S.A.	... *Engine Nacelle Storage and Overhaul Dolly.* (Aviation, Vol. 42, No. 5, May, 1943, p. 241.)
304	11934	Canada	... *Engine Maintenance for the R.C.A.F. (Photographs).* (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 124-126.)
305	12329	U.S.A.	... *"Cold Weld" Repairs for Salvaging Cracked Cylinder Blocks.* (J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 25-26.)
306	12330	U.S.A.	... *Metal Spraying for Repair Work.* (J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 25-26.)
307	11638	U.S.A.	... *Spark Plug Tester.* (Aviation, Vol. 42, No. 2, May, 1943, p. 243.)
			Testing and Analysis.
308	11703	U.S.A.	... *Chemical Removal of Scale from Heat Exchange Equipment.* (F. N. Alquist and others, A.S.M.E. Preprint, April 26-28, 1943.)
309	11710	U.S.A.	... *Removal of Water-Insoluble Turbine Deposits by Caustic Washing.* (W. L. Webb, A.S.M.E. Preprint, April 26-28, 1943.)
310	12196	U.S.A.	... *Applicability of the Schwartz-Gurney Method for Determining Dissolved Oxygen in Boiler Feedwater and Modification of the Method to Make it Especially Applicable in the Presence of such Impurities as are Encountered in Power Plants. (Preprint No. 91.)* (R. C. Ulmer and others, A.S.T.M., 1943, Preprints, June 28-July 2, 1943.)
311	12197	U.S.A.	... *X-Ray Diffraction Methods in the Study of Power Plant Deposits. (Preprint No. 93.)* (C. E. Imhoff and L. A. Burkardt, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
312	12198	U.S.A.	... *Diagnosis of Water Problems at Linto Station. (Preprint No. 94.)* (E. P. Partridge and others, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
313	12199	U.S.A.	... *The Interpretation of Analyses and Problems Enumerated in Water Deposits. (Preprint No. 95.)* (J. A. Holmes and A. O. Walker, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			General.
314	10985	G.B. ...	... *Technical Abstracts issued by the Aero Engine Dept., Bristol Aeroplane Co., Ltd.* (Vol. 8, No. 22, 3/6/43.)
315	11470	U.S.A.	... *38th Annual Meeting of the S.A.E.* (Aviation, Vol. 42, No. 4, April, 1943, pp. 177 and 394-395.)
316	11714	G.B. ...	... *Rolls-Royce Technical Abstracts and Information, issued by Rolls-Royce Aero Engine Dept.* (Vol. 111, No. 6, June, 1943.)

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317	11728	G.B. ...	... *Technical Abstracts issued by Aero Engine Dept., Bristol Aeroplane Co.* (Vol. 8, No. 23, 10/6/43.)
318	11729	G.B. ...	... *Technical Abstracts issued by Aero Engine Dept., Bristol Aeroplane Co.* (Vol. 8, No. 24, 17/6/43.)
319	11730	G.B. ...	... *Technical Abstracts issued by Aero Engine Dept., Bristol Aeroplane Co.* (Vol. 8, No. 25, 24/6/43.)
320	11731	G.B. ...	... *Technical Abstracts issued by Aero Engine Dept., Bristol Aeroplane Co.* (Vol. 9, No. 1, 1/7/43.)
321	11732	G.B. ...	... *Technical Abstracts issued by Aero Engine Dept., Bristol Aeroplane Co.* (Vol. 9, No. 2, 8/7/43.)
322	11733	G.B. ...	... *Technical Abstracts issued by Aero Engine Dept., Bristol Aeroplane Co.* (Vol. 9, No. 3, 15/7/43.)
323	12249	G.B. ...	... *Rolls-Royce Engine School.* (Flight, Vol. 44, No. 1,803, 15/7/43, pp. 72-74.)

FUELS AND LUBRICANTS.

Aviation Fuel.

324	12072	U.S.A.	... *Report of Committee D. 2 on Petroleum Products and Lubricants (including Appendices: Tests for Knock Characteristics of Aviation Fuels and Motor Fuels; Ignition Quality of Diesel Fuels). (Preprint No. 68.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
325	12202	U.S.A.	... *War Products from Petroleum (Aviation Fuel, Explosives, Rubber).* (F. J. Van Antwerpen, Ind. Eng. and Chem (News Edition), Vol. 21, No. 12, 25/6/43, pp. 900-959, 986-987.)

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326	11507	G.B. ...	... *The Application of Town Gas to Industrial Drying Processes, Tech. Bull., June,* 1943. (J. of the Inst. of Prod. Engs., Vol. 22, No. 6, June, 1943, pp. 22-27.)
327	11550	Australia	... *Town Gas for Motor Vehicles.* (Engineer, Vol. 176, No. 4,566, 16/7/43, p. 58.)
328	11687	G.B. ...	... *The Calorific Value of Gas.* (J. E. Davis, Mech. World, Vol. 114, No. 2,949, 9/7/43, pp. 46-48.)
329	12073	U.S.A.	... *Report of Committee D. 3 on Gaseous Fuels. (Preprint No. 69.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
330	12204	U.S.A.	... *The Future of Natural Gas and its Derivatives.* (K. S. Adams, Ind. Eng. and Chem. (News Edition), Vol. 21, No. 12, 25/6/43, pp. 967-968.)
331	12312	U.S.A.	... *War Products from Natural Gas and Natural Gasoline.* (P. M. Rhigorodsky and F. H. Dotterweich, National Petroleum News, Vol. 35, No. 15, 14/4/43, pp. 14-16.)

Oils and Lubricants.

332	12237	G.B. ...	... *Oil Additives—The Trend of Modern Lubrication Practice.* (E. W. Steinitz and F. J. Grose, Automobile Engineer, Vol. 33, No. 438, July, 1943, pp. 273-275.)
333	12272	U.S.A.	... *Frequency of Motor Oil Changes Under Wartime Driving Conditions (Need for 60-Day Oil Change).* (National Petroleum News, Vol. 35, No. 23, 9/6/43, pp. 32-33.)

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334	12273	U.S.A.	... *Latest Technique in Combating Oil Fires.* (National Petroleum News, Vol. 35, No. 23, 9/6/43, pp. 34-37.)
335	12308	U.S.A.	... *Speeding Products of Oil to War, New River Craft.* (National Petroleum News, Vol. 35, No. 21, 26/5/43, pp. 26-33.)
336	12311	U.S.A.	... *Manifold System at Pan-American's Texas City Pumping Station (Crude Oil).* (National Petroleum News, Vol. 35, No. 17, 28/4/43, p. 20.)
			Coals and Coke.
337	11705	U.S.A.	... *Iowa Coals in the National Emergency.* (H. L. Olin, A.S.M.E. Preprint, April 26-28, 1943.)
338	12076	U.S.A.	... *Report of Committee D. 5 on Coal and Coke. (Preprint 71.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
339	12090	U.S.A.	... *The Gieseler Method for Measurement of the Plastic Characteristics of Coal. (Preprint No. 86.)* (G. C. Soth and C. C. Russell, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			General (Economy, Research, etc.).
340	11735	G.B. ...	... *Fuel Research Intelligence Section. Summary for Two Weeks ending 22 and 29 May,* 1943.
341	11736	G.B. ...	... *Fuel Research Intelligence Section. Summary for Two Weeks ending 5 and 15 June,* 1943.
342	11737	G.B. ...	... *Fuel Research Intelligence Section. Summary for Three Weeks ending 19 and 26 June and 3 July,* 1943.
343	12306	U.S.A.	... *Patent for Production of a "Balanced Motor Fuel."* (National Petroleum News, Vol. 35, No. 21, 26/5/43, p. 16.)
344	12307	U.S.A.	... *Catalytic Refining Patent.* (National Petroleum News, Vol. 35, No. 21, 26/5/43, p. 16.)
345	12314	G.B. ...	... *Distilling Drinking Water from Sea Water (Contd.).* (Petroleum Times, Vol. 47, No. 1,199, 10/7/43, pp. 340-344.)
346	12328	U.S.A.	... *Increased Economy with Fuel and Tyre Rationing.* (E. O. Wirth and A. H. Winkler, J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 220-228.)
			THEORY OF ELASTICITY.
			Stresses.
347	11424	Germany	... *Determination of Stress Distribution by Extensometer Measurement.* (D. Rotscher, Symposium of Papers on the Elements of Machine Design (Aachen), 1935, pp. 3-8.)
350	11811	U.S.A.	... *Code for Working Stresses—Pt. II.* (By J. Martin, The Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 35-38.)
351	11912	U.S.A.	... *An Investigation of the Behaviour of Residual Stresses Under External Load and their Effect on Safety.* (J. T. Norton and D. Rosenthal, Welding Literature, Vol. 5, No. 2, May, 1943, p. 98.)

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352	12054	U.S.A.	... *On the Transition from a Ductile to a Brittle Type of Fracture in Several Low Alloy Steels.* (*Preprint No.* 39.) (P. G. Jones, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
353	12056	U.S.A.	... *Hyperbolic Sine Chart for Estimating Working Stresses of Alloys at Elevated Temperatures.* (*Preprint No.* 42.) (A. Nadai and P. G. McVetty, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
354	12193	U.S.A.	... *Impact Testing of Plastics—1. Energy Considerations.* (*Preprint No.* 88.) (D. Telfair and H. K. Nason, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			Fatigue Testing.
355	12039	U.S.A.	... *Second Progress Report on the Effect of Size of Specimens on Fatigue Strength of Three Types of Steel.* (*Preprint No.* 24.) (H. F. Moore and D. Morkovin, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
356	12057	U.S.A.	... *The Effect of Overstressing and Understressing in Fatigue.* (*Preprint No.* 43.) (J. B. Kommers, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
357	12058	U.S.A.	... *The Fatigue Properties of Some Cold Drawn Nickel Alloy Wires.* (*Preprint No.* 44.) (J. N. Kenyon, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
358	12059	U.S.A.	... *Fatigue Tests on Some Copper Alloys in Wire Form.* (*Preprint No.* 45.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
359	12194	U.S.A.	... *The Relation Between Results of Repeated Blow Impact Tests and of Fatigue Tests.* (*Preprint No.* 89.) (W. N. Findley and O. E. Hintz, Jr., A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			Plates (Compressive Properties).
360	11522	U.S.A.	... *Perforated Cover Plates for Steel Columns: Compressive Properties of Plates having Circular Perforations and a Width to Thickness Ratio of 53 (Contd.).* (A. H. Stang and M. Greenspan, J. Res. Bur. Stands., Vol 30, No. 3, March, 1943, p. 177.)
361	11602	U.S.A.	... *Perforated Cover Plates for Steel Columns: Compressive Properties of Plates having Ovaloid Perforations and a Width-to-Thickness Ratio of 53.* (A. H. Stang and M. Greenspan, J. Res. Nat. Bur. Stands., Vol. 30, No. 1, Jan., 1943, pp. 13-39.)
			Creep Tests.
364	11706	U.S.A.	... *Creep of Metals at Elevated Temperatures—The Hyperbolic Sine Relation Between Stress and Creep Rate.* (P. S. McNatty, A.S.M.E. Preprint, April 26-28, 1943.)
365	11799	U.S.A.	... 100,000-*Hour Creep Test.* (By E. L. Robinson, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 166-168.)

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			Strength Characteristics of Certain Materials.
366	11659	U.S.A. ...	*The Elasticity of Synthetic Rubbers at Low Temperatures (Elastometer Testing).* (G. W. Kisk, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 245-246, 257, 339.)
367	11686	G.B.	*Strength of Glued Scarf Joint.* (Mech. World, Vol. 114, No. 2,949, 9/7/43, pp. 53-55.)
368	12055	U.S.A. ...	*The Technical Cohesive Strength and Mechanical Properties of Metals at Low Temperatures. (Preprint No. 40.)* (D. J. McAdam and R. W. Mebs, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			Box Beams (Testing).
373	11813	Germany ...	*Calculation of Box Type Frames Restricted Against Deformation.* (From Die Werkzeugmaschine, Vol. 46, No. 4, Feb., 1942, pp. 97-101.) (The Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 42-45.)
374	12014	U.S.A. ...	*Theoretical and Experimental Investigations of Thin Webbed Plate Girder Beams.* (H. L. Langhaar, Preprints of Papers Presented at the Los Angeles Meeting of the A.S.M.E., June 14-17, 1943.)
			MATERIALS (PROPERTIES, FABRICATION, INSPECTION).
			A. Properties.
			General Properties (Magnetic, etc.).
375	11061	U.S.A. ...	*Mechanical Properties of Cellulose Acetate as Related to Molecular Chain Length.* (A. M. Sookne and M. Harriss, J. of Res. Nat. Bur. Stands., Vol. 30, No. 1, Jan., 1943, pp. 1-14.)
376	11283	G.B.	*Controls of Raw Materials.* (Engineering, Vol. 155, No. 4,041, 25/6/43, pp. 511-512.)
377	11557	G.B.	*Significance of Mechanical Test Properties of Metals.* (Hugh O'Niel, Engineering, Vol. 156, No. 4,043, 9/7/43, pp. 38-40.)
378	11561	U.S.A. ...	*High Polymers. A Series of Monographs on the Chemistry, Physics and Technology of High Polymeric Substances. Vol. IV: Natural and Synthetic High Polymers (Book Review).* (K. H. Meyer, Res. Sci. Instrum., Vol. 14, No. 4, April, 1943, p. 107.)
379	11803	U.S.A. ...	*Principal Characteristics of the Important Textile Fibres.* (By Werner von Bergen, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 183-190.)
380	11847	G.B.	*Caustic Embrittlement.* (E. W. Colbeck and others, Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 171-176.)
381	12020	U.S.A. ...	*Annual Report of the Executive Committee. (Preprint No. 1.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
382	12023	U.S.A. ...	*Report of Committee E. 10 on Standards. (Preprint No. 5.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)

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383	12027	U.S.A. ...	*Report of Committee A. 6 on Magnetic Properties.* (*Preprint No.* 9.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
384	12063	U.S.A. ...	*Report of Committee C. 8 on Refractories.* (*Preprint No.* 53.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
385	12066	U.S.A. ...	*Report of Committee C. 16 on Thermal Insulating Materials.* (*Preprint No.* 56.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
386	12079	U.S.A. ...	*Report of Committee D. 9 on Electrical Insulating Materials (Insulating Liquids, etc.).* (*Preprint No.* 74.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
387	12080	U.S.A. ...	*Report of Sectional Committee on Electrical Insulating Materials.* (*Preprint No.* 74*a*.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
388	12083	U.S.A. ...	*Report of Committee D. 13 on Textile Materials.* (*Preprint No.* 77.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
389	12207	U.S.A. ...	*Cumulative Index,* 1913-1942 (*of Papers, Authors and Subjects*). (Proceedings of the I.R.E., Vol. 31, No. 6, Pt. 2, June, 1943.)
			Iron and Steel.
390	11261	U.S.A. ...	*Atomic Structure of Martensite.* (Metal Progress, Vol. 43, No. 5, May, 1943, p. 762.)
391	11553	G.B.	*Rapid Identification of Nickel Steel.* (Engineering, Vol. 156, No. 4,043, 9/7/43, p. 26.)
392	11556	Sweden ...	*Research on Fine-Grained Steel.* (Engineering, Vol. 156, No. 4,043, 9/7/43, p. 29.)
393	11685	Sweden ...	*Swedish Researches in Fine-Grained Steel.* (Mech. World, Vol. 114, No. 2,949, 9/7/43, p. 41.)
394	11842	G.B.	*Hardness of Steel.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 155-158.)
395	11849	G.B.	*Special Steels and the Conservation of Alloys.* (Dr. W. H. Hatfield, Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 181.)
396	11851	Germany ...	*Solubility of Steels in Lead and Lead Alloys.* (From Zeitschrift für Metalkunde, May, 1942.) (W. Timmerhoff, Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 187-188.)
397	11855	Germany ...	*Austenitic Manganese Valve Steels.* (H. Cornelius (from the German), Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 191-192, 198.)
398	11862	G.B.	*Manufacture of Ferrous Material from Ore (Study of Foreign Processes).* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 201.)
399	12024	U.S.A. ...	*Report of Committee A. 1 on Steel.* (*Preprint No.* 6.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
400	12025	U.S.A. ...	*Report of Committee A. 3 on Cast Iron.* (*Preprint No.* 7.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)

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401	12029	U.S.A.	... *Report of Committee A. 7 on Malleable Iron Castings.* (*Preprint No.* 10.) (A.S.T.M., 1943 preprints, June 28-July 2, 1943.)
402	12042	U.S.A.	... *A Test for Measuring Drawability of Deep Drawing Steels.* (*Preprint No.* 26.) (F. H. Boulgen and F. B. Dahle, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
403	12043	U.S.A.	... *The Steam Ageing of Killed Low Carbon Steel, with Particular Reference to the Effect of Titanium.* (*Preprint No.* 27.) (G. F. Comstock, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
404	12044	U.S.A.	... *Structure and Creep Characteristics of Cast Carbon-Molybdenum Steel at* 950°*F.* (*Preprint No.* 28.) (H. E. Montgomery and J. Urban, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			Al. and Mg. Alloys.
405	11366	G.B. ...	... *Extinguishing Magnesium Fires.* (Metal Industry, Vol. 63, No. 3, 16/7/43, p. 38.)
406	11414	G.B. ...	... *Production of Multi-Coloured Effects on Anodised Aluminium.* (V. F. Henly, Metal Industry, Vol. 62, No. 25, 18/6/43, pp. 386-388.)
407	11423	G.B. ...	... *Canadian Magnesium Production from Dolomite Deposits.* (Metal Industry, Vol. 62, No. 25, 18/6/43, p. 398.)
408	11513	G.B. ...	... *Aluminium in Post-War Reconstruction—II.* (R. Hammond, Engineer, Vol. 176, No. 4,565, 9/7/43, pp. 33-35.)
409	11830	Germany	... *Properties of Magnesium Alloys as Affecting Design and Fabrication.* (*R.T.P.3 Translation No.* 1,396.) (K. Renner, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 651-657.)
410	11861	G.B. ...	... *The Effect of Minor Alloying Elements in Aluminium Casting Alloys.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 199-201.)
411	12035	U.S.A.	... *Report of Committee B. 7 on Light Metals and Alloys, Cast and Wrought (Including Appendices on "A Comparison of the Performances of Anodic Coatings on Wrought Aluminium Alloys when Exposed to Salt Spray and to the Weather," and "Aluminium Sheet and Plate for Use in Welded Pressure Vessels").* (*Preprint No.* 18.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
412	12040	U.S.A.	... *Report of Joint Committee on Filler Metal (Aluminium and Aluminium-Alloy Metal Arc-Welding Electrodes).* (*Preprint No.* 24*a*.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
413	12049	U.S.A.	... *Experiments on Plastic Bending for Aluminium Alloy* 17*S-T.* (*Preprint No.* 34.) (J. Marin and S. D. Cotterman, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
414	12217	G.B. ...	... *Magnesium: Its Production and Use.* (E. V. Pannell, Engineering, Vol. 156, No. 4,046, July 30, 1943, p. 83.)

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ITEM NO.	R.T.P. REF.		TITLE AND JOURNAL
			Non-Ferrous Metals.
415	11363	G.B. ...	... *The Effect of Certain Impurities on Copper and Copper Alloys.* (G. L. Bailey, Metal Industry, Vol. 63, No. 3, 16/7/43, pp. 34-36.)
416	11367	G.B. ...	... *Brasses as Substitutes for Gun Metal.* (Metal Industry, Vol. 63, No. 3, 16/7/43, pp. 39-40.)
417	11368	G.B. ...	... *Economy in Copper.* (Metal Industry, Vol. 63, No. 3, 16/7/43, p. 40.)
418	11518	G.B. ...	... *The Effects of Certain Impurities on Copper and Copper Alloys.* (G. L. Bailey, Metal Industry, Vol. 63, No. 2, 9/7/43, pp. 20-22.)
419	11525	U.S.A.	... *Thermal Expansion of Titanium.* (P. Hidnert, J. Res. Bur. Stands., Vol. 30, No. 2, Feb., 1943, pp. 101-105.)
420	11684	G.B. ...	... *Tin and Its Uses.* (*Issued by the Tin Research Institute.*) (Mech. World, Vol. 14, No. 2,949, 9/7/43, p. 41.)
421	11741	G.B. ...	... *Abstracts Issued by the Zinc Development Association, July,* 1943.
422	11825	U.S.A.	... *Army Tin Economies.* (Sheet Metal Industry, Vol. 17, No. 192, April, 1942, p. 627.)
423	11856	U.S.A.	... *Production of Metallic Calcium in the U.S.A.* (A. B. Kinzel, Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 193-195.)
424	12028	U.S.A.	... *Report of Committee B. 1 on Copper and Copper Alloy Wires for Electrical Conductors.* (*Preprint No.* 12.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
425	12030	U.S.A.	... *Report of Committee B. 2 on Non-Ferrous Metals and Alloys.* (*Preprint No.* 13.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
426	12033	U.S.A.	... *Report of Committee B. 5 on Copper and Copper Alloys, Cast and Wrought.* (*Preprint No.* 16.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
427	12048	U.S.A.	... *Lead Alloy Coated Copper Wire for Electrical Conductors.* (*Preprint No.* 33.) (C. J. Snyder, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
428	12210	G.B. ...	... *The Problem of Copper and Galvanised Iron in the Same Water System.* (L. Kenworthy, Engineering, Vol. 156, No. 4,046, July 30, 1943, pp. 85-86.)
429	12223	G.B. ...	... *Cu-Sb-Ni Gear Alloy* (*I.B.F. Report*). (Metal Industry, Vol. 63, No. 6, 6/8/43, pp. 86-89.)
430	12344	U.S.A.	... *The Uses of Iridium.* (Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, pp. 191-192.)
431	12346	U.S.A.	... *A New Brazing Alloy, Phos. Copper.* (Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, p. 192.)
			Plastics and Resin.
432	11411	U.S.A.	... *New Plastic Material for Making Dies, Jigs, etc.* (*Thermo-Cast*). (Ind. and Eng. Chem., Vol. 21, No. 8, 25/4/43, p. 561.)
433	11415	U.S.A.	... *Plastic Hinges Replace Metal* ("*Tenite*"). (Ind. and Eng. Chem., Vol. 21, No. 8, 25/4/43, p. 580.)

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434	11533	G.B. ...	... *Vinylidene Chloride Polymers.* (R. C. Reinhardt, British Plastics, Vol. 15, No. 170, July, 1943, pp. 68-78.)
435	11534	Canada	... *Plastics are Essential Materials.* (J. H. Savage, British Plastics, Vol. 15, No. 170, July, 1943, pp. 80-81.)
436	11538	G.B. ...	... *Acrylic Resins Toughen Leather.* (British Plastics, Vol. 15, No. 170, July, 1943, p. 91.)
437	11539	G.B. ...	... *Julelite—an Indian Development.* (British Plastics, Vol. 15, No. 170, July, 1943, p. 91.)
438	11541	G.B. ...	... *All Fibre Plastics-Lined Oil Container.* (British Plastics, Vol. 15, No. 170, July, 1943, p. 92.)
439	11542	G.B. ...	... *Compasses of "Lucite."* (British Plastics, Vol. 15, No. 170, July, 1943, p. 92.)
440	11588	G.B. ...	... *Metallizing Plastics (Contd.).* (E. E. Halls, Plastics, Vol. 7, No. 74, July, 1943, pp. 281-286.)
441	11591	Germany	... *Influence of the Chemical Constitution of Plastics on Their Mechanical Properties.* (From Kunstoffe Technik and Anwendung, Vol. 12, 1942, p. 215.) (K. H. Hawk, Plastics, Vol. 7, No. 74, July, 1943, p. 292.)
442	11739	G.B. ...	... *Plastic Abstract No. 45, Issued by Controller of Chemical Research.*
443	12086	U.S.A.	... *Report of Committee D. 20 on Plastics. (Preprint No. 81.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
444	12191	U.S.A.	... *Deformation Under Load of Rigid Plastics. (Preprint No. 87.)* (R. Burns, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
445	12206	G.B. ...	... *The Practical Use of Plastics in Building and Constructional Work.* (F. S. Snow and others, Chemistry and Industry, Vol. 62, No. 31, July 31, 1943, pp. 287-290.)
446	12212	G.B. ...	... *Hot-Air Ducts of Non-Metallic Material.* (Engineering, Vol. 156, No. 4,046, July 30, 1943, pp. 87-88.)
			Rubber (Nat. and Syn.).
447	11412	U.S.A.	... *Synthetic Rubber Linings for Concrete Fuel Storage Tanks (Thicol F.A.).* (Ind. and Eng. Chem., Vol. 21, No. 8, 25/4/43, pp. 580-583.)
448	11801	U.S.A.	... *War Rubber Problem of the U.S.A.* (By A. V. Karpov, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 179-181, 207.)
449	12081	U.S.A.	... *Report of Committee D. 11 on Rubber Products. (Method of Test for Low Temperature Brittleness of Rubber and Rubber-like Materials; Testing Compressed Asbestos Sheet Packing; Specifications for Insulated Wire and Cable; Polyvinyl Insulating Compound; Specifications for Rubber and Synthetic Rubber Compounds for Automotive and Aeronautical Applications.) (Preprint No. 75.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)

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450	12192	U.S.A. ...	*Relaxation of Rubber-like Materials. (Preprint No. 87a.)* (I. L. Hopkins, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
451	12203	U.S.A. ...	*Paracon (Polyester Rubber).* (B. S. Briggs and C. S. Fuller, Ind. Eng. and Chem. (News Edition), Vol. 21, No. 12, 25/6/43, pp. 962-963.)
452	12305	U.S.A. ...	*Experiments in Growing Russian Rubber Producing Dandelion.* (National Petroleum News, Vol. 35, No. 21, 26/5/43, p. 7.)
453	12309	U.S.A. ...	*Production of Synthetic Rubber, New Alky-Rubber Plant.* (National Petroleum News, Vol. 35, No. 22, 2/6/43, pp. 18-20.)
454	12310	U.S.A. ...	*Synthetic Rubber Discussed by Chemurgic Conference.* (National Petroleum News, Vol. 35, No. 13, 31/3/43, p. 19.)
455	12343	U.S.A. ...	*Use of Synthetic Rubber (Ameripol for Anti-Vibration Mountings).* (Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, p. 191.)
			Wood, Plywood, Paper.
456	11630	U.S.A. ...	*Plywood Bonding—Data Sheet.* (Aviation, Vol. 42, No. 5, May, 1943, pp. 209-211.)
457	11662	U.S.A. ...	*Official Plywood and Veneer Specifications.* (R. C. Perkins, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 273-284.)
458	11802	U.S.A. ...	*Wood—Raw Material of the Future.* (By N. C. Brown, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 182, 196.)
459	11931	Canada ...	*Plywoods and Plastics—Part II.* (C. A. Carter, Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 186-190.)
460	12077	U.S.A. ...	*Report of Committee on Paper and Paper Products. (Preprint No. 72.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
461	12269	Germany ...	*New German Material—Processed Wood ("Pressband").* (Flight, Vol. 44, No. 1,804, 22/7/43, p. 98.)
462	12271	G.B.	*Plywood and Plastics—I.* (W. Nichols, Flight, Vol. 44, No. 1,804, 22/7/43, pp. 99-102.)
			Glass, Plexiglass.
463	11360	G.B.	*Glass Gauges for Routine Inspection.* (Machinery, Vol. 63, No. 1,604, 3/7/43, pp. 42-44.)
464	11384	U.S.A. ...	*Strength Properties of Plexiglass—II.* (W. F. Baritoe, Aviation, Vol. 42, No. 3, March, 1943, pp. 140-149 and 359.)
465	12065	U.S.A. ...	*Report of Committee C. 14 on Glass and Glass Products. (Preprint No. 55.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
466	12201	G.B.	*Cutting Wide Bore Glass Tubing (Heat Generated by Looped String followed by Quenching in Water).* (A. G. Lipscomb, Chemistry and Industry, Vol. 62, No. 32, 7/8/43, p. 303.)
			Silver.
467	11846	G.B.	*Silver as a Substitute in Engineering.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 170.)

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468	11864	G.B. ...	... *Silver for Bearings.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 204.)
			Cements, Mortars, Concrete.
469	11523	U.S.A.	... *Some Properties of Heat-Setting Refractory Mortars.* (R. A. Heindl and William L. Pendergast, J. Res. Bur. Stands., Vol. 30, No. 2, April, 1943, pp. 303-310.)
470	12060	U.S.A.	... *Report of Committee C. 1 on Cement (Including Notes on the "Effect of Alkalies in Portland Cement on the Durability of Concrete").* (*Preprint No.* 50.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
471	12062	U.S.A.	... *Report of Committee C. 7 on Lime.* (*Preprint No.* 52.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
472	12064	U.S.A.	... *Report of Committee C. 9 on Concrete and Concrete Aggregates.* (*Preprint No.* 54.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
473	12068	U.S.A.	... *Increasing the Reflectivity of Standard Portland Cement Concretes by Additions of Hydrated Lime.* (*Preprint No.* 58.) (C. W. Muhlenbruch and B. Marcin, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
474	12069	U.S.A.	... *A Study of the Heat of Solution Procedure for Determining the Heat of Hydration of Portland Cement.* (*Preprint No.* 60.) (L. Shartsis and E. S. Newman, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
475	12070	U.S.A.	... *A New Aspect of Creep in Concrete and its Application to Design.* (*Preprint No.* 64.) (D. McHendry, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
476	12074	U.S.A.	... *Report of Committee D. 4 on Road and Paving Materials.* (*Preprint No.* 70.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
477	12075	U.S.A.	... *Report of Sectional Committee on Road and Paving Materials.* (*Preprint* 70*a*.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			Bituminous Substances.
478	12078	U.S.A.	... *Report of Committee D. 8 on Bituminous Waterproofing and Roofing Materials.* (*Preprint No.* 73.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
479	12987	U.S.A.	... *A Method for Evaluating Performance in Service of Slow-Curing Asphalts.* (*Preprint No.* 83.) (J. Zapata, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
480	12088	U.S.A.	... *Accelerated Weathering of Bituminous Materials—Effect of Operating Variables.* (*Preprint No.* 84.) (B. Weetman, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
481	12089	U.S.A.	... *A Method for the Testing and Evaluation of Road Tars.* (*Preprint No.* 85.) (E. O. Rhodes and H. E. Gillander, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)

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			B. Fabrication.
			Arc, Spot and Flash Welding.
482	11512	G.B. ...	... *Fractures in Welded Ships.* (J. Tutin, Engineer, Vol. 176, No. 4,565, 9/7/43, pp. 28-29.)
483	11546	G.B. ...	... *Fractures in Welded Ships.* (H. B. Fergusson, Engineer, Vol. 176, No. 4,566, 16/7/43, p. 52.)
484	11680	G.B. ...	... *Preventing Wastage of Welding Electrode Stubs.* (Mech. World, Vol. 114, No. 2,949, 9/7/43, pp. 33-34.)
485	11681	G.B. ...	... *Welding Light Metal Sheets.* (Mech. World, Vol. 114, No. 2,949, 9/7/43, p. 34.)
486	11835	G.B. ...	... *Steel Framed Houses Using the Arc Welding Process.* (Boris Osman, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 681-690.)
487	11837	G.B. ...	... *Arc Welding of Magnesium Alloys (Contd.).* (W. S. Loose and A. R. Orban, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 693-696.)
488	11845	G.B. ...	... *Increasing the Speed of Arc Welding.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 167-170.)
489	11904	U.S.A.	... *Physics of the Arc and the Transfer of Metal in Arc Welding: A Review of the Literature to February, 1942.* (W. Spearagen and B. A. Lengyel, Welding Literature, Vol. 5, No. 2, May, 1943, p. 85.)
490	11905	G.B. ...	... *Unionmelt Welding.* (R. R. Sillifant, Welding Literature, Vol. 5, No. 2, May, 1943, p. 87.)
491	11906	U.S.A.	... *Welding Given Tremendous Impetus by War.* (F. J. Oliver, Welding Literature, Vol. 5, No. 2, May, 1943, p. 88.)
492	11907	U.S.A.	... *Arc Welding of Magnesium Alloys.* (W. S. Loose and A. R. Orban, Welding Literature, Vol. 5, No. 2, May, 1943, pp. 90-91.)
493	11908	G.B. ...	... *Under-Water Arc Welding.* (A. J. Hipperson, Welding Literature, Vol. 5, No. 2, May, 1943, p. 93.)
494	11911	U.S.A.	... *High Speed Tube Welding.* (G. V. Slottman, Welding Literature, Vol. 5, No. 2, May, 1943, pp. 97-98.)
495	11913	U.S.A.	... *Unusual Resistance Welding Developments and Operations.* (R. T. Gillette, Welding Literature, Vol. 5, No. 2, May, 1943, p. 99.)
496	11914	U.S.A.	... *Refrigerant-Cooled Spot-Welding Electrodes.* (F. R. Hensel, E. I. Larsen, E. F. Holt, Welding Literature, Vol. 5, No. 2, May, 1943, pp. pp. 101-102.)
497	11915	G.B. ...	... *Flash Welding.* (L. A. Ferney, Welding Literature, Vol. 5, No. 2, May, 1943, pp. 103-104.)
498	11916	G.B. ...	... *Spot Welding Kink.* (D. Holden, Welding Literature, Vol. 5, No. 2, May, 1943, p. 105.)
499	11921	Germany	... *Welding of Aluminium.* (Herrmann, Welding Literature, Vol. 5, No. 2, May, 1943, pp. 119-120.)

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500	12009	G.B. ...	... *Welding of Cast Iron.* (Nature, Vol. 152, No. 3,844, 3/7/43, p. 25.)
501	12200	G.B. ...	... *Special Applications of Welding.* (C. W. Brett, Chemistry and Industry, Vol. 62, No. 32, 7/8/43, p. 301.)
			Heat Treatment and Foundries.
502	11365	G.B. ...	... *Correlation of Foundry Practice and Quality (Discussion).* (H. G. Warrington, Metal Industry, Vol. 63, No. 3, 16/7/43, pp. 37-38.)
503	11555	G.B. ...	... *Heat Treatment of Wrought Aluminium Alloys.* (Engineering, Vol. 156, No. 4,043, 9/7/43, pp. 27-28.)
504	11708	U.S.A.	... *Performance Characteristics of a Downdraft Coking Furnace.* (J. R. Fellows, A.S.M.E. Preprint, April 26-28, 1943.)
505	11819	Germany	... *Carborundum in Foundry Practice.* (By Chr. Bruchhausen, from Die Giesserei, Vol. 29, No. 12, 1942, pp. 208-211.) (Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 55-57.)
506	11844	G.B. ...	... *Infra-Red Heating.* (E. E. Halls, Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 159-166.)
507	11860	G.B. ...	... *Plaster Patterns for the Foundry.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 197-198.)
508	12022	U.S.A.	... *Proposed Standard Definitions of Terms Relating to Heat Treatment of Metals. (Preprint No. 3.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
509	12032	U.S.A.	... *Report of Committee B. 4 on Electrical Heating, Electrical Resistance and Electric Furnace Alloys. (Preprint No. 15.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
510	12215	G.B. ...	... *Foundry Practice and Quantity in Light Alloy Castings.* (H. G. Warrington, Engineering, Vol. 156, No. 4,046, July 30, 1943, pp. 97-100.)
511	12222	G.B. ...	... *Induction Melting of Aluminium.* (Metal Industry, Vol. 63, No. 6, 6/8/43, p. 85.)
512	12232	G.B. ...	... *Furnace Brazing in a Controlled Atmosphere.* (Prod. and Eng. Bull., Vol. 2, No. 7, May, 1943, pp. 291-296.)
513	12239	G.B. ...	... *Nitriding Furnaces.* (Automobile Engineer, Vol. 33, No. 438, July, 1943, pp. 277-282.)
			Casting.
514	10695	G.B. ...	... *Pressure Castings—I.* (F. Dunleary, Foundry Trade J., 18/3/43, pp. 217-221.) (Met. Vick. Tech. Bull., No. 859, 26/3/43, p. 1.)
515	11285	G.B. ...	... *Correlation of Foundry Practice and Quality as Applied to Light Alloy Castings.* (H. G. Warrington, Metal Industry, Vol. 63, No. 1, July 2, 1943, pp. 3-5.)
516	11293	G.B. ...	... *Producing Magnesium Castings.* (E. Bremer, Metal Industry, Vol. 62, No. 26, 25/6/43, pp. 404-405.)
517	11364	G.B. ...	... *Barrel Cleaning of Castings.* (Metal Industry, Vol. 63, No. 3, 16/7/43, p. 36.)

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518	11509	G.B.	*Improved Method of Marking Reference Numbers on Castings.* (J. of the Inst. of Prod. Engs., Vol. 22, No. 6, June, 1943, pp. 30-31.)
519	11519	G.B.	*Correlation of Foundry Practice and Quality as Applied to Light Alloy Castings (Contd.).* (H. G. Warrington, Metal Industry, Vol. 30, No. 2, 9/7/43, pp. 23-25.)
520	11537	G.B.	*Salvage of Porous Castings by Means of Plastics.* (British Plastics, Vol. 15, No. 170, July, 1943, p. 86.)
521	11598	G.B.	*Sealing Porous Castings.* (Plastics, Vol. 7, No. 74, July, 1943, pp. 303-305.)
522	11857	U.S.A. ...	*Centrifugally Cast Guns.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 196.)
523	12034	U.S.A. ...	*Report of Committee B. 6 on Die-Cast Metals and Alloys. (Preprint No. 17.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
524	12345	U.S.A. ...	*Better Iron Castings (Mechanite Process).* (Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, p. 192.)
			Surface Protection.
525	11536	G.B.	*Methyl Methacrylate for Chrome Plating.* (British Plastics, Vol. 15, No. 170, July, 1943, p. 84.)
526	11552	G.B.	*Electroplated Coatings and the Salt Spray Test.* (Engineering, Vol. 156, No. 4,043, 9/7/43, p. 23.)
527	11833	G.B.	*New Uses for Vermiculite (Enamel).* (Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 672-673.)
528	11834	G.B.	*Weather Resistance of Porcelain Enamelled Iron Structural Units.* (W. N. Harrison and Dwight G. Moore, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 677-679.)
529	11848	Germany ...	*Bonderised and Lacquered Steel Sheet (German Developments).* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 177-180.)
530	12036	U.S.A. ...	*Report of Committee B. 8 on Electro Deposited Metallic Coatings. (Preprint No. 19.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
531	12046	U.S.A. ...	*Properties of Plated Lead Coatings on Steel. (Preprint No. 30.)* (G. Soderberg, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
532	12047	U.S.A. ...	*Use and Misuse of the Salt Spray Test as Applied to Electro Deposited Metallic Finishes. (Preprint No. 32.)* (C. H. Sample, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
533	12071	U.S.A. ...	*Report of Committee D. 1 on Paint, Varnish, Lacquer and Related Products. (Preprint No. 67.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
534	12205	G.B.	*Exposure Behaviour and Colour Matching Problems with Bitumen Emulsion Camouflage Paint.* (J. A. Rawlinson and L. G. Gabriel, Journal of the Society of Chem. Ind., Vol. 62, No. 7, July, 1943, pp. 111-112.)

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535	12226	G.B. ...	... *Thickness Testing of Electro Deposits.* (Metal Industry, Vol. 63, No. 6, 6/8/43, pp. 90-92.)
536	12321	G.B. ...	... *Protective Chemical and Surface Finishes for Scientific Instruments and Apparatus.* (H. Sutton, Journal of Scientific Instruments, Vol. 20, No. 6, June, 1943, pp. 86-92.)
537	12322	G.B. ...	... *The Anodic Oxidation of Aluminium and Aluminium Alloys.* (E. Bovey, Journal of Scientific Instruments, Vol. 20, No. 6, June, 1943, pp. 92-97.)
538	12323	G.B. ...	... *Protective Paints and Varnishes for Scientific Instruments and Apparatus.* (W. E. Wornum, Journal of Scientific Instruments, Vol. 20, No. 6, June, 1943, pp. 98-102.)
			Soldering and Bonding.
539	11608	U.S.A.	... *Bonding Koroseal to Steel.* (Ind. and Eng. Chem. (News Ed.), Vol. 21, No. 10, 25/5/43, p. 764.)
540	11919	Germany	... *Hard Soldering Under Protective Gas.* (F. Pawlek, Welding Literature, Vol. 5, No. 2, May, 1943, p. 108.)
541	12050	U.S.A.	... *Conservation of Tin in Soft Solders.* (*Preprint No.* 35.) (D. L. Colwell and W. C. Lang, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
542	12051	U.S.A.	... *The Testing and Properties of Non-Tin Solders Listed in Recent Federal Specifications.* (*Preprint No.* 36.) (J. A. Kies and W. F. Roeser, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
543	12067	U.S.A.	... *Measurement of Bond Between Bricks and Mortar.* (*Preprint No.* 57.) (J. C. Pearson, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			Rolling, Cutting, Drilling.
544	11009	U.S.A.	... *The Importance of Cutting Fluids.* (J. Geschelin, Metal Progress, Vol. 43, No. 4, April, 1943, p. 548.)
545	11362	G.B. ...	... *Drilling Work on Hardening Metals.* (Machinery, Vol. 63, No. 1,604, 8/7/43, p. 48.)
546	11822	Germany	... *Cold and Hot Rolling of Metals.* (O. Emicko and K. H. Lucas (R.T.P.3 Translation No. 1,735), Sheet Metal Industries, Vol. 17, No. 192, April, 1942, p. 611.)
547	11852	G.B. ...	... *Rod Rolling Speeds.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 188.)
548	11863	G.B. ...	... *Cutting by Abrasive Wheels.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 202-204.)
			Powder Metallurgy.
549	11786	U.S.A.	... *Powder Metallurgy.* (By Lieut.-Col. J. W. Frye, Army Ordnance, Vol. 24, No. 138, May-June, 1943, p. 499.)
550	11818	G.B. ...	... *Powder Metallurgy—Pt. II.* (Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 53-55.)
			Polishing, Machining.
551	11506	G.B. ...	... *Machining Efficiency of Lead Bearing Steels.* (J. of the Inst. of Prod. Engs., Vol. 22, No. 6, June, 1943, pp. 211-229.)

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552	11815	Germany ...	*Effective Cooling for Machining.* (By H. Zeder, from Meschinentau (Der Betrut), Vol. 24, No. 5, May, 1942, pp. 203-206.) (Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 46-48.)
553	11853	G.B.	*Electro Polishing of Micro Sections.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 189-190.)
			Extrusion.
554	11585	U.S.A. ...	*Extruded Plastic Tubing* (" *Tulox* "). (Rev. of Sci. Instrum., Vol. 14, No. 5, May, 1943, pp. 154-155.)
555	11609	U.S.A. ...	*Plastic Tubing.* (Ind. and Eng. Chem. (News Ed.), 25/5/43, p. 765.)
556	12225	G.B.	*Control of Press Speed in Extrusion.* (Metal Industry, Vol. 63, No. 6, 6/8/43, p. 89.)
			Machines and Tools.
557	10878	G.B.	*New Super Hard Rivet* (" *Hi Shear* "). (Aeronautics, Vol. 8, No. 4, May, 1942, p. 42.)
558	10295	U.S.A. ...	*The Longhorn Tin Smelter.* (Metal Industry, Vol. 62, No. 26, 25/6/43, p. 406.)
559	11358	G.B.	*Reconditioning Milling Cutters.* (Machinery, Vol. 63, No. 1,604, 8/7/43, p. 33.)
560	11361	G.B.	*New " Hot Press Method " of Making Carbide Tools.* (Machinery, Vol. 63, No. 1,604, 8/7/43, p. 46.)
561	11376	G.B.	*An Adaptable Drill Jig (Speejig).* (Airc. Eng., Vol. 15, No. 172, June, 1943, p. 183.)
562	11515	G.B.	*New Super Finishing Machine.* (Engineer, Vol. 176, No. 4,565, 9/7/43, p. 38.)
563	11520	G.B.	*Automatic Plating Control Flexibility of the Cuprous Oxide Rectifier.* (G. E. Huenerfauth, Metal Industry, Vol. 30, No. 2, 9/7/43, pp. 23-25.)
564	11532	G.B.	*The Development of Carbide-Tipped Tools.* (Airc. Eng., Vol. 15, No. 173, July, 1943, p. 214.)
565	11826	G.B.	*Vibration of Presses.* (Sheet Metal Industry, Vol. 17, No. 192, April, 1942, p. 629.)
566	11859	G.B.	*Wire Enamelling Equipment.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 197.)
567	11909	U.S.A. ...	*Worn High Speed Tools Tipped with Carbide.* (J. S. Gillespie, Welding Literature, Vol. 5, No. 2, May, 1943, p. 94.)
568	12233	G.B.	*Horizontal Boring Machines.* (Prod. and Eng. Bull., Vol. 2, No. 7, May, 1943, pp. 299-301.)
569	12236	G.B.	*Precision Grinders.* (Automobile Engineer, Vol. 33, No. 438, July, 1943, pp. 267-272.)
			C. Inspection.
			General Analysis and Testing.
570	10779	U.S.A. ...	*Predicting Hardenability—Calculation of Joining End-Quench Curve from Analysis.* (J. Field, Metal Progress, Vol. 43, No. 3, March, 1943, pp. 402-405.)
571	10827	U.S.A. ...	*Single Crystal Research for Better Magnetic Materials.* (Sci. Am., Vol. 168, No. 2, Feb., 1943, p. 60.)

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572	11524	U.S.A. ...	*Analytical Separations by Means of Controlled Hydrolytic Precipitation.* (R. Gilchrist, J. Res. Bur. Stands., Vol. 30, No. 2, Feb., 1943, pp. 89-99.)
573	11603	U.S.A. ...	*An Improved Electrode Holder for Spectrographic Analysis.* (B. F. Scribner and C. H. Carliss, J. Res. Bur. Stands., Vol. 30, No. 1, Jan., 1943, pp. 41-45.)
574	11828	G.B.	*The Mercury Cracking Test for Brass Articles.* (R. G. Johnston, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 645-647.)
575	11843	G.B.	*Electrolytic Isolation of Iron Carbide.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 158.)
576	11850	Germany ...	*Spot Reactions in Steel Analysis.* (G. Thanheiser and M. Waterkamp (from Archiv für das Eisen-Lüttenwesen), Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 186.)
577	11854	G.B.	*A Rapid Electrolytic Non-Destructive Test for the Detection of Carbide Precipitation in 18-8 Steels (Abstract).* (H. W. Russell and others, Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 190.)
578	11918	U.S.A. ...	*Correlation of Metallographic and Radiographic Examination of Spot Welds in Aluminium Alloys.* (D. W. Smith and F. Keller, Welding Literature, Vol. 5, No. 2, May, 1943, p. 107.)
579	12008	G.B.	*New X-Ray Evidence of the Nature of the Structural Changes in Cold-Worked Metals.* (H. Lipson and A. R. Stokes, Nature, Vol. 152, No. 3,844, 3/7/43, pp. 20-21.)
580	12010	G.B.	*New X-Ray Evidence on the Nature of the Structural Changes in Cold-Worked Metals.* (W. A. Wood, Nature, Vol. 151, No. 3,838, 22/5/43, p. 585.)
581	12021	U.S.A. ...	*Report of Committee E-1 on Methods of Testing. (Preprint No. 2.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
582	12037	U.S.A. ...	*Report of Committee E. 3 on Chemical Analysis of Metals. (Preprint No. 21.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
583	12038	U.S.A. ...	*Report of Committee E. 4 on Metallography. (Preprint No. 22.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
584	12041	U.S.A. ...	*The Measurement of A.C. and D.C. Permeability on 28-CM Test Specimens (Flat Magnetic Materials). (Preprint No. 25.)* (J. P. Barton and G. W. Smith, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
585	12061	U.S.A. ...	*Report of Committee C. 5 on Fire Tests of Materials and Construction (including Fire Tests of Window Assembly). (Preprint No. 51.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
586	12195	U.S.A. ...	*Field and Laboratory Determination of Dissolved Oxygen. (Preprint No. 90.)* (R. C. Adams and others, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)

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587	12238	G.B.	...	*Dynamic Testing.* (Automobile Engineer, Vol. 33, No. 438, July, 1943, p. 276.)
588	12342	U.S.A.	...	*Electrophosesis of Colloids Under Wartime Conditions.* (K. G. Stern, Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, p. 187.)
				Hardness Testing.
589	11257	U.S.A.	...	*Computations of Hardenability—Effect of Undissolved Carbides.* (Metal Progress, Vol. 43, No. 5, May, 1943, pp. 745-746.)
590	11260	U.S.A.	...	*Avoiding Hardening Cracks.* (Metal Progress, Vol. 43, No. 5, May, 1943, p. 748.)
591	11812	Germany	...	*Scatter of Results of Hardness Testing.* (From Stahl und Eisen, Vol. 62, No. 16, April, 1942, pp. 321-328, by W. Hengemühle.) (The Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 38-42.)
				Corrosion Testing.
592	11858	U.S.A.	...	*Increasing Corrosion Resistance of 18-8 Stainless Steel.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 196.)
593	11920	Germany	...	*The Corrosion Resistance of Hard Soldered Joints in Pure Aluminium.* (R. Kottisch, Welding Literature, Vol. 5, No. 2, May, 1943, p. 110.)
594	12026	U.S.A.	...	*Report of Committee A. 5 on Corrosion of Iron and Steel and on Field Tests of Wire and Wire Products. (Preprint No. 8.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
595	12031	U.S.A.	...	*Report of Committee B. 3 on Corrosion of Non-Ferrous Metals and Alloys (Atmospheric Corrosion and Total Immersion Testing). (Preprint No. 14.)* (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
596	12052	U.S.A.	...	*The Atmospheric Corrosion of Copper. (Preprint No. 37.)* (A. W. Tracey and others, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
597	12053	U.S.A.	...	*The Total Immersion Corrosion Test. (Preprint No. 38.)* (W. A. Wesley, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
				INSTRUMENTS.
				Aircraft.
598	11476	U.S.A.	...	*Vulta Flight Test Recorder.* (Inter. Avia., No. 867, 1/5/43, pp. 13-14.)
599	11634	U.S.A.	...	*Octant Collinator.* (Aviation, Vol. 42, No. 5, May, 1943, p. 239.)
600	11639	U.S.A.	...	*Master Tachometer Test Stand.* (Aviation, Vol. 42, No. 5, May, 1943, p. 243.)
601	11661	U.S.A.	...	*Airframe Stress Analysis Using the Electrical Strain Gauge.* (W. T. Thomson, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 259, 261-263.)
602	11776	G.B.	...	*The Sperry School for Aircraft Instruments Maintenance (Sperry Bombsight, Sperry Gyropilot).* (Aeroplane, Vol. 65, No. 1,675, 2/7/43, pp. 26-27.)

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603	11898	G.B.	*An Instrument for Testing Pilot Fitness.* (C. E. Ferree and G. Rand, J. Aviation Med., 1939, Sept., Vol. 10, No. 3, pp. 114-128.) (Bulletin of War Medicine, Vol. 1, No. 4, March, 1941, pp. 264-265.)
			Electron Microscopes.
604	11369	G.B.	*A Scanning Electron Microscope.* (M. K. Zworykin and others, Metal Industry, Vol. 63, No. 3, 16/7/43, pp. 41-44.)
605	11370	G.B.	*Mounting Micro Specimens.* (Metal Industry, Vol. 63, No. 3, 16/7/43, p. 44.)
606	11521	G.B.	*The Electron Microscope.* (Metal Industry, Vol. 63, No. 2, 9/7/43, p. 28.)
			Flow Meters.
607	11583	U.S.A. ...	*New Flow Indicator.* (Rev. of Sci. Instrum., Vol. 14, No. 5, May, 1943, p. 152.)
608	11668	U.S.A. ...	*Remote Reading Fuel Flow Meter for Fuel Oil, etc.* (Aero Digest, Vol. 42, No. 5, May, 1943, p. 409.)
609	12338	U.S.A. ...	*An Apparatus for Measuring Air Flow During Inspiration.* (R. C. Lee and L. Silverman, Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, pp. 174-181.)
610	12341	U.S.A. ...	*An Indicator for the Level of Liquids.* (A. D. Power, Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, p. 188.)
			Temp. Recording.
611	11581	U.S.A. ...	*Experimental Details for a Precision High Temperature Control Unit Utilising the Hull Circuit.* (C. E. Waring and G. Robinson, Rev. of Sci. Instrum., Vol. 14, No. 5, May, 1943, pp. 143-146.)
612	12013	U.S.A. ...	*Automatic Temperature Recording Control System.* (M. E. Moore, Preprints of Papers Presented at the Los Angeles Meeting of the A.S.M.E., June 14-17, 1943.)
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613	11526	U.S.A. ...	*Miniature Geiger Muller Counter.* (L. F. Curtis, J. Res. Bur. Stands., Vol. 30, No. 2, Feb., 1943, pp. 157-158.)
614	11554	G.B.	*Insulation Stripping Machine for Electric Cables.* (Engineering, Vol. 156, No. 4,043, 9/7/43, p. 27.)
615	11582	U.S.A. ...	*A Fast Clock Switch for Automatic Control Circuits.* (N. L. Yeater, Rev. of Sci. Instrum., Vol. 14, No. 5, May, 1943, pp. 146-147.)
616	12224	G.B.	*Recording Dilatometers (Electrical Capacity Types).* (Metal Industry, Vol. 63, No. 6, 6/8/43, p. 89.)
617	12315	G.B.	*The Electrical Amplifying Stethoscope and Phono-Electrocardioscope (with Discussion).* (G. E. Donovan, J. Inst. Elect. Engs., Vol. 90, Pt. III, No. 10, June, 1943, pp. 38-52.)
618	12339	U.S.A. ...	*A Two-Cycle Flasher (a Light Valve for Providing Single Flashes of 3 m./sec. Duration or Longer).* (S. A. Talbot, Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, pp. 181-184.)

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619	12340	U.S.A. ...	*A Synchronised Calibrator for Sweep and Gain in Cathode Ray Recording (for Oscillographic Study of Nerve Potentiates).* (S. A. Talbot, Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, pp. 184-186.)

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620	11418	G.B.	*Power Washing Machines.* (K. P. Bellinger, Metal Industry, Vol. 62, No. 25, 18/6/43, pp. 393-394.)
621	11517	G.B.	*Gauges for Sheet Metals and Wires.* (Metal Industry, Vol. 63, No. 2, 9/7/43, pp. 18-19.)
622	11558	U.S.A. ...	*Slotted Cylindrical Rotors for Photometric Calibration.* (J. R. Platt and others, the Review of Sci. Instrum., Vol. 14, No. 4, April, 1943, pp. 85-88.)
623	12334	Germany ...	*Determination of the Composition of Smokeless Powders by the Haig Manometric Test.* (M. Tonegutti and E. Brandimarte, Z.G.S.S., Vol. 38, No. 5, May, 1943, pp. 77-81.)
624	11560	U.S.A. ...	*Laboratory Liquid Air Storage.* (J. R. Roebuck, Rev. Sci. Instrum., Vol. 14, No. 4, April, 1943, pp. 90-97.)
625	12229	Germany ...	*The Determination of the Depth of Waterways by the Land Log (Accurate Location of Observer).* (O. Marxen, Schiff und Werft, Vol. 44-24, No. 11-12, June, 1943, pp. 193-195.)

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626	11289	G.B.	*Conservation and Production of Essential Metals for War.* (Metal Industry, Vol. 63, No. 1, 2/7/43, pp. 10-11.)
627	11375	G.B.	*Sampling Inspection and Quality Determination.* (H. Rissik, Airc. Eng., Vol. 15, No. 172. June, 1943, pp. 179-182.)
628	11383	G.B.	*High Speed in the War Time Production Shop.* (G. Schlesinger, Preprint of Paper Presented to Inst. of Prod. Engs., April, 1943.)
629	11437	U.S.A. ...	*Aviation's Place in the Controlled Materials Plan.* (J. Foster, Aviation, Vol. 42, No. 4, April, 1943, pp. 114-115 and 378-389.)
630	11438	U.S.A. ...	*Absenteeism in the Aircraft Industry.* (Aviation, Vol. 42, No. 4, April, 1943, pp. 116-117 and 333-337.)
631	11439	U.S.A. ...	*20 Years of Consolidated Aircraft.* (Aviation, Vol. 42, No. 4, April, 1943, pp. 122-125 and 404.)
632	11455	U.S.A. ...	*Consolidated Sub-Contract System.* (H. G. Golem, Aviation, Vol. 42, No. 4, April, 1943, pp. 195-197 and 342-350.)
633	11514	G.B.	*Problems of Employment (Nuffield College Report).* (Engineer, Vol. 176, No. 4,565, 9/7/43, pp. 35-37.)
634	11620	U.S.A. ...	*Reduction of Man-Hours in Aircraft Production at Consolidated Vultee's Aircraft Plant.* (I. M. Laddon, Aviation, Vol. 42, No. 5, May, 1943, pp. 170-173 and 356-360.)

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635	11713	U.S.A. ...	*Operation of Industrial Power Plants Under War-time Conditions.* (G. H. Scibs, A.S.M.E. Pre-print, April 26-28, 1943.)
636	11771	G.B. ...	*Quantity Control at "Bristols."* (Aeroplane, Vol. 65, No. 1,675, 2/7/43, pp. 12-13.)
637	11791	U.S.A. ...	*Balanced Production for War.* (By H. Bruce, Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 510-512.)
638	11797	U.S.A. ...	*Industry in the Post-War World.* (By A. W. S. Herrington, Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 496-498.)
639	11798	U.S.A. ...	*Post-War Industrial Development.* (By G. A. Sloan, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 163-165.)
640	11823	G.B.	*Plant and Process Problems (Contd.) (Hardening of Steel, etc.).* (D. G. P. Paterson, B.Sc., A.I.C., Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 614-622.)
641	11832	G.B.	*Production Control.* (A. J. Milne, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 669-671 and 673.)
642	12324	U.S.A. ...	*Economic Aspects of Standardization.* (B. C. Boulton, J.S.A.E., Vol. 51, No. 6, June, 1943, pp. 20-22, 44-47.)
			Research and Training.
643	10822	G.B.	*Library Information and Statistics.* (Engineering, Vol. 155, No. 4,031, 28/5/43, pp. 431-432.)
644	11140	G.B.	*Library Notes, Issued by the Library Research Division of I.C.I. (Explosives), Ltd.* (Vol. 23, No. 25, 24/6/43.)
645	11477	U.S.A. ...	*Institute of Aeronautical Science Awards.* (Inter. Avia., No. 867, 1/5/43, p. 15.)
646	11279	G.B.	*Sources of Information (Aslib Guide to Engineering, No. 5).* (Engineering, Vol. 155, No. 4,041, 25/6/43, p. 512.)
647	11548	G.B.	*Problems of Employment.* (Engineer, Vol. 176, No. 4,566, 16/7/43, pp. 56-58.)
648	11614	U.S.A. ...	*Science Abstracts—Section A.* (Issued by the Inst. Elect. Engs., Vol. 46, No. 546, June, 1943.)
649	11697	U.S.A. ...	*The Training Programmes of the Bureau of Training of the War Man Power Commission.* (P. S. Van Wyck, A.S.M.E. Preprint, April 26-28, 1943.)
650	11698	U.S.A. ...	*Practices and Policies of Vocational Training for War Production Members.* (L. S. Hawkins, A.S.M.E. Preprint, April 26-28, 1943.)
651	11711	U.S.A. ...	*C.A.A. War Training Programme in Colleges from a Teacher's Standpoint.* (E. C. Lundquist, A.S.M.E. Preprint, April 26-28, 1943.)
652	11712	U.S.A. ...	*The Services of T.W.I. (Training within Industry).* (A. E. Peterson, A.S.M.E. Preprint, April 26-28, 1943.)
653	11754	U.S.A. ...	*Lease Lend Report.* (Inter. Avia., No. 869-870, 18/5/43, pp. 18-19.)

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654	11804	U.S.A. ...	*Planned Conservation of Man Power.* (By F. K. Mitchell, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 191-196.)
655	11806	U.S.A. ...	*Engineering Education.* (By R. G. Freeman, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 202-204, 207.)
656	11807	U.S.A. ...	*The Organization of Textile Research for War.* (F. S. Blanchard, Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 205-207).
657	11808	U.S.A. ...	*Women in Engineering.* (Mechanical Engineering, Vol. 65, No. 3, March, 1943, p. 210.)
658	12003	G.B.	*Co-operation in Scientific Research in the British Empire.* (Nature, Vol. 152, No. 3,845, 10/7/43, pp. 29-31.)
659	12218	G.B.	*Scientific Research (Extract from Lord Cherwell's Speech in the House of Lords).* (Engineer, Vol. 176, No. 4,569, 6/8/43, pp. 108-109, 110.)
660	12319	G.B.	*Education and Training for Engineers (Report submitted to I.E.E.).* (J. Inst. Elect. Engs., Vol. 90, Pt. I, No. 30, June, 1943, pp. 223-233.)
661	12353	G.B.	*Need for More Research in the British Aircraft Industry.* (Inter. Avia., No. 871, 26/5/43, pp. 12-13).
			Aircraft Production Methods.
662	11454	U.S.A. ...	*Aircraft Steel Tubing (Data Sheets of Specifications, etc.).* (Aviation, Vol. 42, No. 4, April, 1943, pp. 189-191.)
663	11442	U.S.A. ...	*Data on the Engineering and Production of Plastic Components for Aircraft—Part I.* (J. Sasso, Aviation, Vol. 42, No. 4, April, 1943, pp. 141-143 and 403.)
664	11642	G.B.	*Mosquito Design Facilitates Production.* (J. Montagnes, Aviation, Vol. 42, No. 5, May, 1943, pp. 259-261.)
665	11378	U.S.A. ...	*Producing the B-25 Bomber.* (R. E. Dawe, Aviation, Vol. 42, No. 3, March, 1943, pp. 106-111, 359-362.)
666	11379	U.S.A. ...	*Design and Production with Substitute Materials.* (S. R. Carpenter, Aviation, Vol. 51, No. 3, March, 1943, pp. 106-111, 359-362.)
667	11380	U.S.A. ...	*Cold Heat to Expedite Plywood Fabrication.* (C. S. Ricker, Aviation, Vol. 42, No. 3, March, 1943, pp. 116-120 and 327-333.)
668	11385	U.S.A. ...	*Theory and Technique of Perspective Projection—II (Airc. Prod.).* (G. F. Bush, Aviation, Vol. 42, No. 3, March, 1943, pp. 140-149 and 359.)
669	11387	U.S.A. ...	*Centralised Planning for Small Parts.* (J. H. Stephens, Aviation, Vol. 42, No. 3, March, 1943, pp. 217-225.)
670	11440	U.S.A. ...	*Single Assembly Line Produces both B-24 "Liberator Bombers" and C-87 "Liberator Express" Cargo Transports.* (R. C. Sebold and S. J. Powell, Aviation, Vol. 42, No. 4, April, 1943, pp. 126-133, 403-404.)

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671	11443	U.S.A. ...	*Aircraft Tool Planning—Part I.* (R. H. Luders, Aviation, Vol. 42, No. 4, April, 1943, pp. 144-147 and 374-378.)
672	11447	U.S.A. ...	*Theory and Technique of Perspective Projection—Part III.* (G. F. Bush, Aviation, Vol. 42, No. 4, April, 1943, pp. 171-174 and 368-371.)
673	11495	U.S.A. ...	*American Glider Industry.* (Inter. Avia., No. 868, 10/5/43, pp. 14-15.)
674	11549	U.S.A. ...	*American Aircraft Production.* (Engineer, Vol. 176, No. 4,566, 16/7/43, p. 58.)
675	11531	G.B.	*Design and Production Technique—Principles Involved in Shearing.* (A. J. Schroeder, Airc. Eng., Vol. 15, No. 173, July, 1943, pp. 207-212.)
676	11622	U.S.A. ...	*Aircraft Tool Planning—Pt. II.* (R. H. Luders, Aviation, Vol. 42, No. 5, May, 1943, pp. 179-181 and 430-437.)
677	11623	U.S.A. ...	*New Curtiss-Wright Propeller Conveyor Assembly Line.* (Aviation, Vol. 42, No. 5, May, 1943, p. 185.)
678	11625	U.S.A. ...	*Theory and Technique of Perspective Projection—Pt. IV.* (G. F. Bush, Aviation, Vol. 42, No. 5, May, 1943, pp. 194-197 and 375-376.)
679	11652	U.S.A. ...	*African Front Line Aircraft Assembly.* (Aero Digest, Vol. 42, No. 5, May, 1943, pp. 122-124.)
680	11655	U.S.A. ...	*Lofting Problems of Streamline Bodies—Pt. 13.* (C. M. Hartley and R. A. Liming, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 160-164.)
681	11670	U.S.A. ...	*Wartime Production Short Cuts (Douglas Works).* (Aero Digest, Vol. 42, No. 5, May, 1943, pp. 367-371.)
682	11679	U.S.A. ...	*Automatic Pilots Production.* (Aero Digest, Vol. 42, No. 5, May, 1943, pp. 195-197.)
683	11696	U.S.A. ...	*Finishes for Plywood in the Aircraft Industry (Types and Applications).* (R. B. Anderson, A.S.M.E. Preprint, April 26-28, 1943.)
684	11917	U.S.A. ...	*Spot Welding in Aircraft Structures.* (E. S. Jenkins, Welding Literature, Vol. 5, No. 2, May, 1943, p. 106.)
685	11922	U.S.A. ...	*Survey of Arc Welding Practice in the Aircraft Industry.* (M. Nelles, Welding Literature, Vol. 5, No. 2, May, 1943, pp. 121-122.)
686	11927	Canada ...	*Aircraft Plywood and its Finishing Requirements—Pt. III.* (C. A. Carter, Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 96-98.)
687	11930	Canada ...	*Packard "Merlin" Production.* (F. M. Reck, Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 76-79.)
688	11932	U.S.A. ...	*Polishing "Plexiglas" Nose Assemblies (Photograph).* (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, p. 182.)
689	11933	Canada ...	*Canadian Wright Engine Assembly Plants (Photograph).* (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 128-130.)

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690	11935	U.S.A. ...	*Lockheed's "Constellation" (Constructional Details) (Photograph).* (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 110-118.)
691	11936	Canada ...	*Canadian De Havilland's Build "Mosquitos" (Photographs).* (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 60-65.)
692	11937	Canada ...	*Canadian Vickers' Manufacture of Amphibians (Photographs).* (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 66-68-90.)
693	11940	Canada ...	*Noorduyn Plant for Advanced Trainers.* (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 80-84.)
			General Methods.
694	11051	U.S.A. ...	*Production of Specialised Precision Gears.* (Sci. Am., Vol. 168, No. 5, May, 1943, p. 199.)
695	11220	G.B.	*Recent Advances in Electro-Metallurgical Industry.* (J. W. Cuthbertson, Nature, Vol. 151, No. 3,841, 12/6/43, p. 676.)
696	11394	U.S.A. ...	*Technical Developments in High Production Sheet Metal Forming.* (W. Schroeder and J. H. Haylett, J.S.A.E., Vol. 51, No. 5, May, 1943, pp. 170-192.)
697	11658	U.S.A. ...	*Precision Production Welding.* (F. Shaw and Fogett, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 237-242 and 337-339.)
698	11790	U.S.A. ...	*Mechanized Ammunition Manufacture.* (By Col. William E. Larned, Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 504-509.)
699	11816	G.B.	*Composite Stampings Relieve Critical Shortages.* (By G. W. Birdsall, Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 49-51.)
700	11821	G.B.	*Rolling, Processing and Testing of Tin Plate. Pt. III: Pickling.* (By W. E. Hoare, B.Sc. (Eng.), and E. S. Hedges, M.Sc., Ph.D. (Manc.), D.Sc. (Lond.), A.I.C., Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 605-610.)
701	11824	G.B.	*Determination of the Thickness of Tin Coatings.* (Sheet Metal Industry, Vol. 17, No. 192, April, 1942, p. 625.)
702	11827	G.B.	*Spraying Inside Shells, Tubes and Containers.* (G. Montgomery, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, p. 629.)
703	11831	G.B.	*Basis of a Rapid Degreasing Process.* (Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 658-659 and 673.)
704	11836	G.B.	*Treatment of Fusian Welds.* (A. J. T. Eyles, Sheet Metal Industry, Vol. 17, No. 192, April, 1942, pp. 691-692.)
705	11838	G.B.	*A New Electrode Holder for Arc Welding.* (Sheet Metal Industry, Vol. 17, No. 192, April, 1942, p. 696.)
706	11839	G.B.	*Radium in Industrial Radiography.* (R. L. Durant, Metal Treatment, Vol. 9, No. 32, 1942-1943, pp. 139-148.)

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708	11929	Canada	... *Plastic Punches for Drop Hammer and Hydraulic Press.* (Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 80-86.)
709	12045	U.S.A.	... *Chromium Plate in Engineering Applications—its Thickness and Finishing.* (*Preprint No.* 29.) (T. G. Coyle, A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
			Equipment and Layout.
710	11408	U.S.A.	... *Scale Models for Chemical Plant Construction.* (W. Alphin, Ind. and Eng. Chem., Vol. 21, No. 8, 25/4/43, pp. 556-558.)
711	11508	G.B. ...	... *Special Purpose Horizontal Borer* (*Tech. Bull., June*, 1943). (J. of the Inst. of Prod. Engs., Vol. 22, No. 6, June, 1943, pp. 28-30.)
712	11814	Germany	... *A New Automatic Sizing Gauge for External Cylindrical Grinding Machines.* (From Werkstatt und Betrieb, Vol. 75, No. 9, Sept., 1942, pp. 217-218.) (Engineers' Digest, Vol. 4, No. 2, Feb., 1943, pp. 45-46.)
713	11938	Canada	... *Fairchild Plant Production Equipment* (*Photograph*). (Commercial Aviation, Vol. 5, No. 2, Feb., 1943, pp. 70-74.)
714	12085	U.S.A.	... *Report of Committee D.* 19 *on Water for Industries Uses.* (*Preprint No.* 80.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
715	12219	G.B. ...	... *Triplex Process Steel Works in the U.S.A.* (*Combined Cupola, Converter, and Electric or Open Hearth Furnace*). (Engineer, Vol. 176, No. 4,569, 6/8/43, p. 109.)
716	12300	U.S.A.	... *Automatic Rivet Bucker.* (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 114.)
717	12301	U.S.A.	... *Moulded Plywood Tester.* (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 114.)
718	12302	U.S.A.	... 5,500-*Ton Press.* (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 114.)
			Scrap Salvage.
719	11840	G.B. ...	... *The Salvaging of Worn and Under Machined Parts by Plating Methods.* (Metal Treatment, Vol. 9, No. 32, 1942-1943, p. 148.)
720	12082	U.S.A.	... *Report of Committee D.* 12 *on Scraps and Other Detergents.* (*Preprint No.* 76.) (A.S.T.M., 1943 Preprints, June 28-July 2, 1943.)
721	12234	G.B. ...	... *The Importance of Separating Steel Scrap.* (Prod. and Eng. Bull., Vol. 2, No. 7, May, 1943, pp. 309-311.)
			Welfare.
722	11422	G.B. ...	... *Localised Exhaust Appliances for Control of Fumes, Dust, Gases. etc.* (Metal Industry, Vol. 62, No. 25, 18/6/43, p. 396.)

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723	11612	U.S.A.	...	*Transparent Plastic Hood for Moving Parts of Machine to Protect the Worker (Lumarith).* (Ind. Eng. and Chem. (News Ed.), Vol. 21, No. 10, 25/5/43, p. 827.)
724	11650	U.S.A.	...	*Some Elements of Plant Camouflage.* (H. Goff, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 119-121 and 347.)
725	11669	U.S.A.	...	*Welders' Safety Clothing.* (Aero Digest, Vol. 42, No. 5, May, 1943, p. 397.)
726	11882	Germany	...	*Health Protection of Workers in the Explosives Industry (German State Regulations).* (Bulletin of War Medicine, Vol. 3, No. 9, May, 1943, pp. 529-531.)
727	11883	U.S.A.	...	*Metabolic Disturbances in Workers Exposed to Dinitrotoluene.* (L. C. McGee and others, Bulletin of War Medicine, Vol. 3, No. 9, May, 1943, p. 531.)
728	11884	U.S.A.	...	*Trauma of the Skin Due to Wartime Activities.* (J. G. Downing, Bulletin of War Medicine, Vol. 3, No. 9, May, 1943, pp. 531-532.)
729	11894	G.B. ...	...	*The Health and Efficiency of Munition Workers (Book).* (H. M. Vernon (Publishers: Humphrey Milford, Oxford University Press, 138 pp., 1940), Bulletin of War Medicine, Vol. 1, No. 3, Jan., 1941, pp. 197-198.)
730	11902	G.B. ...	...	*Heating, Ventilation and Lighting for Industry in Wartime.* (W. D. Seymour (Occupational Psychology, 1940, Jan., Vol. 14, No. 1, pp. 56-64), Bulletin of War Medicines, Vol. 1, No. 4, March, 1941, pp. 266-267.)
731	11928	Canada	...	*Fire Fighting Mistakes.* (H. E. Heigis, Commercial Aviation, Vol. 5, No. 2, March, 1943, pp. 99-101.)
732	12235	G.B. ...	...	*Black-Out Ventilation.* (Prod. and Eng. Bull., Vol. 2, No. 7, May, 1943, pp. 313-314.)
733	12296	U.S.A.	...	*Accident Prevention in Aircraft Production.* (W. S. Rhodes, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 105-106, 116-119.)

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734	11265	G.B. ...	...	*The Alaska Highway: Its Survey and Construction—II.* (Engineer, Vol. 175, No. 4,563, 25/6/43, pp. 499-500.)
735	11789	U.S.A.	...	*Amphibious Jeep (Photograph).* (Army Ordnance, Vol. 24, No. 138, May-June, 1943, p. 503.)
736	11795	U.S.A.	...	*Tyre Conservation.* (By R. Wood, Army Ordnance, Vol. 24, No. 138, May-June, 1943, pp. 547-550.)
737	12228	Germany	...	*Electrical Speed Control of the Towing Carriage of the Göteborg Tank.* (W. Hinterthan, Schiff und Werft, Vol. 44-24, No. 11-12, June, 1943, pp. 187-191.)
738	12240	G.B. ...	...	*Suspension Springs for Railcars and Motor Coaches.* (P. K. Beemer and Lindvall, Automobile Engineer, Vol. 33, No. 438, July, 1943, pp. 283-287.)

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739	12277	U.S.A. ...	*Has Aviation Doomed the Tank?* (W. Lenenor, Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, pp. 21-23, 128-130.)
740	12303	U.S.A. ...	*Goodyear's New Channel Tread Tyre.* (Flying and Industrial Aviation, Vol. 33, No. 1, July, 1943, p. 116.)
741	12313	U.S.A. ...	*Preventive Maintenance for Trucks and Passenger Cars.* (National Petroleum News, Vol. 35, No. 15, 14/4/43, pp. 24-30.)

WIRELESS AND ELECTRICITY.

Radio Direction Finder, Transmitter, Tele-communication, etc.

742	11631	U.S.A. ...	*Instrument Approach by Radio Direction Finder (Pt. I).* (C. H. McIntosh, Aviation, Vol. 42, No. 5, May, 1943, pp. 224-225 and 317-325.)
743	11734	G.B.	*Abstracts and References Compiled by Radio Research Board (Wireless Engineer).* (July, 1943.)
744	12275	U.S.A. ...	*U.S. Army Portable Transmitter-Receiver.* (Wireless World, Vol. 49, No. 7, July, 1943, pp. 196-197.)
745	12276	G.B.	*Waves in Metals and the Ionosphere.* (M. Johnson, Wireless World, Vol. 49, No. 7, July, 1943, pp. 208-211.)
746	12316	G.B.	*The University Education and Industrial Training of Engineers, with Particular Reference to Telecommunications (with Discussion).* (W. Jackson, J. Inst. Elect. Engs., Vol. 90, Pt. III, No. 10, June, 1943, pp. 53-72.)
747	12318	G.B.	*The Technique of Frequency Measurement and its Application to Telecommunications (Discussion).* (J. Inst. Elect. Engs., Vol. 90, Pt. III, No. 10, June, 1943, pp. 73-74.)
748	12337	U.S.A. ...	*An Improved Cosmic Ray Radio Sonde.* (W. H. Pickering, Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, pp. 171-173.)
749	12347	U.S.A. ...	*"Radar" Radio Detecting and Ranging.* (Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, pp. 192-193.)

Electrical Properties of Materials, Dipole Theory, Electronics.

750	10688	G.B.	*The Electrical Properties of Fibres—I.* (J. W. Illingworth, Textile Recorder, Feb., 1943, pp. 39-43.) (Met. Vick. Tech. News Bull., No. 864, 30/4/43, p. 1.)
751	10696	G.B.	*Electrical Properties of Fibres—II.* (J. W. Illingworth, Textile Recorder, March, 1943, pp. 42-46.) (Met. Vick. Tech. Bull., No. 859, 26/3/43, p. 3.)
752	11599	G.B.	*Electrolytic Aspects of High Polymeric Systems.* (B. J. Brajnikoff, Plastics, Vol. 7, No. 74, July, 1943, pp. 314-322.)
753	11613	U.S.A. ...	*Electrical Engineering Abstracts—Section B.* (Issued by the Inst. Elect. Engs., Vol. 46, No. 546, June, 1943.)

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755	12006	G.B.	*Ultra High Electro-Magnetic Frequencies.* (Nature, Vol. 152, No. 3,845, 10/7/43, p. 54.)
756	12208	G.B.	*The Dipole Theory and the Characteristics of Organic Insulators.* (T. F. Wall, Engineering, Vol. 156, No. 4,046, July 30, 1943, pp. 81-83.)
757	12213	Germany ...	*Three-Phase Synchronous Motors.* (From Elektrotechniq. und Maschinenbau, May 22, 1942, p. 234.) (W. Putz, Engineering, Vol. 156, No. 4,046, July 30, 1943, pp. 94-95.)
758	12317	G.B.	*Discussion on "Electronics in Industry."* (J. Inst. Elect. Engs., Vol. 90, Pt. III, No. 10, June, 1943, pp. 72-73.)
759	12336	U.S.A. ...	*An Electronic Circuit to Control Intensity and Timing of Power for Spot Welding.* (W. B. Nottingham, Review of Scientific Instruments, Vol. 14, No. 6, June, 1943, pp. 161-170.)
760	12401	G.B.	*The Organization of Post-War Electrical Research.* (Journal of the Institution of Electrical Engineers, Vol. 90, Pt. I, No. 30, July, 1943, pp. 261-263.)
761	12402	G.B.	*Standardization as Applied to Industrial Electrical Instruments (with Discussion).* (K. Edgcombe, Journal of the Institution of Electrical Engineers, Vol. 90, Pt. I, No. 30, July, 1943, pp. 263-297.)
762	12403	G.B.	*The Design of Ultra Short Wave Field Strength Measuring Equipment (Abstract).* (F. M. Colebrook and A. C. Gordon-Smith, Journal of the Institution of Electrical Engineers, Vol. 90, Pt. I, No. 30, July, 1943, pp. 300-301.)
763	12404	G.B.	*The Determination of the Electrical Properties of Soil at a Wavelength of 5 Metres (Frequency 60 Mc/S.) (Abstract).* (J. S. McPetrie and J. A. Saxton, Journal of the Institution of Electrical Engineers, Vol. 90, Pt. I, No. 30, July, 1943, p. 301.)
764	12405	G.B.	*The Measurement of the Characteristics of Concentric Cables at Frequencies Between 1 and 100 Megacycles per Second.* (T. I. Jones, Journal of the Institution of Electrical Engineers, Vol. 90, Pt. I, No. 30, July, 1943, p. 302.)

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Thermal Scattering of X-Rays, Rate of Ice Formation, Reflectivity Measurement of Metals, etc.

765	11579	U.S.A. ...	*Determination of Optical Constants of Metals by Reflectivity Measurements.* (J. R. Collins and R. O. Bock, Rev. of Sci. Instrum., Vol. 14, No. 5, May, 1943, pp. 135-141.)
766	11604	U.S.A. ...	*Photo Chemical Stability of Papers.* (H. F. Launer and W. K. Wilson, J. Res. Bur. Stands., Vol. 30, No. 1, Jan., 1943, pp. 55-74.)

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767	11709	U.S.A.	...	*Rate of Ice Formation.* (A. L. London and R. G. Coll, A.S.M.E. Preprint, April 26-28, 1943.)
768	11817	G.B. ...	...	*Heating by Reversed Refrigeration.* (By R. D. Heitchue, Engineer's Digest, Vol. 4, No. 2, Feb., 1943, pp. 51-53.)
769	12007	G.B. ...	...	*Thermal Scattering of X-Rays by Crystals.* (G. H. Begbie and M. Born, Nature, Vol. 152, No. 3,844, 3/7/43, pp. 19-20.)
770	12011	G.B. ...	...	*Insulation of Heating Systems.* (Nature, Vol. 151, No. 3,838, 22/5/43, p. 593.)
771	12231	G.B. ...	...	*Thermodynamics of Crystal Lattices.* (M. Born and M. Brhoborn, Cambridge Philosophical Society Proceedings, Vol. 39, No. 2, June, 1943, pp. 100-127.)

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772	11445	U.S.A.	...	*Photoprint Process of Loft Layout Reproduction.* (F. B. Marshall, Aviation, Vol. 42, No. 4, April, 1943, pp. 154-161.)
773	11559	U.S.A.	...	*A Method for Removing Microscopic Fog from Photographic Plates.* (L. N. Lieberman and H. H. Barschall, The Rev. of Sci. Instrum., Vol. 14, No. 4, April, 1943, pp. 89-90.)
774	11665	U.S.A.	...	*Republic Aviation's Photographic Reproduction System.* (D. C. Cooke, Aero Digest, Vol. 42, No. 5, May, 1943, pp. 221-222, 292 and 296.)

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775	12004	G.B. ...	...	*The Solar Corona and Geomagnetism.* (Nature, Vol. 152, No. 3,845, 10/7/43, p. 44.)
776	12274	G.B. ...	...	*Tracing Thunderstorms—A Use for Atmospherics.* (J. S. Forrest, Wireless World, Vol. 49, No. 7, July, 1943, pp. 192-194.)

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777	11090	Germany	...	*Air War at High Altitudes and Physiological Research.* (T. Benzinger, Luftwissen, Vol. 10, No. 4, April, 1943, pp. 105-110.)
778	11098	Germany	...	*Investigations on Particular Individual Variation of the Altitude Cramp Threshold. II, The Influence of Atmospheric Humidity on the Resistance of the White Mouse.* (Denyer, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, pp. 137-140.)
779	11099	Germany	...	*Height Adjustment for 8,000 m. Acquired at a Level 2,000 m. A Report from the Rechlin Experimental Station of the Luftwaffe dated 29th May, 1940.* (Benzinger and Doering, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, pp. 141-149.)
780	11100	Germany	...	*Research on the Influence of Oxygen Breathing on Alveolar CO_2 Tension in the Low Pressure Chamber.* (Schweppes, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, pp. 150-159.)

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781	11101	Germany ...	*Hyperæmia and Adrenaline Content of the Blood* (Lehmann and Michaelis, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 292.)
782	11102	Germany ...	*Weather and Health. Vol.* 1. *The Determination of the Action Time and Estimation of the Influence of the Weather and the Sun's Action on Healthy Men. (Book Review.)* (Dull, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 292.)
783	11103	Germany ...	*Carbide Dioxide Loses its Position of Importance. Reflections on Respiratory Regulation.* (O. Pizt, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 118.)
784	11104	Germany ...	*The Course of the Apnoea Curve after very long Hyperventilation.* (Herrlinger, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 119.)
785	11105	Germany ...	*The Conduction of the Brain Action Currents as a Method of Investigating Altitude Sickness.* (Kornmuller and others, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 123.)
786	11106	Germany ...	*Nervous Disturbances at Low Pressure and Their Determination.* (Chauchard and others, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 123.)
787	11107	Germany ...	*Changes in Sensitivity of the Circulatory Centre in Anoxæmia.* (Grosse-Brockhoff, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 124.)
788	11108	Germany ...	*The Altitude Adjustment on the Jungfraujoch. II, Tidal Air and CO_2 System in Acute Oxygen Deficiency Before, During and After Altitude Adjustment.* (Becker-Freysing, Luftfahrtmedizin, No. 7, No. 2-3, 1942, pp. 180-204.)
789	11109	Germany ...	*The Altitude Adjustment on the Jungfraujoch. III, Increased Altitude Tolerance During Altitude Adjustment and After Return to Sea-Level.* (Luft and Opitz, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, pp. 205-217.)
790	11110	Germany ...	*The Altitude Adjustment on the Jungfraujoch. Adjustment Changes of Respiration at 3,500 m. and the Action of NH_4CL.* (Loeschke and others, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 218.)
791	11111	Germany ...	*The Heat Regulatory Adjustment of the Organism in Fluctuating Climatic Conditions (Temperature, Humidity, Wind Velocity). I, The "Climate Chamber" for the Production of any Desired Climatic Conditions.* (Weyler and Thauer, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 237.)
792	11112	Germany ...	*The Heat Regulatory Adjustment of the Organism in Fluctuating Climatic Conditions (Temperature, Humidity, Wind Velocity). II, Circulation and Gas Metabolism of Man in Different External Temperatures.* (Weyler and Thauer, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 237.)
793	11113	Germany ...	*Experimental Investigation on the Increase of Venous Adjustment in Oxygen Deficiency.* (Frey and Kuchle, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 260.)

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794	11114	Germany ...	*A Simple Experiment for the Simultaneous Measurement of the Maximum Pressure in Volsava's Experiments or in the Nasopharynx Pressure Experiment, with Indication as to which of the Two Experiments the Aviator can Employ to Produce Pressure Equilibrium in the Middle Ear.* (Nordhoff, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 269.)
795	11115	Germany ...	*The Effect on Man of Persistent Oxygen Breathing at Various Altitudes.* (Becker-Freysing and Clamann, Luftfahrtmedizin, Vol. 7, No. 2-3, 1942, p. 272.)
796	11135	Germany ...	*Comparation Investigations on the Visual Field Capacity with Koch's Apparatus and with the Ziess Steroscope and Pulfrich's Test Tables.* (Weissig, Luftfahrtmedizin, Vol. 6, No. 1-4, 23/4/42, pp. 166-173.)
797	11136	Germany ...	*Height Tolerance on Mount Rosa. I, Rest Experiments; II, Work Experiments.* (Delius and others, Luftfahrtmedizin, Vol. 6, No. 1-4, 23/4/42, p. 213.)
798	11562	U.S.A. ...	*Biological Symposia. Vol. VII, Visual Mechanism (Abstracts).* (Rev. of Sci. Instrum., Vol. 14, No. 4, April, 1943, pp. 108-110.)
799	11568	U.S.A. ...	*Vision, Hearing and Aeronautical Design.* (L. D. Carson and others, J. Aeron. Sci., Vol. 10, No. 4, April, 1943, pp. 127-130.)
800	11865	Canada ...	*Medical Aspects of Air Crew Selection.* (F. A. L. Mathewson, Bulletin of War Medicine, Vol. 3, No. 10, June, 1943, p. 583.)
801	11866	U.S.A. ...	*Nitrogen Clearance from the Blood and Saliva by Oxygen Breathing.* (P. F. Scholander and G. A. Edwards, Bulletin of War Medicine, Vol. 3, No. 10, June, 1943, pp. 583-584.)
802	11867	Germany ...	*Limits of Cardiac Output Increase in Acute Oxygen Lack.* (Abstract, Luftfahrtmedizin, Vol. 7, No. 1, 1942, pp. 1-8.) (H. H. Loeschcke, Bulletin of War Medicine, Vol. 3, No. 10, June, 1943, p. 584.)
803	11868	Germany ...	*Decompression Sickness.* (W. Hornberger and T. Benzinger, Luftfahrtmedizin, Vol. 7, No. 1, 1942, pp. 9-34.) (Bulletin of War Medicine, Vol. 3, No. 10, June, 1943, p. 584.)
804	11869	Germany ...	*Rapid Decompression in Mammals.* (R. Kilches, Luftfahrtmedizin, Vol. 7, No. 1, 1942, pp. 35-45.) (Bulletin of War Medicine, Vol. 3, No. 10, June, 1943, p. 584.)
805	11870	Germany ...	*Muscular Tone in Acute Anoxia.* (J. Schnell, Luftfahrtmedizin, Vol. 7, No. 1, 1942, pp. 68-83.) (Bulletin of War Medicine, Vol. 3, No. 10, June, 1943, p. 585.)

MATHEMATICS AND PHYSICS.

806	11809	U.S.A. ...	*Euler's Number.* (Mechanical Engineering, Vol. 65, No. 3, March, 1943, pp. 210-211.)

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807	12012	G.B. ...	... *H. L. Callendar and the Theory of the Liquid State.* (Nature, Vol. 151, No. 3,838, 22/5/43, pp. 588-589.)
808	12221	G.B. ...	... *Steering Experiments (Forces on Elliptical. Rectangular and Square Planes).* (R. W. L. Gawn, (Engineer, Vol. 176, No. 4,569, 6/8/43, pp. 116-118.)

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