

A well-known competitor at Vintage race meetings, A. G. Lewis takes his 1929 overhead-camshaft A.J.S. into a corner at Cadwell Park. The massive chain drive for the camshaft has been a characteristic of all A.J.S. racing singles

## The cammy AJS

A T.T. Replica machine was the prize possession of most of the "sporty boys" of the late Vintage and post-Vintage era and of the several examples made, the "cammy" A.J.S., to me at any rate, was the most glamorous. For actual performance and success in racing, it was no doubt surpassed by the camshaft Norton, the Model 90 Sunbeam and the Replica Rudge—and of course by the KTT Velocette as far as the 350 c.c. class was concerned—but ever since I owned my first, a 1929 three-fifty, the model has always fascinated me, and the history of the o.h.c. A.J.S., in all forms, is an interesting one.

In checking information and obtaining further details of the models I went for help to George Rowley who, until recently, spent the whole of his working life with the marque and who had a long and successful riding career, not only in racing circles but in trials such as the I.S.D.T. Most people with any ideas on the subject would probably say the first overhead-camshaft A.J.S. was produced for the 1927 T.T., but in fact an experimental engine was built as early as 1920 and tried out at speed trials at Blackpool and Colwyn Bay. It was rather a crude affair. The camshaft was run across the two plates which normally carried the o.h.v. pushrod-operated rockers and worked out in the open on to rockers adapted for the job. The camshaft, as on every o.h.c. A.J.S., was chain driven, but with all working parts exposed, the indifferent steel available, and virtually no lubrication

except that applied before the engine was run, the wear rate was colossal; and so the "cammy" idea was abandoned for the time being.

But the 1927 T.T. machines were a different proposition altogether. The engine was an entirely new design although the original bore and stroke of the pushrod engines were retained—74×81mm for the three-fifty and 84×90mm for the five-hundred. The camshaft chain was enclosed in a massive alloy casing which ran up the side of the cylinder barrel and gave the engine its characteristic appearance. That feature, at any rate, was retained right up to modern times. So was the Weller steel tensioner, which compensates for different loadings as the valves are opened and for expansion as the engine warms up. The cambox, flat on top and rounded underneath, rested on extensions of the cylinder-head holding down bolts, and the camshaft ran centrally across the head.

For lubrication, the engine had a dry-sump system—already tried as early as 1924—and force feed to the cambox. But at this stage there was no scavenger pump and although oil was

supposed to return via the camshaft tunnel, much of it escaped to the great outdoors. The result was that consumption was rather excessive and sometimes, before a rider realized it, insufficient oil was getting to the big-end, with obvious consequences. The bikes were fast (80-90 m.p.h.) but acceleration was rather poor. Nevertheless, Jimmy Simpson brought one home third in the Junior in spite of having to stop and disentangle the primary-chain guard when it broke loose and became mixed up with the chain and sprockets.

Another interesting feature were the gearboxes which were four-speed when most other racers had only three. But they were still operated by hand, with a car-type gate at the side of the tank.

The first production camshaft models came the following year and the engines, at least, resembled the T.T. units. They were designated K7 (350 c.c.) and K10 (500 c.c.).

### Misunderstanding

Before I continue I might mention an apparently general misunderstanding as to the numbering of the camshaft Ajays. The three-fifties always had the number 7 and the five-hundreds the number 10. Up to the time when the old Wolverhampton firm of A. J. Stevens went into liquidation, there was a prefix letter according to the year—K was 1928, M—1929, R—1930 and S—1931, but no camshaft models were made in 1932. When the model was re-introduced by Matchless in 1933 it became the 33/7 and 33/10 respectively. The following year they were 34/7 and 10, and so on up to 1939, except that the five-hundred was dropped after 1937. The 1938 and 1939 models had R added to the model number and so were 7Rs . . . exactly the same as their illustrious post-war brother, the Boy Racer. Many people think the early camshaft three-fifties were designated R7, but the only R7s were the 1930 three-fifties.

General layout of the 1928 production models followed then-current A.J.S. design—straight top-tube open-diamond frame, side-spring Druid type front forks, and the normal A.J.S. three-speed gearbox, but with close ratios and no kickstarter. But there were several features exclusive to these models. The flat tank carried petrol only (two gallons in the five-hundred, 1½ gallons in the three-fifty) and had a distinctive “tank-top-tummyrest-toolbox” which was considered very sporty looking in those days. Oil, contrary to the layout of the other models, was carried in a separate tank on the saddle tube, the dry-sump system having been retained. No doubt they had improved the oil-tightness since the T.T. The three-fifty was priced at £65, the five-hundred at £76 15s.

For the T.T. in 1928 the firm reverted to pushrod engines, as the camshaft design was considered as not sufficiently developed for racing. But development went on and the camshaft models were again in the range for 1929 and were raced in the T.T. From then on all racing A.J.S. engines were o.h.c. from the original design by Harry Stevens.

### Changes for 1929

The entire A.J.S. range underwent considerable alteration and improvement for 1929 . . . new frame with saddle tank, new centre-spring fork and many other minor modifications. But the price was reduced, to £62 for the three-fifty and £72 for the five-hundred.

The camshaft T.T. machines were similar to the production jobs in general appearance, but were in fact considerably altered. Bore and stroke were changed to 70×90mm for the three-fifty and 79×101mm for the five-hundred—in other words, they became “long strokes,” fashionable at the time. (The Norton was 79×100mm and remained so for many years to come.) The frames were of standard design but dimensions were slightly altered to accommodate the taller engines. Later, an additional stay was added from the rear-wheel bracket to the bottom of the



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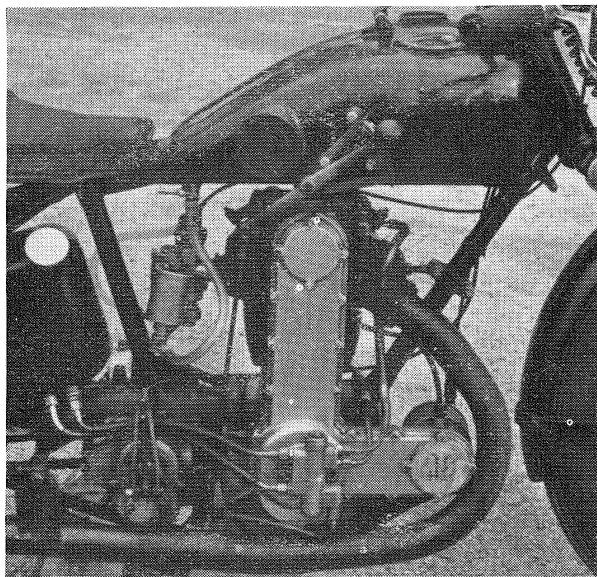
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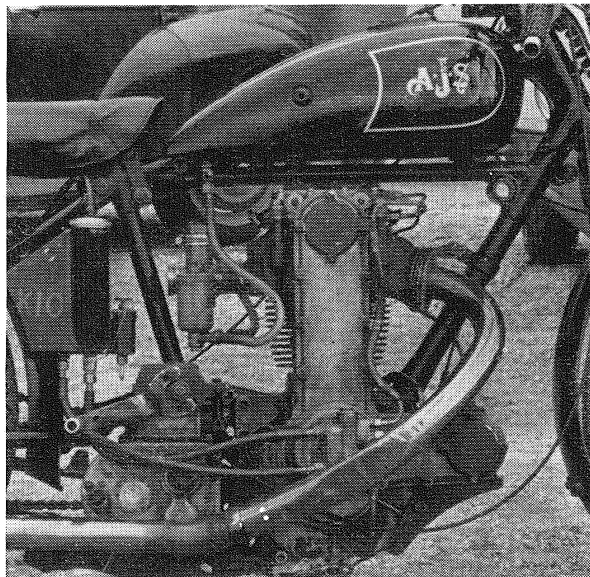
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## AGED BUT STILL VIGOROUS AJAYS AT A 1965 CADWELL MEETING



*A 1929 three-fifty M7 to original specification, apart from later carburettor*



*Although K10 (1928) appears on oil tank, this five-hundred is in fact 1929*

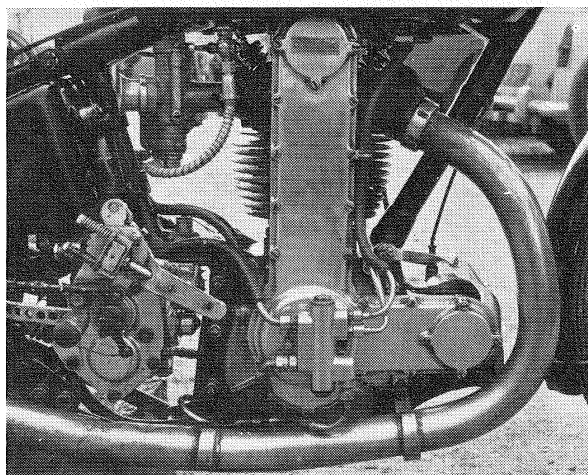
engine plate underneath the gearbox. The gearboxes were four-speeders again but worked from a conventional lever on the tank and did not have the 1927 car-type gate. Brakes were very large—8in front and 9in rear. The saddle tanks were of larger capacity than standard, holding 3½ gallons. Dry-sump lubrication was used but this time a scavenger pump was incorporated in the back of the cambox.

In the T.T. they gained a second place, with Wal Handley runner-up to Freddie Hicks (Velocette) in the Junior Race. In Continental grands prix following the T.T. they had considerable success in the hands of Leo Davenport and George Rowley, finishing the season with first, second and fourth in the 350 c.c. class of the Ulster, winning at record speed and gaining the record lap.

In 1929 the A.J.S. firm began to take an interest in track racing and records which hitherto they had ignored. Nigel Spring—one of the first of the modern-style private sponsors and tuners—with Bert Denly as rider set about developing at the factory the camshaft Ajay for that specialized branch of the sport, and with considerable success. Between April 6 and September 28 1929, 117 world records fell to A.J.S., mostly at Brooklands and Montlhery. Most coveted of these was the One Hour which Denly took from Bill Lacey on August 3 at 104.51 m.p.h. It was a short-lived supremacy. Lacey got it back on August 30, recording 105.25 on his Grindlay-Peerless J.A.P. and then, before the year was out, Ernie Nott put the record up to 106.49 m.p.h. on his Rudge. Denly also had the two-hour record taken away from him by Rudge Whitworth when Ernie Nott and Tyrell Smith increased the speed from 101.26 to 102.9 m.p.h. a few days after they had secured the classic Hour.

All classes were tackled in this record-breaking business and for the sidecar categories special 598 and even 743 c.c. engines were built by stretching bore and stroke to the limit. Another impressive performance by one of these A.J.S.s that year was a 500 c.c. flying kilometre record of 118.98 m.p.h. On the same occasion a one-way flying mile was covered at 119.76 m.p.h. Record breaking continued during 1930 and Denly regained the One Hour with 108.6 m.p.h. and the 350 c.c. record with 104.52 m.p.h.

I have an engine and frame from one of these track machines, and it has been built up with standard 1930 wheels into quite a



*This 1930 T.T. five-hundred has linkage to reverse travel on Hicks-designed gear change*

potent Vintage sprinter. Although the history of this particular engine is not known—I hope to be able to trace it accurately one day—there is no mistaking its origin. One feature of these Spring/Denly machines was the special long barrel and connecting rod—about an inch longer than standard and T.T. engines—which together with the long stroke, gave them an extraordinarily “tall” look. To accommodate these engines in the frame, the two down tubes from steering head and saddle were especially long, and different engine plates were employed. Even so ground clearance, in spite of 21in wheels front and rear, is only about 1½in.

Apart from their smaller machines for track records A.J.S. also built in 1930 an o.h.c. vee-twin of 1,000 c.c. for an attempt on the world's record. The engine consisted really of two camshaft five-hundred top halves except that the heads were of light alloy with steel valve seats, set at 50 degrees on a common crankcase. A forked connecting rod was used, with a bridge piece as a tie across the base, and the big-end consisted of four rows of rollers in Duralumin cages. Both exhausts ports faced forward, the pipes coming out on each side of the machine, and

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# The cammy AJS

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of course two carburettors were fitted, the machine at that time being unblown. A Sturmev-Archer three-speed gearbox was fitted, with positive-stop foot control.

The engine and gearbox were housed in a massive cradle frame with a 2½-in-diameter top tube. A T.T.-type girder fork was fitted but with extra large links and dampers; the handlebars were in two sections held in clips below the level of the top head race. The wheels, too, were pretty hefty, the hubs being machined out of solid steel bar. As on the track machines, no front brake was fitted and in fact the vee-twin resembled a track machine and did not look freakish in any way.

The first time it was tried out was on open roads near Wolverhampton, but after that most of the testing was actually done at Brooklands. Capt. O. M. Baldwin was the rider chosen for the record attempt which was made at a records meeting at Arpajon in August 1930. The "course" used for these Arpajon meetings is a stretch of the main N20 running from Paris to Orleans, closed specially for the occasions. If you are travelling on this road today you will notice the village of Arpajon just beyond Montlhery, near the famous specially constructed track. It is a dead straight stretch of road with a slight incline approaching the measured "course," but it is not very wide by modern record venue standards.

The world's record at that time was held by the German Ernst Henne on a B.M.W., with a speed of 134.68 m.p.h. The best the A.J.S. could manage was 130.5 m.p.h., but as a matter of interest Joe Wright, riding the O.E.C.-Temple-J.A.P., very nearly beat it with a speed of 134.51 m.p.h., achieving 142.3 on one run.

The 1930 production camshaft models followed 1929 T.T. machines in having the new bore and stroke; in fact, this part of the design then remained unaltered up to the war. Also fitted were the larger brakes, the additional frame stay, and the scavenger pump in the cambbox. The maroon panel in the tank, a feature of the 1929 models, was dropped and from then on the traditional black and gold-lined tank finish remained unaltered on the cammy models up to 1939.

As far as 1930 T.T. models were concerned, the engines were altered only in detail, but a new frame with massive single top tube and fork incorporating idler bearings for the spindles were built. These machines were the work of Freddie Hicks who joined A.J.S. in 1930. One of them, which is now owned by Dan MacDiarmid of Luton, was described in our April, 64 issue. In addition to the Junior and Senior machines a Lightweight (250 c.c.) version of the now famous camshaft engine was produced and it gave one of the most famous of T.T. riders, Jimmy Guthrie, his first T.T. win. Another machine finished fifth. The two-fifties were not used after 1930, and no production model was made, but one of the T.T. bikes at least was used for some years afterwards, distinguishing itself at grass-track meetings in the South.

Although camshaft machines were shown at Olympia at the end of 1930 and listed as 1931 models, prices now up to £80 and £90, as far as I can make out, few, if any, were made or sold. Fred Hicks and George Rowley entered for the T.T., with some factory backing, but not as official A.J.S. entries as by then the firm was beginning to feel the effects of the depression which hit the motorcycle industry. Some improvements had been made on the engines, including draught inlet pipes, but they were virtually 1930 machines. In the Junior race Hicks retired with engine trouble after lying third and Rowley finished ninth. The Senior race was disastrous. Poor Hicks, battling gallantly to keep up with the all-conquering Nortons, was killed on the fifth lap at Union Mills while in fourth place. George Rowley had already retired on the second lap. Not long after the T.T., the

Wolverhampton factory closed down and no more camshaft A.J.S.s were to appear for two years.

When Matchless Motor Cycles took over A.J.S. in 1931, George Rowley joined the firm too, but was told by the Colliers—No racing! And thus there were no camshaft models in the A.J.S. range from Plumstead for 1932. But Rowley did ride in trials, and in the International Six Days that year was a member of the winning Trophy team, riding what was, to all intents and purposes, a T.T. A.J.S. suitably adapted for the job. During 1931 another of the T.T. machines unexpectedly turned up. A letter arrived at Plumstead from Cooks, the travel people, saying that they had a racing machine from the Continent awaiting collection. In those days transporting racers from one Continental race venue to another was left to Cooks, and for some reason this one—a three-fifty—had been left in Italy, and, somehow, forgotten. Cooks asked for a bill of £10-odd for freight charges, to be paid first, but Matchless said they did not want to know. . . . Rowley decided it would be a pity not to get hold of the bike so he took it upon himself to pay the bill and had the A.J.S. stored away in a quiet corner of the factory, lifting the dust sheet occasionally for a nostalgic look. On one occasion he got the A.J.S. out, started it up and found everything in order and ready for racing.

In those days George Rowley spent a lot of time at Brooklands, testing new machines and prototypes, and some time in 1932 he was talking to some of his old track pals when the subject of the 100 Mile Grand Prix, due to be run in the near future, came up. He got the irresistible urge to ride again—he had won both 350 and 500 c.c. classes in 1930. So, without any fuss, he entered the T.T. three-fifty in both classes.

Unfortunately for George his entry earned him embarrassing publicity. Did Rowley's outing mean, one news-hound inquired in print, that A.J.S. were going to race officially again? It all came to the notice of Harry Collier, and George had a strip torn off him in no uncertain way, but in the end he was allowed to ride. In fact, on the day, the Colliers turned up in force to see Rowley perform. He finished in both races—fifth in the Junior and seventh in the Senior (in the three-fifty he was slowed towards the end with petrol blockage caused by flaking of the inside of the rubber pipe from the tank).

On the following Monday morning, he was called into Mr. Collier's office and told that the directors considered his performance on Saturday "very creditable." They also considered that if a machine more than two years old and with no recent development could go so well, it might be worth starting racing again and developing the camshaft engine further. So that is how A.J.S. came to return to racing officially; if it had not been for George Rowley playing truant it might never have happened.

In preparation, therefore, for new T.T. machines, the cammy model was reintroduced, in the 1933 range—it was the policy then to sell racing bikes to the public to help pay for the racing programme. This 1933 model was sold in both "competition" and racing form and to commemorate Rowley's performance in the 1932 I.S.D.T. was named the Trophy model.

But in reality it was an entirely new model. One of the most obvious differences from the previous camshaft jobs was in the magneto; before it had been set forward, now it was behind the cylinder. There was a new frame, four-speed gearbox with positive-stop foot change, and the lubrication system included a scavenger pump mounted above the camshaft chain cover and driven by the offside of the camshaft—previously it had been incorporated in the nearside of the cambbox. The "competition" model was supplied with low-compression piston, upswept pipe and silencer and crankcase shield, while the racer had a straight-through pipe, rearward footrests, and a more highly tuned engine with three different pistons available to give compression ratios of 7.5, 9 or 11 to 1. The price, in either form, was £65 for the three-fifty and £70 for the five-hundred.

I should mention here that there was another cammy Ajay on sale, in either 1932 or early 1933, but it was sold only by Grays, the used-machine specialists. These were new and, as far as I know, are the only unused machines ever sold by that firm. The Grays camshaft models were a small batch of three-fifties built up by George Rowley and his assistants after they went to Woolwich and consisted of parts from the Wolverhampton factory of what would have been the 1931/32 camshaft model, together with some of the cycle parts of the current Plumstead Road machines. In other words, they were a cross between the old models with forward magneto and the Trophy models. They sold for about £48 and were pretty potent. I know, because I had one; but they also suffered from one or two annoying troubles. They had a scavenger pump for the cambox similar to the arrangement on the Trophy but the drive coupling kept coming adrift, with the result that the pump ceased to work and oil went everywhere. I had to replace three exhaust valves—they bent either through warping or touching the piston, but as this little trouble usually occurred at comparatively low r.p.m. it was difficult to see quite how this happened. I changed my model after about six months, for an ex-T.T. O.K. Supreme-J.A.P.

However, that is by the way. In 1933 there was no official T.T. entries but another attempt on the world's maximum was made with the vee-twin. This time it was supercharged, Joe Wright was the rider, and the attempt was made on Southport Sands. By then the record had been put up to over 150 m.p.h. by Henne. The A.J.S. was no faster than when it had been unblown, and Wright could not get within 20 m.p.h. of the record.

The name Trophy was dropped for the camshaft machines the following year and the factory concentrated more on the racing version of the model. One noticeable alteration on the 1934 production machines was horizontal finning on the cylinder head . . . all earlier models had vertical finning . . . and, on the T.T. bikes, hairpin valve springs were employed, with long holding-down bolts for the bi-metal heads.

For 1935, for the T.T. machines, there was some concentration on weight reduction, Electron and light-alloy being used for many components, with the result that the 350 c.c. model came out at only about 260 lb. But the sensation of 1935, as far as A.J.S. was concerned, was the introduction at the Olympia Show of a four-cylinder roadster. Once again it was the factory's idea to sell a machine to the public to help pay for what was ultimately to be the new 500 c.c. factory racer. In fact, none was sold and although the Show model probably never had any innards, a bike was completed and ran on the road . . . and a very handsome machine it was, too.

The capacity was 495 c.c. (50×63mm) and it was an air-cooled vee-four. Each cylinder had its overhead cambox with chain drive running up between each pair of cylinders. There were four separate exhaust pipes, but one carburettor to each induction pipe, joining the two pairs of cylinders. Twin magnetos were bevel driven from the offside of the crankcase. The engine fitted neatly into a frame which was almost identical to that used for the o.h.c. singles. A Burman four-speed gearbox was employed, and the girder fork, wheels and brakes were more or less standard. An interesting point is that the engine plates in front of the crankcase had provision for a dynamo or *supercharger if so desired!* The price (unblown) was to be £89 5s.

The four was raced in the T.T. in 1936 by George Rowley and Harold Daniell but without success and it did not appear again in the T.T. until two years later, when it was supercharged. But the blower was found to be more of a liability than an asset. Most of the time the engine was wasting power in driving the blower, without deriving any benefit. It was only at places on the course such as the straight from the Craig down to Brandish that sufficient "blow" was produced to have any effect. This, together with other factors, caused serious overheating and the next year, 1939, the four was water cooled.

In the meantime, the single-cylinder three-fifty camshaft models gradually progressed, improvements and modifications tried out in the T.T. being incorporated in the next year's production machines. New oil pumps, Burman gearboxes, check springs on the front forks, larger tanks, an inclined magneto platform were some of the alterations. In June 1937 a "new" three-fifty racer, to be available in limited quantity after the T.T., was announced. These were more or less exact T.T. replicas and were sold, including testing at Brooklands, for £87 5s. The frame, first used in the T.T. that year, was of double-loop type but with a single front down tube. Megaphone exhausts also appeared that year and were incorporated in the new overhead-camshaft model.

Spring frames were used on the 1938 T.T. models and the design consisted of short pivoted arms to which were attached spring boxes supported top and bottom by the main-frame tubes. But the 7Rs, as they were now designated, continued with rigid frames up to the war.

For the last T.T. before the war the four-cylinder, as already mentioned, was water cooled and had undergone considerable development in the hands of Matt Wright who took it over in 1938. It was now extremely fast but although installed in an improved spring frame it was rather a handful. The only man who could really tame it was the Blond Bombshell from Ireland—Walter Rusk. There was a lot of cylinder-head-gasket trouble in practice, which was finally cured but rather too late. The best Rusk could do was to finish 11th, while Bob Foster, riding the second four, was 13th.

The four had its moment of glory two months later in the Ulster Grand Prix which that year claimed, as it had done several times before, to be the fastest European road roace. Walter Rusk, riding the A.J.S., became the first man to lap at 100 m.p.h. He led the race from the start and gained a considerable lead over Freddie Frith (Norton) and Serafini on the Gilera four. On the third lap he achieved the magic ton but then had to retire during the next lap with a broken front-fork link. The four was very fast, but it was still difficult to hold, and Rusk's struggle to keep the model under control had caused the link to fracture! But that sort of thing never worried Walter. While practising, he used to say he could do with even more speed and when it was found that by gearing up the blower more power was produced, he kept asking Wright to "go up another tooth."

The test figures obtained by Matt Wright before the Ulster for the engine, which Matt was kind enough to show me recently, showed that it gave 55 b.h.p. at 7,200 r.p.m. and that maximum b.m.e.p. was 200 lb/sq in at 7,500 r.p.m. Compression ratio was 7.9 to 1, the blower pressure 19 lb/sq in and the top gear ratio 4.54 to 1.

The war stopped further development. Harry Collier designed a new engine in 1939—a three-cylinder—but eventually an entirely new twin, lying horizontally in the frame, came along . . . the Porcupine . . . but that is another story.

But I was not allowed to forget cammy Ajays, even during the war. While serving in the Middle East I came across a 1935 five-hundred in Cairo, bought it and kept it for a couple of years until the Afrika Korps kicked us out of Mersa Matruh. An Australian sergeant spotted the bike, tracked me down and wanted to know how I had managed to get hold of a cammy Ajay in such an unlikely part of the world. He turned out to be, back in civvy street, the A.J.S. agent in Tasmania. Moreover, he then owned the 1,000 c.c. vee-twin and held the Tasmanian speed record!

After the war the overhead-camshaft A.J.S. appeared in an entirely new form—as the Boy Racer—but as a postscript to the story of those pre-war 7Rs I should mention that at Haddenham, in June 1949, Bemsee put on a special six-lap race for three-fifty Ajays—and it was won by Ted Iffland on a *pre-war* model.

F. P. H.