

Legacy of a brilliant man

By Alan Cathcart



Racer Test

350cc AJS 7R and 500cc Matchless G50

ASK MOST enthusiasts what they consider to be the archetypal British racing single and the mantle will almost certainly fall on the Manx Norton. Yet the history of the AJS 7R and the Matchless G50 is almost as long and honourable — and by the time the AMC factory ceased all production of racing machinery at the end of 1962, the two models were very evenly matched with the Nortons. Despite this, and the longevity which sees so many Seeley G50s still in use in classic racing today, there is the feeling that the AMC single was never quite as good as the equivalent Manx. But, as so often, a closer examination of the facts shows that — certainly as regards the ultimate development of each design — this is an illusion.

Although the designation 7R was first affixed to a pre-war cammy AJS, when revived post-war the title was applied to

an entirely new design which bore little in common with its predecessor, other than that it was a 350 single with a chain-driven single overhead camshaft. Designed by Philip Walker, and intended to compete initially not with the Norton, but with the Mk VIII KTT Velocette, with which it shared identical bore and stroke dimensions of 74 x 81mm, the 1948 7R looked remarkably similar to the last of the line produced in 1962. With its duplex cradle frame, telescopic front forks and large conical hubs cast from magnesium alloy, the cycle parts changed very little over the years. However, the pool petrol in use at the time required a compression ratio of only 8.45:1 to be used, resulting in 30 bhp at 7,000 rpm.

Not surprisingly, this wasn't enough to cope with the Manxes and Velos, but the 7R quickly caught on among the clubmen of the racing fraternity at whom it was aimed. Though Jock West did some early testing, there is little doubt that most development work was carried out by the model's early customers — for the simple reason that AMC had allowed little or no budget for such a programme of its own! Notwithstanding this, the 7R's popularity was such that it quickly received the epithet of 'Boy Racer' and was gradually improved while campaigned with success over the next five years. Matt Wright in particular must be credited with the early development.

In 1953 a major redesign took place, entailing a completely new frame with narrower cradle and a much more rigid engine/gearbox assembly positioning; this arrangement effectively remained unchanged until the end of production in 1962. The engine, too, was modified, and given a narrower crankpin and a more rigid bottom end. A development version was produced for the works team, and was known as the triple-knocker by reason of its three-valve head (two exhausts, one inlet). Though development costs persuaded the short-sighted AMC board to abort the project, it was on the triple-knocker that Rod Coleman gave the 7R its only TT win, when he took the Junior in 1954. In that same year, the most significant event in the 7R/G50's life occurred when the late Jack Williams joined AMC to take over the racing department.

I'm sure that Jack would not have minded my saying that he was always a development engineer first and foremost, and a designer second. Working on a shoestring budget, and often taking on the whole of the AMC management in

order to be allowed to do things his way, he wrought miracles with the two-valve 7R, whose finest moment up until then had been in the 1952 Manx GP, when Bob McIntyre won the Junior, and finished second in the Senior race on the very same machine.

Jack constructed his own test apparatus, including a dummy cylinder with a detachable wooden head to which could be fitted a variety of ports, the shape of which he altered with plasticine. Similarly, he also lined the inside of a cylinder with white cardboard, to find out what the flow of fuel was doing as it passed through the head; by mixing coloured dyes with the petrol he could see at a glance where the drops of mixture went inside the airstream. Years later, Dick O'Brien, the legendary Harley-Davidson engineer, updated this simple but effective concept by constructing a clear plexiglass cylinder to observe the same function when working on the XR750 engine.

If ever the rival Gilera and MV factories — or even their bitter competitors at Bracebridge Street — could have seen inside Jack Williams' race shop they'd probably have died laughing at his home-made equipment. But Jack's development feats deserve the greatest admiration. From 37bhp at 7,500rpm when he commenced work in the summer of 1954, he painstakingly wrought fractions of horsepower gains, until by 1962 he had achieved 42bhp at 7,800rpm with considerably increased torque and reliability.

These efforts resulted in an 'off the peg' racer that was fast enough to take on the best of the Italian factories without being disgraced. It was thus doubly ironic that one of the 7R's greatest assets — reliability — should desert it at two crucial moments when a Junior TT win was on the cards. In 1959 excessive vibration (later traced to the aluminium bridge-piece connecting the gearbox to the frame) caused Bob McIntyre to retire after he had given a big fright to the MVs of Surtees and Hartle, while in 1961 the gudgeon pin on Mike Hailwood's engine broke while he was leading on the Mountain on the last lap.

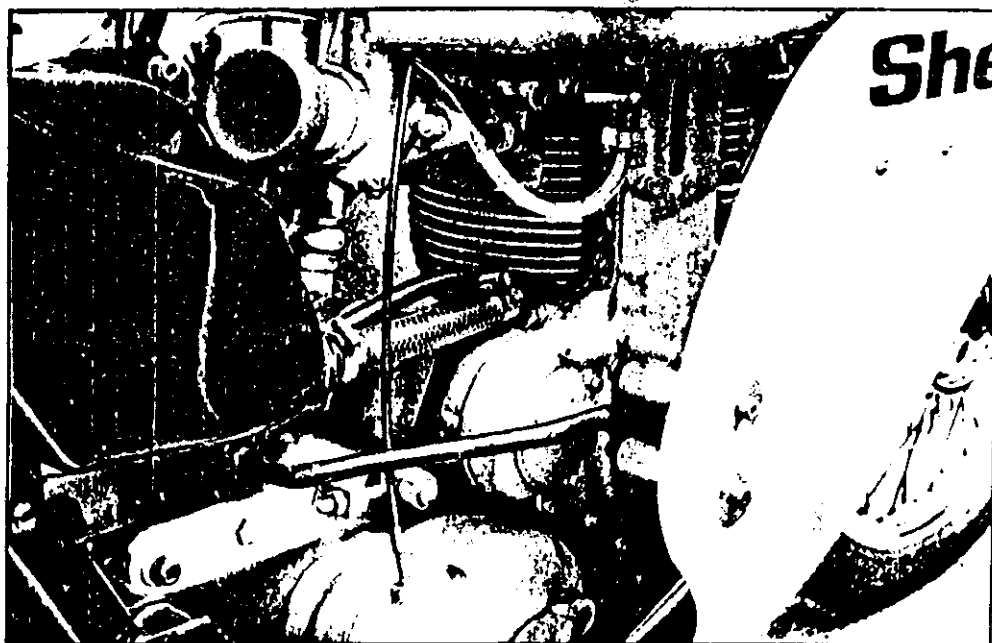
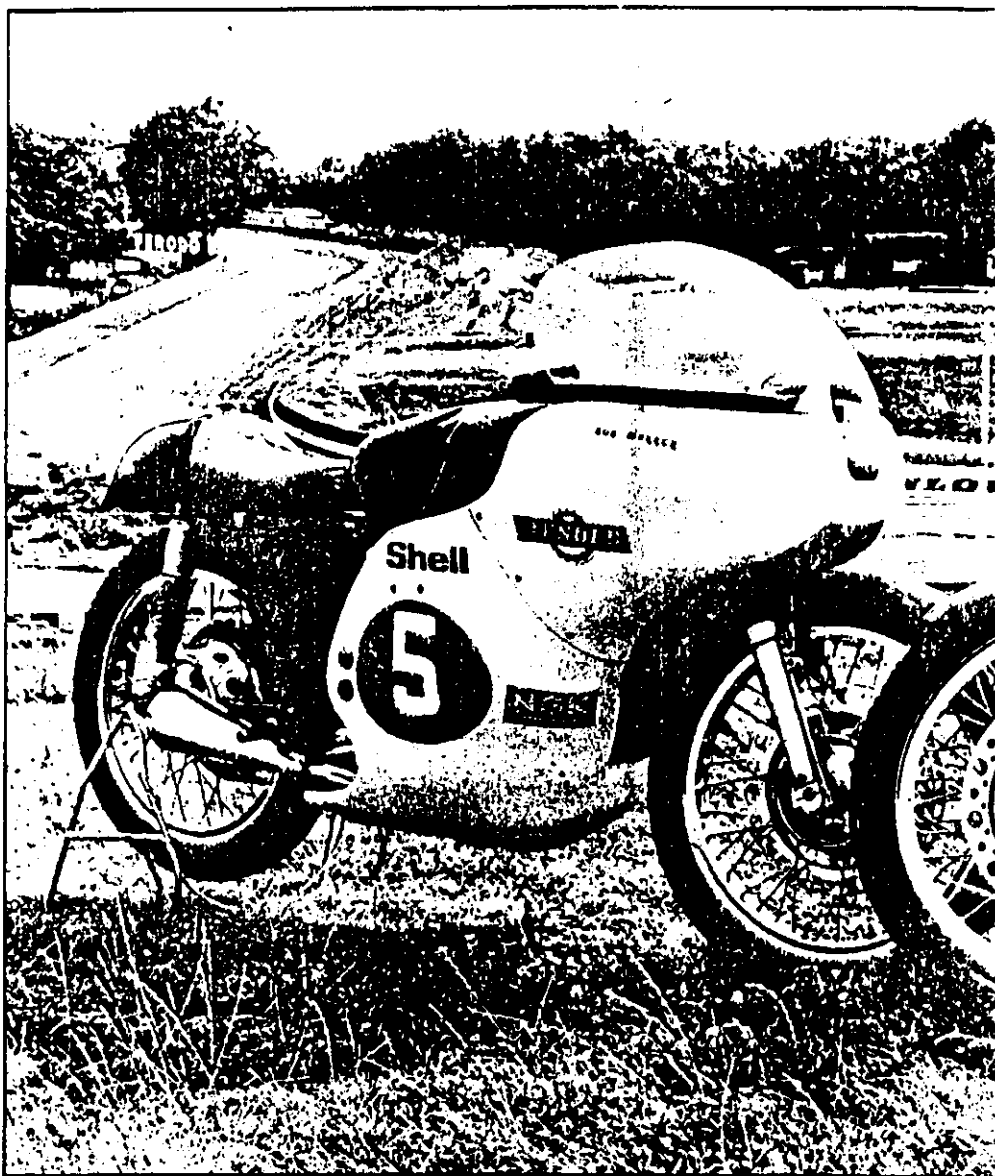
The two-valve 7R never won a TT, but its considerable success in the Manx GP and in the hands of private owners persuaded the factory to allow Jack Williams to produce a 500cc version. In 1956 the 7R engine dimensions had been revised to the near-square proportions of 75.5 x 78mm, permitting a safe rev limit of 7,800. In fact most riders regularly used

8,000rpm and more to 'bridge the gaps' in the four-speed gearboxes of that era, although Jack Williams always discouraged the practice as peak power was achieved at the lower limit. At any rate, when a 500cc model was announced in 1959, it proved to have oversquare dimensions of 90 x 78mm, and produced 47bhp at 7,200rpm on a 10.6:1 compression ratio. For marketing reasons it carried a Matchless badge, but it was surprising that AMC had not produced this version of their established 350 single sooner, especially in the light of the mostly disastrous experiences suffered by owners of their G45 Senior twin.

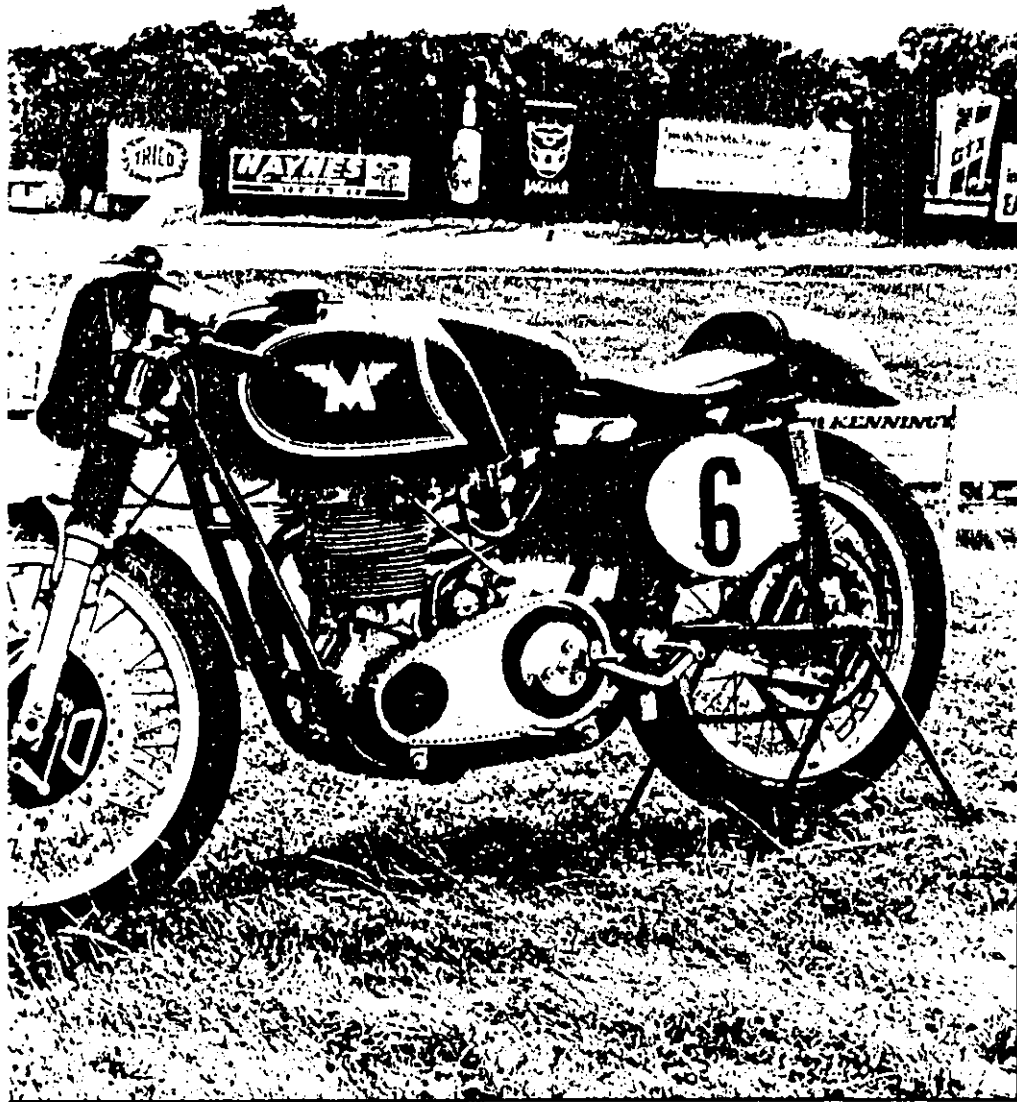
Although slightly slower than the equivalent Manx Norton, G50s proved much more reliable, and above all, easier to maintain, while some assiduous development work by Jack Williams soon had the machine fully competitive with the 500 Manx. He achieved this by following the same path he had used in refining the 7R, by meticulously improving the engine's breathing characteristics. The prototype unit in 1958 had used 7R valves, but, when announced in 1959, the exhaust size had been increased to 1 3/4in; for 1960, an even larger exhaust and a 1 7/8in inlet were used, when at this stage the engine was producing 51.5bhp at 7,200rpm. Weight was identical to the 7R at about 285lb dry.

For the last year of production, 1962, a 2in inlet valve was fitted, and engine power was up to 52bhp. However, this bigger valve resulted in a much less tractable engine, and the small-valve unit always gave much better acceleration. Other modifications for 1962 included the use of a forged piston, with a 1in gudgeon pin, as opposed to the sand-cast piston and 7/8in pin in the 1961 small-valve engine. Compression ratio was now up to 11.8:1, but these later machines definitely represented a backward step in two areas. The heavier reciprocating weight of the revised piston assembly resulted in a more difficult machine to ride, and a sudden loss of reliability arrived in the form of several cracked pistons (usually around the gudgeon pin base) and broken crank pins, the latter being caused by an incorrectly hardened batch. Thus the ultimate version of the Matchless G50 never fulfilled its true potential.

At the end of 1962 the AMC board discontinued the construction of both 7R/G50s and Manxes (Nortons were by now part of the AMC group). In 1966 the company finally went under, and the 7R/G50 patterns and rights became the property of ex-sidecar racer Colin Sealey. Although he completed a few machines from spare parts, as well as manufacturing a batch of engines to fit his own frames, production was very much on a limited basis. When Sealey in turn ceased manufacture in the early seventies, the supply of spare parts dried up completely. Given that fact, it's nothing short of astonishing that so many Sealeys and G50s should still be seen on British tracks today, since spares are not only so pre-



Engine of the test 7R was tested at 41.5bhp when first assembled, and was used to win the 1963 Manx GP.



PHOTOGRAPH JOHN WALLACE

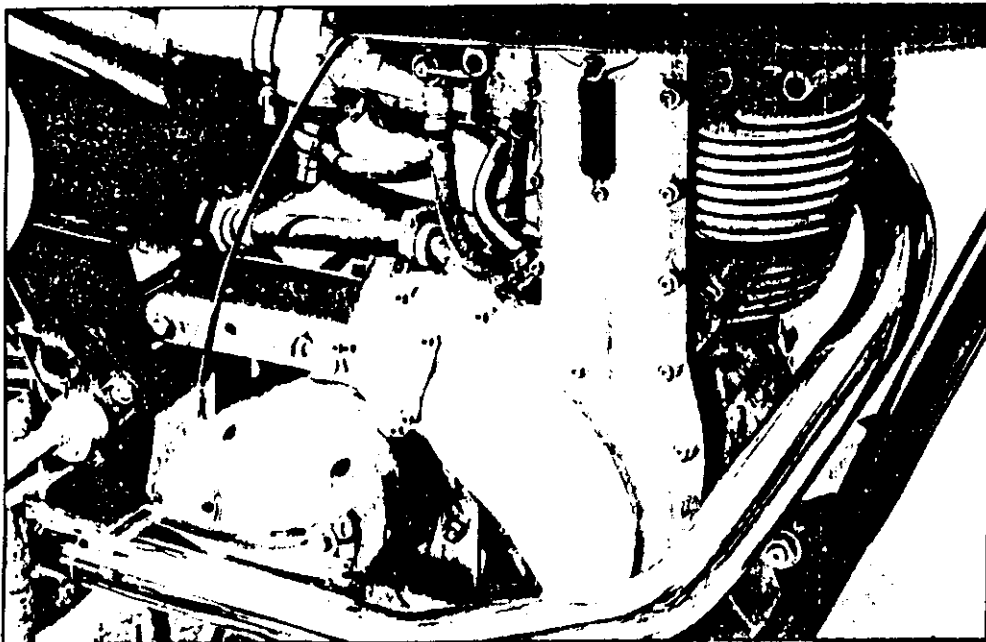
specially made. Precise factory records no longer exist for the construction of 7Rs and G50s. Perhaps a reader can assist with more specific information, but from talking to people who worked in the AMC racing department, it appears that about 475 7Rs were made between 1948 and 1962, and about 180 G50s in the four years from 1959. Added to this were the ten or 15 Matchless-framed G50s that Seeley made from spares, plus the 50 G50 CSR desert racers that the factory produced (and sold!) in 1960 as 'homologation specials' to enable them to race in AMA events in the USA.

At any rate, 1961 represented the apogee of development of the 7R and the G50, and it was by coincidence that the two machines I rode one sunny Wednesday afternoon at Brands Hatch were both manufactured in that vintage year. The G50 is my own, while the 7R is the property of Bob Warren and has a famous history. It was bought new by the legendary tuner Francis Beart, who had been keeping an eye on the development of the AMC singles as they crept up on the Manx Nortons. Francis' engine had been specially prepared by Jack Williams himself, and tested at 41.5bhp at the engine shaft.

The bike's greatest success came in the 1963 Junior Manx, when Peter Darvill won on it by over a minute, and took 30 seconds off the lap record, leaving it at 93.87mph. An amusing Beart anecdote concerning that event is that — at Francis' suggestion — Darvill had painted a red line on the rev counter at the 8,500 mark instead of the normal 7,800, realising that Tom Kirby, their greatest rival, was certain to come nosing around the machine in the warming-up paddock. Sure enough Tom did, and animated discussion ensued about the immorality of using 'works specials' in a clubman's race! What neither Kirby nor his rider Roger Hunter knew was that Darvill and Beart had already decided to use 8,500rpm for the first lap in order to open up a quick lead — and did in fact do so, much to Jack Williams' horror. The engine held together, though, and this was the only time that any of Francis' numerous wins on the Island was scored with anything other than a Manx Norton.

Bob Warren bought the bike in 1972, and has campaigned it successfully ever since. Amazingly, Francis Beart rebuilt the engine last year and discovered that its piston is still one of his specially-modified Wellworthy examples that has been running reliably all these years, including in at least six Manx GPs! The Peel 'Mountain Mile' fairing Bob has fitted adds a delightful period touch to the machine.

When I bought my G50 in 1975 it, too, had a Peel fairing, which served me in good stead in those early days of my racing career. I'm ashamed to admit that I fell off the bike at least half a dozen times, but never with any worse result



Handsome cover for the camshaft chain is a distinctive feature of both 7R and (pictured here) G50 engines.

than a bent footrest or gear lever, because each time I went down, the all-enveloping fairing took it like a man and practically bounced me back up again! I grew very attached to the 'Matchstick' that season, particularly as I won my first trophies with it, and after letting it languish in my garage for two or three years, I finally restored it last winter.

- For someone considering a similar project on a 7R or a G50, a few words of advice are relevant. First of all, have the engine rebuilt by someone with experience of these motors. Jim Boughen worked in the AMC race shop and experimental department for 14 years, and today prepares the fast and reliable winning engines used by Richard Cutts. Jim — he can be contacted on 01-310 1456 — rebuilt my engine beautifully — and only just in time. Though a small-valve motor, the piston was cracking under the gudgeon pin boss (where else!) and a new big-end was needed. After Seeley ceased production, G50 pistons became in very short supply, especially for the more potent small valve engines. German Mahle examples were used for a while, but these had a short life and were very

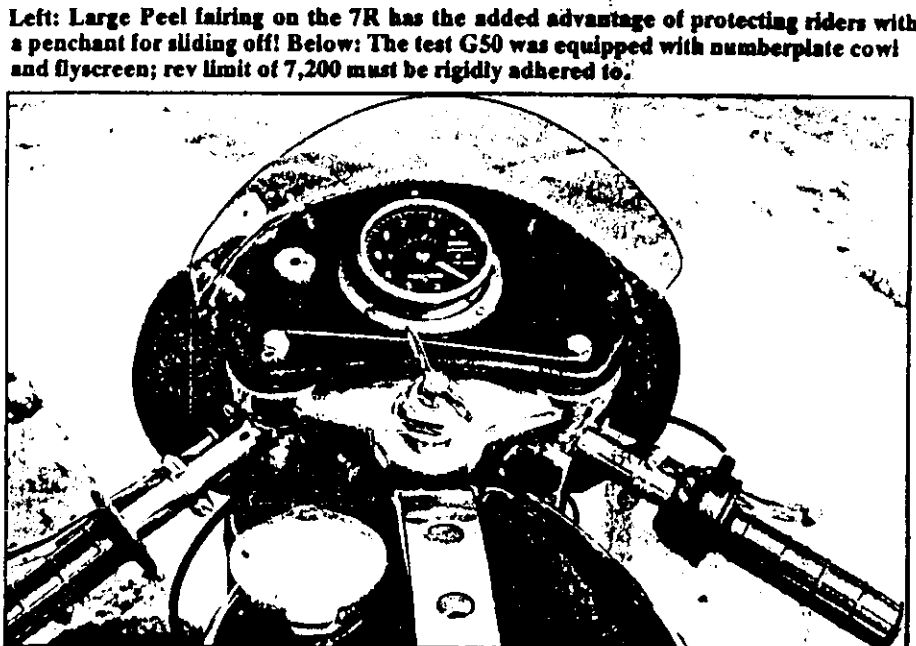
expensive. A new American Venolia piston has now gone into this engine: it's beautifully made and their superb reputation with all manner of racing machinery Stateside bears witness to the quality of their workmanship.

Though not a fetishist for originality (yes, I know those are Manx Norton front mudguard brackets!), I wanted my rebuilt bike to look authentic, so dispensed with the by now very battered Peel fairing, and purchased a front number plate cowl and screen from George Beale Motorcycles in Burton-on-Trent (tel: 216428). Though rather roughly made, these parts can be tidied up quite nicely, although the perspex screen comes flat and isn't too happy about being bent to a curve. Beale's also supplied the fluted alloy wheel trims shown in the picture, and can also provide replica seats, chainguards and exhausts.

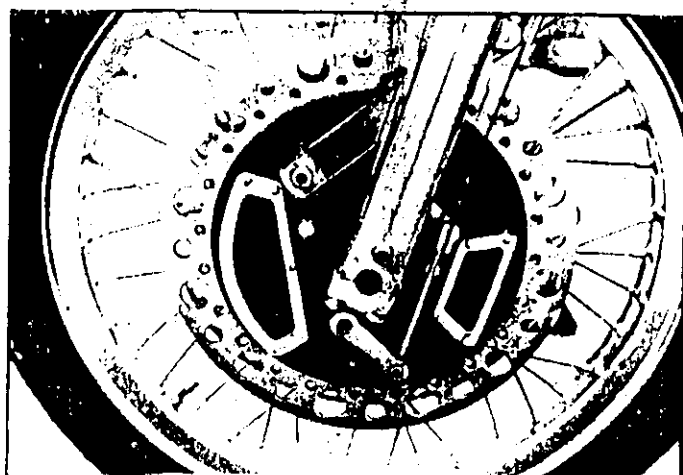
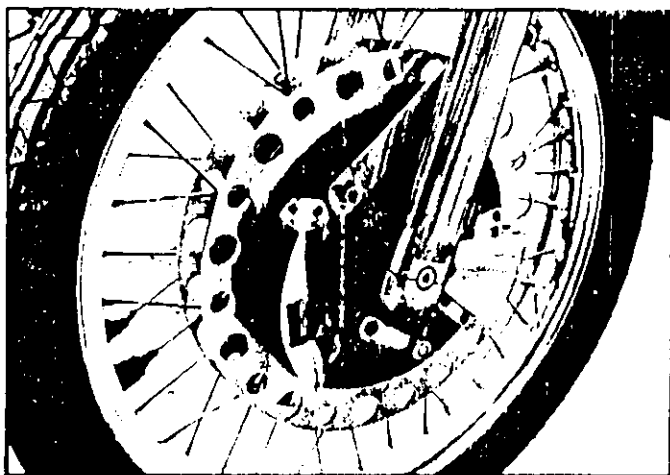
Almost any G50 or 7R engine will have several broken fins: this is because the material used was basically too brittle an alloy, unlike on the Manx Nortons where this problem rarely occurs. Ron Lewis, who rebuilt the cycle parts and is basically

responsible for restoring a very tired old racer into the practical classic seen in the pictures, managed to save the original head and barrel by the laborious but effective technique of welding-up and machining-down new fins. The result is as you see in the pictures — though I am obliged to say that after our test day at Brands one fin had already cracked again! On Bob Warren's bike the fins have been pegged, to some effect.

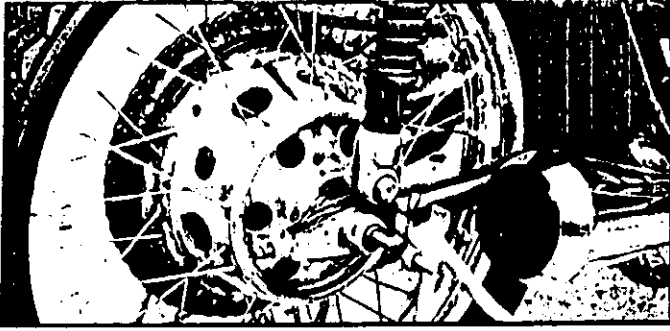
Reacquainting myself with the G50 on the track proved a nostalgic and highly enjoyable experience. Although not possessed of anything like such a famous history as Bob's 7R, the Matchless' previous owners had evidently looked after it and updated it over the years. The cooling ring on the front brake was a period 'accessory' offered by Francis Beart in his catalogue, which apparently proved very effective. The gearbox is fitted with a six-speed Schafleitner cluster, which transforms the machine and enables you to keep the engine continuously on the boil. This was our third session with the bike since the rebuild and it was by now fully sorted. It's as much of a delight to ride as I remembered, with a willing engine that



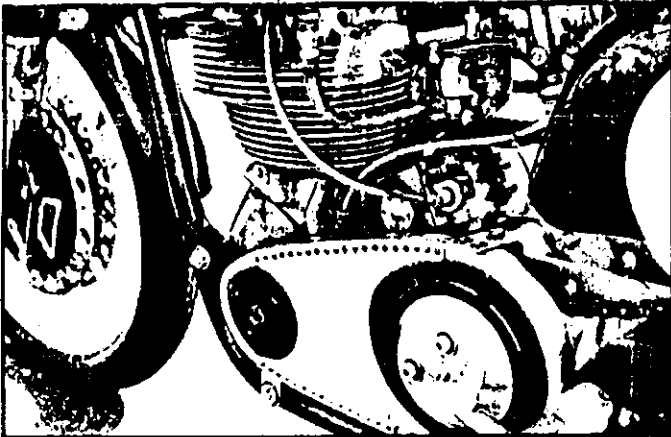
Left: Large Peel fairing on the 7R has the added advantage of protecting riders with a penchant for sliding off! Below: The test G50 was equipped with numberplate cowl and flyscreen; rev limit of 7,200 must be rigidly adhered to.



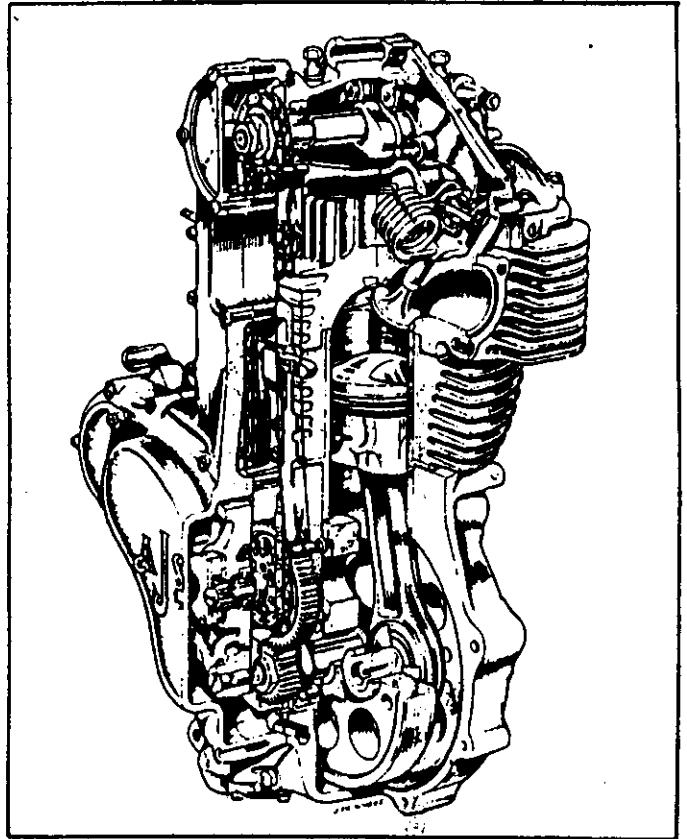
Both 7R (left) and G50 use a single-leading-shoe front brake, which is quite adequate. Cooling rings are non-original.



Seen here on the 7R, the rear hub is a massive casting in magnesium alloy.



G50 engine, like the 7R, is prone to suffer fin breakages, but original head and barrel on this unit were saved by welding-up and machining.



Originally designed by Phillip Walker, the 7R unit was later developed by Jack Williams into a competitive single that could occasionally trouble the Italian multis.

wants to rev well over the 7,200 rpm limit — but beware of dire consequences if you do, because even with a small-valve engine and meticulous Boughen assembly a bent valve awaits the careless or deliberately heavy-fisted.

Handling was superb and predictable over the twists and bumps of the Brands circuit, except on the descent to Bottom Bend, where the ripples caused the front suspension to patter when the bike was laid over for the left-hander — possibly a little more TQF hydraulic fluid is needed in the front forks. Surprisingly, for a machine fitted with a (slightly reversed cone) megaphone exhaust, megaphonitis is practically non-existent, though the six-speed gearbox does help you keep within the 5,000-7,200 rpm power band much more easily than would be the case with a standard four-speed gearbox. I must say that the riding position seems much more comfortable on both bikes than on Manx Nortons I have ridden, but perhaps that's a question of personal taste.

Bob's 7R had been fitted by a previous owner with an SU float chamber (a common modification in those days) in an attempt to cure the carburettor gremlins which this engine has always experienced. These had manifested themselves earlier in the day when Bob was riding, but decided to absent themselves for my stint. Remembering to turn on the primary chain oiler (R30 oil is carried in the top frame tube, and issues via a drip feed to lubricate the chain), I pulled back on

compression, gave a quick shove, and got away. No G50 or 7R was ever fitted with an advance-retard mechanism, nor an air lever, and neither is needed. These engines must, however, be warmed up carefully from cold with a soft plug, and the appropriate RL50 Lodge or NGK 9 fitted for racing.

Pulling away on the 7R I immediately discovered the major inhibiting factor that applied during its competitive life — the four-speed gearbox. Even allowing for the fact that I was only revving to 7,500 in deference to the elderly piston, the gap between the ratios was quite pronounced. First gear in particular seemed very notchy and — when I was forced to select it for Druids — much too low. No wonder people experimented with all sorts of unsatisfactory Swedish five-speed gearboxes to try to get round this problem, until the excellent Schafleitner clusters came on the market. A five- or preferably six-speed gearbox would transform this engine even more than the G50, whose bigger capacity and improved torque need fewer cogs. Bob's bike was better set up than mine in the handling department, and in spite of oil on the track at Bottom Bend, I was soon down to a 60-second lap (as opposed to 57.6 on the faster G50).

Nevertheless it must be said that the machine did seem rather slow and almost vintage after the G50. Megaphonitis was also quite pronounced, and encountered — because of the four-speed box — be-

tween 4,200 and 4,600 rpm. No wonder riders of the day used to over-rev the engines deliberately to try and avoid dropping out of the power range. Even so, the Peel fairing allows you to travel deceptively quickly, because sitting so totally enclosed as you are, it's more difficult to judge speed and distance than on an unfaired bike, and a couple of times I had to use the excellent front brake quite sharply to get round Paddock. Incidentally, top speed on a good 7R was between 115 and 120 mph, and on a G50, 125 to 130 mph (though Jack Findlay's McIntyre Matchless was once timed in the Island at 133 mph).

With their elegant, understated lines and beautiful detail work, the AJS 7R and Matchless G50 epitomise all that was best in British racing motorcycle design in the post-war period. To a certain extent, too, they represent the triumph of development over design: Jack Williams would surely have liked nothing better than to have started afresh with a clean sheet of paper when he took over the racing department at AMC in 1954. That the products of that department remained so competitive for so many years (Jack Findlay finished second in the 500cc World Championship on the McIntyre G50 in 1970) bears testament to Williams' tenacity and ingenuity, and the Seeleys appearing in club racing today, as well as original machines such as the two depicted in these pictures, are a living memorial to the success of his work.