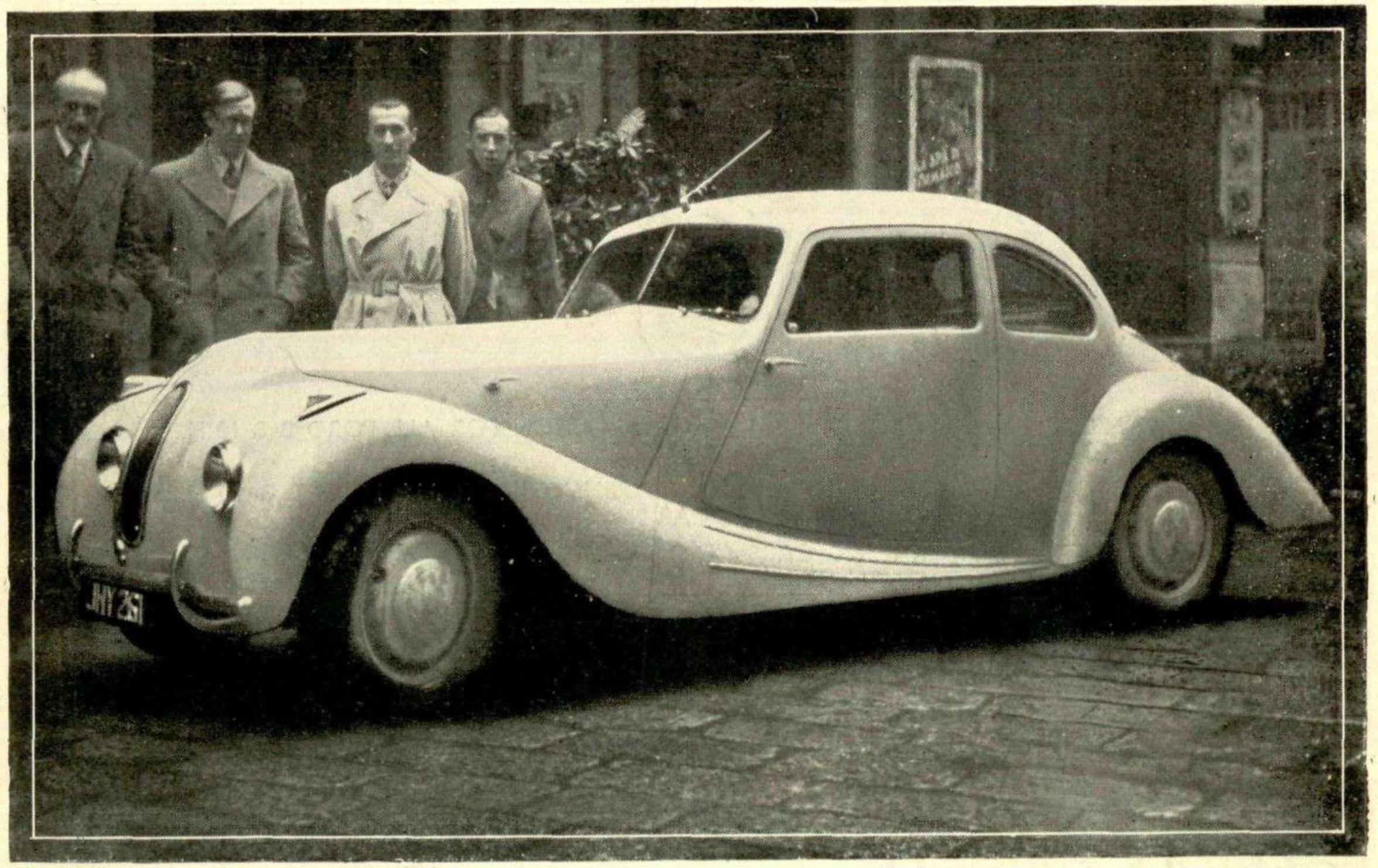
Vol. XXIII No. 1 **VISIT TO THE HEALEY FACTORY** *January, 1947*

MOTOR SPORT

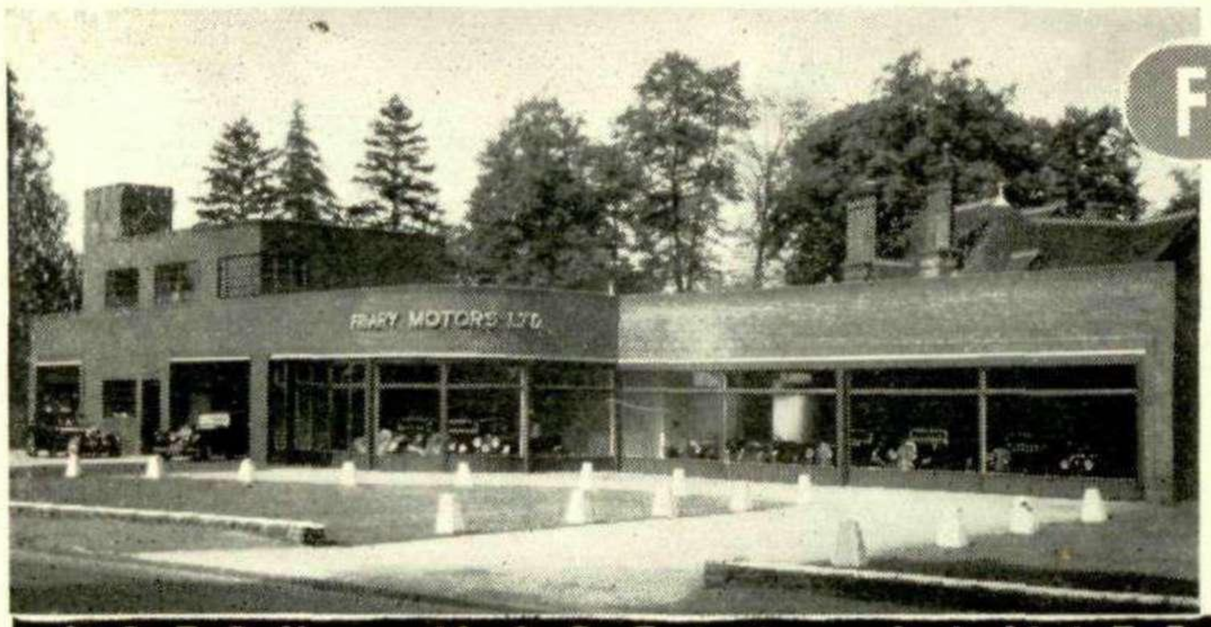
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CONTENTS

The Meeting of the Clubs	3	Entomological Dissection	11
Ex-Bellevue M.G. Magnette	6	"Motor Sport" Road-Test (Post-war Series), No. 2	12
B.R.D.C. Notes	6	Looking in on the Healey	14
Reports of Recent Events	7	The Cisitalia	17
"Motor Sport" Photographs	8	Rumblings	18
Sideslips	9	Club News	19
Letters from Readers	22		



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Although Whinlands Works was originally built to further the interests of the enthusiast and racing motorist, it is remarkable the number of drivers of ' family boxes ' who pay a visit to the works and come away ' converted ' (in more senses than one). Many times recently, a Gentleman's Carriage has entered the works, spent a week or two in the company of various pieces of fast-moving machinery calculated to instill the right ideas into it, and then emerged once more with a completely new outlook on life. (Note, this is not only confined to Gentlemen's Carriages—Ladies are bringing their Carriages in ever-increasing numbers for similar training.)

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THE MEETING OF THE CLUBS

EARL HOWE EXPLAINS EFFORTS TO SECURE SOMEWHERE TO RACE

ON December 11th last year the R.A.C. *Competitions Department called the* second meeting of Approved Motor Clubs, with Earl Howe in the chair. Much of value resulted from this frank airing of views on matters relating to the Sport. Major Dixon Spain introduced the four new members of the Competitions Committee, F. S. Barnes, T. A. S. O. Mathieson, Maurice Toulmin and Lord Waleran. He was able to say that 27 *new speed courses have been inspected* and that three more await inspection, that the record of racing drivers' performances is right up to date and that the third party insurance scheme has been extended to cover gymkhanas and similar events. Major Dixon Spain called for good behaviour on the part of all competitors and recommended shorter events in order to retain public interest and enthusiasm.

Earl Howe, who took the chair so very ably, told us of his efforts to get us somewhere to race. He felt that the S.M.M.T.'s reply about Donington had rather lost us the chance of using that course. He had inspected two aerodromes, one hopeless, the other good and round which a 3.3-litre Bugatti had lapped at 96 m.p.h. But the *landowners* had quashed the use of this course. Eight Government Departments have to be consulted, including the Home Office, Ministry of Supply, Board of Trade and Ministry of Town and Country Planning, before anything can be settled and, at the end of the road, there is the Treasury. But at least one important member of the present Government is fully conscious of the need for racing successes to boost our export trade, and Howe is still hopeful of finding a course. The A.C.U. pointed out that the Motor-Cycle Manufacturers' Union *wants* Donington.

Earl Howe paid a very fine tribute to *Lt.-Col. Gardner's courage and initiative* in taking 750-c.c. records, and announced that this year was the Jubilee of the R.A.C. The R.A.C. Rally will be held, in September, finishing at Scarborough, "petrol or no petrol." An exhibition of racing cars and veterans may be possible, and the Brighton Run will be held, while the British Hill-climb Championship will be contested at Shelsley Walsh, Prescott, Craigantlet, Bo'ness and Bouley Bay.

This led to statements that the Jersey Race, with the co-operation of the J.C.C., will be held on May 8th, and the Blackpool Rally in June, and that the Experts' Trial will be elaborated, and possibly staged as a two-day event in 1948. On the subject of the change in the British racing colour, Earl Howe said he was entirely to blame. At the C.S.I. meeting he had attempted to get sanction for *independent drivers to use their own* colours (like Seaman's black) and, high-speed technical French rather confusing the issue, had allowed himself to give approval to a trial period of using blue.

S. C. H. Davis thanked Earl Howe for his frank admission and said he was sure no blame attached, but Howe said there *was* blame on his shoulders and he would do his best to get the ruling rescinded at *the next C.S.I. meeting, which he thought* would not be difficult. [This frank and fair statement should be accepted by everyone without further quibble.—ED.]

On the subject of sports-car regulations, Earl Howe favoured the T.T. rules of the R.A.C., which he thought had produced a very reasonable fast touring car. Italy had proposed a new sports-car definition and the C.S.I. had asked her to run races under these rules and then to report to them again, and, proposing touring car races, she was told that saloon cars must run with the windows open and rear window removed. [Sensible, but non-aerodynamic.—ED.] Howe would like to see a stock-car race on American lines.

The number of clubs that should be invited by an organising club to its closed invitation events was discussed and was to be debated at the meeting of the C.C. on December 12th. Many ways of cleaning up the trials situation were discussed after Earl Howe had said it was *essential* not to annoy the general public or to impair their safety. He regarded Buxton as overworked in the past in respect of trials.

The locked-differential problem came up, and while Toulmin agreed with Ballamy ("750" Club) that progress in design must not be retarded, he felt the matter worth discussion. Kirkman (Southsea M.C.) said he had beaten locked-

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Will bring you one year nearer heaven—
At least, that's where we hope you'll go
When you depart this vale of woe.

But still, before you are "flagged-in,"
We trust your highest prize you'll win ;
So that, whatever race you run
You'll feel at heart you have well done.

Vintage or modern, *sans* all care,
Of Motor Sport may you have share ;
For which we send an invocation
That some day they'll increase the ration.

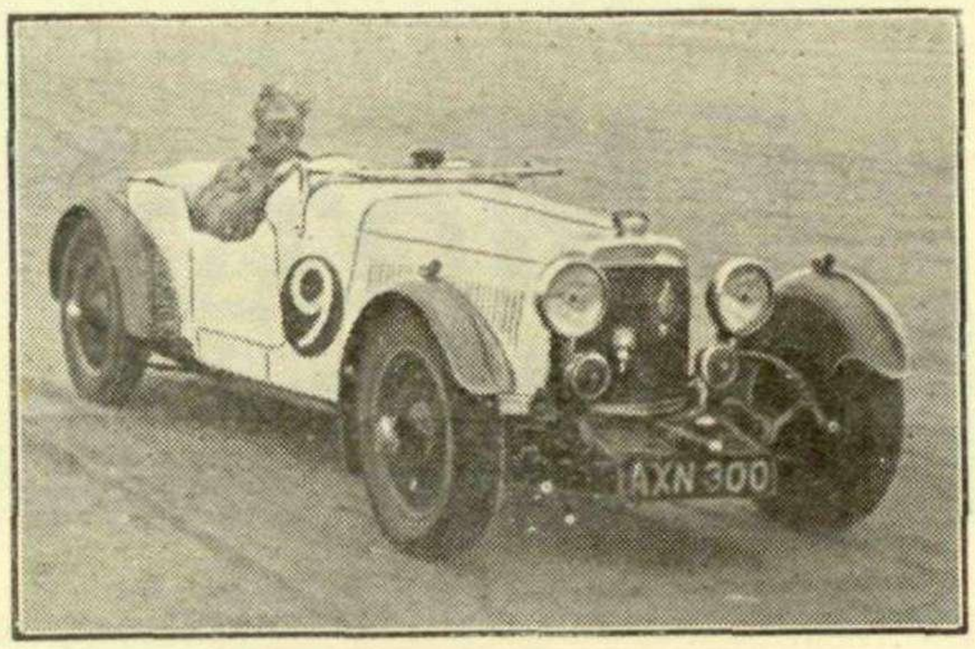
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A bright and prosperous New Year :
A perfect "dice" just now and then—
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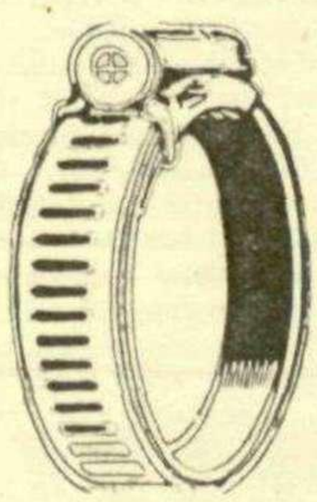
This car has had every attention and is considered to be one of the best of its year in existence. The two seater body by Bertelli is untouched and is cream with green cycle type guards. There is a new hood and four new tyres. The genuine mileage is 58,000 only. This car has been tuned for use of Methanol for competition work and for Pool petrol for ordinary use.

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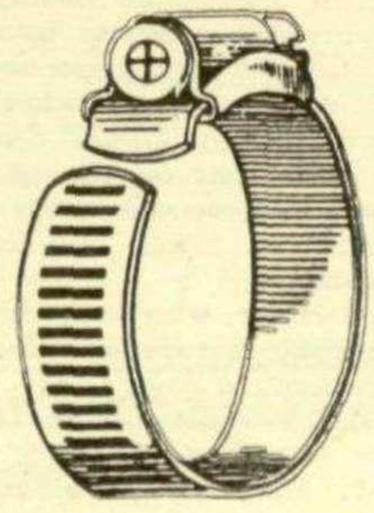
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differential cars with his Alvis, but the meeting suggested to him that locked-differential cars cannot be competed against by normal cars. Imhof (N.W.L. M.C.) said any regulations introduced should at least be enforced and Callender (Scottish S.C.C.) reminded us that Scotland's Standing Regulations ban locked differentials, while not excluding cars like the Frazer-Nash and Trojan. Birkett ("750" Club) said the restricted differential was a new menace. A motion to ban locked differentials was carried by a large majority.

The Liverpool M.C. suggested extending Competition Licences to trials-drivers, and while many people were against this, Fred Craner thought this a good thing and Toulmin said that a system of registration would suffice. This was confirmed by vote.

After tea racing matters were discussed. The B.R.D.C., represented by S. C. H. Davis and Kenneth Evans, gained almost all its points, which covered allowing one marshal to help a driver restart his car if he stalled his engine in a race, and running all racing car entries, for both runs, in the *middle of sprint programmes* (which Rivers Fletcher reminded us had been suggested at the "Rembrandt"). Earl Howe certainly backed the marshal-helper idea, recalling his own stalled engine at a Rheims G.P., and Eric Giles, Leslie Wilson, and the Jersey, Ulster and Bo'ness organisers were able to say that racing cars would be run between the sports-car classes at their 1947 fixtures. Spectators invading the road at the end of a meeting would need to be guarded against.

The question of issuing Standing Regulations for speed events cropped up, but most people favoured individual classifications and rules for sprints.

Other matters relating to regulations did not progress very far, but Strang ("500" Club) asked if standardised positions for carrying racing numbers could be agreed and Howe confirmed that this was important. Davis (B.R.D.C.) thought 500-c.c. cars might be scrutineered while they were a-building. Davidge Pitts (Hants and Berks M.C.) felt that too many thinly-disguised racing cars were allowed to run in sports-car classes at sprint meetings, often using methanol.

In reply to Bowler (Vintage S.C.C.), Earl Howe hoped an aerodrome circuit would become available for hire to clubs. Tett (Harrow C.C.) announced a complicated scheme for a "Trials-Drivers' Star" contest, which his club wished to introduce, but Toulmin reminded him that the B.T.D.A. was handling such a scheme, and Tett said if that was so the Harrow C.C. would withdraw. Many speakers felt that the problem of big cars winning all the "pots" in trials could be obviated by using capacity classes or grading starting points on the hills. [We favour this line of approach to a growing problem.—Ed.] Toulmin said that if the big cars did win everything did that matter? No one expected to beat Raymond Mays at Shelsley Walsh with an unblown 850-c.c. car. [But we must remember the effect of "Talbot-Darracq domination" on entries.—Ed.]

Dewey (Southsea M.C.) said that it is difficult to get *numbers printed in small* quantities and could the R.A.C. undertake to do this, selling supplies to the clubs. Major Dixon Spain said this was an expensive hobby, but Dewey, quite rightly, emphasised that, far from being a hobby, this is a necessity. It is understood the R.A.C. will supply numbers.

Thus concluded a most useful meeting, attended by club representatives from far and wide, the North of England being especially well represented. Cecil Clutton (B.O.C.) proposed a vote of thanks to Earl Howe and the Competitions Committee.

CALENDRIER SPORTIF INTERNATIONAL, 1947

(AS RECEIVED)

N.B.—Les "*Grandes Epreuves*" *sont soulignees deux fois et les "Epreuves a Priorite" une seule fois.*

Fevrier			
23	Suede	... ...	Circuit de Vitesse (C).
Mars			
21-22-23	France	... ...	Rallye International Lyon-Charbonnières-les-Bains (ST).
30	France	... ...	Grand Prix Automobile de Nimes (C).
Avril			
1-7	France	... ...	Rallye International du Cinquantenaire de l'A.C. de Nice.
5-8	Grande-Bretagne	...	Circuit of Ireland Trial (Ulster A.C.).
6	France	... ...	Course Internationale de Côte de la Turbie (cinquantenaire).
7	France	... ...	Grand Prix Automobile de Pau.
13	Italie	... ...	Circuit de San Remo (C).
20	France	... ...	*Prix Automobile des Trois Villes.*
27	Italie	... ...	Coupe des Mille Milles.
Mai			
4	France	... ...	Grand Prix de Picardie.
8	Grande-Bretagne	...	Circuit de St. Helier-Jersey (Junior Car Club).
11	France	... ...	Prix de Paris Automobile.
ou 5 Octobre			
17	*Grande-Bretagne*	...	*Course de Côte Bo'ness* (S.S.C.C.) (C.S.).
17-18	France	... ...	Grande Prix de Marseille.
24	Grande-Bretagne	...	Course de Côte Shelsley Walsh (Midland A.C.) (C.S.).
25	Belgique	... ...	Grand Prix des Frontières à Chimay.
25	Italie	... ...	Grand Prix de Rome (C).
25-26	France	... ...	Bol d'Or Automobile.
26	Grande-Bretagne	...	Circuit de Vitesse (J.C.C. and B.R.D.C.).
30	Etats-Unis	... ...	INDIANAPOLIS 500 MILES MOTOR SWEEPSTAKES.
Juin			
1	Luxembourg	...	Grand Prix de l'A.C. du Luxembourg.
8	Suisse	... ...	GRAND PRIX DE SUISSE.
15	France	... ...	Circuit des Remparts.
15	Italie	... ...	Grand Prix de Turin (F.I.).
15-22	Pologne	... ...	XIIIème Concours International Automobile de l'A.C. Polski.
21-22	France	... ...	*24 Heures du Mans.*
29	Belgique	... ...	GRAND PRIX D'EUROPE.
Juillet			
6	France	... ...	Grande Prix de la Marne (C).
6	Suisse	... ...	Course Int. de la Côte de la Maloya (C.S.).
11-15	France	... ...	Rallye International des Alpes Francaises (S).
12	Irlande	... ...	Course organisée par le Irish Motor Racing Car Club.
12-14	*France*	... ...	*Rallye International des Pays Nordiques sur la Baule.*
13	Italie	... ...	Circuit de Vitesse de Bari (C).
13-14	France	... ...	Grand Prix d'Albi (C).
20	France	... ...	Grande Prix de Nice (C).
20	Suisse	... ...	Course Internationale de Côte Develier-les-Rangiers (S.C.T.).
20-25	Tchecoslovaquie	...	Rallye de St. Christof (S.T.).
27	France	... ...	Course Internationale de Côte du Mont Ventoux (C.S.).
27	Belgique	... ...	Course à Liège (C).
27	Italie	... ...	Circuit du Lido (S).
Aout			
3	France	... ...	Circuit de Strasbourg.
3	Italie	... ...	Course de Côte du Stelvio (C.S.).
4	Grande-Bretagne	...	Course (Junior Car Club).
5-10	Italie	... ...	Rallye Stella Alpina (S.T.).
9	Grande-Bretagne	...	Ulster Trophy Race (Ulster A.C.) (C).
10	France	... ...	Grand Prix Automobile du Comminges (C).
15	Italie	... ...	Circuit de Pescara (C).
23	Grande-Bretagne	...	TOURIST TROPHY RACE.
30	Pays-Bas	... ...	Grand Prix de Zandvoort (C).
30	Grande-Bretagne	...	Course de Côte Craigantlet (Ulster A.C.) (C.S.).
31	Suisse	... ...	Course Internationale de Côte Montreux-Caux (S.C.).
Septembre			
1	Grande-Bretagne	...	Brighton Speed Trials (Brighton and Hove M.C.).
7	France	... ...	Rallye International Genève-La Baule.
7	Italie	... ...	GRAND PRIX D'ITALIE (C).
13	Irlande	... ...	Course organisée par le Irish Motor Racing Club.
14	Grande-Bretagne	...	Course de Côte Prescott (Bugatti Owners' Club).
20	Grande-Bretagne	...	Course de Côte Bo'ness (S.S.C.C.).
21	France	... ...	GRAND PRIX DE L'AUTOMOBILE CLUB DE FRANCE.
27	Grande-Bretagne	...	Course de Côte Shelsley (Midland A.C.).
28	Suisse	... ...	Grand Prix de Zürich (F.I.).
Octobre			
4	Grande-Bretagne	...	Donington Grand Prix (Derby and District M.C.).
5	Suisse	... ...	Grand Prix de Lucerne (F.I.).
11	Grande-Bretagne	...	Circuit de Vitesse (B.R.D.C.).
Decembre			
21	Suisse	... ...	Coupe de Nöel Course de Côte Sierres-Crans.

Donald Pitt describes—

HIS EX-BELLEVUE M.G. MAGNETTE

This car, as most readers will recall, was that built in 1937 by W. E. Wilkinson, of Bellevue Garage, to the special requirements of John Dugdale.

The chassis itself was originally a standard N-type M.G. "Magnette." Upon this chassis was built an off-set, single-seater body, complete with a 25-gallon tank, which comprises the tail, and a most ingenious radiator, the outer frame of which is off-set to comply with the body-line.

A very special unblown K.3 M.G. "Magnette" engine was installed, fitted with twin T.T. S.U.s alongside the much-modified inlet manifold, the idea being to bring it into a different handicap category, as against the other more potent "Magnettes."

With a very special camshaft, high-compression domed-top pistons, Lucas automatic-advance magneto, and running on 50/50, the car was capable of 90 m.p.h. in 3rd and 110 m.p.h. in top, with acceleration to match.

Unfortunately, I have few details at the moment of its history whilst in John Dugdale's hands.

Before the war the car changed ownership and was raced by Edmundson and Hurst, being successful in several events. It put in several laps on the Outer Circuit at 108 m.p.h., driven by "Wilky." [The car's best race performances were: Outer Circuit, Wilkinson, 91.38 m.p.h.; Campbell Circuit, Hurst, 63.56 m.p.h.; Mountain Circuit, Hurst, 65.21 m.p.h.—ED.]

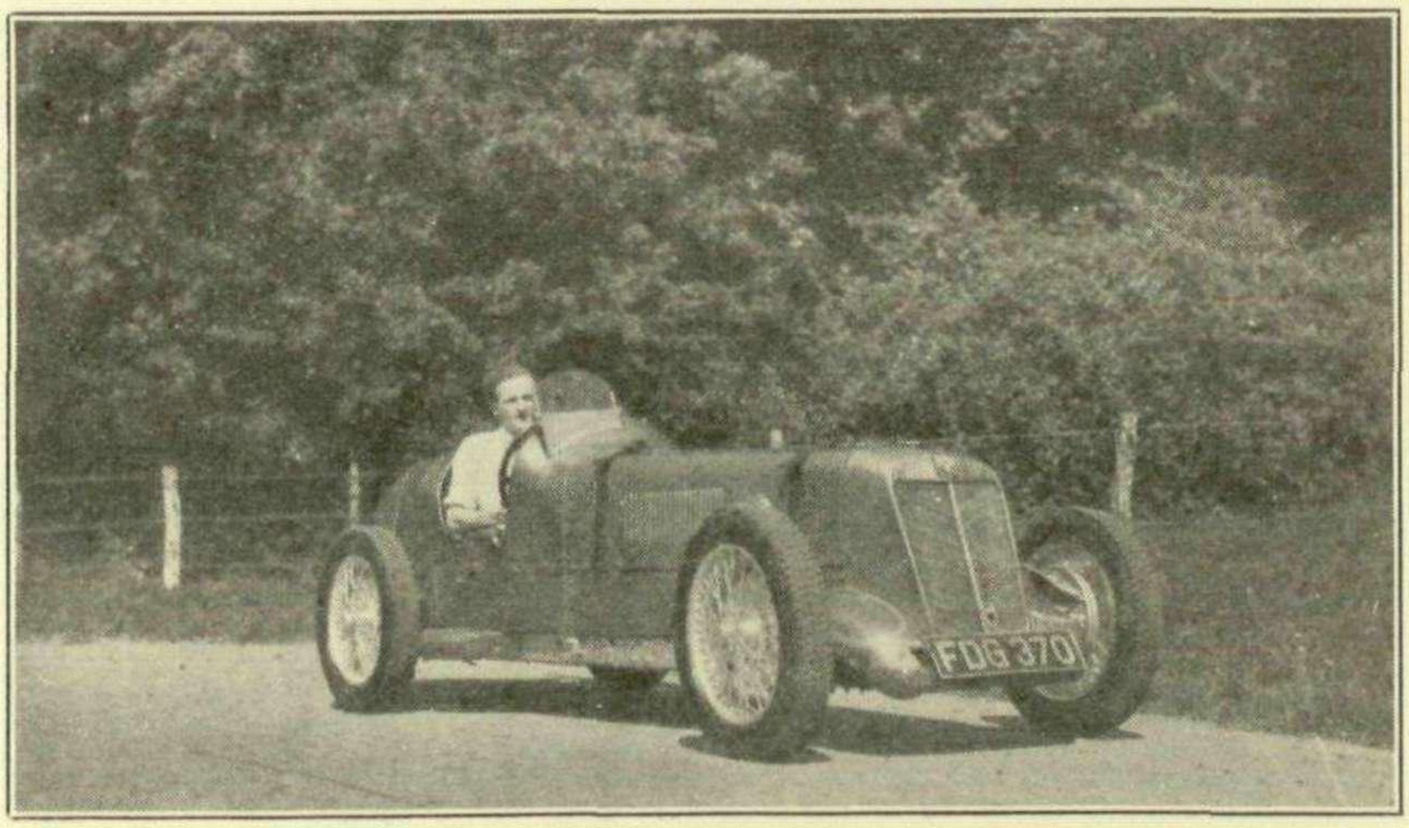
A long-distance 'phone call, a rapid journey to Town in a Riley "Kestrel," a careful inspection at close quarters, and the car became mine. It was decided, rather energetically, to pull everything to pieces, rebuild the car and enter it for a Prescott meeting a fortnight later.

Monaco Ltd. were entrusted with this work. Meanwhile, I had decided to tax the "Magnette," partly to get the general feel of it in the few hours available after completion, and partly to get it home as quickly as possible. I drove the car home from Monaco to Stroud, arriving in the late evening before Prescott.

Yes, this M.G. most certainly had something, even though it was unblown. The urge from 70 m.p.h. onwards was something on its own, and with the close-ratio gearbox 3rd and top seemed very close indeed; this, with the whine of the E.N.V. straight-cut pinion assembly, together with the Brooklands exhaust system and the pungent smell of "dope," made this motor seem a very rapid means of conveyance. It is, however, also remarkably tractable, gives no fuss or bother with plugs, and is an easy starter.

At the Brighton Speed Trials, after a journey through a very damp night, we competed and had a lot of fun, being matched alongside Ian Connell's E.R.A., "Bira's" original "Remus." I drove the "Magnette" home from Brighton the same night, completing 400 miles for that day.

Several modifications have been done since I took over, including the fitting of duralumin Andre shock-absorbers at the rear, which Andre Components Ltd. very obligingly made specially in eight days. The whole car was re-cellulosed black and aluminium. Altogether a very attractive little motor car, with great potentialities, and much work is planned on it during the winter months. The car will very definitely be in action again next season, in an entirely different form from that originally planned.



Pitts' M.G. photographed after the owner had taken delivery of it from Monaco Ltd.

BRDC Notes

"THE STEERING WHEEL"

Racing folk have long felt the need for a social club in the West End, like the old Gilson's. The B.R.D.C., in conjunction with the J.C.C., has now opened such a club, at 2a, Brick Street, W.1, which is open between noon and 3 p.m. and again between 5 p.m. and 11 p.m. each day. Known as the United Motor Sports Club, or, more briefly, "The Steering Wheel," the annual subscription is two guineas. The club was opened by a cocktail gathering on December 16th last and restaurant facilities, under the supervision of a Swiss-trained *chef de cuisine*, will soon be available. The club's telephone number is Grosvenor 2765.

It looks as if new records may be made at Bonneville Salt Flats between August 15th and September 15th. John Cobb will be there to try to make his Railton exceed 370 m.p.h., and Ab. Jenkins will also be present.

Eric Verkade has been in this country with his sensational touring car, a Maserati sports Zagato two-seater with two straight-eight racing engines placed side by side, giving a capacity of 4 litres. The bore and stroke are 62 by 82 mm. and the crankshafts run in seven roller and two plain bearings; there are split cage roller big-ends. Keeping to 5,000 r.p.m., Verkade gets 110 m.p.h. and, although the gearbox provides but three speeds, acceleration is most impressive. The other quite astounding car at Rowland's Byfleet garage has been one of the 1939 3-litre type "M.163" Mercédès-Benz G.P. cars, the sort with two-stage supercharging, giving over 480 b.h.p. at 7,800 r.p.m. The Czechs "borrowed" this car from the Germans, it eluded the Russians, and it really is here in this country. Its fate is undecided.

TO ALL CONCERNED

In consequence of the Christmas Holidays and our desire to avoid delay in providing our readers with their monthly tonic, "Motor Sport" had to be sent to press earlier than usual.

We have therefore been compelled to refuse all classified advertisements received after the advised closing date, viz. 20th. If your advertisement does not appear, please accept our apologies.

Reports of Recent Events

HARROW C.C. COTTINGHAM TRIAL

Held on Bagshot Heath, this event unfortunately clashed with the Veteran Car Run. The fifty competitors who entered had a hard day's sport in fearful weather. Two sections failed the entire entry, while two hills were included which only Morrish's 1928 Frazer-Nash managed to climb. Red Roads, divided into three sections, was in dour mood and only the Frazer-Nash (we believe its owner is A.F.N. Ltd.'s store-keeper), C. A. N. May's Ford V8 Special and the Price-Special got up. Imhof's Allard dug itself in near the top. Price won the trial, but even he did not qualify for any other award—it was a difficult day all right!

Results

COTTINGHAM MEMORIAL TROPHY: D. W. Price (3,922-c.c. Price-Special).
COMMITTEE CHALLENGE CUP: M. H. Lawson (1,497-c.c. H.R.G.).
C.L.J. CHALLENGE CUP: C. A. N. May (3,622-c.c. Ford-Special).
DRYDEN CHALLENGE CUP: K. Delingpole (1,497-c.c. H.R.G.).
TEAM PRIZE: Harrow C.C. Team—L. Potter (4,000-c.c. Allard), D. W. Price (3,922-c.c. Price-Special), K. Hutchison (3,622-c.c. Allard-Special).
FIRST-CLASS AWARDS: F. Morrish (1,496-c.c. Frazer-Nash), J. H. Appleton (4,000-c.c. Allard), K. Hutchison (3,622-c.c. Allard-Special).
SECOND-CLASS AWARDS: G. N. Mansell (3,917-c.c. Allard-Special), K. E. O. Burgess (4,000-c.c. Allard), A. L. S. Denyer (1,496-c.c. Lea-Francis), E. J. Newton (1,497-c.c. H.R.G.).

TAUNTON M.C. ALLEN TROPHY TRIAL

Thirty-nine entries produced 34 starters in spite of fearful conditions and flooded roads. The Price-Special had apparently overdone things in the "Cottingham" the previous Sunday, for it had axle trouble just prior to the start. The Glade failed everyone, best effort to ascend it being by Warburton (Ford-Special), after good attempts by the Allards of Parker, Hutchison and Burgess. The upper sections of Underhill again failed everyone, and only C. A. N. May's Ford V8 Special, McAlpine's V12 Allard and Evans' "Special" with 2-litre engine got up Carpenters. The first special test saw Bryant's T-M.G. make best time, and the second test gave f.t.d. to Warburton, with Buncombe's Jeep only 0.2 sec. slower. The Allards and Fords nearly all got up Truckwell, Appleton and Parker very quickly, Potter and Warburton in slow but sure fashion, while Hutchison just failed. Of the smaller cars, Cleave's Morris-Special, Morrish's two-carburetter, blown M.G. "Midget" and Evans' "Special" were outstanding. Five cars failed to finish, including Best's blown 1½-litre Singer, which broke a piston. Evans, in a car he calls the "Stark Adder," won on his times in the tests, from May's Ford-Special.

Results

BEST PERFORMANCE OF THE DAY: C. C. Evans (1,991-c.c. Stark Adder), 15 marks lost, 33.2 sec. total time in driving tests.
RUNNER-UP: C. A. N. May (3,622-c.c. Ford Special), 15 marks lost, 54.4 sec. total time in driving tests.
1,100 C.C. CUP: W. A. Cleave (1,086-c.c. Morris), 20 marks lost.
1,500 C.C. CUP: T. C. G. Butler (1,287-c.c. Ophelia), 25 marks lost.
OVER 1,500 C.C. CUP: L. Potter (4,000-c.c. Allard), 20 marks lost.
FIRST-CLASS AWARDS: J. H. Appleton (4,000-c.c. Allard), 20 marks lost; A. G. Imhof (4,000-c.c. Allard), 20 marks lost; G. Warburton (3,622-c.c. Ford-Special), 25 marks lost; K. E. O. Burgess (4,000-c.c. Allard), 25 marks lost; J. W. Dyer (1,089-c.c. Riley), 25 marks lost.
SECOND-CLASS AWARDS: L. Parker (4,438-c.c. Allard), 25 marks lost; C. S. Dewey (2,093-c.c. Willys Jeep), 30 marks lost; J. Buncombe (1,983-c.c. Ford Jeep), 30 marks lost; K. Hutchison (3,622-c.c. Allard), 35 marks lost; A. W. Morrish (939-c.c. M.G.), 35 marks lost.
TEAM AWARD: "Candidi Provocatores" Allards (A. G. Imhof, K. E. O. Burgess, J. H. Appleton).

V.S.C.C. DRIVING TESTS

The Vintage Sports Car Club again held a series of driving tests at Bisley on November 24th. Rain fell unmercifully, but lunch at the "Pavilion" did much to dispel the gloom. After Forrest Lycett had said a short grace a very good meal was served and the attendance must have been a record. Spectators' cars included a new member's old four-cylinder Crossley tourer, Packman's Trojan (the one which used to tour the world on the deck of a battleship), Power's Rolls-Royce "Twenty" saloon, full of humanity, many Bentleys, Peter Clark's "Aerodynamic" H.R.G., etc. The first test consisted of accelerating to a considerable speed, stopping, reversing over a line and accelerating off again. Cruelty to vintage cars, but interesting. Birkett's Austin delivery van was first victim. Hill's Edwardian "Alphonso" Hispano-Suiza was outstanding, but Samuelson's *very* desirable 1914 T.T. Sunbeam rather crashed its gears. Axel Berg was terrific in a friend's "100-m.p.h." low-chassis Invicta, a "12/50" Alvis waited whilst its driver climbed out to search for reverse gear, and a "30/98" Vauxhall couldn't stop. The 2-litre Lagondas, Bentleys and Lancia "Lambdas" were generally neat, and Peter Clark, the ultimate winner, carried a full crew—Ariel and her two children—in his "Le Mans" H.R.G. The next test was an in-and-out-the-garage affair, after which came the more welcome tea and film show.

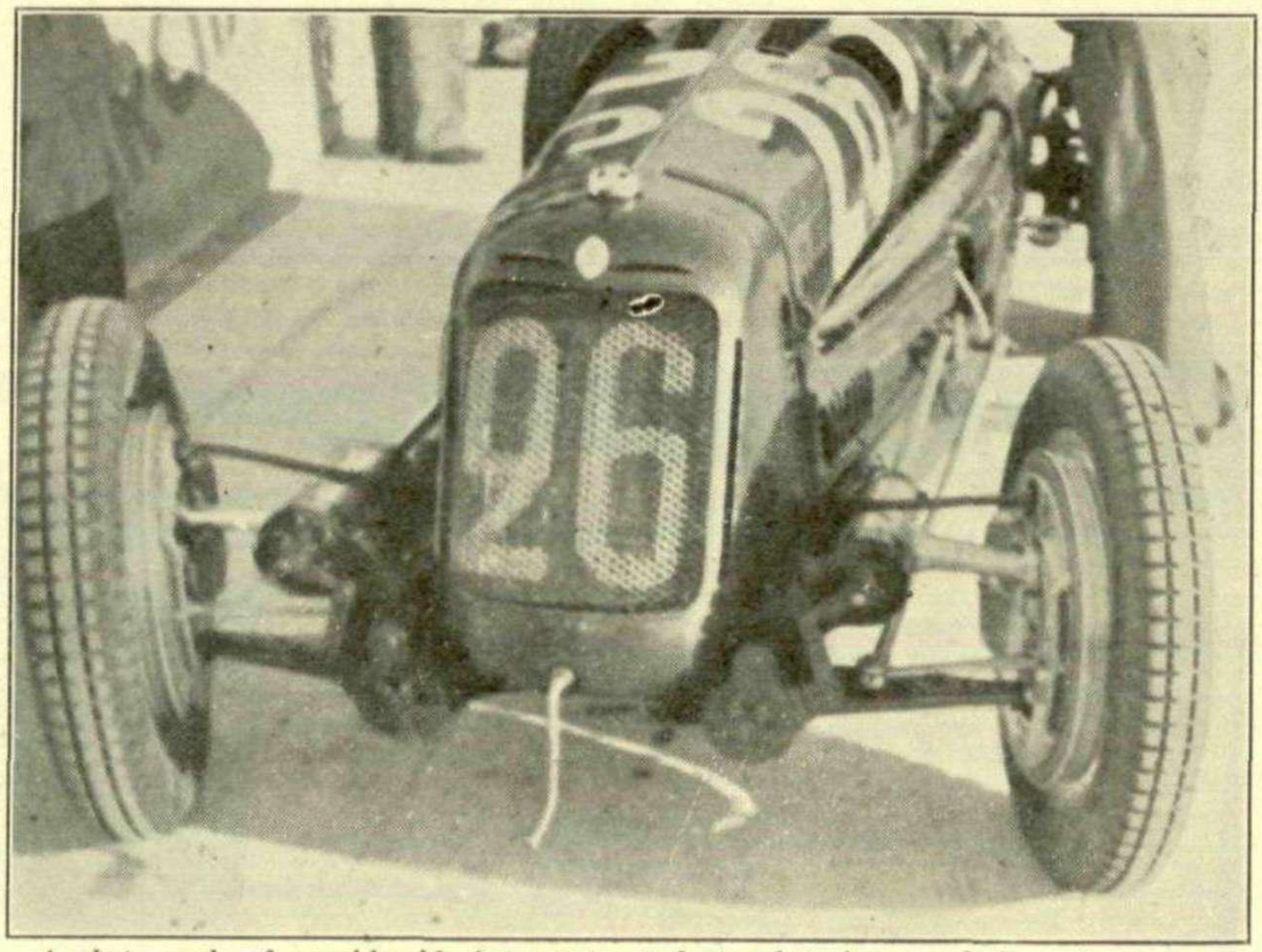
Results

OVER 1,500 C.C.: (1) Richardson (3-litre Bentley); (2) Jane (Lancia "Lambda"); (3) Cuthell ("12/50" Alvis).
UNDER 1,500 C.C.: (1) P. Clark (H.R.G.); (2) Welfare (Austin); (3) Blackall (M.G.).
SPECIAL AWARD: W. A. Hill (1912 Hispano-Suiza "Alphonso").

N.W.L.M.C. GLOUCESTER TRIAL

This old-established classic of the N.W. London M.C. attracted 65 entries, if we discount A. N. Atom's Uno-1956 of .001 c.c., entered by the Suicide Club, and due to carry No. 13, but which didn't appear. The trial took place in typical country, and was run in two circuits, the hills being Bownham, Juniper, Hodgcombe and Nailsworth. Juniper and Hodgcombe proved unclimbable on the first circuit and the latter was cut out on the second, while Juniper's "observed section ends" notice was brought halfway down the hill. In this condition, clean ascents were scored by Parker's Allard, Delingpole's H.R.G. (easily!), Mansell's Allard (just!), Newton's H.R.G. (*only* just), Zwick's Allard (splendidly!) Uglow's H.R.G. (*beautifully*!), Imhof's Allard (fast!) and Hutchison's Allard. Good efforts were made by May's Ford, which nearly got up, Yates' Austin Seven, Morgan's Riley, Virr's B.M.W., Lund's M.G., and McAlpine's Allard. Amongst those whom we saw defeat Nailsworth's notorious "step" on the second circuit were Lund's M.G. and

Continued on page 23

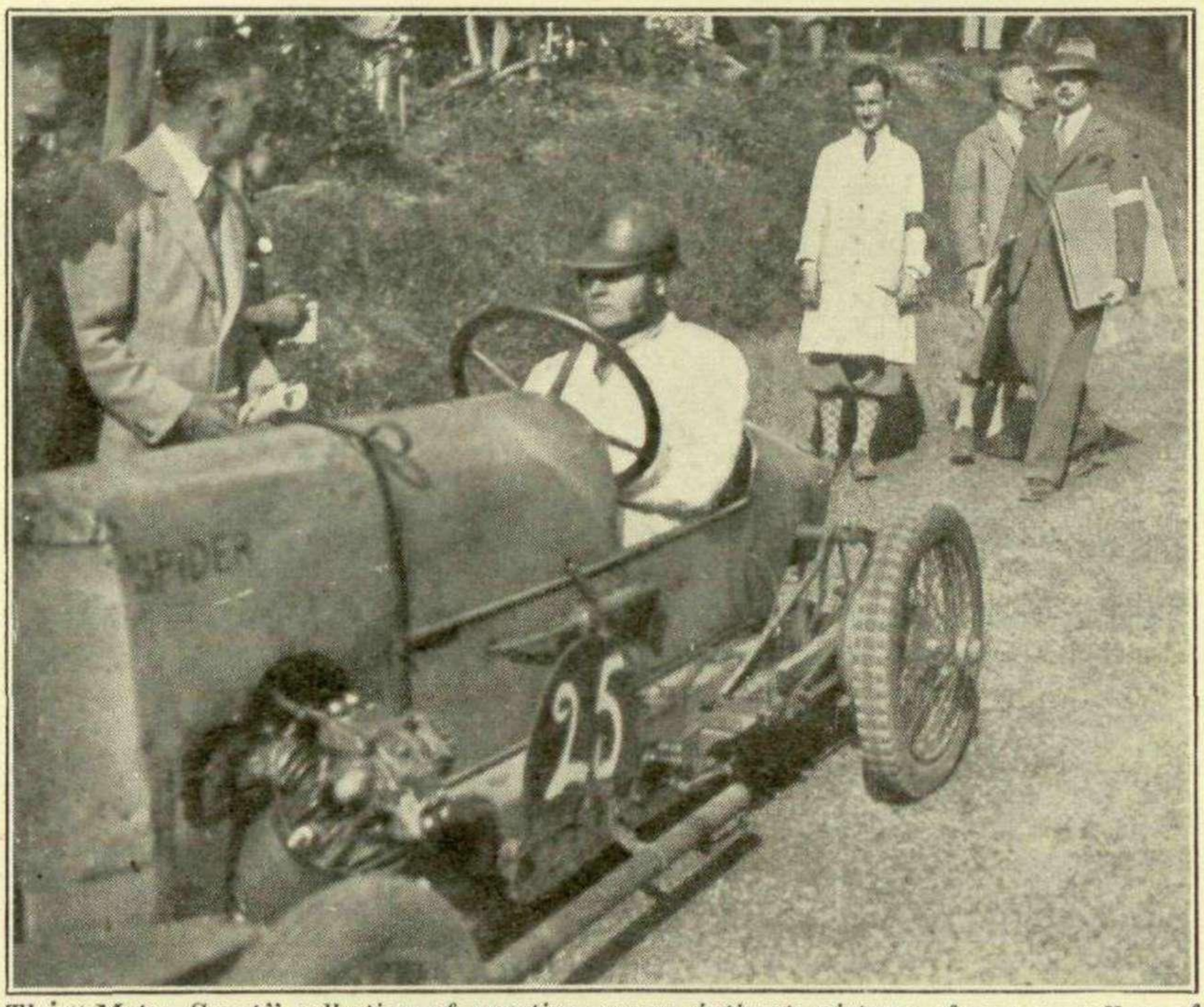


A photograph of considerable interest to students of racing-car design, showing a 2.9-litre Maserati with torsion-bar i.f.s.

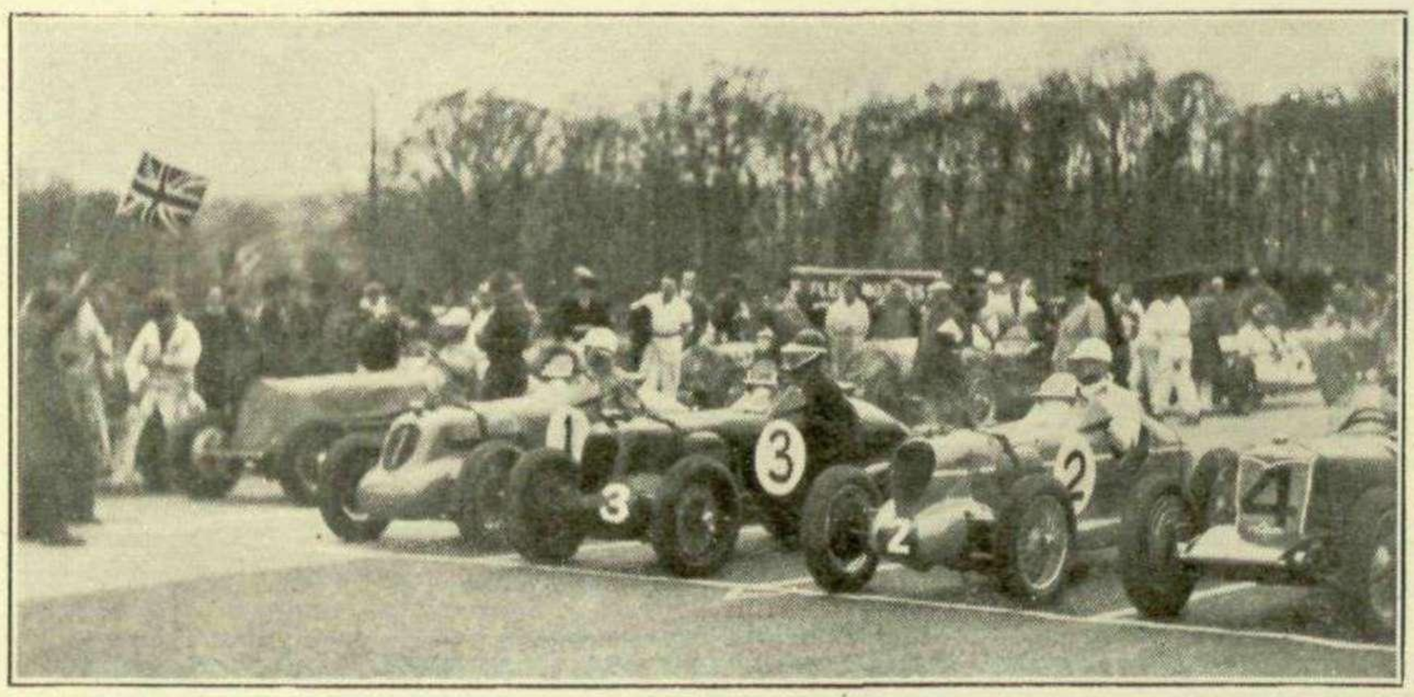
"Motor Sport" Photographs

In these hard times many pleasures are denied us, and one of them is the lavish use of the camera, or even of obtaining unlimited printing paper for the reproduction of old negatives. For the latter reason, at present we cannot offer readers a decent photographic service. But it may be as well to mention that we have in our possession several thousand negatives and plates covering, in particular, the major events for the period 1935-1938 in very considerable detail. Beginning with some isolated earlier shots of High-Speed Trials, Brooklands and odd sprints, the following titles are logged for 1935:—All B.A.R.C. meetings, all Donington meetings, 500-Mile Race, Mannin Moar, Mannin Beg, International Trophy, I.O.M. races, both Shelsley Walsh Hill-climbs, Brighton Speed Trials, Syston Speed Trials, L.C.C. Relay Race, R.A.C. Rally, London-Gloucester Trial, Inter-varsity and W.A.S.A. Trial, J.C.C. Brooklands Rally, Harrow C.C. Trials, J.C.C. High-Speed Trial, Ulster T.T., Le Mans, Monaco and French G.P. Of each of the more important events there are over 50 copyright action and static pictures. The same service exists for subsequent years and the whole constitutes an extremely valuable and historic collection.

We hope later to be able to offer prints to interested persons, but at present the restricted supplies of printing paper render this impossible. It might be possible to make exceptions in especially deserving cases or to loan isolated pictures if these were very urgently required by clubs for a particular purpose.



The "Motor Sport" collection of negatives covers intimate pictures of cars as well as of drivers—here is Davenport's famous "Spider" at a pre-war Shelsley Walsh meeting.



Another picture from the "Motor Sport" negatives—a nostalgic Donington line-up. When will we get a racing circuit again?

Blakes

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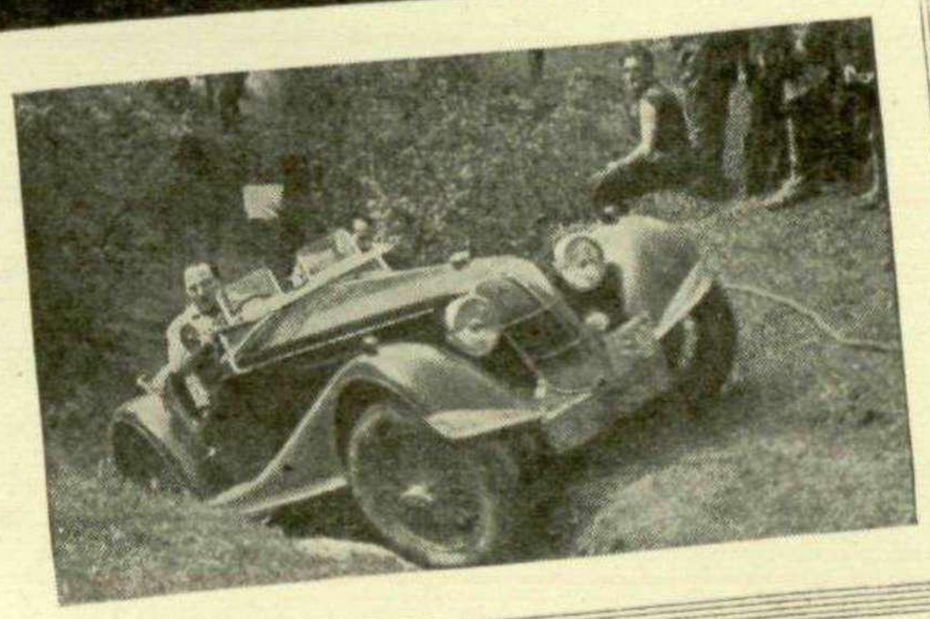
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SIDESLIPS

by

"BALADEUR"

THE Editor of MOTOR SPORT is an indulgent man. That much is obvious from the fact that he is prepared, month after month, to provide this skid-patch whereon his contributor "Baladeur" may perform his evolutions. At the same time he has been known to remind me that not all his readers live in that world of the past which I appear continually to inhabit. And, completely undeterred, I propose on the present occasion to revert, not to the nineteenth century, but to the Middle Ages.

The reason for this curious behaviour is not an attempt to discover a designer of automobiles anterior to Leonardo da Vinci, but simply a desire to open an enquiry into the origins and effects of the rule of the road. And the necessity for this lengthy historical journey arises from the fact that it was apparently a mediæval Pope who decreed that all vehicles throughout Christendom must keep to the left. (I believe that I have once known *which* mediæval Pope; but the fact that I have subsequently forgotten is perhaps of no great significance.) At any rate, supposing that he considered it desirable to achieve uniformity in the matter, there was, in my opinion, a good deal to be said for His Holiness's choice of the left rather than the right. Although I have never driven a four-in-hand and, indeed, my hippomobile experience is confined to sundry farm waggons and a two-wheeled dog-cart drawn by a superannuated polo pony, it seems clear to me that, for a right-handed driver, it is definitely the most convenient arrangement to hold the reins, which are operated by movements mainly of the shoulder and elbow, in the left hand, and the whip, which relies primarily on movements of the wrist, in the right. This being the case, it seems equally clear to me that it must be more convenient for a coachman to keep to the left, so that his whip does not get entangled in the hedge and is, moreover, on the right side for him to flick oncoming Jehus in the face, if, in his opinion, they do not draw far enough over.

Such, then, were, I suppose, the arguments which appealed to His Holiness when drafting his Bull; and its provisions, more or less strictly (I suspect less rather than more) were quite happily observed for centuries by the western world. Then, in 1789, there burst upon civilisation a cataclysm, of which, perhaps, we have not yet seen the last, in the shape of the French Revolution. Now to the revolutionaries, anything that smacked of the church and the old régime, however inherently right, was necessarily wrong. In this case the left was necessarily wrong also; and just because Louis XVI and the Pope kept to that side of the road, the men of the New Era decided that they must keep to the other. Obediently the tumbrils rumbled their way to the guillotine with their wheels in the right-hand gutter.

Now there was this to be said for the revolutionaries, that while the change must in some respects have been most inconvenient to coachmen, it made them drive on what is, in my opinion, unquestionably the natural side of the road. Right-handed travellers when lost in the desert, or so I have always understood, perform endless gyrations in a clockwise direction before they finally lay them down to die of thirst; and it is possible that if only the drivers of small saloon motor cars were encouraged to gravitate towards the right-hand ditch, they would not so persistently proceed at 30 m.p.h. in the very middle of the road. This much at least is certain, that strenuous efforts on the part of the London Underground to induce pedestrians to keep to the left had to be abandoned as a dismal failure, and personally I have always found it easier to change from the left- to the right-hand rule of the road than to change back again.

At any rate Napoleon, as a true son of the Revolution, was an enthusiast for the right-hand rule, and wherever his armies went there the rule went with them. By 1812 France had swallowed up the Low Countries and the western side of Italy as far south nearly as Naples; Spain, the rest of Italy and all Germany except Prussia and Austria, shorn of the Tyrol and her territories round the head of the Adriatic, were dependent states; and Denmark, which at this epoch included Norway, was in close alliance with the conqueror. I apologise for the history lecture, but we are at last getting near to a motor car; for examination of the 1934 edition of that invaluable guide called "Europa Touring," which used to be published in Switzerland, reveals that at that epoch the right-hand rule of the road prevailed throughout western Europe, with the exception of Sweden and Hungary, which had never been subdued by Napoleon, and Czechoslovakia which had formed part of the Austrian Empire; while, most remarkable of all, in Austria itself there were two rules of the road, traffic keeping to the right in the Tyrol and Vorarlberg, which were the provinces that had been lost in the Napoleonic wars, and to the left in the rest of the country. Historically, nothing could have been neater; in practice, as I know from personal experience, no arrangement could have been more inconvenient except perhaps that ruling in Italy thirty years earlier, where, in spite of Garibaldi, some flicker of the Papal enactment lingered on in municipal regulations, with the result that, in the early days of motoring, it was necessary for the chauffeur before entering an Italian town, to assure himself as to whether the mayor favoured the church or the revolution.

Napoleon, however, unlike those national heroes Julius Caesar and William the Conqueror, was no more successful at invading England than was Hitler. Of course, if anyone had remembered in 1605, when Guy Fawkes tried his large-scale experiment in internal combustion, that to keep to the left smacked of "Popery," I have no doubt but that Protestant enthusiasm would have anticipated the revolutionary change to the right by nearly a couple of centuries. But apparently nobody did, and in any case the rule of the road in this country seems to have been exceedingly vague until quite modern times. Thus at the beginning of the eighteenth century, Sir Roger de Coverley, not content, apparently, with inventing his dance which was my peculiar bane at children's parties, was writing in *The Spectator* of "the right we had of taking place, as going to London, of all vehicles coming from thence"; which, if it means anything at all, presumably indicates that traffic bound for the metropolis could blind down the middle of the road and that anything coming in the opposite direction had to get into the ditch as best it could. A state of affairs which was not long in proving its inconvenience, as witness an Act of Parliament of 1756 concerning the Widening of London Bridge (29 Geo. II, cap. 40) which, after clearly setting out a "No Parking" regulation in the words ". . . and that no Coachman or Driver shall stand or ply for hire with any Coach or other Carriage whatsoever upon the said Bridge, or leave any empty Coach or Carriage there; and that no Carman, Carter, Drayman or Driver of any Carriage whatsoever, shall wilfully remain with any Cart, Carr (*sic*), Dray, Waggon or other Carriage whatsoever on the said Bridge, longer than shall be necessary for going over the same"—proceeds to clarify the rule of the road in the words, "Be it further enacted . . . that all Carriages passing over the said Bridge from *London* shall go on the East Side thereof as near as may be, and that all Carriages passing over the said Bridge to *London* shall go on the West Side thereof as near as may be . . ." [Fine not to exceed 20s. or be less than 2s. 6d.].

But London Bridge was evidently one thing and all other roads quite another. Even as late as the epoch of motor fire-engines, the "Manual for the Use of Fire Brigades" is still complaining that "the *law* governing the rule of the road is very scant"; adding that, "the Statute law governing traffic generally is the Highway Act, 1835, C50, Section 78, whereby it is enacted that if the driver of any waggon, cart, or other carriage whatsoever [including, presumably, a motor fire-engine], or of any horses, mules or other beast of draught or beasts of burthen shall not keep his waggon, cart, or carriage, or horses, mules, or other beasts of burthen on the left or near side of the road, he shall, in addition to any civil action to which he may make himself liable, forfeit a sum not exceeding £5, and in case the offender be the owner of such waggon, cart, etc., a sum not exceeding £10."

Which pronouncement may or may not be "scant," but at least seems to me to be about as lucid on the subject as the Highway Code is—and shows that the value of money was falling even then!

In the meantime the French enactment to the contrary had presumably been phrased in the correct Gallic idiom and, no doubt, incorporated in the Code Napoléon, with the result that all but left-handed or ambidextrous continental

coachmen were forced for a century to sit on the side of the box next the gutter. Such a driving position was not altogether satisfactory, for reasons which have already been mentioned and which must have appealed to Carl Benz, who accordingly designed his first 3-wheeler of 1885 so that the driver should sit on the left, and continued this practice for a number of years.

The idea, however, found no favour in France. I have before me as I write a delightful photograph of one of the first, if not, indeed, the very first, Panhard et Levassors, date about 1890 or 1891. It is an elegant, if somewhat lofty, back-to-back dog-cart, and on the after seat the genial Panhard, smoking a cigar, is turning round, supported on his walking-stick, to talk to Madame Levassor, who had previously been married to Gottlieb Daimler's friend Sarazin, and had brought her second husband an option on the Daimler patents as her dowry. On the right-hand side of the front seat, with his faithful foreman Mayade beside him, sits Emile Levassor himself, wearing a bowler hat, a beard and buttoned boots, grasping the tiller in his *left* hand and the brake or gear lever in his *right*. In fact this photograph seemed at first to solve the whole problem as to why, in a country such as France which is not noted for conservatism, the early *chauffeurs* clung so persistently to the driving position of their coachmen predecessors. An early Benz, as is well known to anyone who has tried to drive one, needs six pairs of hands for its control whatever the position of the driver, who can therefore be placed on the left or the right as the fancy of the designer chooses. In a nineteenth century Panhard, on the other hand, the action required to operate the tiller, or later the steering-wheel for that matter, is very similar to that performed by the hand when holding reins ; while the lever of a sliding-pinion gearbox demands for its successful manipulation just those deft flicks of the wrist which are used when cracking a whip.

Strict regard for historical truth, however, forbids unqualified acceptance of this theory. Amédée Bollée's steam coach *l'Obeissante* of 1873 seems, it is true, to have been steered from the centre of the front seat, but *la Mancelle* (1878), *la Marie-Anne* (1879), *la Nouvelle* (1880) and *la Rapide* (1881), which followed it, all seem to have been driven from the right, although they had no need of gear-levers. The same goes for the steam dog-carts, brakes and phaetons produced in the '80's and '90's by de Dion and Bouton, as well as for Serpollet's steam tricycle of 1889. But then one would expect a tendency towards locomotive practice from the builders of steamers, and I still adhere in the main to my theory that it was the dexterity of the human hand that fixed the drivers of Panhard-type petrol cars so firmly in the seat in which their forefathers had sat.

In the meantime across the Atlantic there had arisen a mighty republic, deeply imbued with the spirit of the Revolution, and even less conservative than post-revolutionary France. Small wonder, therefore, that the United States, which was eventually to produce more motor cars than the whole of the rest of the world put together, decreed that its traffic should keep to the right. By the end of the nineteenth century its industrial progress had clearly reached a point where it felt that it should be able to compete successfully with the old world in the production of automobiles. Unfortunately just one thing was lacking—adequate roads for them to run on ; and, the sturdy European type of petrol car being clearly unsuited for tackling the prairie, early American makers developed a strong penchant for light steam buggies. In 1894 *The Engineer* gave an illustration of one built by a Mr. Simmond, in which, as one would, perhaps, expect, the driver was seated on the left. But when an attempt was made the next year to run a race from Chicago to Waukegan and back, only one car succeeded in covering the course of just over 90 miles, and then it took more than ten hours to do so. For the moment, clearly, American cars were hardly to be regarded as serious competitors by their European contemporaries, wherever the driver might sit.

Indeed, well after the turn of the century commentators in the Old World were still inclined to be patronising when describing trans-Atlantic automobiles. Thus in 1902 *The Autocar* published a photograph of "An American Petrol Car" (make not specified), and remarked, "This machine is interesting as it shows the tendency among the builders of petrol cars in the United States to copy the European outline of car." One might indeed mistake the vehicle for a Charron or something of the kind, were it not for the fact, to which, incidentally, our contemporary did not see fit to call attention, that it had left-hand steering ; but this feature in no way contends with our general theory, as it is stated that, "an epicyclic train is used for speed variation." Indeed, where the sliding-pinion type of gearbox was used, the driver seems to have been as firmly relegated to the right-hand side of the car in America as in Europe. A recent issue of the *Gazette* of the Horseless Carriage Club of California, which has found its way into my possession, includes among its features a reprint of the finely illustrated report of the 1906 New York Motor Show which appeared in *The Horseless Age*. Here we have the American car of the day comprehensively portrayed, from the luxurious Model K 6-cylinder Ford (recognisable only by its steering-wheel as the forerunner of Model T) to a range of makes whose names to me are not, most of them, even a memory—Crawford, Jackson, Acme, Compound, Marion, Dragon, Lambert, Dolson, Harrison, Conover, Moore, Cartercar, De Luxe (described as having "valves in the heads, those for each cylinder being operated from a single cam by a walking beam on top") ; and all of them, without exception, have got right-hand drive.

Unfortunately I can draw no contrasting conclusion from the left-hand drive Frayer-Millers which had run in that same year's eliminating trials for the Vanderbilt Cup Race, because, frankly, my only information on the subject of them is derived from Gerald Rose, who remarks, "The three 110-h.p. Frayer-Millers were odd-looking cars with huge air-cooled cylinders, a centrifugal fan in front forcing the air over the engine on the usual Frayer-Miller principle. The driver sat on the near side, and was close to the ground, the wheel being nearly horizontal" ; and because this incomparable authority on early motor races says nothing about the transmission system of these somewhat freakish machines.

However, by 1909 Henry Ford had designed and marketed Model T, "with nothing but pedals to push," and it was not long before he realised that this feature of his most famous design had finally emancipated the driver from his seat on the right. Well, pictures of left-hand drive Fords merely heightened their comical character in European eyes, and nobody worried much about it. Then, in 1921, Jimmy Murphy won the French Grand Prix on a left-hand-drive Duesenberg, and I can remember to this day the sensation of shame and horror which swept over me when I realised that this "glorified flivver" had fallen heir to the laurels of Szisz's Renault, Nazzaro's Fiat, Lautenschlager's Mercédès and Boillot's Peugeot. What was worse, the next year there was Rolland-Pilain, the respectable French house of Rolland-Pilain, committing the very same abomination, which now seemed, by comparison, to have been positively excusable in what was only a Yank motor car anyhow ; in the Touring Grand Prix, the very house of Peugeot was guilty of the same hideous crime. And what was more, once the rot had started, there seemed to be no stopping it. It spread to all the very best French marques ; it was not content to be confined to France, by 1928 it had captured even Caracciola's famous "SS" Mercédès-Benz. There was no salvation from it, except in the single-seater racing car.

But, of course, all my prejudices of the 1920s were utterly illogical. Once manufacturers had taken to mounting gear-levers on the top of the gearbox instead of on a cross-shaft, it was as sensible to seat the driver on the left-hand side of the car as it had previously been to seat him on the right. And since in England I do not particularly want either to sit in the gutter, or to change speed with my left hand, they can move the gear-lever to the steering-column as soon as they like, as far as I am concerned, and I shall just pretend that I am driving an early Darracq !

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Outstanding, magnificent, clean,
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But beware, reader dear, though it sounds very fine,
Adverts. aren't always QUITE what they seem.

E. E. P.

ENTOMOLOGICAL DISSECTION

Harold Biggs reveals, we believe for the first time, what makes the "Grasshopper" Austin Seven such a desirable little car.

★

EVER since the Austin "Grasshoppers" made their debut in trials, I, as an Austin enthusiast, had been anxious to obtain some genuine details of their amazing little engines.

When my friend George Symonds purchased the ex-Scriven car, it appeared that a source of information was to hand, but it was not until the car was destroyed by fire that the engine was removed, or, in fact, dismantled in any way, and my long-delayed wish was gratified. To commence with, the crankshaft is of the 3-bearing type, with $1\frac{5}{16}$-in. big-end journals, although the crank cheeks are more robust than those of the standard 3-bearing crank, being more like those of the 2-bearing "Ulster" shaft. There are two oil feeds, one to the centre main as standard, and one by external pipe from the main gallery to a nose piece, as fitted to pressure-fed, 2-bearing engines.

As the shaft was still mounted in the crankcase I was unable to tell the exact distribution of the oil. Possibly the centre main feed also looked after numbers three and four big-ends, and the nose feed catered for the needs of numbers one and two big-ends, or the nose feed might supply all big-ends and the centre main feed only the main bearing. Symonds informs me that the running pressure is over 30 lb./sq. in.

Oil is drawn from a "Nippy" 1-gallon, ribbed aluminium sump. The connecting rods are offset, as on the standard 3-bearing engine, but are of a deep "H" section, machined all over and relieved at the sides of the big-end bolt lugs, as in the "Nippy." The big-end liners are of the thin-wall pattern and the pistons are a very light, slipper type with one stiffening rib on the underside of the crown, two very narrow compression rings and one slotted scraper. The gudgeon pins are fully floating in unbushed little ends, with aluminium end-pads.

Looking at the cylinder block one can at once see that it is quite special. Water passages around the valves and ports are larger, the connecting passages between block and head are in the form of elongated slots, and the internal sweep of the ports differs from those of any other Austin.

Each cylinder has two external ribs on its bore sides running from water jacket to base flange, and the block is held to the crankcase by $\frac{3}{8}$-in. studs, with the usual special pair at front and rear.

The cylinder head is of aluminium with a long, cast water-outlet passage along the centre; it is retained by the standard number of studs, but these are of $\frac{3}{8}$-in. diameter; 14 mm. plugs are arranged over the exhaust valves.

The valves are about $\frac{3}{8}$ in. longer than "Ulster" valves, and the inlet is slightly larger than the exhaust; they are closed by very long, double springs retained by split taper cotters and standard collars. To accommodate these very long valves the tappets are short, as are the cast bosses in the base flange which carry the tappet guides. Clearance is set by ground buttons.

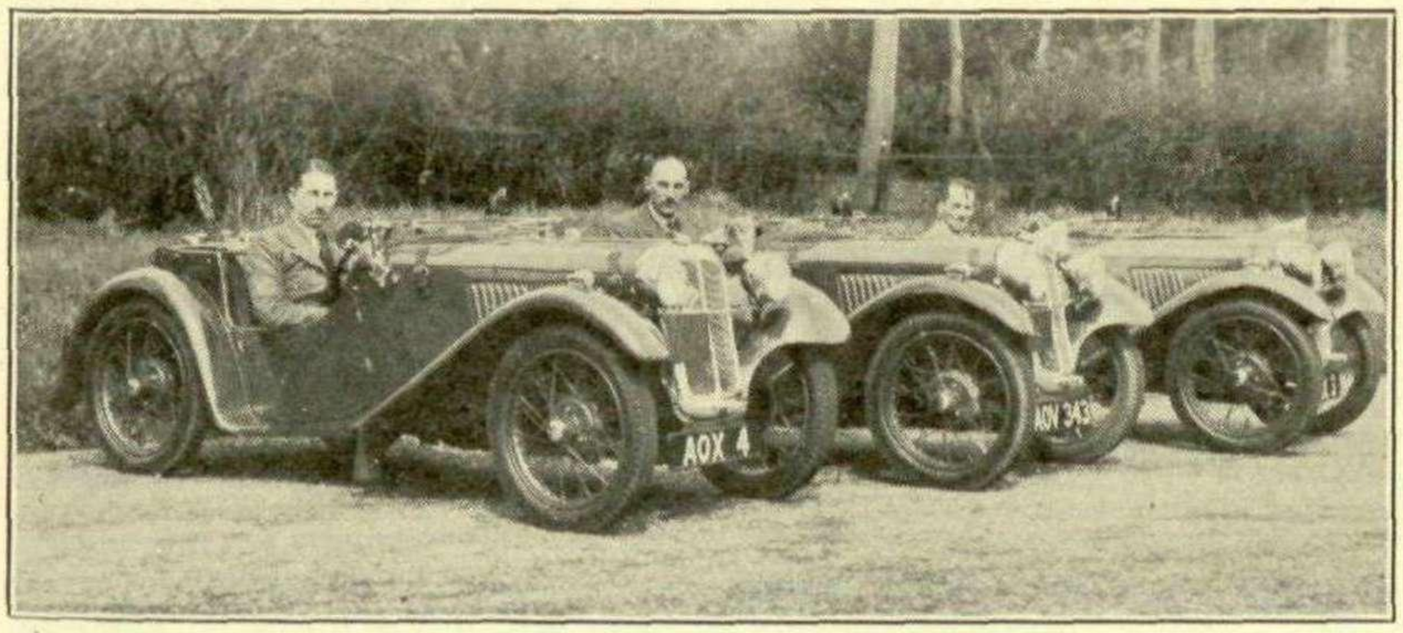
The camshaft is a very high lift type, with split-bush centre bearing and steel gear. This gear meshes with another in the special dynamo housing and the dynamo spindle carries the pulley from which the blower is driven, this pulley revolving at engine speed. The pulley on the blower is of similar size. The blower, a Type 125 Centric, is mounted by means of its outlet port studs on the inlet port of the separate induction manifold, which port is situated on the top forward end of the main horizontal trunk of the aluminium manifold. The blow-off valve is at the rear, and blower pressure is 6 lb./sq. in. at peak.

The actual drive is by vee belt, this belt passing over the fan pulley, which can be swung in an arc giving the required adjustment range; to resist the belt tension load on the blower shaft a strut is fixed between the supercharger casing and the timing case cover bolts.

Austins apparently find that a very thin (about $\frac{1}{32}$-in.) copper and asbestos gasket stands up well as a cylinder head-to-block seal. The exhaust manifold is very similar to that used on the "Nippy," pairing with the inlet manifold in a similar manner. A vertical updraught Stromberg carburetter is used. Passing on to ignition, it was interesting to observe that an apparently standard Lucas distributor, possibly fitted with an automatic advance range to suit the engine, and also with a manual over-riding control, was fitted. I understand that, on this particular car, when the contact point gap was fixed it was locked by soldering in addition to the usual nut. A revolution-counter drive was taken from the base of the distributor shaft, the outer casing being anchored to the drive casing. Normal "Ulster" cast-iron clutch linings are used, with a standard steel floater plate as on the earlier Austins.

Symonds informed me that he obtained excellent results by using Champion NA 14 plugs, and that a standard Lucas coil stood up to its work admirably.

However, I still retain my enthusiasm for the Austin Seven.



In a recent letter Harold Biggs enquired how many "Grasshopper" Austin Sevens there were, and in the adjacent article describes the "Grasshopper" engine. Here are Messrs. Richardson, Orford and Milton with one of the "Grasshopper" teams.

PARISIAN VIEW

In the current issue of the Parisian *Revue de l'Aluminium*" there is an interesting article entitled "Racing Cars."

"Motor racing," it states, "is a remarkable means of submitting both engines and chassis to very high strains, thereby proving designs in the most rigorous practical fashion. Lessons learnt in racing yesterday substantially aid the designer today.

"Whereas 15 years ago the average weight of powerful racing cars exceeded a ton, just prior to the war Maserati, Alfa-Romeo and Darracq were weighing around 14 cwt.

"This new era of weight reduction has largely been brought about by the use of light alloys.

"The desirability of weight reduction is not only apparent in power/weight ratio but in rolling resistance, as is illustrated by the following figures:—

At 66 *m.p.h.*	*Car weight* 21 *cwt.*	*Car weight reduced to* 14 *cwt.*
Windage	17.6 lb.	17.6 lb.
Rolling resistance	26.0 lb.	18.5 lb.
Total	46.6 lb.	36.1 lb.

"Thus there is an improvement of 22.6 per cent. through lightening.

At 170 *m.p.h.*	*Car weight* 21 *cwt.*	*Car weight reduced to* 14 *cwt.*
Windage	110 lb.	110 lb.
Rolling resistance	121 lb.	77 lb.
Total	231 lb.	187 lb.

"In this case an improvement of 19 per cent. through lightening.

"The recently-introduced Cisitalia, derived, like the Gordini, from the 1,100-c.c. Fiat, can produce 63 b.h.p. unblown, for a weight of only 7 cwt. 10 lb.

"Achieving weight reduction through the means of drilling numerous holes around the neutral axis of a member is deprecated."

MOTOR SPORT Road Test (Post-war Series) No. 2

THE M.G. "T.C." MIDGET 2-SEATER

A very well-appointed car with a lively performance. Excellent roadholding and braking, and effective weather-protection.

★

IT is good to know that the ever-popular M.G. Midget has survived the war and is in production again. It is the same trim, efficient 2-seater we knew pre-strife times, with 1,250-c.c., push-rod, o.h.v. 4-cylinder engine, 4-speed gearbox, and ½-elliptic suspension, now improved in a number of practical ways and endowed with greater elbow-room and even better weather protection.

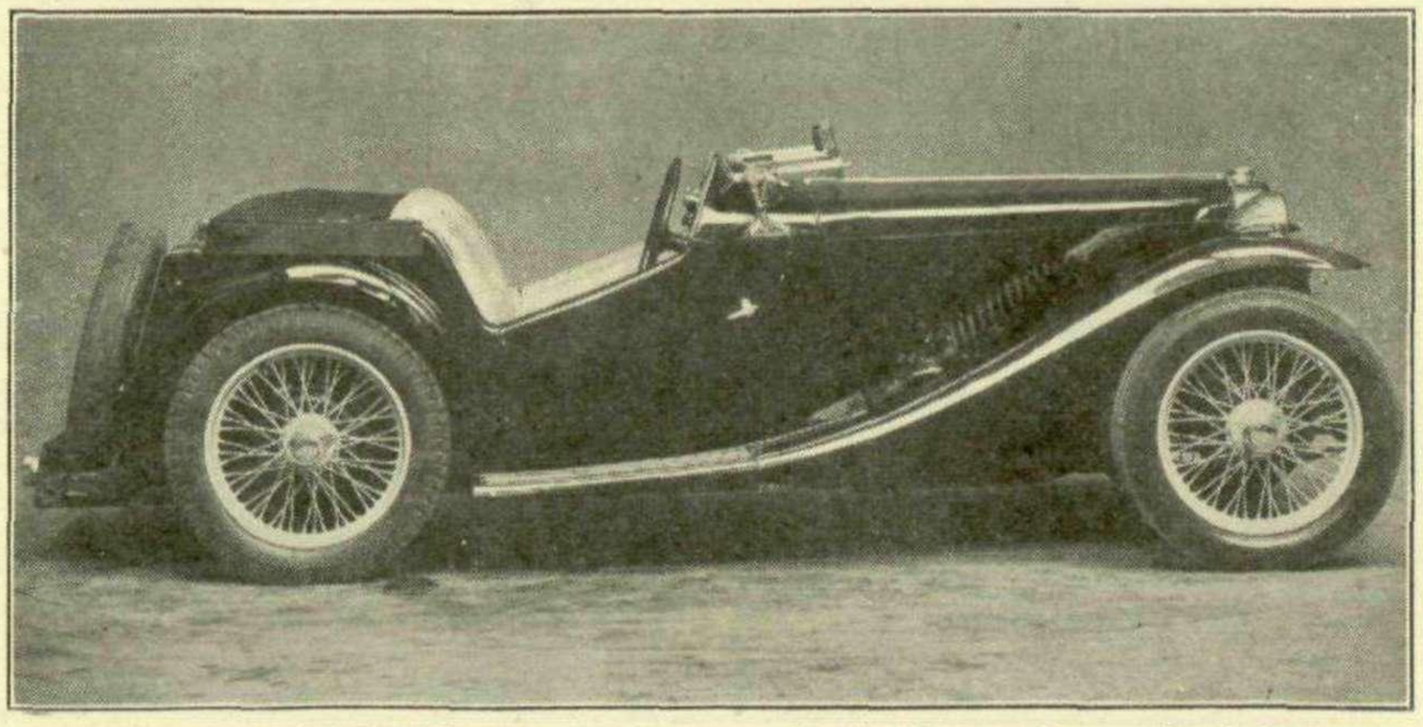
We took one of these cars over from the M.G. works at Abingdon last November and subjected it to a strenuous 400-miles test ; the more we drove it, the more reluctant did we become to take it back to Mr. Cox, M.G.'s Publicity Manager. From the commencement a driver feels at home in this M.G. and, as he enthuses over the comfortable driving position and the layout of the controls, his passenger is invariably praising the comfortable seating and the very generous leg room. The bench-type front seat has been contrived so that not only is it possible to slide the two separate cushions forward, but also to adjust the rake of the squab, while the steering column is telescopic, so that the best seating position is quickly attainable. The seat strikes just the right balance between sponginess and hardness, and, while perfectly comfortable, the driver is prevented from rolling about when indulging in faster-than-normal cornering. For competition work raising the cushion some 3 in. would aid visibility, as the bonnet slopes upward to some extent, although both wings are visible in any case. M.G.s have always fitted the near-perfect handbrake and the centrally-disposed lever on the "T.C." is no exception. Of "fly-off" type, it really holds the car, releases instantaneously when pulled back, and locks effectively if the thumb-catch is pressed down. It is indeed an excellent brake.

The central, remote-gear-lever calls for equal praise. It could hardly be better placed, is short, absolutely rigid, with a pleasantly slim grip. This is well merited, for the synchro-mesh gearbox is one of the nicest we have operated. The synchro-mesh works well, but double declutching is equally effective, and upward and downward changes are really quick. The change back into top gear from 3rd is very pleasant, helped by the sensible positioning of the lever. It is also quite practical to "snatch" upward changes with the throttle foot held down. The only care necessary is not to pull the lever too far to the right when going from 2nd into 3rd, or it tends to catch on the gate ; the reverse position works easily against a spring. The clutch is light and works well, but it might be a trifle more progressive. The brake pedal needs fair pressure, but gives excellent results.

The wood facia has a centre panel carrying Lucas ammeter, ignition and lamp switch, horn button and dipper, Jaeger oil gauge reading to 160 lb./sq. in., starter pull, mixture pull, fog-lamp switch, battery charging socket, panel light switch, and screw-type, slow-running adjustment. It is flanked by a dash-lamp and a 30 m.p.h. warning lamp and, on the left, is the 100 m.p.h. Jaeger speedometer with mileometer and trip, and on the right the Jaeger rev.-counter reading to 6,500 r.p.m. and having an inset clock. Also, on the extreme right, is a window which flashes the word "Fuel" when the tank capacity is down to about two gallons ; unfortunately, it does this very vividly, right in the driver's eyes. Speedometer and rev.-counter are simply but effectively calibrated. The oil gauge is somewhat blanked by the steering wheel, but not seriously ; the lamp dipper is rather too close to the wheel and could with advantage work the other way, so that it could be flicked with the left forefinger, instead of having to be fumbled for with the thumb. The panel lighting is adequate for reading all the instruments, but too much green light leaks round them for the light to be left on while driving. The starter is up to its task and the mixture-enrichener for the twin S.U. carburetters is spring-loaded to obviate driving off in "rich"—a good point. The ignition key in the "off" position does *not* render the electrics dead, yet has to be "on" to work the wipers. The dynamo gives a good, controlled charge and the dual screen wipers are efficient but very noisy. Normal oil pressure is 42 lb./sq. in. and does not vary with hard driving. There are only two hexagon-motifs now visible from the seat, one in the centre of the 3-spoke steering wheel and one on the back of the licence holder. The scuttle has the two familiar wind-deflecting "humps" and the screen folds flat, with wiper box before the passenger. Entry into the M.G. is no more difficult than in any other low-built car of this type, and is aided by the low running boards. Door handles and bonnet fasteners work effectively, and each door has a pocket. There is no cubby hole.

Our initial impression of the "T.C." Midget was its trim, well-balanced appearance and the high quality of the finish. The car could certainly take its place unashamedly with the "limousines and landaulettes" outside the best hotels, while there was practically no suggestion of austerity. There are carpets on the floor, and a wind excluder round the handbrake, and the finish of the car—red in our case with upholstery to match—and the equipment included, leave nothing to be desired. A most useful item of the body layout is the generous luggage space behind the seat. This is covered by a "tonneau"-cover when the hood is down, or by the hood when this is erected, and will hold several suitcases, still with room to spare for coats and similar etceteras. This is a very valuable feature, and the need to carry luggage externally should never arise.

Getting away from Oxford, after inspecting that pleasingly-stark 1923 o.h.v. M.G. in the Nuffield Showrooms, we soon found we were cruising at 55–60 m.p.h. on the speedometer. The M.G. proved to have a very subdued exhaust note, even when accelerating in the lower gears, and in towns it attracted only favourable comment and attention. We soon found ourselves keeping the engine speed above an indicated 2,500 r.p.m. by making full use of the gearbox, encouraged by the excellent placing of the rigid gear-lever and the ease of the change. This desire to employ the lower ratios is enhanced by a complete absence of gear noise on any ratio and only the slightest sound on the over-run. The steering we found to be really high-geared (in quite the vintage tradition) ; it actually needs 1⅝th turns, lock to lock. The lock is moderate. As the test progressed we confirmed not only the ability to control the car by wrist-movements alone, but that no return motion is felt through the wheel on any surface, and that there is



The "T.C." M.G. Midget ready to undertake the MOTOR SPORT *timed tests.*

admirable castor action. The wheel judders in the hands at times, but never to an abnormal degree, the scuttle, like the radiator, being commendably rigid. It is rather heavy steering through appreciable arcs, but very reasonable in normal motoring. The door cut-away tends slightly to impede the elbow when "dicing." This steering is in no way "spongy," and after 7,500 miles showed little lost motion.

The M.G. corners as well as its predecessors. If anything, it understeers, which is all to the good, especially as the quick castor action brings it out of corners very nicely. We could not make the car slide, even on wet roads, and it steers accurately both on the straight and when cornering. The steering remains good when reversing, which is useful in special tests, and the car certainly does not roll, even under "rally-test" driving. The tyres protest rather early, but not too loudly. The suspension is pleasingly hard in quite the "old-school" manner, yet the car is not uncomfortable and can be taken over gulleys and bad surfaces without any feeling of remorse. This firmness of the suspension undoubtedly endows the "T.C." M.G. with the good roadholding aforementioned and, if it occasions a few body rattles, we feel these are entirely forgivable in view of the pleasant handling qualities achieved.

The brakes are really good. They call for fairly firm pressure on the pedal, but have a secure, hard feel, are very powerful, and progressive braking is quite easy to accomplish. There is only occasional brake noise and in the wet, if the wheels are allowed to lock, the car remains controllable.

On the first day of the test a cold wind made us resort to the excellent weather protection which we were so glad of later on. Four rigid sidescreens are stowed in a felt-lined locker at the back of the luggage compartment. They fit, two on each side, by inserting metal tongues into slots at the back and metal sockets over studs at the front, where wing nuts secure them. We soon erected the front screens and found that they excluded side draughts. When we encountered driving rain and a gale-force wind we erected the disappearing hood and the rear side screens, and in a matter of miles gave full marks to the weather protection of the new M.G. Midget. Hardly any rain drove in and the interior of the car was literally warmer than that of a saloon —so much so that in less severe conditions we should have removed the rear side-screens in order to ventilate the car. The weather really was quite abnormal and the M.G. came through with flying colours, the interior almost bone dry. No one need have any qualms about using this car in winter, and this protection is rendered practical by two windows in the back of the hood, permitting of easy reversing, and by signalling flaps at the base of each sidescreen, normally secured by a press-stud tab.

As we have observed, the driving position is generally comfortable, but, unfortunately, there is nowhere to stow one's clutch foot and the accelerator is rather difficult to hold fully depressed. The fuel tank holds the useful quantity of 13½ gallons and possesses a very excellent quick-action filler cap.

Two other good points about this M.G. deserve special emphasis. One is the provision of centre-lock wire wheels, rare on modern cars. They carry 4.50 in. by 19 in. Dunlop synthetic tyres. The other is the excellent lighting. It is possible to drive at maximum speed after dark, thanks to the long-range beams from the Lucas headlamps, yet these "dim" effectively, while the small Lucas spot-lamp is one of the finest we have driven behind. The sidelamps rather reflect in the headlamp plating and so can be checked as "on" from the seat; there is a good brake lamp, but no reversing light.

M.G. MIDGET "T.C." 2-SEATER

Engine : 4 cylinders, 66.5 by 90 mm. (1,250 c.c.), 11 R.A.C. h.p.

Gear Ratios : 1st, 17.32 to 1; 2nd, 10.0 to 1; 3rd, 6.92 to 1; top, 5.125 to 1.

Tyres : 4.50 in. by 19 in. Dunlop synthetic.

Weight (in road trim with approx. 3 gall. of fuel, but less occupants): 16½ cwt.

Steering Ratio : 1⅝th turns, lock to lock.

Fuel Capacity : 13½ gall. (2-3 in reserve).

PERFORMANCE DATA

Acceleration :
0-50 m.p.h., 16.25 sec. } mean of two-way runs
0-60 m.p.h., 27.25 sec. }
s.s. ¼ mile : 23.45 sec. (mean), 22.0 sec. (best run).

Speed :
f.s. ¼ mile : 63.50 m.p.h. (mean), 65.75 m.p.h. (best run).
Maximum in indirect gears (corrected for speedo. error) :
1st : 22.6 m.p.h. at 5,500 r.p.m.
2nd : 39.2 m.p.h. ,,
3rd : 56.6 m.p.h. ,,

Fuel Consumption : Approx. 27 m.p.g.

We subjected the car to our usual timed tests, and here it was decidedly unlucky. Wind was gusting up to gale force across the course, which was sodden with rain—*very unfavourable conditions.* The figures we obtained are given in the accompanying table, but before you commit them to memory, some explanation is necessary. At Brooklands it was possible to work a car up to its true maximum speed. Under prevailing conditions we cannot do this, but our speed for the flying ¼-mile is a fair approximation of what can be expected under road conditions. As usual, we did several runs in both directions of the course with the screen down, and carried a lightweight passenger and only a few gallons of petrol. The main figures were: flying ¼-mile at 63.5 m.p.h., mean speed, best run at 65.75 m.p.h. Best standing ¼-mile in 22 sec., 0-50 m.p.h. in 16.25 sec., 0-60 m.p.h. in 27.25 sec. The wet road affected the braking, which from 30 m.p.h. to a standstill occupied 41 ft; the car slid with locked wheels and did well in the circumstances. Incidentally, before doing these tests we check the speedometer to eliminate inaccuracies; weight is ascertained on the same weighbridge in each case.

The engine of the "T.C." M.G. is smooth and free from flat-spots, so that the speed attained before changing into a higher gear really rests with the driver. An indicated speed of 3,000 r.p.m. is very pleasant, or 4,000 r.p.m. for brisker occasions. The engine sounded to have reached its safe limit at an indicated 5,500 r.p.m., and the corrected road speeds were then 22½ m.p.h. in 1st gear, just over 39 m.p.h. in 2nd gear, and 56½ m.p.h. in 3rd gear. In top gear we got an indicated speed of 4,400 r.p.m. entering the measured stretch and 4,600 r.p.m. leaving it, on a run timed at 62.1 m.p.h., which shows that, given a longer run, the car would probably have improved on its maximum speed. On the road, in fact, on one occasion the speed exceeded 70 m.p.h.

It was most interesting to find that the engine did not protest in the slightest degree to "Pool" petrol. It started at once from cold, but needed some encouragement from the enrichener before it would pull. It always cut clean on the switch, and in just over 400 miles no oil or water was needed. The fuel consumption, checking a tankful against the trip reading, came out at 27 m.p.g., much town work and all the timed tests included. In top gear the engine began to "take hold" above an indicated 3,000 r.p.m., and in the same ratio would run down to a few m.p.h. without transmission snatch. Beneath the bonnet the oil filler is readily accessible on the valve cover, and coil, electric fuel pump and junction box equally so on the bulkhead. The external mirror is well placed, but visibility suffers with the sidescreens up on a wet night. The starting handle is clamped to the front of the luggage shelf and the tools are in a locker beside the battery box on the bulkhead. The engine is finished in light grey paint and the rev.-counter is driven from the belt-driven dynamo. The wheelbase is 7 ft. 10 in., the track 3 ft. 9 in., and those with garaging problems may like to know that the overall dimensions are 11 ft. 6 in. by 4 ft. 8 in.

To sum up, the "T.C." M.G. Midget is a good-looking, attractive car. It corners very well indeed, and its excellent gear-change and good brakes, together with "vintage-like" roadholding and suspension, enable it to live up to its slogan of "Safety Fast." Its other characteristics, if less outstanding, are equally satisfactory, and its economical speed, willing acceleration and very practical and complete equipment, combine to render this car a thoroughly useable 2-seater. Full details from the M.G. Car Company, Ltd., Abingdon-on-Thames, Berkshire. The price, with purchase tax, is £527 16s. 8d.—W. B.

Looking in on the Healey

The Editor and Cecil Clutton visit the factory where one of Britain's most outstanding High-Performance Cars is in production

*

FROM its inception the 2.4-litre Healey has aroused widespread interest and a visit to the factory at Warwick to inspect it was high-priority on the Editorial agenda. When the Editor made this journey with Cecil Clutton, early last month, he had not seen actual performance figures relating to the car, but on his arrival Mr. James Watt, the Sales Director, was able to greet us with the news that the saloon Healey had been timed by the Automobile Club of Milano to do 104.65 m.p.h. over a flying ¼-mile on the Milan-Como Autostrada, and to have clocked 17.8 sec. for the standing start ¼-mile. It had also covered a kilometre at 106.56 m.p.h. These figures, in respect of which the Italian Club has issued a Certificate covering the deeds of car No. NX 199, engine number M 502, chassis number A 1502, were a fitting prelude to our inspection, because these performances by a closed car of 2.4 litres capacity are, frankly, momentous. The aerodynamic bodywork clearly pays big dividends, especially as the fuel consumption came out at well over 30 m.p.g. at 70 m.p.h. cruising. Donald Healey has convincingly realised one of his ambitions, to market a production saloon car able to exceed 100 m.p.h. That he has done this with a moderately-tuned, four-cylinder engine of but 2.4 litres capacity is all the more to his credit.

Mr. Watt told us of the origin of the Healey. Donald Healey, noted for his exploits with Triumph and Invicta cars, particularly in the Monte Carlo Rally, felt that it was about time Britain competed properly with Continental high-performance cars. So he set about evolving the Healey and each problem in respect of design was approached by considering first how much given components would weigh, afterwards, how much they would cost. His ideal was to build a car weighing just a ton and then to give it a 100-b.h.p. engine. He hasn't quite realised that ideal, but in view of the performance figures quoted above, there is no need to carp about that! Actually, the "Big Four" Riley engine selected gives 104 b.h.p. at 4,500 r.p.m. (it will run up to 5,000 r.p.m.), and the complete saloon weighs 22½ cwt. unladen.

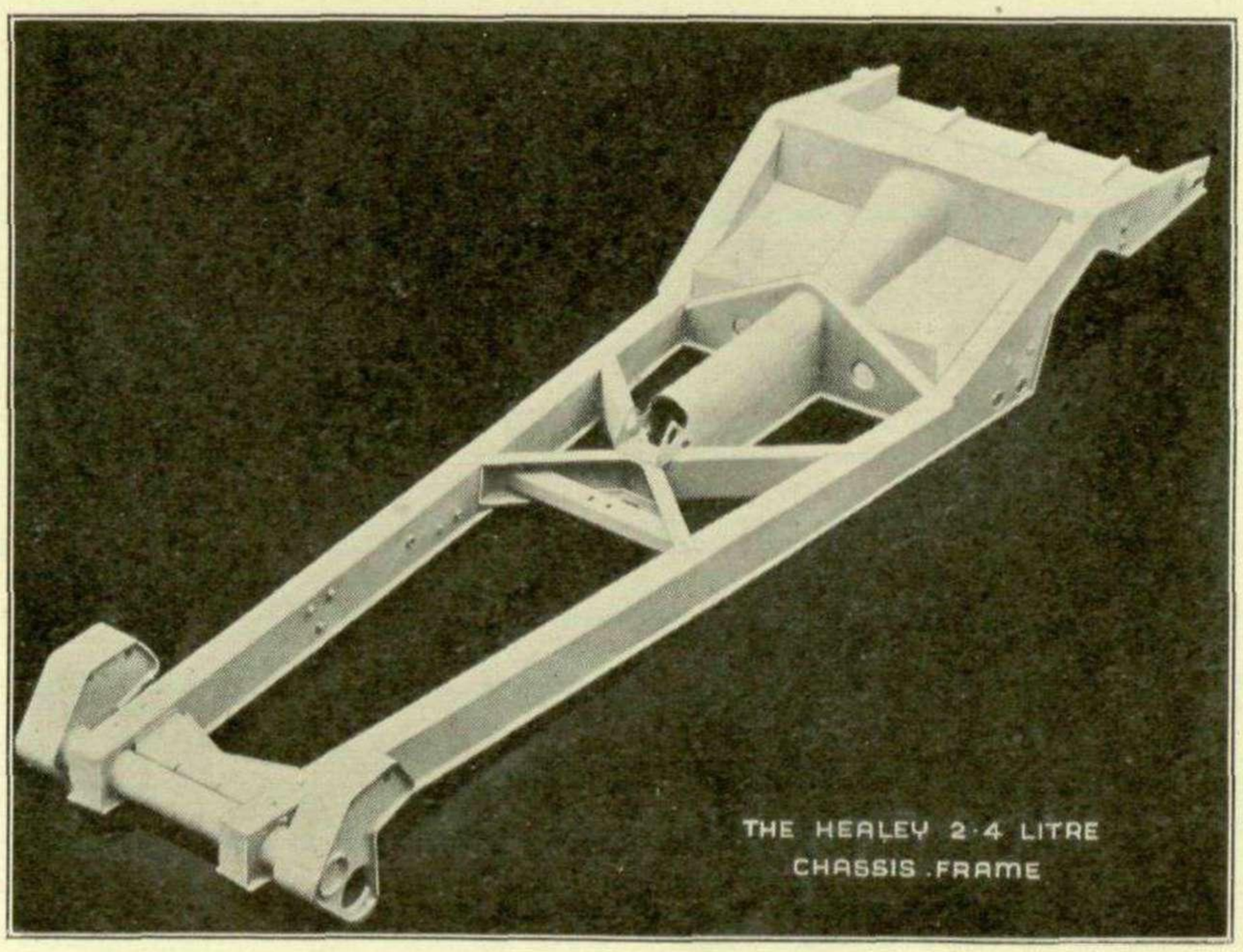
To revert to the prototype car, this commenced to take form in 1942 and the completed components were assembled in about a fortnight by Donald Healey in person, working under extremely trying conditions, partly in the open amongst cement-mixers dumped outside a friendly factory. That was in 1943-45, and Watt came home from India to see the chassis, only to be posted abroad again before he could help with it—he was a S/Ldr. in Coastal Command during the war and associated with Hudsons and, later, heavier metal, such as the York.

All that had to be done to the Riley engine to make it suitable for Healey's purpose was to replace the down-draught carburetter with two S.U.s and fit an easy-flow exhaust system. The latter gave some five additional b.h.p. We understand that each engine is supplied by Rileys with a power curve, and that they use the same modifications for the engine in the new 90-h.p. 2½-litre Riley car. The Healey's compression-ratio is 6.5 to 1 but this may be increased to 6.8 to 1 when pump fuel improves in quality. The engine in the prototype has apparently done 100,000 miles without mishap. Sam Clutton asked about piston velocity in relation to road-speed, in view of the 120-mm. stroke, and we discovered that 2,500 f.p.m. at the pistons equals 69 m.p.h., although Watt said that going up to the Edinburgh Cavalcade, for instance, he held 75 m.p.h. without concern.

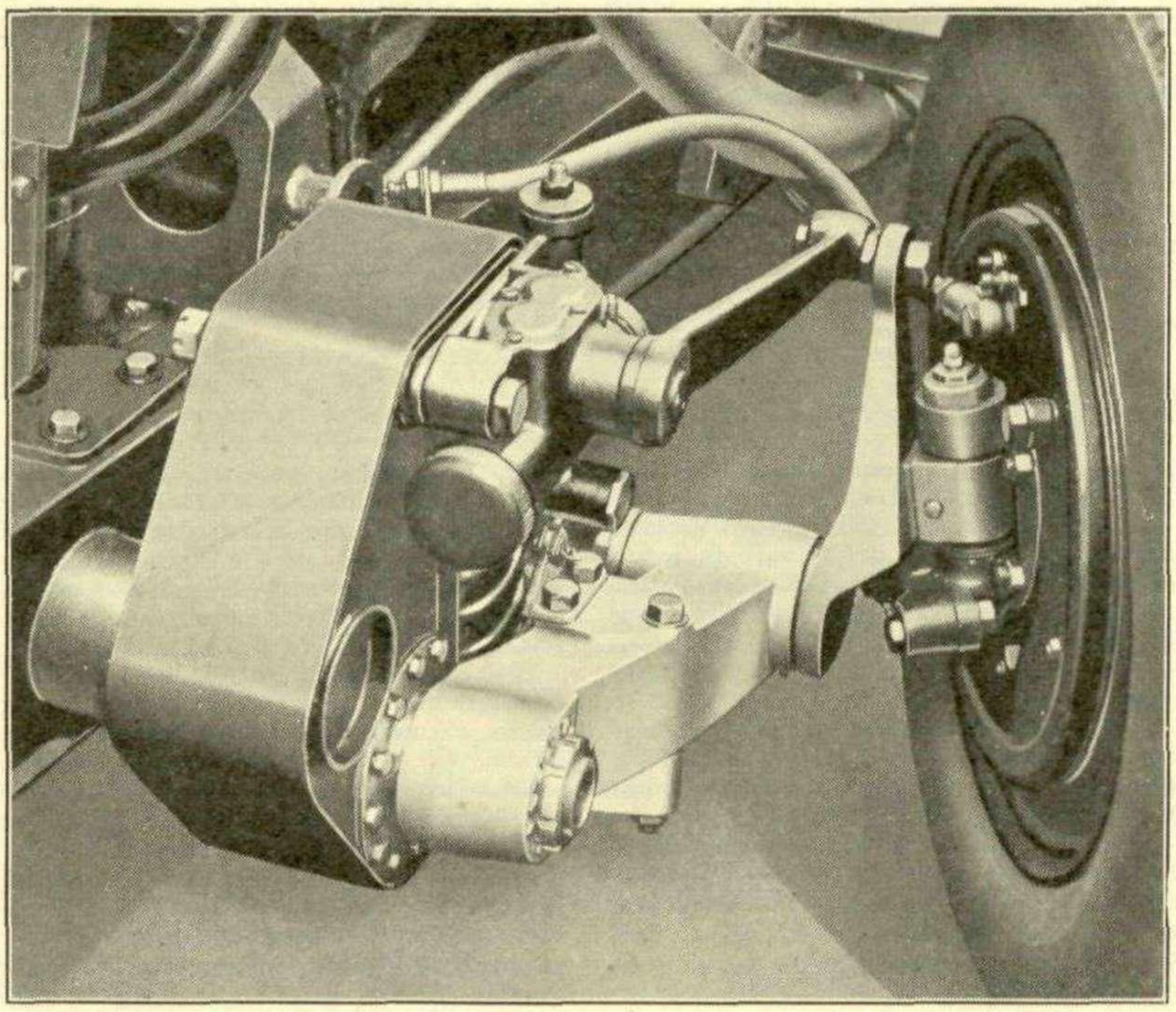
It has been said that "All you need know about the radiator of the Healey is that it is a 'Serck'," but we propose to add to this—an interesting innovation is the use of pressure cooling. The release-valve in the overflow pipe of the sealed system is set to open at 15 lb./sq. in., quite a high pressure. This puts the boiling point up to 228½°F., and it is possible to use bottom gear for appreciable periods up long Continental hill-climbs without fear of overheating. Water is the coolant at present, but glycol may be used later, still further raising the boiling point. The filler cap is sealed with a rubber washer, enabling the radiator to be topped-up in the normal way.

The chassis frame is made of 18 gauge sheet steel of "top-hat" section, with a closing plate at the base. The interior of the "top-hat" section is rust-proofed and the whole frame is given a corrosion-resisting coating of a tar-like substance by Dockers. The side-members are straight, because curves weaken a structure, and the photograph shows the construction. A very rigid chassis results, yet one that is astonishingly light. Either end can be picked up with ease and, with all fittings, body brackets, engine and spring-mountings, rear platform, etc., but less tank, the weight is a mere 160 lb. So stiff is this chassis that the jack lifts centrally and keep-cables hold the front wheels clear of the ground as the suspension goes slack. Very flexible i.f.s. in the modern manner was decided upon and a fine trailing arm layout was designed. For this, and much of the rest of the chassis, A. C. Sampietro, who was with Railton when Cobb's 370 m.p.h. car was designed, was largely responsible. The suspension arms look heavy; actually they are of R.R.56 alloy and very light. Their length makes possible a wheel deflexion of 7½ in. while employing normal coil springs in the suspension units. These springs work in conjunction with built-in hydraulic dampers. The trailing arms pivot on needle-roller bearings carried in boxes on the chassis frame. These bearings are packed with grease on assembly and require a mere couple of strokes with a grease-gun every 15,000 miles. At the rear, in the interests of weight-reduction, a normal axle is used, with coil-spring suspension of lower periodicity than at the front, the wheel movement here being 3½ in. A Panhard rod locates the axle and two stays, also adopted for the 90-h.p. Riley, run forward from the extremities of the axle to the transmission torque-tube, to steady the axle under hard application of the brakes.

The steering layout is most ingenious, the motion from the non-reaction steering box to the wheels being via a swivelling



The chassis frame of the Healey—light yet rigid.



How Healey's do it—The trailing-link independent front suspension.

plate and link-members. This plate is attached beneath the chassis on a light-alloy mounting and it pivots on ball and roller bearings. These bearings are packed with grease to combat condensation, but no further lubrication is required during the life of the car. While on this subject, there are twelve lubrication points in all on the steering and i.f.s. assembly, and the swivel-pins have oil reservoirs at the base which require replenishment every 1,000 miles. Rubber covers keep the lubricant where it should be on the steering joints. The steering plate provides proper Ackerman angles at the wheels, by reason of the points at which the links are attached to it, and the whole steering gear has been designed expressly to eliminate kick-back at the steering wheel. The column rake is adjustable and if clients require further adjustment they can either be individually measured for their cars, or dished spring-wheels can be fitted. The castor-action is easily adjusted through 3°, but cars are sent out with neutral castor.

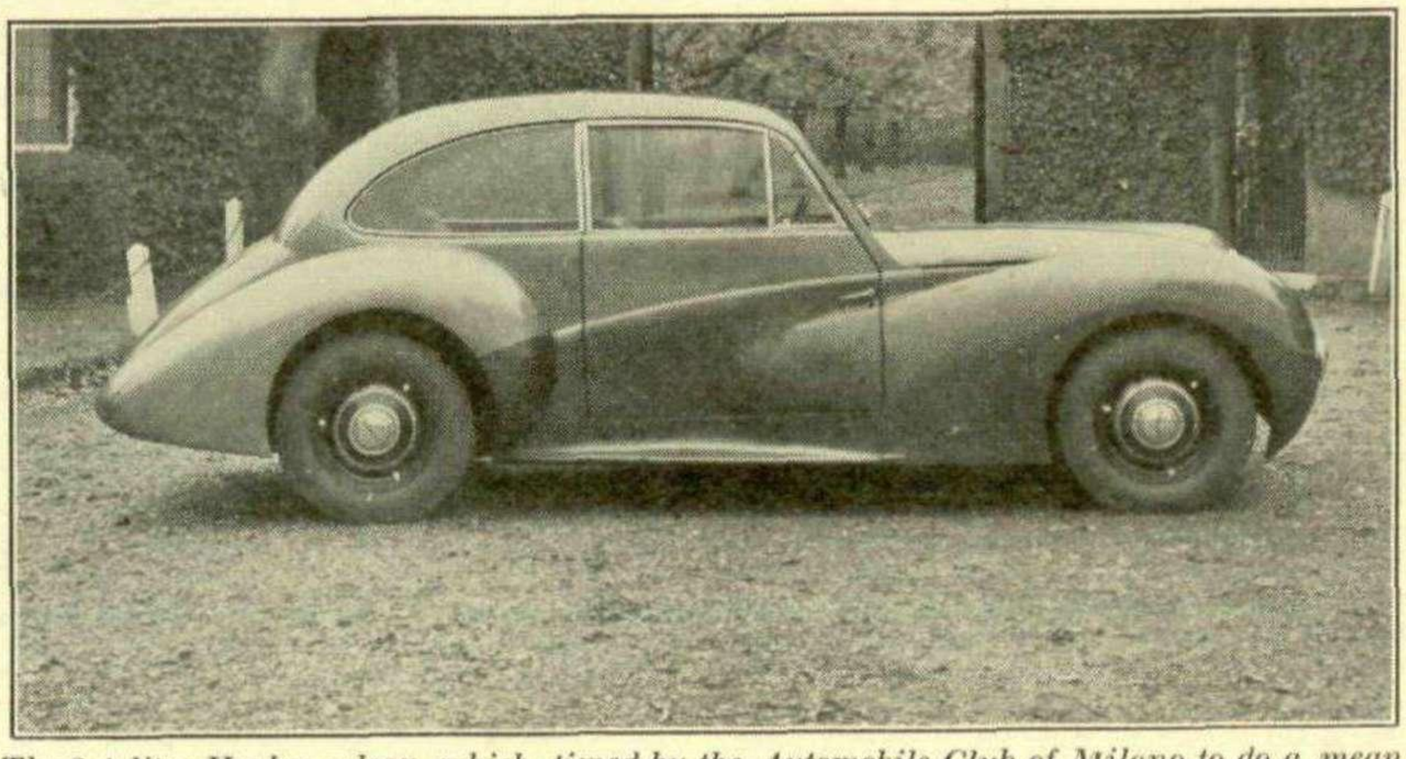
The gearbox is the normal Riley unit, but by using a 3.5-to-1 axle ratio indirects of 4.96, 7.54 and 12.76 to 1 are obtained, light-weight construction and streamlined bodywork permitting these high ratios in spite of the engine's 2,443 c.c. The arrangement was finally decided upon in preference to an over-drive top. At 1,000 r.p.m. in top gear the engine is doing 22 m.p.h.

The wheels are bolt-on discs carrying 5.75 by 15-in. tyres. The smallest possible wheels were chosen, to reduce unsprung weight, and when Clutton asked if small wheels did not drop into holes in the road, Watt said they did, but look at the spring deflections that looked after your comfort in a Healey. We queried why centre-lock hubs are not used and were told that a check had been taken on comparative weights. Apparently the saving in *unsprung* weight on four wheels by using bolt-on wheels is 25 lb., but, quite honestly, Watt said that the question of cost and availability of supplies would have decided that point anyway.

The brakes are Lockheed hydraulic and because of the small wheels the drums are fairly small—10 in. dia. at the front and 11 in. dia. at the rear. This has been found satisfactory, and the difference in drum size is intentional, to put 68 per cent. of the braking force on the front of the car as, from the viewpoint of comfortable riding, there is more weight aft than forward. The front drums contain two leading-shoes, but the rear brakes have normal shoe mounting, to give effective braking in reverse.

Throughout the chassis one notices the care given to detail work. The pedals are in R.R.56 and extremely light, and they are mounted on "Oilite" bushes, while the linkage to brake-cylinder and clutch-arm incorporates these bushes and proper pins throughout. The propeller shaft has double Hardy-Spicer universals, more nearly to obtain true constant-velocity joints, and the engine mounting angle humours the transmission line. The universal-joint trunnions and Panhard-rod joint are rubber bushed and the torque tube which encloses the rear end of the propeller-shaft is located on a rubber-mounted anchorage on the chassis. Simmonds lock-nuts are used throughout and where a component is attached to the side-members a rod is run across the chassis and the joints welded. The throttle-pedal is of piston type, conveying motion through an enclosed push-cable. Two Burgess silencers are mounted in tandem on the near side of the frame, a very nice exhaust manifold and steel p pe leading into them, while, again to r d .ce weight, the tail-pipe is of three per cent. magnesium alloy.

The aerodynamic bodies for the Healey were the subject of wind-tunnel tests with $\frac{1}{8}$th scale models, in the wind-tunnel of Armstrong-Whitworth Ltd. Much experimentation was engaged in before the final form was settled. The saloon has ample head room and a large screen area. The wind-up windows are Perspex, treated against abrasion, as such windows were in R.A.F. aircraft. The rigid, streamlined wings weigh 8½ lb. each. Very satisfactory bucket seats, leather upholstered, have been evolved, and the body width of both models is approximately 3 ft. 8 in. at the front seat. The bodies are panelled in magnesium alloy, and the bonnet hinges up from the rear to give very good accessibility. The saloon costs £1,597 19s. 5d. with purchase tax, the roadster £1,566 0s. 7d. The chassis comes out at £900 exclusive of tax.



The 2.4-litre Healey saloon, which, timed by the Automobile Club of Milano to do a mean speed of 104 m.p.h. over the two-way quarter mile, with other performance qualities to match, proved itself one of the most outstanding high-performance cars of to-day.

At present orders are flowing in, many for export, but delivery takes some time, as delay occurs unavoidably at the coach-builders. However, some 30 persons are turning out three chassis a week and a few of these can be delivered immediately to anyone wishing to market a special-bodied car or to have a body built privately. Endowed with a shell-body, which would not take so long to build, the Healey would have a staggering performance and many people will doubtless be interested to pursue this line of thought. The firm does not intend to race, but will give every encouragement to private entrants in events such as the T.T.

Whichever way you look at it, the over-100 m.p.h. maximum of the Healey, coupled with tremendous acceleration (it goes from rest to 60 m.p.h. in about 12½ sec.) is a most outstanding show by a 2.4-litre saloon basically priced at £1,250 today. It qualifies our enthusiastic remarks as to the quality and capabilities of present British high-performance cars with which we prefaced the "Show"-supplement in MOTOR SPORT last November. And it fully justifies aerodynamic bodywork. After we had thus critically examined this breath-taking newcomer, Watt produced a roadster for an excursion around Warwick and we hand over to Cecil Clutton, the well-known car critic, for a report on the trip.

Cecil Clutton's Impressions of the Healey

I have often written in MOTOR SPORT that the very best modern motor-cars have all the handling qualities of the vintage era, and more besides. But in practice, I am bound to confess that this commendable theory is seldom borne out. Although there are some modern sports-cars whose handling qualities are beyond reproach, the result is often achieved in a spongy, indefinite sort of way which, although it may be perfectly satisfactory, contributes nothing, either to the confidence or pleasure of the driver. The best of them seem to be those which have fairly stiff springing, somewhat in the vintage tradition when, of course, the problems of independent suspension and gyroscopic effect are considerably reduced. One front-line modern-to-the-minute sports-car, which unquestionably holds the road as few others, is notorious for a back end which floats about in the most *degage* manner, and this is by no means conducive to the driver's peace of mind. Other cars cling, leech-like, to the road until the moment of break-away, when the controls seem to go soggy, as on a stalled aeroplane, and produce just about as much effect—a horrid feeling. Some American machines have ultra-low-rate suspension which works well at low and medium speeds over rough surfaces, but at high speeds the whole car works up a low-rate wallow, which can easily lead to hedge-hopping and other aerobatic activities for which the wing-loading is altogether inadequate. Added to which, they roll madly.

The Healey car does none of these things.

In praising it, it is difficult to know where to start, since it has all those qualities which attach, in theory, to soft suspension, but which are so seldom achieved. And the suspension of the Healey is very soft indeed. When stationary, the car can be rocked from side to side with only a light hand-pressure. With a high centre of gravity, the Healey would roll outrageously; that is one of the points on which the Americans fail so conspicuously. But the Healey is exceptionally low built, and it is entirely free from any tendency to roll, even though it has none of the fashionable anti-rolling expedients. The chassis is also conspicuously rigid, although so light, and unsprung weight has been studied meticulously. As a result of these two factors, the wheels follow the road-surface whatever happens, and the rest of the car remains rock-steady, even when travelling at ridiculous speeds over "colonial sections," or when one wheel is wantonly driven over a kerb. A passenger might never know it had been done.

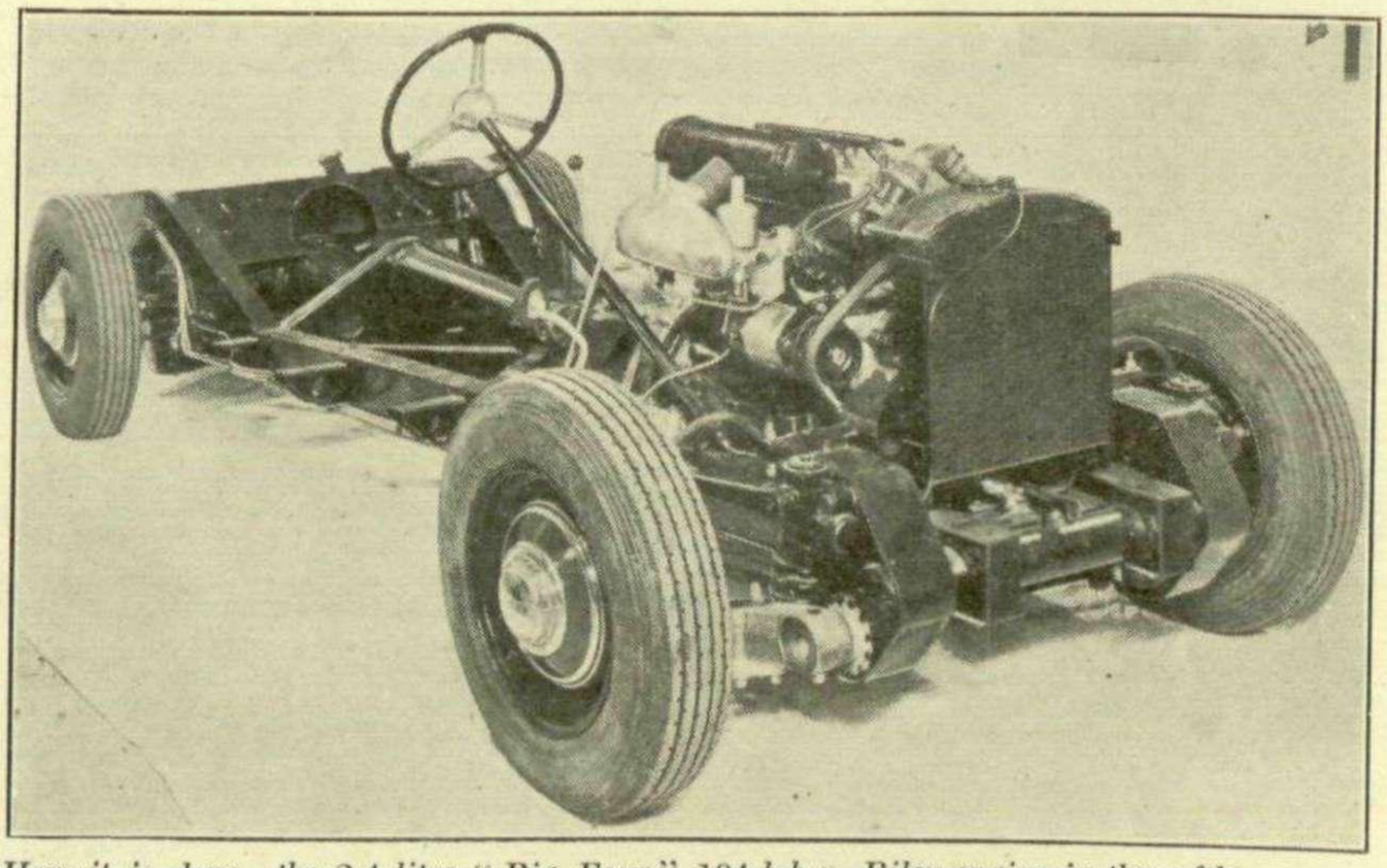
The Healey therefore satisfies the three absolute necessities of soft springing—low centre of gravity, stiff chassis, low unsprung weight. I venture that there is no production-car today which conforms more closely to all three requirements.

The practical gains are the obvious ones of outstanding passenger comfort, freedom from wheelspin, and maximum resistance to side-slip when cornering.

Every form of i.f.s. involves certain compromises, but it is widely held that the trailing-link arrangement gives the best result, and the most pleasant from the point of view of "feel," which is so important to the driver. The Aston-Martin "Atom" prototype quite converted me to this way of thinking, and the Healey confirmed my opinion. At the same time, it is difficult to obtain any large range of travel and, therefore, a low spring-rate, with trailing links, but this difficulty has been overcome entirely on the Healey by the layout which has already been described, in conjunction with very long trailing arms. These, of course, are subject to high lateral stresses when cornering quickly, but the Healey apparatus has obviously been made with this difficulty kept well in mind, since it is exceptionally rigid, while weight is kept down by the use of light, high-tensile alloys.

In so many fast cars one becomes rather painfully conscious of the back axle at high speed. The exceptional rigidity of the Healey layout, both laterally and in twist, aided by the light unsprung weight, contributes to a back-end which is entirely self-effacing; one never gives it a thought.

The steering gear itself is light and positive in action, trouble having been taken to screw the steering box firmly on to the chassis; an elementary precaution which so many designers seem to overlook. It is reasonably high-geared, but some people might prefer it even higher. This point of view might be justified for the reason that the driver's right elbow is somewhat cramped, and large arm movements are not easily made. Particularly is this the case since the steering wheel (although possessing reasonable adjustment for rake) comes very snug into the driver's lap. With low build and streamlined coachwork it is difficult to see how this can be overcome. The low build necessitates a substantial tunnel to contain the transmission arrangements, and the seats (splendid ones, incidentally, rock-solid and perfectly gripping the shoulders) are necessarily set on each side of the tunnel. In a non-streamlined open car (it was the open Healey I drove) the side of the body comes inside the driver's right elbow, which thus has the freedom so desirable in fast cornering. But a streamlined body has to be pretty well the full width of the car, and high, so that the elbow cannot



How it is done—the 2.4-litre "Big Four" 104 b.h.p. Riley engine in the softly-sprung, lightweight chassis of the 8ft. 6in. wheelbase Healey high-performance car.

be hung outside. It is difficult to see how this can be overcome in rear-wheel-drive cars, except those with independent or de Dion layout, when the prop. shaft tunnel can be very much reduced in size. My high-built saloon Bugatti, although two or three inches narrower than the Healey, affords considerably more living room for the driver.

The engine is luxuriously cushioned and smooth for its type, but you cannot expect completely to smother up a big four-cylinder unit, burning 600 c.c. of gas at each explosion, and showing no less than 125 b.m.e.p. at its peak revs. of 4,500 per minute, when the piston speed is also the considerable one of 3,600 feet per minute. The engine is in no sense rough; indeed, its balance is obviously splendid; but you know it is working away. Anyway, the outfit is avowedly a sports-car. It somewhat upsets preconceived notions about piston speed, since 2,500 f.p.m. gives only 70 m.p.h. and the car will definitely cruise effortlessly at anything up to 80. This does not mean that accepted tenets are wrong, but that they may be over-ridden in special cases.

In the first place, the Healey-Riley engine and crankshaft are both short and exceptionally rigid. In the second place, even at 80 m.p.h., only a small throttle opening is called for, so that the engine is working quite lazily. These factors evidently more than offset the high frictional losses concomitant with high piston speed, as is shown by the startling fuel economy at high road speeds recently obtained by the *Motor* (31.2 m.p.g. at 70 m.p.h. and 24.8 m.p.g. at 80 m.p.h.). The low fuel consumption is also a tribute to the good aerodynamic qualities of the coachwork.

The power curve is, I should guess, something between the flat-topped variety popular in America, and the straight-line pattern of the high-revving, short-stroke engine, like the V12 Lagonda.

The gear ratios are well suited to the power-curve, being only moderately closely spaced. A change from top to third demands a 30 per cent. increase in engine speed, and from third to second 33 per cent. The engine will pull smoothly at less than 1,000 r.p.m. in top (about 22 m.p.h.), and pulls away well from that speed if the throttle is opened gradually. But it is from 60 m.p.h. that top really comes into its own, and this speed is easily attained in third, when the engine is turning at only 3,800 r.p.m. (the safe limit is 5,000 r.p.m., which gives 80 m.p.h. in third and 53 m.p.h. in second). Obviously, therefore, the ratios are spaced out to the best possible advantage, and the free use of them is facilitated by good synchromesh arrangements and dog engagements. The clutch itself is light to operate and smooth in action, it being perfectly easy to get away from rest in third with a minimum of clutch slip. The particularly effective output of the engine is contributed to largely by the excellent ingurgitation through twin S.U. carburetters, and unimpeded expectoration through the beautiful four-pipe, Bugatti-like exhaust manifold.

And then, the car as a whole?

Immediately on taking over control the driver has every feeling of confidence. At once, the car is put through fast open bends at speeds which would even embarrass most Bugattis. The steering is sufficiently sensitive for the driver to be able to judge exactly what is going on at each corner of the car, and it is always the right thing which is happening. The car is free from over or understeering bias, but in extremity, the breakaway is at the back end, which is where it should be. There is not a trace of roll and the bonnet remains rock-steady, like the very best racing cars. The Healey must, one feels, be very much like the German G.P. cars. Although the steering is so accurate there is very little reaction, thanks, no doubt, to the geometry of the linkage.

The driver sits well up and has a good view forward and of both mudguards. The screen pillars are narrow. The brakes, too, are well up to the performance and produce none of the peculiar effects one might expect with 68 per cent. of the effort on the front wheels, together with the long trailing links.

Actual performance figures remain to be taken in the near future, when the car is submitted to the full Motor Sport road-test curriculum. The foregoing remarks are the results of a short drive, undertaken to afford no more than some general impressions.

And the impression afforded is that of a very fine motor-car indeed, of which England may well be proud.

THE CISITALIA

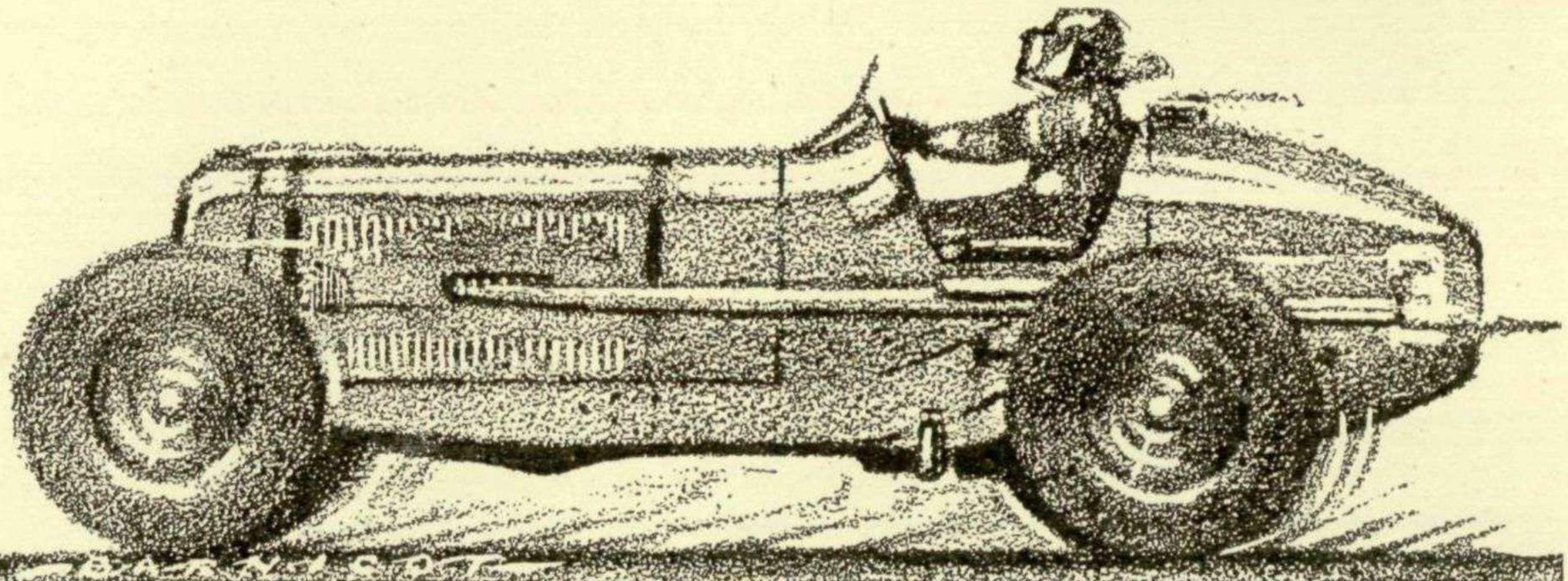
THE Cisitalia has been a sensation from its inception, and rightly so. Rowland has not yet received his example, but we suspect that when he does there will be quite a pilgrimage to Byfleet to see it. Meanwhile, a brief description of this new car will not come amiss. Some very good pictures of it appeared in *Motoritalia*. Incidentally, it would seem that the way to be able to produce really fine motoring papers is to lose a war!

The success of the Cisitalia will surely depend on its clever chassis frame. This is a very light structure of molybdenum steel tubing—literally a welded-up fuselage. A low radiator is attached to the front, and behind this the very simple front suspension, consisting of a transverse leaf spring clipped to the upper frame member and very light, tubular wishbones pivotted to the lower frame. The rear suspension is likewise light, simple and efficient, with coil springs between frame and axle. A triangular locating wishbone is hinged on the top of the bevel housing and anchored in a spherical mounting on the rearmost cross-member, and torsion bars and radius arms link the axle with the chassis side-members. In the early cars Bugatti-disposed leaf springs were used in place of these torsion bars and arms. The propeller shaft runs below the hypoid axle, as a double-reduction gearing lowers the transmission, the drive passing through this and a short inclined shaft back to the axle.

The engine is a modified Fiat "1,100" 4-cylinder, of 68 by 75 mm., for which 60 b.h.p. at 5,500 r.p.m. is claimed, on a 9.5-to-1 compression-ratio. Such special features as an alloy head, balanced (3-bearing) crankshaft, dry-sump lubrication, machined steel connecting rods, oil cooler before the main radiator and copper-lead bearings, contribute to this useful output. Ignition is by a vertical Marelli MVE.105 magneto on the near side, and there is a Zenith 26 VMF carburetter on the opposite side, fed by mechanical pump from a 10-gallon duralumin tank in the tail. Fuel consumption is given as nearly 19 m.p.g. at racing speeds. The brakes are Lockheed hydraulic. The 3-speed gearbox has ratios of 3.63, 4.9 and 6.5 to 1 and a clever change is incorporated by which moving the clutch pedal automatically effects the changes between top and 2nd gear. A lever controls bottom and reverse gears. Centre-lock wheels with alloy rims take 4.00 by 15 front and 5.00 by 15 rear tyres, and at 1,000 r.p.m. in top the road speed equals 20.6 m.p.h., or 4,850 r.p.m. at 100 m.p.h. The wheelbase is 6 ft. 6¾ in., the front track 4 ft., and rear track 3 ft. 8½ in.; ground clearance is nearly 5 in. The real merit of the Cisitalia is, of course, its low weight, which is quoted as 815 lb. dry. There you have it—60 b.h.p. from an engine for which spares are available throughout Italy, in a 7¼ cwt. car, able to pull high gear-ratios, with automatic upper gear-changes, and efficient suspension. It is backed by a neat all-aluminium single-seater racing body, with four aerofoil cowlings shrouding the front suspension. Front shock-absorption is by fluid absorbers, rear by disc-type absorbers. No wonder Nuvolari has been trying out the Cisitalia. The steering wheel detaches for ease of entry and the driver is confronted merely with oil and water inlet and outlet thermometers and rev.-counter.

According to the Swiss Press, the Cisitalia directors intend to tour the world very shortly, taking twenty of their wonderful little cars, to be demonstrated by ten picked drivers, Chiron, Dusio and Taruffi amongst them, and the other ten to be put at the disposal of local talent. There's a good time coming. America, Australia and Africa are amongst the countries to be visited.

Over here Rowland has the sole British agency and hopes to enter a Cisitalia for this year's events. His very fine racing-service van is ready. At the moment two racing Altas and a fantastic V16 two-crankshaft sports Maserati 2-seater (the fastest road-car?) occupy his premises. Reverting to the Cisitalia, the maker's claim 109 m.p.h. for the single-seater, and a sports 2-seater and an aerodynamic coupé are to be made weighing about 8 cwt., both of which are expected to exceed 100 m.p.h. It is to be hoped that British manufacturers have already started to unhitch their suspenders—preparatory to pulling-up their socks.



RUMBLINGS

At this time of year racing cars used to change hands and everyone was agog at the glowing prospects for the coming season. If the prospects are not so glowing as before the war, at least the cars are finding new owners all right. David Hampshire has sold his 6-cylinder, 1½-litre Maserati to Leonard Potter, of Continental Cars, and has taken unto himself Parnell's "Challenge." It will be recalled that this car was a very special "special" which Parnell ran once with an Alta engine installed. He is, however, popping in one of his straight-eight Delage engines for Hampshire's edification. Then Barry Woodall, who ran a "Shelsley" Frazer-Nash last year, has acquired one of Parnell's Delage cars, while Yates, who was getting his hand in with the 2.9-litre Maserati last season, is importing, they say, a 1½-litre, 6-cylinder, 24-valve Maserati from Italy. Parnell has also sold the ex-Maclure Riley and the ex-Howe Zoller E.R.A. Harrison has relieved him of the latter. Reg. has big ideas for himself—he has been to Alfas, tried a Type 158, approved it, and now hopes to import one. Ken Hutchison is another would-be racer, for which purpose he has acquired the ex-Ferrari *monoposto* 2.9-litre Alfa-Romeo which A. F. Ashby raced. You will recall that Ashby modified this car quite a bit, as reported in MOTOR SPORT at the time, in order to obviate the cylinder-head troubles to which these cars were prone. So Hutchison takes over with i.f.s., 12-lb. boost, cast-iron blocks and hydraulic brakes and hopes to try out the car at Bo'ness next May. Rowland awaits his sensational Cisitalia and Cowell plots some flat-twelve G.P. cars, assembled largely from proprietary components. Rumour has it that bits of Raymond Mays' new team, such as Laystall-made con.-rods, are coming along, and E.R.A., Ltd., talk of having the one-and-only Bert Hadley to test each E.R.A. for 150 miles or so at racing speed—we wouldn't know *where*. It looks as if Parnell, Brooke and Leslie Johnson will have their E-type E.R.A.s to back Whitehead's this year.

General Post

Over here, too, the "specials" are flourishing, largely as 500-c.c. cars, but in addition John Bolster schemes a rear-placed, "hotted-up" V8 Mercury engine in his old four-J.A.P. chassis, and Lance Macklin's lengthened, Mercury-engined Fuzzi is well on its way, down at Lightwater.

Over and above all this, there are high hopes of a Mille Miglia, and possibly Le Mans, this year. A sort of picnic for Cisitalias and the new sports 2½-litre Alfa-Romeo, perhaps.

And Bugatti has at last got his Molsheim factory back. Count Lurani has been over here, feasting with the J.C.C. and visiting Earl Howe, and he brought over some news of Italian teams for this year. Alfa will put out Wimille, Sanesi, Varzi and Trossi in the invincible-last-year 1½-litre, Type 158s, the rear-engined, flat-twelve cars coming out later on. This Maserati will counter with a new tubular chassis, de Dion rear-end car using the well-known 4-cylinder, 16-valve engine, three-stage supercharged, their team to comprise Sommer, Ruggeri and, it is hoped, Nuvolari. The flat-twelve Alfa-Romeo they will match with a (front-engined) flat-twelve of their own. Add to this Ferrari's new V12 Colombo-designed team, with Farina, Villoresi and Cortese as pilots, and you just must get over to a Continental Grand Prix this year.

We wouldn't like to prophesy who will come out on top, but the Maseratis are doubtless rubbing their hands together and pointing out that Raymond Sommer has been declared French champion of 1946.

Darracq have a new 4½-litre which Farina may handle, and over and above all this, Madame Itier's Union Sportive Automobile has the most breath-taking plans for taking on cadet drivers free of charge and letting them race seriously against men like Sommer and Wimille in twenty identical 3-litre, 3-carburetter, single-seater Delage cars, if they pass a medical and certain preliminary trials in single-seater Salmsons. This is so much what we have all dreamed about that we withhold further information until the thing becomes an accomplished fact. But if you can support yourself in France while trying to get in on this munificence, there is no harm in trying to get details from the Union, at 190, Rue de Rivoli, Paris. It really seems there is a good time coming, possibly.

Club News

WE HEAR

Competition Cars, Ltd., have in their possession what sounds like the old "flat-iron" Thomas-Special which at one time took diesel records. It now has the straight-eight engine reinstalled and, while the heavy steel body and frame will be kept for sentimental reasons, the new owners intend to fit a streamlined body of light alloy and to carry out certain other "mods." The Thomas will then be raced next season by T. P. Bayliss.

Up in Leeds, Goodman is busy trying to assemble a steam car from masses of parts, a task rendered more difficult because the chassis is what he describes as "non-standard." He is also working on an R.L.S.S. "22/90" Alfa-Romeo of about 1927 vintage. It is very good news that Forrest Lycett is only waiting for a more ready supply of petrol and a resumption of the sale of Discol to get his famous 8-litre Bentley on the road again. At the last Brighton Speed Trials only four of the racing cars bettered the time for the s.s. kilometre which Lycett established when taking Class B records. It was also very nice to see R. G. J. Nash again, on his 1900 Peugeot in the Brighton Run. He tells us he is going to set up a motoring museum and open it to the public, which someone should have done years ago. His own well-known veterans, both cars and aeroplanes, will be on view and he will be glad to hear from anyone who will contribute photographs, data, drawings, accessories and vehicles at reasonable fees, particularly of the 1800-1918 period. Incidentally, the game little Peugeot took three persons through the "Brighton" on "Pool" petrol, giving no trouble at all and ascending all the hills.

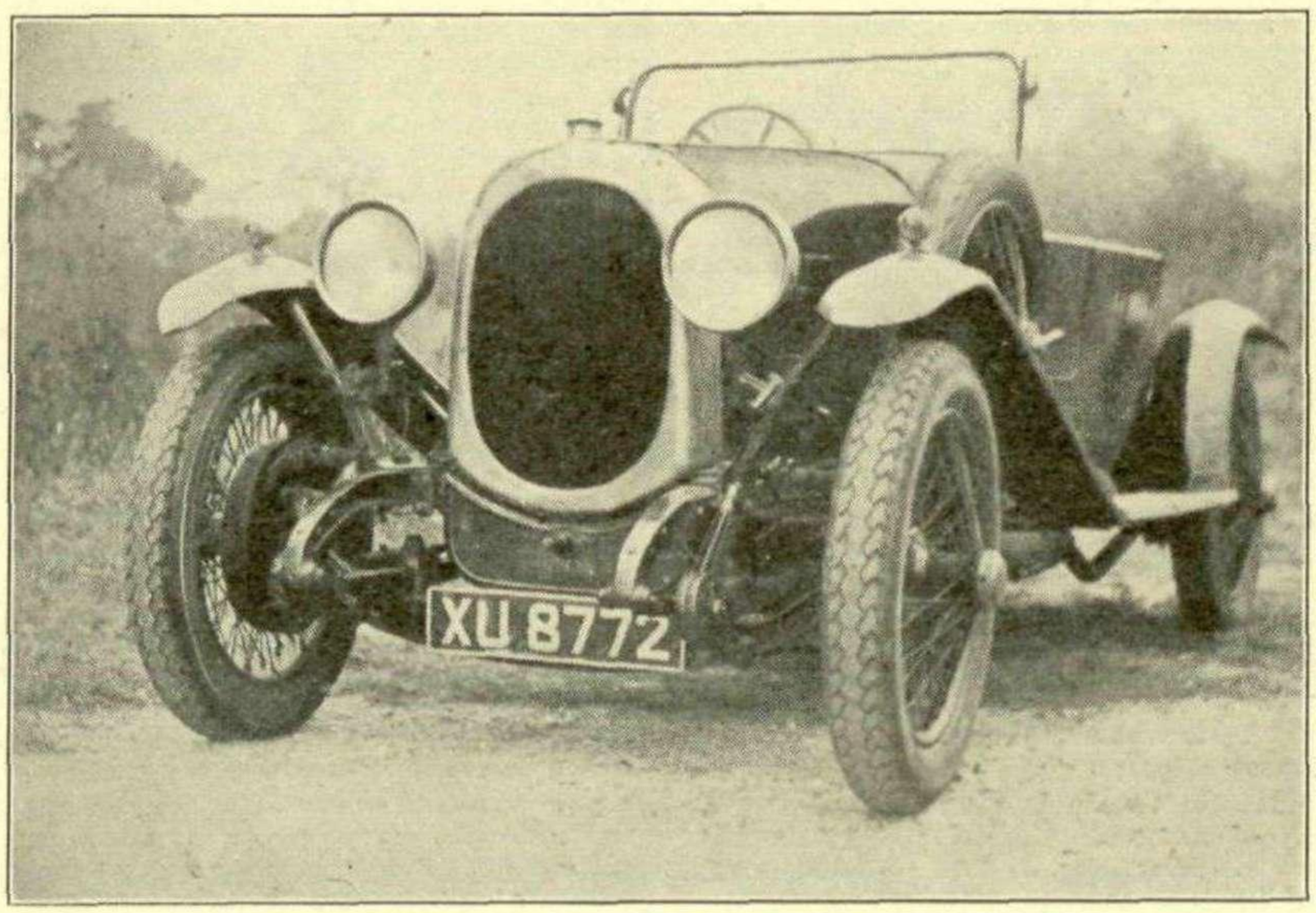
Vaughan Oliver is having the ex-Betty Haig A.C. reconditioned for next year's events. He mentions, in passing, that the Malden and D.M.C., founded in 1927, is getting back on its feet and will be glad to hear from prospective members. T. H. Leigh has a 1927 Frazer-Nash, No. PH 3522, engine No. S.S. 4879, chassis No. 1135, and wishes to contact any previous owners; while Lt. J. M. Icke, Royal Marines, runs an "8/18" Talbot fitted with a "10/23" engine, and would like to hear of any more of these cars, or spares. A Napier, described as a 1921 20-h.p., 4-cylinder tourer, will soon be going to a Biddenden breaker if someone does not save it.

Up at Beaconsfield, Louis Giron has got a very useful workshop and is busy, mostly on Bugattis, in his own inimitable style. Kenneth Neve has acquired that fine, ex-Hughes "30/98" Vauxhall, thus fulfilling, he says, an ambition of ten years' standing. It has climbed Prescott in 54 sec., Shelsley in 48 sec., and lapped Brooklands at 108 m.p.h., yet is decently docile, and an easy starter—not only on the button, but away from the traffic lights, we presume! By the way, Neve traced the ex-Wallbank, 1914 T.T. Humber to a Durham breakers, where it was a total loss, so his car is now the only known representative of the type. David Howard is trying to start a boys' motor-racing club. Walker still gets good service from his elderly A.C. Anzani and would like to hear from anyone who can give him hints on tuning the engine, while Gold has changed his Riley Nine for an unblown 1,750-c.c. Alfa-Romeo saloon. A really early, flat-radiator Alfa-Romeo coupé, probably a push-rod "15/50," was encountered recently on the Southend road. Percival Marshall, Ltd., 23, Great Queen Street, W.C.2, have introduced a plans service for model car builders, these covering such cars as B-type E.R.A., "T.T. Replica" Frazer-Nash, o.h.c. racing Austin Seven, Lancia "Aprilia," etc. These are accurate four-view drawings of the real cars and cost 2s. 9d. each, post free. The December issue of the *Model Car News* contained an article on "Cars Worth Modelling," covering the 1914 G.P. Mercédès and many other interesting articles. "Bira" recently made a replica of himself in his E.R.A. from butter supplied from his wife's Jersey cow and had it exhibited at the Bodmin Show. The International Model Aircraft Co., Ltd., has introduced little rubber-driven plastic toy racing cars, at 2s. 6d. each.

It seems that some worth-while British cars are brewing for 1948. We have an idea Morris may introduce a really nice little aerodynamic saloon, that the M.G. company have a compact 1½-litre saloon with coil-spring i.f.s. and rack and pinion steering in hand, and that Vauxhall's intend to lower appreciably the bonnet line of their "Ten." These are only telepathic findings, as yet. But the new 2½-litre Riley is an accomplished fact.

Willfams is having a new body made for the ex-Hunter Alta he raced last year. Samuelson is preparing the 1914 6½-litre Peugeot which he drove at Lewes before the war, for future Edwardian competitions, and he has also acquired the 1914 T.T. Sunbeam with 4-seater body (the Guinness car) from Breen. He uses a venerable 1925 Renault for agricultural duties. George Hill has found the remains of another Sunbeam Mabley, that queer, wooden-framed two-track 4-wheeler, and hopes to be able to rebuild it, although it is in a sorry state. The number of Brighton-age veterans discovered during the war, when there wasn't much petrol and everybody was very busy, suggests that still more are likely to come to light in the future.

Granville Grenfell and his wife did a Swiss tour last year on two motor-cycles. If anyone wants a 1926 21-h.p. Lanchester saloon, we know of a very good example, maintained by two chauffeurs, which was the property of the late Lord Somers. It seeks a kind home.



This month we resume the gallery of vintage types with a rather rare car, a Chenard-Walcker. They made a name for themselves in French sports-car races about twenty-two years ago, and the 1,100-c.c. car appeared in streamlined form. The brakes were on transmission and front wheels only, worked by a Hallot friction servo motor.

We have very little space in which to report the Dunlop war film, "Far Horizons," but two words will suffice: "See it!"

What is the most sensational thing we have heard, this month or any other time?—Why, that there is a 3-litre Grand Prix Mercédès at R. C. Rowland's garage in Byfleet!

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N.Z.S.C.C.

Club bulletins are attaining a very high standard nowadays, and their arrival is awaited with keen anticipation. That of the New Zealand Sports Car Club for last September contains a long account of a special "Speed Six" Bentley, believed to be New Zealand's fastest car; a "Cars I Have Owned"; a description of Tolley's first lap of Brooklands—on Lacey's 350-c.c. Grindlay Peerless-J.A.P., with 16½-to-1 compression-ratio, giving 42 b.h.p. at 7,200 r.p.m.—at 103 m.p.h. (the run home was in a *saloon* Frazer-Nash, Staniland driving!); and an account of the Club's night trial. The last-named event was won by Forlong's Austin "12/4," with Tooley's Armstrong-Siddeley and Watson's Singer "Le Mans" tying for second place. New members' cars include a Frazer-Nash, a straight-eight Sunbeam, an "18/80" M.G., and P-type M.G. The Bulletin cover photograph is especially interesting, showing Ken Hemus' 1921 T.T. straight-eight Sunbeam, sister car to Heal's in this country, now with simple touring body.

Hon. secretary: T. Wickham, Box 406, Wellington, New Zealand.

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N.Z.N.S.C.C.

The Northern Sports Car Club of New Zealand recently held its "Boot Cup" winter trial. Seventeen cars started, from Auckland, and five sections were included in the 60-mile route. 30 m.p.h. had to be averaged through the city and the metal roads of Waitakere Ranges, which four cars managed to do. Roycroft's Riley excelled on the first hill, where Hemus' T.T. Sunbeam, not surprisingly, failed. This car finally broke an oil pipe and retired, and Gilroy's Austin also dropped out, with a split fuel tank. Most of the sections were easy except the last, which was cut out. The trial was won largely on correct route-finding and time-keeping, O'Callahan's Ford Ten beating Roycroft's Riley Nine, with Tappenden's Pontiac 3rd, Rundle's Morris Eight 4th, and Watson's Singer 5th.

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DICTIONARIES?

With terms such as "streamliner," "D-wagen," "midgeteer" and the like coming into use in connection with the Sport, we shall soon all need motoring sport dictionaries . . .

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DOMESTIC?

Charles Mortimer and his wife were recently filmed in a motor-racing capacity for a news-reel. The "hand-out" implies that Charles, although preferring the cockpit of his Alta, is quite willing to lend a hand at the kitchen-sink. Now, Charles, this puts the more humble "special"-builder and enthusiast in a spot. If you, sir, with your taste in "Speed Six" Bentleys and your present Rolls-Royce, will deign to do the wiping-up, how will the "Austin Sevenists" ever convince their wives that, while they do not in the least mind washing-up, making the beds, dusting the mantelshelf, beating the carpets and cleaning the windows, not to mention feeding and changing baby, *there is a little work to do in the garage . . .?*

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NOTICE

The Motor Sport Library scheme continues. When the Editor moved from Yorkshire to the South the thing became a bit chaotic, but instruction books covering most sports cars, vintage and modern, and many ordinary cars, have been safely preserved, and books can be loaned for three weeks to anyone sending us a really large, adequately-stamped envelope. If a book applied for is not received by return, that is because someone else has borrowed it. They may even have lost it, in which case you will not get it at all, and no correspondence can be entered into about it. But we do our best to send out all books applied for, and a 4d. stamp, on the average, covers postage. Space-cramp precludes publication of a list of the books we hold. If anyone should have returned a book to us and has not done so, will you please remember that another enthusiast may be in need of it. Contributions, especially of rare instruction books, are still most welcome. So far as a further "Register of the Unique" is concerned, it is unlikely that there will be sufficient space to include one this year, but we shall be glad to refer to unusual or interesting cars for sale, even queer small cars, especially at modest prices. By sending details on a postcard you can assist those searching for cheap beginners' cars, or held up for spares, etc., and the need is certainly great—but this is *not* a free advertising scheme for disposing of your own car!

JANUARY FIXTURES

4/5th.	Hants and Berks M.C. Closed Invitation Night Trial.
10th.	S.U.N.B.A.C. Annual Dinner/Dance, Botanical Gardens, Birmingham.
11th	Bristol L.C. & M.C.C. Full Moon Closed Trial.
17th	V. S. C. C. Annual General Meeting, London.
26th.	N. Midland M.C. Sporting Trial.
Feb. 2nd.	Hagley and D.M.C. Invitation Trial.

OH, DEAR!

A reader has found the following in an old book of "ruthless rhymes":—

INCONVENIENCE

"I collided with some trippers
In my swift de Dion Bouton,
Squashed them out as flat as kippers,
Left them *aussi mort que mouton.*
What a nuisance trippers are,
I must now repaint the car."

★

POPULAR VETERANS

The V.C.C. must have felt very pleased at the reception the veterans got on Brighton Sunday. We gather that the news-reel rather made fun of the cars, but, on the contrary, *Punch*, of November 27th last, had an excellent humorous description of the Run, complimentary to the cars. Apparently *Punch's* reporter rode on a 1900 Benz, while their artist, Brockbank, went in a 1903 Clement-Talbot. Together they did an excellent account of the Run, all the more pleasing because it appeared in the last place in which we expected to find the veterans eulogised.

★

B.D.C.

The Bentley Drivers' Club "Review" for December keeps up this publication's very high standard. Apart from breezy reports of this Club's very lively meetings, there is some early racing history by Dr. Benjafield, and some excellent photographs. Eighty-seven new members were elected last quarter and the score is now 339 Bentley-minded souls with 142 3-litres, a 4-litre, 104 4½-litres, 15 "blower" 4½s, 11 "Big Sixes," 14 "Speed Sixes," 15 8-litres, seven 3-litres with 4½-litre engines, a 4-litre endowed with 4½ litres, eight 3½-litres and 11 4¼-litres, between them. If you are a Bentley owner and a non-member you are missing a very great deal and we recommend you to write at once to S. Sedgwick, "The Cobb," Stoke Close, Cobham, Surrey.

★

"POP"

In the office of the Sales Director of the Healey Motor Co., Ltd., is a framed "Pop" cartoon from the *Daily Sketch*. And with good reason, for it shows "Pop" entering a railway carriage, placing his suitcase on the rack and taking from it a large placard. This placard reads: "I Don't Think Much of the Government, Rationing or Picasso. I Like the New 2.4-litre Healey Car. Wake me up at Exeter." This "Pop" places in front of him and presumably sleeps uninterrupted throughout the journey. Naturally, we assumed that either the publicity man at Healey's had a "pull" with the artist or that a huge sum had been paid for this mention. Neither is correct. "Pop's" creator had obviously looked through the *Daily Sketch* for topical headlines and found the Healey car prominently written-up as a Good Thing, for its sponsors had let Kay Petre take one out on test. Their co-operation with the *Daily Sketch's* motoring correspondent was thus to lead to publicity which other manufacturers must have regarded with awe and envy. *Verb. sap.*!

TYRES

Excellent news! Dunlops announce that from time to time old-size tyres are being put into their production programme (21 by 5.25 in., 21 by 6.00 in. and 21 by 7.00 in., also metric sizes, are mentioned) and made in small numbers; also that enquiries for racing tyres should be addressed to N. W. H. Freeman at the Albany Street depot.

★

B.O.C.

The Bugatti Owners' Club held its 11th Annual Dinner and Dance at Grosvenor House, Park Lane, on December 7th. An excellent dinner was followed by the presentation of awards for the 1939 and 1946 seasons by Earl Howe, K. W. Bear being the popular winner of the Victor Ludorum Trophy. We cannot say whether the dancing or a gramophone record of racing-car noises at Prescott (which was played during the evening) was the more popular with the Bugattisti. But it is worth announcing that the Antone Co., of Ewell, sell this double-sided 10-in. record at 7s. 6d., for those who would bring the E.R.A. into the drawing-room, at least orally. These sound-effects were excellent and must have bemused those who, as the saying is, had dined well but not wisely. We have often thought that running commentaries of racing events should have been put on to gramophone records and present this idea free of charge to the recording firms, with emphasis on the fact that Tony Curtis has done it first—although the Antone effort is almost all car-noise at the expense of commentary. Nevertheless, we are certain this record will be listened to again and again by true believers.

★

INDIANAPOLIS 500-MILE RACE

Because there are so few suitable blown 1½-litre racing cars available in the United States, the 1947 500-Mile Motor Sweepstakes at Indianapolis will again be run under the old formula to permit 3-litre blown cars to compete. Thereafter, the Indianapolis authorities will comply with the new formula, in so far as piston displacement is concerned, but the fuel restriction will not be enforced.

Entries for the 1947 race from experienced British drivers with suitable 3-litre blown, or 4½-litre unblown, cars will be welcomed, and travelling expenses from port to port will be guaranteed by the organisers.

It is understood that there is a ready market for blown 3-litre cars in the United States, where they are extensively used on dirt tracks, and British entrants of cars of this size, who so desire, should have little difficulty in disposing of them at a satisfactory price. This should be preferable to shipping them back to this country, as there will be few opportunities to race them in future European events.

The Contest Board of the American Automobile Association urges that European contestants should arrive at Indianapolis not less than one week before the race so that they may have ample opportunity to familiarise themselves with the track (which is not quite so easy at it looks), if for no other reason than their own safety.

COVER PICTURE

Exciting new British high-performance cars are beginning to appear and many of them have already been subjected to searching long-distance tests on the Continent, notably the H.R.G., Allard, Healey and 90-h.p. Riley. The new Bristol has also been thoroughly tested in this manner and the photograph on the cover shows the car in Milan, where heavy rain was falling. The picture was taken on the occasion of the latest of several visits to the Continent. This test covered several thousand miles, in Belgium, France, Italy and Switzerland, and over the Autostrada averages of over 80 m.p.h. were easily attained. With the Bristol are H. J. Aldington and D. H. Murray, who conducted the test, accompanied by Count Lurani and Signor Phillipano.

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GENERAL NOTES

A long-run undertaken almost on the spur of the moment gains something by the lack of planning beforehand, and so it was when someone, finding a blank Sunday in the calendar, said, "Let's do a long run." And someone else, "I've never seen Cheddar Gorge." We decided there were worse things to do than occupy the back of the Austin, so by midday we were on the way. The familiar route to the West Country was taken for a while, with a welcome lunch at Andover. Then we motored on, across Salisbury Plain, past Stonehenge, spoiled by the wire fencing round it and the request to "pay at the hut opposite," so that we searched, instead, for the two separate memorials to early military aviators, which flank the road hereabouts. Cheddar came up and was an inspiring sight on this autumn afternoon, although we should prefer to see it alone, in mid-winter, when the stream of tripperish traffic would have gone. Nor do we particularly wish to "do" the caves again. However, the journey became more fun as we progressed, for after a brief glimpse of the sea from Weston-super-Mare's uninspiring front, we sought a better piece of coastline and, in the dark, got into lonely, winding lanes, finally "fetching-up" at a bird sanctuary at Brean Down, still closed for the purposes of war. In Weston again, we had a meal, the driver discovered in a car park a "12/60" Alvis saloon he had once owned, and we set off for home. The long evening run was somehow very satisfactory, odd places reminding us of pre-war trials coming up on those signposts that we consulted frequently by torchlight as we made our way cross-country.

Then there was the Allard to test, enough to blow away all the war-time cobwebs in the first few miles. We took that car fast cross-country up to Bletchley on a warm, overcast afternoon which seemed timeless, perhaps because the car covered so much ground so effortlessly. We came through parts of Buckinghamshire we once knew well, but had forgotten, and returned to Hampshire by way of Bedfordshire and Hertfordshire, comfortably between lunch and dinner.

On another occasion, in the security of a Vauxhall Ten, we went, of all places, to Vauxhall Motors, Ltd., at Luton, to see their veteran and vintage cars, then on to Dunstable to inspect the newest E.R.A., finally deciding, on the spur of the moment, to press on to Warwick and drop in on Mr. Watt, of Healey's. Everything went according to plan, and that car did get along very nicely, and with a degree of refinement praiseworthy in a Ten.

Came the Brighton Run, which, for us, commenced early on the Saturday morning, when we set off in a Hillman Minx with uncertain steering qualities to tow Kentish's 1902 de Dion to London, followed by the willing, if somewhat tired, Austin Seven. Stowing the car in Swiney and Hill's garage—we hadn't met Hill since the days when he had been with Humphrey Symons—we ate a snack lunch at an adjacent café and set off, with the trailer, for Brighton. The early part of the route was well known to us, along tram-lined roads until we swung left on to Purley Way, passing those pleasing signposts which indicate Thornton Heath in one direction, "Ladies" in another. At Bolney we encountered Leslie Allard still working on his veteran Napier, and a queer small 4-seater of the early nineteen twenties (possibly a Meteorite; will someone please confirm?) hurried past in the London direction. Leaving the Hillman and trailer in the garage of Brighton's Grand Hotel, we came back to London by train, an excellent 60 min. run in electrified cleanliness, only marred by having to pay 1s. 6d. for the privilege of occupying the restaurant car, and another 1s. 3d. for a minute toast-and-biscuit tea. That, we hoped, was that—until tomorrow. But a 'phone call reported the Austin's sick rear axle as getting worse and the car not a reliable tender for the de Dion. So we contrived to borrow the Vauxhall Ten and set off at 9.30 p.m. to collect it from Hornchurch. Now Hornchurch always reminds us (you will have to forgive us) of a passage by Cecil Lewis in "Sagittarius Rising." Lewis, on leave from the R.F.C., had been in London, at a party which he describes at sufficient length for us to believe that he enjoyed himself, with a partner of his own choosing. Later . . . "The old two-cylinder Renault which, from a sense of war-time economy, seemed to run on one cylinder most of the time, chugged and bucked its way down the Mile End Road. The seats were hard and slippery, and the cab too small for me either to lie on the floor or loll on the seat. It was a sort of purgatory, but I was oblivious of everything. At last dawn came up, ghostly over the hopfields, and seven o'clock found me paying the taxi-driver eight pounds at the Bekesbourne sheds. The sun was up, the day glorious, cloud-free. We took off, wheeled, formed flights, and turned south. Two hours later we were lunching, back in the Mess, at Elstree Blanche." Well, we also went out *via* the West End, through Holborn and up the miserable Mile End Road. But we found no particular adventure, bar patchy fog in which we got lost once or twice on the Southend Arterial, and were back in bed in the Kensington Palace Hotel by 1.15 a.m. on the Sunday

How we fared on the "Brighton" was recounted last month. Suffice it to say that we are now dry once again (!), that the Vauxhall brought us home manfully after the Mayoral Tea (although the

Continued on page 23

Letters from Readers

AN APOLOGY

Sir,

I take the strongest possible exception to the report appearing in MOTOR SPORT that I made a derogatory remark about the car I had driven to Brighton at the end of the run on November 17th.

The words you report me as having uttered are a complete fabrication and I certainly have nothing but admiration for the one-cylinder Alldays which, despite the appalling weather conditions, nevertheless succeeded in transporting me to Brighton on that day.

Mr. G. J. Allday, the owner of this car, is naturally much upset by this report and I may say that I am too, and I must ask you please to make adequate retraction in the next issue of MOTOR SPORT.

I am, Yours, etc.,

ALAN HESS.

Birmingham.

[We are sorry we reported Mr. Hess as saying something he now says he did not say. We intended to place emphasis on the bad day and not to be in any way derogatory to the Alldays, which was surely obvious, since, in spite of the bad day the Alldays got to Brighton and, as we emphasised, ran in the Cavalcade which followed. Mr. Hess must know that we appreciate the sportsmanship of one in his position—he is Public Relations Officer to the Austin Motor Co., Ltd.—who is ready to drive alone in a veteran car to Brighton under such conditions.—ED.]

* * *

Sir,

With reference to my notes on "Spider" in your November issue, I have since received a letter from my old friend H. R. Godfrey, the original "G." of G.N. He writes :—

> "You did not mention that the "Spider" was originally a 1920 G.N. It never was a Frazer-Nash as both the chassis and original engine were made by G.N. Ltd., Wandsworth, when I was there."

I apologise for not making myself clear. Actually, I purchased the parts from Capt. Frazer-Nash, who had taken them over from G.N.s, when they went out of business.

I am very pleased, however, to get an authentic date for the origin of the components of my car. Godfrey ought to know, as he was there at the time (1920), two years before I thought, and he is still going strong. He also writes :—

> "The car should surely be called and entered as either 'Davenport Spider' or, I think more correctly, 'Davenport G.N.' or 'G.N. Spider'."

Now, I read your article on names of "specials" and agree with you, although I see a good number of your readers did not.

In the light of Mr. Godfrey's information I think the name of my car is due for a change. Which name do you think I ought to use in the 1947 racing season? Perhaps some of your readers may have ideas? I rather prefer G.N. "Spider." In any case, whichever name is chosen I should not be frightened to paint it on the bonnet of the car in large letters!

I am, Yours, etc.,

B. H. DAVENPORT.

Macclesfield.

[We think the designation suggested by Mr. Davenport very much the one to use. Incidentally, we apologise to "B. H. D." for getting his initials mixed in the article to which he refers.—ED.]

* * *

Sir,

We have recently installed a 300-h.p. eddy-current Heenan & Froude dynamatic dynamometer for testing power output, etc., on internal combustion engines.

During the next two or three months this brake will be available for such purposes and we propose, before stripping down this winter, to put Mr. Monkhouse's Type 51 eight-cylinder Bugatti engine on the brake, for the purpose of discovering the present power output and fuel consumption. It occurred to us that we might make the same facilities available to others, and because we are doing it ourselves could do this correspondingly cheaper. We should therefore be prepared to bench-test and provide a certified power and consumption curve for any Bugatti engine, subject to the following conditions :—

Fuel.—You will be required to supply ten gallons of the fuel which you would normally use in this car.

Engine.—You will be required to arrange collection and delivery of your own engine, although if necessary as an extra, we could arrange to remove it from the car chassis ourselves, provided the car was brought out to us.

Supervision.—We should require the attendance of one of your own representatives during the test.

Time taken for Test.—Subject to the availability of the brake, the time required for the test would be two to three days from receipt of engine.

Tuning.—Any extra tuning that might be required would be charged as an extra according to the work involved.

Ignition Timing.—In view of the fact that magnetos on these engines are separate, it will be necessary for you to inform us of the ignition timing which you require the engine tested on, so that when erected on our rig this timing is repeated.

Plugs.—We would request that you supply your own hard plugs for the test.

Condition of Engine.—We shall require the engine complete with water outlets, exhaust pipes, clutch, sump, carburetter, etc., and in a reasonably clean condition.

Additional Information.—Should additional information be required during the course of the test which is within the scope of the test, this can be supplied by us free of charge, and we should be only too happy to co-operate with any client's special requirements.

Secrecy.—The strictest secrecy can be guaranteed on all tests, and no information obtained on any tests will be divulged to any other clients.

Price.—We can quote an inclusive charge for erecting, testing, providing information, dismantling, and arranging for removal, of £27 10s. (trade terms can be offered).

We need hardly stress the very great advantages to be gained from the intelligent use of an engine test brake in maintaining or increasing power output for next season's racing. This is even more so now in view of the complete absence of any sort of test facilities, and while an engine tuned on the bench does not necessarily provide the complete answer for racing conditions, it does very nearly, but if the engine can be induced to run satisfactorily at full throttle for some period it is conclusive proof of the condition of the engine and its ability to develop maximum power, and it is quite impossible to arrive at this information in any other way. Quite apart from the inconclusiveness of road testing, and its attendant dangers and inconveniences, one is wearing out a perfectly good motor car doing it, and for the very low fee at which we offer these facilities, the great financial saving alone that will result from obtaining this information quickly and efficiently rather than not obtaining it, but nevertheless undergoing a tedious and long drawn-out process of road-testing, can be readily seen.

The test will be carried out under the skilled supervision of qualified test engineers, and personally supervised by Mr. Monkhouse.

This letter applies, of course, to Bugattis in particular, but we should of course be happy to arrange and quote for similar facilities for other engines within the scope of our brake (up to 300-h.p., from 1,500 to 8,000 r.p.m.), particularly E.R.A.

I am, Yours, etc.,

p.p. Monaco Motor & Engineering Co., Ltd.,

P. R. MONKHOUSE,
Managing Director.

Watford.

* * *

Sir,

I was interested in the article by "Baladeur" in the November issue on the old de Dion, particularly concerning petrol consumption. My experience of the de Dion was largely confined to the earlier 4½-h.p. model. Although the larger model had the engine in front, I do not think that there could have been a very big difference in power-to-weight ratio or, for that matter, frontal area. Under the circumstances I would have anticipated the petrol consumption of the two cars to have been reasonably comparable.

In these circumstances I was very careful to check the consumption on the recent Veteran Rùn to Brighton. One and a half gallons being poured into an empty tank, the mileage, when the tank ran dry was, as nearly as possible, 67. I think you will agree that the weather conditions were scarcely ideal; added to this the fact that, with split-second time-keeping, it was frequently necessary to stand, with the engine ticking over, before entering the time check.

My normal experience with this car is that I get between 45 and 50 to the gallon and, in view of the fact that the last time certificates of performance were issued by the R.A.C. for this run it averaged 20.18 m.p.h., I can scarcely be accused of driving with petrol economy in mind. I think, therefore, that your correspondent will have to look for an explanation elsewhere of the 6-h.p.'s extravagance other than in "an automatic inlet valve at 1,600 r.p.m."

I do not think that this explanation will be hard to find.

I am, Yours, etc.,
R. C. PORTER.

London, S.W.13.

* * *

Sir,

I am enclosing herewith a photograph of my Stanley steam car which I think you may care to publish. Seated at the wheel is my friend Ralph Neville, of Nottingham, with whom I stayed during my 1,000-mile tour in August of this year.

During this journey I went as far north as Newcastle-on-Tyne to show the Stanley, in its restored condition, to the previous owner. I also took the gentleman concerned and his wife for quite a good run in the car.

I have also accomplished a business trip right through Cornwall to Land's End, and use the car regularly for business purposes in Bristol and district when the weather is not too bad. Needless to say the car creates quite a commotion, and wherever I go someone always asks, will I sell it.

I am, Yours, etc.,
LEONARD TAYLOR.

Portishead,
Somerset.

* * *

Sir,

Now is the time for clubs to plan some sort of scheme for race meetings next season, presuming, of course, that circuits will be available.

One suggested idea is to run racing and sports cars in the same race on a handicap basis. Personally I believe that this would impose an unnecessary danger on drivers of really fast cars, unless sports car drivers were vetted by the R.A.C. Competitions Department before their entries became acceptable.

On the other hand, I do think that individual handicaps would be a good thing for sports car racing. Naturally there would be the usual grumbles, but as the intrinsic value of awards would be negligible the true enthusiast won't care two hoots if his own handicap is somewhat unfair for initial meetings—clubs will soon be able to form an idea of individual performances after a couple of events. And after all said and done, to finish the season on the scratch mark in even short races of a few miles should give a driver more satisfaction than being given a bigger start after each meeting.

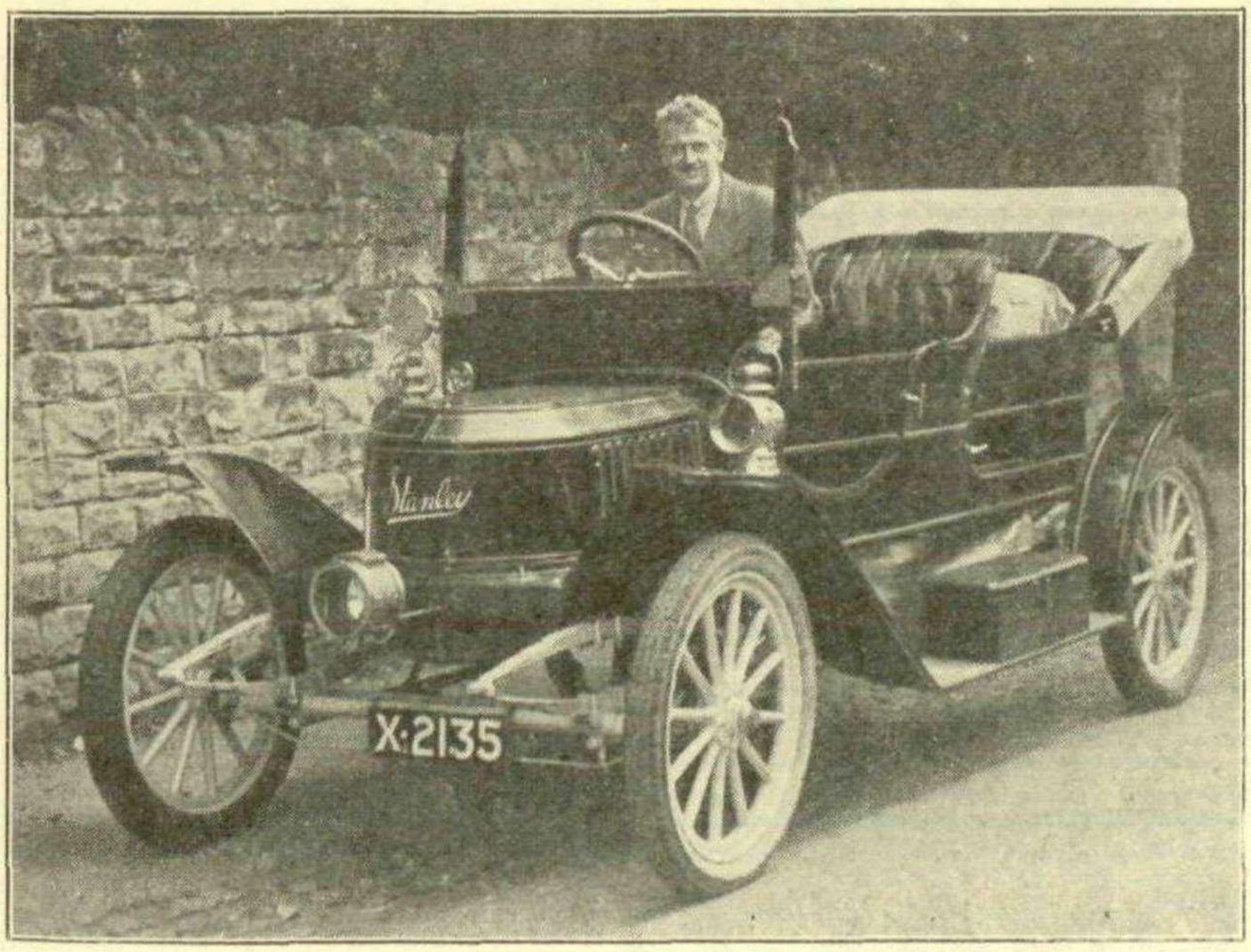
Generally speaking, handicaps in any form of sport are unpopular and unwanted, but, as in golf, horse-racing and rifle shooting, they are sometimes essential. I must confess that individual handicaps would probably be more advantageous to me personally than class handicapping, as the 3.5-litre Jaguar (yes, my car was licensed as such at the beginning of this year) is one of the smallest-engined cars in the 3-5-litre class, and has little hope, on paper (or on the track for that matter!), of competing with a Darracq or 4.9 Bugatti on equal terms.

Before the war some most enjoyable meetings were staged on the Manufacturers' Circuit at Donington, and although I think I was always on scratch I managed to pass a few more cars than if there had been class handicapping.

One final point; where the number of entries permit and individual handicapping is *not* employed, blown cars should be put into a separate class, sub-divided into engine sizes.

I am, Yours, etc.,
CYRIL MANN.

London, N.4.



Mr. Leonard Taylor's Stanley steamer, which will make many V.C.C. members envious

THE BRITISH GREEN

In view of the very fair manner in which Earl Howe dealt with the matter of the proposed change in the British racing colour from green to blue, we have withdrawn all correspondence on this subject. We feel that this will be in accordance with the wishes of those who wrote without full knowledge, and no further reference will be made to the matter in MOTOR SPORT *for the present.*

REPORTS OF RECENT EVENTS—
Continued from page 7

Uglow's H.R.G., amongst many failures. Imhof had a North Downs Eng. Co. Marshall twin-belt-driven blower on his Allard. Welfare had a baby's shoe dangling from the instrument panel of his Austin Seven—we conclude that the baby had fallen out on one of the sections, leaving at least *one* shoe behind to humour tradition; or perhaps the driver had merely provided for any eventuality.

Results not available at time of going to press.

CLUB NEWS—
Continued from page 21

petrol gauge registered "empty" for miles, and it wasn't until later that we discovered that the spare can on which we relied held *paraffin*) and that we returned the car next day and got back from Hornchurch in the Austin, in spite of its axle noises and a punctured spare tyre, although so pessimistic were our friends that we were quite relieved to reach home—actually, the little car is still running.

Next excitement was testing the "T.C." M.G. Midget, an excellent car and one in which it was grand fun to drive spiritedly along winding country lanes. Our experience of this M.G. also embraced a great deal of motoring in London traffic, and the test was interrupted to allow someone else to sample it, what time we had an eventful night run down into Sussex in another car, getting lost in the wilds after leaving the deserted main street of Billingshurst and seeing a "Danger-Floods" notice in the nick of time by the light of the Notex.

CLASSIFIED ADVERTISEMENT SECTION

RATES (prepaid) 1/6 per line

Minimum 3 lines
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In future all Classified Advertisements should be sent, not later than the 20.h of the month, to 15-17, City Road, E.C.1

FOR SALE

MONOMARK Service. Permanent London address. Letters redirected. 5s. p.a. Royal patronage. Write Monomark BM/MONO6V, W.C.1.

ASTON-MARTIN 1934 "Le Mans" 2/4-seater. Engine recently overhauled at cost of £60. New hood, side curtains, tonneau cover. £550. Seen Hampshire. Box No. 1, MOTOR SPORT, 15, City Road, E.C.1.

FIAT 11-h.p. "Balilla" Mille Miglia 2-seater. £350. Vintage 4-seater wanted. Jackson, 38, Woodlands, Girton, Cambridge.

RILEY 1,100-c.c. racing single-seater, Zoller supercharged engine. Approx. 150 b.h.p., road speed about 130 m.p.h. Weight approx. 6½ cwt. Fully independently sprung all round. Porsch front axle, rear swinging half-axles. Torsion bar controlled. Huge ribbed 16-in. alloy brakes, Lockheed leading shoe. Body alloy streamline copy of Mercédes-Benz, including spare engine, gearbox, brakes, etc. Price £1,000, or exchange for any good private car and cash. Seen any time, any day, Onslow Bartlett, Eagles Nest Lodge, Exeter Road, Bournemouth.

1910/11 SUNBEAM model "12/16" suitable for Veteran events. Is a runner but needs rebuilding. Ken Wharton, Hume Street, Smethwick 0613/4.

KEN WHARTON wishes to dispose of his 750-c.c. Wharton-Special. This car can be made the fastest 750-c.c. sprint car in the country. Genuine reason for sale. Full details. Only interested purchasers apply. Ken Wharton, Hume Street, Smethwick 0613/4.

3-LITRE Sunbeam. Cylinder block cracked. Two-seater body by James Young & Co. Six wheels and tyres. In superb condition but requires new block. Complete with full equipment, £100. Apply Barling, Alfrick Court, Worcester.

ENTHUSIAST'S 1936 Talbot "105" 21-h.p. 2/3-seater. Suitable town or sports. Practically everything new, including appearance. About £500. Full particulars, history and photographs to genuine enquiries. 22, York Road, Birmingham 16. Edgbaston 3130.

BENTLEY 3-litre "Blue Label" open tourer. New front axle, single Solex, sound. £200. Box No. 8, MOTOR SPORT, 15, City Road, E.C.1.

FOR sale, 1926 Dis. "14/40" Delage open 4-seater, remarkable condition, many spares. Nearest £300, exchange. V. Axel-Berg, Little Morton, Brockenhurst, Hants.

WORKSHOP equipment, including 1½-in. screw-cutting lathe, ⅝-in. pillar drill with many drills, large vice, 9 ft. wood bench, many hand tools and miscellaneous equipment. Also 12v. horn and w/s wiper, spotlight, Norton and Rudge spares, including sprockets, Martlet 11 : 1 piston, Amal twin-float chambers. Write or call for full particulars. Bayly, Laurels, Steeple Claydon, Bucks.

FOR SALE—*continued*

RILEY Brooklands "Imp" in first-class mechanical condition, recently overhauled Riley works, aero screens, new all-weather equipment, bodywork as new (scarlet). An exceptional car, £525. Leeson, Iverley, Stourbridge. Hagley 9234.

RILEY Nine four-seater sports, excellent engine, good tyres, bodywork resprayed grey, green leather upholstery, brand-new all-weather equipment. First £250. Leeson, Iverley, Stourbridge.

GRAND PRIX BUGATTI
SPARES AND SERVICE
F. O. CLEVELAND HARMER
Bugatti Specialist
83, Old Oak Road, Acton, W.3
Shepherds Bush 5022

MORRIS Eight 1935 two-seater sports, good engine, bodywork red, black wings. £185 to clear. Leeson, Iverley, Stourbridge.

RILEY Nine Ulster "Imp" team car, excellent condition. Weatherley, 6, St. George's Terrace, Perranporth.

B.M.W. o.h.v. 600-c.c. engine, clutch, gearbox unit with all electrical equipment—as new. Box No. 2, MOTOR SPORT, 15, City Road, E.C.1.

BENTLEY 3-litre "Red Label," 1927-8, short chassis, excellent condition. £450 or offer. Particulars from Box No. 3, MOTOR SPORT, 15, City Road, E.C.1.

VINTAGE enthusiast reluctantly compelled to part with 1927 Vauxhall "14/40" open tourer. This car is absolutely as standard, with 4-speed r.h.-change box, superb 4-wheel brakes, Rudge knock-on hubs, triple-spoked wheels, two new tyres, new hood, sidescreens and battery in September last year, new radiator muff, replated headlamps, reflectors, etc. A very handsome car. £175. Also Vauxhall "30/98" "E"-type, less body but with four almost new M.P. tyres. £95. Sutton Coldfield 2527.

LAYSTALL
for
CRANKSHAFTS

GUY GRIFFITHS
Motor Racing Photographs,
11, NEWLANDS AVENUE, THAMES DITTON, SURREY.
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FOR SALE—*continued*

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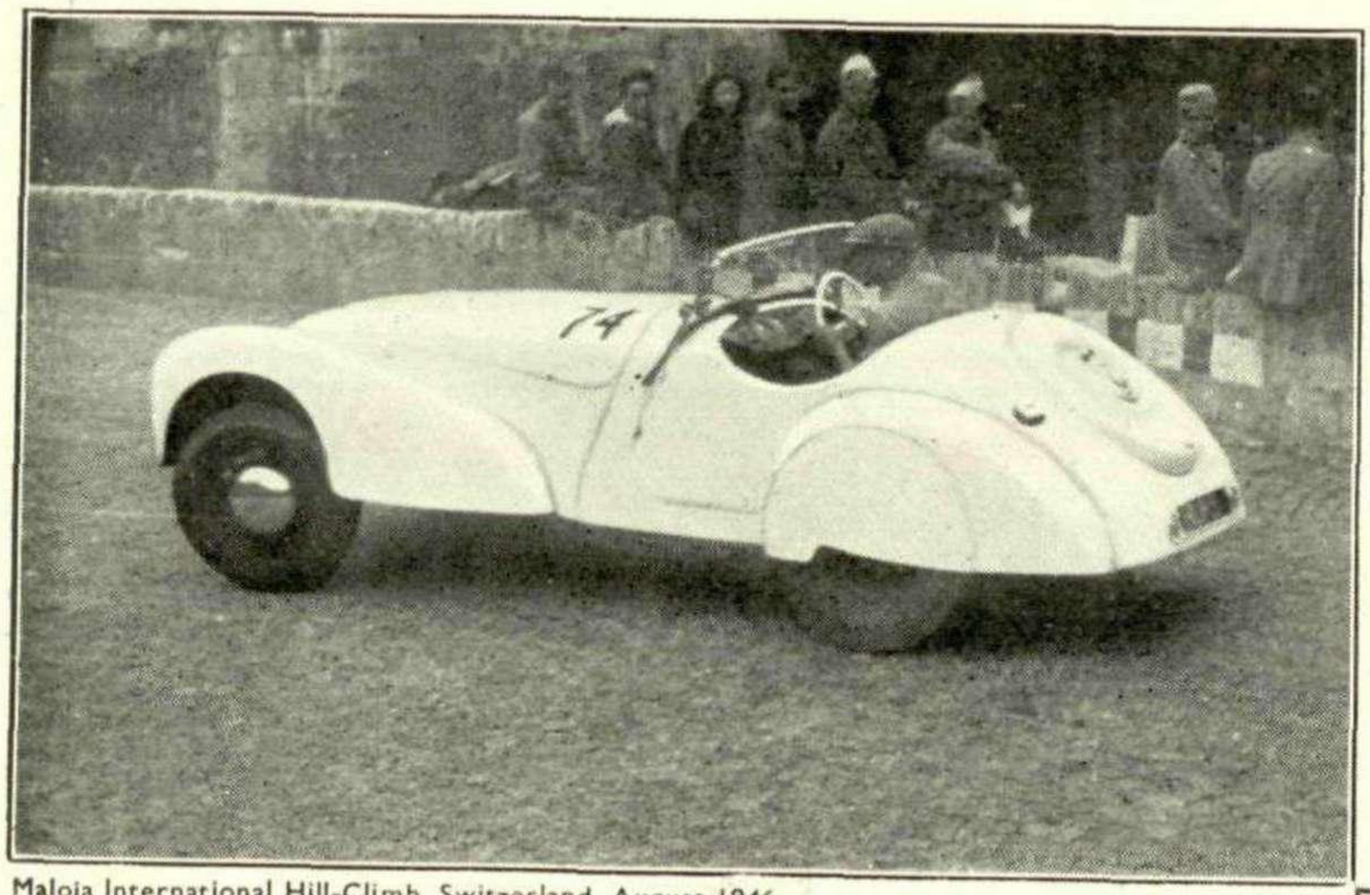
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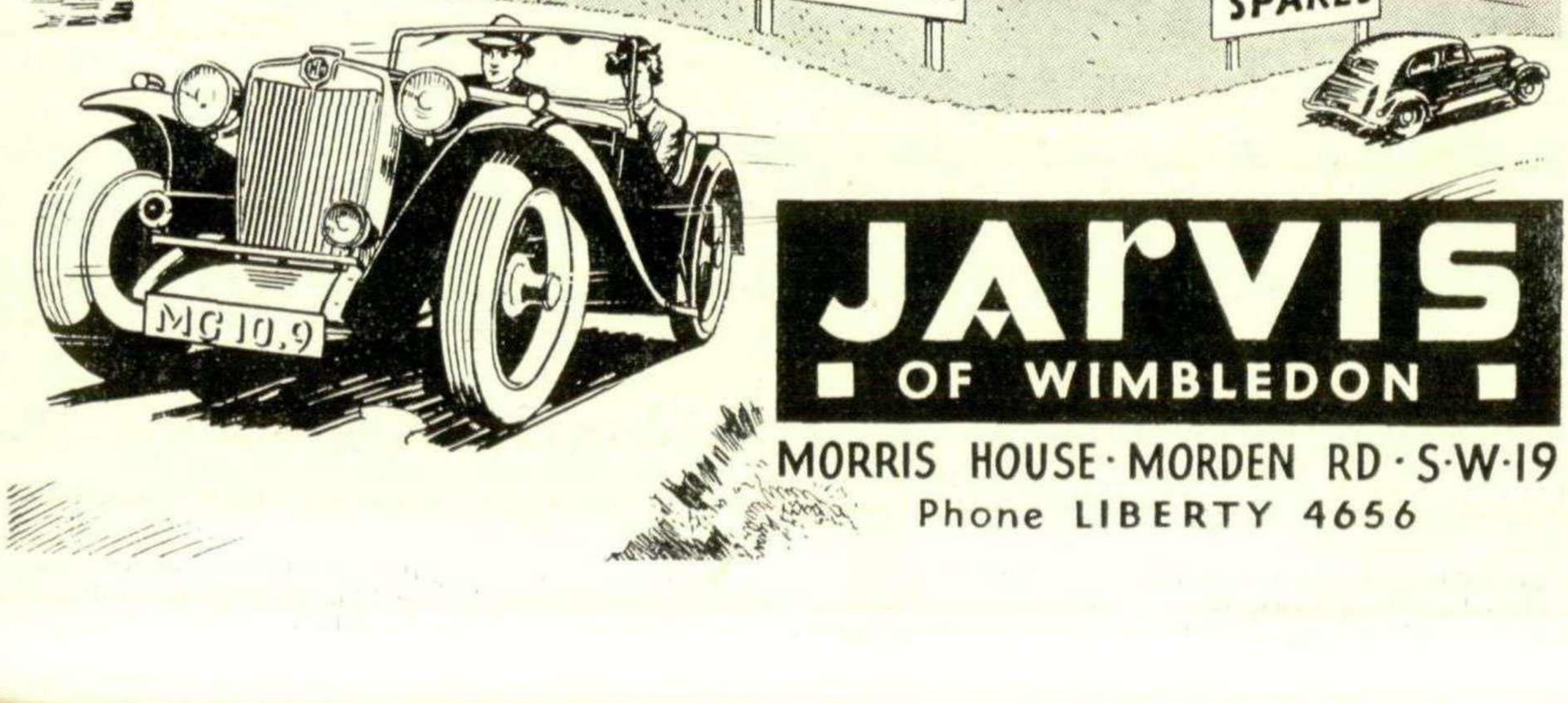
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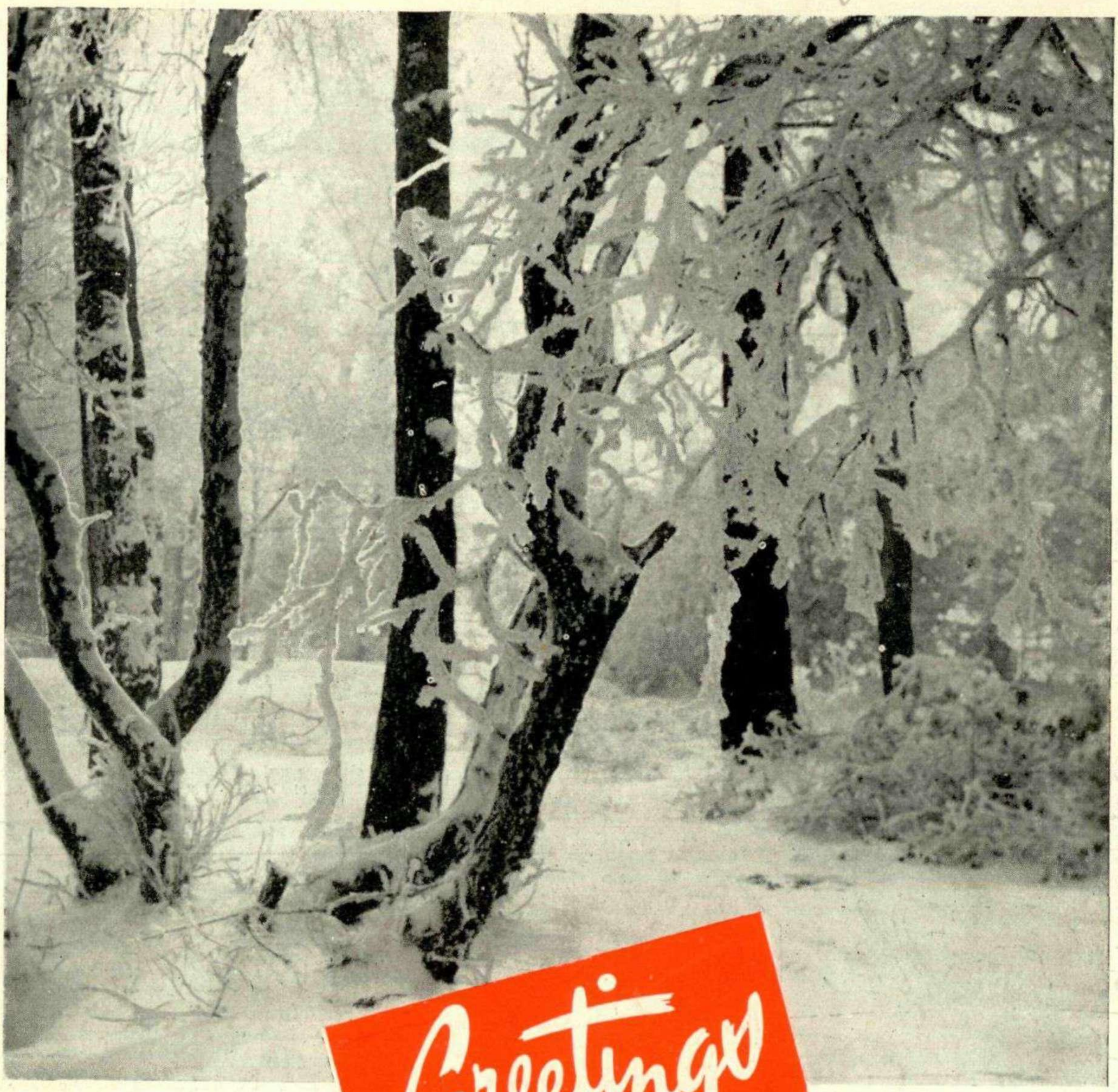
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