ENTERPRISE

December 1957 2d

On behalf of the directors of the de Havilland Companies, I extend to readers of "Enterprise" and their families, whether at home or overseas, best wishes for a happy Christmas, and health, peace & success in their efforts in the New Year.

Geoffrey E. Nixon.

Christmas. 1957.

ENTERPRISE

The internal magazine of the de Havilland Companies

DECEMBER 1957 PRICE TWOPENCE

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A Merry Christmas to All

THE Christmas message from the Chairman of the parent de Havilland company may be said to voice the feelings of de Havilland people in many parts of the world. Engineers and flying men, draughtsmen and machinists, office girls, fitters, apprentices, field service representatives, regional managers and agents, we are a widely scattered family, and the little magazine *Enterprise* circulates among us in the Aircraft, Engine and Propeller Companies and overseas.

At this season we reflect upon our friendships and upon the goodwill that we have always been fortunate enough to enjoy through our innumerable working associations. Our contacts everywhere impress upon us how much nicer people are than their newspapers and their politicians would have us believe.

Christmas is the family festival, as befits its origin, and we shall observe again that the young, at least, remain undaunted by the threats of science that are apparent to us all.

Grown-ups will ponder on the implications of the first man-made satellites, and it is unthinkable that either the *Gazette* or *Enterprise* could omit to express the respect which de Havilland engineers, in line with engineers everywhere, feel for this technical achievement by the Russian members of their own profession. This is a wonder quite distinct from its political aspect.

How easily — now that man's range of activity is no longer confined to his own globe — how easily this Christmas might it be declared that material science explains everything. The weakness in that is the fact, admitted by sceptics, that mankind has already manifest a quality, a spark of something, which material science has not explained, which indeed runs contrary to science. To give it a name is most difficult, and here *Enterprise* immediately gets out of its depth, but if science can explain emotion, art and humour, can it also explain the human element of altruism? Science is without mercy, Nature is red in tooth and claw, is it not?

Cynics have explained altruism by arguing that man's intelligence has developed enough to recognise that selflessness pays in this world, and may earn a place in the next. It has a selfish motive. That, however, does not satisfy logic — it does not appeal to the senses. There is a spark which material science has not accounted for. It is this curious spark that will always resist and prevail over the doctrine of subjection of the individual to the system. It is a denial of materialism, it is a certain perverseness, and it shines in the darkest places. It shines brightly at Christmas time. Upon that reflection (and apologising if we have trespassed a little) may we wish all our readers good fortune and happiness in the New Year.

THE QUEEN'S HERON FLIGHT IN U.S.A.

Her Majesty the Queen and H.R.H. Prince Philip on their arrival at Washington Airport on the evening of October 20. They had visited the thoroughbred training farm of Mr. Paul Mellon at Middleburg, Virginia, and travelled in a Heron aircraft of the British Joint Services Mission at Washington.

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D.H. around the world

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SPECIAL COMETS FOR B.O.A.C.

Captain Peter Kane (In charge of B.O.A.C.'s Comet fleet) is here seen taking over "the ship's papers" from Mr. John Cunningham, de Havilland Chief Test Pilot. Mr. C. S. Thom, de Havilland Business Director, is present. The Comet 2Es (one is Ministry of Supply property) are making regular flights to and from Beirut in the Lebanon, building up engine hours and experience with the Rolls-Royce Avon RA.29 engines fitted outboard. The larger outboard air intakes are apparent in our picture.

JAPANESE BLESS ANTARCTIC BEAVER

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The first Beaver to be taken over by the Japanese Antarctic Expedition was blessed at a Shinto Ceremony at Chofu Airfield, Tokyo. The aircraft was shortly afterwards stowed away on board the Japanese Expedition ship Soya Maru. At the ceremony the Beaver was named Showa.

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A NON-SMOKING CHIMNEY

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A seasonal reminder that smoking chimneys are anti-social! At 17,520 feet a Heron Executive Aircraft skims over the now extinct crater of Popocatepetl, the highest volcano in Mexico.

★

THE SUPER SPRITE IN PRODUCTION

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A general view of Super Sprite assembly work at the de Havilland Engine Company's production division where both the rocket and its nacelle are made. Each engine is given an endurance run on the test-bed before final assembly.

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MUCH TRAVELLED COMETS

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Royal Air Force Comet 2s and one of the "V" Bombers —a Valiant—"sit it out" on the apron at United States Air Force base Pinecastle, Orlando, Florida, after ferrying ground crews for Bomber Command. Comets have been seen recently in New York, San Francisco, Hawaii, New Zealand and many European and Asian bases.

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Retirement of Mr. C. C. Walker

MR. CHARLES CLEMENT WALKER, C.B.E., A.M.I.C.E., Hon. F.R.Ae.S., Hon. F.I.A.S., Chief Engineer of The de Havilland Aircraft Co. Ltd. and one of its founders in 1920, having resigned from the Board on December 31, 1954, after serving as a Director since 1920, retired on November 30, 1955. His withdrawal from the active life of the de Havilland Enterprise has been a gradual process. He still attends his office some days in the week and all hope that, as with Mr. F. T. Hearle, his abiding interest will bring him frequently to the works so that his old colleagues may continue to enjoy his company and counsel. Nevertheless, *Enterprise* has to record the formality of his retirement, and in doing so takes the opportunity to recall something of his great work and influence.

Mr. Walker has been Sir Geoffrey de Havilland's closest colleague on the technical side since January, 1915, when the project in hand at Hendon was the D.H.2 single-seat pusher fighter (mono-Gnome 105 h.p. engine). "C.C. Walker," Sir Geoffrey once said, "wrote to me at Airco shortly after the start of the war in 1914, asking whether there was a vacancy for an engineer to help in the design office. I saw him for the first time a few days later and it was settled that he should start work at once. He stipulated that he should receive no salary until he proved that he was useful. That is how one of the greatest personalities of this firm came to join us. Ever since those days C.C. Walker has been, in his quiet way, a great power for good in the de Havilland Aircraft Company. His technical qualifications are outstanding, and his influence is to be seen in all the de Havilland designs. It has been my good fortune that he also soon became one of my closest friends."

Mr. Walker was born in Highgate on August 25, 1877, and educated at Highgate School, 1887–92, and University College, 1892–95. He was apprenticed to a heavy-engineering concern on the Tyne, then articled to a firm of civil engineers in Westminster. He was thus trained as a civil engineer and later, whilst training and working in that capacity he studied the laws of aeronautics through the works of their discoverers, appreciating in particular Dr. Lanchester's early expositions of the theory of flight. Joining the Aircraft Manufacturing Co. at the age of 37, he went straight to work on aerodynamic and stressing problems, bringing basic science to bear in this new field. From then on at Hendon, and from 1920 in the de Havilland Company, he was directly responsible for these two departments which constituted the technical side of design. In recent years, whilst gradually relinquishing the reins, he has maintained a very close advisory contact with the whole technical side of the activity.

Mr. Walker has inevitably been closely concerned in every decision of technical policy, every new aircraft type. He investigated the aerodynamics of multi-engined aircraft as early as the days of the D.H.3 twin-pusher bomber (Beardmore 120 h.p.) in 1916. He shared de Havilland's enthusiasm for the D.H.29 high-wing monoplane in 1921—an aeroplane that was before its time. From earliest days he argued the need for a controllable-pitch propeller, and a report of his in the early 20's was later published in

Flight (January, 1927) and reprinted as a technical memorandum of the N.A.C.A. of America; there it found a receptive readership, and practical work on C-P propellers began shortly afterwards.

He played a great part in each of the design exercises for pure performance, especially the D.H.71 monoplane racer, built around the first Gipsy (and Hubert Broad), which did 186 m.p.h. on 130 h.p. in 1927. He contributed much to the D.H.77 interceptor with Halford H-type 337 h.p. engine (1929). He worked outstandingly on the D.H.88 Comet Racer of 1934 and on the D.H.91 Albatross airliner which followed it in 1937. He urged aerodynamic cleanness to achieve air-transport economy through speed at a time when everyone argued that speed had to be paid for. He was a great protagonist for the D.H.98 Mosquito (1939–40) and contributed notably to its aerodynamic efficiency and success. Thereafter he applied himself to the new form of aircraft propelled by the jet turbine, collaborating with Major Frank Halford on the Goblin-engined Vampire that first flew September 20, 1943, at once evoking thoughts of a jet-propelled airliner. The still higher altitudes and speeds made possible by the rocket engine were occupying him before the war ended.

Whilst Mr. Walker appreciated the scope for every form of propulsion nobody had a greater enthusiasm than he for the jet-airliner project, studied at Hatfield from 1943, and through every phase of the Comet development he guided and encouraged the now extensive technical departments at work on it. His contribution to the Company's thinking on technical aspects of the Comet enquiry in 1954 was invaluable; his appreciation of the problems was exceptionally penetrating.

For all his ability in the formulation of technical policy

he never minded taking his coat off to an important dull job, and he invariably brought the light of brilliance into its darkest corners. He served for many years between 1929 and 1946 on the Council and committees of the Royal Aeronautical Society, and he could lift the most routine meeting on to an interesting plane. When the Air Registration Board was founded in 1937 to establish civil airworthiness standards, he applied himself to the task as a representative of the manufacturer's point of view. As a Council Member of the Society of British Aircraft Constructors for 21 years from 1925 he combined honesty of purpose with an initiative and detachment that helped to keep policy from slipping into ruts. During the second world war he was chosen for the Independent Advisory Committee of the R.Ae.S. which the Minister of Aircraft Production (Lord Brabazon, then Colonel Moore-Brabazon) set up in July, 1941. He was beloved for his artless sagacity in the deliberations of such bodies. He has been called upon for advice by authorities on both sides of the Atlantic.

In 1935 he was awarded the R.Ae.S. Silver Medal for his work in civil aircraft design, at the time when Halford was similarly honoured in respect of the Cirrus and Gipsy engines. In 1938, in recognition of his service to aviation, Mr. Walker was made a fellow of University College, where he had studied in the past. In the Birthday Honours of 1947 he was appointed a Commander of the Order of the British Empire. In 1951 he was made an honorary Fellow of the Royal Aeronautical Society. He was elected as the Honorary Foreign Fellow of the Institute of the Aeronautical Sciences for the year 1952.

Recognition, however, has never been sought by Charles Walker. Work and the simple life are for him their own rewards. The *Gazette* once said that his achievements in the public sense, were far transcended by his personality. Rich human qualities radiate from him and are felt by all who meet him, so that, whether in the design office or in a Hertfordshire garden, to be with him is always a pleasure. To all about him he is approachable and his response is at once kindly, sympathetic, unreserved.

This fraternal outlook, combined with a natural grasp of social and international affairs, produces in him a kind of impartial realism towards world problems and an ability to perceive tendencies and to forecast their outcome. Once the Battle of Britain was over he seemed able to predict the course of the war stage by stage and, despite a personal sacrifice, he always saw the bright side.

He seldom utters a word that is not interesting; this would be remarkable in a taciturn man, but in one who enjoys discourse at all times it is exceptional. His knowledge, centred in scientific matters but ranging widely, is profound, and one feels that it is lodged in a mind free from prejudice and controlled by a character wholly honourable. He was a keen golfer, swimmer and tennis player in his younger days. Geography always interested him, particularly its geological aspects, river systems and climates. He has captured the best events and funniest experiences throughout the years, and, although the joke often goes against himself, he is ready to recount them, true to the original happening and without a wasted word, in a way that always gives enjoyment. It would be true to say that in conversation with him one not only is entertained but experiences a clarifying of one's own principles, and departs with one's faith in mankind a little stronger.

What would the Company be, we said some years ago, if one could not knock at Mr. Walker's door and seek his guidance about some technical enigma? And how could his advice be given otherwise than after gazing at the carpet and drawing on his pipe for ten or fifteen seconds, and then replying in his deep, slow voice, "Well, take the case of a knitting needle a mile long, with a fly perched in the middle."

From the outset his approach to all engineering and scientific problems has always been essentially objective and from the standpoint of sound physical principles. Whilst putting the humanities first, he has gone so far as to advocate a good working knowledge of physics as part and parcel of the education of people in almost any walk of life. Self-control is very marked in him, and he never allows personal emotion to enter into any discussion; if it shows signs of appearing he will wait for it to pass away, himself remaining a sort of anchor of basic thinking. An example of his ability to bring things back to earth when a technical conversation is becoming confused was the instance when engineers were talking about the Newtonian propulsive efficiency. After pondering awhile he asked, "*What* is the maximum when *what* is half of what?"

Once when drifting down the River Waveney in Norfolk he observed that the boat was consistently moving faster than the water, which, he said at the time, was probably due to the friction between the boat and the water being less than that between the water and the banks, since both boat and water were sliding down a slightly inclined plane. He puzzled about this for many years until he heard von Karman confirm his view in a paper on turbulence which he was giving in London.

Himself technical to the very essence, Mr. Walker tends to suspect the word "technician" and will never admit that there is any scientific phenomenon which cannot be expressed in plain language "so that it will appeal to the senses." In a series of simple technical articles published by the Company under the title "Even *I* can understand," he wrote, "Forward thrust in fluid-borne vehicles is obtained by throwing stuff (generally some of the fluid) backwards. To throw back a large mass slowly is more efficient than to throw back a small mass quickly."

He is always on guard against confusing possibility with probability, and he once made young Geoffrey de Havilland laugh immoderately when they were idly discussing the argument that a row of monkeys banging on typewriters must eventually produce a Shakespearian sonnet. They were on the beach at Winchelsea at the time and Mr. Walker said, "Well, the sands of the seashore are rearranged a good deal, but how often do you see them form a portrait of the Kaiser?"

Almost any letter of Mr. Walker's would be worth quoting, but perhaps the following extract from a letter written to the President of the Institute of the Aeronautical Sciences on February 11, 1948, upon the death of Orville Wright, is interesting as the reflection of an English engineer who was contemporary with the Wright brothers:

"It is difficult to recapture the atmosphere of forty-five years ago, but the present writers recall very vividly the intense interest aroused by the rumoured experiments at Kitty Hawk. Little or nothing was known about these events until the brothers came to Europe and demonstrated, and any rumours were received generally with incredulity. Fairly circumstantial accounts however used to appear in *The Scientific American*. These would have been unseen by most people here had it not been for a humble paper called *The English Mechanic* which always reprinted them. It was through this medium that we, knowing flight was soon to arrive and having witnessed Maxim's trials, eagerly sought every paragraph referring to the Wright brothers' experiments.

"It was no sudden lifting of the veil for us when they came to Europe. We felt we had been in touch for several years with the progress of pioneer work which was about to reach triumphant realisation."

The *Gazette* has stated that the team spirit is strong in Mr. Walker because the common good is his aim. For this reason he has fitted ideally into the team which from 1920 has guided this Enterprise. Forward technical policy has always been the interest of Sir Geoffrey and himself. Up to the middle of the war they implicitly left the production organisation to Mr. Hearle, later to Mr. Nixon, the watchdog on finance, and they looked to Mr. St. Barbe to measure saleability and to direct the sales effort. Nowadays, of course, with the formation of a Holdings Company late in 1955, the hierarchy of administration has become enlarged and decentralised.

Mr. Walker keeps abreast with the latest aeronautical progress, at any rate in the general sense, and maintains contact with many of the leading engineers in Britain, America, and elsewhere. We know that he would always be pleased to hear from old friends. Many de Havilland people and others will have happy memories awakened when they read this inadequate tribute to him; tens of thousands in our own companies on the other hand have not had the opportunity of knowing from personal experience about the part that he has played in the organisation which they serve, and which serves them. For us who know him well and have worked under him for many years the inevitability of his retirement cannot soften our sense of loss.

COMET SETS NEW SPEED RECORD

London to Johannesburg — a quarter of the way round the world in under thirteen hours

THE Comet 3 development aircraft G-ANLO (four Rolls-Royce Avon R.A.29 engines) set up a new long-distance speed record when on October 23, piloted by John Cunningham, it flew from London to Johannesburg with one stop at Khartoum in an official city-centre to city-centre time of 12 hours 58 minutes 57·3 secs. which includes the 53 minutes stop-over at Khartoum. The Great Circle distance between city centres over which the record is measured is 5,634·6 miles, although the distance actually flown by the Comet via Khartoum was about 6,000 miles. The average speed including the Khartoum stop was 434 m.p.h.

It will be recalled that on October 16 the Comet 3 flew from London to Khartoum in the record time of 5 hours 51 minutes 14·8 secs. Both these records are subject to official confirmation by the Fédération Aéronautique Internationale.

This performance demonstrates in a practical fashion the commercial capabilities of the Comet 4 Intercontinental airliner on very long stages.

Flying the slightly shorter West African route via Kano, a Comet 4 could be in Johannesburg in less than 13 hours after leaving London, including a 45-minute halt in Kano, thus cutting more than seven hours off the fastest airline timetable of to-day. On these very long stages (Kano to Johannesburg is 2,970 miles) the Comet 4 could pay its way with only half its seats filled.

The Comet 3 development aircraft flew to Johannesburg to carry out take-off and landing performance measurements on Jan Smuts airfield (altitude 5,559 feet). These measurements are part of the certification programme for the Comet 4 and when they are completed the Comet 3 will have carried out something like 90 per cent. of the certification flying for the Comet 4 before the first production aircraft flies early in 1958. Nineteen Comet 4s are now being built for the British Overseas Airways Corporation and delivery is expected to begin in the latter half of 1958.

When the trials of the Comet 4 are complete the detachable wing tips of the Comet 3 development aircraft will be removed. The Comet 3 will then embark on a new series of tests and performance measurements with a reduced wing span corresponding to that of the Comet 4B, six of which are on order by British European Airways for delivery from the end of 1959.

The Comet 3 immediately after its arrival in record time at Jan Smuts Airfield, Johannesburg.

J. E. BURTON
A. E. EBLING
D. N. S. MOYNIHAN

Enterprise regrets to record that three members of de Havilland Propellers Limited, John Edward Burton, Albert Edward Ebling, and Dudley Neville Stephen Moynihan, lost their lives on November 6, 1957, in the accident to the Bristol Britannia airliner near Filton. They were flying in the aircraft to carry out observations of the propeller equipment.

John Burton joined the Company in July, 1946. He held the post of section leader in the strain-gauge department and was thus a leading member of a group of engineers engaged in propeller research. He died at the age of 40 and leaves a widow and one young son.

Albert Ebling was 33 years of age: he joined de Havilland four years ago. He was also employed in the strain-gauge department and was a member of the research team led by John Burton. He was married but had no children.

"Jack" Moynihan joined the Company in 1954. He was a senior development engineer, resident at Bristol, and was responsible for the bench and flight testing of propellers fitted to Bristol aircraft and engines. He died at the age of 37 leaving a widow but no children.

THE INTERMEDIATE COMET 4C

AN intermediate version of the Comet between the Intercontinental Comet 4 and the Continental Comet 4B is announced.

The Comet 4 was developed to serve stages up to 3,000 miles and to pay its way in conditions of moderate traffic density using airfields of moderate size.

The Comet 4A (improved as the 4B) was a logical variant to serve shorter stages (300 to 1,500 miles at low altitude, up to 2,000 miles at high altitude) with a larger payload — the main differences being a clipped wing to permit a low-altitude high-speed cruise and a longer fuselage to carry more passengers.

Both are in production, typically suitable to the operations of their respective purchasers, B.O.A.C. and B.E.A.

Operators working stages of intermediate length have shown interest in the possible application of the larger fuselage of the Continental Comet 4B to the full-span wing of the Intercontinental Comet 4, so as to obtain substantially more payload capacity than the Comet 4 at the cost of a small reduction in maximum range.

This formula, combining the superior operating economies of the Continental with a payload-range capability only slightly short of that of the Intercontinental, yields an aircraft of exceptional economy and versatility of operation in conditions where neither very long nor very short stages are the main consideration.

The Intermediate Comet 4C will carry 21,785 lb., say 85 mixed-class passengers on stages up to 2,475 statute miles (2,150 nautical miles). Rolls-Royce R.A.29 engines of 10,500 lb. thrust are fitted as in the 4 and 4B.

DE HAVILLAND ENGINES TO POWER FIRST BRITISH-BUILT OPERATIONAL MIXED-POWER AIRCRAFT

THE de Havilland Engine Co. Ltd. are now permitted to disclose that the new S-R.177 high-performance naval fighter, announced recently by Messrs. Saunders-Roe Ltd. as being developed under a Ministry of Supply contract, will be powered by a de Havilland Gyron Junior supersonic turbojet and a fully-controllable de Havilland Spectre rocket engine.

This announcement is the direct result of many years of collaboration between the Saunders-Roe and de Havilland Engine companies to produce a closely integrated weapons system of outstanding combat capability.

The use of the mixed-power formula in an aircraft of very advanced design, equipped with a comprehensive search and interception radar system and employing as its main armament air-to-air guided missiles, has long been advocated by the two companies.

Such an aircraft is capable of climbing to high stratospheric altitude in a very few minutes, of a very rapid acceleration to speeds greater than Mach 2, and, with the excess of rocket power which is available at these heights, it possesses a high degree of manœuvrability during an attack in the rarefied atmospheres. It can also carry sufficient fuel to undertake a mission of useful operational duration.

At a time when first reports of progress with long-range ballistic missiles are being circulated, it should be remembered that some time must still elapse before such weapons enter service and that the threat to be countered in this period will still come from the fast high-flying manned bomber. Defence against this must aim to be absolute, and although the substantial progress now being made with surface-launched and anti-aircraft missiles indicates that a time will come when this sytem of defence will achieve the degree of reliability required, there can be no doubt that an immediate need exists for a manned weapons system capable of operating at missile speed, and which possesses the operational flexibility that can only be provided at this time by human supervision.

Such an aircraft, with its ability to use small forward airstrips, has an added advantage in that it can also be employed in other important roles — notably that of army close-support.

S-R. 177

From the outset the Gyron Gynorm was developed for operation with reheat. An early version of the afterburner assembly is here seen on its journey from the Engineering Division at Stag Lane to the test bed at Leavesden. Subsequent development work enabled some reduction to be made on the weight of this interesting component.

The Gyron Gynorm

First details of a new jet turbine designed specifically to be the most powerful in the world. 240,000 lb. (108,860 Kg.) static thrust without reheat.

THAT it has always been the policy of the de Havilland Engine Company to strive to foresee the future propulsive requirements of a rapidly progressing aircraft industry has been stated frequently — some might think too frequently — in the *Enterprise*.

It is well known that the Gyron and Gyron Junior turbojets and the Spectre series of rocket engines are examples of such far-sighted thinking, but the Gyron Gynorm, of which details are given for the first time on these pages, falls into a different category.

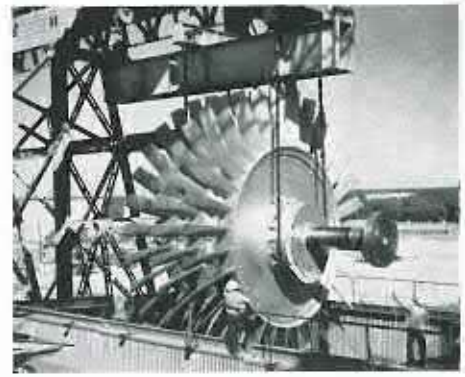
It will be recalled that for some time the de Havilland Engine Company have been at pains to substantiate their claim for the Gyron that it was "the most powerful jet engine in the world." In recent years this has become more difficult for two main reasons. In the first place a security system peculiar to these Isles, whilst allowing a percentage of the total thrust figure to be disclosed, strictly bans mention of the rest. The Gyron, it will be remembered, appeared at the Paris Show with a published output of 25,000 lb. and a few knew of the remaining 6,000 lb. closely pegged by Security. In the second place other and less modest manufacturers have at last entered the supersonic field, and unfortunately with even bigger engines.

If this state of affairs was allowed to remain unchallenged, only carefully qualified and, therefore, misleading statements could be made in public. "The most powerful engine in the world," on the successful first run of a competitor's engine, might have to be changed overnight into "the most powerful type-approved jet engine in the world." It only requires the rival company to experience another modicum of unexpected luck and the claim must again be modified to "the most powerful type-approved jet engine in the world now in an advanced stage of development." Further qualification is difficult to achieve without interfering with the geographical impact. It can thus be seen that an engine which started its career quite simply as "the most powerful jet engine in the world" can, within a very short time, end up as "the most powerful type-tested jet engine to have reached an advanced state of development in Southern England" or, at the worst finally "in Hertfordshire."

At a time when the implications of a White Paper on Defence have, to say the least of it, put a brake on creative thought, it was natural that a strong and virile design team (striving to foresee . . . etc., etc.) should turn from the operational requirement branches of the various Ministries and Services and for once pay heed to a Publicity Department which, if nothing else, was reputed by several members of the Company to possess a budget capable of handling the financial outlay. It was also felt that if such an advanced engine failed in the long run to be favoured by an actual aircraft application this was not altogether unprecedented in the history of the Company.

The accompanying pictures reveal the Gyron Gynorm to be in all major respects a true member of the Gyron family. Low frontal area is combined with light weight and robust construction — all features indispensable to the special formula for high-supersonic flight. A noticeable difference, however, is in the use of a simple 3-stage axial compressor in place of the more usual 7- or 8-stage layout, and this feature was finally decided upon after a long period of study by performance engineers, and clinched by an objection from the Ministry of Transport and Civil Aviation to the effect that the new test rig scheduled to be constructed in the Company's test colony at Hatfield for larger compressors would seriously interfere with long-term plans for widening the Great North Road.

As with other de Havilland engines the Gyron Gynorm was designed and constructed as a private venture and it was only after the prototype had established the validity of the design that the engine was offered to the British Government. At this time future plans for the Gyron Gynorm cannot be discussed but if there is a noticeable restraint in Government circles prior to the issue of instructions to proceed, it is, after all, understandable in an age of military aviation where nobody really knows what they want anyway.



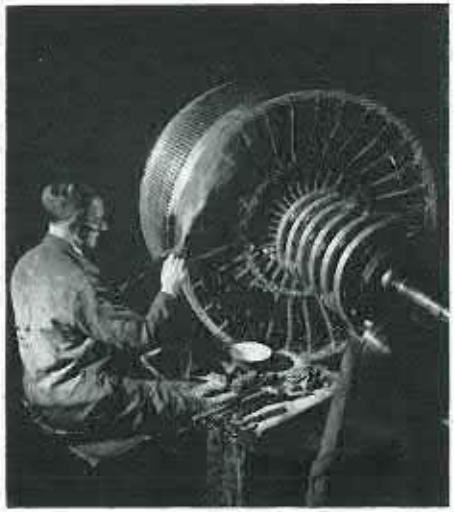
As an important part of the detailed component matching programme which preceded the first run of the Gyron Gynorm, the three-stage axial compressor underwent an extensive series of calibration and over-speed tests. This photograph, taken as the component is lowered into the compressor test rig, clearly shows its compact form and elegant simplicity.

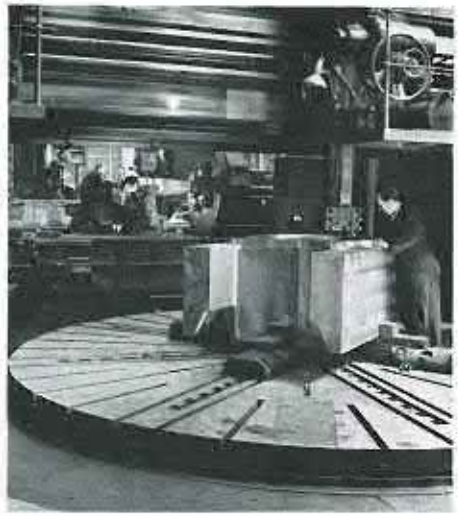
The Editor of Enterprise *is grateful to the Chairman of* Engineering *for his kind permission to reproduce some of the photographs which made possible the article on pages 194, 195, 196 and 197.*

Acknowledgment is also made to The British Thomson-Houston Company, Ltd., Davy & United Engineering Company, Ltd., Thos Firth & John Brown Ltd., The Hydro-Electric Power Commission of Ontario, Ashmore, Benson, Pease & Company and The Air Research and Development Command, United States Air Force, whose products are depicted in a setting for which they were never intended.

It was considered that an advantageous situation in regard to both economy and efficiency would result if the test work was carried out under the eye of the Publicity Department from whose budget the entire programme was being financed. For this reason the new test bed shown here was built at the Company's Leavesden works, beneath the windows of the commercial manager's office.

Below: Although a slightly scaled-up version of the de Havilland hydrogen peroxide turbo-starter would be fitted to production versions of the Gyron Gynorm, a conventional electric starter motor was used for early running. A craftsman, complete with the intricate tools of his trade, is seen here soldering the armature joints. Mounted in the intake bullet this unit accelerates the engine to its self-sustaining speed within the half-hour.

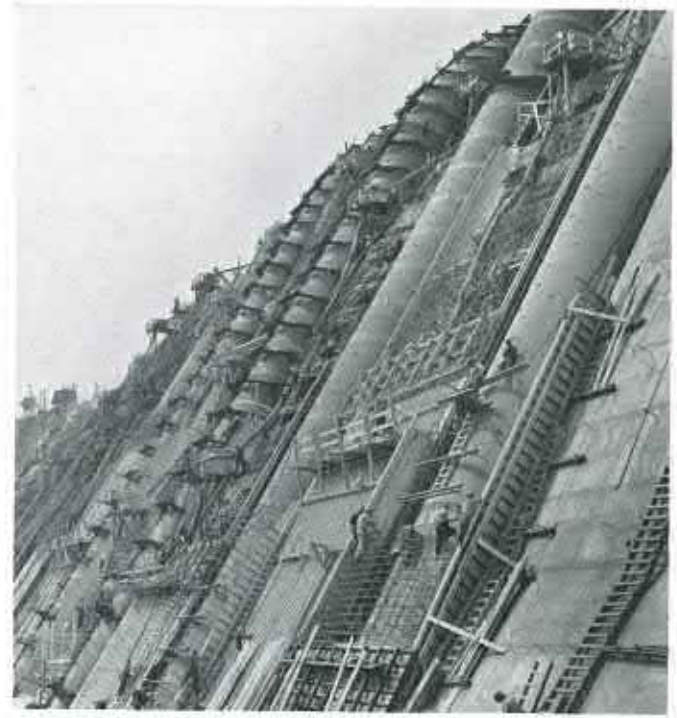




Above: An intensive programme of work was laid down to accelerate the manufacture of the prototype engine, and in this respect it is interesting to note that it had already completed an unofficial acceptance run before drawings could be issued to the shops. Practical craftsmen with practised eye and a flair for improvisation were responsible for this — often, as is shown here, machining from the solid. In the foreground a rear bearing housing and, at the background, an accessory-drive quill shaft take shape from billets of high-tensile steel.

New and weighty difficulties required solution before a satisfactory two-bearing rotor support could be provided. This problem was overcome in the manner shown here.

No small effort was required to cement firm foundations for the new engine's future. This view, taken during the extension of the Halford laboratory at Hatfield shows something of the unremitting effort necessary to-day to keep pace with the rising tempo of development.



Below: Detail assembly work on the Gyron Gynorm. The idlers in the fuel and lubrication pump gear-trains are being inspected prior to their installation in the slender intake spoke.

Above: To absorb the massive power output of the Gyron Gynorm, equally massive support frames for the thrust-measuring pads had to be constructed. One of the eight required is shown here in the hands of the Plant Department during the fabrication of the Leavesden bed.

About Ourselves

HATFIELD AIRCRAFT

Mr. Beresford M. Johnson welcoming Mr. Theodor Kern, Judge of the exhibits. In the background is B. T. Holloway, General Secretary of the club.

ART: The Society in its 14th year has been honoured by having for its President, Sir Geoffrey de Havilland. In the past year or two he has become a keen amateur artist, and he exhibited his first still-life oil painting this year. Mr. Frank T. Hearle has also taken up painting and exhibited some lovely flower studies.

The pictures which were awarded places were as follows:

OIL COLOUR

1st	Sails in the Sun	Beresford M. Johnson
2nd	Still Life	John E. Walker
3rd	Hertfordshire Fields and Sky	Peter Elms
4th	Mary	Derek F. Bartlett

WATER COLOUR

1st	Clayton Mills	Norman K. Phillips
2nd	The Yellow Field	Beresford M. Johnson
3rd	Polperro	D. Mount
4th	From Chapel Stile	George N. Cross

OTHER MEDIA

1st	At Coniston	George N. Cross
2nd	The Three Horse Shoes	Derek F. Bartlett
3rd	Alpine Panorama	Allen S. Ward
4th	Salisbury	Alfred W. Turner

HANDICRAFTS

1st	Earthenware Jug	Fred Beaumont
2nd	Pottery	Betty Evans
3rd	Fruit Bowl	Fred Beaumont
4th	Design for Table Lamp	Margaret Gunton

WINNER OF THE ART TROPHY: BERESFORD M. JOHNSON

CRICKET: A very successful season was brought to a close with the section's annual Dinner and Dance held in the Aerodrome Restaurant, Hatfield, Friday, November 1.

This was the climax of a cricket year in which the 1st XI played 30, won 15, drew 8 and lost 7, while the 2nd XI played 28, won 8, drew 4 and lost 15 matches.

The 1st XI batting averages were headed by H. Cutino and E. Brown with averages of 34·8 and 30·3 respectively, while A. Bush came top of the bowling with an average of 9 runs for 37 wickets.

In the 2nd XI W. Pidgeon, J. Giles and I. Woodhouse headed the batting averages with 13·78, 13·44, and 12·69 respectively. The bowling was topped by D. Beeching who took 11 wickets at a cost of 7·09, although the outstanding performances in this sphere for the 2nd XI were by W. Pidgeon and D. Wright with 38 wickets for 319 runs and 40 for 408 respectively.

During the season the section visited Christchurch for what proved to be the most enjoyable game of 1957, and made the trip to Chester in the Butler Trophy only to find that due to prolonged rain, play was impossible.

The Inter-departmental competition attracted 21 teams and was won by the Stress Office, who beat the Aerodynamics in the final.

During October a film show was organised by the section in conjunction with Mr. Alan Oakman, the Sussex and England batsman. This show, "With the M.C.C. in South Africa," was attended by some 150 people in the club hall at Hatfield and included Major Lay, secretary to the Herts C.C. and some of his officials; also representatives of six other clubs in the county.

Wing Commander C. A. Pike, president of the Cricket Club, presenting the Best Sportsman of the Year Cup to P. Neville.

This year has seen the retirement of A. Bush, who has been chairman of the section, and was its longest playing member at the time of his retirement. He had served the cricket section, during his long association, in all its official capacities, and to mark his retirement a presentation was made to him at the dinner.

A presentation was also made to H. Cutino for his outstanding performances as an all-round cricketer during 1957.

The annual presentation of the "Cricketer of the Year" Trophy was made to P. Neville.

GOLF: 1957 results.

The St. Barbe Championship was won by G. A. North.

D. Dimmock was the runner up.

The winners of the Mills Four Ball were L. J. Jackson and E. J. Hislop.

Runners up J. Dimmock and J. Mallard.

The Captain's Prize was won by W. Harrison and I. Hollis.

H. J. Sheppard representing the de Havilland (Hatfield) Club won "The Club Secretary" Cup at Moor Park. This is an annual competition organised by the monthly magazine called "The Club Secretary" and our photograph shows Mr. H. G. Watkins (United Trade Press) presenting the Cup to H. J. Sheppard.

* * *

The **CHRISTIAN FELLOWSHIP** continue to meet in the Sports Pavilion at 1 o'clock on Fridays. All are welcome.

We are hoping to hold a Carol service at the same time on Tuesday, December 24, also in the Sports Pavilion.

We extend a welcome to anyone to come and sing carols with us on this occasion.

Contact F. C. West. Int. Tel. No. 472.

CHRISTMAS DANCES

Thursday, December 19,
KEEP FIT ANNUAL DANCE with The IMESON BROS. Club Hall.

Thursday, December 26,
BOXING NIGHT DANCE—Club Hall.

Tuesday, December 31,
NEW YEAR'S BALL—Club Hall.

BOWLS: The past season has indeed been a memorable one and the club's successes have been printed in the last two issues of *Enterprise*.

Club competitions for members:

THE CHAMPIONSHIP CUP
Winner: F. Ready
Runner-up: F. Hopwood

HANDICAP CUP
Winner: J. Brownbill.
Runner-up: F. Ready.

PAIRS CUP
Winners: T. Moult and H. Lewis.
Runners-up: L. Linton and A. Bennie

INTERDEPARTMENTAL RINKS
Winners: S.A.D.
Runners-up: Engineering.

DODD CUP
Winner: D. Buchanan.
Runner-up: M. Bowens.

BROWNBILL CUP
Winner: M. Bowens.
Runner-up: H. Holgate.

LOSTOCK

SPORTS FIELD: Although mention was made in the last issue of *Enterprise* of progress in the erection of the new pavilion, it was not until October 27 that the official opening was performed by Lady Sorley.

On this particular afternoon the gladiators from the three units of the Northern Group met to do combat in the various sports arenas, fortunately without bloodshed.

After tea the Sorley Trophy was presented to Lostock, the winners, and the company proceeded to the Club for the evening.

We are fortunate in that we have been able to make use of the field adjacent to our own sports ground for Rugby Union. For this we are very grateful to the farmer, as it will cut out the half-mile walk, previously unavoidable, when home games are being played.

Both rugby teams are again doing very well.

HOCKEY: A series of coaching lessons given to the girls by M. A. Sheppard at the commencement of the season, appears to be paying dividends, and they are maintaining a top-of-the-league position.

SWIMMING: The Second Annual Gala was held at the Moss Street Baths in Bolton on the evening of October 11, attended by a full house.

Before the races began Mrs. Critchley presented certificates of proficiency to children of members who had been taught to swim by the club.

The races that followed were keenly contested, and the chief results were:

Ladies' Championship Free Style — Miss M. Worthington.

Men's Championship Free Style — D. Pye.

Lostock's new club-house now completed, was opened by Lady Sorley on October 27.

The Inter-departmental Trophy presented by the Management was won by the Planning Department.

Our thanks go to the members of Bolton Swimming club and Darwen Swimming club for their help in making the evening so enjoyable.

RIFLE: We are hoping to be able to announce the opening of our own range on the works premises before long. Plans and site have been approved, but there is still some work to be done before we can obtain final clearance.

MONTHLY STAFF CLUB: Once more the visit of our Chester friends on Friday, October 4, proved a terrific success for all who attended the indoor "Sports Jamboree." Cocktails on arrival of visitors were followed immediately by the serious business of the game. Serious you say? Visitors were bringing their own cues for the billiards and snooker, their own darts for the darts games. Who said their own cards for the card games?

Whilst the men were in the games rooms the ladies were in the Concert Hall being entertained by three or four of the men members at "Housey Housey," etc., with prizes for the winners.

At 9 p.m. the attack was launched on the buffet and justice was done in the next half hour.

Immediately after refreshments games were resumed, and, with some very thrilling encounters, the sports ended in the traditional draw.

Members, guests and friends then retired to the Management Mess for coffee and biscuits and a final chat before leaving for home about 11 p.m. after a welcome speech by Mr. Payne as Chairman of the Management Club. Mr. Kibble suitably replied on behalf of the Chester contingent.

FARNWORTH

The fast tempo has slowed considerably since the excitement of the Nixon and Butler Trophy Competitions. New thoughts are already moving on to Christmas and its activities. The usual programme has been approved consisting of lunch-time concerts, wine club issues, children's parties and the Christmas draw.

Before these transpire however, we have the second leg of the Sorley Trophy taking place against Lostock, the final leg of the Nixon Trophy against Chester at Lostock and our own dances for the Farnworth Disaster Fund. All these in addition to our normal programme will ensure a busy period until the next holidays.

It is hoped to promote more and more inter-departmental competitions to encourage more people to play. The lack of convenient facilities is a drawback but will be overcome somehow.

BADMINTON, TABLE TENNIS and **FOOTBALL** are well under way, and the newly formed **PHOTOGRAPHIC** section is continuing in its present form until a dark room can be procured. The **CAR CLUB** has reason to be proud of its success in organisation support. The **GOLF** section has been very active, particularly at weekends, although the weather selected for the Section competitions has been of a doubtful quality.

The **TENNIS** section achieved only one major success last year by gaining a narrow victory in the final of the Tennis Cup K.O. for second teams. This was a very creditable effort on their part.

CHRISTCHURCH

FOOTBALL: The senior team had an indifferent start to the season, having won two and drawn one of their six opening matches in the Bournemouth senior league First Division. At the time of going to press they are in ninth position, having scored 14 and conceded 19 goals. Several changes have been made to endeavour to improve the position, but none has borne fruit so far. When it is considered that two of the three home matches have been won and the other drawn, it is obvious, as in past seasons, that an improvement of form is required in away matches.

This is emphasised by the 7–3 defeat by Longfleet, at Wingfields, in the first round of the Bournemouth Senior Cup after suffering a 5–2 league defeat at Longfleet only a fortnight previously. As there are now four away league matches running perhaps the team will find the form required to lay what has become a D.H. bogey.

The Junior team are in a good position, having collected 10 points from 7 games. They are at present second in the Bournemouth Junior League, division IV, by virtue of their superior goal average of 24–7, as three other teams also have 10 points. In contrast to the Senior team, 3 of the 4 points have been dropped at home. They have also overcome the first hurdle in the Hampshire Junior "A" Cup by winning 10–0 away to Boldre. Considering the formidable crop of injuries and the recent 'flu epidemic, which has hit this team in particular, they have made a fine start to the season. A vote of thanks is due here to those players who, although not commanding a regular place in the team, have turned out at short notice. Not one refusal has been received.

Incidentally, the 10–0 victory, referred to above, was achieved with five such replacements from the original selection. This is a source of worry to the committee as so many players are fighting for each position.

RUGBY: The new club got away to a resounding start to their first official season by winning two of the three matches played, with fairly large margins.

The wins were from S.R.D.F. — 13 points to 6 points and from New Milton — 16 points to 8 points.

Losing to Walcot O.B's. at Bath — 6 points to 3 points — taught us the lesson "take every advantage until the referee stops the play." Maybe with a season's experience behind us the team will provide good opposition to all comers; now, with 28 playing members, 10 non-playing members and a fairly complete fixture list, the club will endeavour to justify their efforts to organise Rugby football at Christchurch.

More support however is still needed to help the planned social events to swing, and to keep the "touch-lines" noisy!

AMATEUR DRAMATICS: Now in its third winter season, the flourishing Dramatic group are busily rehearsing at the Priory Church Hall for their next full-scale production — the Comedy-thriller "Such Things Happen." To be shown to the public on Friday and Saturday, January 31, and February 1, 1958, this somewhat difficult play will then be staged in the new clubhouse at Wingfields.

Social events undertaken by the Dramatic group recently have included a successful games and dancing evening at the club, and two interesting trips to the Southampton Docks, where members were able to make a detailed tour of the liner *United States*.

The section are now planning a carol-singing evening for late December, when all contributions (if received), will be given to charity.

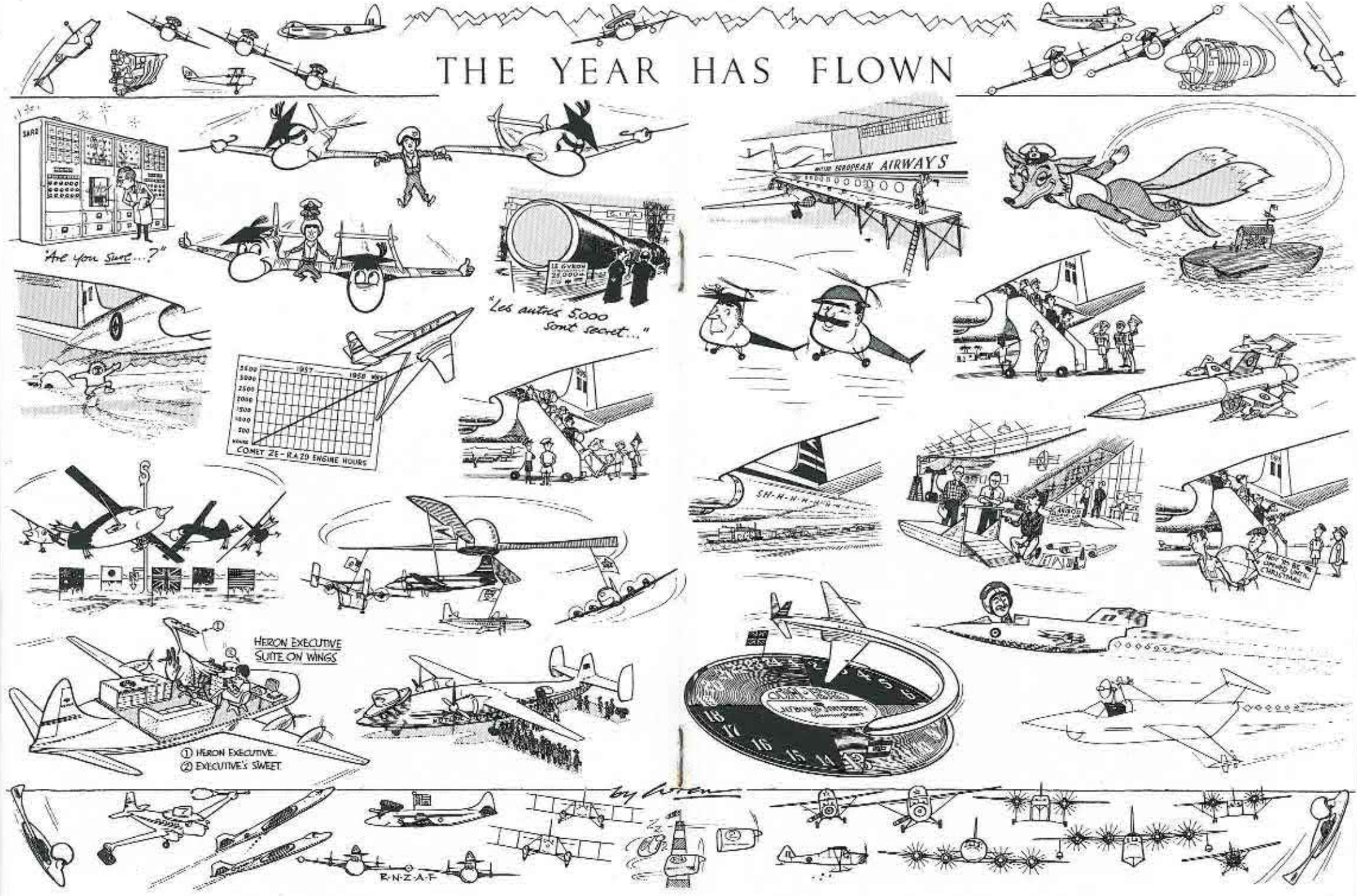
HATFIELD PROPELLERS

GOLF: The Golf section concluded a very successful season on Saturday, October 12, when they won the Welwyn Garden City and Hatfield Business House Cup against strong opposition. The competition was for teams of six, playing in three pairs as a two-ball alliance.

(Continued on page 204)

Swimming Section Gala Night on Friday, September 27, saw the first of what is intended to be an annual event at the Linden Hall Baths. Some 22 events were contested in which a very high standard of swimming was demonstrated.

THE YEAR HAS FLOWN



The team which won the Welwyn Garden City and Hatfield Business Houses cup. J. Bowker (res.), F. Palmer, W. Bates, R. Martin, B. Wells, R. Warren (capt.), C. Rogers.

(Continued from page 201)

The scores of the three cards were totalled in order to decide the winners.

The event produced some first-class golf, and at the conclusion the Propeller Company's team returned a total of 192 against the par figures for the course of 204. One of the best returns came from the section's Chairman, Fred Palmer, and Secretary, Bert Wells, with a card of 62. The other pairs, W. Bates and R. Martin, and R. Warren and C. Rogers, both returned cards of 65.

The Trophy was presented to the team's Captain, Reg Warren, by Mr. Allan Pearson, who deputised for the donor, Mr. E. J. Power of Murphy Radio Limited.

FOOTBALL: Following the previous successful season it was decided to concentrate on only two teams this year, one in the Primary Division and one in the Reserves Section of the Herts County League. After a rather shaky start the first team seem to have settled down and have recently enjoyed a winning run which has raised them to second position in the league tables. The Reserve team also have had their successes and their class of "soccer" has been to a high standard. Teams have been entered in both the Aubrey and Herts intermediate cups and should, according to the way they are playing now, stand a good chance in both competitions. Unfortunately, the enthusiasm of the players is only matched by half a dozen supporters. More supporters will be most welcome, so what about it chaps! And ladies too!

To conclude, all concerned with the football section would like to take this opportunity to thank A. M. Taylor for his conscientious work as secretary and to wish him all the very best in any activity he may undertake in the U.S.A. At a farewell party held in the Club House on Friday, October 18, Mr. Ling, the Sports Club secretary, presented Mr. Taylor with a brief case, subscribed for by members of the section.

NEW SECTIONS

PHOTOGRAPHIC: The first meeting of the Photographic section was held on October 9, when 20 members were enrolled.

Meetings will be held every fortnight in the clubhouse, where a new darkroom is nearing completion.

Those wishing to join the section, and all are welcome, should contact the Hon. Secretary, V. Mathews, of the Alternator Drawing Office.

BASKETBALL: The newly formed basketball section meets every Wednesday evening at Hatfield School, where it has the use of the gymnasium and changing rooms from 6 p.m. to 9 p.m. So far the section has been very well supported, and has great hopes for future games with neighbouring clubs.

Mr. Ling, the Sports Club Secretary, will be happy to enrol any new members.

Mr. A. M. Taylor (left) receives the brief-case, presented by the members of the Football section, from Mr. Ling.

GOOD SUGGESTIONS: L. Stockley, an Inspector in the Propeller Company's Hatfield machine shop, and P. Walsh, of the Guided Weapons Division in the same factory, have recently received awards under the Joint Production Committee suggestion scheme.

Mr. Stockley has evolved a simple method of checking the blade form of Cold Air Unit turbine wheels to replace the lengthy and involved method previously used. Mr. Stockley's method, which besides saving considerable time, allows the operator to judge the accuracy of his work for himself, is briefly as follows:

Using a rotary printing attachment, ink is applied to the blade form cut. A print of the cut is then made on a strip of polythene. The print is enlarged 50 times on a projector, where a direct comparison can be made with a master drawing.

A check taken over a period of four months has proved the accuracy of the method to ·0005 in., while the time of inspection is approximately one-third of that previously taken.

Mr. Stockley (holding blueprint) explains the design of his printing attachment to Mr. Walsh.

Mr. Walsh learnt that an urgent requirement had arisen for a new type of harness to be used in the final testing of guided weapons and launching shocs. Within a week of having the necessary pneumatic and electrical supplies explained to him, Mr. Walsh produced a harness which satisfied every requirement. Unfortunately, due to security regulations, details of the design cannot be disclosed.

Harnesses to Mr. Walsh's design are now in use at Woomera in Australia, at Lostock and at Hatfield.

CHESTER

BADMINTON: Although membership of the section is increasing there is still a shortage of ladies. Facilities provided are considered better than at most other clubs, particularly in height of building, lighting, and the availability of three courts.

Unfortunately several members are registered with their local clubs and therefore not available for league games. The section has a team entered in Division II of the Chester and District League which involves 12 matches, one having been played to date, and lost.

RIFLE: During the past few months encouraged by the provision of a new range, the riflemen have done exceptionally well. There are now more than 30 subscribing members with an average of 12 appearing each practice night. Two teams are entered in the Chester League and a third in the Flint and Denbigh.

TABLE TENNIS: With teams in the second and third divisions of the Chester league the section has made a satisfactory start to the season, having won two of the four games played. Last season's experience has proved of considerable value to the younger players and they are now showing a much improved class of table tennis. The section has been strengthened by new players and the welcome return of George Heywood, dope shop, and Doug Green, expediting. Club nights are held on Tuesdays and Thursdays when learners will be most welcome. It is also hoped that coaching films will be available for showing in the not-too-distant future.

FOOTBALL: At the time of going to press the team, playing in C division of the Chester and District league, were undefeated. Their six

Mr. H. Pear, Chester Rectification Department. First prize winner in the Sea Angling 1957 festival held at Llandudno. He won the contest with a conger eel weighing more than six pounds.

Stevenage Bowls winners, F. Bedall, W. Moore, P. Bacchus and L. Howell, receiving the League Trophy from Mr. J. Arthur.

matches have yielded 44 goals with only 9 against, a most encouraging revival after not having been able to field a team last season.

RUGBY: The Rugby XV won their first match of the season, defeating Liverpool Collegiate by 6 points to 3. Either we have improved or the Liverpool side is particularly bad, for in the last match of the 1956/7 season they defeated us by 46 points to 3 at Broughton.

COMING EVENTS

December 31 — Olde Tyme New Year Eve Ball.
January 4 — Children's Pantomime Outing.
February 21 — Ivy Benson Dance.

PORTSMOUTH

FOOTBALL: The third team playing in the local North End League are to date having a very successful run indeed. The team consists mainly of apprentice lads, and of the eight league engagements played five have resulted in victory with one drawn game.

STEVENAGE

SMALL-BORE RIFLE AND ARCHERY: These sections under the leadership of Mr. Charles Penny, Assembly Department, have both done well despite the fact that they were formed only a few months ago.

The Archery section entered a team in the Stevenage Inter-Works Sports and Social Organisation archery competition on Saturday, September 14, and the team captain was awarded a medal for the highest score attained with practice equipment. The awards were presented by Mr. J. A. Arthur, President of the Stevenage Inter-Works Sports and Social Organisation.

The Small-Bore Rifle section now has one of the largest memberships in the club and has closed the season by holding a competition and awarded certificates to members with the highest average score of the evening.

TENNIS: The Tennis section attained 3rd place in the Stevenage Inter-Works Sports and Social Organisation tennis league and Miss Monroe of the Plastics department was runner-up in the Ladies Singles tournament. Mr. Ravenscroft, Assembly Inspection View Room, is to be congratulated for increasing the membership from two at the beginning of the season to 25 members at the close.

BOWLS: The section were winners of the Stevenage Inter-Works Sports and Social Organisation bowls league, and runners-up in the same league, and runners-up in the inter-works "Knock-out" competition. Mr. Bacchus, skipper, and his team are to be congratulated for the hard work which they have put into their section this season. The Trophy was presented by Mr. J. A. Arthur at the Annual General Meeting of the Stevenage Inter-Works Sports and Social Organisation.

Portsmouth's youthful footballers (Left to right standing) C. Pratt (Sect.), B. Davis, M. Hawkins, J. Newman, L. Le Clercq, R. Swanson, D. Jenkins (Trainer), T. Crutchley (Selector). (Front row) A. Wringe, M. Hoskins, K. Dodgson, J. Collins, N. Efford.

For the convenience of employees at the de Havilland Engine Company's Leavesden factory a well-stocked shop has been built near the canteen at No. 1 factory. It was opened on October 29 by Mr. H. Buckingham who made the first purchase. In this photograph Mr. Buckingham is seen with Mr. M. G. Ash and Mr. H. Grainger.

YOU, TOO, CAN BE A MILLIONAIRE !

A WELL-KNOWN national daily newspaper recently announced a new competition under the title "You, too, can be a Millionaire!" Competitors were asked to submit a 300-word essay outlining their idea for setting up in business with the ultimate aim of "making a million"!

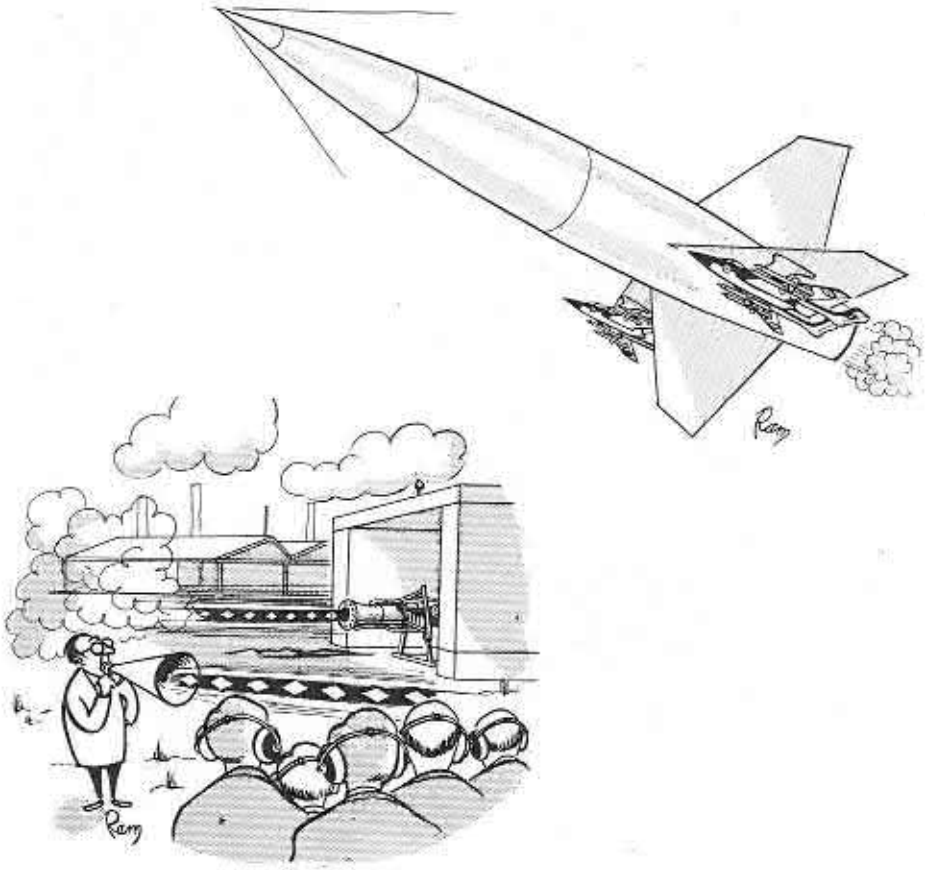
Mr. John Moores, multi-millionaire football pools magnate, offered a prize of £1,000 to the winner to enable him to start up in business, plus a further £1,000 boost after the business had been running for one month. Among the 23,738 entries received was one from Don Ormand, a fitter in the Erection shop at Christchurch.

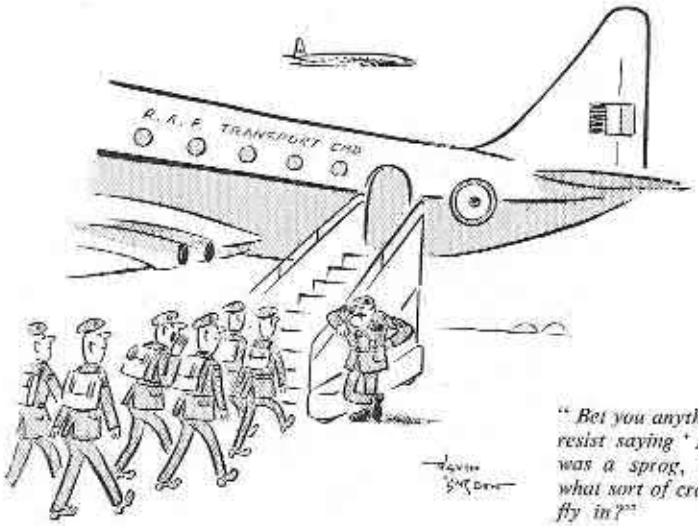
It is pleasing to record that of this very large entry Don was chosen as one of the nine finalists who were invited to London as guests of the sponsors, there to elaborate their ideas to a panel of judges — Mr. John Moores and the Editor of the *Daily Mirror*.

Don's idea takes the form of a revolutionary and economical carburettor; designed, patented and built by himself. Economy is achieved by means of a very fine mixture control which gives not only a 25 per cent. saving in fuel but also shows a marked improvement in the all-round performance of the vehicle. To date, Don has carried out trials both on cars and motor-cycles, the results being most encouraging. As this carburettor does not employ either a float or float chamber it naturally follows that manufacture of this accessory will be considerably cheaper than the orthodox carburettor. Any vital piece of equipment that costs less to build and is also cheaper to run should surely find a ready market.

Although Don failed to win the competition he did receive much advice and encouragement from the sponsors, together with a consolation prize of £25.

Seated here are the nine finalists, together with the judges—Mr. John Moores and the Editor of the Daily Mirror; *also present is Mr. Noel Whitcomb, the* Daily Mirror *columnist. The nine finalists were the guests of the sponsors at a luxury London hotel, where this picture was taken of them at lunch. Don Ormand is seated in the immediate centre foreground, facing the camera.*





" Bet you anything he can't resist saying ' Now when I was a sprog, d'yer know what sort of craft we had to fly in?"

The Story of the Circus

Christmas without a circus would be considered on a par with Easter without an egg. Customs change with the passage of time, but at present the circus enjoys a popularity as great as our traditional mince-pie or plum-pudding. Close on half a million people come to town to see the great Olympia show alone.

THE precise origin of the circus is obscure; we know that ringside spectacles were booming in the days of ancient Rome. There were certainly four, and possibly eight or ten huge arenas in and around the capital. The largest of these was the Circus Maximus, built about 605 B.C. to accommodate well over a quarter of a million spectators. Julius Cæsar further enlarged it, adding specially constructed waterways on which spectacular sea fights could be staged. The Colosseum cost more than a town to build and when Pompey opened his theatre in 55 B.C. the programme lasted for five days, during which time 25 elephants and some 500 lions were destroyed.

Here in Britain from Roman down through medieval times, bands of travelling jugglers, acrobats and performing bears, served to keep the circus flame alight until the year 1770 when Philip Astley, the father of the English circus, roped off a ring in an open field near the site of the present Waterloo Station. Astley had served during the Seven Years' War with the 15th Light Horse cavalry regiment, and on his discharge he married a girl who was the daughter of a trick-rider.

His stock-in-trade was a white army charger, the gift of his General who was a great admirer of Astley's equestrian skill. After each display, Astley would collect the pennies and half-pennies of his delighted audience in his hat. The show prospered, he bought another house at Smithfield Market and then built an improved circus with permanent seats near the south end of Westminster Bridge. In the morning, he taught horsemanship to increase his revenue; acrobatic turns, tight-rope walkers and balancers began to appear in his programmes. Incidentally, it was Astley who sent the first real English clown into the ring. He went from strength to strength, and despite many setbacks (his famous Amphitheatre was twice destroyed by fire) he well and truly laid the foundations of the modern circus.

The great " Lord " George Sanger (seventy years a showman) was the son of a travelling conjurer and peep-show proprietor, and in 1832, at the age of five, was " on the road "

with his father's home-made roundabouts — the motive power of which was obtained from the ever-present following of boys who were suitably rewarded by free rides on the strange contraption! Young George had showmanship in his blood and at a very tender age was the proud owner and exhibitor of his self-trained menagerie. He taught white mice to climb up poles, canaries to walk the tightrope and hares to jump through hoops.

At the age of eighteen George was on the road with a little show of his own. One of his early novelties was billed as " A Naval Engagement " — goldfish towing toy boats whilst George (hidden from view) let off numerous crackers! Another of his ingenious sideshows

Tonita and Lill go through their tight-rope routine in a Bertram Mills circus performance specially arranged for 12,000 children at Olympia.

bore the amazing title: " The Only Tame Smoking Oyster " — a shameless bit of spoofing which brought in the cash most satisfactorily. George's oyster shell was certainly puffing away at an old clay pipe — but what matter if beneath the table was concealed a small boy with a rubber tube in his mouth? All's fair in love and circus sideshows!

" Lord " George's first real circus was erected at King's Lynn Charter Fair — admission 1d. and 3d. His prestige grew and admission prices rose to 2s. In a short while he owned 60 horses, six lions, a first-class circus band, a troupe of 12 Arabs and a large company of talented performers. In 1871 he bought Astley's Amphitheatre and before long had shows at the Agricultural Hall and in many of the larger towns and cities. Kings and Queens of England and the Continent were his patrons and his spectacular show travelled almost every road in Europe.

George had no legal right to be called " Lord," but even Queen Victoria (with a twinkle in her eye) addressed him as such. The fact of the matter was that his American opposite number, the Honourable William Cody (" Buffalo Bill ") annoyed him by constantly splashing his title. Said George: " If that chap's an Honourable I'll go one better and be a *Lord!*" The great showman met a tragic end in 1911 when enjoying a well-earned retirement. A manservant whose mind had become unbalanced set upon him with a hatchet — and so passed the founder of the Showman's Guild and the friend of travelling circus folk less fortunate than himself. Sanger was a great man — but he never forgot he once trained white mice to climb up poles or canaries to do the tight-rope act. . . .

The English circus of Astley's day soon had imitators far beyond the shores of Britain and the first American show may be said to date from 1875 when Ricketts established a small show at Philadelphia. Barnum's, of course, was indeed the " greatest show on earth " — a highly organised combination of menagerie, museum, freak collection and circus. Phineas Barnum, who was born at Connecticut in 1810 was an amazing personality. He was in turn a grocer, clerk, editor and showman — and the greatest spoof-merchant who ever lived. He was king of freak-collectors — bearded ladies, living skeletons, dwarfs and midgets, india-rubber men and so forth — and it was Barnum who made George Stratton famous the world over as " Tom Thumb." Many tried to skittle Barnum out, but such was his audacity and genius that he scored off his critics every time and made priceless publicity for his show into the bargain. Teaming up with an even more brilliant businessman, James Bailey, and with permanent headquarters in Madison Square Gardens, the show became the greatest spectacle of its kind in the world. Barnum died a millionaire in his eightieth year.

Although not strictly a circus, Buffalo Bill's Wild West Show must needs be mentioned, for Will Cody was the most picturesque figure the show world ever produced. Unlike most great showmen, Cody was not born to the job. He was in turn a scout, a colonel in the American army and an employee of the Kansas Pacific Railroad Company. It was his work on the railroad that earned him the nickname of Buffalo Bill. His specific job was to hunt and kill bison in order to provide food for the railroad workers on the prairie. He won his title by killing no fewer than 5,000 buffaloes in 18 months. His friends persuaded him to take up showmanship and his first public show at Omaha convinced him of its possibilities. With his Redskins, Cowboys, Gauchos, Arabs, Boers and Cossacks, he thrilled and delighted millions

Lydia, a much-travelled young lady is shown with her group of lions.

and was given a tremendous reception when he brought his colourful outfit to this country some 50 years ago.

" Out of their rompers into the ring " is the traditional manner in which the majority of circus folk begin their careers. Strangely enough, Bertram Mills, the founder of the world's most spectacular ringside show, was not born of circus stock, for his father was a coach-builder and harness-maker. Demobbed from World War I he found himself more or less out of a job. One night he went to a circus at Olympia. Asked by one of the directors what he thought of the show, Mills replied that he had enjoyed it greatly, rashly adding: " But if I couldn't put on a better show myself I'd eat my hat!" The director retorted: " Well, Olympia is free next Christmas, so why not take it and start chewing your hat right now?"

The Guttenbergs give a polished equestrian acrobatic display.

At the time Bertram Mills knew as little about circus technique as an elephant knows of astronomy, but taking the plunge he booked the great hall and set off touring Britain and the Continent for likely acts, signing on nothing or no-one until he had seen the act with his own eyes — taking special note of the turns his son enjoyed. Such was his genius at talent-spotting that the 1920 Olympia Show was a great success. This policy of personal selection is still rigidly followed by the Mills' brothers to-day. They will go to the ends of the earth if need be and Mr. Cyril Mills is a seasoned pilot with a permit to land on almost any airfield in Europe.

It is now 20 years since the first Mills' tented circus took to the road. From the moment the show pulls out of its winter quarters in Berkshire, the whole outfit follows a brilliantly organised time-table that would do credit to the most experienced of military planners. So smooth is the organisation that the specially constructed wagons at the railhead begin to move off almost as soon as the last act is over. Already a duplicate set of the massive 64-ft. steel " king " poles which support the " big top " have been set up at the next port of call, and this policy of leap-frogging goes on throughout the season.

The road show carries no passengers — the only hangers-on you'll find are the men heaving at the guy lines as the " big top " is hoisted when half a gale is blowing. As like as not our old friend Coco or Percy Huxter would be hanging grimly on to that straining rope — top-line stars in the clowning world, but just one of the gang to the rest of their fellows. If only the world had the team spirit of the sawdust ring our tangled web of political intrigue

One of the DONATHAS bears seen riding a motor-scooter — a popular feature in the Bertram Mills circus.

and suspicion might never have been woven.

The family spirit among circus folk is as strong to-day as ever it was and breaking into the Bank of England would be easier than gate-crashing into the circus profession. Consider how such families as the Bakers, Sloanes, Cookes and Henglers have been associated with the sawdust ring for generations; the families have intermarried, grandsons slipping into the ring as grandfathers faded out, until to-day there is scarcely a circus of any size without some descendant of such families somewhere on the bill.

Circus costs are staggering. Consider for a moment that there are sometimes one hundred thousand pounds' worth of animals in residence at the Mills' winter quarters. Even before the war an animal dealer's list read: " Elephant, £400; tiger, £300; giraffes, £1,500 per pair; gorilla, £600; hippopotamus, £490; zebras, 90; kangaroos, £50 each."

Ringling's Circus in America is the biggest show on the road to-day and often it starts its spring tour with a payroll of 1,600 persons, about half of which are artistes. In addition it has to maintain about 1,000 wild animals and 700 horses. The " menu " of one of the largest Continental travelling circuses makes interesting reading. The daily rations for its animals include 3,300 lb. of hay, 3,300 lb. of carrots, 1,650 lb. each of oats and clover and 440 lbs. of horse flesh. The walruses, sea lions and seals require 350 lb. of fish daily, whilst cod-liver oil for the polar bears has to be bought by the gallon. Space forbids a list of fees paid to circus stars, but may it suffice to say a first-class clown may earn anything over £500 a week. Circuses are big business these days.

In detail the circus may have changed, but fundamentally it is the same. Electric lights blaze where once oil and acetylene lamps hissed and spluttered. The big shows go by rail and we miss the glamour of the gaily painted wagons winding through our countryside and there are saxophones in the band. . . .

But the leopard hasn't changed his spots nor the ring-master lost his immaculate elegance. As surely as the sun rises, country parsons and their bishops, dear old ladies and learned men of science will all be coming to Town — lured there by the magical and indefinable spell of the sawdust ring.

The " King of the Clowns ", Felix Adler, seen with Nina Unus, daughter of Unus the Finger, and Felix's piglet, Nelly, during a circus's tour " on the road."

AUSTRALIAN APPOINTMENTS

de Havilland Aircraft Proprietary Limited, Sydney, Australia, has appointed **Mr. T. H. Dalton,** hitherto Senior Sales Executive under Wing Commander R. Kingsford-Smith, Sales Manager of the Company, to take charge of the Company's office in Melbourne. **Mr. Laurie Jones** has been appointed to the Business Department to take Mr. Dalton's place. **Mr. William D. Tulloch** has been appointed Public Relations Officer under the Sales Manager.

1957 National Gliding Championship Meeting at Lasham, Hampshire — a measure of the increasing popularity of the Gliding movement.

The Fascination of Soaring

by Lt.-Col. A. J. Deane-Drummond, M.C.*

Soaring goes on all the year round. Some readers may even be soaring during the Christmas break, and it is hoped that this article will have a fresh-air appeal to all.

THE day dawned cold and clear with a light north-easterly wind. By mid-morning small puffs of white cloud were dotting the sky and a small knot of half a dozen or so people clustered round a smooth, sleekly streamlined glider were looking anxiously upward and itching to get airborne.

Attempts to stay up had been made many times that morning without success. Each time a magnificent white tower of cumulus drifted by, the car on the runway took up the slack in the wire cable and one of the pilots was soon careering upward to the limit of the wire. From 1,000 feet over the airfield each pilot in turn had 5–10 minutes to explore possible sources of up-currents, which if successful would cut the cords which were pulling him inexorably down to earth.

At last my turn came and I strapped myself into the cockpit and closed the perspex canopy. A quick check on the controls and I was climbing steeply over the lovely Hampshire countryside. At a 1,000 feet or so, when right above the car which was charging down the runway, I released the wire. I, too, had only a few minutes to show if I could find one of these elusive bubbles of hot air. Off to one side, a grass drying plant was going full bore and I thought that something ought to be rising up from it to one of the lovely cloud castles in the air overhead. As I flew over the chimney I could feel the air tossing in milliards of little

*The author won the 1957 National Gliding Championships earlier this year. He is also well known for his Prisoner of War escapes, graphically described in his book " Return Ticket " (Wm. Collins.).

eddies and I knew that an invisible upcurrent would be found somewhere in its vicinity. The slightest indication of one wing or the other being pushed up would give me the clue which way to turn and so it turned out to be. My left wing rose up smartly and, trying to anticipate it, I pushed it down against the upcurrent and round I went to the left. In ever tighter circles I gradually edged the glider into the core of the thermal; after two or three circles the altimeter confirmed that I really was gaining height. The cords were now cut and I could relax a little and take notice of the beautiful scenery as it flowed past the nose of the glider.

Looking downwards, the white upturned faces of the other pilots came into view; soon they were too small to distinguish. The climb indicator was showing a steady 300 feet per minute climb and as long as I kept the glider in the centre of the thermal all was wonderfully smooth. Edge too near to one side and immediately the quivering, restless air might take over, forcing me to steer back into the core of the bubble of air.

At 3,000 feet the climb indicator was now showing 500 feet per minute as we rushed upwards towards the dark grey mass overhead. Soon we would be entering cloud; I switched on the artificial horizon which would shortly be required for "flying blind" up the middle of the cumulus.

It was now time to check that I really had selected the fastest moving part of the bubble of air; decreasing the angle of bank I nosed around all the edges of the upcurrent. One part gave a great surge upwards as we flew through it clearly indicating the presence of yet faster moving air. This was the place to turn in and gradually the rate of climb steadied at 800 feet per minute.

From this height the Solent, the thicker haze of London, the Thames valley and Salisbury Plain successively swam into view as we swung round in effortless circles. But now cloud base was reached at 4,000 feet where I could see little streamers of cloud being sucked up into the vortex above.

All round in front was now grey, but immediately below, a fast disappearing circle of sunlit fields was still visible. The horizon was running well and the climb indicator was now showing just over 1,000 feet per minute climb. All I had to do was to hold the glider in a steady circle and see what happened. The upcurrent in the middle of the cloud was far bigger than the chimney of air leading up to it, and except for the quickly moving needle of the altimeter and a rate of climb which moved up to the maximum of 1,200 feet per minute, there was little indication of any bump or ripple to show me how fast the climb really was.

At 8,000 feet the cloud was still dark around

His Royal Highness gave the gliding movement an enormous fillip when he attended the National Gliding Championships earlier this year. Prince Philip is talking to Mrs. Rika Harwood and crew.

Enthusiasm, not age or sex, is the criterion. Brothers in Success—Commanders Nick and Tony Goodhart were second and third in this year's National Gliding Championships. The author was first. Dress for gliding is informal.

me and only on one side of the circle the sunlight made vain efforts to pierce the mist. I knew that I had to record a gain of height of 10,000 feet for the Gold "C" qualification and the clouds on this day looked as though they went high enough. Glancing out through the windscreen I could see ice on the pitot head and on the first few feet of the leading edge of the wing which then disappeared into the grey mist.

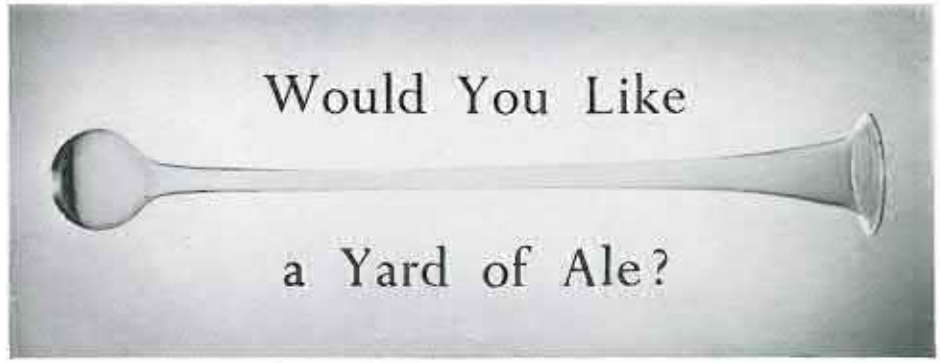
Quite suddenly at 9,000 feet the air became bumpy. First the horizon showed one wing going up, then the other and sometimes even the nose going up or down. It was time to steer clear and so, feeling rather depressed, I straightened out the glider on a north-easterly course and flew straight through the bumps. The climb indicator was now twisting itself to show the maximum possible downcurrent although most of the turbulence had ceased. We were down to 8,000 feet before the rate of climb came back to neutral and once again the air became bumpy requiring the maximum stick movement to keep the glider flying straight. The air suddenly became uncannily smooth as once again the climb indicator gradually showed the maximum possible climb. Up we rocketed and within a few minutes the altimeter was showing 12,000 feet.

I had qualified for a Gold "C" at last and a quiet glow of satisfaction spread over me. All I had to do was to steer out of the cloud which was now quite light all round. Once again the eddies pushed the glider about but quite suddenly we broke thorugh the edge of the cumulus which still towered a few hundred feet behind. The windscreen had a layer of ice on the inside which could be scraped off with a thumb nail and then, right out before me, stretched the most wonderful vista of isolated towering clouds and a patchwork of green and brown fields below. Behind was the blank wall of cloud and ahead in the clear air I could see cumulus which must have been 100 miles away or more. Such days are ambrosia to pilots like me, and to anyone with any imagination and a sense of adventure in their hearts. Overhead are the cloud peaks which can be reached by skill and fortitude. Underneath are the other pilots, who, like you, will want to pit their skill against the up-currents leading to the clouds and later on try their hand at flying blind.

You will need perseverance to get over the initial training period. It is here that a properly qualified instructor and a two-seater are vital to impart the sound lessons of true airmanship and set an example all should follow. It will take three months or so to go solo from *ab initio*, unless you go on a fortnight's course; even then it will be another two or three months before you will be flying completely automatically and thus be able to concentrate on using the up-currents. Then one glorious day you will find yourself soaring. I know few people who can resist the fascination from this point on.

It's a Queer World!!

Unfortunate photographs having no need of further explanation



THE BRITON has always enjoyed his "noggin," whether mead, ale, porter or bitter beer, and whatever the container he has quaffed it from. Our earliest inhabitants used crude drinking vessels. The Roman occupation introduced the utensils and art of the Europe of the time, although the Latin drinking cups now to be seen in many of our museums were used only by the upper classes. For the "man in the street" there was usually the horn vessel of his ancestors or the wooden drinking bowl. And when the Dark Ages descended after the fall of Rome in the fifth century of our era, these more common vessels became almost general in use.

The Saxon invaders put drinking vessels amongst the most treasured of their possessions. We know this from sundry excavations up and down the country which have revealed the tombs of warriors buried with their drinking cups so that they could use them in the merry halls of Valhalla. At Taplow in Buckinghamshire a Saxon chieftain was laid to rest twelve centuries ago, accompanied by his drinking equipment which consisted of five cow horns and four glass cups.

The former were of great size, 2 ft. long, richly mounted at the mouth end and at the point with silver bands embossed in gilt. Each glass cup was a trumpet shape with a smallfoot, while the sides were ornamented with hollow pointed tubes bent downwards, and open on the inner side so that the liquid would fill them.

In the 9th and 11th centuries various new shapes were tried, some resembling our modern tumbler in shape, others, not unlike a dice box. Horn shapes certainly retained their popularity, and many vessels of this type were no doubt actual horns, though often they were made of other materials.

Came medieval times and a love of the ornate, and it became the practice to turn drinking vessels on the lathe; and the most common form in which they were found was in the shape of a shallow bowl about six inches in diameter, with a broad expanding rim of silver gilt called a "mazer". These mazers were often engraved with graceful mottoes such as, "In the name of the Trinity Fille the Kup and drinke to me."

Although wooden drinking cups more or less elaborately mounted continued to be in use until well into the 16th century as a fashion, many other materials of far greater intrinsic value were in use among the wealthy long before that time. Crystal, agate and other hard stone, ivory, Chinese porcelain, were all shaped into drinking vessels in addition to the precious metals themselves.

By the 15th and 16th centuries the shape of drinking vessels, their decoration and the materials of which they were made were infinite and many of the designs are among the

Ronald Shiner, famous cockney actor and landlord of the Black Boys Inn near Uckfield, Sussex, counts among his "regulars," Jimmy Edwards the noted comedian.

75 - year - old Charlie Griggs enjoys his pint in the bar of the Cock and Bell, High Easter, Sussex.

world's irreplaceable treasures of craftsmanship.

Some of the more ingenious designs not unnaturally became stylised and most people have seen at some time or another the half ostrich egg, or the half coconut, mounted on an elaborate silver base. It was about this time too, that glass cups became more common, as the monopoly which the city of Venice had held on this product was rapidly being broken.

The 16th century saw the introduction of a most unusual drinking vessel — the Yard of Ale. Made of a long tube of glass a yard in length, it was generally shaped like a coach-horn, but sometimes ended in three prongs like a trident, the opening being at the handle. This unique vessel had more than a utilitarian purpose, as may be supposed, for it was usually produced at that time in a party when all members were ripe for anything. The main idea was to see who could drink the deepest without taking the lips away from the mouthpiece. Bets were laid and anyone who has attempted to drink from a Yard of Ale knows that the winner deserved the prize money.

It was about this time too, that the tankard emerged as a household drinking vessel very much in the shape in which it appears nowadays, but with one difference — always it was given a hinged lid on top, and in this it resembled the Heidelberg Mug. Many were the designs of the thumb-piece to this lid — coats-of-arms, animal caricatures and other designs.

The word tankard is interesting. It is supposed to come from the Greek, meaning a large vessel or pot, and at first it was often very loosely used to describe the whole variety of vessels, drinking and otherwise.

Then it came to denote a water vessel with a capacity of two or more gallons and finally has reached the more modest, and manageable, proportions we know to-day.

Tankards were generally made of metal. One favourite, pewter, an alloy probably known to the Chinese, was certainly used by the Romans and reached a tremendous popularity in the reign of the first Elizabeth. As an alloy whose base is tin, it was prohibited for use in Communion vessels by the Council of Westminster in the 12th century, but with the founding of the Pewterers' Company of London some 100 years later the objection to it seems to have been removed.

As in the case of silver and gold, the pewter designer regarded his drinking vessels as works of art and many examples of his skill can be seen in British and Scottish museums.

A Toby jug, now seldom used but popular as showpieces on public-house shelves.

Overheard at lunch:

Canadian Comet Captain: "We were just overtaking the DC-6 when we heard a funny rumbling noise. Now do you believe in Comet silence?"

Editor's Note: It is perfectly possible to hear piston-engined aircraft when overtaking them in a Comet. However, the noise is quickly passed.

* * *

"The automatic telephone isn't working properly."

"No. There's nothing much you can do about it. It puts itself right in the end."

* * *

"Now, what is she going to be like this time? Will it be a gentle approach and a smooth touch-down, or will she do a quick turn-around and climb steeply away on the wrong course?"

The house is named "The Lurch" because she is left in it such a lot.

* * *

He does seem rude. Mark you, his rudeness is more real than apparent.

* * *

Finishing touches on our exhibition stand:

"Wouldn't our extravagant claims look best just here?"

* * *

He whistles — a sure sign that he has not only nothing to worry about but nothing to think about.

* * *

B.B.C. "Broadcast for Schools," July 3, 1957:

"To-morrow's 'Current Affairs' talk will be on the subject of Stonehenge."

* * *

I don't mind the straight path, but I must say I can't bear it to be narrow.

* * *

Yes! You are right! Because, you know, I do agree with you.

* * *

At a luncheon ceremony in Tokyo of the Japanese Antarctic Expedition, Mr. Ineno said he was proud to announce that all but two of the essentials carried by the expedition were Japanese. The exceptions were Scotch Whisky and a de Havilland Beaver.

MARVELOUS ASHTRAY

Patent No. 32-1466

What a phenomenal success its marvelous ashtray.

As you will put on somking cigarette's on the tray, its by conduction of cigarette's heat, rotating the sweet meldy from inside of trays automatically, then take off cigarette's the meldy to close.

They are give rejoicing for visitor at drawing-room and with your warkable friend in the office-room then to raise the level of efficiency.

They will guide to the happily road to dream-land; sleep when a quite sleep the night to free from trouble, at the bed-room.

Assotment Color Bule L/-Green Pink L/Bule L/Brown Purple Crimson Lake and Flower Design.

* * *

There will always be exploiters. It's just a question whether you want to make all-powerful uncivil servants of them.

* * *

Made us livid:

"All the characters speak in the same idiom, which veers between 'Heightened prose' and declasse verse; like a Gipsy Moth in a heavy storm, Mr. Hall's style is forever taxi-ing but never able to take off."

Theatre critic in "The Observer," London.

* * *

Acknowledgments for some of the photographs reproduced in this issue are due to: United Press Photo, New York; Saunders-Roe Limited; Camera Press Limited; Fox Photos Limited; Keystone Press Agency Limited; Charles E. Brown; Studio Lisa Limited; Daily Mirror Newspapers.

Now Winter's here —

— can Spring be far behind?

Printed in England by Samson Clark & Co. Ltd., 57-61 Mortimer Street, London, W.1